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GLOBALISTICS AND GLOBALIZATION STUDIES

Global Transformations and Global Future

Leonid E Grinin, Ilya V Ilyin, Peter Herrmann, Andrey Korotayev

► **To cite this version:**

Leonid E Grinin, Ilya V Ilyin, Peter Herrmann, Andrey Korotayev. GLOBALISTICS AND GLOBALIZATION STUDIES Global Transformations and Global Future. 2016, 978-5-7057-5026-9. hprints-01794187

HAL Id: hprints-01794187

<https://hal-hprints.archives-ouvertes.fr/hprints-01794187>

Submitted on 17 May 2018

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GLOBALISTICS AND GLOBALIZATION STUDIES

Global Transformations and Global Future

Edited by
Leonid E. Grinin,
Ilya V. Ilyin,
Peter Herrmann,
and **Andrey V. Korotayev**



‘Uchitel’
Publishing House
Volgograd

Globalistics and Globalization Studies: Global Transformations and Global Future.
Yearbook / Edited by Leonid E. Grinin, Ilya V. Ilyin, Peter Herrmann, and Andrey V. Korotayev. – Volgograd: ‘Uchitel’ Publishing House, 2016. – 400 pp.

The present volume is the fifth in the series of yearbooks with the title *Globalistics and Globalization Studies*. The subtitle of the present volume is *Global Transformations and Global Future*. We become more and more accustomed to think globally and to see global processes. And our future can all means be global. However, is this statement justified? Indeed, in recent years, many have begun to claim that globalization has stalled, that we are rather dealing with the process of anti-globalization. Will not we find ourselves at some point again in an edifice spanning across the globe, but divided into national apartments, separated by walls of high tariffs and mutual suspicion? Of course, some setbacks are always possible, because the process of globalization cannot develop smoothly. It is a process which is itself emerging from contradictions and is shaped by a new contradiction. They often go much further than underlying systemic changes allow. They break forward, as the vanguard of a victorious army, and then often meet resistance of various social and political forces and may suddenly start to roll back just at the moment when everyone expects their further offensive. We believe that this is what is happening with globalization at present.

The yearbook will be interesting to a wide range of researchers, teachers, students and all those who are concerned about global issues.

The publication of this volume has been supported by the Russian Science Foundation (Project No. 15-18-30063 ‘Historical Globalistics: historical evolution, current state and forecast development scenarios for global networks of flows, interactions and communication, global processes, and planetary institutions, the role of Russia and BRICS’).

‘Uchitel’ Publishing House
Kirova Street, 143, Volgograd, 400079, Russia
Printed in Volgograd polygraphic complex “Ofset”
Kim Street, 6, Volgograd, 400001, Russia

ISBN 978-5-7057-5026-9
Volgograd 2016

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Contents

Introduction. How Global Can Be Global Future? (by Leonid Grinin, Ilya Ilyin, Peter Herrmann, and Andrey Korotayev)	5
--	---

Part I. Big History and Global History

<i>David Baker</i> . 10 ⁵⁰⁰ . The Darwinian Algorithm and a Possible Candidate for a 'Unifying Theme' of Big History	10
<i>Ken Baskin</i> . The Dynamics of Evolution: What Complexity Theory Suggests for Big History's Approach to Biological and Cultural Evolution	21
<i>Barry Rodrigue</i> . Retrofitting the Future	43
<i>Daniel Little</i> . Nation, Region, and Globe: Alternative Definitions of Place in World History	48
<i>Julia Zinkina, Andrey Korotayev, and Aleksey Andreev</i> . Mass Primary Education in the Nineteenth Century	63
<i>Julia Zinkina, Andrey Korotayev, and Ilya Ilyin</i> . The Nineteenth-Century Origins of the Global Secondary and Higher Education	71
<i>Peter Herrmann, Fan Hong, and Remi Rzepka</i> . Education in an International Setting	76
<i>Leonid Grinin, Ilya Ilyin, and Alexey Andreev</i> . Global History and Future World Order	93

Part II. Global Demography

<i>Jack A. Goldstone</i> . Population Ageing and Global Economic Growth	111
<i>Leonid Grinin and Andrey Korotayev</i> . Global Population Ageing, the Sixth Kondratieff Wave, and the Global Financial System	119
<i>Andrey Korotayev, Jack A. Goldstone, Julia Zinkina, Sergey Shulgin, Daria Khaltourina, and Daria Bykanova</i> . Mathematical Modeling and Forecasting of the Demographic Future of Russia: Seven Scenarios	139
<i>Ivan Aleshkovski</i> . International Migration and Globalization: Global Trends and Perspectives	164
<i>Miriam Farhi-Rodrig</i> . Global Migration: A Transnational Problem	177

Part III. Aspects of Globalization and International Politics

<i>Paul A. Smit</i> . Transnational Labour Relations in SADC: Regional Integration or Regional Globalisation?.....	187
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<i>Endre Kiss</i> . Constructivity and Destructivity in the Globalization, as a Background of the Problematic of Peace	203
<i>Stanislav Bilyuga, Alisa Shishkina, Julia Zinkina, and Andrey Korotayev</i> . Global Correlation between GDP Per Capita and the Level of Sociopolitical Destabilization between 1960 and 2014: A Preliminary Quantitative Analysis	213
<i>Olga Kornienko</i> . Social and Economic Background of Blending	220
<i>Oleg Alekseenko and Ilya Ilyin</i> . The Theory of High-Level Process Integration Research and Development of Global Communication Networks	226
<i>Alexander Lenger and Florian Schumacher</i> . The Social Functions of Sport: A Theoretical Approach to the Interplay of Emerging Powers, National Identity, and Global Sport Events	231
<i>Ilya Ilyin, Stanislav Bilyuga, and Sergey Malkov</i> . The Empirical Analysis of the Voting Results in the UN General Assembly	249
<i>Olga Leonova</i> . Interpretation of the ‘Soft Power’ Concept in the Russian Political Science	271
<i>Olga Kolesnichenko, Alexander Rozanov, and Liu Debin</i> . The Role of BRICS in Global Politics	277
Part IV. Energy and Climate	
<i>William R. Thompson</i> . Energy, Kondratieff Waves, Lead Economies, and Their Evolutionary Implications	283
<i>Yury Sayamov</i> . Strategic Stability and the Role of the Global Energy Sphere	303
<i>Mohammad Mohabbat Khan and Md. Shahriar Islam</i> . Climate Change Adaptation in Developing Countries: Does Globalization Act as a Facilitator?	309
<i>Vladimir Klimenko and Alexey Tereshin</i> . Shale Gas: An Energy Miracle or a Climate Disaster?	321
Part V. Future and Forecasts	
<i>Leonid Grinin and Anton Grinin</i> . The Sixth Kondratieff Wave and the Cybernetic Revolution	337
<i>Valentina Bondarenko</i> . Providing the Balance of Technological and Social Changes in Real-Time Regime Plus the Economic Growth	356
<i>Ilya Ilyin, Arkady Ursul, Tatyana Ursul, and Midegue Dugarova</i> . From Millennium Development Goals to Sustainable Development Goals	380
Contributors to the volume	395

Introduction. How Global Can Be Global Future?

*Leonid Grinin, Ilya Ilyin,
Peter Herrmann, and Andrey Korotayev*

Globalization processes continue to develop and we should pay more and more attention to them. We also need to systematize our ideas about globalization and Global Studies to somehow fit the realities. We hope that our Yearbook contributes to the realization of this goal.

The present volume is the fifth in the series of yearbooks with the title *Globalistics and Globalization Studies*¹. However, why Globalistics, not Global Studies? Elsewhere we explained that the notion of Globalistics first appeared in Russia, this is a translation of the Russian term *globalistika*; however, we believe it might be useful within the English Global Studies thesaurus. We are sure that the introduction of this term is meaningful, because it expresses the vision of systemic and epistemological unity of global processes, the presence of a relatively autonomous field with its own research subject. Morphologically this term is identical with such well-established designations of academic disciplines as Economics, Linguistics, Physics, and so on (for more details see Grinin, Ilyin, and Korotayev 2012b, 2013b, 2014b).

In all the issues we strive to describe the leading process of the present-day world – globalization – in all the aspects and dimensions. Furthermore, we have to note that globalization is not only – and we suppose not primarily – about interconnectedness of economic activities in a narrow sense (trade, value chains of production *etc.*). More relevant in the long term is the alignment of ‘lifestyle’, in some cases as a matter of directly influencing each other and assimilation; in other cases as matter of setting a principle of orientation that is aligning the various processes into one long line of big historical development, creating a world order. As such it goes far beyond the World System be it one of 500 or 5000 or even 10000 years (see Frank and Gills 1993/1996; Grinin and Korotayev 2009b, 2014b). Instead, this constellation is now not about dependencies but about a new stage of union of opposites and contradictions. Though always present throughout history, the mutual dependency is now emerging for all actors as a somewhat conscious strategic moment which includes the interpenetration of the different life worlds. This means as well that paradoxically the principally retard of the socio-political dimension of the process gains in part and temporarily a dominant position: life and living follows rules for which the economic conditions are still emerging. The periphery itself is increasingly shaped by the characteristics of the centre and, vice versa, the ‘Brazilianisation’ becomes prevalent and visible and moves into the middle of the societies of the centre.

¹ For the earlier issues see Grinin, Ilyin, and Korotayev 2012a, 2013a, 2014a; Grinin, Ilyin, Herrmann, and Korotayev 2015.

The subtitle of the present volume is *Global Transformations and Global Future*. We become more and more accustomed to think globally and to see global processes. And our future can all means be global. However, is this statement justified? Indeed, in recent years, many have begun to claim that globalization has stalled, that we are rather dealing with the process of anti-globalization. Will not we find ourselves at some point again in an edifice spanning across the globe, but divided into national apartments, separated by walls of high tariffs and mutual suspicion? Of course, some setbacks are always possible, because the process of globalization cannot develop smoothly. It is a process which is itself emerging from contradictions and is shaped by a new contradiction. They often go much further than underlying systemic changes allow. They break forward, as the vanguard of a victorious army, and then often meet resistance of various social and political forces and may suddenly start to roll back just at the moment when everyone expects their further offensive. We believe that this is what is happening with globalization at present.

The problem is that there is a great disproportion between different dimensions of globalization that creates great tensions. To diminish these disproportions it is necessary to closely merge the socio-political component of global change (political globalization) with the narrowly understood economic dimension (for definitions and paradigms of globalization, see Andreev, Ilyin, and Zinkina 2015). Obviously, the latter is far ahead of the former. And further development would be difficult without such a catch-up. Yet, the narrowing of the gap between economic and political globalization is inevitable and we denote this process as a reconfiguration of the World System (see Grinin 2013; Grinin and Korotayev 2012; Grinin, Ilyin, and Andreev 2016).

The major vectors of this reconfiguration include weakening of the former core of the World System (the USA and the West), and simultaneous strengthening of the positions of a number of peripheral countries and a generally increasing role of the developing countries. However, one should bear in mind that the 'catching up' (between the political and economic components of globalization) will also bring severe political and geopolitical crises in different regions. Elsewhere we have considered the crises and turmoil in the Middle East after 2010, as well as the Ukrainian crisis as both 'reconfiguring' and geopolitical crises which require transformations in the world order. At the same time, grave and probably unexpected crises in other societies or regions seem rather possible. Their abruptness may be akin to earthquakes. And to continue the geological metaphor, one should note that just like the tectonic shifts occur under the most mobile Earth's crust and at the boundaries of tectonic plates, the reconfiguring crises occur in the least stable regions and societies which are situated at the junction of geopolitical 'plates.' Both the Middle East and the Ukraine are regions of this kind. Nevertheless, many of the ruptures are also visible in other areas – actually for instance in the different aspects of European disintegration, reaching from anomie of political legitimacy and Brexit to xenophobia.

We also argue that stability or instability of the world order depends on the stable or fragile character of the balance of power. The current balance of power obviously undergoes some transformations. If the suggestion of the weakening role of the United State is correct, what would the shift towards a new balance look like? We assume that one of probable scenarios is the creation of various alliances between countries to strengthen their positions and increase opportunities. As we have seen, this process has even involved the United States, usually reluctant in taking over different commitments. Thus, the search for a new balance of power has already started and it will be manifested in a more active crea-

tion of various alliances and coalitions of countries and their associations. We denote this process as an epoch of new coalitions (Grinin 2009, 2011, 2012, 2013; Grinin and Korotayev 2010, 2011, 2012, 2014a, 2015). This process of reshuffling brings up the issues of the loss of power, or may we say that the crumbling away of the hegemonic role is not least a matter of the dissolution of the ‘American dream’ and the ‘American lifestyle’. The suggestion that ‘another world is possible’ is not limited to alter-mondialists but it is equally prevalent in the emerging economies as for instance the BRICS and Latin America. How strong these movements will be is still an open question. But at least they clearly show that the strive for a new hegemonic system is going far beyond the claim of a new dominance on the world market.

Against this background of the different layers of change we believe that the political future of our planet will be still and even increasingly global, but the path to the future will take different route and it will be increasingly coined by global turbulence and instability.

The First Part of our yearbook is devoted to the field of Big History. What is Big History? Big History is a vast and extremely heterogeneous field of research, encompassing all forms of existence and all timescales, bringing together constantly updated information from different scientific disciplines and the humanities. The unique approach of Big History has opened up vast research agendas, taking a variety of forms. This discipline weaves together various disciplines into a single narrative where interdisciplinary work is not only possible, but essential. As has been mentioned on a number of occasions, the rapidly globalizing world needs global knowledge that can explain a unified global system (about Big History see Hughes-Warrington 2005; Nazaretyan 2005; Spier 2005; Christian 2005; Carneiro 2005; Markov, Korotayev, Grinin 2009; Grinin, Carneiro, Korotayev, and Spier 2011; Grinin and Korotayev 2009a; Grinin, Korotayev, and Baker 2014). Thus, we may say that globalization itself becomes propulsion for Big History.

The Second Part is devoted to the issues of global demography and the articles pay special attention to the global ageing which constitutes one of the most powerful trends of the modern world and that will change our world dramatically in the forthcoming decades.

The Third Part includes articles dealing with various aspects of globalization and international politics.

Finally, the last part (Part IV) is devoted to two topics: climate and energy which both are the sources of anxiety. How fatal can be climate change for humanity? Will there be enough energy for our descendants? What will be the energy of the future? We hope that our yearbook articles will help readers better understand these challenges and possible responses to them.

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Part I. BIG HISTORY AND GLOBAL HISTORY

10⁵⁰⁰. The Darwinian Algorithm and a Possible Candidate for a 'Unifying Theme' of Big History

David Baker

This article postulates another aspect of the long sought-after 'unifying theme' of Big History, in addition to the rise of complexity and energy flows. It looks briefly at the manifestation of the Darwinian algorithm, that is to say an algorithm of random variation and non-random selection, in many physical processes in the Universe: cosmology, geology, biology, culture, and even the occurrence of universes themselves. This algorithm also seems to gradually open more forms of variation and more selection paths over time, leading to a higher level of free energy rate density, or what we know as 'complexity'. In fact the complexity of the object under discussion seems to correspond to the available number of selection paths. The article closes with a bit of philosophical reflection on what the Darwinian algorithm and the rise of complexity could possibly mean for humanity and the future of the cosmos.

Keywords: *Universal Darwinism, random variation, non-random selection, complexity.*

One thing that the inaugural International Big History Conference in August 2012 made clear was that one of the major tasks of Big History in the coming years is to prove it can sustain research projects, just like any other genre of historical scholarship. As someone who entered the field to do precisely that, I know that such research is not only possible, it is essential – both to bridging the gap between the sciences and humanities and to our understanding of the history of life and the cosmos. The unique approach of Big History has suddenly opened up a vast horizon of research agendas, or, to put it another way, triggered a speciation event where hundreds of new niches have opened up, waiting to be filled. The ecological terrain is vast and the numbers that currently populate it are few. I urge anyone interested in researching in Big History to do so. The research comes in a variety of forms. There are, of course, Esther Quaedackers's Little Big Histories that cover the full 13.8 billion years of any subject – extending the Big History perspective to any line of inquiry. There are also research agendas that pursue debates and questions about a certain chunk of the grand narrative, but nevertheless hearken back to broad trends. Many of these are highlighted in the course we teach in Sydney, and many of these would make excellent fodder for graduate research projects that can be realistically achieved within a set timeframe. There are also more ambitious ideas that deal with the unifying themes of Big History, themes which encompass the full trajectory of the universe and underscore

Globalistics and Globalization Studies 2016 10–20

total heat death of our universe.⁴ The number of different sets of physical laws that form the game of cosmic selection is greater still. That is the magnitude of 10^{500} . Some of those universes that arise would operate without electromagnetism. Some of those universes would never form clumps of hydrogen and helium, and by extension stars and galaxies. Some of those universes would never form atoms at all. And some of those universes would be based on properties, fundamental forces, and dimensions that, once again, in trying to understand how they operated using the physical concepts with which we are familiar in this universe would be like trying to explain colour to a dog.

From this primordial niche comes a vast array of scholarly works that recognize the Darwinian algorithm in a variety of universal processes. At the cosmic level, Lee Smolin and E. R. Harrison have both proposed models for universes themselves, with those more likely to produce black holes or intelligent life, respectively, being favoured (Smolin 1997; Harrison 1995: 193). Both remain highly speculative and favour a hereditary connection between universes. At the end of the day such selection criteria and heritability may not even be required since the number 10^{500} is so large that it covers every variation to make inheritance between universes unnecessary and yet still mathematically finite, making non-random selection possible. Wojciech Zurek has created a model whereby the predictable physics of the Newtonian realm emerge from the chaos of the quantum world – a model that recently gained some new evidence (Zurek 2003; Burke *et al.* 2010: 1–4). If this is correct, then it provides an explanation for the uncertainty in quantum physics. The chaos at the quantum level does not abrogate the idea that the universe functions in a certain way, as would-be scientific determinists have lamented, because the very randomness at the quantum level is fundamental to the prevailing system. In the geological realm, Robert Hazen *et al.* have proposed an evolutionary model for the generation of new minerals (Hazen *et al.* 2008). While making sure to clarify that the model differs from biology, the authors highlight several places where selection, punctuation, and gradients for change are present, exponentially increasing the number of mineral types throughout geological history, from stellar nebulae, through planetary accretion, and all the changes thereafter. But the most thorough examination of the Darwinian algorithm in areas beyond the realm of biology has been within cultural evolution. The idea was first pioneered by Donald Campbell and later revived by Richard Dawkins, and then most effectively, in my opinion, developed by Peter Richerson and Robert Boyd (Campbell 1960; Dawkins 1976; Boyd and Richerson 1985). In cultural evolution, any ideas, knowledge, beliefs, values, skills, and attitudes that are more practical or more appealing, are easier to learn or are better geared toward survival, are more likely to lead to social prominence than others, spread more easily from person to person. Those cultural practices that lead to early death or social stigma are less frequent or simply disappear (Richerson and Boyd 2005: 5–12). From so simple a beginning, came a flood of works on cultural evolution in recent years.⁵ It also

⁴ If total heat death is indeed what awaits it. There are a number of possible scenarios and perhaps others undiscovered (Adams and Laughlin 1997).

⁵ Many works have been written on the subject, though I believe Richerson and Boyd remain the most successful at explaining it. Richard Dawkins, by contrast, as recently as *The God Delusion* (Dawkins 2006: 228) claimed Susan Blackmore (1999) held that honour. A number of other works have also been written on the subject: Stephen Shennan (2002), Ruth Mace, Clare J. Holden, and Stephen Shennan (2005) – particularly David Bryant, Flavia Filiman, and Russell Gray (2005) who advocate the NeighborNet program to plot trees for both vertical and horizontal transmission for all the Indo-European languages, John Ziman (2000), and a close runner up to Richerson, Boyd, and Blackmore is Stephen Shennan (2009), notable for its many in-depth investigations.

provoked a great deal of debate.⁶ Two of the most rigorous bits of research, in my opinion, have been Lake and Venti's work on nineteenth century bicycle technology and Ritt's work on the formation of dialects and new languages (Lake and Venti 2009; Ritt 2004). Finally, at the recent conference, my colleague and fellow big historian, Christian Jennings, and I have discussed how Darwinian algorithms are used to fill a range of useful functions in the computer realm. Not all mechanisms of information in a computer are processed in a Darwinian algorithm. But since the 1970s, numerous programs have employed a 'genetic algorithm' which is a search heuristic that mimics the process of natural evolution. The computer automatically finds better ways to run programming through a game of variation and selection. It is currently employed in bioinformatics, engineering, economics, chemistry, mathematics, and more. Various entities of the universe are simply different forms of information – whether energy flows, DNA, or cultural ideas – and they seem to be processed by the same algorithm just as information in a computer. It is not the place of this article to confirm or deny the accuracy of the assertions cited above, but rather to exhort big historians to future research, especially on any project that ties these various manifestations of the Darwinian algorithm together into one theory. The spectre of the algorithm has already been spotted by a number of scholars working in a number of disciplines. This could be what unites them all – an elegantly simple process, a form of variation, selection, and preservation that underwrites all things.

It may also have a trajectory. If the Darwinian algorithm is present, if not instrumental, at every stage in the rise of complexity in the universe, it may be that this pattern tends ever more to greater forms of complexity. And it would appear that the number of possible outcomes is relative to the complexity of the process under discussion, hence why relatively few outcomes make it from the quantum to the Newtonian level, why only a few thousand variations emerge from the geological level, whereas in biological evolution the number of possible selection paths is increased manifold, and the number of cultural variations is exponentially greater still. When we arrive at something as complex as culture and modern human society, with a free energy rate density 25 times higher than the average product of genetic evolution and 500,000 times higher than the Milky Way, there are a mind-boggling number of combinations of ideas and innovations. The rate of complexity seems to increase with the number of viable selection paths.

Table

Generic Structure	Free Energy Rate Density ($\text{erg s}^{-1}(-1) \text{ g}^{-1}(-1)$)
Galaxies (<i>e.g.</i> , Milky Way)	1
Stars (<i>e.g.</i> , Sun)	2
Planets (<i>e.g.</i> , Earth)	75
Plants (biosphere)	900
Animals (<i>e.g.</i> , human body)	20,000
Brains (<i>e.g.</i> , human cranium)	150,000
Society (<i>e.g.</i> , modern human culture)	500,000

Source: Chaisson 2001: 139.

⁶ For instance, see Joseph Fracchia and R. Lewontin 2005: 1–13, 14–29, and 30–41, in several back and forth exchanges. Fracchia and Lewontin's misunderstanding of what cultural evolution actually led both sides to more or less repeat the same arguments at each other.

At the recent conference, I asked futurist and IBHA board member, Joseph Voros what sort of complexity we might expect to see from an intelligent species capable of harnessing increasing levels of energy, that is, the power of stars and the galaxy, known as Type II and Type III civilisations. He said that another exponential increase in free energy density was less likely than an increase in the complexity of networks. It would appear, for the time being, cultural evolution and the complexity it bestows is the highest point in this process of which we are yet aware. Others may open up that we cannot predict, but it is worthwhile to understand exactly what cultural evolution involves. There are two tiers of human evolution. The first is genetics, which operates in the same way as for other organisms. Those genes gave humans a large capacity for imitation and communication. Those two things enabled the second tier. Culture operates under similar laws, but on a much faster scale. Cultural variations are subject to selection and the most beneficial variations are chosen. Unlike genes these variations can be transmitted between populations of the same generation and can be modified numerous times *within* that generation. Like a highway overpass looming over older roads, cultural evolution can blaze along at a much faster rate of speed. Ultimately, culture accumulates. Population pressure compels some of this accumulation to be geared toward increasing the human ability to extract resources from the environment. This process raises the carrying capacity, which produces more people, which produces more accumulation, which in turn raises the carrying capacity. The cycle continues and grows in complexity. If expressed as a general principle, it may be said that the rate of growth of the carrying capacity of a human population is relative to the number and connectivity of variant innovations.

The second evolutionary tier of culture, a swifter form of evolution, should not come as a surprise in a Darwinian algorithm. Gradually through natural selection, not only do species become better at surviving, they become better at evolving. This follows the logic that improving the *rate* of your improvement of your survival chances is just as naturally selected for, since it also improves the rate of your survival. Logically, a third tier is likely to emerge where our growing knowledge allows us to directly guide the evolution of our genes. If we discard the manmade concept of tiers, in a sense through a relatively short evolutionary process of 200,000 years, our genes have evolved the ability to develop more rapidly and efficiently. The universe is composed of webs of energy of varying complexity. Life-forms are entities that harvest energy to perpetuate their complexity, to spread it, and even to increase it. Human history has been dominated by this hunt for resources. Our evolution, both genetic and cultural, has ultimately been geared toward aiding this hunt. Standard evolution can be defined as the change in the traits of a population of organisms through successive generations to sustain or increase their complexity. Human evolution can be described as the change in traits and behaviours between populations of the same generation and through successive generations to sustain or increase their complexity.

We now know that there is no hard-and-fast division between the organic and inorganic world. As such, life can be (somewhat coldly) defined as a series of physical processes that contain a hereditary program for defining and directing molecular mechanisms that actively extract matter and energy from the environment that are converted into building blocks for the perpetuation and reproduction of those physical processes (Spier 2010: 77). Life is the only thing in the universe that does this. Stars, minerals, and the rest of the inorganic world do not actively seek out matter and energy from the environment. Even objects as gigantic as stars burn their fuel like lamps and candles and eventually flicker out. This has been proceeding since the beginning of the universe. Eventually every single last

tiny slow burning star will be extinguished. Only life has the agency to go out and extract energy from the environment to keep itself going. We do not just sit still and wait for death to take us. We fight – for a time. If we want to preserve our vast complexity, we have to continue harvesting matter and energy to keep ourselves going. All other considerations are secondary. It is the bottom line of human history. During most, if not all, of our history, the quest to extract matter and energy to perpetuate our existence has been the overriding theme (Spier 2010: 116). It is the battle with disorder, chaos, entropy, and the second law of thermodynamics which we have carried on since the very beginning of our existence, and it is a battle that physicists believe we must eventually and inevitably lose.

This brings me to the topic of how the Darwinian algorithm relates to how we perceive ourselves in the grand narrative and how Akop Nazaretyan at the recent conference exhorted big historians to provide the world with non-exclusive ‘meanings of life’ – beyond religion and ideology that inevitably vilify the infidel and the ‘other’ – to ideas of meaning that bind the entire human race together in common cause (Nazaretyan 2010). If the Darwinian algorithm prevails at many stages in the rise of complexity in the universe, then it is possible that the evolution of life and species capable of cultural evolution is just another stage in this trajectory, just like star formation or planetary accretion. At risk of sounding sensationalist and glib, two things that I abhor, I must state that research in this direction may *possibly* provide us with something approaching a secular and objective ‘meaning of life’ that unites us all.

There are as many as 10^{500} possible sets of physical laws for universes. Each of these sets of physical laws governs the evolution of a universe in various ways. Our universe is 13.7 billion years old, very complex life on Earth about 550 million, and the human race as we know it only about 200,000. Our local star is middle-aged and will last only another 5 billion years and will boil the Earth's surface dry in well under 3 billion. If the human race does not destroy itself in the meantime, it has hundreds of millions of years to exist and evolve on Earth, after which time we could venture out into other solar systems and long outlast the death of our own. We could huddle around the fires of hundreds of thousands of stars in the habitable section of the Milky Way for nearly a trillion years and more stars would be produced in the centre of the galaxy and eventually spread out and be used too. But unless we somehow learn to create stars ourselves, in 100 trillion years every single last dim little star will have flickered out and the universe will become a cosmic graveyard, where bodies of dead stars and planets will wander in pitch black. Until, of course, the energy that creates matter itself (which, remember, is really just a congealed form of energy) in 10^{40} years will grow feeble and matter will cease to exist, and then after a period of 10^{100} years, even black holes will cease to exist, and the universe will be an empty orb of weak cosmic radiation – a victim of Heat Death.

Here is the grim fate to which we must resign ourselves that also seems to indicate that our story and the story of the universe itself is ultimately and objectively pointless. Yet, the notion of the Darwinian algorithm of random variation and non-random selection governing processes in the universe as disparate as geology, biology, and culture, indicates another interesting possibility. Life is the only entity in the universe that actively harvests energy rather than just burning down and in only the last 250 years human beings have mastered the atom and figured out how to harness energy in impressive magnitudes. The next ‘spontaneous’ rise of complexity in the universe will be down to intelligent life. Current physical processes in the universe indicate a future of heat death. But those calculations do not take the evolution of intelligent life into account. That grim fate for the uni-

verse may be avoided. It is very difficult to see why the wheels are churning when we ourselves are inside the machine. We have millions, billions, if not trillions of years before us, to devise a way to keep the lamps of the galaxy lit, energy flowing, and the universe itself from ‘dying’. And, perhaps most profoundly of all, life itself may have been another one of those ever-present Goldilocks conditions: an entity that keeps harvesting and creating energy to perpetuate the complexity of the universe. Like tiny white cells in the human body, our small and seemingly insignificant species may nevertheless have an extremely important role in the universe. Our fates might be bound together. It may be why we are here. In that sense, the ‘meaning of life’ is a fairly easy question. The question of the ‘meaning of the universe’, on the other hand, is a much more difficult proposition.

At any rate it remains an open possibility – and it has significance for us today, not just trillions of years from now. Albert Camus (1913–1960), a French writer and philosopher, once said that in all philosophy there is only one problem, and that is suicide – judging whether life is or is not worth living amounts to the most fundamental question of philosophy (Camus 1942: 15). In the secular scientific narrative of Big History, we are robbed of traditional answers to that question. In a cold, often cruel, empirical universe based on fact and not on fantasy, we do not have access to the pre-packaged meaning, morality, and life purpose that animates religious culture. What we are left with is a universe that evolved from impersonal physical laws and is so vast as to reduce all the trials of daily life and indeed all human history to a state of woeful insignificance. The universe does not owe you a sense of purpose. It does not owe you a sense of comfort. Lacking an objective scientifically reinforced meaning of life and purpose to existence, where the universe has no higher role for living things, there ultimately is no point. In such a state of affairs that is the hard, grim, inevitable fact. You are an accident of physics, kept alive by an evolutionarily instilled fear of death that translates into a multitude of subjective, often paltry, excuses for why you have not yet opened your throat. Even good answers to that question, like the noble scientific curiosity to explore the universe, or love, or duty, or stubbornness (KBO, the motto from British trenches in the First World War, keep buggering on), just sound like provisional reasons so we can move on and stop thinking about it. Even now the reader's mind may be racing, reminding themselves of their own reasons for living. And perhaps these subjective excuses are all we can ever hope to achieve. The Darwinian algorithm, however, returns to the question of an objective secular scientific meaning of life and whether life is or is not worth living – the fundamental question of philosophy.

Research on the Darwinian algorithm may be crucial in a variety of ways. From it we might attain a greater sense of where humanity fits in the history of the universe. We might identify some of the processes that govern human development and also identify the universal context in which humanity faces the distant future. From here it may be possible to establish an objective sense of human purpose in the universe, though the validity of this last step is far from certain. And when I use words like ‘meaning’ and ‘purpose’ I do not engage with the idea of strong emergentism and those scientists who are using concepts of strong emergence to revive ‘religiosity’ and the feelings of ‘awe’, ‘creation’, ‘enchantment’, ‘transcendence’, ‘reverence’, ‘gratitude’, and ‘objective and universal morality’, normally associated with the traditional religions.⁷ I have no desire to replace religion with science or anything else for that matter in an increasingly secular age.⁸ I am content

⁷ The most explicit statement to this effect is Ursula Goodenough and Terrence Deacon, ‘The Sacred Emergence of Nature’ (Goodenough and Deacon 2006).

⁸ See also Stuart Kauffman, ‘Beyond Reductionism: Reinventing the Sacred’ (Kauffman 2006), and also the seminal (and less proselytising) works on emergence, Stuart Kauffman (1993, 1995), and also Terrence Deacon's recent ode

to let such feelings of ‘religiosity’ go. Empirical work on the Darwinian algorithm should not be optimistic or indulge in mysticism. To mature intellectually in the twenty-first century, one must stop being such a child and admit that the questions of existence and morality are not as clear-cut as old religions had led us to believe, the answers are not often uplifting, and it is harder to take refuge in feelings of reverent religiosity today than it was in the time of your ancestors. Science will not revive those feelings. Being perpetually confused and scared is part of being an adult in the twenty-first century. We are in the process of casting aside old fairy tales. Now is not the time to be inventing new ones. But it is my fear that research on the Darwinian algorithm will be just another desperate grasp at a comforting myth. I remain characteristically pessimistic about its prospects, but it is too interesting a possibility to pass up. But the possibility may fail and join the ranks of other pathetic exploits in pseudo-science, in which case there is very little besides subjective reasoning between you and the stark contemplation of the grand unfolding tale of 13.8 billion years.

Paul Dirac (1902–1984), English theoretical physicist who predicted the existence of antimatter, and whose brother, Felix, committed suicide in 1925, wrote his entire philosophy of life on three pages of a notebook in 1933, in which he said:

My article of faith is that the human race will continue to live forever and will develop and progress without limit. This is an assumption that I must make for my peace of mind. Living is worthwhile if one can contribute in some small way to this endless chain of progress (quoted in Farnelo 2009: 221).

There is, of course, absolutely no guarantee that humanity or our descendant species will not go extinct, and much to indicate the contrary as we enter the bottleneck of the twenty-first century. But perhaps Dirac is right, despite this assumption. Perhaps, within the Darwinian algorithm, life is worthwhile if we can contribute in some small way to the rise of complexity in the universe – a strange, blind, but inexorable process that has been proceeding for 13.8 billion years.

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The Dynamics of Evolution: What Complexity Theory Suggests for Big History's Approach to Biological and Cultural Evolution

Ken Baskin

The twentieth century science, from physics to neurobiology, redefined our understanding of the world, overturning the linear worldview of Newtonian physics for a more dynamic image. Especially as illuminated by complexity theory, this worldview suggests a conception of evolution in which phenomena adapt to each other, at many scales, embedded in a continually expanding universe of interconnected agents. Given this conception, human culture has evolved to adapt to changing conditions which, thus far, have generated a social world whose complexity has increased to serve a larger, more technologically advanced, more highly interconnected population. To demonstrate this conception of evolution, one can examine the Axial Age and Modernity as cultural 'phase transitions,' periods of experimentation punctuating periods of relative stable social structures. Such an examination offers an insight into the potential for Big History to contribute to solutions of the many challenges that call for innovative adaptations across our world.

Keywords: relational evolution, world story, Axial Age, Modernity.

Big History often focuses on the increasing complexity in the cosmos, life on Earth, and human culture that evolution has produced. David Christian discusses 'the endless waltz of chaos and complexity' (2004: 511), and Fred Spier, 'the rise and demise of complexity at all scales' (2011: 21). Yet, with the possible exception of Eric Chaisson (2001), writers in our discipline have not examined the dynamics by which complexity increases. In this essay, I want to reframe this discussion, drawing on the principles of complexity theory, because, while Big History treats complexity as a *measure* of diversity and interaction, complexity theory treats it as a *dynamic* to be examined (Bondarenko 2007). My purpose is to explore how an understanding of this dynamic – and the conception of evolution it suggests – can become an intellectual tool for our discipline.

My argument is that evolution is a much 'thicker' process than traditional theory suggests. Such a conception of evolution can enable students of Big History to reconsider any number of issues and develop a deeper understanding of the dynamics of both biological and cultural evolution. To explore this argument, I want to touch on four major issues:

- two key principles of complexity theory;
- the conception of 'relational' evolution suggested therein;
- the resulting theory of historical evolution;

Globalistics and Globalization Studies 2016 21–42

- an examination of the Axial Age and Modernity in terms of this theory, as periods of punctuation, and why this perspective can be so valuable.

In an essay of this length, I can only begin this exploration. In addition, I have little choice but to oversimplify a number of issues that deserve deeper consideration. So I want to ask the readers' indulgence for this obvious limitation. With that caveat, I turn to the dynamics explored in complexity theory.

Complexity Theory Dynamics

Complexity theory emerged in the late 1970s, as researchers in fields, ranging from fluid dynamics to economics, armed with desktop computers, modelled their subjects on non-linear mathematics and began finding striking similarities across disciplines and scales (for a full discussion see Pagels 1988). Those similarities suggested a meta-discipline, complexity theory, which, for me, is best understood as the study of 'the patterns that emerge as complex, multi-scaled phenomena evolve' (Baskin 2013: 4). I prefer the word 'phenomenon', to the more generally used 'system', to describe the networks complexity theory studies, because, where the concept of systems suggests mechanical stability, that of phenomena (see Barad 2007) indicates more dynamic structures.

Two principles of complexity theory are critical to my argument – the structure of matter as nested networks and 'attractors'. First, physical reality is composed of networks of agents embedded in networks at many scales, from atoms networked in molecules to organs networked in living bodies, and solar systems in galaxies. As a result, understanding the behaviour of an ant colony as phenomenon requires *at least* knowledge of the behaviour of the ants that are its micro-scale agents, the colony itself, and its macro-scale environment.

The second critical principle is the attractor, which represents the dynamic balance between the behaviour of the agents and the constraints of the environment. The term attractor comes from non-linear mathematics, describing the pattern in phase space into which the solutions to equations are drawn. Lorenz's 'Butterfly Attractor' is among the best known. In complexity theory, more generally, an attractor describes the pattern of behaviour, of all possible behaviours, that characterizes any phenomenon under specific conditions (Cohen and Stewart 1994: 204–207). Over time, a phenomenon's attractor will draw it to behave something like this figure, which I first scribbled as a 'back-of-the-cocktail-napkin' doodle when I was wrestling with complexity theory's basic principles.

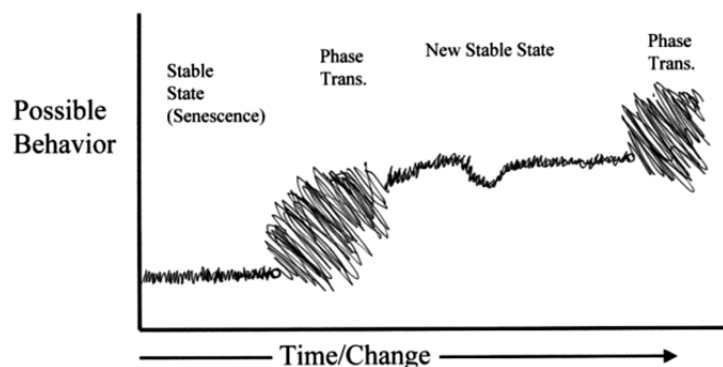


Fig. 1. Life Cycle of an Attractor

Put a chunk of ice in a pot on the stove and turn up the heat. It will remain solid until it approaches its melting point, then enter a turbulent phase transition, and transform into liquid. It will remain liquid until it approaches its boiling point, become turbulent again, and transform into gas. Phenomena, then, oscillate between turbulent phase transitions, in which their agents seek the behaviours that enable them to survive current conditions, and the stable states in which those behaviours form their characteristic attractors.

To my surprise, I soon realized that much human behaviour conforms to this pattern. Human psychological development, the economy's boom/bust cycle, and the rise and fall of human empires (Baskin 2008, 2009) – all conform to this pattern. It also reflects other thinker's analyses, from Foucault's evolution of Western *episteme* (1994) to Arrighi's cycles of Western Capitalism (1994). At some point, I realized that this pattern also reflects the still-controversial theory of punctuated equilibrium (Gould 2002), and that I had probably been strongly affected by the discussions of it I had read.

The Life Cycle of an Attractor is meant to be what Bruno Latour (2005) calls a 'panorama' – overly neat and coherent, an approximation of the networks it maps, not a mathematical or even literal representation. The panoramic map is not the territory, merely a guide for the explorer. Nonetheless, the behaviour of many evolving phenomena conforms to this figure, suggesting a model of evolution.

Evolution like Molasses

We live today in an environment in which a new worldview is emerging (see Laughlin 2005; Boje and Baskin 2010; Smolin 2013), and our understanding of evolution is changing to meet this new worldview. The traditional conception of evolution, the 'neo-Darwinian' 'modern synthesis' 'asserts that this history of life at all levels – including and even beyond the level of speciation and species extinction events, embracing all macroevolutionary phenomena – is fully accounted for by the processes that operate within populations and species' (Hoffman 1989: 39). Like the Newtonian worldview in which it developed, neo-Darwinian evolution is linear, focusing on cause-and-effect changes in distinct entities, a 'straight line of continuous transformation of one species into the next' (Tattersall and Schwartz 2001: 33). Richard Dawkins' theory of the 'selfish gene', which reduces organisms to vehicles for their genes, is an excellent example of this approach (Dawkins 1976).

Mainstream cultural evolution articulates a similar conception of 'evolutionism'. As Robert Carneiro (2003) notes, evolutionism has gone in and out of favour with anthropologists since Herbert Spencer began discussing the idea in the 1850s. Much of the disagreement about such cultural evolution centred on the Newtonian sense of determinism often associated with its 'stages' and 'directionality'. Carneiro insists that this Newtonian reading misinterprets such thinkers as Leslie White and Gordon Childe. With his more dynamic reading of evolutionism, for example, Carneiro explains that, while cultural evolution has a direction, increasing social complexity – that is, movement toward more hierarchical socio-political levels – 'a process can have a direction without having a goal' (*Ibid.*: 163). He goes on to define cultural evolution as 'a series of adaptive readjustments, each adding to the structural complexity of the society and often initiating a series of other internal changes that further contribute to its evolution' (*Ibid.*: 199). Nonetheless, Carneiro does not develop a fully dynamic interpretation of cultural evolution.

With this traditional view of evolution, researchers made great strides during the twentieth century. However, a more dynamic and non-linear worldview is emerging today, and the conception of evolution itself is evolving. The point I want to make is not to criticize theorists such as Dawkins or Carneiro; the traditional understanding of evolution reflects the worldview in which it developed. As a new worldview emerges, so does a different understanding of evolution. I shall follow Lee Smolin (2013: xvi) in calling it 'relational' – that is, phenomena are best described in the context of the networks of which they are part. Many of my ideas are certainly not original. I draw on or independently developed ideas, to name only a few, that include the 'punctuated equilibrium' of Niles Eldredge and Stephen Jay Gould (2002), Stuart Kauffman's 'adjacent possible' (2000: 150), Henri Claessen's Complex Interaction Model, which incorporates many of the dynamics of my model (Claessen 2000); and Mark Taylor's image of living things as both 'genuinely creative' individuals and the 'product of the matrix of relationships in which they exist' (Taylor 2007: 335). By organizing such ideas with a complexity-oriented discourse I am trying to move toward a fuller and a more coherent theory.

Consider the image most often used to express the traditional conception of evolution – the 'Tree of Life' (*e.g.*, Pyne and Pyne 2012: 269), a static, two-dimensional image, beginning in its roots as the most primitive form of life and growing to its apogee in Man. With dynamic evolution, a more appropriate image might be molasses moving downhill, a colloid of many particles, affecting each other, and being affected by both the hill and the weather. Relational evolution moves, then, at multiple scales, along the balance between the demands of external conditions and the conditions of a set of phenomena's internal networks. Over time (see Fig. 1), the still-weakly-connected agents of an incipient phenomenon in a phase transition – whether the living things in an ecosystem after an extinction event or the people in a social network after a collapse – search for behaviours that enable them to survive and thrive in current conditions. When those agents find successful behaviours, they begin to practice them and continue as long as the behaviours produce success.

Over time, they build relationships by practicing these behaviours, and the longer they succeed, the deeper the relationships become and the more the welfare of the agents comes to depend on those relationships. It is this dependence on specific behaviours and relationships that gives any attractor its power to constrain its agents' responses. Agents in the phenomenon continue to adapt to external change, until, at some point, those agents have become too wedded to their behaviours to adapt. At this point, the phenomenon enters 'senescence', a concept Stan Salthe (1993) developed to describe the evolution of ecosystems, and the agents subsume environmental change to their characteristic patterns. Finally, the external change becomes so great that agents can no longer survive; so the attractor collapses. At that point, agents, often connected in less extensive networks, must either dissipate so that the phenomenon no longer exists as a functioning network or re-enter the phase transition so that it can develop another attractor. Clearly, other processes – ageing or the tendency to form self-reinforcing cycles – are also at work, often interacting with evolution. A fuller consideration would touch on them more.

Today, societies across the world seem in senescence. One sees evidence in the gridlock in American government or the corruption in Russia and China, in the economic crisis in the European Union or the chaos of the 'Arab Spring'. Overwhelmed by decades of rapid change, those in power depend so deeply on the old attractors that support their

wealth, power and sense of self, that they cannot make the fundamental changes today's conditions demand.

Because phenomena evolve at many scales simultaneously, the agents that make up any network continually undergo what Francois Jullien (2011) describes as 'silent transformations'. The process of ageing goes on every moment of every day throughout our bodies, even though most people rarely note it. In this way, Jullien notes, we are not so much getting older as the ageing world is taking us with it. Most of these transformations are habitual, often programmed; others are essentially experiments by which agents strive to respond to changes in their environments, Kauffman's exploration in the adjacent possible (Kauffman 2000). In this way, a myriad of micro-scale changes among agents, often barely noticeable, are tested within the phenomenon, and those that survive become available for further development. Such micro-scale changes are only partially expressed in stable states; however, during a more chaotic phase transition the agents are freed to explore the full potential that these changes have inherent within them. In biological evolutionary theory, these tendencies are described as 'developmental canalization' and 'developmental plasticity', respectively (Hoffman 1989); similarly, Elman Service (1988) described this dynamic as the 'Law of Evolutionary Potential'. One advantage of a complexity-oriented conception of evolution is that it explains this dynamic in both organic and cultural evolution at a more detailed level.

In genetic theory, mutations build up in organisms when ecosystems are stable, and remain latent or not fully expressed until the more chaotic phase transitions, when organisms explore survival strategies (Cohen and Stewart 1994). Mammals first appeared about 210 million years ago; they remained 'mainly small, nocturnal, tree-dwelling creatures' (Leakey and Lewin 1995: 66), surviving in ecological niches in which they could avoid dinosaur predators. They would then accumulate the mutations that would enable those that survived to dominate all the world's ecosystems, until the extinction event that removed the dinosaurs 65 million years ago. It was only in the ensuing ten-million-year phase transition that mammals could explore the full potential of their 140 million years of silent transformational mutations, in the wide-open ecosystems they now inhabited. Once again, I have oversimplified; any dynamic as complex as the emergence of mammal dominance deserves much fuller examination than is possible here.

In cultural evolution, innovations, such as writing, also develop through millions of silent transformations. Written notation appeared in a variety of times and places, as knots, notches, or pictographs, as an aide to memory (Fischer 2001). With growing populations, agricultural surpluses, and increased trade, such marks became invaluable for keeping records. Full writing systems appear to have emerged as a part of the process of state-formation, in order to manage increasingly great resource bases, in the late fourth century BCE in, first, Sumer, and, then, Egypt (Nissen 1988). Throughout the pre-axial period, however, the resulting literacy would remain what Assmann (2012) calls 'sectorial' – that is, used in the accounting, religious, and government sectors in which it emerged. Used more and more widely in such cultures, it was still constrained in a stable state where culture was predominantly communicated and managed orally. With the phase transitional Axial Age, people in such cultures as Greece, India, and China, freed of the constraints of their stable state, would experiment with writing and develop its most powerful potentialities. Literacy would become 'cultural', penetrating 'into the central core of culture' (Ass-

mann 2012: 383), enabling the personal reflection that reading drove or the 'religions of the book', for instance (Ong 1982).

What makes relational evolution different from the neo-Darwinian approach is not the facts of evolution; many neo-Darwinians will agree with most of what I have thus far written here (*e.g.*, Hoffman 1989). The difference is in the basic discourse, some would call it a paradigm that makes these agreed-upon facts significant. The discourse in traditional evolution focuses attention on the development of individual changes, the most extreme example being Dawkins' selfish genes (1976). A relational approach, on the other hand, focuses on both individual developments and the context of wide, deeply interconnected networks of evolving phenomena, perhaps even of the universe itself. Evolution therefore suggests the thickness of molasses. It occurs on many scales – biological evolution on the molecular, cellular, organic, species and ecosystem, geologic and climatic scales, and cultural evolution on the individual, family, social organizational, cultural, ideological, technological and economic scales. The interaction of all such changes creates evolutionary patterns. In addition, the evolution of the inanimate Universe, life on Earth, and human culture all affect each other. The first major shift in human social evolution occurred after a development in inanimate evolution, the end of the Ice Age, which made more complex social structures necessary. Similarly, events in the evolution of life, the domestication of grains and animals, for example, have contributed to human social evolution. Thus, interactions between events in the three forms of evolution further thicken the process.

This relational discourse suggests ways to re-examine a variety of issues in biological and culture evolution. For example, is evolution gradual, as neo-Darwinians believe, or subject to punctuated equilibrium (*e.g.*, Hoffman 1989)? So intense was the disagreement that, in *The Blind Watchmaker* (Dawkins 1986), Dawkins entitles a chapter 'Puncturing punctuated evolution'. Yet, a relational approach largely resolves the disagreement. On the micro-level, agential evolution, in genes or individual people, is gradual; however, when the stable state of the macro-level goes into phase transition, the environment, whether ecosystem or culture, punctuates its equilibrium, driving radical adaptive changes for survival purposes at the micro- and meso-levels. Both processes are essential to evolution; to focus on only one is to misrepresent the full complexity of the facts. Similarly, the suggestion that biological and cultural evolution are different because the biological is mostly 'Darwinian' and the cultural, mostly 'Lamarckian' (*e.g.*, Grinin *et al.* 2011) shifts with relational evolution. The difference here is in the carriers of 'genotypic' information. In biological phenomena that carrier is DNA, embedded in the body; in cultural phenomena it is a variety of stories, narratives, and meta-narratives people in any culture tell each other (*e.g.*, Lyotard 1984). Take into account these differences in how information is carried, and the mechanism of both types of evolution seem remarkably similar.

Toward a Dynamic Theory of Human Social Evolution

From this relational point of view, a panorama of human history over the last 50,000 years might look something like this (first presented in Baskin and Bondarenko 2011).

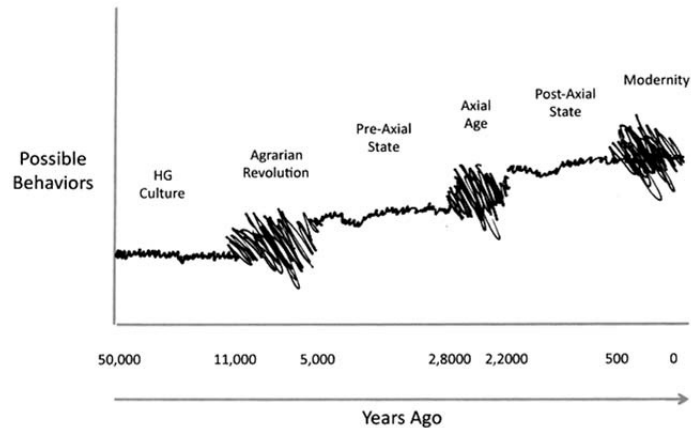


Fig. 2. Human history as 'punctuated equilibria'

History is too messy and abundant, and, what we know with certainty, too limited, to assume that events should conform to our abstractions; so I left this figure imprecise. For example, the movement indicated in the figure is overly linear. For the most part, cultural stable states do not simply end and phase transitions begin; rather, societies often move back and forth between the two. Still, the basic pattern seems valid as a Latourian panorama, rather than attempt to articulate the truth.

This conception of cultural evolution has a significant explanatory power. For instance, the period from *c.* 3000 BCE to 1500 CE is often defined as the 'tribute' (Tainter 1988; Amin 2009) 'stage' of society. Yet, the social institutions in Greece, India and China, before and after the Axial Age, are clearly distinct – mythic religion *vs.* religions of the book, for example, or government by royal lineage *vs.* bureaucracy (*e.g.*, Lewis 1990). The evolutionary model I am developing explains those differences as two cultural stable states that represent adaptations to different levels of complexity. This understanding was recently validated by its similarity to the more mathematically rigorous work of Korotayev and Grinin (2012: 34), in modeling the growth of urban populations.

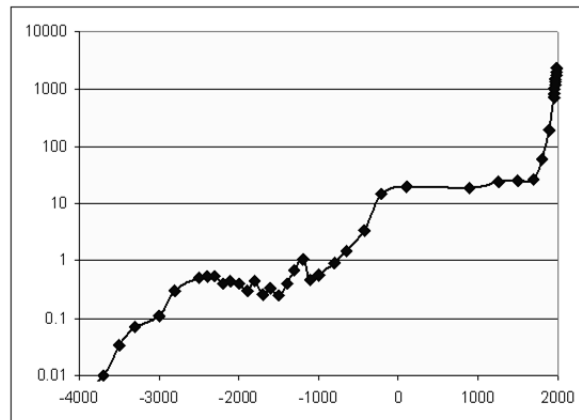


Fig. 3. Dynamics of World Urban Population

Note: In millions, for cities of more than 10,000, 4000 BCE–1990 CE, logarithmic scale.

Here we see that urban population remains essentially flat in pre-axial and post-axial stable states, while it increases exponentially in the Axial Age and Modernity. According to Koro-tayev and Grinin, such rapid population growth results largely from an acceleration in technological innovation. Viewed in terms of relational evolution, this acceleration of innovation reflects the phase transition and the enhanced ability to experiment with and to socially integrate the wide range of social mutations – manifested, for example, in the feedback loops of increased collective learning – that had already developed, as well as new innovations.

In the rest of this essay, I shall explore whether, as a relational theory of evolution suggests, the Axial Age and Modernity share similar dynamics. Space limitations make it impossible to explore key issues such as capitalism, imperialism, or developments outside Eurasia in any detail. If this theory does seem accurate, however, it should offer fascinating insights into such topics at another time.

At the heart of events in both cultural phase transitions is the transformation in the cultural ‘phenotype’, the institutional structures that enable continuing survival, which requires a new cultural ‘genotype’, the equivalent of organic DNA. Bondarenko and I call that cultural genotype a ‘world story’. Such culture-defining sets of stories must answer a series of questions about survival including:

- How did we human beings get here?
- What is our purpose?
- Who are ‘we’ as a group, and how should we behave toward each other and our world?
- How should we manage the communities in which we live?
- Why, in a world full of fear and pain, should we not kill ourselves?

In this way, the world story of hunter-gatherers had to explain the ‘profane’, day-to-day issues of survival, from how to hunt and gather, house and clothe themselves to social relationships in groups that rarely exceeded 30 members; yet, it also had to explain the sense that ‘sacred’ forces ‘incomprehensible, intractable but eminently efficacious’ (Caillois 2001: 22), were continually moving things – from climate shifts to the animals they hunted and the flora they gathered. Such world stories are not merely ‘religious’ (see Nongbri 2013); they articulate a discourse that integrates spiritual concerns with social, economic and political questions, encoding any society's cultural attractor. Moreover, as Taylor (2007) notes of his expanded concept of religion, world stories function both to create the ground for social structure and to destabilize it, especially during times of cultural phase transition.

The world stories of the predominant pre-axial states (*c.* 3000 BCE – *c.* 800 BCE) focused on maintaining order amid the forces of chaos that threatened large societies dependent on agricultural surplus. In Sumeria, Egypt, and China, for example, controlling the sacred forces threatening large-scale agriculture, from drought and flood to the devastation of war, was central. In all of them, the king was conduit to the divine, whether as god himself or, more often, master of order-creating ritual. In Egypt, for example, the pharaoh had to practice the rituals that ensured *Ma'at*, both the triumph of order over chaos and justice for society at large (Assmann 2008, 2011). The resulting societies were institutionally integrated, so that worship, politics, and economics – as in the use of temples for grain collection and distribution (*e.g.*, the story of Joseph administering the seven years of plenty and seven of famine, Genesis, 41) – function as parts of an order as integral and nat-

ural as the order and chaos they balance. This style of world story successfully governed these societies until *c.* 1000 BCE, when the combination of increased trade and wealth, a wider use of writing, and rapid improvements in warfare, especially the iron metallurgy that made weapons cheaper and more plentiful (McNeill 1982), as well as a doubling of world population between 3000 and 1000 BCE (Livi-Bacci 1992), demanded a new way of living in the world.

The Axial Age

Pre-axial social structure began to break down in the Mediterranean world *c.* 1200 BCE, when the ‘Sea People’ (*e.g.*, Sandars 1987) destroyed both Hittite and Mycenaean cultures and drained the power of Egypt during the twelfth century BCE. In China, the Zhou Dynasty began losing control of its territories by the middle of the tenth century BCE, eventually disintegrating into 170 competing kingdoms (Fairbank and Goldman 2006). Karl Jaspers (1953: 1) named the resulting transition the Axial Age (800–200 BCE), the ‘axis in world history ... which has given birth’ to everything that followed. The school that follows his lead (*e.g.*, early Bellah 1976; Eisenstadt 1982; Armstrong 2006) explains the similar experiences in these states largely in terms of a spiritual transformation that, for them, happened unpredictably in unconnected cultures. Relational evolution, on the other hand, suggests that this period represents, as Assmann (2008, 2012) points out, cultural breakdowns followed by breakthroughs that drove total social transformations in societies that were experiencing the same sort of increase in complexity.

To adapt to it, people in these societies needed to recreate their institutions, from the pre-axial order that emphasized loyalty to one’s lineage to a more formal connection and sense of obligation. In describing China’s axial experience, Mark Lewis (1990: 246) notes that, just as warfare was transformed from a means of defending honor among aristocrats to the tightly organized extension of armies of hundreds of thousands directed by the will of a single man, the commander, ‘all of society was re-imagined in terms of the hierarchical ties of superior and subordinate’. In Greece, this movement toward order and control appeared in the phalanx and later the troops of Philip of Macedon, as well as the bureaucratic empires that emerged from Alexander’s conquests.

To transform their institutions in this way, they would first have to re-interpret their world by evolving new world stories. As Assmann (2011) notes of the Israelite experience, the new world stories evolved through roughly three phases. In each, people, freed of their older world-story attractors, behaved according to their evolving stories, experienced the results, and then changed the stories in response. Assmann identifies the phases of axial world story as ‘foundational texts’, ‘religious texts’, and ‘commentary’. Rather than his ‘religious texts’ (for a discussion of some problems with this term, see Nongbri 2013), I shall use the term ‘tragic/new world story texts’, to include Timothy Reiss’s understanding of tragedy. For him, the tragic reflects a ‘sense of injustice’ and ‘the inevitable gap between the human known and knowable and all that escapes discourse’, ‘appearing at certain moments of seemingly abrupt epistemic change ... making a new class of discourse possible’ (Reiss 1980: 20, 2). Tragedy recognizes the terror that people experience as their old order no longer works.

For the sake of brevity, I shall focus on the axial experiences in Greece and China (for a treatment of the process in Israel, see Assmann 2011; for the Indian experience, several essays in Eisenstadt 1986).

Each culture's foundational texts articulate group identity as 'remembered past', mixing myth and history (Assmann 2011: 59), translating pre-axial mythos into a world where the cultural attractors have collapsed. The fear of chaos dominates all of them. In Greece that fear appears in the poetry of Hesiod and the epics of Homer, articulated in divine figures who eat their children and precipitate a decade-long war over a beauty contest. Faced with this chaotic and capricious world, Homer shows the aristocracies of the Greek states as fractious brothers, coming together to protect each other's honor, going to war over Helen and defeating the eastern enemy, Troy. The Greek *poleis* enacted this story when they cooperated to defeat the Persians in 490 and 480 BCE. Having achieved this success in enacting their foundational texts, these city-states acted like brothers again, fighting among themselves over political and economic control in alliances led by Athens and Sparta. The devastation of the Peloponnesian Wars would drive Greece's Golden Age of tragic/new world story texts.

In China, the foundational texts are also about taming chaos, although the High God of the Shang Dynasty (*Di*) had been translated into the concept of Heaven (Schwartz 1985). Order was Heaven's gift so that the key issue would be why people introduce disorder by deviating from it. The actors in China's axial foundational texts are not divinities, but early 'sages', such as Yu, who invented irrigation and water control after the Great Flood of the Yellow River, or the kings Yao and Shu, who exemplified an ordered practice of public rule (*Ibid.*; Lewis 1990). The ideal inherent in this foundational myth was of order through strong kingship in an extremely hierarchical, united China. Partly as a result, the central theme of China's Axial Age was the movement from fragmentation to unity, from chaos to order. In this way, in the Spring and Autumn period (771–476 BCE) early Axial Age China witnessed a constant state of war – one account lists 540 interstate wars and more than 130 civil wars in one 295 year period (Lewis 1990: 36) – intensifying the fear of chaos that had existed previously. By the end of the Spring-and-Autumn period, warfare had reduced the number of competing states from 170 to seven. It would also stimulate the tragic/religious texts that appeared in late axial China.

In the axial societies, the terror provoked by these wars would combine with the increased integration of writing beyond the scribes and formal keepers of social order to encourage a level of reflection previously unknown (see Assmann 2012). Literacy facilitated the rise of individualism, as reading, an individual activity, begins to replace communal storytelling, and it became possible for people to become more reflective with a text in front of them (Ong 1982). The tragic / new world story texts in these societies would be one result of this increased reflection.

In Greece, those texts appeared first in the tragedies of Aeschylus, Sophocles, and Euripides, which span the fifth century BCE, from the beginning of the Persian Wars in 499 BCE to the end of the Peloponnesian Wars in 404 BCE. The tragedies demonstrated how even good people become caught up in chaotic forces, no matter how hard they resist. These texts demonstrate Reiss' (1980: 21) 'moment of rupture', as people recognize that the old ways do not work, and that the order provided by reason can be disrupted by dark sacred forces.

The new world story to explain this chaos and terror emerges in Greece from its tradition of philosophy, with all the experimental variety one would expect in a period of phase transition: the Pythagoreans (fifth and sixth centuries BCE) insisted on the ultimate reality of numbers; Heraclitus (fl. 550) saw reality as a constant change; and the atomists, such as

Democritus (fl. 410), viewed reality ‘as a lifeless piece of machinery’ (Lindberg 2007: 29–30). All this intellectual searching culminated in the philosophy of Plato (427–328 BCE) and Aristotle's practical application (384–322 BCE).

Having lived through the devastation of the Peloponnesian Wars, Plato knew first hand that human-induced chaos had to be controlled. To do so, his philosophy emphasizes rationality, insisting that the world was created by a rational spirit, the Demiurge (see *Ti-maeus*), based on the abstract Forms of things, their true reality. Chaos crept into the world, not because of the Forms, but the material with which the Demiurge worked (e.g., Bellah 2011). Because, as the Parable of the Cave (*Republic*) indicates, most citizens never understand the reality of Forms, they are governed by emotions and appetites, and government must prevent those emotions and appetites overwhelming citizens' reason. To make such government work, Plato replaced the heroic leaders of Homer with his *theoros*, the philosopher who ‘loves the spectacle of truth’ (Nightingale 2004: 98). The *theoros* would allow most citizens to have their ‘unfalsifiable’ mythic beliefs (*mythos*), but they themselves would live by the rational, ‘falsifiable’ *logos*. Plato recognized that such a rationally governed life was only for a very few. For the rest, he suggested that the gods, goddesses, and narratives of the old world story would be sufficient.

Aristotle, born after this devastation, ‘was able calmly to look around the new world that Plato had opened up and explore its many possibilities, without rancor’ (Bellah 2011: 395–396). Plato's Demiurge would become Aristotle's ‘Unmoved Mover’, a divinity of pure thought, beyond our world of matter, and the cosmos it created contained both the chaotic, ever changing world below the Moon and the unchanging Heavens (Freely 2012: 28), rotating in perfect circles. Humans created chaos only because they would not allow the pure intellect of the divine to guide them. To avoid chaos, the *polis* must train citizens in using their reason. Aristotle's many other studies continued to apply his own rational principle to one field of study after another, answering the questions behind any world story. His *Ethics*, for example, explored how the individual could achieve *eudaimonia* to live the life of *theoria*. In these and other explorations, Aristotle would ‘sketch out most of the fields of inquiry that would preoccupy later thinkers’ (Bellah 2011: 395).

The Chinese experience with tragic/new world story texts manifested itself as the philosophical flowering of the ‘hundred schools’, which arose in the century leading to the Warring States period (403–221 BCE). These schools reflected the wide variety of thought responding to the violence of the Spring-and-Autumn period, as articulated by the *shih*, the growing class of often-wandering scholars dispossessed from their noble lineages (Schwartz 1985). All of them were trying to understand the same tragic dilemma: If order was the gift of Heaven, why was chaos so widespread? Why had men lost ‘the Way of Heaven’? Three of these schools would define the positions that would be negotiated into China's post-axial world story. For the Confucians, the issue was social: the Zhou had already achieved a ‘universal, all-embracing, ethicopolitical order’ (*Ibid.*: 65). Only by re-establishing that order could social order be recaptured. To do so, Confucius (551–479 BCE) and his followers focused on living life according to the ritual formulas for one's position and on education as a means for both individuals and society at large to understand the ‘Way’ of humans in society. For the Daoists, the issue was more personal: the overly civilized order of the Confucians had made it impossible for people to behave naturally, in consonance with the Way and the Heaven-given laws of change (Graham 1989). Only by the individual learning the Way and acting according to it could order be returned. Final-

ly, the Legalists believed that the problem was the passionate, unruly nature of human beings and that order required clear, harshly enforced laws so that people knew exactly what behavior would be expected and what would happen if they did not conform (Feng 1976). Throughout the Warring States period, the intensity of warfare increased, as armies reached several hundred thousand men (Lewis 1990). By 300 BCE, even Mencius (c. 372–289 BCE), the strongest Chinese believer in human goodness, recognized that the only way to social order was unity (Schwartz 1985). With a complex cosmology already in place (*Ibid.*: 350–382), these three perspectives would become more and more closely intertwined throughout China's commentary period.

Assmann (2011: 269) describes the period of commentary as 'an indispensable accompaniment to the cultural transformation ... keeping those texts alive by bridging the ever widening gap between them and the changing reality of life'. In this way, as Alexander spread Hellenism, Rome rose in the West, and the Qin united China at the end of the Axial Age, as population and wealth increased, and technology accelerated, new ways of governing and behaving in increasingly complex societies could be articulated and enacted.

In Greece, this commentary would play itself out in philosophy and science, continuing its evolution through the Hellenistic period and later. The rationalist commentary that began with Plato and Aristotle continued through the work of thinkers such as the Cynics and Neo-Platonists in the Hellenistic period, early scientific thinkers such as Ptolemy and, later, the Fathers of the Church, such as Augustine and Origen (*e.g.*, Gillespie 2008). Significantly, their central assumptions were set in place by Plato and Aristotle, including the analysis of the world as distinct 'things', the concept of a soul separate from the body, the idea of an Unmoved Mover, and the emphasis on moral distinctions. All these assumptions would be integrated into the world stories of the Roman Empire and, later, that of Western culture.

The Chinese commentary period seems to have been underway in the fourth century BCE. Throughout it, the Chinese thinkers of all schools would borrow from each other to develop the most effective philosophies for aiding kings in the seven states in their efforts to unite the country. The Legalist Han Fei (d. 233 BCE), for example, briefly the chief minister for the King of Qin as he was uniting China, borrowed from Daoist *Laotzi's* ideas about the Way and *wu-wei*, probably best translated as effortless action (Slingerland 2003), to provide a metaphysical basis for his emphasis on punishment (Graham 1989). In spite of a reaction against the extreme Legalistic policies of the First Emperor, so that it lost its position as a school of philosophy, the concepts of Legalism remained key assumptions for the Chinese government. Neo-Confucianism, with its emphasis on right behavior and education, incorporating elements of both Daoism and Legalism, would become the state philosophy (Fairbank and Goldman 2006).

Modernity as Another Axial Phase Transition

The terms in which Modernity is often described – Latour's (1993: 10) 'new regime, an acceleration, a rupture, a revolution in time', for example, or Samir Amin's (2009: 13) 'claim that human beings, individually and collectively, can and must make their own history' – could also characterize the Axial Age. As a result, it makes sense to examine Modernity (c. 1500 CE to the present) as a phase transition in human history with remarkably similar dynamics.

As with the Axial Age, the ability of an older world story to govern an increasingly complex society was breaking down. For more than a millennium, the bureaucratic empires of Byzantium, the Islamic world, and China had justified themselves with world stories in which religions of the book were integrated with the efforts of the secular kings and bureaucracies that enabled them to govern vast territories. So successful were the post-axial empires that the conquests of the Yuan Dynasty, led by descendants of Genghis Khan, united Eurasia as a world economic system in the thirteenth century (Abu-Lughod 1989). Then, in 1453, the Ottomans took Constantinople, threatening to overwhelm Christian Europe.

Yet, within 200 years, these empires were losing the ability to respond to the social complexity that they had enabled. With a world population that would exceed one-half billion before the end of the sixteenth century (Livi-Bacci 1992: 31), the first system of worldwide trade by the end of the thirteenth century (Abu-Lughod 1989), and acceleration in the rate of technological innovation in Islam and China (*e.g.*, Lindberg 2007; Temple 2007), their old world stories began to falter. As Jack Goldstone (1991) notes, the inability of government to adapt to the needs of growing populations as economic activity evolved caused the mid-seventeenth century revolts in England, China, and the Ottoman Empire. The Ottomans and Chinese fell back into the older behaviors that would enervate them when faced with Western imperialism. The English, in the midst of their phase transition, moved forward.

In addition, the European politics was fragmented, as in early axial China and Greece, with Italian city-states, German principalities, and emerging national states in Spain, Portugal, France and England (*e.g.*, Bondarenko and Korotayev 2011). In fact, writers, such as Eric Jones (2003), claim that Europe's political fragmentation in 1500 CE was key to its subsequent rise. Moreover, as the axial transformations were partly driven by innovative applications of writing and iron metallurgy, early modern Europeans took printing (Eisenstein 2005) and the commercially efficacious machine, both invented in China, 'to a high pitch' (Jones 2003: 58), that, together, made a higher level of complexity possible, and with it the ability to respond to a more complex environment.

Since the fall of Rome, Western Europe had experienced a chaos of diverse influences – from the rationality of ancient Greece, through the memory of the Roman Empire, and monotheism, through Christianity, to the Germanic, Viking and Islamic invasions. By the end of the twelfth century, the foundational text of the modern period began to emerge, initially in the stories of the Quest for the Holy Grail (Spengler 1932), combining the restless spirit of multiple invasions with the Christian, theo-centric tradition of worship and belief, especially as articulated in the Apocalyptic millennialism of that period (*e.g.*, Noble 1999; Gillespie 2008). As suggested below, these stories would not express their full power until some time around 1500, when the breakthrough of the modern phase transition followed the breakdown of the medieval period.

Even as the grail quest literature was championing the authority of a social order joining the Catholic Church and the feudal economic/political class, events continued to provoke chaos. The loss of Jerusalem in 1187, followed by the failure of the Third Crusade (1189–1192) to retake it, undermined the legitimacy of the Papacy's claim to represent God on Earth. After the Mongol creation of a world economic system in the thirteenth century, increasing trade and wealth would build the fortunes that would finance the Renaissance, but also encourage the corruption in the Church, especially the Papal indulgences, which allowed the rich to 'buy' salvation, outraging Martin Luther. Finally, the Black

Death (1348–1350) and the Hundred Years War between England and France (1327–1453) would devastate the population of Europe (Gillespie 2008). The medieval world story would then break down and the modern phase transition would begin.

This phase transition would consist of a series of social explorations of Kauffman's adjacent possible, each of which led to a social consensus, the enactment of that consensus, a series of (mostly unexpected) results, and new explorations. Perhaps the most striking, this evolving modern world story repeatedly destabilized the institutions and belief systems created when it was enacted.

At the beginning of the sixteenth century, both the Renaissance and Reformation looked to different paths for governing an increasingly complex society. The printing press introduced by Gutenberg *c.* 1450 (see Eisenstein 2005) changed the nature of communication, making increasing amounts of knowledge available to the Renaissance and personal reading of the Bible to the Reformation, generating a significant acceleration of the collective learning so central to cultural evolution (Christian 2004); the machine, employed in everything from the printing press to the newly improved firearms, intensified politics, warfare and commerce. Building on these innovations, the Renaissance strove to improve human life by employing the increasing store of knowledge; the Reformation used the availability of Bibles in the vernacular to challenge the often-abused spiritual monopoly of the Catholic Church (Gillespie 2008). For Martin Luther, the End of Time was near. As a result, for many in the Reformation, there was no need for the attempts at education and reform championed by Renaissance spokesmen such as Erasmus. The Reformation won out, plunging Europe into 150 years of devastating religious wars, as the Spring-and-Autumn wars had devastated China.

Even before these wars culminated in the Thirty Years' War (1618–1648) and the English Civil War (1642–1651), the tragic/new world story texts would begin appearing in Shakespeare's major political tragedies, *Hamlet*, *King Lear*, and *Macbeth*, in the first few years of the seventeenth century. There, he demonstrates the inadequacy of the medieval model of monarchy, with its dependence on family lineages and the relationship between the king and his knights. As with the Greek tragedians' criticism of Homeric ideals, Shakespeare points us to Reiss's (1980) moment of rupture when a new way of governing a more complex world must emerge. By the end of the religious wars, the new world story was also emerging.

That story had roots in a growing tradition of scientific rationalism. Francis Bacon (1561–1626), for example, called for an experimental science whose priest-like devotees would 'discover the hidden powers by which nature moves in order to gain mastery over it' (Gillespie 2008: 39). In addition, Kepler, Copernicus and Galileo conceived of 'the machine of the universe ... similar to a clock', to use Kepler's words (quoted in Dolnick 2011: 182), and written in the language of mathematics. The explorations of this mechanistic worldview turned on the issue of how best to apply scientific realism to govern a world weary of war's chaos.

For René Descartes (1596–1650), science was the rational search for the Truth that would 'discover the ground for a radical transformation of European society' (Gillespie 2008: 177). Such a science of *certainty* was possible for two reasons. First, the human being alone was a thinking being with the godlike ability to remake the world. Second, science can be true because mathematics, as the language of the universe, is true, and, Descartes believed, God is not a deceiver. A different version of this rational world story came

from Thomas Hobbes (1588–1679), for whom science was not so much the search for the truth, but for knowledge of how things worked. Because God was omnipotent – and thus capable of deceiving human beings – science must study the dynamics by which God willed motion to occur. Human beings can never know the truth of these dynamics, only that an explanation works, enabling them to manipulate a segment of the world (Gillespie 2008: 177).

Descartes' version, with its emphasis on the ability of science to achieve certainty, would become the central statement of the modern era's world story for the next 300 years. Its emphasis on mathematics, in particular, allowed those enacting the story to dismiss the messiness of life, especially after the century and a half of religious wars, as deviation. Only mathematics, the language in which God revealed His Book of Nature, was real. Such a science would fulfill the growing belief in progress, 'leading toward ever greater perfection of human nature' (Nisbet 1970: 5). The story would be enacted and further articulated in Robert Boyle's experiments in physics, William Harvey's description of the circulation of blood, Isaac Newton's mechanical physics and calculus. In many ways, Descartes and Newton were Modernity's Plato and Aristotle, the two thinkers who finally crystallized the theory and practice of their world story.

Meanwhile, Europe's grail quest knights were exploring the world – first the Spanish and Portuguese, then the Dutch, English, and French – trying to do God's work of bringing salvation to the heathens and, incidentally, profits back home. They looted the gold and silver of the Americas, buying themselves ever more tightly into the world economic system and whetting their taste for the fine products of the East (Frank 1998).

The commentary on the new world story would emerge over the next 250 years, exploring how best to apply it. Among the key issues were the transformation of worship and belief from a shared part of the common world story to a private matter (Nongbri 2013) and the intensified application of Modernity's great social experiments – nationalism, the nation state and capitalism – throughout the Enlightenment. Among the mutations of the world story that would contribute to this process are:

- Baruch Spinoza's (1632–1677) 'obscene', 'profane', and 'blasphemous' (Nadler 2011: 2–3) interpretation of the Bible, his identification of God with Nature, and his insistence that democracy and freedom of expression would enhance the power and stability of the state;
- John Locke's (1632–1704) social contract with which people form government to protect their interests (Pagden 2013), key for the democratic nation-state; and
- Adam Smith's (1723–1790) 'invisible hand', which created a quasi-religious free-market philosophy to replace Christianity's omnipotent God (Israel 2011).

Throughout this period, people would enact this evolving world story, introducing social mutations ranging from a host of scientific discoveries and technologies to more effective industrial organizations, better weapons to more efficient military structures, as well as the imperialistic successes they enabled. As long as society seemed to exhibit the Enlightenment ideal of progress, the rationality so critical to its worldview seemed to promise the perfection of man envisioned by Descartes (*Ibid.*). However, when French finances began to fail and the monarchy could no longer meet its responsibilities to the people (Goldstone 1991), a wave of destabilization, articulated by *philosophers*, such as Diderot and D'Alembert, in France, and Priestly in England, began to create a 'widespread consciousness in influential circles of the need to abolish privilege and rank' (Israel 2011:

229), as well as a conservative reaction. When the French monarchy failed, however, the result was not government by the ideals of Enlightenment rationality, but a devastating destabilization in an explosion of full-flowered nationalism and revenge, leading to two decades of war, evoking the same emotions religion had during the religious wars.

After Napoleon was finally exiled in 1815, Europe continued following its ideal of progress, with further commentary on the world story and enactment of it. The Industrial Revolution and its critics, from Charles Dickens' novels to Karl Marx's economics, drove the evolution of the new world story into new areas of the adjacent possible. And Bacon's 'priests' of science would continue to destabilize the world story as they enacted it. The geological theories of Charles Lyell and evolutionary theory of Charles Darwin set the stage for driving God out of the modern world story, exciting the same reaction as Spinoza had. More and more, the modern world story was appearing increasingly unstable.

Then, in the twentieth century, it began to collapse. First, scientists, practicing the Newtonian methodology they had learned, discovered that their worldview was, if not wrong, then, at least, askew. Albert Einstein's theories of relativity showed the dead matter of Newtonian physics to be structures of transformed energy. Then quantum mechanics demonstrated that Newtonian distinct 'things' were intimately interconnected, and its determinism open to chance and contingency (Smolin 2013). Second, after three generations of peace in Europe, at a point where Enlightenment progress appeared to be pointing toward human perfection, two world wars erupted, with levels of devastation proving that rationality could not be the cornerstone of human nature Descartes and those who followed him had believed (*e.g.*, Berman 1992).

In addition, since World War II, the modern confidence in the value of education, free trade, and human equality has destabilized the political order by which Western Europe had dominated the world for more than two centuries. As people in formerly 'backward' nations have taken advantage of scientific education, they have entered into full partnership in a world economy where China is likely to become the leading power. As the Internet has accelerated the process of global interconnection, the nations of the world are becoming increasingly interdependent in trade, financial dealings, and resource allocation, as well as their attempts to control the dangers posed by terrorism, environmental contamination and global warming (Sachs 2008). Here one of the most powerful experiments of the modern world story, national culture, has become one of the chief obstacles to solving all these problems (*e.g.*, Smith 1995). Because different national cultures, based on their unique histories, include different ways of thinking about the world, it has become increasingly common for people from those cultures to experience the world very differently (*e.g.*, Nisbett 2003). For example, Western and Chinese business people have different understandings of the concept of Law (Baskin 2009), leading to significant mutual antagonism over issues of intellectual property.

In order for our societies to adapt to all these changes, still another world story is emerging. Nobel Laureate in Physics Robert Laughlin (2005) calls its worldview 'emergent', David Boje and I (Boje and Baskin 2010) 'post-Newtonian', Smolin (2013) 'relational'. In this paper, I have used Smolin's relational, a term used similarly in Taylor (2007), because it implies that the 'things' we experience as distinct behave *both* as agents *and* as members of networks interconnected to other agents, in the moment and historically. Such a worldview, I believe, stands at the heart of Big History, and has also been incorporated in other social sciences – Latour's (2005) sociology of actor networks, for ex-

ample, or the philosophy of Karen Barad (2007) as well as much of Michel Foucault's (1994) 'anthropology'. It is, after all, the relational interconnection of agents, often on many scales, in both space and time, that makes a relational conception of evolution so thick.

Conclusion

Despite the unavoidable oversimplification, I hope that I have demonstrated that the basic dynamics of the Axial Age and Modernity seem similar, from the social breakdown and political fragmentation through the intense social, political and technological innovation, from the terror roused by periods of intense warfare through the evolution of new world stories. Clearly, the Axial Age and Modernity also have significant differences. The axial transformation occurred in four very different cultures, which remained only tenuously connected. On the other hand, the modern transformation began in one area and spread across a globe that became increasingly interconnected. Yet, both periods seem unmistakably to confront the need to adapt to a significantly higher level of social complexity.

I believe that further examination will show relational evolution can be valuable to the study of Big History. A relational perspective, after all, offers tools to explore how national cultures evolved as parts of their societies' world stories, under deep historical pressures. This analysis is essential because it is the world story that contains any culture's definition of identity – our group *vs.* the other. As Ed Hall (1976) points out, most people still believe that anyone who does not behave according to their own culture is a barbarian, uncouth at best and insane at worst. Yet, with all the problems the world faced that can only be solved by international cooperation, the human community needs to redefine this issue of identity. Such a redefinition has been part of past cultural phase transitions. During the Agrarian Revolution, group identity was expanded from membership in a small band to membership in a state. During the Axial Age, it was again from the state to the empire. Unfortunately, we humans seem to need to define the world as 'us' and 'other'. Yet, without an invasion from space, we have run out of others.

The alternative is, not to expand, but to thoroughly redefine what we mean by us and other. As Big History demonstrates, the human race comes from a single origin. The differences between us are a matter of adaptations to different circumstances, and the question becomes whether human beings can let go of the implication of enemy that has been built into the other. Can we see the other as someone like us, who merely found a different story? Without such a redefinition, it seems unlikely that people from different cultures can come together to discuss issues of mutual interest – from economic integration to nuclear proliferation and ecological degradation – without the distortions of cultural difference and enmity.

At first, this seems an impossible goal. When the United Nations cannot address the chaos in Syria, the European Union is increasingly troubled, and some of the most industrialized nations refuse to agree with treaties on global warming, the combination of power politics and cultural difference seems insuperable. Yet, who, living in a hunter-gatherer band 1,500 years ago could have imagined identifying as a member of a city of 80,000, such as Ur in 2800 BCE (Modelski 2003: 28), or a nation of a billion, such as China and India today? We, human beings, are capable of learning to live and think very differently, especially when our survival depends upon it. For me, Big History has the potential to contribute to this effort of relearning what it means to be a human being in a fully global-

ized world, rather than one largely segregated by culture, as the world was even 500 years ago. And I invited the reader to consider the analysis in this essay, as sketchy and oversimplified as it is, as a set of tools in the further development of Big History.

Acknowledgement

This paper is largely the result of three years of writing and discussion with Dr. Dmitri Bondarenko. While his expertise in areas with which I was not familiar was invaluable, the give and take within our explorations and discussions is the one factor that most enabled me to make this argument.

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Retrofitting the Future

Barry Rodrigue

This paper considers the subspecialty of adaptive technology. It looks at technology development in the light of our rapidly changing world and in the context of Big History. The author makes a case for past technologies serving as models from which new technologies may be developed. In this way, he sees a collective knowledge of the past, as well as considerations of the present and future, conferring survival benefits on civilization. In this way, Big History holds great pragmatic promise for humanity.

Keywords: *adaptive technology, Big History, traditional ecological knowledge (TEK), future studies, indigenous heritage.*

Big History is involved in a great project of expanding the view of humanity's place in the universe. Its studies are leading to new connections between previously separated entities, from cities and minerals to shipping lanes and thermoclines. But as scientists and scholars develop new insights of cosmic history, they should also think back to their ancestors – to our forefathers and foremothers who took their living from the land, sea, rivers and hillsides of the ancient world. They should also think about today's indigenous peoples who are custodians of a middle tradition between the old and the new ways. Such reflection on the past should not be a focus of just antiquarian interest but it should also reflect a present-day concern for sustainable adaptation to life on our rapidly changing planet.

Classically minded scholars tend to designate the small agrarian cities of 5000 years ago as the 'start of civilization' but, in fact, the individual components that collectively constitute 'civilization' existed long before Mesopotamia became its so-called cradle. The first understandings of the universe began with our Paleolithic ancestors, not with Neolithic rulers and priests. These understandings developed in continual and collective processes, beginning with the evolution of our genus more than two million years ago.

This is borne out with the discovery that many of the traditional hallmarks used to identify 'civilization' began before the adoption of agriculture. Take, for example, permanent residency in single locations and the development of ceramics. Hunters and gatherers lived in permanent communities in places like Palestine and Japan over 10,000 years ago, while pottery has been pushed back 20,000 years with its recent discovery in southern China (Wu *et al.* 2012). Indeed, it was hunters and gatherers who developed strategies that led to the development of agriculture. While hardly news to most scholars, it is a fact that needs to be better articulated with a public that tends to focus on technological and social aspects of Neolithic society.

The hunting and gathering peoples of the world knew their landscapes and waterscapes better than the farmers who had to micro-manage their crops on small plots of lands. Agriculture might have allowed the division of labor so that a few specialists could

spend their time studying the stars, but, in the older tradition, a majority of hunters and gatherers acquired such knowledge of nature. This, indeed, is a point made by social scholar James Tierney: ‘The tendency is to lump all our ancient ancestors into the category of hunter-gather. This implies to the lay person, as well as many scholars, that these were small bands forever on the move, with little or no behaviors that we might describe as “advanced culture”’ (Tierney 2011: 290).

Examples

On low alpine peaks along the coast of Maine are small cuts in the granite ledges. These elongated holes were quarries dug a hundred years ago to extract mica. Maine was one of the world's large mica producers back then. Mica is an igneous form of silicon whose name can be translated from Latin as ‘a glittering crumb’. Indeed, as you walk up the tote roads on these hills, the earth glitters with fragments that fell off horse-drawn carts a century ago. Mica is inert, flexible, lightweight, non-conducting, and opaque. In earlier days, it was used as windows in boilers (isinglass), in lanterns to shield lampshade fabric from a wick's flame, as well as insulation for electrical plugs and toasters. Today, mica is used in atomic force microscopy, which produces high resolution, three-dimensional imaging.

This is an example of how older uses of technology can be migrated into more modern uses. There is nothing unusual about this process. People have adapted older technologies into newer ones for millennia – this paradigm of transferrable technology is a backbone of material sciences. Pigments that our ancestors developed for use on the walls of caves, like Lascaux and Duogate and Blombos, have been developed for use on the walls of the international space station and are even enroute to Mars (NASA 2012).

My professional training lies in the disciplines of geography and archeology. The research that I entered focuses on the movement of humans into the northern Appalachian Highlands – the frontier region between Canada and the United States. While this research has been about past events, I soon discovered a specialty of adaptive technology that can be called ‘futures archeology’. This specialty became apparent one day in 1994, when I discovered the remains of a half-dozen deserted farms, which lay on a hillside, in the woods, many kilometers from any presently existing habitation.¹

After a long day of work, when I got back to my tent that night, I discovered that I had neglected to measure the downhill dimensions of a causeway. So I got up at 05:00 the next morning. It was raining. I had breakfast – as the rain got worse. I crossed the river, parked my car at the end of a dirt road, and began hiking through the forest. The rain came down even harder. However, it turned out that this torrential downpour was a very fortunate experience, since I got to see the causeway in action.

A causeway is a stone bridge that allows humans and livestock to cross over a stream but allows water to pass beneath it in such a way to minimize erosion. In this case, the causeway worked brilliantly, 150 years after its construction and abandonment.² The water pooled upstream and drained through the stonework, leaving the stone crossing dry and the streambed intact.

¹ Barry Rodrigue, Maine Historic Preservation Commission, ME 534-016.

² Barry Rodrigue, Maine Historic Preservation Commission, ME 534-014.

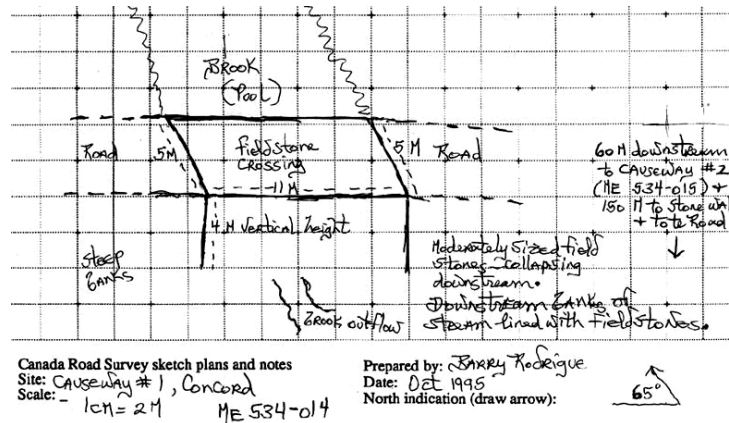


Fig. 1. Causeway plan. Barry Rodrigue, Causeway No.1, Concord, Maine, ME 534-014, for the Maine Historic Preservation Commission, Augusta, Maine (USA)

I took the measurements that I needed and hiked back out of the forest. Back at my field camp, I mentioned the experience to the owner of a hunting lodge. She said this design would solve one of their problems, as their stone causeways washed out every year. This began my thinking about old methods being used to solve modern problems. Conversations with archeologists and other professionals revealed similar examples of adaptive technology.

However, simple adoption of old techniques can be problematic. One infamous example is that of the sailing vessel, *John F. Leavitt*. In the wake of the oil crisis of 1973–1974, people began to search for alternatives to petroleum power. A well-designed adaptation of a traditional coastal schooner was developed in Waldoboro, Maine (USA) – it was 30-meters long and had two masts rigged with fore and aft sails. In the winter of 1979, it set sail down the eastern seaboard of the United States with a cargo of lumber, bound for Haiti. However, it foundered in moderate seas off Long Island, New York. After much study of the incident, the problem was identified as the crew not having sufficient knowledge of commercial deep-water sailing, which had been lost in the century since the era of ‘wind, water and wood’ (Koltz 1980: 40–42).³ In other words, knowledge needs to go with technology.

Bridges to the Present

The examples of this more complete development of technology and its use abound. Two examples may be seen in Alaska. Archeologists, biologists and indigenous peoples in Southeast Alaska have begun collaborating to deal with declines in the region's basic fisheries economy. Traditional halibut hooks fashioned by the indigenous Tlingit were designed in such a way so as to avoid capture of immature fish and large breeding females, while their intertidal salmon weirs allowed for capture of fish only at certain times of an ebb tide. This was a technology-based method of conservation (Ratner and Holen 2007: 45–46, 48). Likewise, architectural studies of earth-fast, traditional housing among the indigenous peoples of Alaska led to construction of new housing forms in Anuktuvuk Pass,

³ I would like to thank Nathan Lipfert of the Maine Maritime Museum for his background information of this incident and others.

a Nunamiut Eskimo community in the Brooks Mountain Range in the Alaskan arctic. By merging traditional design and with high-tech design, the result was a cut in the cost of house construction and a reduction in the annual heating fuel use by a factor of ten. This kind of merger of traditional and modern skills is referred to as 'traditional ecological knowledge' or TEK (Ratner and Holen 2007: 45–46, 48).

Russian anthropologist Anatoly Alekseyevich Shtyrbul, who teaches in Western Siberia, at the Omsk State Pedagogical University, has carried this view further by stating that the so-called 'primitive' traditional societies possess many of the skills that we will need to adapt to the future.⁴ Shtyrbul is echoed by American archeologist, Stephen Scharoun, who specializes in eighteenth- and nineteenth-century farm technology and systems of farm management. His career was not chosen because of an atavistic appreciation for the past. His view is that with the decline of cheap fossil fuel, we should know such techniques, so that we can adapt them to soon-to-be changing forms of food production.

This is by no means a unique view, as many journals, societies, books, individuals and organizations advocate it. In the United States, *Foxfire* magazine was begun in 1966, the *Whole Earth Catalog* in 1968, and the *Small Farmer's Journal* in 1976. These are the kinds of technological compilation begun by encyclopediasts in fifteenth-century China and eighteenth-century France. The designer, Victor Papanek, devoted his life to such applied uses, as in his 1971 book, *Design for the Real World*.

Since the 1980s, agricultural scientist Anil Gupta of the Indian Institute of Management in Ahmedabad has researched grassroots innovation by common people throughout South Asia.⁵ Alexander Petroff has successfully established a self-sustaining program of agricultural recolonization based on oxen power in eastern Congo, an area lacking petroleum access. Petroff envisions his organization, Working Villages International, to be applicable to other regions of the world.⁶

But what is new about these efforts is that the present and future circumstances of life on Earth have so dramatically changed, and that a new, degraded world is in sight – one with little cheap energy, one that is polluted, overpopulated, and trying to adapt to collapsing infrastructures. Such adaptations as articulated by Shtyrbul and others are perhaps more important than ever. So, what does this kind of adaptive technology mean for Big History?

Big History and Adaptive Technology

In a way, adaptive technology could be seen as an extension of *Little Big Histories*, where a complete historical profile is given on a subject. In this respect, Esther Quaedackers has analyzed Tiananmen Square as an expression of building styles, making connections between human and other animals' construction techniques, while Craig Benjamin has analyzed the deep history of Jericho as the world's oldest and continually inhabited city (Quaedackers 2011; Benjamin 2011).

However, adaptive technology moves the concept of *Little Big Histories* a few steps further into the realm of filtering them for pragmatic lessons, for application to life. It thus could become prescriptive as well as descriptive. We, Big Historians, have done well in describing the past and beginning the assemblage of deep historical contexts. I propose that a next step might be more in the direction of applications.

⁴ This discourse was part of Shtyrbul's presentation at the Fifth International Conference on Hierarchy and Power in the History of Civilizations (Shtyrbul 2009).

⁵ Gupta's organization, the Honey Bee Network (<http://www.sristi.org/hbnew/>), promotes grassroots innovation.

⁶ See the website for Working Villages International at <http://workingvillages.org/>.

In his study of the Little Big History of Jericho, Craig Benjamin has outlined the factors that gave Jericho such an advantage, such as reliable fresh water source, protected valley, closeness to a major trading route, fertile soil, *etc.* If we were to convert such a predictive model to a prescriptive model, it might point us in directions to plan our lives for more stable and equitable existence – for example, on site locations for cities like Camargue, France (below sea level) or San Francisco, USA (on an earthquake fault).

Our indigenous societies are repositories of knowledge and ways of learning that the modern world will increasingly come to need as our access to cheap fuel dwindles and the damage from industrial waste increases. This is not to advocate for the celebration of primitiveness or ethnic identity, but an acknowledgement that we need to establish a ‘world heritage commons’ where the best ideas, both technology and process, are assembled and adapted.⁷

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⁷ Occoquan Paleotechnics (<http://www.occpaleo.com/about.html>) is an example of an effort that focuses on the study and reproduction of primitive technology.

Nation, Region, and Globe: Alternative Definitions of Place in World History

Daniel Little

The paper begins in the recognition of the importance of 'world history' and considers some of the current challenges this field faces. It considers several important contributions to the field that illuminate the value of fresh approaches: James Scott's construction of 'Zomia', Emmanuel Todd's historicization of 'France' as a nation, Bin Wong and Kenneth Pomeranz's new approach to Eurasian economic history, and Victor Lieberman's analysis of the strange synchrony between Southeast Asia and Western Europe over a millennium of political development. The essay concludes with several historiographical maxims: avoid eurocentrism, expect variation, look for mechanisms of inter-connection, avoid capture by 'nation-state' concepts, and pay attention to different schemes of historical time.

Keywords: world history, eurocentrism, Southeast Asia, Western Europe, nation, region, historiographical maxims.

Global Historiography

A question that arises in historiography and the philosophy of history is that of the status of the notion of 'global history'. This issue is important in contemporary debates about world history – for example, when economic historians make the case for Eurasian history rather than French history or Japanese history. There the view is that expanding the scope of vision from the separate nation states of Europe or Asia to the broader panoply of multiple peoples, cultures, and structures is helpful when it comes to understanding the past four hundred years. But what are some of the more general concerns that make thinking about global history an interesting or important topic?

One important reason for thinking globally as an historian is the fact that the history discipline – since the Greeks! – has tended to be eurocentric in its choice of topics, framing assumptions, and methods. Economic and political history, for example, often privileges the industrial revolution in England and the creation of the modern bureaucratic state in France, Britain, and Germany, as being exemplars of 'modern' development in economics and politics. This has led to a tendency to look at other countries' development as non-standard or stunted. So global history is, in part, a framework within which the historian *avoids privileging one regional center* as primary and others as secondary or peripheral. Bin Wong makes this point very strongly in *China Transformed* (Wong 1997).

Second is the apparent fact that when Western historical thinkers – for example, Hegel, Malthus, Montesquieu – have turned their attention to Asia, they have often engaged in *a high degree of stereotyping* without much factual historical knowledge. The ideas of Oriental despotism, Asian overpopulation, and Chinese stagnation have encouraged a car-

toonish replacement of the intricate and diverse processes of development of different parts of Asia by a single-dimensional and reductive set of simplifying frameworks of thought. This is one of the points of Edward Said's critique of orientalism (Said 1978). So doing 'global' history means paying rigorous attention to the specificities of social, political, and cultural arrangements in other parts of the world besides Europe.

So a global history can be expected to be more agnostic about patterns of development, and more open to *discovery of surprising patterns, twists, and variations* in the experiences of India (and its many regional differences), China, Indochina, the Arab world, the Ottoman Empire, and Sub-Saharan Africa. Variation and complexity are what we should expect, not stereotyped simplicity. (Geertz's historical reconstruction of the 'theatre state' of Bali is a case in point – he uncovers a complex system of governance, symbol, value, and hierarchy that represents a substantially different structure of politics than the models derived from the emergence of bureaucratic states in early modern Europe [Geertz 1980].) A global history needs to free itself from eurocentrism.

This step away from eurocentrism in outlook should also be accompanied by a *broadening of the geographical range* of what is historically interesting. So a global history ought to be global and trans-national in its selection of topics – even while recognizing the fact that all historical research is selective. A globally oriented historian will recognize that the political systems of classical India are as interesting and complex as the organization of the Roman Republic.

Another aspect of global history falls more on the side of how some historians have thought about historical structures and causes since the 1960s. History itself is a 'global' process, in which *events and systems occur that involve activities in many parts of the world simultaneously*. Immanuel Wallerstein is first among these, with his framework of 'world systems' (Wallerstein 1974). Wallerstein's prologue to the 2011 edition of the book is a very useful reflection on criticisms and reception of the book in its original version (Wallerstein 2011). But the basic idea is a compelling one. An effort to explain the English industrial revolution by only referring to factors, influences, and experiences that occur within England or on its edges (Western Europe) is inadequate on its face. International trade, the flow of technologies from Asia to Europe, and the flows of ideas and peoples from Asia, Africa, and the Americas have plain consequences for the domestic economy of England in 1800 and the development of machine and power technologies. And a 'globally minded' historian will pay close attention to these trans-national influences and interdependencies. This aspect of the interest of global history falls within the area of thinking about the scope of the causal factors that influence more local developments.

An important current underlying much work in global history is the *reality of colonialism* through the nineteenth and twentieth centuries, and the equally important *reality of anti-colonial struggles and nation building* in the 1960s and 1970s. 'The world' was important in the capitals of Great Britain, France, Germany, and Belgium because those nations exerted colonial rule in various parts of Africa, Asia, and South America. So there was a specific interest in gaining certain kinds of knowledge about those societies – in order to better govern them and exploit them. And post-colonial states had a symmetrical interest in supporting global historiography in their own universities and knowledge systems, in order to better understand and better critique the forming relations of the past.

Then there is the issue of climate and climate change. The 'little ice age' had major consequences for population, nutrition, trade, and economic activity in Western Europe; but the same climate processes also affected life in other quarters of the globe. So to have

a good understanding of the timing and pace of historical change, we often need to know some fairly detailed facts about the global environment (Fagan 2000).

A final way in which history needs to become 'global' is to incorporate the *perspectives and historical traditions of historians in non-western countries* into the mainstream of discussion of major world developments. Indian and Chinese historians have their own intellectual traditions in conducting historical research and explanation; a global history is one that pays attention to the insights and arguments of these traditions.

So global history has to do with

- a broadened definition of the arena of historical change to include Europe, Asia, Africa, the Middle East, and the Americas;
- a recognition of the complexity and sophistication of institutions and systems in many parts of the world;
- a recognition of the trans-national interrelatedness that has existed among continents for at least four centuries;
- a recognition of the complexity and distinctiveness of different national traditions of historiography.

Dominic Sachsenmaier provides a significant recent discussion of some of these issues in *Global Perspectives on Global History: Theories and Approaches in a Connected World* (Sachsenmaier 2011). Sachsenmaier devotes much of his attention to the last point mentioned here, the 'multiple global perspectives' point. He wants to take this idea seriously and try to discover some of the implications of different national traditions of academic historiography. More than half his book is devoted to case studies of global historical research traditions and foci in three distinct national contexts – Germany, the United States, and China. How do historians trained and en-disciplined in these three traditions think about the core problems of transnational, global history? Sachsenmaier believes that these differences are real, and that they can be productive of future historical insights through more sustained dialogue. But he also believes there are conceptual and methodological barriers to these dialogues, somewhat akin to the 'paradigm incommensurability' ideas that Thomas Kuhn advanced for the physical sciences. And he does a good job of articulating what some of these conceptual barriers involve:

Certain hierarchies of knowledge became deeply engrained in the conceptual worlds of modern historiography. Approaching the realities and further possibilities of alternative approaches to global history thus requires us to critically examine changing dynamics and lasting hierarchies which typify historiography as a global professional environment... It will become quite clear that in European societies the question of historiographical traditions tended to be answered in ways that were profoundly different from most academic communities in other parts of the world (Sachsenmaier 2011: 17).

So Sachsenmaier's attention is directed largely to the conceptual issues and disciplinary frameworks that are pertinent when we consider how different national traditions have done history. What he has to say here is very useful and original. But he also makes several of the points mentioned above as well – the need to select different definitions of geography in doing history, the need to put aside the stereotypes of eurocentrism, and the value in understanding in depth the alternative traditions of historical understanding that exist in the world.

Here I want to look at some of the specific historiographic issues that have delayed, but sometimes furthered, the development of a more truly global history.

Methodological Nationalism

Are there logical divisions within the global whole of social interactions and systems that permit us to focus on a limited, bounded social reality? Is there a stable level of social aggregation that might provide an answer to the 'units of analysis' question in the social sciences? This is a question that has recurred frequently in several areas of the social sciences – on regions, on levels of analysis, and on world systems. Here I will focus on the nation-state as one such system of demarcation.

We can start with a very compelling recent critique of current definitions of the social sciences. Andreas Wimmer and Nina Glick Schiller offer an intriguing analysis of social science conceptual schemes in 'Methodological nationalism and beyond: nation-state building, migration and the social sciences' (Wimmer and Schiller 2002). The core idea is the notion that the social sciences have tended to conceptualize social phenomena around the boundaries of the nation-state. And, these authors contend, this assumption creates a set of blinders for the social sciences that makes it difficult to capture some crucially important forms of social interaction and structure.

Their view is a complex one. They think that the social sciences have been trapped behind a kind of conceptual blindness, according to which the concepts of nation and state structure our perception of social reality but disappear as objects of critical inquiry. Second, they argue that there were real processes of nation and state building that created this blindness – from nineteenth century nation building to twentieth century colonialism. And third, they suggest that the framework of methodological nationalism itself contributed to the concrete shaping of the history of nation and state building. So it is a three-way relationship between knowledge and the social world.

'Nationalism' has several different connotations. First, it implies that peoples fall into 'nations', and that 'nations' are somewhat inevitable and compact social realities. France is a nation. But closer examination reveals that France is a social-historical construct, not a uniform or natural social whole. (We will consider Emmanuel Todd's version of this argument in the next section.) Alsations, Bretons, and Basques are part of the French nation; and yet they are communities with distinct identities, histories, and affinities. So forging France as a nation was a political effort, and it is an unfinished project.

Second, nationalism refers to movements based on mobilization of political identities. Hindu nationalists have sought power in India through the Bharatiya Janata Party (BJP) on the basis of a constructed, mobilized (and in various ways fictional) Hindu identity. The struggle over the Babri Mosque, and the political use to which this symbol was put in BJP mobilization, illustrates this point. But 'nationalist politics' also possess a social reality. It is all too evident that even fictive 'national identities' can be powerful sources of political motivation. So nationalist politics in the twentieth century were a key part of many historical processes. (Michael Mann's *The Dark Side of Democracy: Explaining Ethnic Cleansing* illustrates this point [Mann 2005].) And, of course, there may be multiple national identities within a given region; so the 'nation' consists of multiple 'nationalist' groups. Ben Anderson's *Imagined Communities: Reflections on the Origin and Spread of Nationalism* (Anderson 1983) provides an extensive development of the political and constructed nature of ethnic and national identities. Also relevant here are (Frank 1998), (McNeill 1986), and (Hall and Fenelon 2008).

What about the other pole of the 'nation-state' conjunction – the state? Here the idea is that the state is the seat of sovereign authority; the origin and enforcement of legal institu-

tions; and the holder of a monopoly of coercive power in a region. A state does not inevitably correspond to a nation; so when we hyphenate the conjunction we make a further substantive assumption – that nations grow into states, and that states cultivate national identities.

The fundamental criticism that Wimmer and Schiller express – the fundamental defect of methodological nationalism – is that it limits the ability of social scientists and historians to perceive processes that are above or below the level of the nation-state. Transnational processes (they offer migration as an example) and sub-national processes (we might refer to the kinds of violent mobilization studied by Michael Mann in the *Dark Side of Democracy* [Mann 2005]) are either invisible or unimportant, from the point of view of methodological nationalism. So the methodology occludes social phenomena that are actually of great importance to understanding the contemporary world.

Wimmer and Schiller seem to point in a direction that we find in Saskia Sassen's work as well: the idea that it is necessary for the social sciences to invent a new vocabulary that does a better job of capturing the idea of the interconnectedness of social activity and social systems (Sassen 2007). The old metaphors of 'levels' of social life organized on an ascending spatial basis does not seem to work well today when we try to deal with topics like global cities, diasporic communities, or transnational protest movements. And each of these critiques makes a convincing case that these non-national phenomena are influential all the way down into the 'national' orders singled out by traditional classification schemes.

France as a Nation?

The idea of 'nation' has been tested in many settings. One is the case of France. Is France one nation? What makes it so? And what are the large socio-cultural factors that led to modern France? These are the questions that Emmanuel Todd raises in *The Making of Modern France: Ideology, Politics and Culture* (Todd 1991). Todd is one of this generation's leading historians in France, and his conception of the challenge of history is worth studying. He is a 'macro-historian', in that he is interested in large processes of change over extended stretches of space (for example, the extension of industry across the map of France from 1850 to 1970, or the patterns of religious dissent from the twelfth to the twentieth centuries), and he singles out characteristics of family structure, demography, literacy, and religion as a set of causal factors that explain the patterns of historical change that he uncovers.

Todd's starting point seems exactly right: the 'nation' is not a particularly salient level of analysis for making sense of large historical change in the case of France. Social, economic, and political developments should not be presumed to unfold at the level of the nation. Todd puts forward a simple but apt criterion for choosing a level of analysis for historical inquiry: 'one has to observe the social and economic behaviour of the human beings in question and discover their scale in order to define closed and homogeneous groups which then can be called society X or economy Y' (Todd 1991: 7). And in fact, he argues that 'France' is better understood as a configuration of regions and zones than as an integrated national system. As he puts the point, 'one can represent France as a heterogeneous and open area in which social, economic and political forces emerge, spread and establish themselves quite independently of the central power and of the overall national structure' (*Ibid.*: 8). And: 'Notions of "French society", "French economy", "French industry", "French working class" are to some extent myths' (*Ibid.*: 7). (It is interesting to observe that this is one of G. William

Skinner's central insights into Chinese history as well, especially in his analysis of the historical relevance of 'macroregions' in China [Skinner 1977].)

So what are the patterns and causal factors that have given rise to 'modern France' in Todd's reckoning? Crudely, Todd argues that there are large regional patterns of culture, demography, and property that created distinct dynamics of change across eight centuries of French history. The southern half of France is characterized by complex family systems with several generations in the same household and a low rate of reproduction, in contrast to the nuclear families of the north and their higher rate of reproduction. The family values of the southern region gave greater importance to literacy and education than the nuclear (and larger) families of the north. And family structure, patterns of inheritance, and land tenure are in turn highly relevant to the formation of large patterns of ideology. (A similar logic is expressed in another of Todd's books, *The Explanation of Ideology: Family Structure and Social Systems* [Todd 1985].)

The central analytical device in Todd's argument is a fascinating series of maps of France coding the 90 *départements* of France by such variables as the per cent of women holding the *baccalauréat*, the percentage of priests accepting the *serment constitutionnel* (revolutionary loyalty oath) in 1791, or the percentage of workers in a given industrial sector. The maps display striking geographical patterns documenting Todd's interpretation of the large historical patterns and their underlying anthropological and geographical causes. At the largest scale, he argues for three axes of historical causation: a north-south axis defined by family structure that creates differentials of literacy and population growth; an east-west axis defined by the diffusion of industry from northern Europe into eastern France and across the map from east to west; and a political pattern different from both of these, extending from Paris at the political center to the periphery in all directions. The following is a great example; Todd is interested in observing the degree of 'religiosity' across France around the time of the Revolution, and he uses the percentage of priests who accepted the oath of allegiance demanded by the Revolutionary government as a measure. The resulting map reveals conspicuous patterns; the periphery and the south stand out as non-conformist.

Todd also argues that there is a causal order among the large social factors he singles out. Family structure is causally relevant to literacy and education level; literacy is relevant to religious dissent and the emergence of Cathars, Waldensians, and Protestants; family structure is relevant to reproductive rates which are in turn relevant to the spread of industry; and traditions of inheritance are relevant to a region's receptiveness to the ideology of the Revolution. And the patterns created by these causal processes are very persistent; so the southern belt of high-literacy *départements* of the twelfth century coincides almost exactly with the pattern of high incidence of *baccalauréats* and doctors in the late twentieth century.

A particularly interesting part of Todd's analysis is his effort to map out the agrarian regimes of pre-revolutionary France (the *ancien régime*). He observes that this has not been done by existing studies of French rural society, and that there is no suitable statistical data on the basis of which to do so for the eighteenth century in any case. However, he makes use of the first census in 1851 to infer back a century in order to arrive at an analysis into four categories: large estates with hired labor, peasant proprietorship, tenant farming, and share-cropping. And using the mid-nineteenth century census data he constructs

a map of France that indicates the distribution of agrarian property regimes across the territory (Todd 1991: 60).

The large estates are concentrated in the center of France, including Paris; while peasant proprietorship (sometimes combined with share-cropping) predominates in the southern tier. Note as well how closely these patterns conform to the distribution of family structure and fertility at the top of the posting. And Todd argues that these patterns showed substantial continuity before and after the Revolution (*Ibid.*: 61). In other words, there is a very substantial overlap between agrarian regimes and the anthropological-demographic patterns discussed earlier. Todd then uses these geographical patterns to explain something different: the pattern of de-christianization that took place over the century following the Revolution. Basically, de-christianization is associated with the regions involving a large number of landless workers, whereas this cultural process was least virulent in regions of peasant proprietorship. In other words, he offers an explanation of ideology and religion in terms of a set of demographic and social characteristics that are distributed differentially across regions.

I have not touched on the dynamics of politics at all here, which is an important piece of Todd's work. But these comments suffice to illustrate the pattern of historical thinking represented by Todd's work. It is striking for its effort to cross genres, incorporating geography, anthropology, and sociology into the formation of large interpretations of French history. And it is striking for the scale of the canvas that he attempts to paint.

Beyond Divergence

Let us turn now to another of the key challenges of global history, the effort to eliminate eurocentrism from historical analysis. There has been a major debate in economic history in the past twenty years about what to make of the contrasts between economic development trajectories in Western Europe and East Asia since 1600. There had been a received view, tracing to Adam Smith and Thomas Malthus, that European 'breakthrough' was the norm and Asian 'stagnation' or 'involution' were the dysfunctional cases. E. L. Jones represents this view among recent comparative economic historians (Jones 1981). Then Kenneth Pomeranz and Bin Wong challenged this received view in a couple of important books. Pomeranz argued in *The Great Divergence: China, Europe, and the Making of the Modern World Economy* that the premises were wrong (Pomeranz 2000). He argued that Chinese productivity and standard of living were roughly comparable to those of England up to roughly 1800, so China's economy was not backward. And he argued against the received view's main theories of Europe's breakthrough – the idea that European economic institutions and property rights were superior, or the idea that Europe had a normative or ideological advantage over China. Instead, he argued that Europe – Britain, to be precise – had contingent and situational advantages over Asia that permitted rapid growth and industrialization around the end of the eighteenth century. These advantages included large and accessible coal deposits – crucial for modern steam technology – and access to low cost labor in the Americas (hidden acreage). Bin Wong made complementary arguments in *China Transformed: Historical Change and the Limits of European Experience* (Wong 1997), where he addressed the parallel processes of development of political and economic institutions in the two sets of polities. Wong's most fundamental insight was that both processes were complex, and that balanced comparison between them is valuable.

Now the debate has taken a new turn with the publication of R. Bin Wong and Jean-Laurent Rosenthal's *Before and Beyond Divergence: The Politics of Economic Change in*

China and Europe (Rosenthal and Wong 2011). Rosenthal is an accomplished historian of European economic development, and Wong is an expert on Chinese economic, social, and political history. So their collaboration permits this book to bring together into one argument the full expertise available on both ends of Eurasia. The book aims to unsettle the debate in fundamental ways. Wong and Rosenthal take issue with a point that is methodologically central to Pomeranz, concerning the units of comparison. Pomeranz wants to compare England with the lower Yangzi region in China, and he gives what are to me convincing arguments for why this makes sense. The authors want to compare Europe with China, making England a special case. And they too have good reasons for their choice.

Second, they disagree with the temporal framing that has generally been accepted within this debate, where economic historians have generally focused their research on the early modern period (1600–1900). Against this, they argue that the causes of divergence between Europe and China must be much earlier. They set their clock to the year 1000, and they examine the large features of political and economic development that started around that time.

Finally, they offer crippling objections to a number of standard hypotheses about Imperial China as a place to do business. They show that there were alternative credit institutions available in Ming and Qing China. They show that the Chinese state was sensitive to levels of taxation, and kept taxes low (generally comparable to European levels). And they show that Imperial social spending (the granary system, for example) was generally effective and well managed, contributing to economic prosperity. So the traditional explanations for Chinese ‘stagnation’ do not work as causal explanations.

They find one major difference between Europe and Asia during the first part of the second millennium that seems to matter. That is the multiplicity of competing states in Europe and a largely hegemonic Imperial state in China and the scale of the relevant zones of political and economic activity. Chapter 4, ‘Warfare, Location of Manufacturing, and Economic Growth in China and Europe’, lays out this argument. The competing states of Europe were frequently drawn into conflict; and conflict often resulted in warfare. The authors argue that this fact of competition had a fateful unintended consequence. It made fortified cities much safer places than open countryside. And this in turn changed the calculation about where ‘manufacture’ could occur at lowest cost. Labor costs were higher in cities, so absent warfare, producers were well advised to pursue a putting-out system involving peasant workers (proto-industrialization). But with the threat of marauding armies, European producers were pushed into urban locations. And this in turn gave them incentives to develop labor-saving, capital-intensive techniques. Putting the point bluntly: China did not have an industrial revolution because it was too safe an environment for labor-intensive production.

These debates about how best to position the comparison of different aspects of Eurasian economic and political development provide very important impetus to a better version of global history. There is a very vibrant field of work underway with this trans-Eurasian perspective (see also Arrighi 2007 and Beckwith 2009).

Zomia

Now let us consider a particularly interesting challenge to methodological nationalism, James Scott's recent theorizing of Zomia in *The Art of Not Being Governed: An Anarchist History of Upland Southeast Asia* (Scott 2009). Scott opens this most recent book with

quotations from frustrated pre-modern administrators and missionaries whose territories included the peoples of inaccessible highland regions – Guizhou, highland Burma, and Appalachia. Scott finds that the geographical circumstances of highland peoples mark them apart from the political organizations of the valleys; states could control agriculture, surplus, and labor in the lowlands, but were almost entirely incapable of exerting sustained rule in the highlands. And he finds that highland cultures and systems are more or less deliberately shaped to elude the grasp of the state; linguistic variety, swidden agriculture, and ethnic opacity all work to make the art of rational administration all but impossible. The book is a significant contribution to the social and political analysis of very large swatches of the world.

Scott makes use of the concept of ‘Zomia’ to capture the highland peoples of Southeast Asia. Scott estimates the population of the minority peoples of Zomia at 80–100 million. What is intriguing about this definition of space and social reality is that it is *not* defined by nation-state boundaries and jurisdiction, by linguistic groupings, or by ethnic and national identities. Scott emphasizes the enormous linguistic and ethnic variation that occurs across this expanse of space. ‘In the space of a hundred kilometers in the hills one can find more cultural variation – in language, dress, settlement pattern, ethnic identification, economic activity, and religious practices – than one would ever find in the lowland river valleys’ (Chapter 1; Kindle location 343).

Two central arguments take up much of Scott's attention in the book. One is an argument about the logistics of state power in a pre-modern agrarian society and the agency of ‘fugitive’ peoples. Essentially he argues that pre-modern agrarian societies were only able to impose their rule over a tight radius of perhaps 300 kilometers, when it came to collecting taxes, grain, and manpower. Moreover, this radius of power reduced significantly when population was distributed over mountainous country. So as a practical matter, the pre-modern states of Burma, Thailand, and Cambodia were river-valley states, and the peoples of the highlands were rarely subject to central rule. This argument resonates with Michael Mann's analysis of pre-modern state power in *The Sources of Social Power: Volume 1, A History of Power from the Beginning to AD 1760* (Mann 1986). On this scale, the Kingdom of Chicago would barely be able to exert its will over the peasants of Peoria or Milwaukee; and Indianapolis would be a distant and irrelevant place.

And, he argues, the peoples of the highlands deliberately organized their activities in ways that made the power of the state least effective.

Virtually everything about these people's livelihoods, social organization, ideologies, and (more controversially) even their largely oral cultures, can be read as strategic positionings designed to keep the state at arm's length (Kindle loc 26).

The other central theoretical argument that Scott offers concerns the question of ethnicity and identity. Like Ben Anderson (1983), Scott believes that the identities of Burman, Mon, Khmer, Tai, or Shan are constructed identities, not essential or ancient.

Identity at the core was a political project designed to weld together the diverse peoples assembled there. Bondsmen of allied strongmen, slaves captured in warfare or raids, cultivators and merchants enticed by agricultural and commercial possibilities: they were in every case a polyglot population (Kindle loc 1166).

The central plain of what would become Siam was, in the thirteenth century, a complex mix of Mon, Khmer, and Tai populations who were an ‘ethnicity-in-the-process-of-becoming’ Siamese (Kindle loc 1172).

The book takes up the argument that Scott began in *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed*: that a central task of the state is to render its territory and population 'legible' (Scott 1998). The state needs to be able to regiment and identify its subjects, if it is to collect taxes and raise armies; so sedentary, mobile, peripheral peoples are antithetical to the needs of the state. This argument begins in *Seeing Like a State*; and it gains substantial elaboration here. And it is a fundamental call for a different approach to conceptualizing and studying the cultures and populations of Southeast Asia: not by ethnic group, not by national boundaries, but rather by the common circumstances of material and political life in high, rugged terrain.

Scott's work almost always takes the form of an imaginative re-framing of problems that we thought we had understood. But once looking at the facts from Scott's point of view, we find that the social phenomena are both more complex and perhaps more obscure than they initially appear to be. And the Zomia concept seems to force us to rethink the way we partition social space and the concept of ethnicity – highly responsive to the complaints against methodological nationalism.

Zomia Reconsidered

So what about Zomia? How does this concept hold up when considered by other experts on Southeast Asia? As noted, Scott turns in his usual creative, imaginative, and innovative treatment of the subject matter; the book is an absolutely captivating argument about the push and pull between states and fugitive peoples. As such, it suggests the possibility of bringing some of the central ideas and analyses to bear on other geographies as well. But how accurate is Scott's reading of the primary historical experience of these parts of Southeast Asia – Burma, Thailand, Vietnam, China, Cambodia, and Bangladesh?

This is the question posed by a recent issue of the *Journal of Global History*, with essays by C. Patterson Giersch, Magnus Fiskesjo, Sarah Turner, Sara Shneiderman, Bernard Formoso, and Victor Lieberman. All the essays are fascinating, including the editorial introduction by Jean Michaud. But particularly important is Lieberman's essay. Lieberman is one of the leading contemporary historians of Southeast Asia, and he is a very fertile and imaginative thinker himself. So his responses to Scott's arguments are worth looking at closely. (His recent two-volume work, *Strange Parallels: Volume 1, Integration on the Mainland: Southeast Asia in Global Context, c. 800–1830* [Lieberman 2003], is directly relevant to Scott's analysis.)

Lieberman begins by establishing the territory on which he agrees with Scott. First, he accepts the fact of a growing separation between lowland and highland peoples in Southeast Asia during early modern times, and he agrees about the importance of analyzing this pan-Southeast Asian phenomenon. Another point of agreement is the fact of highlander agency. Lieberman agrees with Scott's insistence that highland peoples throughout Southeast Asia crafted their own social worlds in response to the political and natural environments that faced them. So Lieberman acknowledges the importance and boldness of Scott's effort at providing a comprehensive historical study of Zomia. But Lieberman offers a series of important criticisms of Scott's historical case.

First, he finds Scott's documentation to be weak, in that it makes little use of Burmese-language sources. This has led, in Lieberman's opinion, to a number of errors of fact, some more significant than others. He cites estimates of literacy, for example; Scott says less

than 1 per cent of people were literate in Southeast Asia, and Lieberman documents 50 per cent for Burma in 1800.

More significantly, Lieberman believes Scott over-estimates the importance of manpower as a determinant of military success in the region. The degree of maritime commerce was equally important, he argues. And this is critical to Scott's argument, since competition for manpower is one of the primary reasons Scott cites for the efforts of lowland states to attempt to dominate the highlands.

Finally, and most important, Lieberman argues that there is little documentary evidence for significant population flight from lowland to highland (Lieberman 2003: 339). This is key to Scott's interpretation, and Lieberman argues the evidence is not there to support the claim. After reviewing Scott's own evidence and some additional data of his own, he argues that Scott may have over-estimated 'flight'. Moreover, Lieberman argues that Scott's interpretation of the highlands becomes so dependent on one causal factor, state oppression, that it neglects the processes of development that were internal to the highland societies themselves. 'Ecological and cultural conditions that were intrinsic to the hills and that were substantially or completely divorced from the valleys receive little or no attention' (Lieberman 2003: 343).

This point is more important when we consider an example not included in Scott's analysis – the highland peoples of Borneo/Kalimantan. Lieberman argues that these tribes had virtually all the characteristics of culture and agriculture displayed by Zomians, including swidden cultivation and a proliferation of local languages, and Scott interprets these traits as deeply defensive. Yet these features of highland life emerged in Borneo without the pressure of a surrounding predatory lowland state (*Ibid.*: 345). And this casts serious doubt on Scott's anarchist, anti-statist interpretation of Zomia.

Lieberman's point is not that Scott's interpretation of Zomia is unsupportable. Rather, his point is that it is a bold and substantive interpretation of a complex historical domain, and it requires serious, fact-based consideration. And this is exactly what the essays in this special volume of *Global History* promise to do.

This debate is interesting and important, in part, because it sheds light on the practical empirical research challenges that arise when we consider bold new interpretations of social data. A bold hypothesis is advanced, purporting to pull together the processes of development observed in a variety of places; and then there is the practical question of evaluating whether the hypothesis is born out when we do the detailed, local historical research needed to test its basic assertions. In this case, Lieberman is suggesting that several of the components of the theory are found wanting when applied to highland Burma.

Strange Parallels

Let us close by considering Lieberman's own way of recasting traditional ways of parsing the world in his recent work. Lieberman uses the phrase, 'strange parallels', as the title for his two-volume study of Southeast Asian history (*Strange Parallels: Volume 1, Integration on the Mainland: Southeast Asia in Global Context, c. 800–1830*) (Lieberman 1999). Besides offering a highly expert history of Burma and its many kingdoms between 800 and 1830, Lieberman poses a fascinating and novel question: how can we explain the substantial historical parallels that existed between Burma and various parts of Europe, including especially France and Russia? He writes:

In fact, in mainland Southeast Asia as well as in France, the late 18th and early 19th centuries ended the third and inaugurated the last of four roughly synchronized cycles of political consolidation that together spanned the better part of a millennium (Lieberman 1999: 2).

The figure that Lieberman provides illustrates the kind of synchrony that Lieberman is highlighting – over a sweep of some thousand years, there is a rough-and-ready correspondence in the patterns of territorial consolidation that existed in Burma and France.

Lieberman's current work broadens the canvas by looking at broad temporal patterns of consolidation and turmoil across the full expanse of Eurasia, including Russia, France, Japan, China, and Southeast Asia. In two volumes of *Strange Parallels* he documents a degree of synchrony among widely separated polities that demands explanation. Here is how the pulsing of consolidation and disintegration looked in Southeast Asia:

In sum – in lieu of four modest charter polities in 1240, 23 kingdoms in 1340, and 9 or 10 kingdoms in 1540 – mainland Southeast Asia by the second quarter of the nineteenth century contained three unprecedentedly grand territorial assemblages; those of Burma, Siam, and Vietnam (Kindle loc 799).

Lieberman defines consolidation as a broadening of scope of a polity, including territory, population, war-making capacity, and fiscal reach. And he notes that each of the world polities he studies shows a sequence of consolidation, followed by periods of turmoil and breakdown. And this was true as much in Burma as it was in seventeenth and eighteenth century France. Moreover, and this is his key point, these periods show a remarkable degree of synchrony, from Kiev to Paris to Burma. So here is the central question: what kinds of global triggers or events could have created this synchrony?

Lieberman poses the crucial historical question in these terms: 'Why should distant regions, with no obvious religious or material links, have experienced more or less coordinated cycles? If we discount coincidence, what hitherto invisible ties could have spanned the continents?' (Lieberman 2003: 2) To further complicate the picture, Lieberman points out that there were other regions of the world where these patterns of consolidation did not occur, or did so on a very different timeline. So we can exclude the idea that there was some common global cause leading to simultaneous pulses of consolidation; rather, Southeast Asia and Western Europe were synchronized, but India was not.

Lieberman's explanation of this observed historical synchrony goes along these lines. He believes that both internalist and externalist approaches have a role to play. The internal historical dynamics of the state systems in Burma and Western Europe were governed by particular local factors. But they each created a tendency towards consolidation of land and power. And external factors provided periodic 'pulses' that served to synchronize these internal patterns of development. So the effects of an external factor – maritime trade – pushed both Western Europe and Burma into extended periods of state formation and consolidation. This story combines several ideas about causation: local processes that are developing according to their own imperatives, and occasional system-wide pulses that bring these local processes into synchrony. And the explanation allows Lieberman to place the intellectual frameworks of both Tilly and Wallerstein into the story.

Here are a few candidates that Lieberman considers as possible mechanisms of synchrony. For the tenth – thirteenth century, he considers the effects of global climate fluctuation, disease, Viking invasions, and the predations of Mongol armies from Inner Asia.

And for the seventeenth and eighteenth centuries he considers the expansion of Eurasian trade, modern arms, and monetary uses of silver in Europe and Asia (Kindle loc 8745).

Internal to each polity are factors that appear to be local in their effects: population change, agricultural improvements, new organizational forms in governance, military, and taxation, and the diffusion of literacy and national culture. But the logic of these processes does not imply any sort of global synchrony; so, once again, what would serve to link consolidation and disorder in France and Burma?

This is world history you can get your teeth into. It is detailed, making use of the best available sources for each of the regions and polities considered. And it is bold in its effort to arrive at trans-continental, even global causes of these local developments. Lieberman's approach is important for debates about history and the social sciences because it leads us to ask different questions about historical causation and historical time. And it provides important new thinking about how to approach the nexus between regional, national, and global history.

Conclusion

World history is more timely today than ever. 'Globalization' is almost a cliché, from 'The world is flat' to 'the homogenization of cultures' to the 'commodification of place'. Everyone now recognizes the fact of globalization in the contemporary world. But we need to understand the many ways in which many parts of the world were deeply and systematically interconnected long before the post-World War II wave of revolutions in communications networks, rapid travel, containerized shipping, and military power contributed to the current interconnectedness of most countries and peoples. We need a strong historiography for the global world.

To be most productive, however, we need to approach the tasks of global history with some fresh thinking. There are several key points that have emerged as fundamental. The first is to be vigilant about making Eurocentric assumptions about development and change. Whether in the domains of politics, economics, or culture, it is crucial to avoid the assumption that Europe set the model for developments in key areas of historical change. New historiography of Eurasian economic development illustrates the power of an approach that avoids Eurocentrism, including Bin Wong, Ken Pomerantz, and Prasanna Parthasarathi (Parthasarathi 2011).

A second is to expect variation rather than convergence. There are many ways that human societies have found to solve crucial problems of coordination, order, production, and the exercise of power. Global historians need to be alert to the development of alternative institutions of politics, economics, culture, or social cohesion in different locales. In particular, it is important to take note of divergences as well as parallels in the political and economic development of great civilizations like those of India, China, Southeast Asia, or West Africa.

Third, it is important to avoid being captured by the conceptual schemes of nationalism and states. 'France', 'Indonesia', and 'India' are places with diversity and internal variation, and they each followed distinct rhythms of consolidation as states and nations. It is often more revealing to look to regions that cross the boundaries of existing states; we learn much by looking at the dynamics of change in regions that are smaller than nation-states (the American South, for example, as an economic and racial regime that had little

in common with Northern cities); and it is sometimes the case that we are best off considering the histories of dispersed peoples and activities (Zomia, diasporic histories, bandits).

Fourth, the way in which we consider historical time sometimes needs more critical reflection. Lieberman's focus on the punctuated patterns of consolidation that took place from Burma to Kiev is one aspect of this reflection; the world's clock was synchronized in a pattern that was quite distinct from the internal patterns of change in each of the affected countries. And the historian needs to be attentive to both clocks. Likewise, world historians need to be open to considering temporality on a range of scales – from the months of the Terror to the decades of contention that preceded and followed the French Revolution, to the century and a half that separated the French Revolution from the Chinese Revolution.

Fifth, the global impact of environmental factors needs to be given the emphasis it deserves. Climate change, exhaustion of woodlands, extension of mining and extraction – all these processes and factors influence human activity at a range of levels, and their impact needs to be assessed carefully on the basis of historical and physical data.

Finally, world historians need to pay particular attention to the mechanisms of influence through which places exchanged cultural and economic material in the long centuries from the development of substantial Mediterranean trade in the ancient world to the shipping lanes of the contemporary world. Trade, the diffusion of ideas through cultural contact and migration, the effects of the book trade, the military logic of colonialism, the advent of organized long-distance communication and travel, the creation of international governance institutions – these mechanisms of social exchange constitute many of the pathways through which global integration occurs, and their dynamics are worthy of close attention by historians.

Significantly, almost all these factors find their way into the work of many recent historians who are taking on the challenge of making sense of the history of the modern world. World historiography is on a very promising path.

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Mass Primary Education in the Nineteenth Century*

Julia Zinkina, Andrey Korotayev, and Aleksey Andreev

In this paper we review the nineteenth-century origins of the contemporary approach to primary education provision. As we trace the spread of mass primary education in Europe as well as in other regions of the world we come to conclusion that this was a truly global phenomenon of a planetary-scale importance. Moreover, the expansion of the mass education contributed significantly to another global phenomenon – the emergence of nation-states.

Keywords: *education, formal education, mass education, popular education, Prussia, Austria, education in Europe, education in the world.*

During the long 19th century (1789–1914, as defined by Hobsbawm) despite major historic and social differences almost every country of Western Europe introduced an innovative idea of mass education, which later evolved to a compulsory general education (Ramirez and Boli 1987: 2).

However, there are three main aspects which distinguish modern education systems from those existing 150 years ago, namely: centralization, secularization, and subsidization (Ansell and Lindvall 2013). Let us briefly describe them.

Centralization implies a distribution of power in the education sphere between national, regional, and local branches of government. 150 years ago all decisions in the sphere of education were made by the local legislative bodies. On the contrary, starting from the 1870s (in some cases even earlier) the national legislative bodies started to increase their influence on the primary education. There were two main patterns of education centralization: by liberal or democratic parties in the democratic countries or by authoritarian or dictatorial parties in the dictatorial countries.

Secularization means that the secular authorities started to gain control over and to manage the school systems. Hitherto the church had had a full control of the education system.

Subsidization implies that the states provide most of the funding that keeps schools running (Ansell and Lindvall 2013: 505–508).

Meanwhile, Boli, Ramirez, and Meyer specify the following three main institutional features of all the contemporary systems of mass education: 1) mass education is universal, standardized, and rationalized; 2) mass education sets the same goals and has similar organization forms all over the world; and 3) one of the key goals of mass education is to provide socialization for each individual, who is considered to be the main social unit (Boli, Ramirez, and Meyer 1985: 147–149).

* This study has been supported by the Russian Science Foundation (Project No. 15-18-30063).

Andy Green mentions three main aspects of primary education reform: development of universal forms of education provision, rationalization of administrative and institutional structures, and development of state financing and control (Green 2013: 11).

A Historical Survey of the Evolution of Compulsory Primary Education in Western Europe

Prussia: The first step to mass education was taken in 1763, when Frederick the Great issued a decree which made primary education obligatory for all Protestants living in rural areas. Some time later this decree was extended to several cities as well. Education became a priority in rural areas as it was crucial for the army: the Seven Years' War revealed a severe lack of literate officers. The decree implied the creation of a unified system of compulsory primary education (Melton 1988: 173–175).

School education lasted throughout the year; the school day was six hours long in winter, fall, and spring, and three hours long in summer. Half of the time was devoted to religious education and learning of catechism. Fines were imposed on those families who refused to send their children study at schools. Local parish was to help the indigent families pay for school education (Melton 1988: 175).

In the 1770s, the Prussian government started financing schools so that school teachers and directors could receive salaries which for the first time in the Prussian history made it possible for the students to study at schools for free. Yet, *de jure* free compulsory school education was introduced much later (Melton 1988: 179).

It was not only Frederick the Great who contributed to the Prussian education reform. In the first half of the nineteenth century the education system obtained several significant features: a special legislative institution was established to control the education system in the country (the Bureau of Education which was the part of Interior Ministry); special taxes were imposed to finance the education system, state education system was established, and certification was implemented for primary school teachers (Ramirez and Boli 1987: 4–5; Green 2013: 13).

After the decree of 1810 the education became secular with three-year education becoming compulsory. In 1826 education was compulsory already for everyone aged between 7 and 11. Every parish had their own primary schools, and all the teachers were to undergo certain training (Green 2013: 14).

Austria: Frederick the Great's practice inspired the Austrian government (with the help of Prussian experts) to issue a decree on compulsory primary education in 1774. In accordance with that law primary education became compulsory for all the children between 6 and 12 years old. School education took five days a week. It was forbidden to hire those who did not have school graduation certificate as apprentices or servants. Each town and each parish were obliged to have their own primary schools (Melton 1988: 212).

In 1769 Maria Teresia ordered Austrian local authorities to prepare an improvement plan for the primary education system. A special commission was created to achieve this goal. In 1773 this commission made several suggestions on standardization of courses, course books and teaching methods. It is important to mention that there was a big difference between rural and urban schools: rural schools could teach only reading, writing, arithmetic, and religion while urban schools had a wider range of courses to be taught at their disposal, including German, orthography, math, history, geography, *etc.* The main reasons for such diversification were, firstly, the apprehension not 'to overeducate' rural

population so that they would flow to the city in the search for a better life, and, secondly, the strife to educate experts in the cities (Melton 1988: 211).

Denmark: Denmark is considered to be the first country in the world that introduced a government-controlled system of compulsory mass education. The system of state schools started to evolve in 1721. However, a strong connection between the government and the education system was established in 1789, when the Great school commission started to work. In 1814 this commission made a report, which later became the basis of the Danish contemporary school education system. In 1842 basing on the Danish model the Swedish liberals introduced the School Reform Bill. In accordance with the Bill a state system of primary schools was established in the country (Ramirez and Boli 1987: 7).

France: The idea of primary education system appeared at the end of the eighteenth century and even had some impact on the laws of 1791 and 1833. However, those laws had never come into action. Napoleon Bonaparte paid major attention to the development of universities and lyceums, providing higher education while the mass primary education was beyond the primary concerns then. In 1816 every commune was obliged to maintain a primary school for boys. In 1833 the same obligation was extended to schools for girls. By the time of the Second French Empire France was prepared to spread education in terms of legislation and administrative resources. However, this idea was put into practice only after France had been defeated in the war by Prussia (1870–1871). By 1882 a system of free universal compulsory primary education was established together with a special Ministry (Chanet 2012: 118–122; Green 2013: 14–15).

England: The English system of primary education developed with delay in comparison with other countries of Western Europe (Wright 2012: 21; Green 2013: 16). During most of the nineteenth century the primary education was provided mainly by the church and mainly for the children of poor parishioners. It was not earlier than in the 1860s that the government started to participate in the development of the education sphere. In 1860 the government drew up a State Code of Rules related to the organization of primary schools. In 1862 the Code was adjusted. It regulated the range of school courses and established a national system of quality inspections, which checked the reading, writing and math skills of certain students. The financing for schools depended on the inspections results (Wright 2012: 22).

In 1870 the government adopted an education law which required every child aged above 5 and under 12 to be provided with a place at school. If the region lacked places at schools, the state built new schools, and the region was responsible for their maintenance. This issue was the most crucial in big industrial cities. It was the first major step in establishing a state system of schools (Wright 2012: 22).

In accordance with the Law on primary education adopted in 1880 it became obligatory for every child aged above 5 and under 10 to study at school. In 1891 primary education became free of charge. In 1893 the upper age limit was increased to 11, and to 12 in 1899. In 1895 the system of funding was changed and its size began to depend on the education quality in general and not on the knowledge of certain students (Wright 2012: 40; Stephens 1998: 79).

Finally, in accordance with the Law on education adopted in 1902 the government elaborated a system of subsidies which allowed local authorities to establish secondary schools. The students who graduated from primary schools could enter secondary school education on competitive basis (Wright 2012: 22).

Europe: It is crucial to mention that the spread of primary education by the end of the 19th century was influenced not only by the year when the compulsory primary education had been introduced, but by the education policy conducted during the century as well (see Table 1).

Table 1. The year when the compulsory primary education had been introduced and the proportion of children studying at schools

Country	Year of compulsory primary education introduction	Percentage of primary school students 1870 г., %
Prussia	1763	67
Denmark	1814	58
Greece	1834	20
Spain	1838	42
Sweden	1842	71
Portugal	1844	13
Norway	1848	61
Switzerland	1874	74
Italy	1877	29
Great Britain	1880	49
France	1882	75
Ireland	1892	38
Netherlands	1900	59
Luxembourg	1912	–
Belgium	1914	62
USA	–	72

Source: Soysal and Strang 1989: 278.

Thus, the spread of primary education in 1870 correlates very weakly with the year when compulsory primary education was introduced. France, Switzerland and the USA have the highest enrolments, although these countries had not established their national education systems by that time. However, they did have a lot of schools, supervised by the authorities of different level. Hence the spread of school education was rather wide. There is a major difference between the above mentioned countries, on the one hand, and Prussia along with Scandinavian countries, on the other hand, whose education systems were established by the governments themselves.

The Spread of Mass Primary Education in Other Regions of the World

By 1900 North-American countries, Australia, New Zealand and some countries of Northern and Western Europe took the lead in spreading of school education. In the majority of Northern European countries the enrolment varied from 60 to 75 per cent (Benavot and Riddle 1988: 205–206). In other regions, especially in Asia (except for Japan), Middle East and North Africa the spread of school education was significantly more modest.

Table 2. Primary education enrolment among the school-aged, 1900 and 1935–1940, %

Region	In 1900, %	In 1935–1940, %
North America / Australia and New Zealand	86.0	79.1
Northern Europe	67.3	72.0
Southern Europe	37.5	50.8
Eastern Europe	28.6	48.2
South America	22.3	40.7
Central America	21.0	33.7
The Caribbean	41.5	59.0
Asia	13.7	30.6
Middle East and North Africa	11.1	22,5
Sub-Saharan Africa	14.9	19.6
World in general	32.9	40.8

Source: Benavot and Riddle 1988: 202.

However, as it often happens, the data presented in Table 2 disguises significant intraregional differences. In each region there is a country or two where already by 1900 the spread of primary education was comparable with that in several European countries.

Say, in South America we can analyze the data for Argentina and Chile. The primary enrolment in Argentina was relatively high already in 1870 (20.9 %¹) and rose steadily, reaching 33.9 % in 1900 (in comparison with Greece, Italy, Bulgaria *etc.*) and 58.2 % in the period between 1935 and 1940 (comparable with Sweden, Belgium *etc.*). National education law in Argentina was adopted in 1884. In accordance with this law primary education became compulsory and was free of charge for students. Syllabuses, courses and teaching methods were unified and kept under complete state control throughout the country. Special national and regional councils were in charge of this control (Gvirtz, Beech and Oria 2008; Southwell 2013).

In Chile the spread of primary education was a little lower than in Argentina: 18.7 % in 1870, 21.7 % in 1900 and 47.5 % in 1935–1940. Nevertheless, this is still close to some Eastern European and Southern European countries. We would like to point out that Chile was the first country in South America to establish a state education system in 1842 (Schieffelbein and Farrell 1980: 160). During the second half of the 19th century this system was rapidly developing. A system of teachers' training was established, curricula and the range of courses were standardized in accordance with state requirements, various textbooks and course books were published and distributed among all the regions and provinces (Soifer 2009).

In 1900 the literacy level in Argentina (51–52 %) and Chile (43–44 %) among residents aged above 10 was also rather comparable with that of South European countries. High literacy level was also present in Uruguay (54 %) and Cuba (38 %) (Astorga, Berges, and Fitzgerald 2006: 766; Mariscal and Sokoloff 2000: 172; Newland 1994: 452).

Japan is the most remarkable country in the nineteenth-century Asia in terms of distribution of primary education. Japan made a 'great leap' in the period between 1870 and 1940, rising its primary education enrolment from 19.7 % in 1870 to 49.3 % by 1900, and further-

¹ Hereinafter the enrolment data is provided from Benavot, Riddle 1988: 205–207.

more to 60.5 % by 1935–1940. The Meiji government acknowledged that an effective adoption of western technologies was impossible without developing a relevant education system. In 1872 a school system decree was issued. In accordance with the latter each child was obliged to complete an eight-year education. However, it was a challenge to bring the law into action. In 1886 the Decree on primary schools divided all the schools into two groups: ordinary schools with four-year compulsory education and schools of a higher level with two-four-year additional education for those who graduated from ordinary schools. In 1907 the duration of compulsory education period was prolonged to six years (Godo and Hayami 2002: 963; see for details Duke 2009; Lincicome 1995).

Although less known than the case of Japan Thailand also enjoyed a considerable period of successful spreading of primary education. In 1890 the primary education enrolment amounted to 0.5 %. However, it grew significantly in 50 years, rising to 7.1 % by 1920, tripling by 1930, and further doubling by 1935–1940, reaching by this period the value of 52.6 %. There was similar dynamics in Taiwan, especially after the Japanese Occupation, when primary education enrolment rose from 2 % in 1900 to 26.1 % in 1930 and 52.8 in 1935–1940.

Sub-Saharan Africa also had its leader – the Republic of South Africa, where the primary education enrolment rose from 24.7 % in 1870 to 43.5 % in 1940.

We would also like to emphasize that in many developing countries the values of primary education enrolment rose significantly during the period from 1870 to 1940 as well: from 1.9 % to 12.3 % in India; from 7.6 % in 1900 to 24.9 % in 1935–1940 in Egypt; from 1.6 % in 1890 to 26.7 % between 1935 and 1940 in Venezuela; from 9.5 % in 1890 to 30.9 % between 1935 and 1940 in Peru. Thus, the evolving of mass primary education was a significant global process.

Aims and Results of Establishment of Compulsory Primary Education Systems

As it has already been mentioned above, for Frederick the Great the role of primary education was closely connected with the military needs. Literate officers and soldiers could increase the capability of the army (Melton 1988: 173–175). Those countries who followed the Prussian practice also took this idea into account. In particular, after the defeat in Franco-Prussian War France made a decision to establish a national system of compulsory primary education.

Education systems considerably contributed to the formation of national identity. Thus, the Prussian ‘state attempted to use mass schooling to create a more unified national citizenry and thereby consolidate state power both within the nation and relative to other national states’ (Ramirez and Boli 1987: 5). In this case the key goal for education was to unite the country and make students view themselves as national citizens in the first place and only then as residents of certain administrative units (Ramirez and Boli 1987: 4–5).

Therefore, the extension of states' power onto the sphere of mass education was crucial for the formation of nations (Ansell and Lindvall 2013: 506). Indeed, mass education helps people become true members of a society and citizens of a nation-state. It makes citizens loyal to the state and obliges them to contribute to large-scale national campaigns such as wars, tax deductions, and voting. Mass education makes people become devoted to a common system of aims and symbols and helps them behave appropriately in various situations (Ramirez and Boli 1987: 3; Boli, Ramirez and Meyer 1985: 159).

Finally, by the end of the nineteenth century mass education became a factor influencing economic growth, which was the reason for implementing this system in England after this system had already proved to be effective in Germany, England's main rival (Wright 2012: 22).

We would like to conclude the paper with Andy Green's words:

The formation of national education systems in early nineteenth-century Europe marks the beginning of modern schooling in western capitalist societies. With the coming of the school system, education became a universal and national concern, embracing all individuals and having effects on all classes in society. Learning became irreversibly equated with formal, systematic schooling, and schooling itself became a fundamental feature of the state. The national education system thus represented a watershed in the development of learning. It signaled not only the advent of mass education and the spread of popular literacy but also the origins of 'state schooling' – the system which has come to predominate in the educational development of all modern societies in the twentieth century (Green 2013: 11).

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The Nineteenth-Century Origins of Global Secondary and Higher Education*

Julia Zinkina, Andrey Korotayev, and Ilya Ilyin

In this paper we trace the nineteenth-century origins of the contemporary forms or organization of secondary and higher education, which have by now spread all over the world. With respect to secondary education, the authors consider the development and spread of the so-called 'humanistic schools'. As for the universities, we pay attention to the emergence of the two models of modern university in Europe (in France and in Germany) and to the global spread of these models.

Keywords: *education, 19th century, secondary education, humanistic schools, university, French university model, German university model, von Humboldt.*

Secondary Education in the Nineteenth Century: Diffusion of Humanistic Schools

In the nineteenth century, the form and content of secondary education drastically changed. Meanwhile, one can speak about the reformation of secondary education system already starting from the 16th and 17th centuries, when the new types of schools emerged including lyceums, gymnasiums, scientific schools *etc.* (Brockhaus and Efron categorize these schools as 'humanistic schools'), which substituted for monastic and order schools. However, the content of education mainly consisted of Latin and the Law of God, as it used to be in the medieval times. Some changes occurred at the end of the seventeenth century, when German and French were included into the secondary schools' curricula. Later, in the 18th–19th centuries curricula were expanded by adding math (including arithmetic, algebra, geometry, and trigonometry) and natural sciences (including geography, botany, zoology, and mineralogy).

The first gymnasiums of modern type were established in Prussia during the reign of Frederick the First. Their main goal was to prepare students for university education. The Prussian gymnasiums set a new objective at the beginning of the 19th century, when the successful passing of maturity exams became obligatory not only to continue education at university, but also to get a job as a civil servant (Brockhaus and Efron).

By the end of the 19th century humanistic schools were established almost all over Europe: gymnasiums in Austria-Hungary, Prussia, Serbia, Bulgaria and Russia, lyceums and colleges in France, grammar schools and high schools in England and the USA; peculiar types of humanistic schools (functionally similar to the above-mentioned ones) existed in Belgium, Spain, Italy, Switzerland, Scandinavian countries *etc.* (Brockhaus and Efron).

* This study has been supported by the Russian Science Foundation (Project No. 15-18-30063).

Higher Education in the 19th Century

Formation and the beginning of global diffusion of the model of European university

At the beginning of the 19th century as a result of Napoleon's campaign which eliminated a large number of small and underdeveloped higher education institutions throughout the conquered territory the number of universities in Europe was quite small. It was a positive outcome to some extent, since new forms of higher education institutions developed. Some of them exist until present. The most significant form was the model of the university. In this section we would like to examine the differences between university and pre-existing higher education institutions.

Anderson (2004) points out that medieval traditions were a common sight in universities up to the 18th century. Special teachers' and students' corporations existed under surveillance of the government and church although having substantial autonomy. Universities were responsible for preparing ministers, lawyers, and doctors. A university diploma was mandatory to take on those jobs. These objectives defined the university structure: its main divisions were the faculties of law, medicine, and theology along with the faculty of philosophy, which provided general knowledge for all the above-mentioned faculties (Anderson 2004: 5).

At the beginning of the 19th century the situation changed dramatically. Two new university models were formed – the French one, created by Napoleon Bonaparte, and the German one, connected with Wilhelm von Humboldt in the first place (as well as with Kant, Fichte, and Schleiermacher).

A new university was established at the very beginning of the 19th century. It was a very large state corporation with separate faculties. Formalities and the operation of each division, including the teaching methods, students' books and even teachers' private life were under strict control and regulations. This represented a new French model of the university (Brockhaus and Efron, Anderson 2004: 43, 58; Charle 2004: 44–47). According to this model the main objective of the new university was to prepare qualified civil servants. It turned to produce a crucial effect on social and political stability through limiting the spread of freethinking. The implementation of this model had slowed down the establishment of contemporary-type universities, which appeared only at the end of the 19th century. However, this model spread throughout Europe (mostly throughout the conquered territory). Many its elements, such as centralization and strict control over the content of university education, were incorporated in Italian and Spanish education systems, and later spread from Spain to Latin-American countries (Charle 2004: 44–47; Shils and Roberts 2004: 178–179).

Along with the above-mentioned outcome Napoleon's reform created another type of educational institutions – higher education technological institutions, the so-called *Ecole Polytechnique*. Their main goal was to prepare engineers and artillerymen. The basis for such institutions was developed in the 18th century in Germany, Russia, Austria, and Hungary, where mining and engineering schools had been common. The French model added new math and physics courses of higher level to the curricula (Ruegg 2004: 10). In the nineteenth century such institutions became widespread all over the world, including Latin America, Middle East, South and Eastern Asia *etc.*

The German model had a number of significant differences from the French one. Some of them reflected the structural differences of the countries themselves – centralized Bonaparte's France versus fragmented Germany. Contrary to the unique French university

Germany had 35 universities in 1789 (Charle 2004: 33) where the German model developed.

Having its roots in the 18th century (universities of Gottingen and Halle) this model had been fully formed by the beginning of the 19th century and started to actively spread during the second half of the 19th century. Humboldt's ideas of the strong interconnection between scientific research and teaching became the basis for this model. According to Humboldt, teachers were to carry out scientific research whose results were to become the basis for their lectures. Narrowly specialized teachers substituted for professors with encyclopedic knowledge (say, law teachers were substituted with international law teachers, Roman law teachers *etc.*). The content of the classes coincided with particular topics of scientific research.

In other words, professors could choose the topics of their lectures depending on the sphere of their scientific research. The students were obliged to engage in scientific work coached by their professors. Faculty of philosophy was a transitional stage between the gymnasiums and professional faculties. Seminars became a brand new form of teaching in the universities. During such classes students could join in scientific work. One should also point that students were to a large extent free to choose the courses according to their inclinations. The end-of-course assessment helped them to choose suitable courses. In order to get a doctor's degree students had to present the results of their individual research. The final qualification exams for the intended doctors, lawyers, and ministers were carried out by the government (Anderson 2004: 51–58; Charle 2004: 47–51; Brockhaus and Efron, Ruegg 2004: 4–5). The role of the government in Humboldt's model was limited to two functions only – to the preservation of the freedom and to appointments of professors (Ruegg 2004: 5).

Humboldt's ideas were brought to life for the first time and to a great extent in the University of Berlin which was founded in 1810. By the twentieth century the corporations of teachers and students, working to search for the scientific truth, became orthodox (Anderson 2004: 56).

We would like to pay major attention to the spread of contemporary European university model throughout the world. It is necessary to point out that this process had started much earlier. By the end of the nineteenth century some countries of Latin America adopted many university features from Spain. The USA also adopted some features, but from the Great Britain (Shils and Roberts 2004: 163). Russia was one of the first to adopt the German model. A number of universities were founded at the very beginning of the nineteenth century (in Vilnius in 1803, in Kharkov and Kazan in 1804, in Saint Petersburg in 1819) (Charle 2004: 35, 48). German model widely spread in such European countries as Austria-Hungary, Switzerland, Greece, Bulgaria, Scandinavian countries, *etc.* (Charle 2004: 36–44, 64–68). It also influenced the education system in the Great Britain, where by the end of the nineteenth century the research work developed and the number of courses was enlarged to foreign languages and natural science (Charle 2004: 61–62).

During the second half of the nineteenth century some features of the German model (in particular the principle of interconnection of scientific research and teaching, as well as seminars) penetrated the USA education system, which previously had used to follow the tradition of British model with its autonomous colleges. It is important to point out that different universities of the USA adopted the elements of the Humboldt's model to different extent. The universities which reflected this model to the greatest extent were the University of Chicago, John Hopkins University in Baltimore, and Harvard University. Many

of the universities that had been established earlier preserved the traditions of the British model, especially the ones related to the university management. For example, many of them had a position of the President of the University (Shils and Roberts 2004: 164–175).

As mentioned above, the French model influenced the Latin-American countries and French colonies for a long period of time. Some features of the French model also spread across the Middle East and North Africa including Egypt. However, the latter adopted the policy of establishing specialized colleges (medical, polytechnic, law or humanitarian sciences) rather than centralized universities (Shils and Roberts 2004: 186–191). In 1857, the British government established three modern universities in India, in particular, in Calcutta, Bombay, and Madras, applying the model of the University of London (*Ibid.*: 200). In 1877 the University of Tokyo in Japan was established by the example of the American universities. The University of Beijing was opened in 1898 and adopted the pattern of some European universities. Finally, in 1911 the University of Hong-Kong was opened using the examples of British Universities (*Ibid.*: 216–223).

Global Spread of the European Education Model in the 19th Century

By the beginning of World War I the educational institutions of the European type were widespread all over the world (with the only exception of the countries of Arabian Peninsula) and they included the following education patterns.

1) *Anglo-Saxon Immigrant colonies and the USA* represented the nearest periphery of the Great Britain. Contemporary formal education developed following the Western European model and by the beginning of World War I the spread of primary education was comparable to the leading countries of Western Europe.

2) *South Europe* during the first part of the second millennium was a center of establishment of modern European education system. However, in the early Modern Era it lagged behind Western Europe; thus, in the nineteenth century a contemporary education system was spreading in South Europe with a delay.

3) *Eastern Europe* was comparable to South Europe in the spread of contemporary education by the beginning of World War I. All the levels of education were widespread here; however, it was still considerably lagging behind North and Western Europe.

4) Very similar conditions were in the majority of countries of *Latin America* by the beginning of World War I, which were slightly lagging behind their South-European metropolises. However, the gap between Latin America and North America and North-Western Europe was significant.

5) *The Ottoman Empire* was establishing its education system even more slowly and was lagging behind even more. Some features of modern education appeared here in the eighteenth century, however, only in the sphere of military education. In the first half of the nineteenth century some elements of European education were incorporated by Muhammad Ali in Egypt. However, the real establishment of modern education system started during the Tanzimat reforms, when in 1847 the Ministry of Education was established (Mekatib-i Umumiye Nezareti), and in 1848 the first modern universities (*darülfünun*) and teacher training colleges (*darülmualimin*) were established.

6) There was a peculiar model of the spread of modern education in the conquered *colonies* of the European countries. The process of establishing contemporary education institutions proceeded rather rapidly and had started after the conquering, since the me-

tropolises needed qualified personnel from the locals (non-commissioned officers, administrative clerks) to exploit the colonies effectively. However, modern education was spreading very slowly in contrast to resettlement colonies.

7) There was a special model of the spread of the modern European education in *East Asia*. At the early Modern Era there occurred a so-called *closing* of all East Asian countries. Foreign contacts were restricted and the countries were kept under strict state surveillance. Under such conditions it was impossible to borrow any experience from the European countries. After the *opening* of these countries by the Europeans a successful education system modernization was carried out in Japan. Moreover, when Japan occupied Korea and Taiwan, its education system was spread there too. The establishment of modern education institutions in China started in 1862 within the framework of the Self-Strengthening Movement. However, the modernization of education system lagged in comparison with that of Japan.

8) Other Asian and African countries, which preserved their independency until World War I (Iran, Thailand, and Ethiopia), developed different models of education systems. The spread of modern education in Iran started in the 1880s and associated with Haji-Mirza Hassan Roshdieh's activity. Remarkably, he adopted the model of contemporary education not from Western Europe, but from the Ottoman Empire. This decision was probably defined by his studies at the Beirut Teachers Training Institute. Thailand followed the East-Asian path since the country was *closed* in the early Modern Era as well. The modernization of its education system took place when it was *reopened* in the 1870s. Afghanistan and Ethiopia were developing the education systems even more slowly and opened their first European-type educational institutions at the very beginning of the twentieth century at the reign of Khabibulla-khan and Menelik II.

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Challenges for Education in an International Setting

Peter Herrmann, Fan Hong, and Remi Rzepka*

Third Level Education is in many respects increasingly changing in the light of two general developments: internationalisation and globalisation on the one hand, marketisation and commodification on the other hand. Whereas the first is apparently taking up on an intrinsic value of education ('universality of knowledge'), the second can be seen as opposing its values ('knowledge cannot be bought and sold as any other good'). However, the discussion of this contribution shows that in reality we find that on the side of implementation big business has a standing that finds its way much easier to the stage of implementation.

Keywords: *third level education, globalisation, internationalisation, marketisation, educational values, legitimisation.*

Third Level Education is increasingly concerned with distinct, though mutually influencing aspects – they can be aligned along two dimensions: the first spans between development of personality and defining ones' place in professional terms; the other is about growing up in a new global scientific community. What had been for centuries a very privileged area for a few outstanding and lucky scholars, is becoming a field that is increasingly open for many, ready to engage at different levels, beginning with the bachelors degrees. Let us take Bangor College China as an example.

Bangor College China is a joint venture between Bangor University in the UK and the Central University of Forestry and Technology (CSUFT) in China. It was established with the approval of the Chinese Education Ministry in 2014 as an advanced model to facilitate the internationalization of Chinese higher education. A dedicated Bangor College China offers full degrees in China which is the first for a British university. It offers four programmes including BSc in Banking and Finance; BSc in Accounting and Finance; BSc in Electronic Engineering; and BSc in Forestry and Environment Management with more than 600 students in their first and second year studies. A team of dedicated and experienced staff of teaching and administration from both Bangor University and CSUFT were in interaction. Over the last two years Bangor University has invested heavily on Bangor College China. It is responsible for the quality of the programmes and ensures that the teaching standards, assessments and student experience are equivalent to those at the Bangor home campus.

* This article goes back to the work of the authors in Connection with a Presentation to Conference in Shanghai, October 2016. The conference theme was about higher education in an international setting in which presentation included a wide range of progresses made and challenges met within the joint-venture programmes between western universities and their Chinese counterparts.

- Although the running of the joint school in general goes smoothly with good intention from both universities in the UK and China, some major challenges lie ahead in the areas of the merger of different administrative cultures; the search for professional standards; the work towards a common professional understanding, making reference to wealth of different traditions; and the development of new ways learning.

- Remarkable new opportunities go hand in hand with grave challenges: as much as we find the strive for excellence as major field of competitive concern, at the very same time we find the incredible opportunities for smaller projects, such as Bangor College China, is an example that locates the challenge of development of personality and defining ones' place in professional terms in the context of a collaborative setting globally.

Defining the Field

International education – as matter of ranking and also cooperation and as matter of the excitement to explore new shores – experiences a kind of hype, easily overlooking the inherent contradiction. But can we really speak of an inherent contradiction? If we take things at the level of appearance, we find, of course, – and very valid – the feature of cut-throat competition – the winner gets all, at least the cherries of qualified staff and students and also the relevant resources.¹

Although this is undeniably a strong force, we can take as well a more optimistic view – optimistic for those that are not in any relevant top-league, and – importantly – who are actually not seriously striving to gain entrance. Though it is often said that we do stand on the shoulders of giants, we also – and increasingly – are part of an overall team game – not least looking at the ancient Western cultures, claimed to be the crèche of today's enlightened cultures in the east and west, we know that the understanding was very much one of discourse – a discourse between 'experts' and between 'experts' and 'pupils'. The term 'scholar', referring to the learned person and the student alike, may give a hint, as does the term 'scientific community' – and it is worthwhile to mention in parenthesis that these terms are paradoxically loosing meaning at a time when scientific work can only be imagined as part of an undertaking that is social in terms of time and content – without denying the greatness, for instance of Isaac Newton. It did not require much more than a well-studied individual mind and the observation of an apple falling from the tree to find out about the law of gravity. However, using this law as crucial basic knowledge to the undertaking of flying to the moon or exploring other planets, requires the genius of many people collaborating, as also the academic labour is divided and a huge amount of resources. And let us be honest, and a bit German, by referring to the poet Goethe who states in his masterpiece:

Two souls alas! are dwelling in my breast;
And each is fain to leave its brother.
The one, fast clinging, to the world adheres
With clutching organs, in love's sturdy lust;
The other strongly lifts itself from dust
To yonder high, ancestral spheres (von Goethe 1808).

Approaching things *sine ira et studio* (Tacitus), we are today caught in a structural condition that turns easily out as a potential deadlock. One important point is, however, if we truly ask the correct question.

¹ Of course, such general statement needs to be qualified as it is not necessarily clear what exactly this qualification is about (see Holmquist and Sundin 2010; Frey 2003). And it is also frequently discussed to which extent the finance that are relevant here are actually based on specific anticipated 'censorship'.

The perspectives at stake are predominantly based on four principles:

- the globalisation of institutional education/educational standards;
- the globalisation of knowledge and its application;
- the limitation and also ‘streaming/steering’ of resources;
- the increasing renaissance of personal contacts as part of the establishment of networks as functional basis of the system – not least as matter of ‘new principedoms’ – of course, another issue that requires self-critique and kind of critical avowals.

Importantly, this structuration of the field allows us to gain a clearer understanding of the common denominator that defines a substantial perspective, going much beyond the formal and institutional dimensions of education in an international setting.

Underlying is an advanced understanding of standardised knowledge and education that is both, condition and result of a specific form of massification. Leaving the economic dimensions aside, the present focuses on the continuation of the eclipse of reason. Leaving the economic dimension of utilitarianisation and realisation of value again aside, we see the abstract issue that had been expressed in the words ‘Economy of time, to this all economy ultimately reduces itself’ (Marx). This is a point that had been made by Marx in the quoted form, but actually in a different way already in 1848 by J. S. Mills when he noted in his *Principles of Political Economy with some of their Applications to Social Philosophy* about the Stationary state and later by J. M. Keynes when envisaging the 15-hour-week, writing in 1930 about the *Economic Possibilities for our Grandchildren*. All such statements are, besides their central economic concern, focusing indirectly on education, to be precise: the purpose of education. Later, this will be taken up by exploring some aspects of legitimacy and legitimation.

It is easy to see that at least one version of such stationary society is the one where high degree of material wealth and wealth of general knowledge is achieved. Though society may then be still growing, the growth is based on a reflexive mechanism joining the many classifications of society under a single term, we may speak of an *autopietic algorithm society*: ones set in motion, the entire machine works independently. This is surely not happening independently from human beings – even on the contrary, it depends on the ongoing supply of functioning, *i.e.* executing actors. Already the wording should make us aware of what happens: the confirmation of the dominance of executive bodies within the system of third-level education. Thus, it will not come as a surprise that in some universities today income is not increasing for the cadres that are performing educational duties – dealing with students and content; instead, the flows are advantageous especially for personnel working in other areas of the same institutions (Grove 2016). So, we are not least facing a twofold shift.

The one is about the search for new borders. If we see globalisation as something real, *i.e.* also real in terms of reaching a qualitatively new stage, we are confronted with renewing the marks and standards, allowing orientation. The easiest way of doing so is, of course, the strict orientation on manageable, administrable yardsticks.

The other is about the need of finding a way of redefining the object of standardisation – here we are confronted with a contradictory pattern. While, on the one hand, expectations are rising and many areas are increasingly professionalised, the formal transfer of training to third-level institutions of Higher Education does not necessarily mean that we witness a real academisation – actually we may well state the opposite, speaking of a pro-

cess of delimiting professional ‘areas’, and undermining the orientation put forward by Tagore, commending that ‘[t]he highest education is that which does not merely give us information but makes our life in harmony with all existence’ (Tagore 2003: 76). Thus, we have to answer as well the question how the meaning of professional standards themselves changed in history: from a purely reflexive assessment, being caught in an autopoietic circle, to a self-assessment according to praxis orientation, further to a self-assessment based on professional standards as matter of subordination under praxis requirements.

Methodological Considerations

One of the major analytical problems is finding a suitable methodological instrument that allows (a) developing a clear analytical perspective and that furthermore opens (b) a way for elaborating a strategic move forward. This will be described very briefly in the following, suggesting that a system-theoretical approach and the theory of social quality offer a promising reference for such analysis.

Autopoiesis

One core aspect of systems theory – and this refers to some discussions in the 1960s–1970s, undertaken by Georg Klaus (1965) and the version that is linked with the work by Niklas Luhmann² – is the process of self-referential reproduction and even production which became especially known under the term of autopoiesis. The launch of this perspective opened a clearer understanding of the openness and closure of systems. This can be described as generally open systems, sealing themselves off by defining the criteria of referential demarcation. The system itself *cannot* decide about the environment and which requests and requirements come from there. However, it *does* decide what it allows to cross the demarcation line and how it processes the intake.³ We can also speak of a specific language that avails of a hegemonic position, considering that language, once established, is always a matter of structural thinking. This is in line with the concept of general media in systems theory – though there is a permanent development, this is in its mainstay following a once defined path, and faces the difficulty of translation. Or to be more precise: any translation will be specifically defined by that ‘tone’ that gained dominance. We may say that the language of international administration faces a similar fate as that of mathematics about which Hannah Arendt wrote, ‘If we followed the advice, so frequently urged upon us, to adjust our cultural attitudes to the present status of scientific achievement, we would in all earnest adopt a way of life in which speech is no longer meaningful. For the sciences today have been forced to adopt a ‘language’ of mathematical symbols which, though it was originally meant only as an abbreviation for spoken statements, now contains statements that in no way can be translated back into speech’ (Arendt 1958: 23f.) In other words, although the language of administration of international education emerged as a tool to foster educational academic needs, it emerged as language that is now requiring educational and other academic activities to adapt to it.

Social Quality Thinking

Social quality thinking (van der Maesen and Walker 2012) can be packaged for the present context as means that allows establishing ‘indications’ serving as a kind of general gate-

² For example, see Luhmann 1984 and the reference to the work of Maturana and Varela about cognitive biology.

³ And even ignorance and insensitivity is a way of processing.

ways for both, the process of demarcation of the system and the processing within the system. For our purpose, these indications are only taken in very loose terms, more on a formal level, or we may say: the level of a framework of which the substantial definition is at the heart of the processes of actual negotiations. The relevant parameters are, first, the two lines of dialectical tensions along which the international setting is established, presented in Fig. 1.

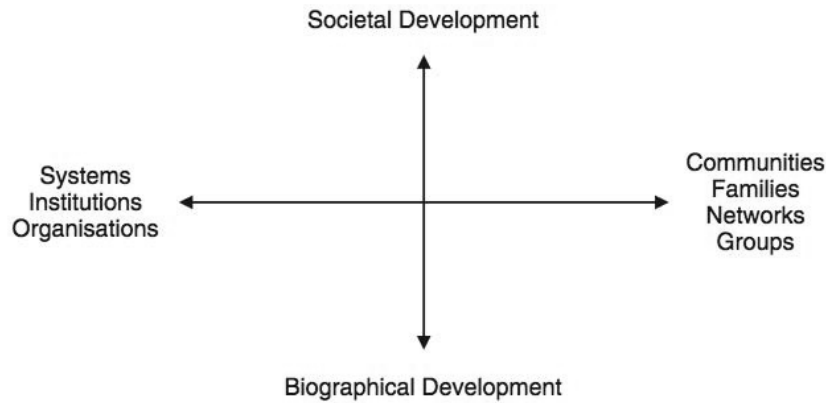


Fig. 1.

A more detailed and slightly substantial orientation is based on three sets of factors which had been systematically compiled as core of the social quality approach. This is presented in Table 1.

Table 1

CONDITIONAL (OPPORTUNITIES)	CONSTITUTIONAL (PROCESSES)	NORMATIVE (OUTCOMES)
Socio-economic security	Personal Security	Social Justice (including Equity)
Social Cohesion	Social Recognition	Solidarity
Social Inclusion	Social Responsiveness	Equal value
Social Empowerment	Personal Capacity	Human dignity

Legitimacy

The fact that the determinants of traditional structures of authority and government changed to an important extent makes legitimacy peculiar today. We can see a similar development as Karl Polanyi described it for the economy, contending '[f]or once the economic system is organized in separate institutions, based on specific motives and conferring a special status, society must be shaped in such a manner as to allow that system to function according to its own laws. This is the meaning of the familiar assertion that a market economy can function only in a market society' (Polányi 1944: 57).

Cum grano salis, this can be directly applied to the present context as matter grasping the detachment of educational processes, reflecting the hegemonic position of the market economy and the subsequent establishment of a market university, or in more commonly used terminology, the market of third-level education. The wider meaning, particularly geared to the question of legitimacy, is looking at the process of detachment, *i.e.* the emer-

gence and consolidation of a systemic rule, colonialising the lifeworld (Lockwood 1964; Habermas 1981).

In any case, however, we should not forget that the fundamental parameters, as they had been systematically elaborated by Max Weber, are very much in place also today. So we are still dealing with the three patterns of charismatic, traditional and legal authority and legitimacy. It makes sense to qualify legal authority as matter of legitimation by procedure (Luhmann 1983), this terminology underlining the detachment from ‘real social process’.

Paradoxically, detachment and alienation make legitimacy today even more an issue of political authority (understood in the widest sense), lurking around every corner, though veiled by market and procedural rules. Referring to William Connolly (1984), Jacqueline Best states that ‘[l]egitimacy ... while not an exclusively modern concept, became a more pressing problem in the modern age as tradition lost its hold on political life and the conventional character of social institutions became apparent. Political authority no longer appeared natural or divine but revealed its flawed, human face. People began to ask why they should obey ...’ (Best 2007: 471). An overly ambitious venture strategy may well be in danger of overwriting this paradox in a one-sided way.

A New Scientific Community?

Although we may say that many of the problems are not fundamentally different from those that are issued at least since the emergence of modern social science and its sub-disciplines including sociology and political science, the secular challenge these disciplines actually try to answer is the relationship between ‘Community and Society’.⁴ And this leads to the present core argument: education in an international setting, and ventures like that of BCC have to be understood in the perspective of an emerging new scientific community. As such they are a gateway which has in particular two tasks. The first is concerned with the ‘translation’ from the side of the mode of living of communities into the patterns of society. The second is about the translation of societal conditions into specific life regimes of communities.⁵ This process involves the elaboration of (i) a new understanding of the meaning of national interests, (ii) a reconsideration of the role of the different agencies, not least the role of students, and (iii) a reflection of the position of mass education on the third level in the overall setting of education. All this requires a commonly accepted task to take the actual definition of the ‘criteria’ for what a scientific community is today.

Part of this is surely a systematic scan not of the implementation of accountability, but the systematic sophistication of their elaboration. The debate of Washington versus Beijing consensus finds surely its place in this context.⁶

The Legitimacy Trap

Of course, talking about a strategic move forward is hampered by the very fact of the constellation in question. Already from what had been said, it is obvious that the core prob-

⁴ Referring to Tönnies' work on *Gemeinschaft und Gesellschaft* (Tönnies 1887; Darmstadt 1988 (based on the edition from 1935)); in the English translation we find initially the edition Tönnies, Ferdinand: *Community and association*; translated and supplemented by Charles P. Loomis; London: Routledge & Kegan Paul, 1955; later it had been translated as ‘Community and Society’.

⁵ See for mode of living and life regime Herrmann, forthcoming.

⁶ See the brief paragraph ‘Education in an International Setting – Part of and Contribution to Changing the Global Agenda’ at the end of the present contribution.

lematique is the juxtaposition of different agendas. The juxtaposition is characterised in different ways, of which at least the following need to be highlighted: the relationship can be (i) mutually supportive ('cross-fertilising'), (ii) hegemonically exclusive, (iii) hegemonically competitive, (iv) pushing towards border-crossing confederation and (v) neutral. In other words, it is about different interests for which the way of working together has to be fathomed.

1) Interests marking the legitimacy trap

Major relevant interest groups and interests respectively are those of traditional academics in the Weberian sense of science as vocation, those we may juxtapose as pursuing science as profession, the institutional agents, directly employed by providing the setting for teaching and research, the political agents that are determinant, students and parents, the various funding bodies, including the representatives of vested interests as industrial and professional bodies.⁷

It should be clear that this is not an exhaustive list, and also that the groupings are not homogenous and that they have different powers and means of making themselves heard. Leaving these qualifications aside, the list allows at least having a glance at some major forces that mark the poles between which legitimacy is trapped. This can only be understood if we recognise that these interests are 'real', *i.e.* part of an overall hegemonic setting that exists in practice.

2) Legitimacy between elitist and mass education

One important aspect can be seen in the fact of the convergence around the issue of competencies/skills/aptitude/fitness – an orientation that is very much geared towards an extrinsic and instrumentalist understanding of acquiring knowledge. This is not meant to present a simple negative stance, though it surely is about a development that is representing a strong ambiguity: Science/academia is not only since recently a closed area, being sealed off by different, though always more or less strict gatekeepers. The discussion today, referring to suicide and prostitution as it had been mentioned earlier (see footnote 1), is surely pointing to important issues. However, it is equally important to understand the underlying mechanism. We suggest that it is not a structural closure, requiring an increasingly adaptive behaviour and moreover psychologically anticipating self-control according to the expectation of expectations. Instead, it is a mix of at least three core issues: (mass) reproducibility of results/focusing on evidence ('empiricism'); exact measurement of performance ('metrics-assessment'); and de-academisation/professionalisation of third-level education ('Bolognaisation'/massification). A decisive aspect of this is the continued split between a relatively small innovative and creative academic elite and a relative large number of foot soldiers – silent pathfinders and implementers – as much as they stand on the shoulders of giants, the later giants walk on the carpets they roll out before them. What really changed are two things: there is a stronger and more immediate link to applied science requirements and the overall increased number of academics.

3) Practice requirement as challenge for defining legitimacy

Many of today's complains are in some way an inversion of earlier complains – those by which the detached character of academia in ivory towers had been reprimanded. Academia itself, however, changed today also in its very own terms and emerged as immediate

⁷ In this context see, for example, Universities UK, 2010; Deutscher Akademischer Austauschdienst/Institut der deutschen Wirtschaft Köln 2016.

productive force. Amongst other things this means that academics and academia are standing more than before in the limelight. This, taken together with the fact of an increasing number of academics, academic institutions and the increased competition taking the form of contracts instead of being openly pursued by status,⁸ we still see very much a replication of the old patterns – apparent as a small elite and elite institutions (the widespread excellence initiatives) being the agenda setters, while the others are striving to follow. In some way we may summarise this cynically by saying that today, with the immediacy of the imperative publish or perish (immediately done, immediately seen) things are known before we are dead. Scanning publications and works of giants of earlier academics for plagiarism and self-plagiarism may not have shown so different results as what we find in academia today, if we relate them properly to the overall numbers of publications, *etc.* This is also important in the context of international cooperation and ventures as we find today very much the replication of education as matter of vocation versus education as matter of professions. However, with science being now an immediate productive force, the bandwidth for manoeuvre is tightened. In this context it is interesting that we find today apparently very much the same patterns as we know them from earlier times: the academic giants of then and now have frequently a wide educational background, they are in many cases not narrowly professionalised and are often not pursuing the work in the areas which would today be seen as their ‘major’ – at least this can be said on an anecdotal basis for many. The difference, however, is that today many of these giants are more likely making a career in business and politics, remaining to a lesser extent in academia.

4) The time constraint

Talking about legitimacy, means not least to return to the definitive matter of social production, *i.e.* the production of society of which we know that ‘[e]conomy of time, to this all economy ultimately reduces itself. Society likewise has to distribute its time in a purposeful way, in order to achieve a production adequate to its overall needs; just as the individual has to distribute his time correctly in order to achieve knowledge in proper proportions or in order to satisfy the various demands on his activity. Thus, economy of time, along with the planned distribution of labour time among the various branches of production, remains the first economic law on the basis of communal production. It becomes law, there, to an even higher degree’ (Marx N.d: Chapter 3).

With the change of the productive forces, the patterns of work and consumption, societal structures and visions, it is also necessary to consciously consider this in the outline of third level education. This is a challenge that is faced also nationally, but on the level here under consideration it is even more virulent as challenge for structuring the processes.

Conclusions

At the early stage of European institutionalisation reference was frequently made to the Monnet method, namely, ‘a concept that calls for small steps on the way forward in Europe, dealing specifically with the integration of Europe’.

- The concept is characterised by the fact that there is no defined end goal in advance but that the EU should act open mind and situation-specific reactive.
- After the Monnet method Europe must let actions speak for and represent the *de facto* solidarity through policy statements. In addition, large institutional pro-

⁸ Alluding to Maine's statement of development being characterised as one from status to contract (see Maine 1861).

jects and political progress must be considered together. Because they generally apply economics as an instrument of policy. The focus is on peace, whose observance is more important than securing prosperity in Europe.

- Especially France and Germany must therefore work together as a European core. Decisions should be made by elites rather than democratically what is often criticized. The European states should get more expertise to a limited extent'.⁹

Cum grano salis, we can apply this also in the given context as a model for further discussion. Presumptions are: 1) we are witnessing a given, automatic push towards integration – against the odds of counteracting factors, emerging from varied¹⁰ systemic forces, and as result of centripetal forces; 2) we are dealing with a secular development that still is opening a playing field for different substantial interests that will be finally defining the concrete course.

Taken as question of a process of building a specific community, we face the problem of properly determining the point of reference of these communities which surely are not anymore the old 'ivory academic world' but also not (yet?) the world of polytechniques in the known sense.

This shift goes hand in hand with the emergence of functional conglomerations. The expectation is that everybody is responsible of everything and has to fill the various roles: the academic as fundraiser, as top-researcher, as secretary, manager and HR-expert to name but a few of the required roles.

Of course, a clear solution to this constellation by way of internal conflict resolution cannot exist as the interests and the contradictions between them are located in different fields. Thus, the actual solution is hegemony of a specific 'economy of time' as it had been said to be ultimately characterising the societal mode of production.

This means that community building, *because* it is a matter of building an incomplete and imagined community, is even more essential as matter of striving for a broad approach. Coming back to the Monnet method, one factor that is only barely mentioned in the quoted characterisation, is the supposition that the elitist character was not limited to decision making but concerned as well Europe as space of business elites, suggesting that from such centre a social space would emerge in the form of concentric cycles: the elites, bringing their interpreters with them, gathering the experts of the different fields, joined by the various support staff, *etc.*, finally ending in the Ryanairisation of travel and the birth of the 'generation easyjet'. Several parts of that 'European programme' failed – and they were doomed to fail. As questionable as the overall approach to 'state building' is from the perspective of any political theory of legitimacy, one surely valid point is the implicit acknowledgment that any strategy that aims at integration is anchored in the actual need to educate its own populace to be experts on their own concerns. A political project like that of the EU would have required the development of a European demos – the European elites did know this and indeed they did fear it (see Herrmann 2006).

This is as well the challenge for a new global teaching and research agenda. So far such agenda is very much driven by (a) specific and mostly narrowly defined interests and/or by (b) highly individualist attitudes, teachers and researchers seeing themselves very much as artistic performers and creators.

⁹ URL: <http://www.fondations.net/monnet-method-definition/>. Accessed 02/10/16.

¹⁰ Economic, political, juridical, cultural, in part in parallel, in part contradictory.

Tertium non datur? Part of the difficulty is that overcoming the particularist stances is caught in a quandary: the first agenda may be able to overcome the individualist orientation by narrowing the substantial scope as everything has to be geared towards realisation of the particular interest; in the second case, it is too frequent to sacrifice collaboration by subordination under the ‘leader’ – not allowing the profound emergence of a demos which would not least call for evoking to be criticised. In case one agrees with the statement that ‘[f]reedom is always and exclusively freedom for the one who thinks differently’ (Luxemburg 1918), it means one also has to agree to self-critique as fundamental; moreover, one has to establish mechanisms that structurally evoke such criticism. Admittedly difficult, though exactly this is a huge potential for success of joint ventures. As such they would go beyond an orientation on comparative advantage in a market setting, aiming at developing collaborative advantage in an open, innovation driven development of mindsets. Of course, the problem may well begin here, many easily agreeing and still, not allowing the self-critique being publicly stated. As much as freedom is always the freedom of the dissenter,¹¹ as much the limitations of freedom are usually seen as coming from ‘the other side’. Still, difficulties should not stop from pushing things further. One of the reasons for some optimism is the fact that traditional patterns of both education and employment are increasingly barred.

The challenge in the light of legitimacy is multilayered – and actually the first issue that needs to be tackled is that of creating an open debate that explicitly starts from difference instead of taking a supposed harmony as central point. It is suggested here that difference is not as such problematic – inept is denying it.

Finally, we have to locate difference of interest in terms of ‘substance’ along the different lines presented in the section 1) Interests marking the legitimacy trap’ of this contribution.

One important – and especially challenging – issue is linked to the vital aspect of community building. The concept of community is essentially based on dimensions as commonality/mutuality, public and nearness. This, of course, is somewhat a misnomer in the context of international cooperation and even bears some danger. Although these factors surely play an ongoing role, there is some danger of a deadlock emerging: only a small number of people are involved in the process, and/or the contacts are completely technicalised. However, in particular smaller venture projects offer perspectives to act in an intermediary function, linking involved staff in exchange on subject matters and into a wider field – an open question is if staff of both sides is ready and has the capacities, which includes *personal commitment* and sufficient *institutional backing*.

The New Normal

International and even global education is by no means new. Leaving a detailed survey aside, we can see at least five phases.

- In very early years we find a predominantly western based inter- and globalisation, based on the missionary ambitions of the church and also in the church's search for universal knowledge.¹²

¹¹ This is another translation of the words used by Luxemburg whose text was written in German language.

¹² Even if it had been in fact the search for the universal justification of Christianity and the hegemonic role of the Catholic Church.

- In the middle years the emergence of network that evolved around global exchange of interest and questions – not detached from practical interest, and even on the contrary: founded in the interest of change, of fathoming options of more fundamental change.¹³

- Still Western, the business and intellectual elite had been a foundation for a new stage of internationalisation of education – although saying Western is not quite right as it had been in its substantial gist strongly dominated by the Anglo-American orientation – aiming at gaining from the at the time undisputed and undisputable centre, modelling the world along the Rostowian model (Rostow 1960, 1990; see also Frank and Gills 1993/1996). One could take it as sublation and supersession of the previous stage, maintaining the idea of internationalisation, gearing it even towards globalisation, however, subordinating it now under the ‘law of the new business cycle’, understood as specifically Anglo-Saxon model (see Aglietta 1976). Those who studied abroad had been very much early skills-searchers: learning from the advanced centre, aiming at applying the acquired skills ‘back home’.

- The knowledge-searchers and acquirers can be seen as a new generation – in part emerging from the previously mentioned group; and in part standing even in opposition; the new explorers of the ‘easy riders’, the late-coming heirs of Columbus, depending on the monies of those whom they wanted (in part) overthrow. Characterising this generation is that ‘crossing borders’ meant as well leaving the ancestral cultural spaces.

- The fifth phase is the one in the middle of which we find ourselves now. In some respect it is the academic branch of the ‘generation easyjet’: open, thirsting for knowledge and, of course, privileged. In some respect it is a new generation, eager to settle, eager to acquire skills and facing a new and unknown world, competitive, and very similar to those we found at stage three: aiming at gaining from the centre. However, this centre had now not been entirely undisputed and undisputable. The situation is now different as many members of this group are (initially only?) committed to learn and return. The development is full of contradictions – part thereof is the self-confident orientation of young people, coming from countries from which the perspective that ‘The World is Flat’ (Friedman 2005) appears to be true. Finally, the Beijing consensus is not only a ‘Chinese issue’ but can at least be seen as well in the perspective from the other capitals of the BRICS-countries: Brasilia, Cape Town/Pretoria/Bloemfontein, Moscow, and New Delhi. On the other hand, we find a tendency to stick in many instances to the ‘fascination by the exotic and the evangelistic’ as much as without any doubt a significant part of the material resources are still very much mirroring the traditional patterns of the distribution of power, we find a certain reflection of this distribution across the entire range of behaviour.

Cum grano salis all this applies to students and teaching staff alike – and indeed one of the problems is at this stage the extreme ‘concentration’ and pre-selection: the fact that there are limited numbers of students and staff involved, and that they are more or less only involved in the ‘implementation of programmes within a new framework’ means not least that major potentials to achieve a new agenda are missed. The fact of frequently in-

¹³ Looking at the timing, this phase overlaps to a large extent with the phase mentioned before. To some extent we also find a substantial overlap as the church could only maintain its hegemonic position by radically changing some of the basic parameters – the attitude and role of pope Urban VIII in the dispute with Galileo Galilei has to be mentioned here, indeed saying much about the in part existing acknowledgement of fundamental change and the need for opening towards a new understanding of science within the church.

sufficient communication surely does not help.¹⁴ The latter is part due to the fact that the running of the programmes and the work in the subject areas are not sufficiently welded together.

Education and Research

In a short article in the guardian Nigel Carrington looks at six myths about how universities spend their tuition fee income (Carrington 2015). He highlights a point that has to be crucial for any considerations on further development; we read that '[i]t is possible to provide high quality education without doing research'. Qualifying this he continues that '[t]his might be true if we see the primary role of higher education as simply producing undergraduates to go straight into employment. It works well, for instance, if your goal is to produce law or accountancy graduates who will go directly into professional careers. But where does the new knowledge come from that is driving the economy of this country? Largely from the postgraduate community.' This qualification should be driven a bit further though, actually touching at core of the present debate. We can easily read it as statement raising the question of academic education. Taking place at a third level institution does not automatically grant academic orientation. And indeed, we may speak of a tendency to erode a certain kind of scholarly work. This is a multifaceted development that cannot be discussed in the present contribution. However, the fact of the existence of the conflictual field needs to be spelled out. Questions as for instance the following have to be addressed: *Should more subjects be academised by way of teaching them in a very narrow sense of advanced skills training? Can academisation offer an opportunity to enhance skills training by offering it at institutions of Third Level Education, enforcing this way the integration of non-academic disciplines into a wider academic framework ('de-academisation of specific functionalities and academisation of general education')? Should there be a return to an explicitly multilayered system of third level education instead of its implicit maintenance as it had been issued by the 'Bologna-sation'? In which way, if at all, can and should students be more involved in developing at an early stage a research strategy, also preparing them for a more academic orientation in their search of their further careers?*

Universities for Students, Society, and Economy

Experiences are important stepping stone for further studies.

On the basis of analysing personal experiences and some – yet not fully explored realm of international education – be that of a student (short or long term abroad), staff (administration/academic, visiting or based in relevant places of employment) and with connection to previously discussed legitimacy trap a certain but still blurry picture starts to (re)appear.

Firstly and in accordance with a small research conveyed¹⁵ and own experiences provided some insight on how the process of students' choice from a very beginning is being

¹⁴ In this brief reflection two issues had not been discussed – and indeed they do not fit into any of such typology. (Talking of a typology means as well to admit that the presentation is massively neglecting the fact of a much more quaint and contradictory reality.) Somewhere along the line we find, at times hugely relevant in quantitative terms, and importantly also influential in terms of 'school building' the emigrants and refugees, establishing a new platform for the old thinking, being allowed to carry on their traditions, and feeling secure enough not to submit (entirely) under the new conditions – of course, often also standing outside of the main competition for funding. Another, though most important, point is the issue of 'brain drain' – its exact causes, meaning and understanding.

formed. Starting with a very sobering but yet increasingly troubling ‘*parental guidance*’ that is based on government policies that promote certain degrees (usually the ones contributing instantly towards the job market) which offers predominantly business-orientated higher education on bachelors level such as Finance, Banking, Accounting and Administration and Management or IT, Software Engineering, Computer Science, *etc.* This is in a sense is a mirror image of the statistical data collected by the US National Centre for Educational Statistics (NCES) or UK (British Council 2012) and enhance the notion that it is the market that is dictating (hegemon) in a top bottom process on what/how and when to study to quickly and almost effortlessly finish degrees to enter the world of 9–5 work.

Paradoxically, the current globalisation processes also brought forth the incredible opportunities for universities, students (possibly it is more correct to speak of the ambitions of their parents) and businesses all around the globe. The staggering growth of international joint-venture universities – that in contrast with a ‘stand-alone’ universities with huge financial backing from governments and/or private sources that provide high-end education for the elites and none for the masses that further disturbs the fragile equilibrium (Ferreira 2006). In this way it transcends the cultural and political boundaries and with setting up of business orientated degrees as its core joint-ventures with an affordable tuitions paves a solid ground for future, diverse degrees and promote the international education due to a number of multinational corporations with high profile seeking future employees (Belyavina, Li, and Bhandari 2013) with such qualities like mobility/languages/cultural awareness and not necessarily educated in top 10 universities.

Finally, this brings us to the character of a student (person) (educated domestically or internationally does not matter) and what he/she really wants. Right within the previously mentioned statements on subject academisation (further understanding) or job specialisation (focus training) lies the reception of experiences that the education offers to the students. Within it (internationally educated matters), we could be able to observe how students from different cultural backgrounds are affected for example on the matter of participation within this different cultural backgrounds. Due to different ways to educate – the international students might differ in reception and engagement; however, it does not define a ‘better or worse’ but rather deepens our understanding of one and allow being flexible that further the understanding thus quality of teaching that student receives. On the whole we could argue that there are more positives to be taken out of international education experiences but some negatives are being overlooked and neglected – especially the troubles of students coming back from studying abroad and their hardships in ‘reconnecting’ with the old or the new (depending on the length) which is often described as post study abroad depression.¹⁶

To sum up, the dominance of business programme orientated joint-venture brings forth the notion of market dictating the future generation of workers with governments and universities following trends and promoting certain degrees on expanse of others (which is a global issue, not only related to China) due to wide range of pressures coming from a mix of different stakeholders such as market and its current needs that are portrayed by governments which want to fill the gap in the labour market and want students to contribute as

¹⁵ Conducted as a series of informal yet anonymous interviews with heads of joint-venture universities in China for a conference in Shanghai on October, 2016.

¹⁶ URL: http://www.huffingtonpost.co.uk/dan-baker-studentuniverse-/post-study-abroad-depress_b_8698630.html; <https://www.theguardian.com/education/2015/jun/04/students-post-year-abroad-blues>; <https://www.gooverseas.com/blog/post-study-abroad-depression>; accessed 6/11/2016.

soon as possible and most crucially – parents and peers paradoxical pressure on ‘climbing a ladder’ and at the same time having steady, stress free job.

Education in an International Setting – Part of and Contribution to a Changing the Global Agenda

Joshua Cooper Ramo states in a recent interview in *The Diplomat*, from August 2016, that ‘[t]he idea of the Beijing Consensus is less that every nation will follow China's development model, but that it legitimizes the notion of particularity as opposed to the universality of a Washington model’ (Elen 2016). Furthermore he contends that

[t]oday, we live in a world in deep crisis. And much of this comes from the over-simple assumptions baked into universalizing ideas about political and economic structure. What works in the financial markets of London, we now all see, is not such an easy match after all for the puzzles of Greek finance. The political solutions that have buttressed several hundred years of European history cannot be installed as easily as a McDonald's in the countries of the Middle East (*Ibid.*).

Indeed, for instance for areas like teaching economics and related topics there is the need to acknowledge change in a more profound way than it is usually done – more or less randomly chosen a report on ‘Meeting China's productivity challenge’ may point in a relevant direction (McKinsey & Company, August 2016).

Taking this as serious issue on board is also relevant in the present context – only by recognising difference, it will be possible to reach a new and higher consensus – we can learn from the book of Zhuangzi. We find the little story of the butterfly:

*Once upon a time, I, Chuang Chou, dreamt I was a butterfly, fluttering hither and thither, to all intents and purposes a butterfly. I was conscious only of my happiness as a butterfly, unaware that I was Chou. Soon I awaked, and there I was, veritably myself again. Now I do not know whether I was then a man dreaming I was a butterfly, or whether I am now a butterfly, dreaming I am a man. Between a man and a butterfly there is necessarily a distinction. The transition is called the transformation of material things.*¹⁷

Taking this seriously, the condition of success of joint ventures depends on recognising them as part of such process of transformation – importantly it will only be workable if it is recognised as one of both sides, namely both sides in terms of national interests – in the given case of China and the UK; and in terms of substantial interests of academia, *i.e.* the scientific community and a business oriented university administration, led by increasingly inadequate resource requirements.

Developing here a perspective in the light of globalistics¹⁸ and Big and Global History (see Rodrigue, Grinin, and Korotayev 2015) two issues are worthwhile to be added, putting things into the perspective of such wider approach to development – and thus as well into the perspective of economic development.

The escalating distancing of the developmental process from the very fundamental basis – Colin Clark's analysis sector (see Clark 1940; for a short contemporary critique see Rothbarth 1941). and its later extension (including a quarternary and quinary sector) and

¹⁷ Zhūangzi; URL: <https://en.wikiquote.org/wiki/Zhuangzi>; 03/10/16.

¹⁸ See in this context Grinin, Korotayev, and Herrmann, in this volume: ‘Introduction. How Global can be Global Future?’

also the perspective of Kondratief Waves (Grinin, Devezas, and Korotayev 2014) offer important insights: at an 'initial stage' we find existence and development as highly 'nature bound', an important aspect of development is, however, the emergence of an increasing distance. Looking more at the psychological and anthropological side, we may speak of artificiality or also of sublimation. Taking these two perspectives – developmental economics and psychological/anthropological – together we see in the narrower perspective of political economy and economics the quasi-separation of use value and exchange value and the emergence of exchange as quasi-independent area of production and exchange. Paradoxically this leads to re-emphasising the orientation of education to the process of production: science – and with this education – is established as immediate productive force. This has major implications for the global and Big History. Artificial Intelligence as governor of the new epoch is often used as general spectre, painting the fearful picture of complete alienation.

This – and the search for a more positive outlook – brings us to David Ricardo. It can be said that the idea of competitive advantage as dominant issue in economics is going mainly back to his work. However, an important aspect is frequently forgotten: he emphasised that such 'law of comparative advantage depends on one stable currency underlying the relationship of actors as unified reference' (Ricardo 1821: 72 ff.). *Cum grani salis* we can apply this to the context of international education. As long as education looks for a new role in the emerging international setting, the move is very much about gaining and maintaining comparative advantage – using one strong currency as lead currency. This may also explain the ease with which a specific 'administrative hegemony could be gained and still can be in large parts maintained: quarrels concerned with the organisation of flights and the eligibility for the different standards as well as formal QA-matters are overshadowing substantial discourses on the different subject areas. And it is, of course, easier to push things forward in the business-related disciplines. However, at the end such system will remain limited to competitive strategies. Moving towards global education, the currency has to be changed, a language of professional standards then returns to the meaning of the standards of the profession, dealing with the discourses and disputes of the various disciplines. The various economic and political dilemmas of the EU show how difficult it is – its foundation was determined by the old language, not daring to admit that the EU would have to be a new currency. The challenge for the future is to find ways that guarantee the variety and specificity of disciplines and national traditions, and still fosters the common exchange. Looking another time at the EU-integration clearly shows that the needed currency has to be one that focuses positively on the realities of people's life (general character of being educated) and the reality of a use-value, social quality oriented societies instead of functioning economies.

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Global History and Future World Order

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The present article analyzes the world order in the past, present and future as well as the main factors, foundations and ideas underlying the maintaining and change of the international and global order. The first two sections investigate the evolution of the world order starting from the ancient times up to the late twentieth century. The third section analyzes the origin and decline of the world order based on the American hegemony. The authors reveal the contradictions of the current unipolar world and explain in what way globalization has become more profitable for the developing countries but not for the developed ones. The authors also explain the strengthening belief that the US leading status will inevitably weaken. In this connection we discuss the alternatives of the American strategy and the possibility of the renaissance of the American leadership. The last section presents a factor analysis which allows stating that the world is shifting toward a new balance of power and is likely to become the world without a leader. The new world order will consist of a number of large blocks, coalitions and countries acting within a framework of rules and mutual responsibility. However, the transition to a new world order will take certain time (about two decades). This period, which we denote as the epoch of new coalitions, will involve a reconfiguration of the World System and bring an increasing turbulence and conflict intensity.

Keywords: world order, American hegemony, global leader, balance of power, reconfiguration of the world order.

Introduction

Soon after World War I and in connection with the formation of the League of Nations the American president Woodrow Wilson coined the term 'new world order', hoping that it would finally become possible to create a system for maintaining international peace and security; meanwhile, the political order had already existed in the Western world for several centuries. In historical terms it would be more precise to speak about the international order when the European order transformed into the global one. Moreover, prior to the European order the inchoate international order could be found in other regions of the World System (the most famous here being the Pax Romana). Thus, with respect to globalization, the search for the origins of the world order leads back to the ancient times. Yet, in historical terms the notion of the world order seems rather amorphous. The humanity has passed a long and perilous way to the establishment of certain international rules and foundations of co-existence. It is worth analyzing them just in terms of the formation (and development) of the world order and the way in which the obtained experience can be employed for making predictions on the forthcoming transformations.

The notions of globalization and world order have become rather closely connected today. The countries' mutual influence as well as the impact of global processes on nations

and states are evident today (Ilyin and Leonova 2015). Within the political realm globalization considerably affects the transformation of the states' sovereign prerogatives since it contributes to the change and reduction of the scope of the states' sovereign powers (Grinin 2009, 2012a, 2012b). All this gradually creates the foundations for the world order whose outlines (although discussed since the end of the Cold War) are actually just being formed. It is obvious that the unfolding globalization cannot but complete with some institutionalizing of the relations in the foreign policy sphere although this path is difficult and ambiguous.

The present article is devoted to the analysis of the world order and this is appropriately manifested in its structure.

Prehistory of the World-order Formation

Politics as a realm of relations connected with distribution of power (Smelser 1988) seems to have appeared around the age of the Upper Paleolithic Revolution. The political sphere had started to separate already before the emergence of the state at the level of complex societies (see Grinin and Korotayev 2009; Grinin 2012a). Moreover, the foreign policy, which implies relations between individual states, is virtually older than the domestic one.¹ However, it is evident that the relations between states could only emerge after a certain system of states had been established, and this happened only in the third millennium BC. Starting from the third millennium BCE one could observe the upswing and downswing cycles of political hegemony (Frank and Gills 1993; see also Chase-Dunn *et al.* 2010). The most famous episodes of the struggle for hegemony in the core of the Afroeurasian world-system (in the Near East) are associated with the rises and falls of the Old Babylonian and Old Assyrian Kingdom (the first half of the second millennium BCE), a clash between the New Kingdom of Egypt and the Hittite Empire (the second half of the second millennium BCE), New Babylonian and Neo-Assyrian Empire (the first half of the first millennium BCE). At the time, the region was actually the most advanced (and the largest) part of the cultural oecumene. Thus, the clashes within its realm can be considered ancestral for the struggle for the global order. This struggle undoubtedly enhanced the links within the World System and supported its unity despite the discord among the ancient states (see Andreev, Ilyin, and Zinkina 2015b; Grinin and Korotayev 2013, 2014b). It also contributed to a quick diffusion of innovations, in particular, of iron metallurgy in the late second and first millennia BCE. Unfortunately, from ancient times until the present the violent fights at external arenas remain the triggers for technological advances.

The struggle between nomadic and sedentary polities was one of the most important phenomena which defined the outlines of the World System political landscape; yet, in the present article we will not concern this issue as well as the period of the formation of the world empires in the Middle East, and history of the Roman and Chinese Empires (Qin, and later Han) (see Grinin and Korotayev 2013, 2014b). It is widely known that by the end of the Middle Ages and beginning of the Age of Discoveries (when globalization had started its new powerful expansion) the political landscape of the forming World System had experienced numerous transformations. Here one should note that the latter contributed to the initial development of certain ideas, principles, trends, and patterns which later would play an important role (and some still remain crucial) in the establishment of the global political order. Thus, the comprehension of these phenomena is extremely im-

¹ War used to be an important element of foreign policy (about primitive warfare see *e.g.*, Keeley 1996).

portant for the analysis of the processes under study. First, with respect to long periods of time one can hardly ignore the fluctuations connected with the establishment or disrupting of a certain balance of power which could launch significant transformations. Such fluctuations are still present.

One can agree or disagree with Henry Kissinger's statement that the system of power balance has hardly ever existed in the human history (Kissinger 1994), but the notion itself of the balance of power is extremely significant (and Kissinger pays much attention to it). Second, one can distinguish some factors particularly influential for changing the balance. Along with the above-mentioned technological factor, the ideological factor also has a certain impact. For a long time the struggle for hegemony lacked an ideological constituent and simply indicated a ruler's success and might.

Starting from the Greco-Persian wars, there appeared the ideas of confronting between Asia and Europe (and of the ideological pattern of the struggle between cultural center and barbarian periphery; the latter resembling the ideology of colonialism). In the Middle Ages, as a result of contradictions between Islam and Christianity, the ideological factor would make an important and permanent contribution to the formation of international order (see also below). Even today it persistently shows itself although it is not the primary source of conflict in the post-Cold War world, as they often interpret Samuel P. Huntington's ideas (1993, 1996). Speaking about ancient and medieval political ideas, one should mark the development of the idea of a legitimate political order within a state which can partially explain foreign policy. These and other principles gradually become institutionalized and during the Modern Age they start to form the basis of political order. This allows a more active interference into the international political processes which by their nature are weakly subject to control. And at present this trend is strengthening although with some fluctuations.

The Age of Discoveries introduced new vectors into the global order. First, the arena had actually expanded to a world-wide scale. Second, the started establishment and redistribution of colonial possessions would define the global policy during the following four or more centuries. Third, the started formation of the World-System core and periphery meant the development of the pattern which is still operating within the current international realm. With respect to Europe of the second half of the fifteenth century one can conventionally speak about a certain unstable balance after a number of devastating and long-lasting wars. However, as a result of the Age of Discoveries and especially of the started Reformation that balance was undermined for more than a century.

The Creation of the World Order

The international order as a system of relations and ideas about the foundations that should underpin the relations between states and generally in the world, started to form in the sixteenth century when diplomatic relations were established alongside with future contours of the system of 'great powers' in Europe. The prototype of legal principles of international relation system emerged as a result of the 1648 Peace of Westphalia which finished the devastating Thirty Years war in Central Europe. Those principles had been developing for more than two hundred years (about the Westphalian system see, *e.g.*, Spruyt 2000). In this respect one should mark in the first place the 'sovereignty' concept which is manifested both in domestic and foreign policy primarily in the right of war and peace (see Grinin 2012b) and in the legitimate supreme power. It came to the forefront after the French revolution in 1789.

The Thirty Years war was the legacy of the sixteenth-century European tradition of religious wars. But at the same time, it introduced two new foreign policy principles, which later would be actively employed by the politicians, namely: 1) the maintenance of

the international 'balance of power' through supporting the weaker coalition against the stronger one; and 2) the priority of national interests over other (religious, ideological, *etc.*) ones. For example, Richelieu formulated and actively implemented both these approaches (Kissinger 1994). As a result, although being a catholic state, France supported the weaker coalition of the Protestant states in their war against Habsburg Empire that strove for the world supremacy. At that time it was the diminished Habsburgs and disunited Germany which Richelieu (and later Louis XIV) considered as France's major national objective which would allow control over tiny German principalities. Given the fact that Richelieu was a Catholic cardinal, it was a bold step which had made foreign policy even more cynical than before. Since that time one observes a trend when the foreign policy started to develop according to certain stratagems and principles.

The Main Factors Influencing the Formation of the European/World Order

As already mentioned, within international relations framework the issue of the balance of power and its disruption is crucial for the perception of the states' foreign policy, as well as for the general pattern of the European and global relations. Deliberate foreign policy of some states (such as France, and later Britain) aimed at creating a number of military-political alliances enabled them to maintain and control the balance in their favor.² Bearing this in mind, one can better understand the peculiarities of the eighteenth and nineteenth centuries' military alliances as well as the reasons of interchanges within them.

Undoubtedly, it was the geopolitical factor that laid the basis for such an order comprising multiple states and several strong powers and lacking a hegemon. In contrast, the Chinese geopolitical environment with China (the Celestial Empire) inevitably playing a central role in the region hampered the development of modern diplomacy based on a complex system of international relations with almost equal powers. The fundamental principles of the Chinese foreign policy evolved around such major issues as the protection of the state from the nomads through setting barbarians on each other and launching successful campaigns against nomads, *etc.* Therefore, it is not surprising that it was the European and not the Chinese model of international relations that was to a certain degree expanded to the global level.

The balance between powers could change due to a number of factors, including internal rebellions, fall of dynasties, *etc.* Among the long-term factors one should mention different growth rates of population, territory, wealth, industry, and commerce.³ But all this should be converted into military power. The gunpowder and military revolutions (Downing 1992) led to the formation of advanced armies (McNeill 1982), which also contributed to state-building and formation of the new-type states (mature in our terms [see Grinin 2012a]). The results of the development of military technologies became evident in the course of successful Swedish (in the seventeenth century), Prussian, and Russian (in the eighteenth century) military campaigns. For our study, it is of particular importance to distinguish the technological innovations convertible into military advantages, because this factor became increasingly influential with time. For instance, France and Britain won the Crimean war (1853–1856) due to their technological superiority over Russia.

² This is reflected in Lord Palmerston's claim that England has no eternal allies and no perpetual enemies. Its interests are eternal and perpetual.

³ Thus, in the sixteenth century the Portuguese and Spanish came to the front after their colonial success and enormous wealth got from there while similar discoveries caused a gradual decline of the Italian trading states.

With the emergence of large-scale armies and completed transition to industrial production principle (Grinin 2007) the state's overall economic power and supply with resources became the main determining factor. It was the total economic power of the anti-German coalition that led to Germany's defeat in both World Wars. Nowadays, different economic (and financial) indicators can help to define the trends of shifting balance of power.

Finally, the balance of power could be significantly although irregularly disrupted by a changing ideological paradigm. Since the latter significantly changed the perception of legitimacy of government and its actions, it also inevitably led to the exacerbation of international relations and wars between ideological enemies. The results of such violations manifested in the Reformation of the sixteenth and seventeenth centuries, religious wars and later in the division of Europe into the Protestants and Catholics. The French Revolution (in the late eighteenth century) caused a new ideological crisis which undermined the sanctity of monarchy and aristocracy.

This was followed by a quarter-of-a-century-long chain of endless wars, coalitions, the triumph and fall of Napoleon's Empire and restoration of monarchies. The new ideological turn began after the First World War as a result of the deep crisis of the world order, and after the Second World War the ideological gap between socialism and capitalism became a determining factor for the new world order.

Although the performed factor analysis of the establishment and changes in the world order is far from being complete, it can explain the causes and results of the evolution of the world order, and can be employed to make predictions on the directions of the future world order development.

From a Concert of Europe to the World Wars

The concert of great powers existed from the seventeenth to the mid-twentieth century and according to Kissinger, it was a model of the world order which to some extent remains relevant even today (Kissinger 1994, 2014). Of course, the powers in the list alternated, and each change was associated with the shifts in the established world order. In the seventeenth century, Sweden could have gained the 'great power' status if not for the defeat in the Great Northern War with Russia, while Russia, on the contrary, joined the 'great powers concert'. Prussia joined this 'club' under Frederick II the Great in the eighteenth century. Then, the number of the great European powers remained the same (five – France, England, Prussia, Austria, and Russia) for about a century, until the unification of Germany and Italy, and later the rise of the USA and Japan. The shift in the European balance of power occurred mainly due to (a) a successful public administration reform and army reorganizations (Russia and Prussia in the eighteenth century are good examples here); (b) growing trade flows and wealth; and (c) a breakthrough in techno-economic sphere (made, *e.g.*, by Britain as a result of the so-called Agrarian revolution and the final phase of the Industrial revolution in the eighteenth century). Thus, in the second half of the eighteenth century it was Britain that controlled the balance of power in Europe, uniting in different alliance and joining or destroying coalitions. Meanwhile, the lag in socio-political transformations caused the decline of the former leading powers like Spain and Portugal, and left Genoa and Venice on the sidelines. The Austrian Empire and France had also considerably lost their positions; and the technological backwardness of Holland, which used to be 'favorite' in the seventeenth century (Arrighi 1994), together with its defeat in the war, led to the loss of political status.

The Congress of Vienna in 1814–1815 and the Holy Alliance of the Russian, Austrian, and Prussian monarchs were significant thresholds in the development of principles and

forms of control over international relations. The monarchs sought to maintain Europe's status quo and cooperated to undermine revolutions. This new ideological turn marked a return to the principle of legitimate (monarchical) power. Then, the concept and an effective system of the 'concert of Europe' emerged which involved the above-mentioned five great powers and was designated to maintain equilibrium and balance of power and to escape wars.⁴ It implied a multilateral diplomacy and opportunities of regular international conferences and existed until the Crimean war of 1853.

The increasing colonial activity involved the Asian countries (China, Japan, Burma, *etc.*) into the global affairs; meanwhile, many new states emerged in Latin America. That was the way how the world order originated with Europe still remaining the main arena.

The desire to preserve legitimate governments persisted in the European policy for three decades, at times running counter the countries' national interests. However, the revolutionary wave of 1848–1849, industrialization in Europe and the change of regime in France had undermined this ideology. It was replaced by a much more direct and cynical one, associated with political maneuvering in search for a combination of alliances, which would allow getting profits regardless the ideological proximity or dislikes. In Bismarck's Germany, this policy was called 'Realpolitik'. This disappearance of the ideological bias explains to a certain extent the existence of various and rather unstable alliances and coalitions of the great powers in the period between the 1870s and early 1900s. Generally recognized as a master of combinations and compromises, German Chancellor Otto von Bismarck initiated the creation of such unions.

As to the causes of tensions and conflicts between powers, they were mostly observed at the final stage of the division of colonial possessions and spheres of influence.

The German Confederation was established by the Congress of Vienna in 1815 (to replace the Holy Roman Empire destroyed by Napoleon). Although the number of German States reduced from three hundred to three dozens, Central Europe generally remained weak. Meanwhile, this was considered an essential part of the balance of power and such situation with Germany was the major objective of the national policy of France, Britain, and other powers. The rivalry for the influence in this part of Germany determined the policy of Prussia and Austria.

That is why the unification of Germany under the Prussian rule became the major change in Europe of the early 1870s, resulting from several victorious wars, Bismarck's shrewd policy and a number of mistakes made by Austria and France. This drastically changed the balance of power, since in the center of Europe a new state emerged which was stronger than any other power in Europe. Thus, France got an urgent necessity to find an ally, since after the defeat in the Franco-Prussian war it dreamed of revenge, but remained weaker than Germany. Bismarck in his turn was afraid of the war on two fronts, and therefore sought an alliance with Russia. But finally, after Bismarck's resignation, the conflict between Russia and the Austro-Hungarian Empire in the Balkans led to the Dual Alliance (1892) signed by Russia and France against Germany, and then there was the agreement between France and Britain (the Entente cordiale) in 1904 which transformed into triple Entente with Russia in 1907. Germany's military and economic strengthening made Britain take its favorite strategy of joining the less powerful group in order to weaken the leading continental power that is Germany. The rapid industrial development in all countries, the explosive technological innovations, a considerable change of war means – all

⁴ One should note here that since the contemporary world divergence from the unipolarity, it is rather probable that the future world system will be a kind of such 'concert' of some leading coalitions.

these pushed rivals (especially Germany) to change the balance of power by means of a military victory.

From the Balance of Power to Bipolarity

Thus, the new military-political alliances emerged in Europe and divided it into two opposing blocks. Eventually, this led to the First World War, which changed the global political landscape and the balance of power. Then, there was established the first international institution – the League of Nations – which attempted to influence the formation of new principles of international relations, and besides, the system of international conventions continued to develop. Nevertheless, after the World War II the new stable world order had existed for quite a short period. The powerful changes that occurred, including the emergence of the USSR, the development of new weapons and the great depression, the reluctance of Germany to recognize the imposed limits and other factors exacerbated the relations and unleashed another war.

The order established after World War II differed significantly from the previously existing one. First, there were only two strong powers (the USA and the USSR), in other words, the world became bipolar with two military blocks (NATO and the Warsaw Treaty Organization). The military core of this balance was nuclear equations and deterrence strategy. Secondly, it was based on ideological foundations which the previous world order had lacked. It is possible that it was ideological bias that supported a rather long existence of the post-war world order.

Generally speaking, a stable world order recognized and supported by the leading actors usually endured from three to four decades, or even less. Thus, the system that had existed before the French revolution (1789) had worked for less than 30 years. It was established after the Seven Years' War (*i.e.*, after 1763) and destroyed in 1790–1791. The Order established after the Napoleonic wars and the Congress of Vienna was destroyed by the revolutions of 1848–1849 and the Crimean war, and had existed for less than thirty-five years. The subsequent system of world order began to form after the emergence of the German Empire (1871), but developed only by the early 1890s and was destroyed by the First World War; therefore it endured for less than two decades. The Treaty of Versailles (1919) was violated by Germany in 1935. Thus, the world order established after the Second World War existed from 1945 to 1990 that is for 45 years, and that was an achievement.

The Issues of the Current World Order

The late twentieth-century shift to Pax Americana.

Globalization and the crisis of the unipolar world

The collapse of the socialist bloc and the Soviet Union destroyed the previous bipolar world order and led to the establishment of a unipolar world. Obviously, the ideas about the new world order that began to develop right in the late 1980s and early 1990s, often reflected the belief in the absolute domination of the Western economies, institutions and ideas (see, *e.g.*, Attali 1991) and became almost synonymous to the idea of Pax Americana (see, *e.g.*, Brzezinski 1998). Thus, Henry Kissinger's views (Kissinger 1994, 2001) on the new balance of power were no exception.

However, while the unipolar order was formed and developed the world balance shifted once again. This was caused by the countries' uneven economic and technological development. Over the last three or four decades, globalization has been constantly and signifi-

cantly effecting the changes in the world order. It eventually shifted the balance of economic power towards the developing world. One of the main reasons was the so-called ‘deindustrialization’ which meant a transition of a significant part of production, economy and technology from developed to developing countries (for more details see Grinin and Korotayev 2014a, 2015). The result is the Western countries' weakening economic growth and their diminishing role in the global arena, while the rest of the world (developing countries) increases the influence (see Fig. 1).

Thus, during the two decades starting from 1991, at the background of weakening Europe and continuing stagnation in Japan one observed the rise of economic giants in Asia (China and India) as well as the emergence of a number of rapidly developing states (from Mexico to Malaysia and Ethiopia) which preserve their growth rates (although with some difficulties) and are likely to take the leading positions in the world in the quite nearest future.

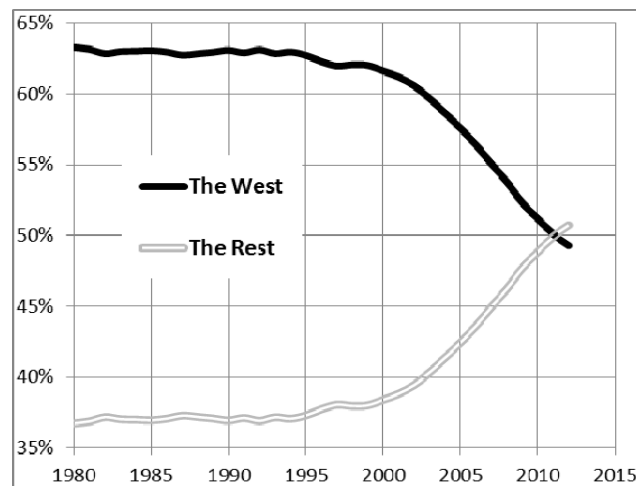


Fig. 1. Dynamics of the share of the West and the rest of the world ('the Rest') in the global GDP after 1980 (based on the World Bank data on the GDP calculated in 2005 purchasing power parity international dollars)

Source: World Bank 2014: NY.GDP.MKTP.PP.KD (Grinin and Korotayev 2015).

World order in the past, present and future

The decline of the American and Western leadership. Is the revival possible? By the 1990s, the USA, unlike the former world leaders, had concentrated a wide range of leadership aspects: from technological, financial and military to scientific and cultural. That was the first (and probably, the last) case in world history. But in 2001, being at the peak of their might, the USA was stricken by unexpected 9/11 events. That was a turning point after which many characteristics and patterns of domestic and foreign policy have become excessive. The USA abandons their own principles of freedom and start surveillance over their own citizens, as well as the leaders and population of other countries. It starts to ignore the international law and principle of sovereignty (Herland 2014).

Pretty soon, during the financial and economic crisis of 2006–2010, it became quite evident that the USA had been losing their leading positions. However, the talks about an inevitable decline of the American might began already in the 1970–1980s (see, *e.g.*, Vo-

gel 1979; Kennedy 1987). Since the 1990s, one observes an increasing number of political forecasts predicting an imminent decline of the American supremacy and simultaneous coming to the front of Asian economies (Attali 1991; Colson and Eckerd 1991; Arrighi 1994; Frank 1997; Buchanan 2002; Kupchan 2002; Todd 2003; Wallerstein 2003; Mandelbaum 2005; NIC 2008, 2012; see also: Grinin 2010; Grinin and Korotayev 2010a, 2010b, 2015). The increasing negative phenomena in America at the background of the Asian countries' success, made the idea of the American decline more feasible, causing either a feeling of triumph or a concern depending on one's preferences. Since 2008, there have appeared more publications arguing that America's power is decreasing, that it is no longer an absolute leader and that the unipolar world is being transformed, *etc.* (see, *e.g.*, Milne 2008; Zakaria 2008; Haass 2008). Many of such articles had rather striking headlines, for instance: 'America's Fall is a Dangerous Opportunity for its Enemies' (Tisdall 2008); 'America's Power Cracks and is Broken into Pieces' (Gray 2008); 'Sun Setting on the American Century' (Reid 2008); 'Is it the End of the American Era?' (Kennedy 2008). Such articles appeared and still appear on a rather regular basis (see, *e.g.*, Bremmer 2015; Klare 2015). Sooner or later the United States of America will no longer be able to lead the world in its common way, and it can result in a drastic change of the geopolitical landscape (for more details see Grinin 2009, 2011, 2012a, 2012b; Grinin and Korotayev 2010b, 2011, 2015).

In 2008, Farid Zakaria, a famous political expert and editor of the *Newsweek International*, called for the USA to become a global mediator and develop, in cooperation with other countries, new rules for the world order. He wrote that the USA had two alternatives. Either it can reinforce the existing world order via cooperation with new great powers. However, it should compromise on some of its power and privileges, and agree that future world will have variety of opinions and different points of view. Otherwise, America may just passively observe how 'the rise of the rest' will rip to shreds of the world order that have been built for the latest 60 years (Zakaria 2008). But he was wrong. The USA, having hardly recovered from the crisis, chose the third way – to undermine the power of its competitors and thus, preserve their position of the only superpower in the world. These 'efforts' have been increasing turbulence in the world in recent years (Heuvel 2015). All this means that we will face much more difficulties than we could on the way to a new world order (not American), which will be established sooner or later.

But still the question of whether the 'sunset' of the USA can probably turn into its new 'sunrise' remains open for discussions because many Americans will hardly put up with such a situation. That is why it is worth considering the arguments of those who believe that the USA can restore its power again.

First of all, the stabilization of the American economy after the crisis supports the ideas that the American age will last a long way down the road. Also, many people hope for a technological or other miracle which will revive the American power, or for the US ability to control the rivals (see also Milne 2008; Kennedy 2008; Bremmer 2015). Technology, as well as a breakthrough in innovations, has quite a strong influence on changing the power balance and formation of a new balance. We have already stated our hypotheses that a new powerful technological wave will start in the 2030–2040s (see Grinin 2007; Grinin A. and Grinin L. 2015). The model of the new world order will strongly depend on who will lead this new technological pattern, especially if these innovations are converted into the military supremacy. Today's developing world invests more and more into technology and has achieved much in some spheres – for example, India is the world leader in Earth's remote

sensing. Quite recently, it has become the first to put a satellite into orbit, which is created for stereo photography of the Earth surface at the height of 618 kilometers.

But it is quite clear that the USA holds the leading position as a claimant upon this technological lead, and thus it has an opportunity to preserve its world leadership. Moreover, today the USA has much more financial resources for this,⁵ not mentioning the remaining control over the global financial and information flows. There is, however, an important trend that should be marked out. During the last decades the American transnational corporations have shown more and more separation from the native state, where they feel cramped, thus involuntarily playing into the hands of developing countries. The USA's new economic partnerships (see below) can strengthen this trend, which is a great deal. The same way, the English technology and funds caused the rise of the USA, India, Canada, and Australia in the nineteenth century, while Britain itself ceased to be the world leader.

On the one hand, the world financial elite has become quite mobile, and the world becomes global and 'digitalized' to the extent that borders and territories will be of no account for big money and its owners. So it seems that one more reset of the world order will hardly destabilize the position of the World-System center. But on the other hand, if the companies are predominantly active outside the USA, then the American population can get poorer, and while the inequality in the country is growing, the internal social tension can increase.

On the one hand, the US population is getting older, and very soon white population among young people will be overgrown by the non-white. All this may aggravate social conflicts. On the other hand, the USA is still attractive for immigrants, which bring human capital of high quality to the country (scientists, analysts, and engineers). In short, the processes will be rather complicated, and as any future processes, they may reveal quite unexpected phenomena.

Problems of the decline of the American leadership with regard to the World System and the of the 'global disorder'

The burden of the only superpower turns out to be beyond America's strength (Klare 2015). It should be taken into account that the USA will face not only other nations' wishes but also regional and sometimes world-scale interests. One can hardly admit that the USA interests are the interests of the world; besides, it is inconceivable to carry this burden of a superpower for indeterminate amount of time, interfering into everything. It is no wonder that even claims for this are becoming overwhelming and the reaction to the lack of power – more and more nervous.

At the same time, some political analysts and economists' hopes for a prompt and availing failure of the USA are groundless: it probably will proceed gradually while objective circumstances, including the growth of peripheral countries, promote it. As the connoisseur of great powers, Paul Kennedy notes this departure will be long (Kennedy

⁵ In spite of the fact, that many developing countries headed by China quite confidently catch up with the USA in the number (but not in the quality) of scientific publications in Scopus and Web of Science, an overwhelming part of the market of patents and technology selling belongs to the developed countries, with the USA having a one-third of the sales volume of licenses on technology. 'The transfer of technology to foreign countries brings big revenues to the USA, exceeding in volume the cash inflow of all other countries-exporters of scientific and technological knowledge' (Zimenkov 2014).

2008; see also: NIC 2008; Zakaria 2008). Besides, we should note that the world is still interested in the US leadership (see, *e.g.*, Barber 2014).

Indeed, the weakening of the US leadership brings a bunch of problems with it. It is widely suggested that the USA place will be occupied by the EU, China or someone else (from India to Russia; more often they talk about China). But it is a big mistake, as it will not be just a simple change of the leader.⁶ When the USA loses its status of the leader, it will lead to the fundamental change of the whole structure of the world economic and political order, as the USA concentrates too many aspects of the leadership. It means that the USA's position in the World-System will remain the same since no other country is able to concentrate as many leader's functions simultaneously. And that is why (as well as considering many other reasons) when the USA loses the leadership position, it means a deep and rather difficult and critical transformation of the World-System itself, when even the nearest consequences are quite unclear (for more details see Grinin 2009, 2011, 2013; Grinin and Korotayev 2010b, 2014a, 2015). That is why it is necessary to analyze the whole range of consequences.

Thus, according to some analysts, the unipolar period is close to its end today. However, it has not yet been replaced by a new global order, since there are multiple opposing principles that operate in the world today and thus, it looks more like a disorder (Le Monde 2008). This disorder is supported by the activities of many, if not all global players, but in recent years a considerable disorder has been particularly caused by the US actions, which is not surprising. On the one hand, the USA declines without being substituted by any equivalent leader. Moreover, there is an ever-growing number of supporters of reducing the US presence in the world in the very United States (see Bremmer 2015; Heuvel 2015). On the other hand, the United States still has power which allows preserving its position in the world. However, the hegemon's clumsy actions evoke opposition in many countries worldwide. On the whole, the decline of the US leading positions together with the attempts of a number of states to change the global rules (*e.g.*, in relation to the dollar's status, *etc.*), as well as America's absolute unwillingness to concede any of its informal prerogatives, increase tensions in the world.

The Prolegomena to the Outlines of the New World Order

The need for a new order, problems of the transition period and the balance of power

Our assumptions about the principles of a new world order are based on the following findings. First, no hegemon has the same range of leadership benefits as the United States to replace it today (for more details, see Grinin 2011, 2012a, 2012b). Second, the weakening of the US leadership is inevitable and becomes more and more noticeable. However, the US will preserve a number of advantages for a long time (see *e.g.*, Bremmer 2015; Zakaria 2008). Third, the world is to some extent interested in the American soft leadership but without dictatorial ambitions to undermine the opponents' power. Fourth, the transition to

⁶ About the Chinese economic, environmental and population problems, which can prevent its further economic expansion see Grinin 2011, 2013; Grinin, Tsirel, and Korotayev 2014. We should note that despite the enormous progress, China still lags behind not only the USA, but also Russia (*e.g.*, the PRC space program has been largely 'copied' from the Soviet one) in the most advanced technological areas, as well as in the military sphere. China's falling into Growth Slowdowns and the Middle-Income Trap is also evident. And the way out could be delayed since their causes are fundamental and hard to overcome for any country of the geopolitical Onshore, including all of the BRICS countries.

a new world order requires a random search for forms, principles, and conditions to create precedents and the desired combinations. Therefore, it will be a long and difficult search. Fifth, the transition to the new world order will temporarily increase turbulence and strife, as well as the lack of stability and struggle between different patterns of the new order.

Thus, today there are ever clearly visible trends towards the fact that the new world order will be different, it will be the world without hegemon but with some centers of power and influence, among which the United States is likely to be the most important. But it can only claim the title of the 'first among equals', rather than the title of superpower and hegemon (NIC 2008). Accordingly, one can suggest the following two scenarios of the US withdrawal: 1) meaningful and the most profitable path of a new world order in the long-term with maximum possible preservation of its influence, but not a dictate; and 2) a bitter struggle of the United States to maintain the status quo, including various actions to undermine and weaken the opponents. This will inevitably create permanent tension and strife. Meanwhile, the United States seems to choose the second pattern (although a big delay of another economic crisis could make them resort to the first one). But even when following the second path the United States will be increasingly forced to seek new alliances and allies.⁷ Anyway, it is the struggle for the American hegemony and its position in relation to the large and fast-growing countries that keep the main intrigue of the contemporary global contradiction.

Why is the increasing 'disorder' more probable, if not inevitable, than a smooth transition? First of all, a move towards a new order requires common wisdom and compromise, but this is particularly so with the United States. But the political elite have always lacked wisdom. However, there are also deeper reasons. The revolutionary change in the global balance of economic power which we mentioned above (see Fig. 1) creates objective conditions for the revision of the existing world order. However, it does not entail an automatic change in military and political balances. Figuratively speaking, this requires pulling the political component of global change (political globalization) to the economic one (for definitions and paradigms of globalization, see Andreev, Ilyin, and Zinkina 2015a). Obviously, the latter is far ahead of the former. And further development would be difficult without such pulling. Yet, the narrowing of the gap between economic and political globalization is inevitable and we denote this process as a reconfiguration of the World System (see Grinin 2013; Grinin and Korotayev 2012).

The major vectors of this reconfiguration include weakening of the former core of the World System (the USA and the West), and simultaneous strengthening of the positions of a number of peripheral countries and generally increasing role of the developing countries. However, one should bear in mind that the 'catching up' (between the political and economic components of globalization) will also bring severe political and geopolitical crises in different regions. Elsewhere we have considered the crises and turmoils in the Middle

⁷ In October 2015, the signing of the Trans-Pacific Partnership (TPP) trade pact was announced. Also, the negotiations are going on with respect to the Transatlantic Trade and Investment Partnership (TTIP) and the Trade in Services Agreement (TiSA). Their implementation (although the recent signing of two agreements, as well as the ratification and operation of the former remain rather doubtful) will mean significant changes and aggravation of economic struggle. After all, all these economic alliances combined can represent two-thirds of the world GDP (at face value). Thus, the United States put at stake their domination in major economic associations. However, we agree with some observers (*e.g.*, Hedges 2015) that these agreements would be more profitable for the American TNCs than for the US economy in general. On the contrary, the latter may weaken due to the expanded import and further transfer of the US production abroad.

East after 2010, as well as the Ukrainian crisis as both 'reconfiguring' and geopolitical crises which require transformations in the world order. At the same time, grave and probably unexpected crises in other societies or regions seem rather possible. The abruptness may be akin to earthquakes. And if to continue the geological metaphor, one should note that just like the tectonic shifts occur under the most mobile Earth's crust and at the boundaries of tectonic plates, the reconfiguring crises occur in the least stable regions and societies which are situated at the junction of geopolitical 'plates.' Both the Middle East and the Ukraine are the regions of this kind.⁸

We also argue that stability or instability of the world order depends on the stable or mobile character of the balance of power. The current balance of power obviously undergoes some transformations. If the idea of the weakening United State is right, what would be the shift towards a new balance? We assume that one of probable scenarios is the creation of various alliances between countries to strengthen their positions and increase opportunities. As we have seen, this process has even involved the United States, who is usually reluctant in taking over different commitments. Thus, the search for a new balance of power has already started and it will be manifested in a more active creation of various alliances and coalitions of countries and their associations. We denote this process as an epoch of new coalitions (Grinin 2009, 2011, 2012a, 2013; Grinin and Korotayev 2010b; 2011, 2012, 2014a, 2015).

We can find similar ideas in some other analysts' works (e.g., Bremmer 2015). Thus, for example, Michael Klare suggests quite a pragmatic scenario. In his opinion, one should accept the obvious facts on the ground that the United States shares the planet with other major powers: none matches the power of the United States, and is weak enough to be intimidated by the threat of the US military intervention. Having taken a more realistic assessment of the US opportunities, Washington should focus on how to co-exist with such powers as Russia, Iran and China, and how to settle the differences with them without increasing tension (Klare 2015).

The Epoch of New Coalitions and the Outlines of the New World Order

Thus, the search for a new balance has brought us to the period which we call *the epoch of new coalitions*. The alliances can emerge accidentally and due to unexpected reasons which can be exemplified by the BRICS (Brazil, Russia, India, China, and South Africa). First introduced in 2001 by an American analyst Jim O'Neil as an appropriate acronym, BRICS during the last six years has become quite a real, dynamic, and multilinear alliance.

It is the most important strategic direction of the Russian foreign policy, and its hope for an alternative center of power. Within the BRICS framework trade with the partners tends to increase, and China plays especially important role in this regard. Unfortunately, there is an insufficient cooperation between the BRICS partners in cultural, scientific, educational and technological spheres; also the member-states' intellectual influence on the global processes is far from the American influence. To implement the idea of the rise of BRICS and related de-

⁸ The societies found to be at the intersection are situated in the South Caucasus and Central Asia, Western China (Tibet and Xiang Jiang), West Africa (at the intersection of Islamic and Tropical Africa), and in some regions of South America. These regions are quite unstable, with already manifested occasional or possible signs of a crisis (but this does not necessarily mean that it will take place).

veloping countries (recently introduced by a group of the Russian scholars; see Sadovnichiy, Yakovetz, and Akaev 2014), there should be developed an ideology which will attract 'intellectual masses.' This has been the case with the countries which had been leaders for long periods of time. But there are no attractive ideas about it yet. The communist ideology underpinning the rise of the USSR and still implemented in China is outdated. The noospheric and humanistic ideas developed by the Russian scientific school (and perceived with interest in China and India) still lacks romanticism that can drive the masses. Therefore, the development of such an ideology as well as setting the leadership objectives and movement to the projected goals remains an urgent task for the BRICS group. An effective solution of the problems can consist in a complex methodology which should include global and regional forecasting and defining the dynamics of interconnected world and regional development; understanding of globalization and accompanying transformation of the world order as objective processes that can be controlled. It also implies mathematical modelling to define an optimal world order based on sustainable development. Such an interdisciplinary approach is fully employed in the project in which the authors of the present article participate and which is aimed at revealing a reasonable alternative to the current world order also within the common global trend of the BRICS rise.

Thus, we see that the Earth has become rather tightly connected for cooperation even at a distance. Thus, there appear different geopolitical fantasies, some of which are likely to come true as it happened with BRICS. However, the flexibility of partnerships within the World-System framework will probably increase for some time, but some of the emerging alliances and coalitions can turn chimeric, ephemeral or fantastic.

The above-mentioned coming turbulence together with the formation of different alliances and combinations may last for some time. But along with probable increase of conflicts and political transformations in different regions there will increase the vector aimed at the formation of common frame for the states' interests. We hope that after a certain period of 'the game without rules' (during one or two decades) the global arena will nevertheless be considered as a common field of interests with acceptable and profitable rules of the game for everyone to follow. The completed catching up of the political component of globalization can create a trend when more and more states will start to develop their policy with the account of global interests.

Certainly, the above-mentioned ideas can seem utopian especially because of the self-centered approaches and double standards that have recently intensified. But probably this shows that the world is in the search for the foundations of a new world order. Probably, this will require passing through certain cataclysms (*e.g.*, new economic crisis) since just the critical events bring dramatic changes.

The search for the most stable, advantageous and appropriate supranational organizational forms can bring to life different and rapidly changing intermediate forms, while the players at the global and regional stages will search for more effective and convenient coalitions and agreements. But finally, some of the new alliances and coalitions will transform from temporary into permanent ones and become effective supranational forms. During this process some new norms of international law will be developed whose necessity has already been much spoken about for some decades.

Thus, the foundations of the future world order must undergo certain transformations. Besides, the countries that continue to roughly and selfishly defend their national interests

will lose in the final count. The largest states' policy aimed at their forceful global and regional dominance (including the most independent and selfish sovereign – the USA) will also undergo radical changes. The national selfishness will hardly disappear; however, any international action should be both relevant and ideologically justified. That is why there is a hope and perception that the concept of foreign policy will change and there will gradually increase the claims for common (regional, world, and group) well-being; yet, the formulations like ‘the best representative of the world interests’ can often conceal selfish goals. But anyway such transformation will lead to significant and mostly positive changes.

The new world order will call for: 1) a rather solid balance of power and interests; 2) new models of the supranational government and coordination of the global processes; and 3) new ideologies. To solve the first task one should recognize the principle of pluralism of political regimes when any regime (including the democratic one) has its advantages and drawbacks. The refusal from imposing democracy at all accounts can become a crucial constituent in creating a common frame of interests and rules. To solve the second task one should reject the idea of the universal democracy at all levels. The European Union's experience has shown that at the supranational scale the democratic procedures work rather improperly. Thus, one needs a comprehensive search for new patterns which would lack an ideological bias. Perhaps, here one could employ international expert organizations co-opted by different countries and coalitions as well as a certain quota system for them at the international level. As for a universal ideology, it seems it can emerge only on the basis of the search for new cooperation patterns.

Thus, although we anticipate rather turbulent times of an emerging balance between different countries and coalitions, the humanity will have rather good chances to use globalization to create the foundations of the new world order.

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Part II. GLOBAL DEMOGRAPHY

Population Ageing and Global Economic Growth

Jack A. Goldstone

The author develops a simple model to examine the impact of population ageing – including reduced productivity and declining labor forces – on global economic growth.

Keywords: *global economic growth, labor force, population ageing, demographic bonus, demographic onus.*

What will be the impact of population ageing on global economic output? How fast will Africa or other regions have to grow to make up for slowing growth in China? Which countries or regions will likely be the prime drivers of global economic growth in the future?

To answer these questions, we can develop a simple model of productivity gains and losses from population growth and population ageing, and apply it to projections of labor force growth (or decline) in various regions. The results provide a set of simulations that allow us to grasp the rough contours of likely global economic growth under various scenarios.

Productivity Gains: From Good to Gone

In theory, productivity gains are easy to come by, with several major routes all contributing significant increases in output per employed worker. First is urbanization; simply shifting workers from lower productivity rural work (mainly agriculture and home production or handicrafts) to urban work (services and machine-aided manufacture) provides major gains. Second is sectoral shifts; the transfer of workers from lower productivity labor-intensive manufacturing and unskilled services (food preparation, janitorial, retail, tourism) to capital intensive manufacturing and professional services provides additional boosts to productivity. The education of the labor force, in regard to both secondary and tertiary education, is a requirement for, and hence is associated with, this kind of sectoral change. Finally, the information/communications revolution, by networking workers and linking them to information, can also provide increases in their productivity; but to be sure our current measurements do not do a very good job of showing those gains in practice (Tripllett 1999).

Yet in recent years many scholars have argued that the easy gains from the first two factors are over, at least in the mature industrial economies (Cowen 2011; Gordon 2012). And indeed, the data on productivity in these economies shows a marked decline in the increase in GDP per person employed. As Fig. 1 shows, since the mid-1970s the growth in

Globalistics and Globalization Studies 2016 111–118

this measure of productivity has declined markedly and remained low for the last 30 years. The only exception is South Korea, which experienced strong productivity gains up through the mid-1990s; but since that period South Korea has joined the other advanced economies in regression to a mean annual productivity increase of 2 per cent.

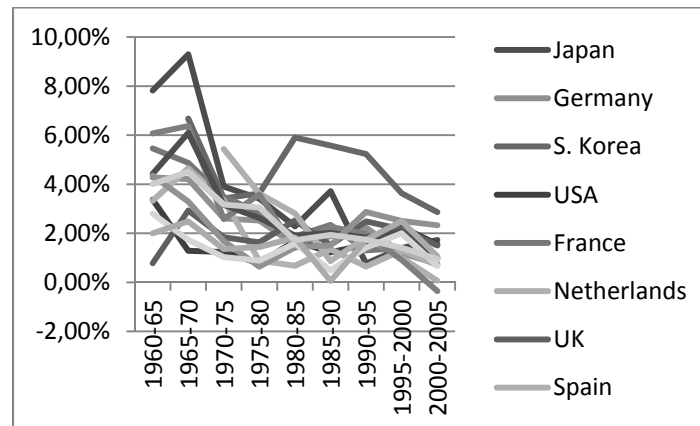


Fig. 1. Productivity decline in the advanced industrial economies, 1960–2005

Source: BLS 2009.

From Demographic Bonus to Demographic Onus

One reason for this widespread decline in productivity may lie in shifting demography. Ogawa, Kondo, and Matsukura (2005), writing about Japan in particular, described the process of population ageing as taking an economy from enjoying a demographic bonus to facing the burden of a demographic onus. The demographic bonus, or demographic dividend (Lee and Mason 2006), is a result of reaching a middling stage in the demographic transition. In that transition, the initial stage is a decline in mortality rates concentrated in the youngest years, while fertility rates remain moderately high. In this stage societies experience a sharp increase in population growth but also a rapid rise in the dependency ratio, as the number of young people aged 1–14 expands very fast relative to the number of working age people (those 15 and older). In this stage, societies have to invest a great deal in clothing, feeding, caring for, and educating the young.

In the middle phase of the transition, fertility rates decline as well. This causes a significant slowdown in the growth of younger age cohorts; but the past growth in the young population now shows up as a rapid expansion of the labor force. Since the younger population is no longer surging, but the past growth has not yet produced a large number of older (over 65) people, the ratio of workers in the prime working years to those who are dependent surges. Moreover, since fewer resources are needed for feeding, clothing, caring for, and educating the young, more capital is available to invest in raising the productivity of those of working age. In addition, the benefits of investing in the health and education of the very young cohorts in the first phase can now begin to pay off, as younger workers are healthier and better educated, and thus more productive, than the workers they replaced.

Of course, this bonus is not automatic. It will fail altogether if the larger labor force cannot find employment; and it will be reduced if the younger workers did not receive more

education and more capital per worker than the older workers that preceded them. Still, in most of today's mature industrial economies, the demographic bonus played a substantial role in boosting their economies and their productivity growth in the 1950s and 1960s; and it also played a similar role in boosting productivity in South Korea in the 1980s and 1990s and in China from the 1980s to the early 2000s (Bloom *et al.* 2003; Cai 2009).

In the third phase of the demographic transition, these positive trends go into reverse. With still diminishing mortality, though now concentrated in the later years of life, much of the enlarged workforce now moves into its senior years (population ageing) and the dependency ratio again increases. Moreover, a larger portion of the workforce will be in the later stages of their careers, from age 40–65. This is a period of general stagnant or declining productivity, compared to workers age 20–40, whose productivity generally rises rapidly with gains in experience and education (Lee and Mason 2011). If the fertility rate declines very sharply, the size of the labor force may experience an overall contraction as well. To some degree, these trends may be offset by rising education and capital investment of the smaller workforce, aided by the savings accumulated by late career workers as they save for retirement, providing a 'second demographic bonus' (*Idem* 2006). Yet as more and more workers enter their 60s, 70s, and 80s, and draw down their savings, more resources will be diverted to providing medical care and retirement support (savings and government pensions) for the elderly. Moreover, unlike the investments in school-age children and younger workers, which produce large payoffs 20 years hence when those workers enter the labor force and their prime productive years, the investments in maintaining the lives, health, mobility, and entertainment of the elderly are a dead-weight loss, buried with the elderly a decade or two hence when they pass. These negative trends create a demographic 'onus' that, other things equal, will eventually lower the rate of productivity growth in ageing societies.

Estimating the Effects of Ageing and Regional Differences in the Global Economy

We can create a rough estimate of how much ageing and population growth in different regions will contribute to global economic growth in the next 25 years (2015–2040) by looking at likely rates of productivity growth (in terms of gains in output per employed persons) in various regions, and multiplying that by the projected increase in the labor force (population aged 15–64) in those regions. Of course, the actual percentage employed will depend on labor force participation and rates of unemployment. But for simplicity we assume that labor force participation will not change dramatically in the next 15 years and that unemployment will be cyclical around an equilibrium rate, so that fluctuations will cancel out over a 15-year period. These two assumptions ensure that the employed population will be a constant proportion of the working age population (labor force), and so the growth rate in employed population over the period will be the same as the growth rate of the labor force.

However, while the employed population may grow in line with labor force, if a population is ageing then a larger proportion of those employed will be aged 40 or above, and hence will not contribute to increasing productivity. I have chosen to enter this effect in a very simple, but transparent and easy to calculate way, by reducing the rate of productivity growth as the median age of the population increases. If we assume (as is the likely equilibrium for advanced industrial societies) an age pyramid in which all cohorts are the same

size, then the number of workers aged 20–39 will be the same for each age. If a one-year increase in the median age pushes the last cohort to age 40, that will reduce the number of workers aged 20–39 by .05 per cent. So I approximate the impact of ageing on productivity growth by reducing the gains in productivity per employed worker (which are assumed to be provided entirely by gains to experience and education in those under 40) by .05 per cent for every year increase in the population median age from 2015 to 2040.

For example, for Europe – as for the other mature industrial economies – I assume that productivity per employed person will continue to grow at a basic rate, driven by capital investment and education growth, at the same level that has prevailed for the last 30 years, namely 2 per cent per annum. However, I reduce this by a quarter, as the median age in Europe is projected to grow by 4.9 years from 2015 to 2040 (UN Population Division 2012), and $4.9 \times .05 = .245$. In addition, the labor force in Europe is expected to shrink significantly, by .51 per cent per year, for a total reduction of 12 per cent in 2015–2040. Multiplying these figures produces an expected economic growth rate, taking account of productivity growth, labor force change, and population ageing, of 1.23 per cent per year for this period. Starting from Europe's GDP in 2014, and using this growth rate to project GDP in 2040, and repeating these calculations for every other region, allows us to calculate Europe's expected contribution to total global GDP increase over this quarter century.

I have divided the world into a variety of economic regions. Europe, the USA and Canada, Japan, and Oceania (Australia and New Zealand) are assumed to be mature industrial economies with base productivity growth rates of 2 per cent per year. Russia and the Former Soviet Union Countries, however, are seen as likely to grow more slowly, due to the constraints that centralized authority and strict information controls will put on their ability to transition to innovation and knowledge-based economies. I assume their base productivity growth rate will be 1 per cent per year. (If Russia continues to be afflicted by ultra-low oil prices and international sanctions, as it is currently, even that may be optimistic.)

Other regions are assumed to still have much higher growth rates, as they are still benefiting from the first or second demographic bonus. Thus, I assume that China will still enjoy annual gains in productivity per employed person of 6 per cent, due to continued shifts to employment requiring higher education, greater investments of capital per worker, and further urbanization. I assume India will have productivity gains almost as high, of 5.5 per cent (representing its most recent rate). Sub-Saharan Africa is also assumed to have a productivity growth rate of at least 5 per cent, as it enters the first demographic dividend (although that will depend on its currently stalled fertility starting to decline [Guengant and May 2013]).

For other regions that are not yet mature industrial economies, but no longer low-development countries, I assume an annual rate of productivity increase of 4 per cent (4.2 per cent for Indonesia as that is its most recent rate); these areas include Latin America and Asia outside of China, India, Indonesia and Japan. For the Middle East and North Africa, I assume a slightly lower rate of productivity growth, given the ravages of the Arab Revolutions of 2011 and the ongoing civil wars still plaguing the region.

Most of these areas will still enjoy a rapid growth of their labor forces in this period (UN Population Division). Using the UN's medium estimates, these rates range from a high of 2.75 per cent per year in sub-Saharan Africa to just 0.32 per cent per year in the US and Canada. However, every region on earth is now experiencing some measure of population ageing. Interestingly, the fastest rises in median age are not in the 'already old'

areas of Europe or Japan. The rate of ageing is highest in China and Latin America, followed by other areas of Asia. Ageing is lowest in areas of still relatively high population growth (sub-Saharan Africa) or areas of high immigration (US and Canada, and Oceania).

With these estimates, the overall rate of growth of the world's economy is 3.1 per cent; about the same as the world experienced from 1990 to 2012 (World Bank 2014). However, some people may find a sustained productivity growth rate for sub-Saharan Africa of 5 per cent excessively optimistic (Rodrik 2014). Given the increase in population and minimal ageing, SS Africa's economy is projected to grow at 7.7 per cent per year in this model, the highest of any region. While growth has been strong recently, this is still well above the level of growth in most African nations. And as there is no sign that Africa's fertility is declining (Guengant and May 2013), the projected demographic bonus may not arise. We can run the model again with assumed lower productivity growth rates for sub-Saharan Africa.

The results are interesting, even dropping Africa's annual productivity increase to 2 per cent only drops its growth rate to 4.63 per cent; this implies that much of Africa's recent 5 per cent per year growth rates are due to labor force gains rather than productivity improvements (World Bank 2014). What is more, the impact on global economic growth is minimal, dropping from 3.1 to 2.96 per cent. This is because Africa's contribution to global GDP is so small, changes in its growth rate have a minimal impact on total global growth rates. But that means Africa cannot play the role of the 'next China' anytime soon. Perhaps after 2040; but in the next 15 years if there is a major slowdown in China's output, there is no way that growth in Africa can compensate.

We can see that by running the model with changes in China's growth rate. In the base projection, China's productivity is set to grow at 6 per cent per year, but rapid ageing and a sharp decline in the labor force, second only to Japan, reduce the net expected growth rate to only 4.92 per cent per year. If China's productivity grows instead by 5 per cent a year, its new growth falls to 3.93 per cent per year. That has a modest impact on global economic growth, which declines only from 3.1 per cent to 2.94 per cent. But for growth in Africa to offset that decline and restore global growth rates to 3.1 per cent, African productivity per person would have to increase by 7 per cent per year, leading to sustained annual growth rates of 9.75 per cent. In other words, Africa can offset a growth decline in China, but only if it grows just as rapidly as China did during its boom years.

The same is true of India. If China's productivity growth averages only 5 per cent in this period, India's productivity would have to increase by 7.5 per cent per annum (a net growth rate of 8 per cent per year) to keep global economic growth at 3 per cent.

The biggest gains to the world economy would, naturally, come from boosting output in the biggest regional economies, namely those of Europe and North America. If Europe or the US/Canada increased their annual productivity gains to 3 per cent per year, the world economy would grow by about 3.3 per cent per year. If both could achieve such productivity gains, the world growth rate would be 3.5 per cent, despite demographic ageing and work force changes.

At the same time, this simulation shows how difficult it will be to achieve a 4 per cent rate of global economic growth, a rate commonly seen or exceeded prior to 1980. In order to boost global growth rates to 4 per cent per year in 2015–2040, given global demographic trends, here is what must happen: annual productivity gains per employed worker of 3 per cent in both Europe and North America; of 7 per cent per annum in China; of 8 per

cent per annum in India, of 5 per cent per annum in Latin American and other Asia, and 6 per cent per year in sub-Saharan Africa. Is this possible? Perhaps – with optimum education and investment in Africa and India, China's economy stabilizing at an overall growth rate of 6 per cent for the next 25 years, and Latin America boosting its growth rate to 'miracle' levels of sustained 5+ per cent growth. In addition, new technological marvels (3D-printing, driverless cars, commercial drones, *etc.*) would have to boost productivity gains in Europe and North America back to the 3 per cent per year levels not seen for several decades.

The Future will be Different

These projections seem highly optimistic. It is more likely that we are simply entering a wholly different world than we experienced prior to 1980. In the immediate post-WWII decades, several factors strongly promoted global growth. First, population growth was rapid in the largest and most productivity-advancing regions, namely Europe and the United States. Second, movements of population out of agriculture to the cities and into manufacturing were easy and widespread in Asia and Latin America (and in China after 1980, where urbanization and growth had previously been suppressed under Mao Zedong's strict communist regime). Third, the development of globalized production and trade stimulated markets around the world and created greater efficiencies in the distribution of capital and production. But these advances have now spread to most of the world, and their potential for further rapid growth is diminished. In addition, the world's largest economies – the USA and Europe – are now experiencing much reduced labor force growth or even decline, in addition to slower productivity increases. Global growth of 3 per cent per year may be the 'new normal' as far as the next quarter century is concerned.

Even Africa, despite its enormous potential for a demographic dividend and increased movement of population from rural work to urban manufacturing, will not be able to boost global economic growth back to 4 per cent on its numerous shoulders. At best, growth in Africa should just offset declining growth rates in China. If we use the model to ask – what growth rate in Africa would be necessary to raise the global growth rate to 4 per cent, if all other regions experience the baseline growth rate, the answer is that sub-Saharan Africa would have to enjoy 25 years of sustained growth of 15 per cent per year, based on productivity gains of 12 per cent per year. That is a rate never sustained even by China with its strong government, internal peace, excellent education, and access to rapidly expanding export markets in 1980–2010; and is extremely unlikely to be reached by a divided, poorly governed, and under-educated Africa. Those who saw 4 per cent global economic growth as 'normal' in the 1960s and 1970s are unlikely to see that return in their lifetimes.

Still, 3 per cent annual growth need not be unpleasant. With global population growth slowing sharply, projected to increase only from 7.32 to 9.04 billion in this period, for an annual increase of under a per cent per year that still leaves plenty of room for per capita income growth. The real question will be how that net growth is distributed. If most of the world's population enjoys a real annual income increase of 2 cent per annum, the future may look bright, with real incomes doubling each generation. But if, as in recent years, most of those gains go to a small fraction of the global population (Piketty 2014), progress for most people will be minimal. The problem is that there is not enough growth to go around; concentrating gains at the same time that global growth is slowing will likely create a new world politically, as well as economically, in the coming decades.

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Appendix

Table 1. A Simple Model of Contributions to Global Economic Growth, Adjusting for Labor Force Growth and Aging, 2015–2040

	Productivity Growth		Labor Force Growth 2015–2040		Labor Force Aging Factor	GDP Growth rate	GDP 2014	Total Growth 2015–2040	GDP 2040
	% per year for 25 years		Avg.	Total	(increase in median age*.05)	2015–2040			
Europe	2	1.640606	–0.51 %	0.88	–0.25 %	1.23 %	17891	1.357856	24293
US+ Canada	2	1.640606	0.32 %	1.083	–0.14 %	2.19 %	18022	1.717772	30958
Japan	2	1.640606	–1.01 %	0.776	–0.33 %	0.64 %	5733	1.172135	6720
Russia + FSU	1	1.282432	–0.32 %	0.923	–0.24 %	0.44 %	2298	1.116069	2565
China	6	4.291871	–0.52 %	0.877	–0.50 %	4.92 %	8062	3.324825	26805
India	5.5	3.813392	0.86 %	1.24	–0.36 %	6.03 %	2097	4.320919	9061
Indonesia	4.2	2.797003	0.66 %	1.18	–0.36 %	4.52 %	901	3.019693	2721
Other Asia	4	2.665836	0.70 %	1.19	–0.38 %	4.33 %	3973	2.887944	11474
Latin America	4	2.665836	0.56 %	1.15	–0.44 %	4.13 %	5970	2.749152	16412
MENA	3	2.093778	1.24 %	1.36	–0.32 %	3.95 %	3767	2.63157	9913
Oceania	2	1.640606	0.99 %	1.28	–0.16 %	2.85 %	1476	2.020097	2982
SS Africa	5	3.386355	2.75 %	1.97	–0.17 %	7.70 %	1552	6.393306	9922
WORLD						3.10 %	71742	2.144149	153826

Global Population Ageing, the Sixth Kondratieff Wave, and the Global Financial System*

Leonid Grinin and Andrey Korotayev

The present paper analyzes some aspects of the population ageing and its important consequences for particular societies and the whole world. Basing on this analysis, we can draw a conclusion that the future technological breakthrough is likely to take place in the 2030s (which we define as the final phase of the Cybernetic Revolution). In the 2020s – 2030s we will expect the upswing of the forthcoming sixth Kondratieff wave, which will introduce the sixth technological paradigm (system). All those revolutionary technological changes will be connected, first of all, with breakthroughs in medicine and related technologies. We also present our ideas about the financial instruments that can help to solve the problem of pension provision for an increasing elderly population in the developed countries. We think that a more purposeful use of pension funds' assets together with an allocation (with necessary guarantees) of the latter into education and upgrading skills of young people in developing countries, perhaps, can partially solve the indicated problem in the developed states.

Keywords: *the sixth Kondratieff wave, the sixth technological paradigm, Cybernetic Revolution, population ageing, world finance, pension funds, human capital, developed countries, developing countries.*

Human capital is one of the most important drivers of economic development whose contribution to the growth of production and innovations is constantly increasing. According to the OECD definition, *human capital* is ‘the knowledge, skills, competencies and attributes embodied in individuals that facilitate the creation of personal, social and economic well-being’ (OECD 2001: 18; see also Kapelyushnikov 2012: 6–7). Human capital is central to debates about welfare, education, health care, and retirement. However, we think that the latter (*i.e.*, retirement) is less frequently debated than it should be. Meanwhile, in the West the rapid population ageing actually devaluates the national human capital in every developed country. There are certain grounds to expect that if the ageing generation is not substituted by a more numerous generation of young specialists, the share of the elderly population will increase and the human capital is likely to decline.

Thus, while the human capital as well as its contribution to the economic development is significantly larger in the developed countries than in the developing ones, the situation with demographic structure of human capital is different. The developing countries' situation is significantly better at this point, and this can increasingly contribute to the econom-

* This research has been supported by the Russian Foundation for the Humanities (Project № 14-02-00330).

ic competition between the First and Third worlds. We should also take into consideration the fact that the generation of highly educated pensioners in the developed states has increased the demands on society and they play a more active political role than the generation of uneducated 'old men' in the developing countries. While the West has apparently depleted its demographic dividend, many developing countries, in fact, are only in the process of its accumulation. And consequently, in this context they can get the most important advantage in the coming decades (see Fig. 1).

This also confirms the idea of growing convergence between the developed and developing countries that we adhere to, as the current differences in the demographic structure and potentialities of the demographic dividend will contribute to the fact that at least in the next two decades the developing countries' growth rates will be on average higher than those of the developed countries, although this process can proceed with certain interruptions (see Grinin 2013a, 2013b, 2013c, 2014, 2015; Korotayev and Khaltourina 2009; Khaltourina and Korotayev 2010; Korotayev, Khaltourina, Malkov *et al.* 2010; Korotayev and Bozhevolnov 2010; Korotayev, Malkov *et al.* 2010; Malkov, Korotayev and Bozhevolnov 2010; Malkov *et al.* 2010; Korotayev, Zinkina *et al.* 2011a; 2011b, 2012; Korotayev and de Munck 2013, 2014; Zinkina *et al.* 2014; Korotayev and Zinkina 2014; Korotayev, Goldstone, and Zinkina 2015; Grinin and Korotayev 2014a, 2014b, 2015a).

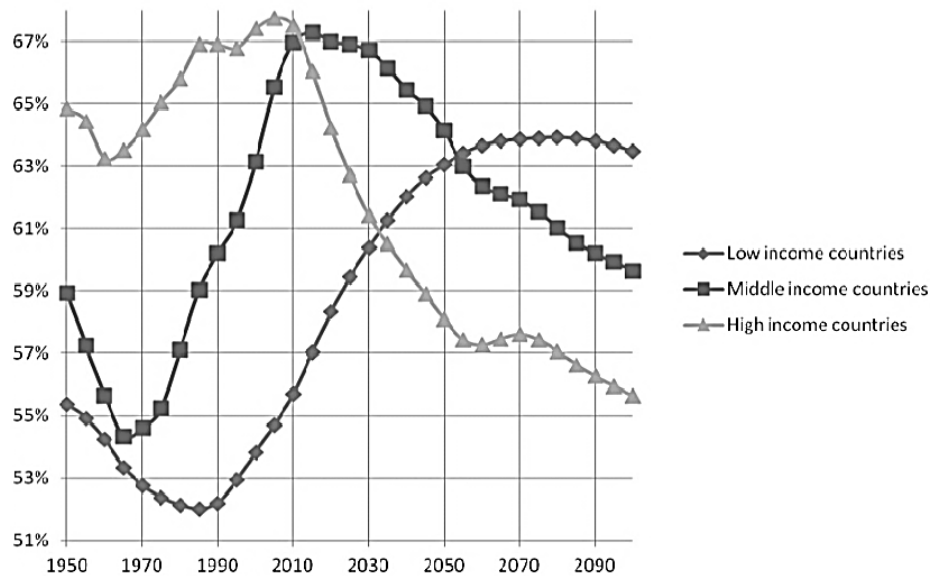


Fig. 1. The dynamics of the working age population percentage in the total population, 1950–2015, according to the UN medium forecast to 2100

Source: UN Population Division 2015.

Problems of Population Ageing and Their Possible Solutions

The population ageing (and an increasing number of disabled people) as well as the change in the population age structure (see Figs 2–5) alongside with forthcoming progress in medicine, innovation technologies, and increasing life expectancy in the developed countries will also bring great problems associated with a) the scarcity of labor resources; and b) problems of pension support for the older population.

In some countries they are rather acute already today, but they are to become much more pressing.

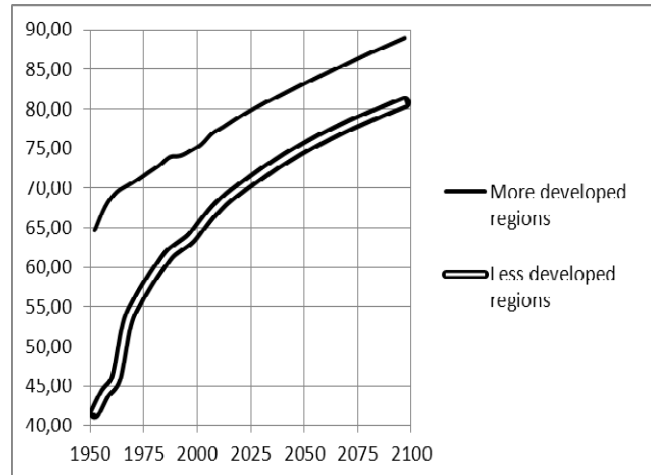


Fig. 2. Dynamics of the expected lifetime at birth (years) in the developed and developing countries, 1950–2015, the UN medium forecast to 2050

Source: UN Population Division 2015.

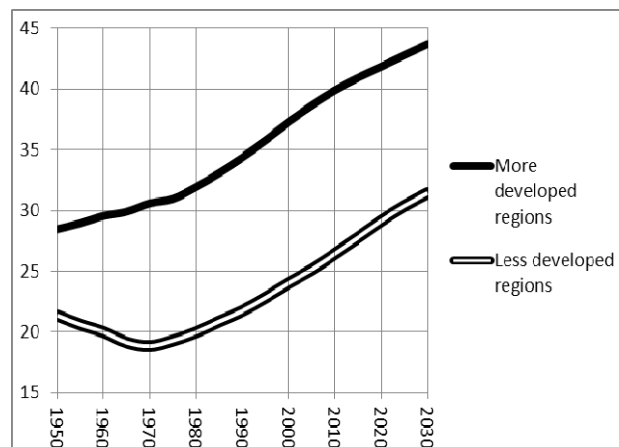


Fig. 3. Dynamics of the median age of population (years) in the developed and developing countries, 1950–2015, with the medium forecast of the UN till 2030

Source: UN Population Division 2015.

We would like to remind that if the median age of population of a given country equals, for example, 40 years, it means that half of the population of this country is younger than 40 years, and the other one is older.

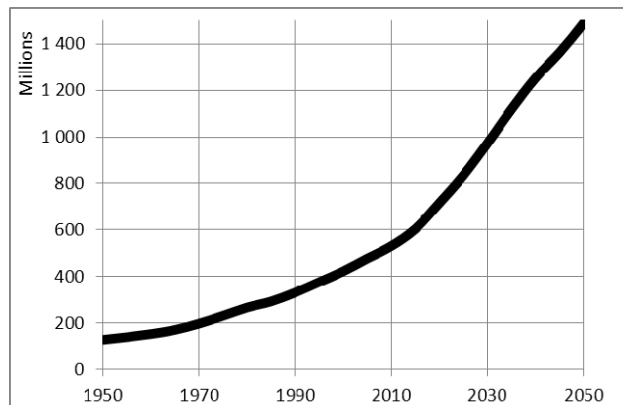


Fig. 4. Increasing number of persons of retirement age (over 65), 1950–2015, with the UN medium forecast till 2050

Source: UN Population Division 2015.

As is shown above, a rapid global increase in the number of retirement-age persons is expected just in the next 20 years when their number will actually double within a small historical period, thus it will increase almost by 600 million and the total number will considerably exceed a billion.

However, a rapid acceleration will be observed in particular as regards the population of people aged 80 years or more. While by 2050 the number of persons of retirement age will approximately double, the number of elderly people aged 80 years or more will practically quadruple, and in comparison with 1950 their number by 2075 will increase almost by 50 times (see Fig. 5).

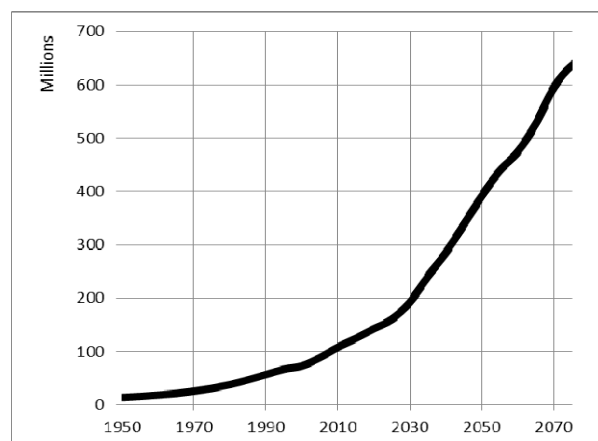


Fig. 5. Increase of global number of elderly people (aged 80 years), 1950–2015, with the UN average forecast till 2075

Source: UN Population Division 2015.

The First World countries will face particular difficulties in the next 20–30 years due to a rapid increase in the number of retirement-age people accompanied with an accelerated reduction of the active working age population, and in 20 years the number of the former will exceed the number of the latter (see Fig. 6).

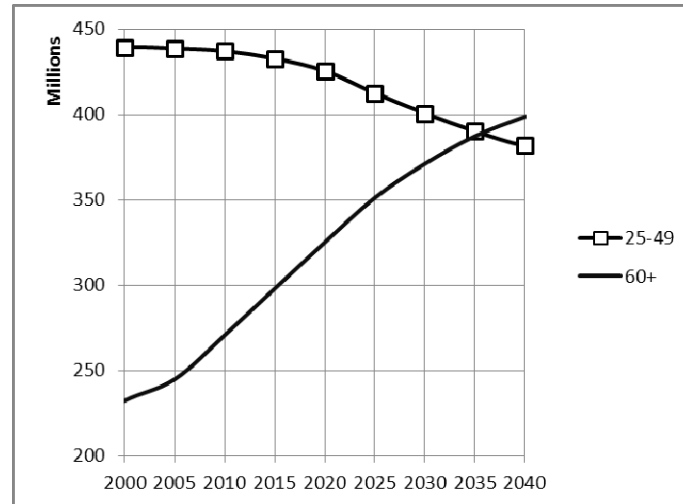


Fig. 6. Dynamics of active working-age (25–49 years) population and number of persons of retirement age (aged over 60) in the more developed countries of the world,¹ in millions, 2000–2015, with the medium forecast of the UN for the period till 2040

Source: UN Population Division 2015.

As one can notice, the number of older people per a working age adult will increase. This is very likely to lead to the decline in living standards and to the increasing tension between generations.

One should keep in mind that the older population will form a major part of voters, thus making the politicians to follow their will. Besides, the highly educated generation of pensioners in the advanced countries has certain demanding social requirements and they are more politically active than the generation of uneducated old people in the developing states. The transition to such a sort of gerontocracy also poses many other threats to a society and to its homogeneity because older people are more apt to conservatism and are less inclined to purchase expensive products, novelties and property, as well as to saving and this may reduce the focus on innovation and lead to considerable change of the contemporary economic model based on the expansion of consumerism. In particular, the population ageing in Japan is one of the reasons of the current deflationary trend (for more details see Grinin and Korotayev 2014c, 2015b).

In theoretical terms, it is possible to distinguish the following possible solutions for the specified problems (here we suppose that all those solutions will be applied, whereas none of them can solve the problem comprehensively):

1. To increase the number of immigrants in the developed countries. Still the opportunities of this pattern are to a large extent depleted and besides, it leads to the erosion of the society's major ethno-cultural basis (today we face serious challenges in this direction).

¹ More developed countries/regions according to the UN classification.

2. To raise the retirement age (together with active rehabilitation of the disabled people). Against the background of the forthcoming revolution in medical and rehabilitating technologies this looks like an important (although insufficient) resource.

3. The development of labor-saving technologies, in particular robot techniques for nursing, as well as elder and disabled people care (for more details see Grinin L. E. and Grinin A. L. 2015a, 2015b; Grinin A. L. and Grinin L. E. 2015b). This will allow a partial reduction of expenses for care and different services, but it can hardly bring a complete solution of the problem of scarce resources.

4. Finally, the development of the financial system opens another path to the solution of problems with the pension system. The population ageing is directly related to the financial system not only within national systems, but within the global financial system as well. Due to the increasing number of retirees the pension savings have become not simply important, but essential to a certain extent. Besides, we should note that, on the one hand, today pension and other social funds are not isolated only within a framework of national system, but make an important component of the world finance in the long run. On the other hand, stable pension system substantially depends on the stable and efficient global financial system, even to a greater extent than on the national one.

In the present article we will consider the second and the third directions in the solution of the problem of global population ageing which are closely interconnected, and then we will pass to consideration of the fourth (financial) one.

Global Population Ageing and the Sixth Technological Paradigm

The Cybernetic Revolution is a great breakthrough from industrial production to production and services based on the operation of self-regulating systems. Its **initial** phase dates back to the 1950–1990s. The breakthroughs occurred in the spheres of automation, energy production, synthetic materials, space technologies, exploration of space and sea, agriculture, and especially in the development of electronic control facilities, communication and information. We assume that the **final** phase will begin in the nearest decades, that is in the 2030s or a bit later, and will last until the 2070s.

We denote the initial phase of the Cybernetic Revolution as a **scientific-information** one, and the final – as a **phase of self-regulating systems**. So now we are in its modernization phase which will probably last until the 2030s. This intermediate phase is a period of rapid diffusion and improvement of the innovations made at the previous phase (*e.g.*, computers, internet, cell phones, *etc.*). The technological and social conditions are also prepared for the future breakthrough. *We suppose that the final phase of the Cybernetic Revolution will lead to the emergence of many various self-regulating systems* (for more detail see Grinin 2006, 2009, 2012, 2013d; Grinin A. L. and Grinin L. E. 2013, 2015a, 2015c; Grinin L. E. and Grinin A. L. 2015a, 2015c).

So we expect the beginning of the final phase of the Cybernetic Revolution in the 2030s and 2040s. We assume that this technological breakthrough at first will be connected with a breakthrough in the field of new medical (and related to them) technologies. Thus, the increasing process of population ageing (as we will show further) will become one of the most important reasons of development of the final phase of Cybernetic Revolution.

This phase, according to our forecasts, will be imposed on the sixth Kondratieff wave (which will probably last from the 2020s to the 2060s). Therefore, the sixth technological

paradigm (known also as technological system or style)² will be connected with major transformations of the Cybernetic Revolution. We consider the widespread ideas that the basis of the sixth technological paradigm will be formed by the NBIC technologies (or NBIC-convergence), which are nano-bio-information and cognitive technologies (see Lynch 2004; Dator 2006; Pride and Korotayev 2008; Akaev 2010, 2011; see also Fukuyama 2002)³ to be only partially true. We believe that the basis of the sixth technological paradigm will be significantly wider. In general *medicine, bio- and nanotechnologies, robotics, information and cognitive technologies* will become the leading technological trends. *They will create a complex system of self-regulated production.* We could define this complex as MBNRIC-technologies, by the first letters of the listed technological directions. Thus, it makes sense to speak about medicine as the central element of the new technological system (see also Nefiodow 1996; Nefiodow L. and Nefiodow S. 2014). Medicine more than any other field has unique opportunities for merging all these new technologies into a single system. Besides, a number of demographic and economic reasons explain why this is precisely medicine that should start the transition to the new technological paradigm.

This will be supported by particularly advantageous situation developing by 2030 in economy, demography, culture, a standard of living, *etc.* that will define a huge need for scientific and technological breakthrough. By *advantageous* situation, we do not mean that everything will be perfectly good in economy; just on the contrary, everything will be not as good as it could be. Advantageous conditions will be created because reserves and resources for continuation of previous trends will be exhausted, and at the same time the requirements of currently developed and developing societies will increase. Consequently, one will search for new developmental patterns.

Let us describe the background.

- By this time the problem of population ageing will show up to the full (for more detail see the previous section). Moreover, this issue can turn simply fatal for democracies in developed countries (because the main electorate will be represented by elderly cohorts, and also the generation gap will increase [see also Fukuyama 2002]). In addition, the problem of population ageing will become more acute in a number of developing countries, for example, in China and even in India to a certain extent (about ageing in Asia see contributions of Park and Shin to this volume).

- The pension payments will become an urgent problem (as the number of retirees per an employee will increase) and at the same time the scarcity of labor resources will increase, which is already felt rather strongly in a number of countries including Russia (for more details see Grinin and Korotayev 2015c, 2010; Korotayev and Bozhevolnov 2012; Korotayev, Khaltourina, and Bozhevolnov 2011; Arkhangelsky *et al.* 2014; Korotayev *et al.* 2015). Thus, *the problem of scarce labor and pension contributions will have to be solved in such a way that people physically could work for ten, fifteen and even more years (certainly here we can also face a number of social problems).* This also implies the disabled people's adaptation for their fuller involvement into labor process due to new technical means and achievements in medicine (for more details see Grinin L. E. and Grinin A. L. 2015b).⁴

² Within this approach every Kondratieff wave is associated with a certain leading sector (or leading sectors), technological system or technological style (see Korotayev and Grinin 2012; Perez 2002, 2010). For example, the third Kondratieff wave is sometimes characterized as 'the age of steel, electricity, and heavy engineering. The fourth wave takes in the age of oil, the automobile and mass production. Finally, the current fifth wave is described as the age of information and telecommunications' (Papenhausen 2008: 789).

³ There are also researchers (Jotterand 2008) who consider GRAIN (Genomics, Robotics, Artificial Intelligence, Nanotechnology) to be the leading set of the technological directions in the future.

⁴ About the influence of ageing on growth rates see the papers of Goldstone and Park and Shin in this volume.

- Simultaneously, by this time, the birth rate in many developing countries will significantly drop (for example, such developing countries as China, Iran, or Thailand already experience below-replacement fertility). Therefore, the respective governments will begin (and some of them have already started) worrying generally not about the problem of restriction of population growth, but about promotion of population growth and population health.

- A huge volume of medical services in the world makes about 10 per cent of the GDP (and in a number of developed countries it makes more than 10 per cent, as, for example, in the USA – 17 per cent [calculated on the basis of World Bank 2015 data]). The population ageing will make these volumes grow rather significantly.⁵

- The development in the Third World countries leads to the growth of a vast stratum of middle class, while poverty and illiteracy are reduced. As a result, the emphasis of these countries' efforts will shift from the elimination of unbearable living conditions to improvement of the quality of life, health care, *etc.* Thus, large opportunities open up for the development of medicine which will get additional funds.

So by the 2030s, the number of middle-aged and elderly people will increase; economy will desperately need additional labor resources while the state will be interested in increasing the working ability of elderly people, whereas the population of wealthy and educated people will grow in a rather significant way. In other words, the unique conditions for the stimulation of business, science and the state to make a breakthrough in the field of medicine will emerge, and *just these unique conditions are necessary to start the innovative phase of revolution!*

It is extremely important to note that enormous financial resources will be accumulated for the technological breakthrough, such as: the pension money whose volume will increase at high rates; spending of governments on medical and social needs; growing expenses of the ageing population on supporting health, and also on health of growing world middle-class. All this can provide initial large investments, high investment appeal of respective venture projects and long-term high demand for innovative products, that is, a full set of favorable conditions for a powerful technological breakthrough will become available.

In the context of population ageing problem we will consider some characteristics of the global financial system.

The Crisis and the Characteristics of the Financial System

The 2008 crisis and subsequent years aggravated both financial and economic, as well as some global social problems. One of the most important problems among them is the problem of secure social guarantees for rapid ageing population of the World System core. In each country the security of these guarantees is connected with stability of the world financial system.

Let us recollect some important reasons of the global financial economic crisis:

- Random and extremely rapid development of new financial centers and financial flows;
- Non-transparency of many financial instruments, which led to the actual concealment of risks and their global underestimation;
- An excessive level of public debt in many developed and developing countries combined with ineffective use of credits.

They often also say that modern financial technologies are fundamentally deleterious and only bring the world economy into various troubles and that they are only beneficial to

⁵ Some studies find that health care costs of patients aged 75–84 years are almost twice as large as the costs of 65–74 years old patients; and the expenses on patients of the 85+ age group increase by more than three times in comparison with the latter (Alemayehu and Warner 2004; Fuchs 1998). The cost of home care and short-term stay in the hospital also to a large degree depends on the patients' age (Liang *et al.* 1996).

the financiers and speculators. Thus, it would hardly be an exaggeration to maintain that the global crisis, as well as other events, has demonstrated, in an especially salient way, the necessity for major changes in the regulation of international economic activities and movements of world financial flows.

Nevertheless, we believe that it is reasonable to speak not only about the negative role of the world financial flows. On the whole, new financial technologies decrease the risks in a rather effective way and expand opportunities to attract and accumulate enormous capitals, involve actors, and penetrate markets.

The positive effects of the new financial technologies consist in the following:

1. A powerful expansion of the range of financial instruments and products, which leads to the expanding opportunities to choose the most convenient financial instrument.

2. The standardization of financial instruments and products provides a considerable time-saving for those who use financial instruments; it makes it possible to purchase financial securities without a detailed analysis of particular stocks; this leads to an increase in the number of participants by an order of magnitude.

3. The institutionalization of the ways to minimize individual risks. Some financial innovations and new regulations help to minimize both the individual risks of unfulfilled deals and also of bankruptcies in the framework of certain stock markets.

4. The increase in the number of participants and centers for the trade of financial instruments. Modern financial instruments have made it possible to include a great number of people via various special programs, mediators, and structures.

We also suppose that new financial technologies and modern financial sector have also got such important positive functions as the ‘insurance’ of social guaranties at the global scale. The matter is that the rejection of the gold standard resulted in the movement of the function of the protection of savings from an ‘independent’ guarantor (*i.e.*, precious metals) to the state. However, there was no state left for the capital owners to entirely rely on as on a perfectly secure guarantor.

The absence of secure guarantees *is especially important in terms of the ways to preserve pension and other social funds.*

The sharp increase in the quantity of capitals, the necessity to preserve them from inflation and to find their profitable application objectively pushed the financial market actors to look for new forms of financial activities. Generally, the faster are the movements and transformations of financial objects, the better is the preservation of capitals.

Another important point is the distribution of risks at the global scale. We observe growing opportunities to distribute risks among a larger number of participants and countries, to transform a relatively small number of initial financial objects into a very large number of financial products. This makes it possible to achieve the maximum diversification by allowing people to choose convenient forms of financial products and to change them whenever necessary.

The next point is the growth of financial specialization (including various forms of deposit insurance) that supports diversification and the possibilities for expansion.

In 2010, there was one pensioner per four working-age adults, whereas in 2025, according to the forecasts of the UN Population Division there will be less than three working-age adults per a pensioner in the developed countries, and there exist even more pessimistic forecasts (see Fig. 7). Who will fill the pension funds in the future? Who will fulfill the social obligations with respect to hundreds of millions of elderly voters?

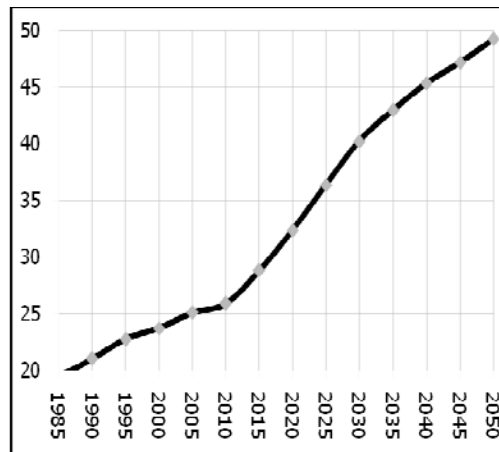


Fig. 7. Dynamics of number of pensioners aged 65 and older, per 100 working age adults aged 25–64 years in developed countries, 1985–2050 with medium forecast of UN for the period till 2050

Source: UN Population Division 2015.

Here one should take into account that most pension funds are concentrated not in the state pension funds, but in thousands of private (non-state) pension funds (OECD 2014b) that rather actively search for the most secure and profitable investments. The amounts of money concentrated in pension and other funds are enormous: dozens trillion US dollars (see, e.g., Shtefan 2008; OECD 2014a; 2014b, 2015; see also Fig. 8).

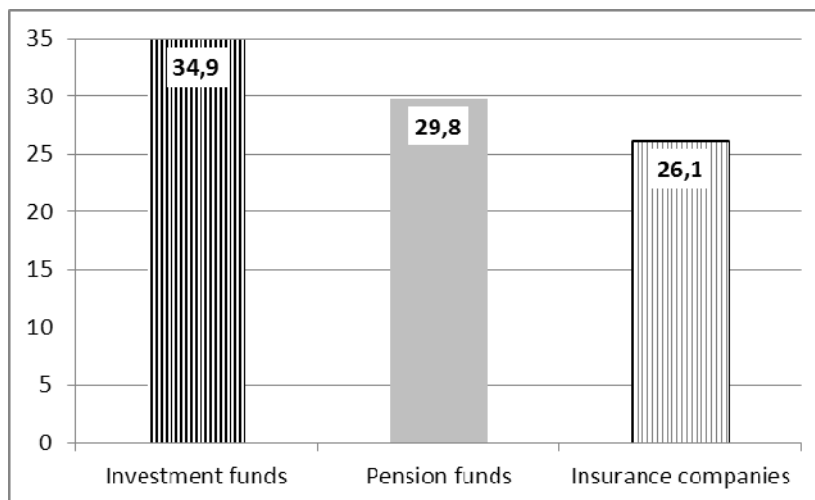


Fig. 8. Amounts of capital accumulated in the countries of OECD by 2013 by the main types of institutional investors (in trillions US Dollars)

Source: OECD 2014b: 7.

In 2012, the accumulations in pension funds of the OECD countries amounted 77.1 per cent of their GDP, but in 2013 this indicator grew to 84.2 per cent (OECD 2014b: 7).

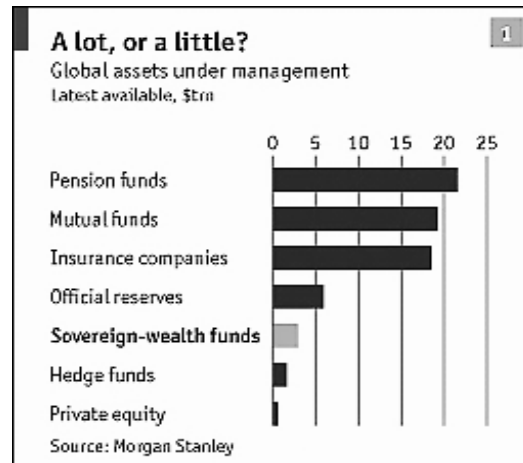


Fig. 9. Assets under management of various types of funds
Source: The Economist 2008.

Meanwhile, in the developing countries we observe a huge number of young adults; and it is extremely difficult to provide all of them with jobs and education (see Fig. 10).

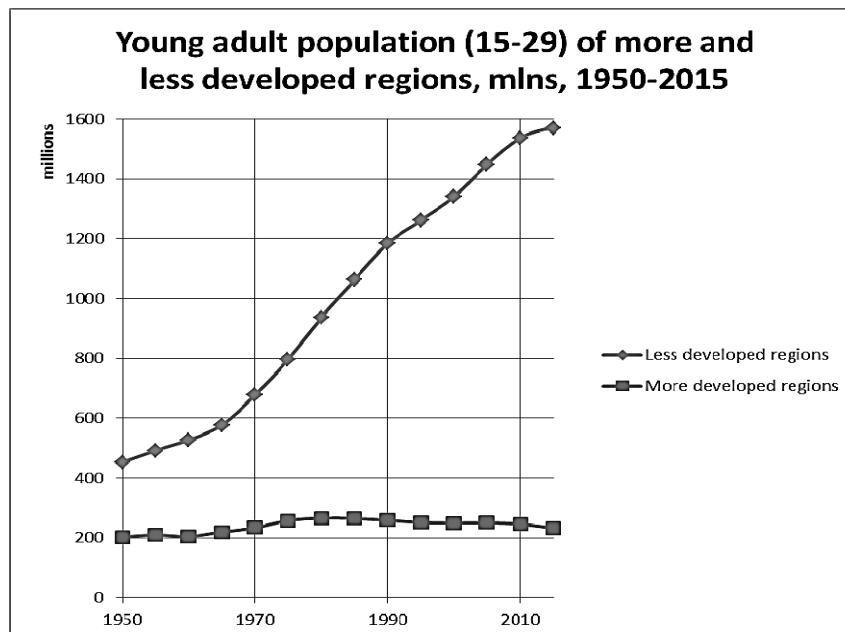


Fig. 10. Young population (aged 15–24 years old) of more and less developed regions, mlns, 1950–2015

Source: UN Population Division 2015.

It is difficult or even impossible to solve this task without active integration of the peripheral economies into the World System economy as well as without diffusion of capitals and technologies from the World System core; in its turn, such integration cannot be

achieved without the development of the world financial system. The situation favors this in some respects because the number of pensioners in the developing countries is still relatively small, the social obligations with respect to them are relatively few, and only after a significant period of time the problem of the pensioners' support will become acute in those countries.

Consequently, the point is to involve pension and other social funds in boosting the developing countries' economies more actively.⁶ It will assist the latter to provide jobs and education for the young people at present and will multiply the funds in the future. In this case under certain agreements between developed and developing countries it will be possible to achieve a situation when the rising economies will allocate some assets to support the growing layer of older people in the West, the latter will act as a rentier in this case (recently Joseph Stiglitz has expressed similar ideas [Stiglitz 2015]).

Then, there will be no need in the direct migration of millions of young people from the Third World to the First one; thus, there could emerge a sort of solidarity between different generations of the global world. Of course, such a system will demand considerable measures with respect to security and reliability of such investments. But at the same time, it would provide a certain convergence of different countries' interests.

Thus, we may say that:

- The participation of pension and insurance funds in financial operations leads to the globalization of the social sphere.
- The countries poor in capital, but with large cohorts of young population, are involved more and more in a very important (though not quite apparent) process of supporting the elderly population in the West through the unification of the world financial system, its standardization, and the search for the ways to make it more fair and socially oriented.
- Modern financial assets and flows became global and international; a considerable amount of money circulates within this system (though, of course, not all its participants make equal profits).
- At the same time, one should realize that a considerable part of the circulating sums is the money from social funds (in particular from the pension ones) and their loss can lead to disasters with such consequences that are very difficult to predict.
- Safe management of the global capital (in addition to its obvious economic and social merits) assures the safe future for the elderly and those who need social protection.
- Therefore, the problem of institutional support of financial globalization becomes more and more important.

Let us indicate some key points which clarify the opportunities and difficulties of the suggested scheme; besides, let us outline some of the most important institutional decisions which could help this scheme to function in practice.

First. The pension monies play a certain role in the financial system and depend on well-being and normal functioning of the latter. Money from pension funds is still one of the major systemic components of national and world financial systems. Actually, this means that these are just pension funds that remain one of the leading traders buying government bonds, and also actively buying shares and other securities at stock markets.

⁶ It is worth noting that they already participate in this process. Thus, in the large private retirement funds surveyed in 2014 by OECD staff, an average of 36.6 per cent of all capital were invested abroad (OECD 2014a: 15), whereas more than a half of the surveyed large pension funds invested a part of their capitals in developing economies (OECD 2014a: 13, 31, 43).

While the conservative investment policy of pension funds is quite reasonable in general, at the same time it makes them as well as many other subsystems of the financial system highly dependent on the manipulations of the Central Bank, rating agencies and other actors. Particularly, the income of pension funds has considerably decreased in recent years due to deflationary tendencies and low rates on the government debt securities (as the government pays low interests rates to pension funds on the most reliable debt bonds).

Second. Mounting crisis phenomena in financial system are able to radically undermine the well-being of pension funds. The latter have actively invested in securities; therefore, the cost of their assets largely depends on the price of securities. On the one hand, the governmental authorities and exchange players wish to manipulate this cost and its artificial high price (*e.g.*, the so-called buyback transaction of the securities by firms), and on the other hand, in case of crisis the assets' slump can be quite serious. For example, while in 2007 the asset value of US pension funds amounted to 78.0 per cent of the American GDP, during the crisis in 2008 it dropped to 59.6 per cent of GDP. The situation returned to pre-crisis level only in 2013 (OECD 2015: Funded Pensions Indicators: Occupational pension funds' assets as a per cent of GDP); in other words, pension contributions have become entirely dependent on the economic situation. Therefore, we need some mechanisms of preserving accumulations, including the opportunity to lean on the world financial system.

Third. As we have said earlier, today the secure preservation of the value of accumulated funds depends on the speed of their circulation. However, finances do not exist by themselves, they can hardly break from the production base for a long time and has to rely on real production (the increasing separation of the financial system from production is one of the main problems of the current situation which is largely supported by the monetary doctrine). Thus, we face the necessity of driving the finances (and pension money) beyond national borders. Especially at present, since the production is rather actively moved to the developing countries. Therefore, no wonder that many pension funds invest into emerging markets to increase their income (OECD 2014a: 15). Only few funds do not invest in foreign assets, while some, on the contrary, invest a large amount of their capital abroad (*Ibid.*). Certainly, the foreign investments do not always imply investments into developing countries. Nevertheless, some investments are made, and thus, the proposed scheme already functions in a certain way. But we can face several serious problems. First, this is most often 'short', in fact, speculative money, whereas generally these are long-term investments that can serve a real source of economic development and income. Second, this money is almost the first to leave the emerging markets because of their volatility (not least connected with the policy of FRS and ECB) and fully justified conservatism of pension funds; and this also increases the volatility. Third, the emerging markets certainly offer less guarantees than the developed ones, and therefore, the cautiousness of the funds is fully justified.

Fourth. For an effective functioning of the proposed scheme some high-level agreements are necessary. Here various forms could be used, for example, investment of money of pension funds in the assets of such largest international financial institutions, as the IMF, WB, ADB, *etc.* These investments would be non-voting, but the money would be much securer there, and special obligations could guarantee that these funds would be allocated to increase the level of education and qualification of young people in the developing countries.

It would be quite reasonable to develop some global organizations for the sake of cooperation between pension and other funds, as well as establishing common insurance

funds that will make it possible to support countries in case of a crisis. One could establish an International Pension Fund or something of the kind which would realize financial transfers so that the assets of the 'older' population of some countries could help to raise the economy in the countries with 'young' population and to accumulate funds for donor countries for the future. Some specific arrangements between countries with certain guarantees for safety of funds would seem rather appropriate. In brief, there could be many options. But the main problem is that despite the fast population ageing, the versions of global solution for the problem are poorly considered.

The Russian philosopher, Alexander Zinoviev, deported to Germany in the 1970s, quite accurately described the Western society as a society of monetary totalitarianism (Zinoviev 2003) where the mechanism, realizing and preserving it, had reached enormous scales and had become one of the most important pillars of the society. This mechanism had formed in the period of the gold standard and after its cancellation the scale of financial economy had grown tremendously, having spread all over the world. In fact, a new huge sector of financial services has emerged which in some countries amounts to 25–30 per cent of their GDP. But the importance of this sector will increase in almost all countries, and will also involve their most important social functions.

Hence, the issue of the institutional support of the financial globalization becomes more and more important. We can speak about an extraordinary importance of the reliability and controllability of this system. Its changes should include the increasing coordination between governments and unified international legislation which regulates financial activities and movements. Besides, one should take into account that today the developed countries generally get more benefits from this system and constantly use it to solve their national issues (thus, affecting the whole world) and also they willingly use it as a means to impact other countries' economies.

We suppose that important guarantees for the future Western pensioners will consist in the development pattern of the global economy which should transform into a single organism. Thus, the global financial system would become strong but will be used neither to get the developing countries under control nor as a means to collapse the Third World countries' economies, nor as a means of unwarranted sanctions and suppression of societies and regimes which the West considers uneasy. There should occur some transformations in the global financial system that would take into account the growing economies' interests and thus allow the developing countries to more actively use the social funds accumulated by the West. And at the same time, this will prevent certain governments from expropriating the invested funds.

Actually, the world needs a new system of financial-economic regulation at the global scale.

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Mathematical Modeling and Forecasting of the Demographic Future of Russia: Seven Scenarios*

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Russia is currently experiencing a financial crisis, due to international sanctions coupled with a decline in oil prices. The length and consequences of this period of turmoil are unpredictable, but it will surely have a visible negative impact on crucial socio-demographic indicators. Recent demographic improvements have become one of the most important indicators of the overall success of domestic policy for Vladimir Putin. In the next few years, however, Russia risks facing a repetition of the 1990s' demographic problems once again – with a new wave of mortality increases and a new wave of fertility decline. Pressing economic issues are currently receiving much more attention from the Government; yet an effective anti-crisis strategy also requires paying attention to the seemingly 'long-term' demographic problems. Several threats to recent demographic gains have appeared with the crisis. As inflation is rising, more of Russia's population is falling into poverty – and risks of impoverishment have traditionally been the highest for families with many children. As the resources available for families shrink, the recent upturn in fertility rates for second and third children may be reversed. When combined with the rapidly declining numbers of women in active reproductive ages (20–29 years) Russia is almost certain to experience a precipitous decline in fertility. In addition, a dramatic increase in the availability of alcohol is looming, reminiscent of the late 1990s. In 1998 Russia experienced a very serious financial crisis accompanied by a jump in inflation (by 84 %) – however, the excise duty on spirits was increased only much more modestly, by 20 %. As a result, during a single year the relative value of excise duty fell by one-third, leading to dramatic cheapening of vodka and other spirits. Throughout the early 2000s this fall stayed uncompensated for, and the increases in vodka excise taxes frequently lagged behind the inflation rate. This caused an enormous increase in mortality in 1998–2005, when Russia 'additionally' lost about two million lives. Today the recurrence of a mortality jump due to various initiatives on liberalizing the alcohol market is, unfortunately, a highly probable scenario. The Government has cancelled an earlier-planned increase in the spirits excise tax, which – given the high and rising rate of inflation – actually means their remarkable decline. The minimum price of vodka has been significantly reduced since February 1, 2015. Beer is supposed to return to side-

* This research has been supported by the Russian Foundation for the Humanities (Project No 14-11-00634).

walk kiosks, the bans on alcohol advertising in mass media and on alcohol sales overnight are to be virtually lifted, etc. As a result, Russia may face a new round of population decline after all the recent claims of demographic victories. Even more sadly, this decline will probably be written off as the consequences of the economic difficulties, while in reality a new wave of depopulation could be averted – or, at least, substantially mitigated – by carefully designed and well-targeted social policy interventions (many of which are purely legislative and would not put any additional strain upon the budget). A new series of calculations performed by a team of researchers from the Russian Presidential Academy of National Economy and Public Administration (RANEPA), the National Research University Higher School of Economics, the Russian Academy of Sciences, and the Moscow State University demonstrates that 'alcohol liberalization' coupled with the absence of a new set of effective family policies may provoke a new demographic collapse with catastrophic consequences. In order to avert this disastrous scenario, appropriate measures must be taken immediately.

Keywords: *demography, Russia, mathematical modeling, demographic forecasts, mortality, fertility, demographic policy.*

The results presented below are based on a new series of forecast estimates made in early 2015 on the basis of the most recent data on mortality and fertility, applying the same method that was used for mathematical modeling of scenarios in the main text of our Demographic Report (Arkhangelsky *et al.* 2015; see also Korotayev *et al.* 2010; Korotayev *et al.* 2011; Korotayev and Bogevolnov 2012; Sadovnichy *et al.* 2014; Arkhangelsky *et al.* 2014; Korotayev, Zinkina, and Bogevolnov 2014).

Fig. 1 presents our population projections for Russia up to 2050 based on the inertial forecast scenario – *i.e.*, with fertility and mortality rates held constant at their 2012 values, and with stable migration inflow at 300 thousand annually (the average rate of immigration in Russia according to the results of the National Population Census 2010). If the current rates of fertility, mortality and migration remain unchanged, Russian population is bound to decrease to 135–136 million by 2040 and to less than 130 million by 2050. At first the population decline will be relatively slow, but it will speed up after 2025, as more women of the 1990s' 'demographic collapse' generation enter childbearing ages (Fig. 1).

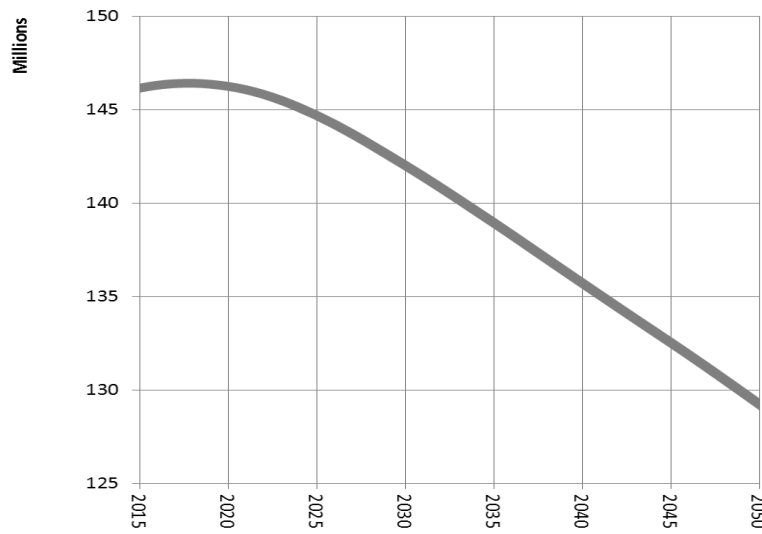


Fig. 1. Population projection for Russia up to 2050 based on the inertial forecast scenario, millions

The inertial scenario looks even grimmer when extrapolated up to 2100 (Fig. 2).

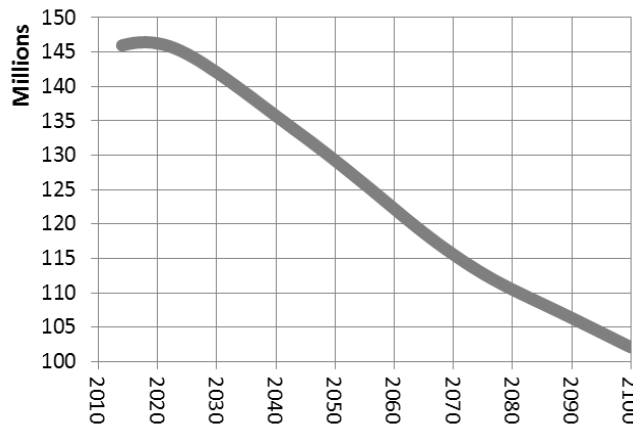


Fig. 2. Population projection for Russia up to 2100 based on the inertial forecast scenario, millions

However, the picture is still not that bad compared to our first inertial forecast scenario, which we calculated in 2009 on the basis of mortality and fertility rates of mid-2000s (see, e.g., Korotayev et al. 2010; Korotayev, Khaltourina, and Bogevolnov 2012). Indeed, according to that inertial forecast Russia's population was to plunge to 111.2 million by 2040 and to 99.5 million by 2050 (Fig. 3).

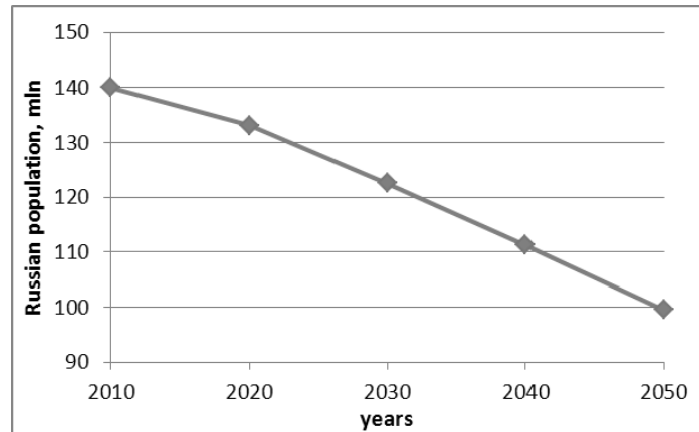


Fig. 3. Population projection for Russia up to 2050, millions. Based on the inertial forecast scenario with mid-2000s' fertility and mortality rates

Source: Korotayev *et al.* 2010: 248, Fig. 6.6.

Thus, the latest inertial forecast projects Russia's population to be 24.5 million larger in 2040 and 29.7 million larger in 2050 as compared to the first inertial forecast scenario. This higher trajectory should partially be attributed to annual net migration being revised from 186 to 300 thousand; however, its role is relatively modest. The main contribution to the difference between the two scenarios is made by very significant progress that Russia made in both fertility increase since 2006, and mortality reduction since 2005.

As mentioned in the main report (Arkhangelsky *et al.* 2015), in 2007–2012 Russia enjoyed a very impressive TFR increase, from 1.3 to 1.691 children per woman (up by 30 %), which was the fastest growth in Europe and the second fastest in the world. Russia moved up from the 35th to the 12th place in Europe in terms of TFR. In absolute terms, the number of births in 2012 was 1.902 million, exceeding the numbers of 2006 by 422 thousand children (or 28 %). The crude birth rate for the period increased from 10.3 to 13.3 per 1000.

Forthcoming Demographic Catastrophe. 'Alco-pessimistic Scenario'

The progress in mortality reduction achieved in our country since 2005 is quite significant. In 2005–2013 mortality went down from 2.304 million (Surinov 2013: Table 2.1) to 1.872 million deaths per year¹ (by 432 thousand deaths per year). The reduction of alcohol poisoning-related deaths was particularly considerable: the number of lethal intoxications fell from 36,000 in 2005 to 6,700 in 2014.²

The crude death rate fell from 16.1 per thousand to 13.1 per thousand (by 19 %). It was the best performance not only in Europe, but among all the high and middle income countries of the world (World Bank 2015). Mortality reduction was achieved almost exclusively due to an increase in life expectancy in Russia, from 65.5 to 70.5 years (by 5 years) in 2005–2012, which was again the best result among all the countries of Europe,

¹ URL: http://www.gks.ru/free_doc/new_site/population/demo/demo21.xls.

² URL: http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/publications/catalog/doc_1140086922125.

America, and Asia (World Bank 2015). Male life expectancy increased by almost six years (Surinov 2013: Table 2.9). The standardized mortality rate among working-age males decreased from 466.8 to 334.3 (almost by 30 %),³ again the best dynamics among all the high and middle income countries (World Bank 2015).

These impressive results were achieved mainly through a reduction in the number of alcohol-related deaths, which had hugely contributed to mortality in the mid-2000s, before the first set of effective anti-alcohol measures was introduced in 2006.⁴ Alcohol caused excessive mortality in Russia in a variety of ways, of which fatal alcohol poisonings formed only a small proportion. In the mid-2000s 19 % of all deaths in Russia were caused by cardiovascular diseases (including heart attacks and strokes), 68 % of deaths from liver cirrhosis, 60 % deaths from pancreatitis, and 61 % of deaths from all external causes, including 67 % of murders and 50 % of suicides, were associated with alcohol (Nemtsov 2003a, 2003b, 2009, 2011). A large proportion of deaths from pneumonia and tuberculosis are also alcohol-related (Son, Ten, and Pronina 2004: 41–44) because the alcohol abusers are more likely to contract infectious diseases and less likely to get proper treatment. In 1998–1999 in the city of Izhevsk 62 % of males who died in the ages between 20 and 55 had high blood alcohol content (Shkolnikov and Chervyakov 2000: 191) According to a large study conducted in the city of Barnaul in 1990–2004, 68 % of men and 61 % of women who died at the age of 15–34, as well as 60 % of men and 53 % of women who died at 35–69, had high blood alcohol content (Zaridze *et al.* 2009: 142–153).

It is noteworthy that the mortality decrease in Russia after 2005 is very similar in its structure to the decline during Gorbachev's anti-alcohol campaign of the 1980s (Khaltourina and Korotayev 2006d, 2008b).

In general, the research demonstrates an extremely close relationship between the production of ethyl alcohol from crops and mortality in Russia. A significant increase in production (and consumption) of alcohol leads to an immediate, significant increase in mortality – and vice versa (Figs 4, 5).

³ We use the World Bank indicator of Adult Male Mortality Rate (per 1,000 male adults), which is essentially a standardized mortality coefficient for working-age males. It shows how many 15-year-old males are bound to die before reaching age of 60 if current age-specific mortality rates persist. It reflects much better the situation with mortality in this age-gender group in comparison with the number of deaths per 1,000 working-age men, since the latter figure is too dependent on the age structure. The values of the standardized mortality rate among working-age men in Russia for the period up to 2010 (inclusive) have been taken from the World Bank database (World Bank 2014); as regards the values for 2011 and 2012, we have calculated them on the basis of the data on the age-specific mortality coefficients published in the Russian Fertility and Mortality Database (RusFMD) prepared by the New Economic School in Moscow (http://demogr.nes.ru/en/demogr_indicat/data).

⁴ See, *e.g.*, Khaltourina and Korotayev 2005, 2006a, 2006b, 2006c, 2008a, 2008c, 2015; Korotayev 2006; Korotayev and Khaltourina 2005, 2006, 2008; Korotayev, Malkov, and Khaltourina 2005.

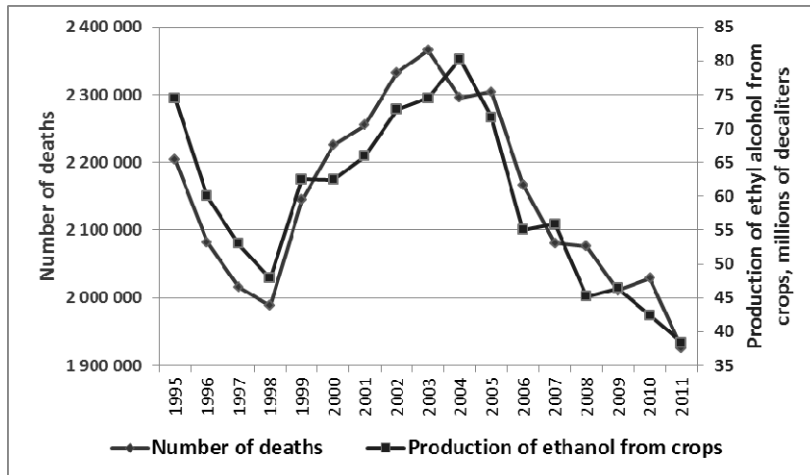


Fig. 4. Production of ethyl alcohol from crops and number of deaths in Russia

Source: URL: <http://www.gks.ru>.

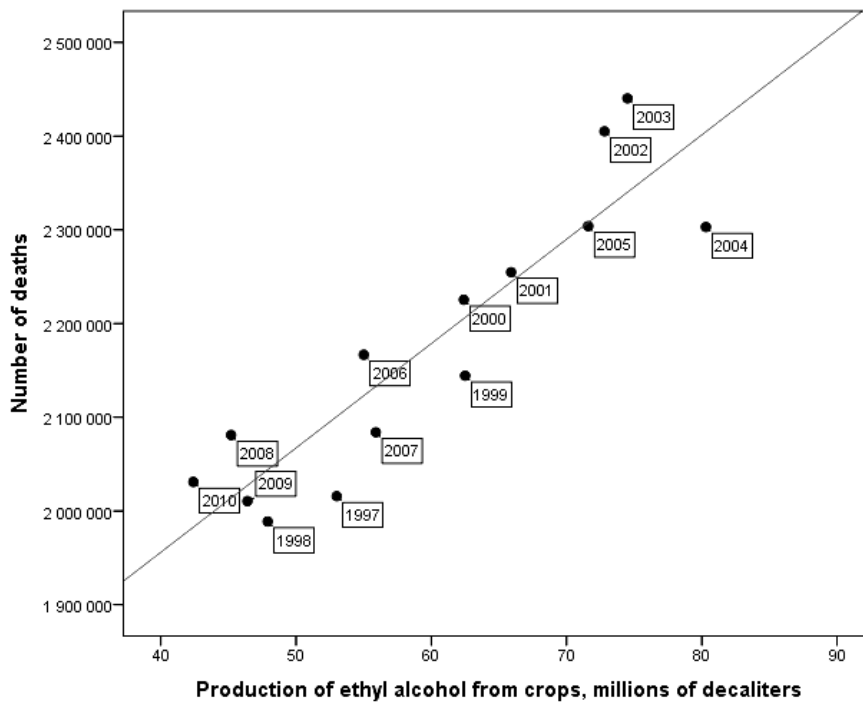


Fig. 5. Correlation between production of ethyl alcohol from crops and the number of deaths in Russia, scatterplot with a fitted regression line

Let us provide some statistical characteristics of the correlation depicted in the last graph. Routinely, the Pearson correlation coefficient (r) is used as a standard measure of the strength of a correlation. In this case its value is greater than 0.9, which means that we are dealing with an extremely strong relationship. It is useful to square 0.9 in order to under-

stand how close the relation is in this case. The square of 0.9 is 0.81 (*i.e.* 81 %), which is the coefficient of determination (R^2). In fact, its value suggests that Russian mortality dynamics of the recent years was predominantly determined by the alcohol factor. Thus, we have a reason to maintain that the record mortality decline observed in Russia after 2005 was more than 80 % determined by a reduction in alcohol consumption, *i.e.* by the effect of the measures aimed at restricting the availability of alcohol.

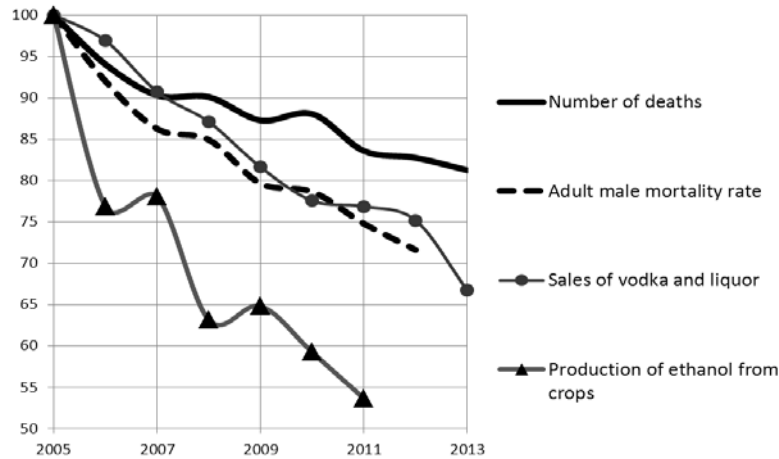


Fig. 6. Relative dynamics of mortality, production of ethyl alcohol from food raw materials, and sales of alcoholic beverages in Russia after 2005 (100 = level of 2005)

Thus, we have strong grounds to believe that Russia's impressive success in reducing mortality after 2005 was achieved mainly due to the state policy of limiting alcohol consumption. These policies were implemented in line with complex evidence-based anti-alcohol measures recommended by the World Health Organization, including higher prices and excise taxes on alcoholic beverages, as well as limitation of the spatial and temporal availability of alcohol. In addition, significant progress was achieved in reducing the consumption of illegal alcohol, marked by the dramatic reduction of alcohol poisonings, including lethal ones.

Yet Russia may lose all these achievements in the near future – if measures are not taken to prevent the looming threats engendered by the initiatives of the alcohol lobby. Hundreds of thousands of ‘additional’ deaths may follow, especially among working-age males, if a return to the days of easy access to alcohol is not averted. Unfortunately, similar reversals have already occurred in recent Russian history: after some growth, fertility would collapse even below its pre-growth level, while significant mortality reduction would be followed by a catastrophic upsurge (Fig. 7).

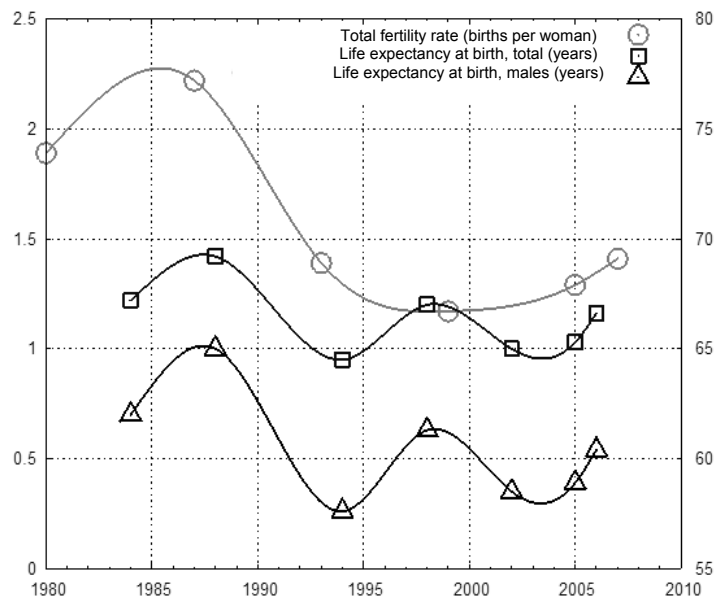


Fig. 7. Dynamics of total fertility rate (births per woman) and life expectancy in Russia. 'Alcohol collapses' of the 1990s and early 2000s

Sources: Rosstat 2015; World Bank 2015; UNICEF 2004: 73.

The current situation bears a striking resemblance to the late 1990s. In the midst of an acute financial and economic crisis, the priority of demographic issues declines in favor of solving more immediately pressing financial and economic problems. Meanwhile, measures are adopted that have the effect of dramatically increasing the availability of alcohol. The situation is similar to that of 1998, when Russia experienced a financial crisis accompanied by a jump in inflation (by 84 %) – *however, the excise duty on spirits was increased much more modestly, by 20 %*. As a result, during a single year the relative value of excise duty fell by one-third. In 2000 the excise tax was increased slightly above the rate of inflation; during the next several years, its annual increase hovered around the inflation rate or slightly below it, so the huge fall of 1998 was left uncompensated for. This fall of the excise tax on vodka was followed by rising income and purchasing power of the population, which caused a huge increase in alcohol consumption (and, hence, mortality) in 1998–2005 leading to the loss of more than a million lives in Russia (see, e.g., Treisman 2008: 9; 2010: 296–297; Nemtsov 2009, 2011; Khaltourina and Korotayev 2006d: 30; 2008b: 28–29). On the contrary, the 2008–2009 economic crisis was not accompanied in Russia by any mortality increase, as it occurred against the background of a strict anti-alcohol policy.

Notably, the acute crisis of the early 1990s led to a catastrophic increase in mortality only in the post-Soviet countries where a sharp increase in alcohol consumption was observed (accompanied by all kinds of the negative social phenomena, such as homicide, suicide, abandoned children, etc.) while in the countries where alcohol consumption remained flat mortality did not increase (as well as the number of murders, suicides, abandoned children, etc.) (Dyomin, Korotayev, and Khaltourina 2009). The current financial and economic crisis is occurring at a time when a set of measures aimed to

increase the availability of alcohol has been planned or already taken, so hundreds of thousands of lives are now under a very serious threat. These measures include:

1. *Freezing and actual reduction in excise taxes on alcoholic beverages.* According to a recently passed law on changes in excise rates,⁵ actual vodka prices are to be lowered in the next two years – instead of a formerly planned increase. According to the previous version of the Tax Code, excise taxes were to be increased from 500 to 600 roubles per liter of anhydrous ethanol. The increase was to come in force on January 1, 2015. However, a law passed in November 2014 annulled this planned increase and set the excise tax to continue at the previous level. With the rocketing inflation this means a substantial reduction in the actual excise tax.

We should note here that the increase in excise duties on spirits in previous years led to a significant reduction in mortality, on the one hand, and to a simultaneous increase in budget revenues, on the other (see Fig. 8).

The prospects for raising excise taxes on alcohol are further threatened by a draft ‘Agreement on the Principles of tax policy in the field of excise duties on alcohol and tobacco products of the Eurasian Economic Union’. This draft was designed to slow down the increase of excise taxes on tobacco products, but it also has already led to a decrease in excise taxes on alcoholic beverages in Russia.

2. *Reduction of the minimum vodka price.* On December 29, 2014, the Federal Service for Alcohol Market Regulation set the new minimum retail price (MRP) on strong alcohol (more than 28 % alcohol content) to come in force on February 1, 2015. For the first time in its whole history, MRP was decreased, not increased. The price for a 0.5-liter bottle of 40 % vodka dropped from 220 rubles to 185 rubles (thus getting 16 % cheaper).

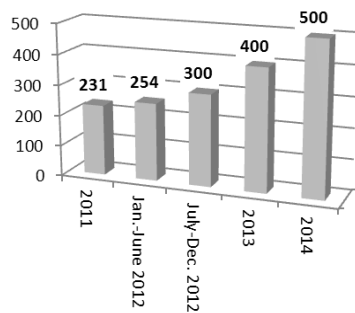
3. *Russia's capacity to implement independent anti-alcohol policy is being undermined.* This threat arises from the draft agreement ‘On regulation of the alcohol market in the framework of the Eurasian Economic Union’ which implies an actual loss of Russia's sovereignty in the issues related to alcohol policy regulation, which will lead to the ‘harmonization’ of liquor prices with Belarus and Kazakhstan (where they are much lower) and, hence, to their further significant reduction, and, consequently, to the further growth of alcohol availability and mortality in Russia.

4. *Alcohol ‘liberalization’ in Russian regions.* Regional authorities now frequently try to sell alcohol for the longest possible hours under the pretext of combatting illegal sales. For example, last December, the Moscow Region Duma passed an amendment to the law limiting the hours of retail alcohol sales, expanding them to 08.00 – 23.00 from the previous 11.00 to 21.00.

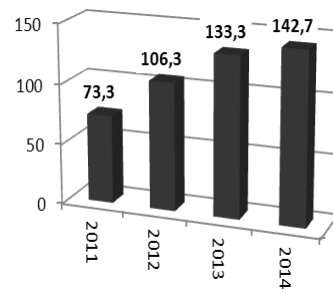
5. *Lifting spatial restrictions on alcohol sales.* The Federal Service for Alcohol Market Regulation has put forward a law project which permits the sale of alcohol in some educational, medical and cultural institutions. The bill is already undergoing the process of inter-ministerial coordination in the Government.

6. *Lifting the ban on remote sales of alcoholic beverages.* The Government is discussing lifting the ban on remote sales of alcohol, which will dramatically increase its spatial availability and may lead to mass violations in terms of alcohol sales to minors, as well as illegal alcohol sales in general.

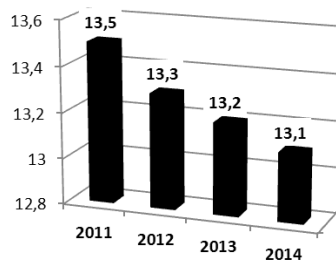
⁵ Federal Law № 366-FZ of November 24, 2014, ‘On Amendments to Part II of the Russian Tax Code and Certain Legal Acts of the Russian Federation’.



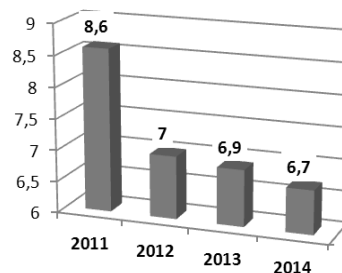
Excise duty on spirits, rubles per liter of ethanol



Budget revenues from excise taxes on spirits, billions of rubles



Deaths from all causes per 1,000



Deaths from alcohol poisoning, per 100,000

Fig. 8. Dynamics of excise tax on spirits, budget revenues and mortality in 2011–2014

7. *Lifting the ban on selling beer in kiosks.* The Federal Antimonopoly Service (FAS) has proposed to lift the ban on selling beer in street stalls. The Ministry of Industry and Trade has created a working group to consider this proposal. Meanwhile, the prohibition of street beer sales played a key role in the recent reduction of alcohol consumption by Russian teenagers. The implementation of the FAS initiatives will lead to a new wave of alcohol availability to Russian youth.

8. *Legalization of alcohol advertising on television.* The State Duma of the Russian Federation has passed laws allowing beer advertising on TV (including the sport channels) and advertising of wine after 23.00, despite the fact that alcohol advertising is one of the most effective ways to accustom youths and adolescents to alcohol consumption.

Projected Effects of State Alcohol Policy Relaxation

The calculations carried out by an expert group of the Russian Presidential Academy of National Economy and Public Administration (RANEPA), the National Research University Higher School of Economics (HSE), Russian Academy of Sciences, and Moscow State University have shown that the forthcoming full-scale relaxation of the state anti-alcohol policy may lead to a total of 5.5 million additional deaths by 2030 (see Fig. 9 and Table 1).

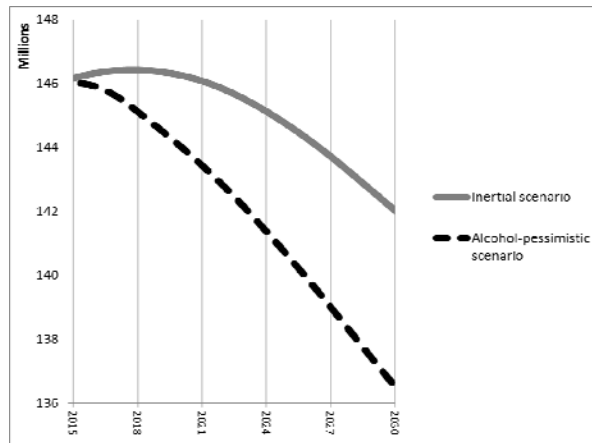


Fig. 9. Population projections for Russia under the ‘alcohol-pessimistic’ and inertial forecast scenarios, millions, 2015–2030

Table 1. Population projections for Russia under the ‘alcohol-pessimistic’ and inertial forecast scenarios, millions, 2015–2030

Year	Projected population of Russia, millions		‘Alcohol-pessimistic’ scenario ‘price’ in the number of ‘additional’ deaths as compared to the inertial scenario
	Inertial scenario	Alcohol-pessimistic scenario	
2020	146,3	144,0	2,3
2030	142,0	136,5	5,5

The number of working-age males will be particularly affected (Fig. 10).

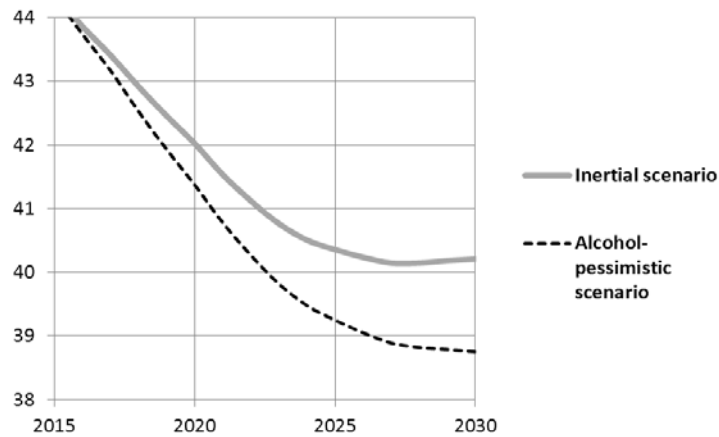


Fig. 10. Population projections for working-age males in Russia under the ‘alcohol-pessimistic’ and inertial forecast scenarios, millions, 2015–2030

Thus, the changes in legislation proposed by the alcohol lobby may lead to a significant increase in alcohol consumption and therefore to an increase in alcohol-related mortality-

ty, morbidity and social problems. Such consequences are extremely likely to seriously undermine Russian progress to goals set forth in the Presidential Decree № 606 of May 7, 2012 'On measures for implementation of demographic policy of the Russian Federation', particularly as regards reaching the target value of 74 years of total life expectancy by 2018. Moreover, their overall demographic consequences for our country may be disastrous; so urgent measures must be taken to avert the upsurge of population loss.

How to Prevent the Demographic Catastrophe

Even if the pending 'pro-alcohol' legislative initiatives are simply blocked, life expectancy will not go beyond the current value of 71 years. A simple preservation of the state anti-alcohol policy in itself will not suffice to increase the Russian life expectancies up to 74. For this, we need additional limitations on the availability of alcohol, both in time, in space, and economically. Price availability of alcohol must be seriously curbed. It would no longer suffice to return to the initially planned (starting from January 1, 2015) increase of the excise tax on spirits from 500 to 600 rubles⁶ (which was derailed by the alcohol lobby). Due to the dramatic inflation jump, the new law should raise the excises not to 600 rubles but at least up to 650 rubles. The ban on the sales of alcohol between 11 p.m. and 8 a.m. should be extended to a bigger time interval between 8 p.m. and 11 a.m. Banning morning alcohol sales has proved highly effective in Nordic countries as this blocks the opportunity to have a morning drink after a hangover (which may often lead to prolonged drinking bouts).

Sales of alcoholic beverages stronger than 15 % are advised to be prohibited in department stores unless separated from other departments with a special entrance. This cuts down on spontaneous purchases, *i.e.* 'once entering a shop to buy some bread, one is provoked to purchase some alcohol by seeing it exposed on the shelves' (Dyomin, Korotayev and Khaltourina 2009: 47).

We should not exclude the possibility of returning to the state monopoly on retail sales of the strong drinks in Russia. This measure has proven to be a very effective tool for reducing alcohol problems and mortality in Sweden, Iceland, Norway, Finland, Canada, *etc.* In the USA 19 states also have some form of monopoly on the sale of liquor. In these states alcohol consumption is 14.5 % lower for those aged 14–18, and the frequency of abuse of alcohol by this age group (intake of more than 70 g of ethanol at one time) is 16.7 % lower than in the states without such a monopoly. There is a 9.3 % lower alcohol-impaired driving death rate under age 21 in the monopoly states versus the non-monopoly states (Holder 2007). In the Scandinavian countries such a monopoly allows the sale of alcoholic beverages (usually stronger than 4.7–5 %) only in state stores (except for bar service). In addition such a monopoly helps to fill the state budget. The monopoly countries enjoy higher revenue from the sale of alcoholic beverages than the non-monopoly countries with the same level of economic development (Rehm *et al.* 2001). A major advantage of the state monopoly on the retail sale of alcoholic beverages is that it minimizes the private interest in maximizing alcohol sales, which in this area often confronts the public interest. An employee of a store belonging to the state has no interest in selling alcohol to minors because his salary does not depend on the store's revenue – while the owner of a private shop may capitalize on it (Ugland 2000).

International experience shows that to maximize health and longevity, national alcohol policy should be regulated by the social branch of the Government, as is done in the Scandinavian countries, not by the economic branch. The Ministry of Health, the Federal Service for Supervision of Consumer Rights Protection and Human Well-Being and the

⁶ Per liter of anhydrous ethanol.

Federal Service for Alcohol Market Regulation must take control over this policy to fight the alcohol black market.

The Worst-Case (Pessimistic) Scenario

However, it is obvious that the alcohol-pessimistic inertial scenario is by no means the worst possible case. The worst (‘pessimistic’, ‘pessimal’) demographic scenario will be realized only if a radical surge in mortality coincides with an avalanche-like collapse in fertility. Unfortunately, this scenario is not entirely improbable. First, a certain decline in crude birth rates is virtually inevitable in the forthcoming decade due to the reduction in the number of women aged 20–29, who mother more than 60 % of all births in Russia. This is given by Russia’s age structure and the very small cohorts born in the 1990s who are now entering their prime child-bearing years. Second, most respondents explain their reluctance to have more children by referring to material difficulties and feeling uncertain about future (Rosstat 2013). Rising insecurity almost inevitably leads to a decrease in birth rates – this is particularly true for financial and economic crises (Fig. 11).

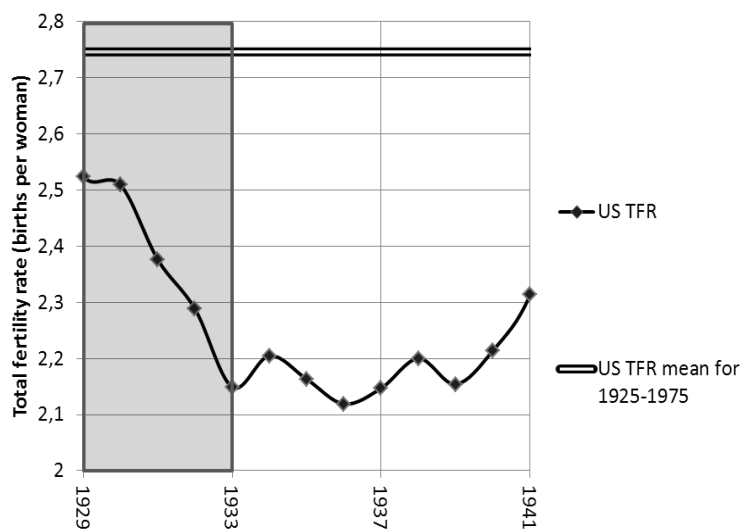


Fig. 11. Birth rate slump in the United States during the Great Depression (1929–1933)

Source: Campbell et al. 1966: 4; World Bank 2015.

The stimulating role of the maternal capital policy in boosting fertility is bound to decrease, as 97 per cent of the families used to spend its benefits for improving their living conditions, which will become much harder during the current economic crisis. Strong measures are required to prevent a severe birthrate collapse. The financial and economic crisis of 2008–2009 in Russia did not lead to the collapse in fertility rates due to strong and effective family policy measures launched before and during the crisis. The crises of the late 1980s – early 1990s and the late 1990s were accompanied by a decline in fertility because no such measures were taken. For example, on the eve of 1998 crisis fertility was already very low (1.24 children per woman) but during the crisis it dropped to an unprecedented level of 1.17 children per woman. In the late 1980s, as the starting point of fertility was already fairly high (see, e.g., Korotayev et al. 2010; Korotayev, Khaltourina and

Bogevolnov 2012: 96–219), the decline in response to the economic distress of the early 1990s was much steeper. In fact, it collapsed so deep that the consequences of the ‘demographic hole of the 1990s’ are still present (see above the main text of the report).

Most likely some decline in the birth rate of Russia in 2015 is inevitable. The positive trend of recent years could be kept only if the proper measures had been introduced in 2014. For example, there were about an additional 100 thousand newborns in 2012 due to the policies of free distribution of lands and allowances for the third child. If the maternal capital program is to be cancelled after 2016 (followed by cuts in other family support programs), this will result in catastrophic demographic consequences.

The ‘most pessimistic’ scenario presents the population projections in a situation when a victory of the alcohol and tobacco lobby is combined with cuts in the family support programs, leading to a retreat to the worse values of mortality and fertility of the mid-2000s.

The results of the calculation of this scenario are as follows (Fig. 12).

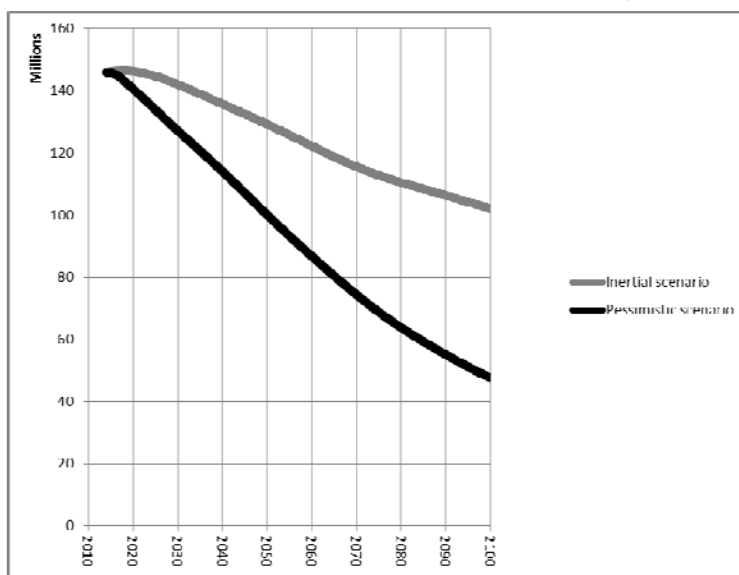


Fig. 12. Pessimistic and inertial scenarios of the Russian population dynamics for the period till 2100, millions

Thus, if no strategic priority is given to socio-demographic policy, this result may well lead to the end of geopolitical career of Russia by the end of the century.

Possible Demographic Effect of a Full-Scale Family Policy Consuming Not Less than 3 Per Cent of GDP

It is also possible to model the effect of developing a high-priority demographic policy structure that would aim to reach Western European levels of fertility, closer to the replacement rate of two children per woman. This effect was modeled by a smooth (for 10 years) transition of age-specific fertility rates by 2020 in Russia to the level of France in 2012 (corresponding to TFR = 2.0), while preserving Russia's age-specific mortality at the level of 2012.

According to international studies and best practice, the most effective measures to improve fertility include a combination of allowances, tax benefits, programs and legislation supporting parents in combining parenting and employment, including access to kindergartens, nurseries, nannies and flexible schedules for employees with family responsibilities. During a crisis the measures stimulating economic activity of parents may be more effective in boosting fertility than cash transfers. An effective system of care for children is also one of the most effective policy measures to support the birth rate. Of all the types of expenditures in OECD the costs of services for child care (namely kindergartens, nursery nurses and payment) correlate the best with the level of fertility. It is extremely important for the child care system to develop a network of services for the care of the youngest children (under 3 years). Comparative analysis shows that all of the most demographically successful countries in Europe have built a wide covering system of free or subsidized services for the care of children under 3 years old. There are not enough kindergartens in Russia and the youngest children are not a priority group. Only 58 per cent of Russian children under six had access to preschool education facilities in contrast with 90 per cent in France. A set of housing support measures such as subsidized rental housing for young and large families, development of housing and savings cooperatives, as well as substantial subsidies of mortgage rates for families with children may also improve fertility.

The corresponding ‘high demographic priority’ forecast of population of the Russian Federation (as compared to the inertial scenario) is as follows (Fig. 13).

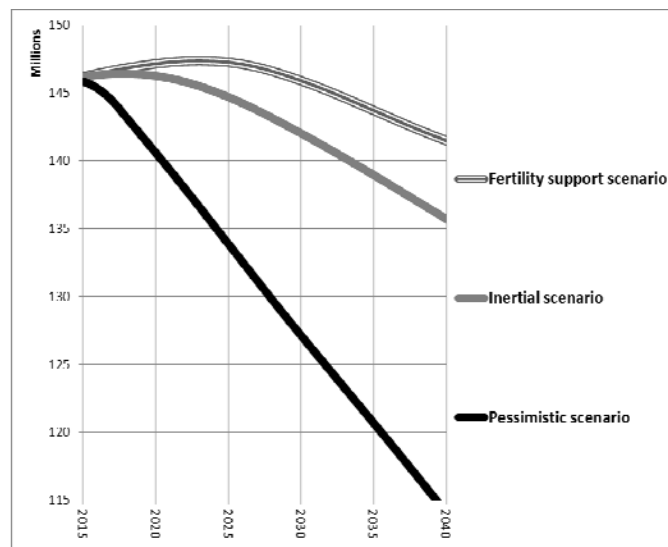


Fig. 13. Scenario of full-scale measures of fertility support in comparison with the inertial and pessimistic scenarios for the Russian population dynamics, millions, 2015–2050

As we can see, measures to support the birth rates can give a significant long-term demographic effect (especially if we can prevent the growth of mortality in our country), but these measures alone are insufficient to prevent Russian depopulation, due to Russia's persistent mortality rates.

Potential Effect of the Anti-Alcohol Policy

If a full-scale alcohol control policy is consistently implemented in Russia, our calculations demonstrate that such a deliberate anti-alcohol policy still has an immense demographic potential and will have a very significant long-term demographic impact (see Fig. 14 and Table 2).

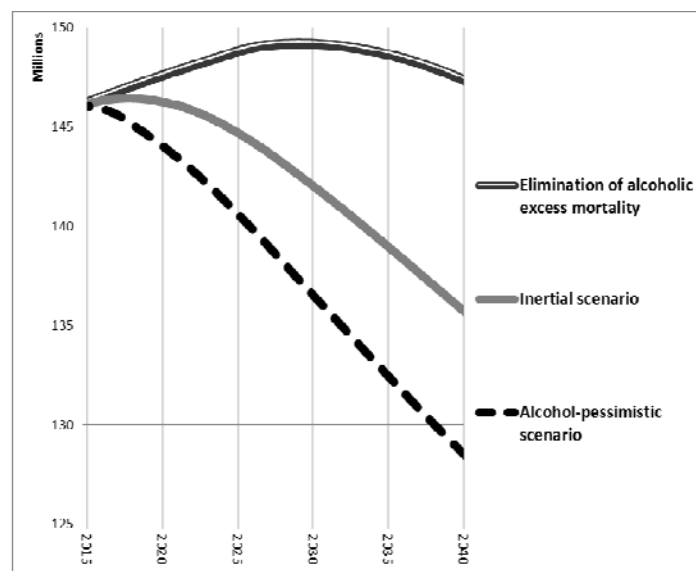


Fig. 14. Scenario of full-scale anti-alcohol policy in comparison with the inertial and alcohol-pessimistic scenarios of the Russian population dynamics, till 2040, millions

Table 2. Population projections for Russia under the 'alcohol-pessimistic' and 'full-scale alcohol policy' scenarios, millions, for 2015–2040 ('Issue price' in human lives)

Year	Projected population of Russia, millions		'Alcohol-pessimistic' scenario 'price' in the number of 'additional' deaths as compared to the full-scale alcoholic policy scenario
	Alcohol-pessimistic scenario (millions)	Full-scale alcoholic policy scenario (millions)	
2020	147.6	144.0	3.6
2030	136.5	149.2	12.7
2040	128.5	147.4	18.9

These estimates demonstrate the enormous demographic potential of standard alcohol control measures recommended by the World Health Organization for the future of our country (Dyomin *et al.* 2009).

Implementation of these affordable and even profitable measures (such as increasing excise duties on spirits or the introduction of a state monopoly on retail sales of alcohol) may save up to 19 million lives by 2040.⁷ Thus, in the short and medium term the alcohol

⁷ In comparison with the scenario of the victory of the alcohol lobby. In comparison with the inertial scenario, the

control policy may have an even greater demographic impact than the policy of supporting the birth rate (though in a long run the fertility support policy is significantly more effective).

The Forecast Effect of Complete Elimination of Russian Excess Mortality

Total elimination of Russian excess mortality would have an especially significant long-term demographic effect. Such results may be achieved through policies including anti-alcohol and anti-tobacco measures, as well as radical improvement of the Russian health care system by increasing the financial allocation for health care to at least 10 % of GDP.

This effect was modeled by a smooth (for 10 years) transition of the age-specific mortality rates in Russia to reach the corresponding values of Norway in 2009 (this scenario does not imply that by 2020 Russia will overtake Norway; it only starts with the assumption that Russia will be converging to Norway, reaching by 2020 the Norwegian level of 2009, so this scenario is not excessively optimistic).⁸

As we can see the complete elimination of Russia's excessive mortality may provide a more significant effect in the short and medium term than fertility support. Nonetheless, because of the small birth cohorts of the 1990s, whose effect will be magnified over time if they too give birth to small cohorts the elimination of Russia's high mortality cannot, by itself, prevent an eventual return to population decline. If extreme mortality is eliminated, but fertility is preserved as it was in 2012, the Russian population will keep growing only until the mid-2030s. It would then start shrinking in the late 2030s, and this decline would accelerate thereafter.

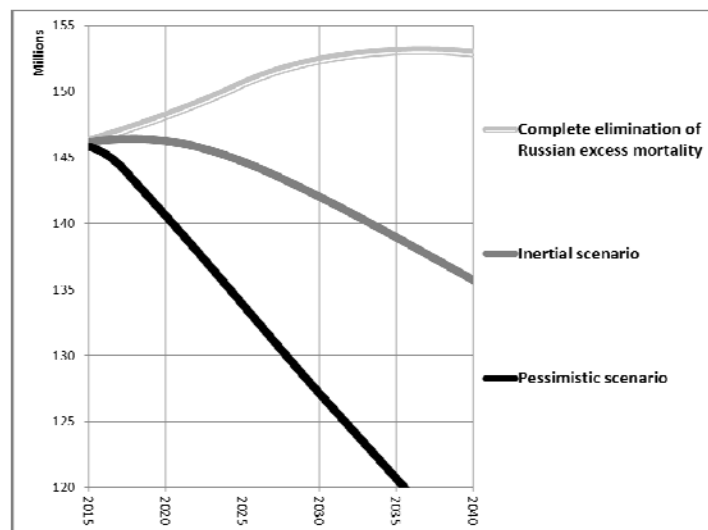


Fig. 15. Scenario of complete elimination of Russian excess mortality in comparison with the inertial and pessimistic scenarios of the Russian population dynamics, till 2040, millions

scenario of the complete elimination of the alcohol excessive mortality in Russia will save by 2040 lives of more than 11.5 million Russians.

⁸ On the other hand, it is based on the assumption of maintaining the gender and age-specific fertility rates at the level of 2012, and at present this assumption may already be considered fairly optimistic.

The Combination of Measures that Can Prevent Depopulation. The 'Most Optimistic' Scenario

Only the combination of an effective fertility support system and the elimination of Russia's excessively high mortality ('the best case scenario') may fully avert the looming threat of depopulation. It is worth noting that even under the optimum scenario the effects of the demographic hole of the 1990s will be felt in the 2040s as the small generation of the children born to the mothers born in the 1990s will reach their reproductive age. Nevertheless, in the most optimistic scenario future population decline would be averted, and in the future the population of Russia will stabilize at a level slightly higher than today's (Fig. 16).

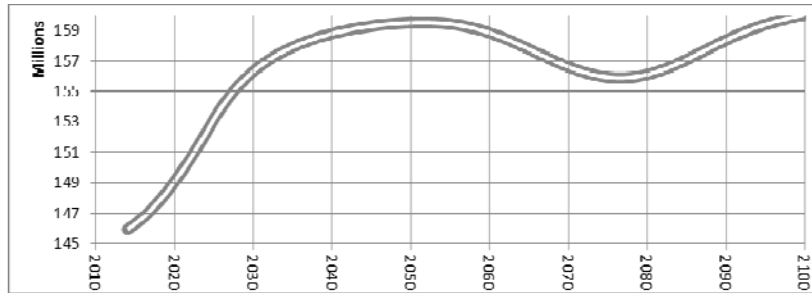


Fig. 16. Optimum demographic scenario of the dynamics of the Russian population (combination of an effective system of fertility support measures and the elimination of the Russian excess mortality), millions, 2015–2100

It is time to compare the optimistic forecast with the other scenarios of Russia's demographic future (Fig. 17).

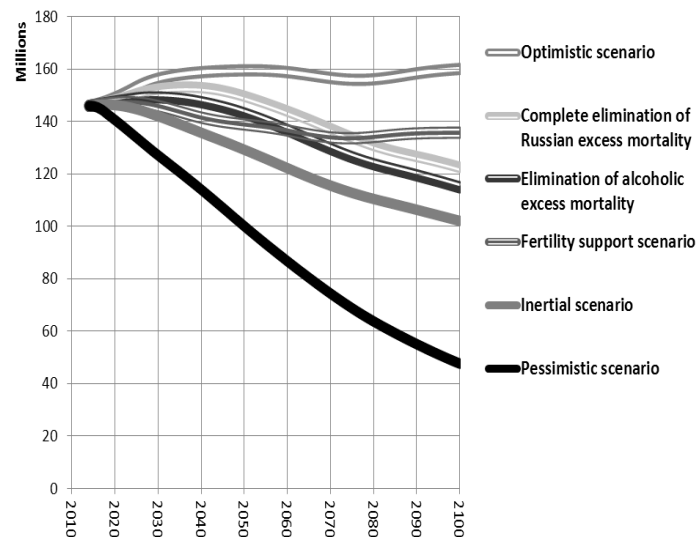


Fig. 17. Forecast scenarios of the demographic future of Russia, projected dynamics of the population of the Russian Federation in 2015–2100, millions

As we can see in Fig. 17, there is a huge gap between the ‘lower’ (‘pessimistic’) and the ‘upper’ (‘optimistic’) scenarios. This is a gap of over 100 million human lives. This estimate gives an idea of the price of decisions made today. The forecast calculations for the period up to 2100 show that the birth support measures have the highest impact on the demographic future in the long run. However, in the short and medium term, the anti-mortality measures are the most effective (in particular, the measures targeting alcohol-related mortality). As a whole, according to our forecast calculations, the demographic future of Russia can be secured only with *both* the elimination of excessive mortality and with continued improvement in fertility toward full replacement rates (*e.g.*, fertility 2.0 or higher).

For this to occur, current attitudes must be changed. Today the availability of alcohol is increasing instead of being curbed. At the same time the country is facing a new crisis while no new measures to provide stronger support for fertility support are expected.

A Demographic Maneuver: Additional Revenues from Alcohol and Tobacco Can Stimulate the Reduction in Mortality and the Growth of Fertility

There is a demographic maneuver that can be undertaken to reduce mortality and stimulate fertility, and at the same time reduce smoking and alcohol consumption, save 300–400 thousand lives a year and ensure the growth of budget revenues. An increase in excise duties, by itself an unpopular measure, should be linked with measures to support families with children. It is recommended to create a Trust Fund, funded by higher excise taxes on alcohol and tobacco, to support family and health.

The Fund should provide funding for the following areas:

- to secure the opportunity for families to purchase housing with mortgage loans at 5 % interest rate after the 2nd birth (through the already existing Agency for Housing Mortgage Lending);
- to secure the opportunity for families to purchase housing with mortgage loans at zero interest rate after the 3rd birth (through the Agency for Housing Mortgage Lending);
- to ensure 100 % availability of pre-school education and childcare for children from 1 to 7;
- co-financing of regional programs for prevention and reduction of cardiovascular disease in areas with a high mortality rate in their working age population;
- co-financing of regional programs of housing rent subsidies for families with children;
- additional social support for families with children in regions with unfavorable demographic situations.

During the economic crisis the Foundation of Family and Health Support could ensure the implementation of additional measures of supportive demographic policy, and contribute to ensuring sustainable growth of population after the crisis.

There are no ‘magic bullets’ to easily solve Russia's demographic problems, which are the result of decades of economic ups and downs and shifts in policy. However, establishing a Trust Fund for family support and national health, increasing taxes on alcohol and tobacco, and using those funds for pro-fertility programs, is a policy that would achieve several goals at once without imposing additional cost on the current budget. It would also focus attention on long-term planning to resolve the problems that threaten Russia's demographic future.

As the earlier sections of the present article have shown, Russia enjoyed great success with its policies to promote fertility and reduce mortality in the last seven years. However,

it would be a foolish and costly mistake to believe those successes had ‘solved’ Russia's long-term demographic problems. Quite the reverse; they were only a promising ‘down payment’ on the policies needed to truly put Russia's long-term demographic future on a secure course. Without continuing and expanding the present policies, that future security will dissolve. Worse yet, the policies currently being considered to boost access to alcohol will almost certainly reverse recent progress and set Russia back upon a path of inevitable demographic decay.

Appendix. Calculation Methodology

We have based our population projections on the standard methodology of building demographic forecasts (see, *e.g.*, Andreev and Vishnevsky 2008: 265–288; Belotelov *et al.* 2001: 43–51; Pavlovsky *et al.* 2005). The calculations were made on an annual basis. At step one, an equation (1) is used to calculate the number of the dead based on annual mortality ratios and migration inflow. The age structure was modified in accordance with the calculation. At step two (equations (2F) and (2M)), the number of infants is calculated based on childbirths and infant survival rate and migrations (migrants with infants). Based on the current age structure, the number of women is calculated for each 5-year group. The number of babies is calculated for each group using age fertility ratios and then summed up. We assumed that 100 girls are born per 105 boys. Then the age structure is moved ‘down’ to the previous year and the number of babies is recorded at the very beginning. The time calculator is increased by one year and then the calculation is repeated (step one and then step two).

Preparation of source data. Source data for birthrates were calculated based on age (5-year groups) fertility ratios and target values (Rosstat 2015) by linear interpolation. A similar procedure (Human Mortality Database)⁹ was performed for mortality and migration.¹⁰

We took as source data the age and sex structure for 2010 (Rosstat). The calculation started from 2010.

The drawback of the Demographic Concept is that mortality is recorded in relative units. We used age and sex mortality per 1,000 people as a demographic indicator for actual calculations.

Equations used for calculations are as follows:

$$u_{M,F}(\tau,t) = \frac{2 - d_{M,F}(\tau-1,t-1)}{2 + d_{M,F}(\tau,t-1)} u_{M,F}(\tau-1,t-1) + m_{M,F}(\tau,t), \quad (\text{Eq. 1})$$

$$u_F(0,t) = \frac{100}{205} L_{F0}(t-1) \sum_{v=15}^{49} b(v,t-1) \sum_{\eta=0}^4 \bar{u}_F(v+\eta,t-1) + m_F(0,t-1), \quad (\text{Eq. 2F})$$

$$u_M(0,t) = \frac{105}{205} L_{M0}(t-1) \sum_{v=15}^{49} b(v,t-1) \sum_{\eta=0}^4 \bar{u}_M(v+\eta,t-1) + m_M(0,t-1), \quad (\text{Eq. 2M})$$

where

- t – time variable (in this case one year);
- τ – lower band of the age group;

⁹ URL: http://www.mortality.org/hmd/RUS/STATS/Mx_1x1.txt.

¹⁰ Our calculations are based on estimates of the demographic structure of migration flow kindly provided to us by Andreev; it is similar to the ones used by Andreev and Vishnevsky in their projections of the demographic development of Russia until 2050.

- $u_{M,F}(\tau, t)$ – number of persons (hereinafter lower indices mean M – men, F – women) aged from τ to $\tau + 1$ years at the moment of time t ;
- $\bar{u}_{M,F}(\tau, t)$ – annual average number of persons (hereinafter lower indices mean M – men, F – women) aged from τ to $\tau + 1$ years at the moment of time t ;
- $b(\tau, t)$ – age specific birth rates, women, age from τ to $\tau + 4$ (i. e. by 5-year groups) at the moment of time t ;
- $d_{M,F}(\tau, t)$ – age specific mortality rate, age from τ to $\tau + 1$ at the moment of time t ;
- $m_{M,F}(\tau, t)$ – number of migrants (arrived in the country), this number (generally) may be negative in case of population outflow from the country;
- $L_{M0,F0}(t)$ – infants survival function at time t .

Equation (1) describes shift of the age structure by one year (due to mortality and migration), equations (2F) and (2M) describe the ‘source’ (i.e. number of babies).

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International Migration Trends in the Era of Globalization*

Ivan Aleshkovski

The author analyzes the impact of globalization on the transformation of international migration flows. The author considers the characteristics of the global trends within international migration, namely: a growing scale of the international migration, a geographic expansion of international migration, qualitative shifts in the structure of migration flows, determining role of economic migration, permanent growth and structural intricacy of irregular migration, increase of forced migration, increasing role of international migration in demographic development, and a dual character of migration policy. The author also points out that only a reasonable migration policy can provide a legitimate field for international migration and rational use of migrants' skills.

Keywords: *international migration, globalization, labour migration, irregular migration, forced migration, demographic development, migration policy.*

In the second half of the twentieth century the humankind experienced an insurmountable and irreversible power of globalization processes, which influenced all spheres of social life and created a global system of interdependency between countries and nations.

This growing interdependency is related to:

- development of integration processes and expanding economic interdependency between national economies;
- growing gap in the levels of economic development between developing and developed countries caused, inter alia, by the demographic factor;
- improvement of communication facilities and the transport system, which allows information, goods and people to move freely and quickly even between territories that are located very distantly from each other;
- activities of international institutes and transnational corporations that engage employees from different countries and promote their movements across the borders;
- social connections that develop as a result of international migration and interracial marriages, in particular, and promote formation of the global system of mutual aid.

Globalization processes within impetuous changes in global political and economic systems have abruptly intensified global migration flows and have led to dramatic shifts in global migration trends that are resulting in the formation of a new stage of migration history of the mankind.

We summarized those trends in our works in the 1990s and 2000s (see Iontsev 1999; Aleshkovski and Iontsev 2008; 2015; Aleshkovski 2016) and by now, they have become well-formed. The most significant among them are the follows:

* This study has been supported by the Russian Science Foundation (project No. 15-18-30063).

- an unprecedented growth of the international migration flows and formation of ‘nation of migrants’;
- a geographic expansion of international migration flows due to involvement of practically every country of the world in migration flows;
- qualitative changes in the structure of international migration flows in compliance with the requirements of globalizing labor market;
- determinant role of economic migration, primarily labour migration;
- sufficient growth and structural intricacy of illegal migration;
- a growing scale and geographic expansion of forced migration;
- growing importance of international migration for the demographic development of the world, countries of origin and destination;
- dual character of migration policy at global, regional and national levels.

Growth of the International Migration Scale

The collapse of the USSR and emergence of separate independent states in its place, important political and social changes in the Eastern Europe, the collapse of Yugoslavia and prolonged conflict between the Serbians and Albanians, the crisis in the Persian Gulf, civil wars in Rwanda, Somalia, and Sudan, conflicts in Afghanistan, Iraq, Libya and Syria – all these and other events of the 1990s and 2000s set in motion vast and often uncontrolled international migration flows and made the international migration become one of the most important global phenomena, which had an influence on the world economy and, respectively, on globalization.

The scale of international migration allows us to define it as a phenomenon with a global impact. According to the United Nations Population Division estimates in 2015, more than 244 million people live outside their country of birth, 57 per cent of the total number of international migrants live in more developed regions. Currently, international migrants make up nearly one of every 32 people in the world, almost one of every eight people in the developed regions and nearly one of every 65 people in developing regions. Collectively, international migrants could now constitute the world's fifth most populous nation if they all lived in the same place – after China, India, the United States, and Indonesia (UN 2015b, UN 2015c).

One should note that these figures do not include illegal immigrants whose number according to different estimates amounts from 10 to 15 per cent of all international migrants (from 24 to 36 million people) and international tourists whose number exceeded 1,200 million. If we add together 150 million labour migrants with their family members, more than 10 million seasonal and frontier workers, and no less than 65 million forced migrants (refugees, displaced people, asylum seekers, ‘ecological refugees’, *etc.*), we will have the total number of people who are involved in international migration in this or that form which amounts to over 1.5 billion people. If we add together all the categories of migrants then every fifth Earth's inhabitant appears to be an international migrant. This brings up the idea of the so-called ‘nations of migrants’ that can be compared by its number with the population of the largest nations of the world (Aleshkovski 2016).

In fact, the fate of the ‘everlasting exile’ mythical Ahasverus is not just a myth but a real destiny of many people wandering over the world in search for better life, knowledge, for the world's progress in culture and science, for the rest and cure *etc.*

As it can be seen from Table 1, in the last half a century there have been significant changes in the regional distribution of international migration flows. If in 1960 the majority of international migrants (57.2 %) located in the developing regions, now more than 57.6 % of international migrants have settled in the developed regions. The most perceptible changes have been observed in Europe and North America where over the period from 1960 to 2015 the number of international migrants has increased by 5.3 times and 4.3 times respectively. Currently, the region with the largest number of international migrants is Europe (more than 76.15 million people in 2015), followed by Asia (75.08 million people) and North America (54.49 million people) (UN 2015c).

Table 1. International migrant stock at mid-year by major area, region

Major Area, Region	1960	1970	1980	1990	2000	2005	2010	2015
World	75.46	81.34	99.28	152.56	172.70	191.27	221.71	243.70
Developed regions	32.31	38.36	47.46	82.38	103.38	117.18	132.56	140.48
Developing regions	43.15	42.97	51.82	70.18	69.32	74.09	89.15	103.22
Europe	14.24	18.79	21.89	49.22	56.27	64.09	72.37	76.15
Africa	9.13	9.94	14.10	15.69	14.80	15.19	16.84	20.65
Asia	28.48	27.82	32.11	48.14	49.34	53.37	65.91	75.08
Latin America and the Caribbean	6.01	5.68	6.08	7.17	6.59	7.23	8.24	9.23
Northern America	12.51	12.99	18.09	27.61	40.35	45.36	51.22	54.49
Oceania	2.13	3.03	3.75	4.73	5.36	6.02	7.13	8.10

Source: UN 2006b; 2015c.

The important indicator reflecting the ratio of international migration, is the growing share of international migrants in the total population of the receiving states. In 1960, there were 27 countries in the world where the percentage of international migrants was up to 10 %, while in 2015 the number of such countries reached 92, and in 16 countries the share of international migrants in total population exceeded 50 % (UN 2015c).

Between 1960 and 2015 the share of migrants in the total population increased most significantly in the oil-producing countries of the Persian Gulf: in Bahrain from 17.1 % to 51.1 %, in Kuwait from 32.6 % to 73.6 %, in Qatar from 32.0 % to 75.5 %, in the UAE from 2.4 % to 88.4 %, in Saudi Arabia from 1.6 % to 32.3 % (UN 2015c).

Thus, international migration flows in the contemporary world became global phenomena and this affects all spheres of life of the global community, and international migration became one of the key factors of social and economic development of states.

Geographic Expansion of International Migration Flows

Nowadays, migrants live almost in every country of the world (UN 2016). Even such 'closed' states as Northern Korea or Cuba are getting more and more proactive in the migration processes considering that emigration is much more strictly controlled there than immigration, as opposed to many other countries.

It should be noted that in spite of the fact that the majority of international migrants originate from developing countries, the contemporary migration flows do not have only 'South-North' or 'East-West' vectors. Nearly half of all reported migrants move from one developing country to another and approximately the same amount move from developing countries to the developed ones. In other words, the number of migrants who move from 'south to south' approximately balances the number of migrants who move from 'south to north'.

In the 21st century, all countries and territories of the world are, in one way or another, countries of destination for some migrants. The era of fast transportation throughout the world affects every country, and international migrants appear everywhere. According to the UN Population Division, in 2015 the only sovereign state in the world, where the number of international migrants was less than 1,000 people, was the Republic Tuvalu (its population is less than 10.5 thousand people) (UN 2015c).

In 1965 there were 41 countries with the number of migrants exceeding 300 thousand people, while in 2000 the number of such countries grew to 66, and by 2015 it reached 81; moreover, in 37 countries the number of international migrants exceeded 1 million persons, while in ten countries it was more than 5 million persons. At the top of the list are the USA (46.6 mln persons), Germany (12.0 mln persons) and Russia (11.6 mln persons) (see Table 2).

Table 2. Countries hosting the largest numbers of international migrants, millions

country	2000	country	2015
USA	34.81	USA	46.63
Russia	11.90	Germany	12.01
Germany	8.99	Russia	11.64
India	6.41	Saudi Arabia	10.19
France	6.28	United Kingdom	8.54
Ukraine	5.23	UAE	8.10
Canada	5.51	Canada	7.84
Saudi Arabia	5.26	France	7.78
United Kingdom	4.73	Australia	6.76
Australia	4.39	Spain	5.85

Source: UN 2006b, 2015c.

Thus, over the last 60 years the shifts in the global migration situation were primarily related to considerable changes in geography of international migrant flows as well as to the increasing number of countries involved in international migration processes.

Qualitative Shifts in the Structure of Migration Flows

The profound changes that happened in the world in the second half of the twentieth century are rooted in the development of the post-industrial sector of economy and associated transformation of the demands at global labor market, as well as liberal reforms and democratic shifts in the post-communist and developing countries. This encouraged a qualitatively new stage in the development of international migration. In what follows we point out the key changes in the patterns of international migration.

Shift from Permanent to Temporary Migration

The existing data do not provide reliable information on temporary migration flows and for the most part temporary movements are not recorded in the statistics, whereas detailed information on temporary migrants is not regular. Meanwhile, surveys conducted in some countries of destination and statistics on travelers prove that in the recent five decades the number of permanent (or long-term) migrants has been gradually increasing, however, the number and frequency of short-term movements were growing much faster.

Among all the forms and types of international migration, the labor migration has been growing most rapidly during the last decades. This happens due to the spreading and greater availability of transport which facilitates migration and 'reduces' the distance between countries and continents. In this situation a temporary work abroad is more preferable than emigration since it incurs fewer material and non-material costs.

On the other hand, globalization of the world labor market demands a more flexible behavior from migrants and this can be partially guaranteed by labor migration. The involvement of foreign workers on a temporary basis also corresponds to the goals of immigration policy in developed countries which are the 'globalization elite' and in many respects define the terms for other countries to participate in globalization.

Shifts in the Qualitative Structure of Migration Flows

In developed countries' labor markets which determine the direction and intensity of international labor migration flows, a constant demand for foreign labor is observed at two qualification 'poles': low-level workers and labors skilled in technologically advanced jobs. At the same time, the demand for foreign labor in countries of destination tend to evolve towards more qualified labor force, while the receiving countries strenuously encourage qualified immigrants in the branches and sectors of a national economy that face labor deficit.

The shifts in the qualitative structure of migration flows mean, first of all, an increasing number of skilled professionals among international migrants. This trend is closely related to the probably most painful phenomenon in international migration known as 'brain drain' which is a non-return migration of highly skilled specialists – scientists, engineers, physicians, *etc.* (including potential intellectuals such as students, post-graduate students, and trainees). The policy specifically aimed at attracting skilled personnel from other countries is widely used by developed countries, especially by the USA.

On the other hand, low- and non-skilled migrants face new barriers that hamper their access to the countries of final destination. Thus, there simultaneously operate the still preserved push factors in less developed states and the pull factors in receiving countries. As a result, the receiving states have to develop guest workers programs for temporary attraction of low-skilled migrants (ILO 2004: 127–151).

Feminization of Migration Flows

It is traditionally considered that males constitute the major part of international migrants. Females, if they took part in international migrations, used to be the male migrants' family members. But starting from the early 1990s the researchers noticed that currently more and more women migrate not in order to join their partners, but in the search for the jobs in countries where they hope to be better paid in comparison to their home country. In 2015, the share of women among international migrants in the developed countries exceeded 51 per cent (totally in the world – 48 per cent). The share of female migrants is the

largest in Nepal (69 per cent), Moldova (65 per cent), and Latvia (60 per cent) (UN 2015b).

In many respects, the above-mentioned fact is connected with structural modifications in the global economy, which accompany globalization processes. The development of the services economy encourage the increasing role of this sector in the structure of the developed countries' labor market (textile industry, leisure industry, social service, sex services, *etc.*) and constantly growing need in female migrants including those occupied in unqualified jobs.

The Determining Role of Economic Migration

The international migration flows emerge under the influence of different factors, among which economic factors are of primary importance. The growing role and scale of economic migration (first of all, of labor migration) is the most stable and long-lasting trend of international migration. It gained a crucial impetus from the expansion of capitalist economy and commercialization of labor. In terms of global economic globalization the most important issue consists in the formation of the global labor market which operates via export and import of labor resources and has developed to an unprecedented scale.

Despite the fact that one can hardly estimate the general scale of international labor migration flows since far from all the countries monitor the labor migration and a considerable number of labor migrants are illegal; thus, the international labor migration appears to be of a considerable scale indeed and moreover, it turns to be a growing trend.

Table 3. Distribution of migrant workers, by broad sub-region, 2013

Broad sub-region	Millions	%
World	150.3	100
Northern, Southern and Western Europe	35.8	23.8
Eastern Europe	13.8	7.0
Northern America	37.1	24.7
Latin America and the Caribbean	4.3	2.9
Sub-Saharan Africa	7.9	5.3
Northern Africa	0.8	0.5
Central and Western Asia	7.0	4.7
Arab States	17.6	11.7
Eastern Asia	5.4	3.6
South-Eastern Asia and the Pacific	11.7	7.8
Southern Asia	8.7	5.8

Source: ILO 2015a: 16.

According to recent ILO estimates, in 2013 there were 150.3 million migrant workers in the world compared to 86 million in 2000 and 3.2 million in 1960. Almost half of migrant workers (48.5 per cent) are concentrated in two broad sub-regions: Northern America and Northern, Southern and Western Europe. These sub-regions together make up 52.9 per cent of all female migrant workers and 45.1 per cent of all male migrant workers (ILO 2015).

Despite the fact that migrant-workers make up less than 4.2 per cent of the total number of economically active population of the developed countries, the role of labor migration for many receiving countries is much more significant. It is necessary to note that many countries are simultaneously host and home countries. For example, Canada is a

traditional country of destination for migrants, but it also sends a great number of workers, especially high-skilled, to the USA (ILO 2004).

We define the following three key factors determining the expansion of international labor migration and the latter's increasing role (IOM 2006: 18):

- the pressure of the changing demographic situation (first of all, the population ageing) and labor market needs in developed countries;
- the pushing demographic factors in developing countries and growing differences of income and opportunities between developing and developed regions, along with an increasing gap between the most dynamically developed countries and other developing world;
- established inter-country networks based on family, culture and history.

Remittances are the immediate and tangible benefit of international labor migration. The receiving countries financially benefit from labor migration mainly via receiving tax payments, while for sending countries the financial inflow from migrant workers is more diverse.

Thus, labor migration as a global transference of human capital has become an important factor of development of the global economy and at the same time it is a result and source of increasing interdependence between countries and regions of the world. Considering that people's international mobility in search for jobs will definitely increase in the globalizing world, it is necessary for countries of origin and countries of destination of migrant-workers to develop an efficient and fair management of labor migration (ILO 2006).

Permanent Growth and Structural Intricacy of Irregular Migration

Labor migration is closely related to another contemporary trend in the international migration – to a permanently growing irregular immigration.

There are no reliable data on irregular migrants in the world. According to different estimations, from 10 to 15 per cent of all international migrants stay in the countries of destination in violation of the law. In other words, irregular immigrants are about half of legal migrant-workers, and their number is not reducing despite the restrictive immigration rules and special laws directed against irregular immigration. Moreover, countries where the use of labor of irregular migrants is widely practiced are replenished with developing countries. For example, Mexico, the largest supplier of irregular immigrants in the world, is at the same time a receiving society for about one million irregular immigrants from the countries of Latin America and Caribbean. It should be noted that the development of irregular immigration brings the emergence of new categories and groups of migrants who violate the law (migration laws, labor codes, *etc.*), both in destination countries and in transit countries (Aleshkovski and Iontsev 2008).

Whatever the routes and means migrants use to enter a destination country and whatever measures are taken to prevent this flow, we think that it is hardly possible to effectively counteract irregular immigration under the existing predomination of capitalistic norms when in receiving countries the employers benefit from the cheap and rightless labor of irregular migrants, so that illegal migrants become 'pure taxpayers' beneficial for employers and receiving state. In combination with demographic pressure and economic

pushing factors in sending countries, these circumstances make irregular migration in the contemporary world structurally insurmountable.

However, this does not mean that we are unable to restrain the scale of irregular immigration. In particular, this can be achieved via a more effective management of legal migration flows. The most important issue for receiving governments is to realize that irregular immigration is neither a form of terrorism or criminality to fight with by all means, nor should they run to another extreme and open the doors wide for migrants, so that the citizens will have to defend their indigenous rights against undesirable invasion (Aleshkovski and Iontsev 2015).

Increasing Scale and Geographic Expansion of Forced Migration

Forced migration is a full range of spatial movements related to permanent or temporary changes in place of residence caused by extreme factors not depending on people's will (political and ethnically based persecutions, natural disasters, technological accidents, ecological catastrophes, armed conflicts, *etc.*). Forced migrants include: refugees, internally displaced people, asylum-seekers, ecological refugees, stateless people and others. For most of them, emergency and life-threat push factors are determinative.

Increase in the scale and geography of forced migration is related to the current stage of international relations filled with political tension, wars, ethnic conflicts, and ecological disasters (after Second World War, over 150 global and regional conflicts happened in the world). According to the UNHCR data, by the end of 2015 the global figure of forced migrants was at 55 million, of which 13.7 million were refugees, 32.3 mln internally displaced people, around 1.8 million asylum-seekers and 3.5 million stateless people (UNHCR 2015).

Table 4. Estimated forced migration stock at mid-year by major area, region, 1960–2015, millions

Major area or region	1985	1990	1995	2000	2006	2015
World	10.7	14.9	27.25	21.8	32.86	54.96
Europe	0.7	0.1	6.5	5.58	3.43	3.90
Africa	3.0	4.6	11.8	6.06	9.75	17.76
Asia	5.1	6.8	7.9	8.45	14.91	25.94
Latin America and the Caribbean	0.4	1.2	0.1	0.58	3.54	6.67
Northern America	1.4	1.4	0.9	1.05	1.14	0.62
Oceania	0.1	0.1	0.05	0.08	0.09	0.07

Source: UNHCR 2015.

Therefore, the forced migration as one of essential contemporary international migration trends has gained a global scale.

The Increasing Role of International Migration in Demographic Development

During the major part of the human history the population number primarily changed due to a natural increase of population. The mortality and fertility rates, growing gap in demographic potentials between less developed and more developed nations, as well as globalization of the world economy have resulted in the growing role of international migration in the demographic development of the globe.

Nowadays, international migration is one of the major factors of stabilization of the world population. As for developed states, it is the principal (and in some countries – the only one) determinant of the population growth, while in the developing states it contributes to the decrease in the population growth rate and alleviates ‘population pressure’. Thus, net migration from less developed regions to more developed regions exceeded 100 million persons during the period from 1950 to 2015 (UN 2015b).

Table 5. Indicators of Demographic Development of More Developed Regions, 1950-2015

time periods	Average annual rate of population change	Average annual rate of natural increase	Average annual rate of migration increase
1950–1955	11.9	11.8	0.1
1955–1960	11.7	11.7	0.0
1960–1965	10.8	10.3	0.5
1965–1970	8.5	7.8	0.7
1970–1975	7.7	6.5	1.2
1975–1980	6.5	5.2	1.3
1980–1985	5.8	4.7	1.1
1985–1990	5.5	4.2	1.3
1990–1995	4.4	2.3	2.1
1995–2000	3.2	1.0	2.2
2000–2005	3.4	0.7	2.7
2005–2010	4.0	1.3	2.7
2010–2015	2.9	1.0	1.9

Source: UN 2015a.

Considering the global tendency of decreasing population growth rates developing regions are at the initial stage of this decrease while in developed countries the rate of natural population growth is often negative. For this reason, the migration potential in developing countries remains high while developed countries are dependent on immigrants' inflow to withstand local population ageing. Between 1950 and 1955 the migration increase gains only 1.7 per cent of total population increase in more developed regions, and between 2010 and 2015 migration increase gains more than 65 per cent of total population increase (Table 5).

It is important to highlight that international migration is not only a way to increase the whole population number but it also has a positive impact on its age and gender structure, bringing higher reproductive standards.

In the 1990s the latter argument was applied within the ‘replacement migration’ concept which emphasized the potential of international migration from ‘demographically younger regions’ to compensate for negative demographic trends in the ‘older’ receiving states (UN 2000). Whether ‘replacement migration’ is able to solve problems of population ageing in developed countries is a scientific problem which requires further discussion. Taking into account constant negative trends in demographic development (first of all, population ageing) in developed countries, the number of immigrants required to replace them seems too large. There are forecasts that the EU countries, in order to ‘compensate’ for ageing of their labor-active groups, are to ‘import’ annually 12.7 million immigrants until 2050. Russia, in order, to provide a stable number of the labor-age population, is to admit annually (up to median forecast) about 700,000 – 800,000 migrants (net migration) and gradually increase this number up to 1.5 – 1.7 million migrants by 2025 (UN 2000).

In the 21st century the depopulation trends along with population ageing will make international migration a non-alternative factor of the population growth in the majority of developed countries. In this context, one should consider not only the impact of immigration on the population size in receiving countries but the fundamental shifts in reproductive behavior, gender, age, and ethnic structure of the receiving countries' populations due to inflow of immigrants from distant regions.

The Dual Character of Migration Policy

The transformation of migratory streams into a global phenomenon has aroused a significant interest of scientists, officials, politicians, international public organizations and public in the issues of international migration. In its turn, there emerged a necessity to improve the management tools for migratory processes (in particular, to prevent and reduce illegal immigration as well as to protect the refugees and others in need of protection) and to create a system of multi-level governance of international migration (GCIM 2005).

At the present stage the following three levels of international migration management can be distinguished:

- the global (world) level associates with a set of international treaties, agreements and other bilateral and multilateral normative legal acts on regulation of interstate territorial movements of population, and which pursues social, economic, demographic, geopolitical purposes, *etc.*;
- the regional (interregional) level which is a set of agreements and other multilateral normative legal acts of integration associations, regional consultative processes and forums on migration on regulation of interstate territorial movements of population;
- the national level (level of individual states) which is a set of measures and general principles to guide a government in managing the international territorial movements of population.

The results of our analysis showed that one of the established measures system characteristics in the field of interstate territorial movements of population management became its dual character.

At the current stage of globalization the dual character of migration policy is distinctly noticeable at three levels (Aleshkovski, Iontsev 2015):

- *the global (world) level* associates with contradictions between interests of various agents of international relations system (developed and developing countries, international organizations and certain states);
- *the regional level (level of integration associations)* associates with existing counteractive trends for liberalization of migration regime within integration associations and simultaneous toughening of migration policy towards citizens of third countries;
- *the national level (level of individual states)* represents a contradiction between social, demographic, and economic interests, on the one hand, and national security, on the other hand.

At the same time, the contradiction between migrants and host states as well as between businessmen and society in general, gains a particular meaning. It is especially important to keep this fact in mind since in recent years, in the developed countries the integrating policy for migrants can be implemented both at the regional and national levels.

Global Level of Migration Policy

The core of the international normative framework on international migration is constituted by agreements, recommendations and others legislative acts, which are adopted at different meetings and conferences, conducted under the auspices of the largest international organizations, mainly the United Nations and its agencies (UNFPA, UNCTAD, UNHCR), International Organization for Migration (IOM) and International Labour Organization (ILO).

The Compendium of Recommendations on International Migration and Development, published in 2006 by the Department of Economic and Social Affairs of the Secretariat, defines to what extent the adopted documents should provide guidance to the governments to promote co-development initiatives in international migration management (see UN 2006a: 95–98).

Thus, the conducted analysis showed that resulting documents of conferences and summits contain various recommendations for improving the migration policy. At the same time, one can define the *dual character* of the approaches to managing the migratory processes at the global level. The duality at the global level proceeds, first of all, from the differing interests of various actors of the international relations system which are often in conflict with each other. For example, there are contradictions between the major countries of emigration and countries of immigration. As a result, many documents and agreements signed at international conferences remain for many years non-consummated or are applied in a limited number of countries since they have been ratified by an insignificant number of countries.

A typical example here is the situation with ratification of international conventions dealing with migrant workers and affecting economic interests of receiving states. For example, by the present time only 26 per cent of countries has ratified the 1949 Convention No. 97 ‘On migrant workers’ of the International Labor Organization, and as many as 12 per cent of countries has ratified the 1975 ILO Convention No. 143 ‘Concerning Migrations in Abusive Conditions and the Promotion of Equality of Opportunity and Treatment of Migrant Workers’. In its turn, the International Convention on the Protection of the Rights of All Migrant Workers and Members of Their Families was adopted in 1990, came into force only in 2003, and has been ratified so far only in 24 per cent of countries (UN 2015a; ILO 2015b).

Regional Level of Migration Policy

Regional cooperation for the management of labor migration can be divided into formal mechanisms of regional integration (*migration policy as a component of regional integration*), regional inter-state agreements (*migration policy in the framework of inter-state agreements within a region*) and less formal mechanisms, such as regional consultative processes and other informal arrangements.

The dual character of the migration policy is expressed in two aspects. First, under the conditions of actively developing processes of the regional integration in the modern world, we witness liberalization of migration policy, the appearance of ‘transparent borders’ in the framework of regional unions, and freedom of movement for the population and labor force among the member countries across the internal state borders of those unions. On the other hand, many countries adopt increasingly strict measures towards migrants from ‘the third countries’, caused by different aspects of the national security

(including a fight against the threats of international terrorism and protection of the national labor markets).

The second aspect is that the interests and goals of integration association, in general, cannot coincide or can even contradict the interests of individual member states. For example, the position of the United Kingdom from the very beginning of its accession into the EU (1973) had a somewhat special limiting character which, afterwards, found its reflection in that it refused to sign the Schengen agreement. Another example is the North-American Free Trade Agreement (USA, Canada and Mexico), giving a lot of a freedom of movement to citizens, including labor migrants between USA and Canada; however, the possibilities of labor migration from Mexico to those countries are significantly limited.

National Level of Migration Policy

In different periods of history, various components of the government migration policy (emigration or immigration) predominate and define the migration policy for a certain period.

In the special periodical UN publication on demographic policy (World Population Policies Database), there is a special chapter on different national government views and state policy on international migration. Currently only 13 per cent of sovereign states do not regulate the scale of immigration, while 45 per cent of countries do not pursue any emigration policy (UN 2013a). At the same time, all developed countries have their immigration policies. Thus, the immigration component prevails in the modern migration policy. Within the framework of this prevailing immigration policy the governments are interested to learn, who the arriving migrants are: the nationality, profession, qualification, age, family status, *etc.* These characteristics receive special attention taking into consideration the labor market situation, demographic tendencies, as well as national security aspects.

The dual character of the migration policy is expressed in the contradictions of economic, demographic and geopolitical nature. For example, the economic development usually requires liberalization of migration policy, while the interests of national security often require stricter policy, which could be vividly observed after the 9/11 events in the United States.

In conclusion it is necessary to note that we believe that in order to overcome the dual character of migration policy and to benefit and use opportunities provided by safe, orderly and regular international migration as a resource of development one should apply a strategically adjusted approach to international migration management.

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Global Migration: A Transnational Problem*

Miriam Farhi-Rodrig

In the present paper I search for a tentative compromise which would be practical and ethical or simply decent in order to contain the problem of global migration. The compromise I suggest is, as much as possible, to take into account the principle or criteria of mutual interest between migrants and native citizens at the municipal level and, to a lesser extent, at the national level and beyond. The regulation of immigration is a national prerogative by national consent, but it is controlled also by regional and global agencies. Here I examine to what extent the formulation of the problem of global migration is conditioned on the model of globalization? In other words, I examine in what way the issues of global migration change with our dynamic concept of globalization. The traditional model of globalization is national, and national government controlled, effectively or not, migration. This means that government regulated the limits of their citizenry. The global problem of immigration and their solutions were formed with regard to national government and the power of global policies (such as those by the UN) was measured with respect to national policies. National policies were the target of evaluation – normatively or effectively. The new model of globalization admits that decisions are effectively made also beyond the national level, that is also both at the municipal and global levels. This model limits the power of government to regulate citizenry. In fact, as this model gets more acknowledgment, cooperation among different levels are enhanced. As a result, the problem of migration may eventually gain more effective recognition as well as enhance the resiliency of one of the new challenges of philosophy, namely the examination of the social, political and economic conflicts global migration creates.

Keywords: migration, liberalism, citizenry, decent society, global problems, mutuality of interest, urban techno citadels, global cities.

Introduction

Our times are enchanting and distorted: we have lost the audacity of the Renaissance, the naivety of the Enlightenment, but, I hope, we have overcome the despair of Post-Modernism as well. We are bravely experimenting with new models in different fields and fearlessly adopting hybrids, multidisciplinary processes and new forms that transcend the existing ones in art, architecture, literature and not least in everyday social life. However, I have not only reservations, but downright dissatisfaction as well, regarding the workings of national and global political economy (on which global migration spreads its loose net).

* An earlier version of this article was presented at the 23rd World Congress of Philosophy, Athens, August 4–10, 2013.

As a result of my dissatisfaction regarding the workings of national and global political economy, I looked for a tentative solution to the problem of global migration. To my surprise, I discovered that global cities, in general, offered workable social and economic solutions to the problem of migration in their cities.

My aim here is to design a conceptual framework for society in conjunction with the problem of global migration. Migrants are the weakest group of the population of any region. The author of the much debated book, *Capital in the 21st Century*, Thomas Picketty (2013), examines the relation between growing wealth and income inequality and finds that immigration boosts growth and, to some extent, reduces the economic gap between the rich and the poor because, he says, there is more income to share and distribute in a growing economy than in a shrinking one. As such, Picketty dissolves the consensus that the problem of global migration is degenerative. In other words, Picketty interprets global migration as a force that expands the economy and acts against plutocracy that creates and widens income inequality.

I look for a robust yet flexible *modus Vivendi* for a decent society of migrants and citizens. My proposition for a *modus Vivendi* is on two levels: political and municipal. On the political level, I propose the implementation of a new form of citizenry within the new limited cosmopolitan space. On the municipal level, I find that the municipalities of global cities to some extent accommodate the problem of the degrading quality of services they offer to their residents that arise as a result of global migration to their cities. I propose that governments of nation-states, as much as possible, adopt the working procedures of the municipalities of global cities where migration is dense. Such procedures may pave the way to decently accommodate social and economic networks for the survival and even flourishing of the legal and illegal residents of global cities in spite of the current reduced and rigid concept of citizenry. I, then, conclude that, just like in the case with home computers, when children taught their parents how to master this new ghost that intruded into their private space, municipalities of global cities have to teach their governments how to deal with the problem of migration that intrudes into the public space. Then, governments would issue more flexible laws of citizenry in the newly transformed public spaces with respect to global migration.

Global migration is a global problem to which global politics should provide solutions.¹ By the term ‘global politics’ I mean global cooperation and coordination backed up and supported by global legislation and, as much as possible, jurisdiction and enforcement. We observe, however, that solutions offered both at global and national levels do not work well. Saskia Sassen (2005: 35), a Dutch-American sociologist from Columbia University, in her article ‘Regulating Immigration in a Global Age: A New Policy Landscape’ writes, ‘yet immigration policy in most of the highly developed countries has not been marked by major innovation as we have seen in other policy realm’.

However, the solutions devised in global cities where migration is dense, work relatively well, and somewhat better than existing solutions provided at national and global levels (Khanna and Maniam 2011). This is not surprising: global politics is not institutionalized and global coordination of migration is not high on the agenda of global institutions, strong governments and globally influential decision makers. Yet, it is generally argued that global migration puts pressure both on economically advanced democratic states and

¹ Regarding estimates on internal migration, cf. UNDP 2009: 21, and also World Bank 2013: 2–13.

on global cities where migration is dense. Sassen suggests that the solutions devised by individual states to control existing borders may not be workable any more:

What is now experienced as a crisis in the control of the state over its borders may well be the sign that we need to redraw the map within which we confront the difficult question of how to regulate and govern immigration flows in an increasingly interdependent world (Sassen 2005: 37).

At the national scale, national political institutions such as political parties, agonize over the pressure from immigration on their electorate and suggest tailor made rules to protect the existing legal status of citizenry, without too much concern for the legal status of migrants. In global cities, the situation is somewhat different: for example, the right of residency and the freedom of settlement are elaborated according to the urgent needs of the residents, both citizens and migrants (see *e.g.*, Acuto and Khanna 2013; Ong 2003).

While exploring the existing solutions to alleviate the problem of global migration in particular within urban spaces hosting migration, I discovered the almost unnoticed and unspectacular contributions of municipalities to accommodate the way migrants are incorporated in urban techno citadels or global cities.

The plan of the paper is as follows: first, I briefly describe the phenomenon of migration. Second, I dwell on the characteristics of a decent society prior to the contemporary era of globalization. Third, I examine a few policies to accommodate global migration. Fourth, I discuss the future of global cities as a hope for transforming the problem of global migration into a sustainable problem waiting to be attended to, at a global level. I, then, wrap up my discussion in three main points and present my modest and tentative solution to the problem of global migration. For example, smart cities, one of the latest developments of the advancement in the communication technology, namely the Internet, accommodate for the adoption of such solutions.²

1. What is Migration?

In the modern period of development of nationalism, migration was simply the movement of people over national borders (Benhabib 2006; Gellner 1983; Beck 2007). It can also be further divided into legal and recorded or illegal and unrecorded migration or according to purpose (family reunion, tourism, work *etc.*) or according to migration being voluntary or involuntary (refugees, asylum seekers and modern slave trades). The rights and the recognition of each group differ. But this does not mean that the problem of global migration may be solved by tailor-made rules since we have to remember that migration is an integral part of global transformations (see *e.g.*, Stiglitz 2010; Krugman 2007).

Today migration is a trend that reshapes society in general and has already triggered contentious debate over policies affecting liberal institutions such as those protecting human rights, group rights, women's rights, freedom of expression, freedom in university education, the relation between state and religion in the sense of extending freedom of worship and reducing the role of the government in social and economic life (Beck 2009; Bauman 1998, 2000). Indeed the spectrum of influence of global migration on all facets of life is wide and ambiguous.

² I develop this point in a forthcoming article called 'Smart Cities and Global Migration'.

2. A Decent Society

Originally, that is in the modern period of nationalism, prior to the era of contemporary globalization, the accepted building blocks of a decent society were based on the traditional political model based on the hard-line approach characterized by a clear cut and rigid perspective. This perspective included, among others, the following principles:

- (1) the motto which calls to find the migrants, arrest them and throw them out;
- (2) rigid and reduced citizenry laws which delineate citizens from migrants;
- (3) a traditional model which reflects a commitment to law and to equality of rights of citizens only.

Global transformations today are thinning this ethos, baring the concept of citizenry to the extent of making it skin deep only, to declining the unique sovereignty of the states over their citizens and to denuding borders of their original *raison d'être* (to prevent infiltration). In other words, the trend is that borders are less of a barrier to the free movement of people and that there are many more cosmopolitans scattered globally with fewer and weaker attachment to nation-states (Habermas 1998, 2001; Benhabib 2006). The cosmopolitans and the progressive liberals within nation-states create a global community with relatively new traits such as global consciousness and global or regional political solidarity (Habermas 2013). Already a century ago, Dewey was the harbinger of this community.

As a matter of fact, a modern society is many societies more or less loosely connected. Each household with its immediate extension of friends makes a society; the village or street group of playmates is a community; each business group, each club, is another. Passing beyond these more intimate groups, there is in a country like our own a variety of races, religious affiliations, economic divisions. Inside the modern city, *in spite of its nominal unity*, are probably more communities, more differing customs, traditions, aspirations and forms of control, than existed in an entire continent at an earlier epoch (Dewey 2016 [1916]: 12, – italics mine, *MFR*).

The global community today, however new, virtual and with almost no judiciary status, is not marginal though not fully mainstream. This community is in the process of developing the global consciousness and solidarity that are needed to support human rights and ecological sustainability. They request a revision in the building blocks of a decent society in the traditional model, in particular regarding its rigid and reduced citizenry laws. This request is met differently by governments of nation-states and municipalities of urban citadels. We even see a divergence in the goals and incentives of national and urban legislation and jurisdictions. In particular, there is pressure from the citizen residents to the national authorities to issue the laws from which clear and stable policies may be devised in order to alleviate the problem of global migration or, more specifically, non-citizen residents, in what concerns their resilience and quality of life (Benhabib 2006; Baubock 2005).

Within this divergence in goals, we find that the criteria of mutuality of interest are more salient and remarkable in urban policy making within the limits of municipal legislation than in national legislation. An example of the way the criteria of mutual interest may be applied is found in the allocation of greater urban spaces to informal economies and to unfamiliar lifestyles in urban citadels with extensive immigration participation (with the aim of extracting the much needed revenues). Nevertheless, the allocation, to some extent,

reduces the marginalization of immigrants and helps monitor a feasible *modus Vivendi* of residents, both migrants and citizens. As such, policy makers in urban citadels maneuver between respecting national legislation and agreements concerning migrants in these urban citadels and protecting the criteria for the mutuality of interest within their area of jurisdiction (Benhabib 2006; Baubock 2005). This maneuvering, on the one hand, touches sensitivities regarding sovereignty and, on the other, only partially alleviates the problem of global migration both for citizens and migrants.

Mutuality of interest dwells on the grounds of mutuality of benefits. This goes hand in hand with the principles of liberalism and the enhancement of existing institutions which I mentioned earlier and that protect liberalism. In fact, to ignore the principle of mutuality of interest as criteria for policy construction may rebuke migrants. The rebuke would immediately harm human rights and thus harm liberal institutions and the current understanding of democracy and liberalism, the pillars of economically advanced modern states. The economically advanced modern states inherited these pillars from the era of Modernity (sometimes also named First Modernity) at the turn of the previous century (see, e.g., Gellner 1983; Farhi-Rodrig 2011). Nevertheless, in spite of these pillars, global migration remains to be an ambiguous and multi-level problem (economic, political, social and communitarian).

In short, the framework for society and space in conjunction with global migration into urban techno citadels is characterized by open, complex and self-organizing systems such as observed in urban spaces: in urban spaces, the self-organizing systems are heavily dependent on economic and socio-cultural global and local processes or briefly, the geo-political transformations. These transformations put pressure on the framework in which global cities develop in a way that it becomes more open, more dynamic and more extensively self-organizing. In addition to that, the lack of clear legislation and jurisdiction leaves to both migrants and citizens the leeway for maneuvering and promoting their respective interests. In other words, the resilience of migrants and citizens is enhanced as the current geo-political transformations challenge the stability and status quo of global cities. As a result, the lifestyle entitlements of the growing population of migrants are, to some extent, accommodated. Migrants, even though they are non-citizen residents, become active participants in establishing policies in urban architecture (such as in parks, in cheap housing, in settlements and in space allowed for informal economies). Migrants, also, act as a trigger in developing policies regarding functional eco-systems such as kindergartens, grocery stores, social clubs and non-profit organizations informed by their lifestyle entitlements and leisure opportunities and preferences. It is these changing policies in urban spaces rather than national jurisdiction that provide freedom of circulation and rights of residency and settlement for migrants while their aspirations for more flexible citizenship rights gradually fade away.

3. Policies to Accommodate Global Migration

Within this framework and viewing the problem of global migration broadly, I find that the new challenge is to design stable policies that are more sensitive to the needs and requirements of migrant minorities and to find a workable *modus Vivendi* which, on the one hand, as much as possible, contains migration and, on the other, harbors migrants with the aim of supporting and sustaining a decent society of migrants and citizens.

Upfront, I acknowledge that if an economically advanced nation-state, such as the USA, would, unconditionally, open the gates to migration (allowing free passage into her territory), its economy would collapse immediately. In other words, though I am a liberal, I do not advocate the unconditional free movement of people. Instead, this acknowledgement, in my view, is rational thinking in interaction with changing socio-economic and cultural processes that are part of the self-organizing systems in the framework of urban spaces. Or put it simply, it is rational thinking given the current framework or situational logic or context. Popper (1979, 1999) coined the term *piecemeal engineering* to denote *this attempt to reach reasonable outcomes*.

According to Popper, given a problem, say global migration, policies devised are challenged by the interaction between the dynamic social environment (global transformations) and the problem itself (global migration). As a result of the implementation of the devised policies, errors are discovered and better appropriated new policies are devised. Eventually, new problems arise and the process starts again. This is piecemeal engineering that may serve as a construct for small interventions and not for ultimate solutions. Small interventions make, to some extent, practical ethics possible and accommodate practical social life as much as possible.

Habermas (1998, 2013), on a similar note proposes the enhancement of communicative rationality between citizens and migrants expecting to achieve intervention on a wider scale. According to him, solidarity (political) among those with similar ideals (faith in democracy, in siblinghood of humanity) is required in order to reach reasonable outcomes. Habermas differentiates between political solidarity and human solidarity (pity, religious principles, paternalism, *etc.*). He emphasizes that communicative rationality is achieved by the development of the new kind of solidarity (political solidarity) as he described.

Still, I find that a massive investment in the economies of the most desolate regions of the world may, in the first place, trigger hope for a better future and then act as a booster to accelerate the desolate economies. This development may immediately contain or delay migration and, to some extent, even invert the direction of migration (Rosenstein-Rodan 1943; Sassower 1995). I mean migrants may go back to their native states and even some citizens of the hosting states may become migrants in the developing states. (When the Mexican economy somewhat improved in the aftermath of the 2008 global mortgage and financial crisis, many would-be migrants in Mexico delayed their immigration to the USA. As the 2008 crisis deepened in the European Union, the flow of immigration from Brazil to Spain slowed down and in some cases the flow of immigration reversed). In other words, by moderating migration and allocating massive investment to desolate regions, also may to some extent, serve as a policy that takes into account the criteria of the mutuality of interest. Next, I wrap up my discussion in three points and, then, make my concluding remarks.

4. A Quick Wrap up

First, on an economic level, it is not clear to what extent global migration is an economic problem for the hosting states. On the one hand, the part of the world, which attracts migration, is economically advanced and democratic and, incidentally, this part of the world saves much less than is required to meet the demands of its aging population. In other words, the hosting states spend more than they can afford to, given their social agreements, say with pension funds. Migrants, on the other hand, produce more income

than they consume in the hosting states making a positive contribution to the GNP of the hosting states. Thus, migrants contribute to increasing savings which may assist natives to honor, at least, parts of their social commitments. This is not all. In the hosting states, the private sector in general and industrialists in particular are for migrants as well, since it is no secret that they like cheap and abundant labor. So global migration is not only a burden to the hosting states, but it is also a blessing for their economy. Picketty (2013) also shows that migrants contribute to the reduction of the income gap in the hosting country, by expanding its gross national product and thus increasing the volume of wealth to be distributed.

Actually, despite episodic efforts to control migration, national governments are generally unable to withstand private sector influences favoring migration and unable to systematically track and regulate individual migration. For example, in Israel, African refugees and asylum seekers make up almost half per cent of the population in the territory and many are currently employed in formal and informal economies, many of them, without any legal status.³

Second, on a political level, on the one hand, migrants put pressure for obtaining more flexible citizenship and residency rights that may lead to greater liberalization with enhanced global, national and civil rights. On the other hand, greater liberalization may threaten political stability in the hosting country and signal to many would-be migrants to leave their countries of origin which would further contribute to the political instability.

Third, on a social and communitarian level, social practices and lifestyle entitlements of migrants are often rejected by citizens, on account that these practices are harmful to their society to the extent of abusing rights and powers that the hosting states extend to their citizens, for example, minimum wages and real estate prices in regions where migrants dwell, generally, in clusters. This is a problem that requires new legislation and policies that reallocate funds to areas and groups most affected by the pressure of migration. Governments of democratic nation states are expected to attend to these problems (Balibar 2006; Mouffe 1991, 2005).

Yet, no matter to what extent these problems will be attended, the urge for survival in desolate areas will motivate many to move, despite marginalization of refugees in the hosting destination states. For example, according to Cowell and Bilefsky (2014)

Frontex, the [European] union's border agency, also said the number of migrants from outside Europe known to have entered Europe illicitly this year was already close to the total for all of 2013 and was likely to rise as summer weather brings calmer seas, benefiting migrants crossing the Mediterranean from northern Africa.

So, the framework in global cities which is open, dynamic and self-organizing will continue to be more open, dynamic and self-organizing, no matter how much antagonism global migration creates within the native population.

5. Conclusion. The Future of Global Cities: A Possible Solution?

Harnessed by the criteria of the mutuality of interest, the open, changing and self-ordering frameworks of the political, social and economic spheres in global cities meet, to some

³ The current number, according to PIBA's (immigration authority) most recent report is 46,437 (33,999 Eritreans, 8,772 Sudanese and 3,049 other Africans). There has never been any formal clarification whether this includes births in Israel, but the assumption is that it does not, since births are not formally registered. More information may be found on PIBA's website: <http://www.piba.gov.il/publicationandtender/foreignworkersstat/pages/default.aspx>.

extent, the new needs of the legal and illegal residents: Khanna (2010), a geo-strategist at the New America Foundation, maintains that 'cities rather than states are becoming the islands of governance on which the future world order will be built'.

This perspective is rather new. In urban techno citadels, this perspective of cities as centers of governance originates, to a great extent, from both the impact of global transformations and of global migration. Following this line of thought, it may be that, eventually, global cities will offer services and solutions to other cities in fields such as global migration, on line identity of their residents and regulatory oversight of national decrees in most aspects of life, social, economic and even political. In other words, cities may become platform managers and curators of ecosystems giving democracy a new turn, transparent, decentralized and organic. The bottom line is that global cities become the locomotive of future changes not only for other cities and for accommodating global migration, but also for corporations, countries and even unions.

As a matter of fact, already today, in urban techno citadels the reduced and limited concept of citizenry is not anymore the unequivocal guard of sovereignty and of the so-called, social glue of society. In such spaces, the reduced concept of citizenry serves a new and weakened purpose: it, simply, serves as a standard of assessment, a tool for inquiring and understanding the changing processes in the framework of urban citadels and beyond (Ong 2003).

Such transformations sharpen sensitivities of certain members of national governments: for example, citizens may discover that their governments contain a ministry of interior more attentive to the economic value of migrants, a ministry of housing more attentive to the loss of value of the real estate in areas where migration is dense, a ministry of education more attentive to the changing needs of the migrant and non-migrant young children and students, a ministry of welfare more attentive to the needs and requirements of the migrant minority. In other words, citizens of these global cities may discover that their governments have become more optimal.

Against all odds and in view of my exploration of the almost organic transformations in global cities, I find that a new world order is evolving in which new political partners will, gradually, pair up to increase resiliency worldwide. The Russian scholar, Leonid E. Grinin expands this point beyond global cities. According to him, global cities would be an intermediary form towards shaping a new political order that is more optimal as well.

During the struggle for a role in organizing and operation of the new world order, *an epoch of new coalitions* will come, which will outline the contours of a new political landscape for a considerably long period... In searching for the most stable and adequate supranational systems various intermediary forms may develop, where the players of the world and regional political arenas will search for the most favorable and convenient blocks and agreements (Grinin 2012: 226–227).

To repeat, in line with the predictions made by Leonid Grinin, I propose that national and municipal policy makers consider the principle of mutuality of interest between themselves, as well as, the mutuality of interest between migrants and non-migrants and thus, loosen both the hierarchy set by the political system and the already scarred sensitivities

regarding national sovereignty. In other words, cities must be empowered rather than restrained by national governments to become more active agents in solving the problem of migration within their municipal territory. Then, national and local legislation and jurisdiction may cooperate instead of act hierarchically. The hierarchy will gradually dissolve within the dynamic public space, eroding sovereignty and gradual transcendence of nationhood. The hierarchy will, then, dissolve into an ideal of global citizenry and of global coordination in which cities are weaved together into a new form of cosmopolitanism and the most desolate regions of the planet are invited to join the bandwagon of the global economy. Migration will, then, gradually become a solution to problems rather than a problem or a burden. The resulting society would be more democratic as well as more human and its economy would be more inclusive.

The question is what can go wrong? Old and new problems may arise in different intensities and dimensions that require the implementation of old and new solutions which will be replaced or reformed as mistakes and new problems are discovered. As long as decision makers stick to democratic procedures and learn from their mistakes, the worst scenarios may be avoided and philosophy may, then, take a short break.

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Part III. ASPECTS OF GLOBALIZATION AND INTERNATIONAL POLITICS

Transnational Labor Relations in SADC: Regional Integration or Regional Globalization?

Paul A. Smit

The Southern African Development Community (SADC) is a transnational organization that has 15 member states and total population of about 280 million people. One of the aims of SADC, as founded in Article 5 of its Treaty, is to strive towards regional integration. SADC has adopted certain basic norms and standards in its Treaty, Charter on Fundamental Social Rights, and various protocols that are applicable to all citizens within SADC. In this paper the concept of a Transnational Legal Process (TLP) and regional labor standards are reviewed. Attention is given to the establishment and original aims of SADC. The SADC Charter is analyzed and the institutional architecture of SADC is discussed. The link between the ILO core conventions and the SADC Charter is also shown. The author argues that regional integration and a Transnational Labor Relations system within SADC is possible and that the SADC Charter and the ILO core conventions can be used as the basis of regional labor standards within SADC which in turn will lead to the achievement of social justice. The author also evaluates the link between regional integration as a SADC strategy and globalization and argues that regional integration is not necessarily regional globalization.

Keywords: *Transnational Labor Relations (TNLR), social rights, labor rights, regional labor standards, international law, regional integration, globalization.*

Introduction

John Donne's famous saying 'no man is an island upon himself' is even more relevant today than it was in 1624 especially in the world of international trade, globalization, international treaties and the United Nations. We live in an age of transnationalism, where transnational legal norms move around the globe. Globalization and the increasing movement of capital and labor across international borders, with the exception of migrant workers who are facing major obstacles by immigration laws, are creating a situation where laws in general and labor laws in particular are obtaining an international character. Internationally the problem of movement of labor is the asymmetric structure between capital and labor in reference to the freedom of movement. In view of increasing globalization, the Conventions of the International Labor Organization (hereafter the ILO) have assumed greater prominence in recent years. Internationalization and globalization have had a growing impact in many areas especially in legal and economic relations (Smit 2010).

There has been a rapid growth in the role of international agreements and supranational authority over the past 40 years that regulate economic, social, communications, envi-

ronmental and human rights behavior (Simmons 1998). Transnational relations influence world politics in almost every issue-area. Many multi-national corporations with subsidiaries in other countries have annual financial turnovers larger than the gross national product (GNP) of several countries, and create adaptation problems for the foreign economic policies of many states (Risse-Kappen 1995). The original concept of transnational relations encompasses almost everything in world politics, except inter-state relations. This has led to a situation where many sovereign nation-states were forced to choose a side in establishing their political, economic, social, and cultural relations and operations, which, in itself, again led to regionalism.

The SADC Region has a total population of about 280 million and is considered to be one of the most promising developing regions in the world in terms of economic potential (Mukuka 2013). Almost 40 per cent of the region's population still lives in conditions of abject poverty which translates to a need of a sustained economic growth in the region of around six per cent per annum. This paper is premised on the conviction that the successful implementation of SADC policies, objectives as found in the SADC Treaty, Charter and protocols through appropriate employment and labor policies as well as strategies can contribute towards regional integration, regional labor standards, improvement in the quality of life of millions of people and the attainment of sustained growth that are required to alleviate and subsequently eradicate the unacceptably high levels of poverty in many SADC member states, it is, therefore, not necessary to re-invent the wheel. Unfortunately, the average citizen within SADC does not see or experience in practical benefit in all these policy documents (Smit 2014).

The purpose of this paper is, therefore, to analyze the theoretical framework of transnational labor relations and regional labor standards and what motivates countries to adhere or not adhere to transnational law. An overview of SADC and its institutional architecture is also provided. The SADC Charter, its origins and link to ILO core conventions are analyzed and the author illustrates how these instruments can contribute towards SADC regional integration and the establishment of a transnational labor relations system within SADC. The author suggests that a transnational labor relations system within SADC is attainable by just adhering to the ILO core conventions and the SADC Charter but that the practical problem lies with compliance and monitoring such. An overview of the concept of globalization is provided and the author argues that in the greater scheme of things the transnational labor relations can contribute towards regional integration and this in turn creates a framework for regional globalization. The possibilities for further research are also indicated.

Conceptualizing Transnational Labor Relations and Regional Labor Standards

Hyman defined labor relations as the regulation of work and employment and it involves different forms of collective regulation which refract and transform the merely monetary dynamics of the employment relationship (Hyman 2001). The living and working conditions of most working people and thus of society as a whole are determined by the nature and quality of labor relations (Kohl and Platzer 2003).

The development of a proficient labor relations system is as much an intrinsic part of a system change as it is a requirement for successful transformation seeing that they are primary components of civil society and can provide indispensable guidance for the resolution of social conflict, forming harmonies, economic modernization and the stabilization of social equality.

Initially labor relations emerged on a confined or sectoral basis, but it became consolidated within a national institutional structure (Hyman 2001). It is important that national labor relations systems must not be understood in isolation, but within a framework or structure to understand a global labor relations framework that is growing and developing (Lillie and Lucio 2012).

Transnationalism can be viewed as the shared, educational, political and economic associations and interactions that take place between people and institutions. Labor markets on the other side become transnational if they involve activities and occupations that require regular and sustained social contacts over time across national borders for their implementation (Horvath 2012). Transnationalism can also be seen as an escalating, deepening process in which innovative social practices, systems of symbols and objects come about through increasing international movement of goods, information and people. New transnational forces of capital and labor have surfaced as important actors as a result of the transnationalization of production and funding in times of global restructuring (Bieler 2005).

Transnationalism and all its different facets have a major influence on all the different role players in Transnational Companies (TNCs) and especially the employment relationship. Not only does a TNC need to integrate various human resource principles and policies to create cohesion (Dickmann, Müller-Camen, and Kelliher 2008), but also have to implement transnational human resource management (THRM) practices (Gennard 2008).

It becomes problematic where employment or labor decisions that are taken in one area of the world have an effect on employment relations somewhere else in the world. It is apparent that transnational relationships of actors have become so intertwined that it is almost impossible to understand the strategies of actors within one country without referring to the events and strategies of actors in other countries (Lillie and Greer 2007). It would seem as if transnational capital plays national environments of against each other but at the same time attempts to create a genuinely global business environment (Lillie and Lucio 2012). The globalization of markets and firms has had a profound impact on labor relations (Greer and Hauptmeier 2008) and defined Labor transnationalism as 'The spatial extension of trade unionism through the intensification of co-operation between trade unionists across countries using transnational tools and structures'.

Research on labor transnationalism is becoming more important due to the rapid growth in TNCs. Political entrepreneurs can play a vital role in the development of labor transnationalism. Political entrepreneurs should have the vision to look at transnational strategies and the leadership skills to impact on their own constituencies. International (or global) framework agreement (IFA) which is an instrument negotiated between a multinational enterprise and a Global Union Federation (GUF) in order to establish an on-going relationship between the parties and ensure that the company respects the same standards in all the countries where it operates also impacted on the research on labor transnationalism.

Helfen and Fichter are of the opinion that 'academic research is only beginning to deal with what we would define as an emerging arena of transnational labor relations' (Helfen and Fichter 2013).

The rise and growth of the EU are the landmarks of a development process that involved the globalization of capital and trade that resulted in the establishment of a new transnational regulations system as well as the reformation of general economies and welfare states. It is on this basis that different forms of transnational labor relations and or regional labor standards have emerged (Horvath 2012).

It would appear that transnational labor relations are still in an emerging, formative phase considering institutionalization, projecting a very fragmented, diverse and mixed

picture of development even though certain processes and institutions. European Works Councils have emerged within the EU that strongly suggests that the EU is on the way to the establishment of the EU transnational labor relations regime or regional labor standards. *Lillie and Lucio* have identified that there are two dominant trends in transnational labor relations research; namely, the optimists who show how it can work in specific situations, and then there are pessimists who stress labor's vulnerability against management-devised competitive frameworks (Lillie and Lucio 2012).

The expansion of transnational labor relations and the establishment of regional labor standards would require trade unions to reassert their main objectives in a contemporary language so that they can effectively function in flexible labor markets and different workplaces (Taylor 1999). There are obvious obstacles that stand in the way of the development of a realistic and permanent transnational labor relations system as transnational trade union federations must decide on strategies to confront the countless challenges from increasing globalization. The development of transnational labor relations and regional labor standards are of great importance as it can assist organized labor to mobilize and enhance its power through international agreements across national borders.

Transnational Law

To understand the general structure of the world's industrial relations system, the role of regional powers and transnational actors should be explained in order to perceive the influences of global challenges (Aliu 2012).

One can, therefore, rightly ask: *What is 'transnational?'* The term would indicate that it is beyond what is considered to be national, in other words, across national borders. *Transnational law* is the term commonly used for referring to laws that govern the conduct of independent nations in their relationships with one another. It differs from other legal systems in that it primarily concerns states, rather than private citizens. In other words, it is that body of law that is composed of the greater part of the principles and rules of conduct which states feel themselves bound to observe and, therefore, do commonly observe in their relations with each other. These include:

- (a) The rules of law relating to the function of international institutions or organizations, their relations with each other, and their relations with states and individuals; and
- (b) Certain rules of law relating to individuals and non-state entities, so far as the rights and duties of such individuals and non-state entities are the concern of the international community.

Transnational law can be equated with a *Transnational Legal Process* (TLP) which provides the key to understand the issue of compliance with international law. This view immediately raises the following question: why do nation-states and other transnational actors obey international law, and why do they sometimes disobey it? (Koh 1996) In order to answer this very important question three very obvious questions come to light, namely: what is a transnational legal process, where did it come from and how does it assist in explaining why nations obey?

Koh sees the transnational legal process as the manner in which theory and practice of public and private actors, nation-states, international organizations, multinational enterprises, NGO's and private individuals interact in a variety of private and public, international and domestic spheres and also how they interpret, enforce and then ultimately internalize the rules of international law. A TLP has four very distinctive features:

- i. It is non-traditional.
- ii. It is non-statist as it also includes non-state actors.

- iii. It is very dynamic and not static.
- iv. It is normative as it not only describes a process but also the normativity of that process (Koh 1996: 184).

It would appear that democracies are more likely to comply with international legal obligations, as they share an affinity with international legal processes and institutions. Countries with independent judiciaries are more likely to trust and respect international judicial processes and political leaders that are accustomed to constitutional constraints on their power in a domestic context are more likely to accept principled legal limits on their international behavior (Simmons 1998: 83–84). A transnational labor relations ‘regime’ would be a set of structures and norms operating across national borders to buttress national law and practices by either reinforcing national norms or superseding them (Trubek, Mosher, and Rothstein 2000: 1194). Chayes and Chayes contend that states enter into international agreements and that they will to a certain degree comply with those agreements on three propositions:

- i. The propensity to comply is more plausible and useful than the assumption that states will violate treaties whenever it is in their interest to do so;
- ii. Very often compliance problems do not reflect a deliberate decision to violate international agreements; and
- iii. Complete or strict compliance of treaties is unnecessary and all that is required is an acceptable level of overall compliance to safeguard the interest of the treaty (Chayes and Chayes 1993).

Efficiency, interests, and norms all favour treaty compliance. This is mainly because decisions are not free, there is a continuous recalculation of costs vs. benefits and also international treaties are related to states interests as international law cannot bind states except with their own consent. As national positions and interests evolve it will help to induce compliance. The fundamental norm of international law is *pacta sunt servanda* – treaties are to be obeyed, the compliance with international treaties and law is, therefore, also a very important normative process.

Noncomplying behaviour can be attributed to the following factors:

- i. Ambiguity and indeterminacy of treaty language as treaty language varies in its determinacy.
- ii. Limitations on the capacity of parties to carry out their undertakings. Apart from a political will to comply, the choice that must be made domestically requires scientific and technical judgment which states, especially developing countries, may be lacking.
- iii. All treaties require a period of transitions before mandated changes can be accomplished. Changing conditions and underlying circumstances require a shifting mix of regulatory instruments to which state behaviour cannot instantly respond. Treaties are not just ‘aspirational’, the ultimate goal is to start a process that will over time bring states into greater congruence with treaty ideals (Chayes and Chayes 1993).

The traditional model of industrial relations that are limited to the borders of nation-states is increasingly becoming problematic, with the opening of and merging of labor markets, of which the European integration process is a very good example (Seifert 2012). The market freedoms enshrined in the TFEU have contributed to building up an internal market on the European scale. Transnational enterprises can easily relocate their activities from subsidiaries in one country to those located to another country (Seifert 2012). Transnational collective bargaining in European-scale companies has gained increasing relevance over the last years due to the increasing number of European works councils (EWCs) that have been established. Jeremy Waddington describes EWCs as a Transna-

tional Industrial Relations Institution in the making (Waddington 2012: 232). European trade unions are also trying to undertake transnational collective bargaining with European-wide companies with European Framework Agreements (EFA) (Seifert 2012). EWCs and EFAs have given a transnational character to the labor relations in the EU.

There seems to be an increasing support for the establishment of a legal framework for transnational collective bargaining within the EU. The use of international labor standards in domestic law must be based on the legal materials available to states under their domestic laws. These materials include international customary law, the manner in which a state's constitution articulates with international law. International labor standards provide a rich and authoritative source for the development of labor law and national level that can ensure consistency between the different systems of law and at the same time ensuring state compliance with international obligations (Cheadle 2012).

Establishment and Original Aims of SADC

Current members of SADC are Angola, Botswana, Democratic Republic of Congo, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, Republic of South Africa, Swaziland, Tanzania, Zambia, and Zimbabwe.

SADC was originally founded in April 1980 as the Southern African Development Coordination Conference (SADCC) by the leaders of the so-called Frontline States in Southern Africa. The original aim was to create a mechanism whereby member-states could formulate and implement projects of common interest in select area in order to reduce their economic dependence, particularly, but not only on the Republic of South Africa. It was conceived as an economic dimension of the struggle of liberation from colonial and white minority rule and the economic domination of the sub-region by the apartheid regime in South Africa (Ngongola 2012).

The founders were clear that trade and market integration were not its priorities, the desire was for genuine and equitable regional integration. Trade liberalization and market integration became part of the SADC common agenda when SADCC became SADC under the Windhoek Declaration and Treaty of 1992. This treaty provided for Regional Economic Communities (RECs) for the different sub-regions of Africa and SADCC had to be repositioned as the REC for the Southern African sub region and by including South Africa as a member and prioritizing trade liberalization and market integration. A protocol on trade was signed by eleven member states, excluding Angola, in 1996, providing for the establishment of a free trade area (FTA). This protocol became into force in January 2000 when it was ratified by two thirds of the members (*Ibid.*).

SADC member states are encouraged to ensure the harmonization of political and socio-economic plans, to develop economic, social and cultural ties, to participate fully in the implementation of SADC projects, developing policies that can lead to the elimination of obstacles to the free movement of people, labor, capital, goods and services and to promote the development of human resources and also the development, transfer and mastery of technology. Eight areas of cooperation have been identified and each area is administered by a protocol. A protocol enters into force if it has been ratified by at least two thirds of the member states and a protocol is only binding on a member state that has ratified it (Ngongola 2008).

The institutional architecture of SADC can be illustrated schematically as follows.

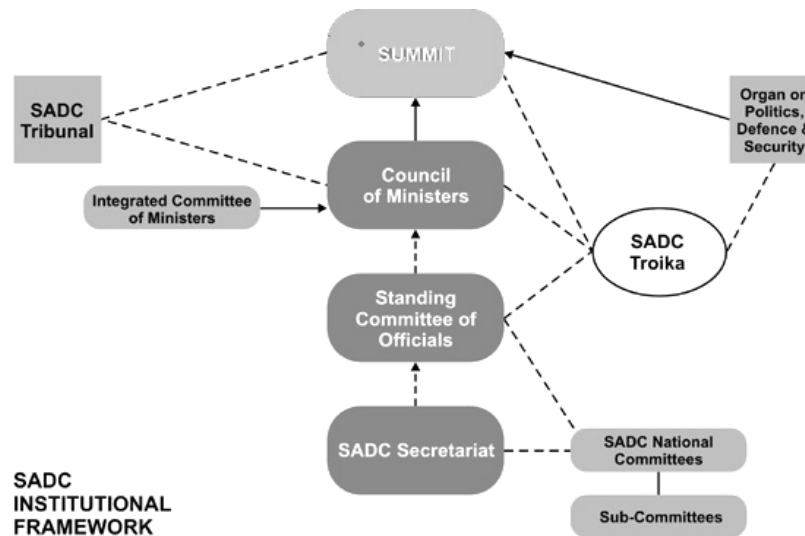


Fig. 1. The institutional architecture of SADC

Source: Peters-Berries 2002.

The main sections within the SADC institutional framework are described below.

1. Summit

The Summit is made up of all SADC Heads of States or Government and meets twice a year. The Summit is the ultimate policy- and decision-making body of SADC, responsible for policy direction and the SADC's overall control functions.

2. Council of Ministers

The Council of Ministers consists of Ministers from Foreign Affairs and Economic Planning or Finance of all member states. The Council oversees the functioning and development of SADC and ensures that SADC's policies are properly implemented. It is the Council's responsibility to manage SADC's affairs and to advise the Summit on matters of overall policy. The Council is the second highest level of authority and the highest functioning level in SADC and meets four times a year.

3. Standing Committee of Officials

The Standing Committee of Officials, a technical advisory committee to the Council of Ministers, meets twice a year. It consists of one Permanent/Principal Secretary, or an official of equivalent rank from each member state, preferably from a ministry responsible for economic planning or finance.

4. Secretariat

This is the principal executive body of SADC. The Secretariat is responsible for the day-to-day activities, co-ordination, strategic planning, and management.

5. Tribunal

The Tribunal, which is no longer functional, was established in Windhoek, Namibia with the signing of a protocol during the 2000 Ordinary Summit. The main aim for the estab-

lishment of the Tribunal was to ensure adherence to and implementation of the provisions of the SADC Treaty and Contributory instruments. Article 15 of the Treaty states that the Tribunal also has jurisdiction over disputes. The Tribunal derives its power and legal status from the SADC Treaty.

The institutional framework of the organization was previously oriented on a cooperative, and not on an integration approach. For this reason institutional challenges remain. There is still a huge gap between SADC regional initiatives and the member states' national objectives. Regional integration is high on the priority list of SADC and the initial agenda was to establish a Free Trade Area in 2008, a Customs Union in 2010, a Common Market in 2015, a Monetary Union in 2016 and regional currency in 2018. This regional integration agenda is very ambitious under the current environment and it is clear that it is not achievable. Some progress has been made towards the establishment of a Free Trade Area and a Customs Union but there still major differences between member states regarding the implementation.

SADC Charter on Fundamental Social Rights

The overall objective of the Fundamental Social rights in SADC Charter is to facilitate through close and active consultations amongst social partners, a spirit conducive to harmonious labor relations within the region.

The Southern Africa Trade Union Co-Ordination Council (SATUCC) played a major role in the drafting and eventual acceptance by the SADC Employment and Labor Sector (ELS) thereof in 2001.

SATUCC represents all major trade union federations within the Southern African region and was initially launched in March 1983 in Gaborone, Botswana (LaRRI 2001). Some of the main aims of SATUCC were:

- i. to co-ordinate union activities in the region;
- ii. to contribute towards economic and social liberation of the region;
- iii. to develop democratic and free trade unions and to assist the oppressed black trade unions, at that stage in South Africa and Namibia; and
- iv. to intensify worker education on matters related to social security and international labor standards.

In January 1995, the SADC Council of Ministers decided to create a new SADC Employment and Labor Sector (ELS) and SATUCC was recognized as the representative regional trade union body. As time went by SATUCC became politically visible and were reporting on economic and employment conditions and were also making suggestions to SADC (LaRRI 2001). The trade union movements within SADC were concerned that the economic focus of SADC states had overridden the political aspirations of regional integration. Several workshops were organized by SATUCC to address amongst other issues, the following:

- i. the development of a plan to regulate the free movement of labor within SADC until greater economic equality is achieved;
- ii. the role unions can play within SADC to ensure that minimum labor standards apply to all workers;
- iii. the need for an integrated policy of industrial and human resource development; and
- iv. the development of a Social Charter with minimum labor standards that should be applied to protect workers.

The Social Charter was adopted by SATUCC and presented to the Southern African Labor Commission (SALC) in Lusaka in March 1992 and was also further discussed at the SALC Conference in Maseru in 1995 (LaRRI 2001). The Charter was also discussed by the ELS of SADC over many years. Initially governments were reluctant to adopt the Charter and many disagreed with the idea of free movement of people in the region, employers also delayed the adoption and demanded that the right to lock-out should be entrenched as a basic right. In an effort to reach consensus amongst governments and employers the Charter went through several changes over the years. The Charter of Fundamental Social Rights in SADC was finally adopted at the ELS meeting of SADC in Windhoek in February 2001.

In 2003, the Council of Minister of SADC adopted the Charter on Fundamental Social Rights which amongst others seeks to provide a framework for regional labor standards. It obliges member states to create an enabling environment, consistent with ILO core conventions, to prioritize ILO core conventions and take the necessary action to ratify and implement these standards. The Charter further requires member states to create an enabling environment to ensure equal treatment for men and woman, and for the protection of children and young people (Van Niekerk *et al.* 2012).

Unfortunately, the Charter cannot be enforced directly, and unlike ILO Conventions there is currently no independent supervisory mechanism to call members to account for any breach of the Charter.

The *main objectives* of this Charter are to:

1. Ensure the retention of the tripartite structure of the three social partners, namely: governments, organizations of employers, and organizations of workers.
2. Promote the formulation and harmonization of legal, economic and social policies and programs, which contribute to the creation of productive employment opportunities and generation of incomes, in member states.
3. Promote labor policies, practices and measures, which facilitate labor mobility, remove distortions in labor markets and enhance industrial harmony and increase productivity, in member states.
4. Provide a framework for regional co-operation in the collection and dissemination of labor market information.
5. Promote the establishment and harmonization of social security schemes.
6. Harmonize regulations relating to health and safety standards at work places across the Region; and
7. Promote the development of institutional capacities as well as vocational and technical skills in the Region.

It is also important to pay attention to some of the most important articles of the charter that relate directly to labor relations and labor standards.

The article on *universal and basic human rights* as proclaimed by the UN Universal Declaration of Human Rights, the African Charter on Human and Peoples' Rights, Constitution of the ILO and the Philadelphia declaration are to be observed (Art. 3).

The article on *Freedom of association and collective bargaining* requires member states to create an enabling environment consistent with ILO Conventions on freedom of association, and the right to organize and collective bargaining (Art. 4). SATUCC is of the opinion that this right should be entrenched in the Constitution of every individual member state of SADC.

The article on the *Conventions of the International Labor Organization* (Art. 5) requires member States to establish a priority list of ILO Conventions which shall include Conventions on abolition of forced labor (Nos. 29 and 105), freedom of association and collective bargaining (Nos. 87 and 98), elimination of discrimination in employment (Nos. 100 and 111), and the minimum age of entry into employment (No. 138). Member states must take the necessary steps, as a priority, to ratify and implement the core ILO Conventions.

The article on the *Equal treatment of men and women* requires that men and women must be treated as equals in all aspects of the work life (Art. 6).

The *Protection of children and young people* in line with ILO Convention 138 deals with employment age, remuneration of children and young people and vocational training (Art. 7).

The issues of *Elderly people*, retirement age and social benefits for elderly people who do not have a pension but have reached normal retirement age are also addressed (Art. 8).

The treatment of *Persons with disabilities* in the work place and their access to training and social security are contained in Article 9 of the Charter.

All employees will have access to *Social protection* and social security benefits and social assistance irrespective the type of employment (Art. 10).

All member States must strive towards the *Improvement of living and working conditions* of employees by addressing issues like working hours, rest periods, paid leave and maternity leave *etc.* (Art. 11).

Every employee in SADC has the right to a *healthy and safe working environment* (Art. 12).

Member States are also required to create an enabling environment so that industrial and *workplace democracy* is promoted (Art. 13).

From the above it is clear that the Charter aims at creating or establishing a broad framework of basic labor and/or social rights and this can be interpreted as a Transnational Labor Relations framework for SADC.

Member states are required to submit regular progress reports to the Secretariat regarding the implementation of the Charter. Unfortunately, the Charter does not specify what is meant by regular reports nor what steps can be taken against a member state that fails to implement the Charter.

Status of ILO Core Conventions in Member States of SADC

It is also important to establish the link between ILO Core Conventions and the SADC Charter as both these instruments can assist in the establishment of regional labor standards which ultimately can play a part in the process of regional integration.

In 1998, the ILO adopted the Declaration on Fundamental Principles and Rights at Work it is an expression of commitment by governments, employers' and workers' organizations to uphold basic human values – values that are vital to our social and economic lives. The Declaration commits Member States to respect and promote principles and rights in four categories, whether or not they have ratified the relevant Conventions.

These categories are:

- i. freedom of association including the right to collective bargaining;
- ii. the elimination and prohibition of forced or compulsory labor;
- iii. the abolition and prohibition of child labor; and
- iv. the elimination of discrimination in respect of employment and occupation.

The ILO Declaration of 1998, thereby makes these core Conventions binding on member states irrespective if these Conventions have been ratified or not. There is currently a discussion within the ILO to include the Conventions on health and safety as well as the Convention on a living wage as part of the core labor rights.

Article 5 of the SADC Charter requires member States to establish a priority list of ILO Conventions and specifically to ratify and implement the core conventions of the ILO.

The table below indicates the 15 member States of SADC and in which year a particular core convention of the ILO has been ratified.

Table 1

Member	C29	C87	C98	C100	C105	C111	C138	C182
Angola	2001	1976	1976	1976	1976	1976	2001	2001
Botswana	1997	1997	1997	1997	1997	1997	1997	2000
DRC	2001	1969	1960	2001	1969	2001	2001	2001
Lesotho	1966	1966	1966	2001	1998	1998	2001	2001
Madagascar	1960	1960	1998	1962	2007	1961	2000	2001
Malawi	1999	1965	1999	1999	1965	1965	1999	1999
Mauritius	2005	1969	1969	1969	2002	2002	1990	2000
Mozambique	1996	1996	2003	1977	1977	1977	2003	2003
Namibia	1995	1995	2000	2000	2010	2001	2000	2000
Seychelles	1978	1999	1978	1978	1999	1999	2000	1999
South Africa	1996	1996	1997	1997	2000	1997	2000	2000
Swaziland	1978	1978	1978	1979	1981	1981	2002	2002
Tanzania	2000	1962	1962	1962	2002	2002	1998	2001
Zambia	1996	1996	1964	1965	1972	1979	1976	2001
Zimbabwe	2002	1998	1998	1998	1989	1999	2000	2000

It is argued that the SADC Charter of Fundamental Social Rights and the seven core ILO conventions that have been ratified by all member states of SADC can form the basis of a Transnational Labor Relations system and or regional labor standards in SADC. The main aims of the SADC Charter will not be achieved in as far as it concerns the place of work and employees if these core ILO Conventions have no real impact on the shop floor and the life's of employees. It is also clear that when SATUCC started its campaign for the establishment of the SADC Charter that the core ILO conventions formed the basis of the proposed content of the SADC Charter. The core ILO conventions have created an international obligation on ILO member states and the SADC Charter aims to establish a further regional obligation on SADC member states.

Regional Integration vs. Regional Globalization

Is Regionalism just a different form of globalization, or are these two terms or ideas compatible? Globalization can be defined as a process by which the economies of the world become increasingly integrated leading to a global economy with global economic policy making, through such international agencies as the World Trade Organization (WTO). Globalization is also viewed by many as a 'global culture' in which the world population consumes similar goods and services across countries and use a common business language, English. This has led to an increase in the openness of economies to international trade, financial flows and direct foreign investment. Globalization can lead to an increase

in the mobility of factors of production mainly capital and labor (Kamau 2013). Many people view globalization as Americanization.

Economic integration occurs whenever a group of nations in the same region join together to form an economic union or regional trading bloc by raising a common tariff wall against the products of non-member countries while freeing internal trade among members. The integration provides an opportunity for industries to take the advantage of economies of large-scale production made possible by the expanded markets. A regional economic bloc should, therefore, be conceptualized as an entity encompassing and transcending nation-states. The economic aspect of these may be described as, in the first instance, the efforts to form free-trade zones through the creation of common markets, and secondly, the co-ordination of economic policies and the implementation of joint economic policies to form even larger economic zones. Regionalism has had enormous impact on the environment of nation-states. It has, for instance, had a regulating impact on MNCs through measures such as corporate laws, competition policies, and labor policies. The very essence for the creation of a regional economic organization is to give them greater ability to protect regional and national interest in relation to other countries, transnational companies and international economic organizations. This contradicts globalization (Yeates 2005).

Regional formations are an important manifestation of state strategies and integral to any analysis of the ways in which collective action is recast at a transnational level. The main of most regional formations are economic by nature. The almost exclusive preoccupation of these formations with economic issues has led to a reaction from international civil society organizations, which increasingly demand that social issues be addressed as well. Yet, civil society demands are articulated through the shadow summits and social forums that now regularly accompany intergovernmental meetings. This lays the groundwork for the development of an inclusive, democratic and developmental social policy at regional level; in this regard the SADC Charter is a very good example.

Social welfare, social institutions and social relations have become entangled in material processes that extend beyond national borders and their transformation now has a regional character (Kamau 2013). These transnational elements and the dynamics that come with it must begin with an appreciation of the contemporary pluralistic global social governance structure which is 'multi-tiered', 'multi-sphered' and 'multi-actored'.

The regional integration strategy of SADC and other regional formations can be found in transnational collaboration, which can include: exchange of information; identification of common issues and positions; collaborative action on specific issues; coordination of national laws, policies and practices; coordination of policy positions; and collective representation at other regional or international forums. But is this regional globalization?

Regional formations are an integral part of any critical assessment of the possibilities for transformative political agency in a globalization context. Regional formations are very often the result of political struggle and negotiations over the content and direction of a social policy that reflects the traditions, interests and needs of member countries and their populations.

Regional agreements in actual fact discriminate against third countries outside the region and become protectionist blocs with their own sets of trade rules. Politically, regional formations can offer member countries a number of advantages. They facilitate governments in the achievement of their foreign policy objectives. Regional formations can also

act as a mechanism and a selective approach to the construction of political collaboration. Since regional formations often entail groups of countries with similar cultural, legal and political characteristics, agreement on the scope and nature of transnational collaboration is more feasible and progress can potentially proceed more quickly than multilateral negotiations, this is, however, not the case with SADC.

The proliferation of regional formations indicates a willingness on the part of governments to commit themselves to collaboration around trade issues, but these commitments have (so far) only in a limited capacity extended to collaboration around social welfare or developmental needs for the particular region. Most regional formations reflect the present preoccupation with narrow commercial objectives over broad social developmental needs. Phrases like 'inclusion', 'democracy' and 'development' can be found in some regional formations' social policy objectives.

The formulation of policies that encourage intra-regional trade and offer barriers to external trade, as founded in most regional formations contradicts the view of the proponents of globalization which are geared towards free movement of the factors of production on a global scale not limited to regions. Regional formations can reduce global trade and obviously reduce efficiency in the market with trade tariffs and is seen by many to reduce competitiveness and renders market forces almost irrelevant which eventually lead to gross market inefficiencies (Yeates 2005).

Regional integration restricts sovereignty of member states in economic policy formulation to a certain degree but has a number of advantages including an increased specialization and realization of economies of scale through the pooling of resources and markets, increased choice through access to wider range of markets and increased competitiveness of goods and services in global markets following the development of intra-regional competition. Regionalization can also lead to better opportunities for scientific and engineering exchange and joining efforts to develop science and technology as well as the creation of better infrastructure in transport, finance and communications (*Ibid.*).

It is clear that there are certain similarities but also differences between globalization and regionalization. These two concepts are not completely compatible but neither are they totally incompatible. The apparent incompatibility of regionalism and globalization withstanding, it is impossible to see a globally integrated system with the ever increasing and stronger regional trading blocs, many with conflicting objectives, approaches and even mechanisms.

Conclusion and Recommendations

If a system of regional labor standards is established for SADC, it must take cognizance of the differences between countries in terms of culture, language, history, the legal system, *etc.* The system that has been designed for the EU and that is currently in place is a uniquely European system and cannot be transferred to SADC as it is. SADC must not try to replicate the EU system of regional labor standards. The proposed system of transnational labor relations for SADC should be a combination of the following:

1. The SADC Treaty, certain SADC protocols, and the SADC Charter should be adapted, extended, and strengthened to make provision for minimum regional labor standards. This treaty on minimum regional labor standards should include, as a bare minimum, requirements of the ILO core standards, the UN declaration of Human Rights, and employees' rights at work. The domestic incorporation of the SADC Treaty, SADC Charter and SADC protocols into national laws can ensure ease of compliance by member states.

2. A code of best practices for TNCs should be established, providing minimum labor standards for any TNC that wants to establish business enterprises in any SADC member state.

3. The local actors in all SADC member states should be empowered through a process of training, so as to provide them with the necessary skills, knowledge, and expertise to create public awareness of human rights, social rights, and labor rights. The local actors in each member state can play a significantly positive role in ensuring that governments adhere to the minimum regional labor standards.

4. An independent monitoring system that brings governments, employers, TNCs to task for failure to comply with minimum regional standards should be established. The SADC Tribunal should become operational as soon as possible, and its mandate should be extended so that it can also act as a labor standards watchdog. The new Tribunal should have the power to take appropriate steps against not only employers or TNCs, but also against governments. These powers can include imposing fines on transgressors.

A transnational labor relations system for SADC is for all practical purposes already in existence, and it can assist in providing certain minimum protections and labor rights for millions of people. The SADC Charter, which has been signed by all member states and the ILO core conventions that have been ratified by all member states, provides the basis of a TNL system in SADC. For this system to be of any real value it is of the utmost importance to involve all role players from all the member states. These must include not only governments and politicians, but also employers' associations, trade unions, and other local actors. Rules are needed at the appropriate levels, so that economic principles and justice go hand in hand, and the standards and the issues at stake have a transnational or supra national character. Thus, SADC must have its own, unique social policy and, consequently, also its own fully fledged labor relations system. SADC must move away from a facilitating authority to an entity that will lead in creating standards and mechanisms that can be of benefit to all SADC citizens and become a truly transnational actor and in this regard the SADC Charter must form the basis.

The possibilities for further research are almost endless. The content, character and impact on grass root level of the labor laws within each member states can be evaluated and measured against the SADC charter as well as the ILO core conventions. It is also possible to establish a regional Labor Tribunal for SADC that specifically deals with labor relations issues and transnational collective bargaining; this in itself will require further research and will have to involve all member states as a political decision will have to be taken by the Summit of SADC.

The regional integration strategy of SADC as founded in the Treaty and Charter as well as other protocols can only be achieved in the SADC region if there is closer co-operation between member states on matters like social policy and labor standards. This will lead to the improvement of the work life of millions of people. Regional formations or regional integration schemes are not regional globalization.

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Constructivity and Destructivity in Globalization, as a Background of the Current Problematic of Peace

Endre Kiss

Within international relationships the specific imperial relations can be distinguished via the principle of the mutually guided competition or rivalry among the diverse actor-states in the framework of a paramount global cooperation. If we take the universal global cooperation as a starting point ('the first line'), it becomes then comprehensible, why this conflict can be conceived in the 'second line' also as a war of a new type. This basic situation (global cooperation and actually comprehensive rivalry and multiple competition of all against all in the second line) is inextricably linked, in our age with the reality of globalization. Simultaneously, the pure existence of these rivalries in the second line already means a fundamental change in the experience and interpretation of war and peace, for this competition personifies a permanent debate, which can much more easily go over to a symbolic or limited war problematic, as it seemed still possible in the past. The imperial conflicts of the second line (behind the global cooperation that constitutes the first line) adopt in any of their constitutions always clear ideological-philosophical forms. These ideologies and these philosophies of life adopt a generally 'fundamentalist' character, what can also be explained by this competition. This movement is also to explain with the rivalry of the individual global empires, in which leading ideologies anyway are often really very close to fundamentalism. This process carries in itself two dangers. Firstly the correspondence-relation of an 'empire' with a civilization/philosophy of life/religion represents a striking simplification, which must be in itself identified directly as the highest danger. Another consequence of this danger of the link of the rivalry of the empires with the rivalry of the ideologies consists in the easily understandable fact, that on this basis the mechanisms of the positive feedback must work (see, e.g., Hardt and Negri 2000). While we have described the globalization as dialectic of the modernity, we must categorize the advance of the fundamentalism (as well vertically as also horizontally) in this doubled rivalry as dialectic of the fundamentalism. While in the 'West' the anti-communism is the opposing fundamentalism number one, in the fundamentalist 'East' (i.e. in the concrete empires, we count there), the anti-liberalism is the concept of enemy number one. The role distribution has the common train, that neither in the 'West' nor in the 'East' (in the here concerned great actors) the fundamentalism is the concept of enemy N°1, this contributes to another acceleration of the dynamics, if not of the dialectic of the fundamentalism.

Keywords: globalization, empire, civilization, peace, fundamentalism, philosophy, cooperation, war, competition.

Introduction

Within international relationships, the specific imperial relations can be distinguished via the principle of the mutually guided *competition* or *rivalry* among the diverse actor-states in the framework of a paramount global *cooperation*. The attribute 'imperial' is neither a random nor a traditional description which connects with each other the phenomena of similar character in a timeless manner and without any further qualification.

In our context, 'imperial' means a specifically new relation and condition which are somewhat described in Huntington's *Clash of Civilizations* (Huntington 1996). One can also understand that current globalization can be characterized and treated not only through this relation, although its increasing importance can no longer be put into question especially somewhat after 2000. The visible validity, let alone the supremacy of the imperial discourse is also therefore an excellent perspective on globalization, because the basic vulnerabilities of globalization do not define at all its significance from the beginning; on the contrary, the relevance of the order of magnitude of the imperial discourse is itself equivalent with an attribute of the respective state of globalization.

Of course, the imperial dimensions can also change in the course of rapid development, partly in their absolute conditions, partly in their relations to other forms of the global discourse, that is to the perspectives, from which globalization can be interpreted and understood also independently. Since the *actorial* dimensions, that is the *action space* of the diverse protagonists in the global processes remain of high importance, this actorial freedom can also on its part increase, in a striking way, the order of magnitude of the imperial dimension amongst the other dimensions. In the context of the imperial dimension, a mixture of objective and subjective action spaces is thus arising, whose constant interweaving can be regarded as one of the major conditions of globalization.

The rapid changes in the imperial dimensions of the process of globalization are very characteristic of this event from the beginning. It goes so far, that during the first years after 1989, the imperial dimension has not been at all thematized publicly, the euphoria of the 'end of the history' promised a world where traditional imperial relations have become, as forever, obsolete. The conscious *profiling* of individual virtual or real global imperial actors is joining this starting situation, for finally the potential imperial role does not depend only on these actors' will.

The Natural Necessity of the Imperial Dimension in the Global Identity Formation, which should not Become Fate

Sometimes the introspection of the great global actors also means a search for identity. Thus, in the first decade of the new millennium China already belonged to the 'empires', this appurtenance revealed, however, as 'virtual', while the situation so quickly changed in the second decade, that now it costs China much effort to avert that impression, according to which the country would already be now the leading state of globalization (or one of the states willing to lead) or intend to become as such. Other categorizations can also remain unfixated, since the imperial major actors are by no means somewhat identical to the members of the leading international organizations. One can say that it should be possible to enter the first leading circle of the global states (in our consciously chosen formulation: 'empires') 'through invitation'.

The First Line and the Second Line: Cooperation versus Competition

Our thought process is concerned with this new phenomenon of the competition among global 'empires'. On the one hand, it bears repeating that it is about a competition which

realizes as a *secondary phenomenon* and as a background for a *multi-strata global cooperation* in the *first line* (e.g., Sorokin 1928). But this phenomenon, also in the form of a competition of all against all, is revealing quite complex and multiple. We must again emphasize this rivalry, and at the same time we do not cast doubt on the validity of reality and relevance of the primary global cooperation. This competition of the second line often takes some asymmetrical forms. This general situation (global cooperation combined with principally comprehensive rivalry and multiple competition of all against all in the second line) is inextricably linked in our age with the reality of globalization.¹ *Every possible similarity to former world-historical or international relationships is basically misleading and actively prevents an easy comprehension of these relationships.*

This competition of the second line is, in its true definitions, quite a new phenomenon. Conscious of this fact, our research approach might be selective since neither a temporal distance nor a sufficiently specific methodology is now available for a thorough study. Simultaneously, the pure existence of these rivalries in the second line already means a fundamental change in the experience and interpretation of war and peace, for this competition represents a permanent debate which can much more easily pass to a symbolic or limited war problematic, as it seemed still possible in the past.

First, we concentrate on the question *to whose expense* this struggle of the second line is led. Now we can generally take the thesis, transmitted to us by the historical tradition that as a rule, the burdens and costs of wars and crises are transferred to the 'society'.

This rivalry on the second line results from conscious *strategic* reflections, that is from a decision, which can be certainly associated with this rivalry. It goes without saying that this decision is of crucial importance for our thought process. We can only develop and interpret this rivalry through facts. It follows, that we will have to deal with a huge number of facts.

Do we take again the universal global cooperation as a starting point ('the first line'), it becomes then clear, why in the 'second line' this conflict can be conceived also as a *war of a new type*. This rivalry is not characterized by clashes of armed forces or frontal clashes. This rivalry is rather determined by the idea of a possible weakening of the opponent (some opponents, all opponents), would it be about a concrete but also *symbolic* or *virtual* weakening.

If this expression has a current sense, in this new context and terrain having to be compared with no former context, we should then say that these conflicts in the second line are oriented against the competitors' *hinterland*. This means, however, that the individual actors of the competition do not attack the other actors' elites or ruling class, rather their '*hinterland*', or the everyday life and conditions of reproduction of those involved, also global 'imperial' participants.

Would it be effectively the case (while we do not consider the designation 'hinterland' as an optimal designation), then the first *purely theoretical* question is whether this phenomenon is distinguished from many similar phenomena of the world history, whether this phenomenon, which we have described as a rivalry and competition in the second line, is mainly a new phenomenon.

Our answer is that this phenomenon must be also then necessarily considered as a genuinely new phenomenon *through the prism of the reality of globalization and also through relevant universal cooperation (the 'first' line)*, although many of its forms strongly remind similar phenomena from the former world history.

¹ For the concrete link of this description of global international relationships with the *theoretical* interpretation of globalization see, e.g., Kiss 2003, 2010a, 2010b; Grinin 2009; Grinin and Korotayev 2010; Korotayev and de Munck 2013.

It is quite difficult to discuss the *real empirical content* of these conflicts. An economic success, changes in prices for raw materials, fluctuations at stock exchange and markets can improve an actor's positions at the expense of the other(s). These conflicts, we accept it now, do not disturb the global communication and cooperation (the 'first line'), they are often not perceived as conflicts, while they can cause concrete and violent damages. Thus, this asymmetrical war is also simultaneously a *silent war*, whose victims or those damaged often do not know themselves whom they fell victim to.²

Would this assumption be right, the Wiki-leaks opportunities and finally, the Snowden case would be considered as *anything but exceptional* phenomena or even astonishments. In reverse order, it would be precisely a surprise, if the individual involved actors would *not* listen to each other in this context. What is so disappointing in the public opinions following these scandals, is not necessarily the visible information on the state of business as usual, but the indescribable lack of claim of the arguments accompanying the declarations, that undertake no attempt to associate this conflict in the second line with that of the first member of the cooperation. In these opinions, we fail to find where the contours of the new global world order would become visible, what we see is only the attitudes of a potential war of all against all, which were characteristic of the pre-global world. The Snowden case underlines our hypothesis, but not only in the assumption of the 'normality' of mutual listening. Also the 'silent' war appears here, for it was also a fact, that we assumed, maybe Snowden would have even also been kidnapped under the peaceful circumstances of the global international life.

Forms and Shapes of the Rivalry of the Second Line

The assumption of this 'imperial' actors' mutual rivalry can be extended to a somewhat modified vision also on weapons production and commerce. However, this also leads further into the experience that the global circumstances and relationships between politics and economy are changing again within a *new* context. For precisely the military sale (through its double rooting in the political and the economic spheres) must not be interpreted otherwise than as an element of this competition in the second line, even if it is carried out from 'purely economic' objectives. The supposed and hypothetical role of victim of the hinterland is again sharply realized in this context: if these guns are needed then this role is clear (for no population can be today kept away from these conflicts), if not, then (and we remain now only with this single consequence) the expenses on the arms are taken from other sections of the budget.

It is also similar with the concurrence of the representations! Events, such as the Olympics in China, winter Olympics in Russia or a football World Cup in Brazil, are certainly considered as rational steps (amongst the others) in the global actors' rivalry in the so-called second line of the international reality in the age of globalization. It is, however, just as clear, that the costs of these mega-events of global representations are ascribed to the account of the populations. These examples show also, that this competition of the second line reveals as a medium that can instrumentalize also events, emerging messages totally independent of their original meaning. We can confidently assume that if in Kuwait the civil population's discontent grows and is also manifested in the public declarations,

² An interesting confirmation of this assumption of the mutual rivalry in the second line can be as follows: if inside the cooperating global structure of these imperial actors other coalitions are emerging, which *feel themselves closer to each other than versus the others*, for this consideration seems to have already taken into account the fact, that this rivalry causes damages to the others (with the closer approach, these can certainly be moderated).

this event can be admitted as a point of the mutual struggle between the global actors of imperial rank or is also just admitted.

The problem of the energy resources and energy supply represents, however, also a type of events, in which the *decisive* (intentionally guided) or *random* (spontaneous) actions could hardly be definitely distinguished from each other. In these domains, we can literally make no step without having influence also on other actors, and this alone, auto-poietically brings the state of competition of the second member in the scene. This type also always shows publicly the everyday reality of this rivalry, which then enhanced through digitalization and information society's approaches, strengthens the impression of the already existing *mutual global rivalry at the expense of the global cooperation*.

In this mutual struggle some actors set certain limits which they decide to consider as *pain threshold* for the others! Thus, we can for example read in the Drone attacks that another imperial actor wants to avoid the Chinese airspace because it assumes that China would not be tolerant of.

Another aspect of the same dimension consists in the support to the civil, female and other social movements (social media!) on the sovereign territory of other imperial actors, in which some blurred borders of influence are also established. For us, this phenomenon is of particular importance since such steps and opinions can serve as indirect confirmation of our assumption.

Mass communication and mass culture have a very particular place in this very concretely conceived conflict of the global empires. Another important fundamental fact is that this rivalry of individual global protagonists takes place thousands of times.

The difficulty and simultaneously the theoretical interest of this domain consist in its *extensive infinity*, in its confusion, but also not less in the considerable asymmetry, that exists among the individual *global players*, while the American mass culture clearly influences the other great empires as it is the case in reverse order, even if this effect can also not be considered as *unlimited* or *unilateral*. An independent complex in this context is, that a mass culture does not only mediate the own and the other 'world', but in several genres also 'works up' and thematizes another world. On working up the essential problems of the other empire, several variations of interpretation can appear, every civilization is working on the fundamental problems of the other, like it was formerly the case in Charlie Chaplin's and Leslie Howard's films on the Third Reich or Andrzej Wajda's films on the Stalinism.

In sign of the universal rivalry of the individual civilizations, multiple and very strange phenomena can also outgrow from this problematic. This is manifested in an interesting way (as one of many phenomena) in the reaction to an American film presently shot about Che Guevara, in which it was affirmed, '*the others relate our history*'. There are, however, examples for that, which one global 'empire' calls into question the other 'empire's' right to exist, like it often happens in an astonishing way between the USA and Europe (e.g., *America = Mars, Europe = Venus*). In this labels some real dimensions of this mutual conflict of individual empires are also thematical, like for example in the matter of relationship between Europe and North-Africa, or in the discussion about the extent the EU interventions should support the individual member-states in other parts of the world.

Real Suffering Hinterlands

In this analysis, a point is also visible, which would be unnoticeable from another starting point. If it is really about the responsibilities of the '*hinterland*' (we still keep so problem-

atically this description), it becomes then soon evident, that *this concept means something quite different in Europe in comparison with all other great global units*. Europe's 'base' consists of individual nation-states which partly protect their sovereignty, partly have abandoned it. This known fact can become relevant in the new context of the competition between the global empires in the second line. If we remain at the level of damages, it is then already quite natural to expect, that they can be unevenly distributed only because of this fact. Here, we want to mention briefly the European policy in education and schooling, when the university shows itself (quite understandable) as a territory where the rivalry of individual great players (behind the comprehensive global cooperation) intensively goes on.

At this point, let us leave aside whether the European politics of higher education is meaningful or not (for us it is not). The chosen strategy in the conflict, however, undoubtedly revealed as a strategy whose disadvantages and losses are distributed unevenly among the individual states. This difference can also be generalized. In Europe, therefore, the negative consequences of the rivalry of the second line are probably unequally redistributed among the individual member-states!

New Rivalries and Old Ideologies

Today we deal with a new phenomenon of globalization which is in many ways similar to the traditional competition of great powers but still one should regard it as a new phenomenon because of the new basic characteristics of globalization. Now, we put the question, whether one can associate this rivalry with the phenomenon which we usually denote as a *conflict, or as a rivalry of great philosophies of life, religions or ideologies* or what just after the advent of globalization Samuel S. Huntington called 'the clash of the civilizations'. It is obviously an attempt, and we proceed from the fact that the global empires' rivalry in the second line and the clash of civilizations have different motives and origins.

Huntington's concept, also as a self-fulfilling prophecy, plays an important role since today we must put just this very question of the rivalry relation between the global powers within large ideological or civilizational struggles. *Huntington has reduced the very complex dimensions of the Modern Age to a fundamentalism as a basic world order.*

If we think of the rivalry of the philosophies of life, religions and ideologies (practically of all what Huntington described as clash of civilizations), we would suddenly realize that only quite a few ideologies take part in this great competition. It is, however, not the case. In fact, there are many more ideologies in the globalized world, which are fighting each other and each of these ideologies has also a rich internal differentiation which also fights within certain ideology or religion.

The convincing impression that Huntington's *Clash of Civilizations* was a self-realizing prophecy (which in its way influenced the events) came mostly from the strange and somewhat fear-instilling experience that this 'struggle' came together with that situation when every ideology or philosophy of life 'fundamentalized' with consequences; in other words, every individual ideology gave rise to a more fundamentalist or the most fundamentalist variation.

The Pluralism of Fundamentalisms

Thus, fundamentalism entered a new phase of its history, which has also made necessary to develop a new history, a new sociology and also a new knowledge of the fundamental-

ism. The development occurred, which in a peculiar way had also moved individual philosophies of life or ideologies closer to each other. Simultaneously, some fundamentalist thought structures became so general, that larger groups and masses, in many countries and in many sociological circles, do no longer recognize exactly the fundamentalist color of their mode of thinking and just use the fundamentalism, like they applied formerly the constructive thought structures; now they even use the fundamentalist structures to solve actual problems.

We can recognize that both universal struggles (empires + civilizations) of the great global actors are today on the way to merge. In the conflict between two empires, the ideological and civilizational clash can easily manifest itself. The difference between communism and post-communism is not also made with sufficient care, while China is still classified sometimes communist, sometimes neo-liberal in these double-level becoming confrontations (in which the level of empire will be interconnected and so unified with the level of ideologies).

Also the eventual differences between America and Europe are already looking for 'ideological' marks, where one part must always stand above the other in ideological terms, even if the criteria of this civilizational superiority are absolutely relative and no longer show the unambiguity of the year 1989.

The imperial conflicts of the second line (behind the global cooperation which constitutes the first line) always adopt clear ideological-philosophical forms in any of their constitutions. This event clearly reminds (as it has been declared so reluctantly in this attempt) of a state that Huntington described in 1992 and 1993. These ideologies and these philosophies of life are adopting (as it has been pointed out) a generally 'fundamentalist' character which can be also explained in terms of this competition. It is almost alarming that this process represents the counter-movement toward the development after 1945, while formerly the individual ideologies/philosophies of life became always more differentiated and demanding. No doubt, this movement is also to explain with the rivalry of individual global empires, in which the leading ideologies anyway are often really very close to fundamentalism; it is, however, to explain also the decreasing role that the really independent intellectuals play in the process of formation of these ideological concepts.

Of course, one can hardly define at which stage this process of common growth of the imperial and ideological-philosophical competition stands; however, this tendency is already clearly visible today.

The Path to a New Dialectics of Fundamentalism

This common growth carries in itself two dangers which should be considered seriously. The first danger is apparently of purely intellectual nature. The correspondence and relation of an 'empire' with a 'civilization/philosophy of life/religion' represents such a striking (!) and amazing simplification of our hypercomplex post-modern world, which must be in itself identified, through the scale of this simplification, directly as the highest danger. This simplification is somewhat as if we would really think that the Roman Empire consisted of the Romans, who represented the civilization/philosophy of life/religion of the Roman Empire!

This extreme simplification has operated until present and will most probably endure in the future, also working as a self-fulfilling prophecy. The concrete orientation of this prophecy is already a negative and self-destructive one. If an 'empire' interprets the plural, multi-strata, modern reality of the other as fundamentalism, it follows then necessarily,

that the own society considers itself also as fundamentalism, possibly emphasizes and supports in itself the own fundamentalist traits. From these virtual processes there often emerges a concept of the enemy. *Two fundamentalistically shaped empires can perceive the others as 'enemies'*, depending on the intensity of formation of the concept of enemy in the own philosophy of life. Today no politician is to blame for the fact that within his fundamentalist basic ideology any other philosophy of life is considered an enemy; he is, so to speak, constrained to perceive the other as an enemy at a certain stage of the self-fulfilling prophecy.

Another consequence of this dangerous association of the rivalry between empires with the rivalry between ideologies consists in the easily understandable fact that the mechanisms of the positive feedback must work on this basis. The perception of this now doubled rivalry leads necessarily to the acceleration and intensification of conflicts among individual great actors. Under some circumstances, this process can become rather swift-flowing, to which we are not prepared and that possibly cannot be perceived in the normal everyday world. This doubling (if not political escalation) of the global rivalry is obviously also supported by many real processes.⁴ The unquestionable proportion of the real processes cannot mislead us about the fact that at the stage when this doubling (if not potentialization) of the rivalry is installing, the importance of the real moments to interpret the rationally decisively regresses. The own dynamics of the already fundamentalistically colored doubled rivalry takes excessive proportions and can highly diminish the control on this development in certain circumstances.

In other words, it seems that in a positive feedback of the redoubled competition (on the level of empires and on the level of 'civilizations'), the chances of the universal fundamentalists are always larger, for the solidarity, emancipation, individualization, information or human rights are hardly able to compete with a fundamentalist competition of 'civilizations' which could win at each concrete location already due to their scale and majority obtained in masses.

The doubled competition in the second line (always under the universal cooperation within globalization of the first line) can transform into the ideological war. The question remains whether this war runs today or not yet. It is, however, certain, that now the doubling of the rivalry already contains the danger of an ideological war of a new type. This danger brings a real risk of the launch of the civilizational struggle in the imperial rivalry which represents a *critical*, if not just an *irreversible* change.

The universal rivalry of global 'empires' (at the moment when the imperial dimension became dominant in the history of the globalization) is, after all, a part of the real normal science of politics, is rational to interpret and might be even also addressed as a trivial event. It is, therefore, of socio-ontological nature, whether we like it or not. The truly tragic consequences of the penetration of civilizational struggles consists in the fact, that the ideologies add new characteristics to the struggle of great empires, *they make a new reality of this struggle and no longer controllable irrational world situation can arise from a politically and socio-ontologically 'normal' situation.*

Forgotten Right-Wing Extremisms?

The mutual rivalry in the second line of globalization can engage new 'double antagonisms' through this link which proceeds within every great empire, a confrontation between 'fundamentalism' and 'true democracy' arises from these double positions, and sometimes also democratic or social elements are to be found in 'fundamentalism' and fundamentalist traits in a 'true democracy'.

Apart from these new simplifications, we must here point out another problematic aspect: while in the 'West' the communism is the opposing fundamentalism Number One, in the fundamentalist 'East' (*i.e.* in certain empires, we count there), the liberalism is the enemy Number One.

The juxtaposition of both these 'fundamental' facts poses considerable dangers for the further development. For, *the role distribution has the common trait, that neither in the 'West' (among the great actors concerned here), nor in the 'East' (among its great actors), the fundamentalism is the concept of enemy Number One, this contributes to another acceleration of the dynamics, if not of the dialectic of fundamentalism.*

In this relation between the 'West' and the 'East', the West wanted mainly to influence with the attraction force of the occidental values, on the population of the East, and also to export democratic institutions. We cannot say that the endeavors have failed even these efforts were however highly hindered by the arising clash of civilizations, because they have been just fully politicized and even the clearest values of democracy and of emancipation could appear as imperial interests.

Conclusion

We came to the conclusion (temporary and in many ways quite hypothetical) that any fundamentalism is an organic component of the double global rivalry of the 'empires' that must act in the context of globalization. While elsewhere we have described globalization as the *dialectic of modernity*, we must distinguish the advance of fundamentalism (both in vertical and horizontal dimension) in this doubled rivalry as the *dialectic of fundamentalism*. It is precisely this dialectic of fundamentalism that appears on the scene also in the events in Syria, when we read that 'like iron particles on the magnetic field, how the fighting groups are organizing on the confessional line'. It seems to us that this observation could characterize also many other situations within current globalization. An open confessional conflict or even a war would also bring an incalculable damage. This (global) confessional war (which is ultimately anything but confessional or civilizational) differs in nothing from the war of the crusaders.

That we previously focused on the confrontation between the 'West' and the 'East', does not at all mean that we have forgotten that there are quite a lot of 'imperial' and 'civilizational' conflicts. The effective reality is constituted precisely of a multiplicity of these conflicts.

In this 'dialectic of fundamentalism' (which, as noted above, is both temporary and hypothetical), we must emphasize the domain of '*mutual affinities and attractions*' (Wahlverwandtschaften) between empires and ideologies. In the beginning of these processes, the individual empires try to find their own (old or new) civilizational ideologies, while the same movement can also proceed from the other end: the organizing civilizational ideologies (that can already exist at this stage also as independent institutions) also try to find their 'own' empire which will allow them to play an 'exclusive' role in this concrete area.

Has the 'dialectic of the fundamentalism' effectively somewhat advanced, it is then inevitable that the democracies would be disadvantaged in this competition. In other words, it is doubtful whether the attraction of democracy in a non-democratic society, or in a state of crisis, could rival the demagoguery or aggressiveness of the well-organized fundamentalist pressure.

It seems to us that the assumption of Huntington's *Clash of Civilizations* was an historical error of the West, mainly of the USA, for the rapid identification with this conception (which in addition is intellectually poorly grounded) has prevented a *more constructive, more communicative* and, finally, *more human* development in the 'global' space of globalization; already the absence of another way must be considered today as a serious mistake.

The interpretation of terrorism is without any doubt a consequence of this politics. On the one hand, this approach hides the real state of affairs, at least in the sense, that this phenomenon is *not* justified by the doubling of imperial rivalries in the second line. Drawn from this context, the terrorism can already be multiply interpreted, even if these interpretations can also contain numerous reasonable ideas.

Thus, the terrorism has, on the one hand, immeasurably increased. On the other hand, the transformation of the so-called terrorism reveals also in a self-fulfilling prophecy, so that at the end we can hardly make the distinction between the *ideological phantom* and the *reality*, as it has been formerly the case with the *Clash of Civilizations*. The integration of the *Clash of the Civilizations* in the (almost obvious) rivalry of the empires within globalization can accelerate the conflicts in the globalization also thus unexpectedly and critically.

Thus, *a huge mutation of fundamentalism can be realized*. It is apparently the consequence, but in reality an unnecessary consequence of globalization itself, if not just its counterpart. It may no longer be called into question that this is a real danger.

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Global Correlation between GDP Per Capita and the Level of Sociopolitical Destabilization between 1960 and 2014: A Preliminary Quantitative Analysis*

Stanislav Bilyuga, Alisa Shishkina, Julia Zinkina, and Andrey Korotayev

Our research suggests that the relation between GDP per capita and sociopolitical destabilization is better described by an inversed U-shaped curve, rather than by a straightforward negative correlation, as is frequently believed. The highest risks are relevant for the countries with medium values of GDP per capita, not the highest or lowest values. Thus, until a certain value of GDP per capita is reached, the economic growth tends to lead to an increase in the risks of sociopolitical destabilization. It is only with higher values of GDP per capita that the economic growth starts to reduce the risks of destabilization. Thus, the higher values of GDP per capita are characterized by a negative correlation with sociopolitical destabilization risks, while its lower values demonstrate a positive correlation with this indicator.

Keywords: *GDP per capita, sociopolitical destabilization, autocracy, democracy, intermediate political regimes, democratization, political development, economic development, anti-government demonstrations, education, middle-income trap.*

The impact of GDP per capita upon the level of sociopolitical instability has already been a subject of considerable research. Most papers are based on a seemingly plausible assumption that the higher the level of a region's economic development, the lower the risks of a civil conflict, and the weaker the support for revolutionary ideas among the population. Thus, MacCulloch (2004) investigates the impact of the level of economic development upon the dissemination of revolutionary ideas in a society using the microdata obtained from the surveys of revolutionary youth. On the basis of changes in the respondents' answers depending on the level of income a conclusion is made that GDP per capita growth by USD 1,600 (in prices of 2001) reduces the risk of the dissemination of revolutionary ideas by 2.4 per cent, while the proportion of people who would like to make a revolution is reduced by 41 per cent (MacCulloch 2004). MacCulloch and Pezzini (2010) use the microdata of the surveys of revolutionary preferences of 130,000 people from 61 countries between 1980 and 1997. In their paper they conclude that two indicators, namely, the increasing level of political freedom and economic growth, reduce the support of revolutionary ideas. On the contrary, a decrease in the authors' index of freedom by

* This study has been supported by the Russian Science Foundation (Project No. 15-18-30063).

a point increases the support for revolutions by 4 per cent. In order to neutralize this increase, an increase in GDP growth rates should amount to 14 per cent (MacCulloch and Pezzini 2010).

Parvin (1973) makes similar conclusions on the basis of cross-section data on 26 countries and states that both the level of income per capita and its changes exert negative influence on the level of political violence.

Another paper reveals that assessing the impact of economic conditions on the risk of a civil conflict emergence is hindered due to the endogeneity of variables. Its authors use the change in the level of precipitation as an instrumental variable for economic growth in 41 African countries between 1981 and 1999. This research also shows a strong negative relation between the economic growth and the risk of a civil conflict (Miguel, Satyanath, and Sergenti 2004).

Research by Knutsen (2014) views the impact of economic growth and the level of income on the attempts at revolutions and successful uprisings in a broad prospect from 1919 to 2003 for 150 countries. This research reveals that a moderate and short-term growth enhances the probability of both attempts at revolutions and successful revolutions. There is also some evidence that higher levels of income are capable of mitigating the revolutionary attempts, though this point remains disputable.

Weede (1981) states that high average income is closely associated with less violence and lower death toll resulting from such violence.

The relationship between sociopolitical destabilization and internal economic indicators, such as international loans, credits *etc.*, has also received much attention in academic community. Thus, it has been revealed that international capital increases the state's capacity to react to the actions of the internal opposition, as benevolent conditions of crediting expand its capacity to limit and suppress the oppositional forces. Empirical data for 141 countries for the period from 1981 to 2007 are used to confirm that the states with greater access to international credit indeed have lower probability of civil conflict emergence (DiGiuseppe, Barry, and Frank 2012). Another paper covering this question concludes that exogenous growth of the international capital price is closely connected with increasing probability of civil conflicts. Dependency on raw materials, low economic growth, and poverty can also increase the risk of civil conflicts through reducing the access to foreign capital (Chapman and Reinhardt 2013).

However, some research implies that in certain conditions economic development can rather increase sociopolitical instability. Thus, in his analysis of the global revolutionary wave of the first half of 2014, Goldstone (2014a) pays attention to the fact that the highest values of sociopolitical destabilization are observed in countries which are not characterized by either the highest or the lowest values of GDP per capita, namely Thailand, the Ukraine, Bosnia, and Venezuela. Goldstone supposes that this is not a mere coincidence.

All four are 'middle-income' countries, among neither the world's richest nor poorest societies. According to the International Monetary Fund, they range from 73rd in per capita GDP (PPP adjusted) – Venezuela's global ranking – to 106th (Ukraine), with Thailand at 92nd and Bosnia 99th. In other words, of the 187 countries in the world ranked by the IMF, they are almost exactly in the middle. They have just arrived at the point where the vast majority of the population is literate, expects a government to provide a sound economy, jobs, and decent public services. Yet, they are not yet economically comfortable and secure. That security, and a better future for themselves

and their children, depends very heavily on whether government leaders will work to provide greater opportunities and progress for the nation as a whole, or only to enrich and protect themselves and their cronies. They are at a point where limiting corruption and increasing accountability are crucial to whether their country will continue to catch up to the living standards of richer countries, or fall back to the standards of poorer ones (Goldstone 2014a).

The implication that until a certain limit the correlation between GDP per capita and sociopolitical destabilization should be not negative, but rather positive, stems from the classic theory of modernization. Let us remember that as early as in 1959, Lipset put forward a hypothesis that in the course of economic development citizens are increasingly less ready to tolerate repressive regimes, while in the course of per capita income growth the probability of a transition from authoritarian to democratic regimes goes up. Lipset's empirical tests supported this hypothesis (Lipset 1959). Later on, this hypothesis was tested and supported by a number of other researchers (Cutright 1963; Moore 1966; Dahl 1971; Brunk, Caldeira, and Lewis-Beck 1987; Rueschemeyer, Stephens, and Stephens 1992; Burkhart and Lewis-Beck 1994; Londregan and Poole 1996; Epstein *et al.* 2006; Boix 2011).

Lipset's hypothesis itself suggests that one should observe not a linear but an inverted U-shaped relationship between GDP per capita and at least some types of sociopolitical destabilization. Indeed, as we will show below, a very high percentage of states with low GDP per capita have authoritarian regimes. Consequently, the growth of instability of authoritarian regimes with the growth of GDP per capita must generate a positive correlation between the GDP per capita and sociopolitical instability within a certain interval. Meanwhile (as we will demonstrate below), the higher values of GDP per capita demonstrate a negative correlation with sociopolitical instability. This gives us grounds to expect that high levels of at least some forms of sociopolitical destabilization should be particularly typical for countries with medium values of GDP per capita.

Let us note that our own empirical test of this hypothesis on the basis of data on 2013 and 2014 destabilization wave has generally supported it. During these years a state's belonging to the medium quintile in GDP per capita proved to be a statistically significant predictor of sociopolitical destabilization of the 'central collapse' pattern (Korotayev, Isaev, and Zinkina 2015).

In this paper we test this hypothesis on a much wider empirical basis.

Data and Methods

In order to test the hypothesis of GDP being a statistically significant factor of sociopolitical destabilization (within a certain interval) we choose GDP per capita PPP¹ for the period from 1960 to 2016 as our independent variable and the system of indicators of sociopolitical destabilization from CNTS database as our dependent variables.

Description and Methodology of Cross National Time Series (CNTS)

The Cross National Time Series (CNTS) database is a result of data compilation and systematization started by Arthur Banks (Banks and Wilson 2015) in 1968 in the State Uni-

¹ In constant 2011 dollars.

iversity of New York – Binghamton. The work was based on generalizing the archive of data from The Statesman's Yearbooks, published since 1864. The database contains approximately 200 indicators for more than 200 countries. The database contains yearly values of indicators starting from 1815 excluding the periods of World Wars I and II (1914–1918 and 1939–1945).

CNTS database is structured by sections, such as territory and population, technology, economic and electoral data, internal conflicts, energy use, industry, military expenditures, international trade, urbanization, education, employment, legislative activity, *etc.*

In our paper we consider in detail the data describing internal conflicts (*domestic*). This section includes data starting from 1919 based on the analysis of events in 8 various subcategories, which are used for building the general *Index of Sociopolitical Destabilization* (*domestic9*). In this process the compilers of CNTS database give each category a certain weight (see Table 1).

Table 1. Weights of subcategories used at compiling the Index of Sociopolitical Destabilization

Subcategory	Variable name	Weight in the Index of Sociopolitical Destabilization (<i>domestic9</i>)
<i>Assassinations</i>	domestic1	25
<i>General Strikes</i>	domestic2	20
<i>Guerrilla Warfare</i>	domestic3	100
<i>Government Crises</i>	domestic4	20
<i>Purges</i>	domestic5	20
<i>Riots</i>	domestic6	25
<i>'Revolution'</i> ²	domestic7	150
<i>Anti-Government Demonstrations</i>	domestic8	10

For calculating the Index of Sociopolitical Destabilization (*Weighted Conflict Measure*, *domestic9*) the numerical values of each subcategory are multiplied by the corresponding weights, the results of the multiplications are summed up, the sum is multiplied by 100 and divided by 8 – see formula (1).

$$domestic9 = \frac{25 domestic1 + 20 domestic2 + 100 domestic3 + 20 domestic4 + 20 domestic5 + 25 domestic6 + 150 domestic7 + 10 domestic8}{8} * 100 \quad (1)$$

Description and Methodology of Calculation of the Independent Factor

Annual values of GDP per capita (PPP, constant 2011 dollars) are used according to the World Bank database (World Bank 2016 n.d.a). In order to reconstruct the data series for the period between 1960 and 1990 we use the GDP per capita growth indicator (World Bank 2016 n.d.b). On the whole, data from 1960 to 2014 are used to test the hypotheses.

² Note that the name of this variable ('Revolutions') is rather misleading since in reality in most cases the respective columns of the CNTS database register coups and coup attempts rather than revolutions proper as they understood in Political Science (see, *e.g.*, Goldstone 2014b). Thus, below we will denote this variable as 'Coups and Coup Attempts' rather than 'Revolutions'.

Tests

A direct test generally confirmed the hypothesis on the presence of an inverted U-shaped curve between the GDP per capita and the level of sociopolitical destabilization. The proportion of the average value of sociopolitical destabilization index according to three tertiles of GDP per capita looks as follows (see Fig. 1).

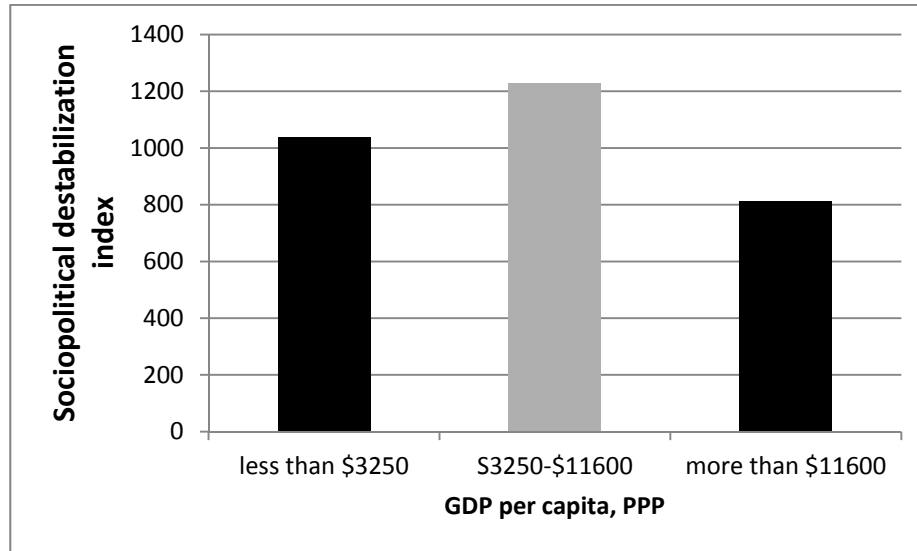


Fig. 1. The average value of sociopolitical destabilization index according to three tertiles of GDP per capita in USD, PPP, 1960–2014^{3 4}

The U-shaped curve looks rather asymmetrical here. Indeed, the negative correlation between GDP per capita and sociopolitical destabilization index is much more pronounced for the second and third tertiles ($t = 2.617$, $p = 0.0045$ ⁵) than for the first and second tertiles ($t = -1.775$, $p = 0.038$ ⁶). Similar results are obtained through ANOVA analysis.

Conclusion

Our research suggests that the relation between GDP per capita and sociopolitical destabilization is better described by an inversed U-shaped curve, rather than by a straightforward negative correlation, as is frequently believed. The highest risks are relevant for the countries with medium values of GDP per capita, not the highest or lowest values. Thus, until a certain value of GDP per capita is reached, the economic growth tends to lead to an increase in the risks of sociopolitical destabilization. It is only with higher values of GDP per capita that the economic growth starts to reduce the risks of destabilization. So, higher values of GDP per capita are characterized by a negative correlation with sociopolitical destabilization risks, while its lower values demonstrate a positive correlation with this indicator.

³ Note: $F=5.109$, $p = 0.006$.

⁴ Statistical significance of the differences between categories (shown by different colors in the figure) is further defined by a Tamhane's criterion ($p < .05$), and the procedure ANOVA.

⁵ 1-tailed.

⁶ 1-tailed.

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Social and Economic Background of Blending

Olga Kornienko

The article studies the interconnections between new word-building processes in languages and social backgrounds of societies. Such an approach is quite important since it allows revealing the type of interrelations between the changes in social, political and economic spheres of life and new elements of the language that now emerge to reflect such changes. The basis of the analysis is the vocabulary of contemporary English and Russian languages where a new phenomenon of coining new words through blending is actively developing. The shift from a stylistic device towards an active word-formation model is closely connected with new conditions in socio-economic environment of modern societies. Attention is paid to connotational differences between blends in English and in Russian as well as to the innovative spheres where this vocabulary enrichment process is most topical.

Keywords: *blending, social communication, metaphorical and metonymical transfer, socio-economic environment, evolution of technologies, connotations, imposed values, detest of the society.*

A language is a sort of computer, which reflects the changes in society. If a society exists in a closed environment the linguistic changes are petty and occur in a similar way to the invention of new things or phenomena. If a society exists in a less restricted environment or is actively integrating into global developments, we rather witness quick changes in language, such as borrowings and new word formation. If a society achieved outstanding results in its development, it starts using its own linguistic resources and even creates new patterns of enriching the vocabulary. Social, economic and political transformations cause substantial changes in the language of a society (Kornienko 2016: 182–274). The language fixes them in the vocabulary, maintains them for shorter or longer periods of time, and gives green light to the ones that correspond most properly to the people's mentality or the stage of historical development, while pushing others into oblivion.

If a society preserves language only in the form of legends, myths, and ballads, then we can speak about the possibility of coining new words by means of comparison and adaptation in the form of metaphorical or metonymical transfer. Such purely spoken languages of the past experienced their vocabulary 50-percent change within the period of 25–30 years, since the above-mentioned process resulted in a continuous flow. For instance, some Native Americans adopted special customs and traditions in naming which were specific to their tribe. Thus, the Californian tribes of the Miwok choose a baby name on the association of how a stream looked when the baby was born. The Lakota, Nakota, and Dakota tribes used the following comparative basis for choosing names: the characteristic honors, nicknames, secret talents, peculiar deeds, and religious spirits. Furthermore, they used the associations with animals, physical abilities, the sky and clouds, day/light

Globalistics and Globalization Studies 2016 220–225

and night as well as various birds. For instance, in the Ojibwe tribes people got such temporal names as: Abitagijib (half a sky), Babibinesi (white bird), Macqwa (bear), Wagosu (fox), Babi-Manigo (white spirit), Anacquad (cloud), and Migisi (eagle) (Nicknames...). In the nineteenth century there was taken a picture of native American leaders with the following speaking names: Little Plume from Piegan, Buckskin Charley from Ute, Geronimo from Chiricahua Apache, Quanah Parker from Comanche, Hollow Horn Bear from Brulé Sioux, and American Horse from Oglala Sioux. In fact, during his lifetime a person could get several names.

Later some of such names fused to form compound words. It often resulted in a shift towards the composition of languages, and we adhere to the opinion that compounds are characteristic of a simplified reflection of the phenomena at a definite period of time and are mainly used in situations within a quickly changing environment. On the other hand, in the global world any living language is characterized by a dynamic flow of spoken and written words and nonce-words. When people use the language, they start creating new meanings and patterns to express new or familiar notions, adapting them to their environment. Some of these adaptations turn out to be fruitful for the main bulk of the language, others represent a very fluid layer of the language which momentarily reflects the atmosphere in the society, entailing a specific stage of its development.

At certain periods, a society is more concerned with domestic problems and challenges than at others. This focus on internal development is characteristic of societies at the stage of active economic development and at the linguistic level it results in the emergence of many words coined via blending, metaphorical and metonymical transfer or composition.

Such processes took place in the British society at turning points of economic and social-political development which can be illustrated by the origin of blends in the sixteenth century when Great Britain started an active expansion associated with the period of the Great Geographical discoveries.

'The blends' are new words that are formed from parts of two or more root-words, phonemes or morphemes. The classical example is the word 'smog' which is coined by blending 'smoke + fog'. The blends reveal active social-political processes in the country trying to 'digest' new developmental realities and phenomena. Sometimes it is done with irony, sometimes – with serious attitude (but with evaluative connotations), and sometimes – with indignance.

Blends started to actively appear in the language in the sixteenth century and some of them are still preserved in the English language: blatterature = blatter + literature (1512); niniversity = ninny + university (around 1590); foolosophy = fool + philosophy (1592); fooleosopher = fool + philosopher – (1549); knavigator = knave + navigator (the late sixteenth – early seventeenth century); unisalphabeth = universal + alphabet (at the beginning of the seventeenth century).

The second period that gave an impulse to blending was the nineteenth century, when Great Britain experienced the technological revolution. It was the time when a new wave of blends was fixed in the Daniel Webster Dictionary (Webster 2010): squirl = squiggle + twirl or whirl (1843); flimmer = flicker + glimmer (1880); scribaceous = scribe + loquacious – (1846); cablegram = cable + telegram (1868); catalo = cattle + buffalo (1889); squarson = squire + parson (1876); solemncholy = solemn + melancholy (1772); clantastical = clandestine + fantastical (1803); astronography = astronomy + geography (1856); wiglomeration = wig + conglomeration (1858).

This process of vocabulary enrichment started as a rhetorical device to create comical and a bit ambiguous impression which was favored by some writers and publishing houses, for example: *balloonacy* = balloon + lunacy (Dickens 1864); *needcessity* = need + necessity (Scott 1818); ‘*shamateur*’ = sham + amateur (The Guardian 1896). The English Dialect Dictionary (EDD) fixed the following blends in 1898–1905: *baffound* = baffle + confound; *smothercate* = smother + suffocate; *boldacious* = bold + audacious; *squirearchy* = squire + hierarchy. A very interesting blend was ‘*gerrymander*’, which is a fusion of the Massachusetts governor’s name (Elbridge Gerry) and ‘*salamander*’ (1811).

One of the most popular examples, referring to the period, is the book by Lewis Carroll ‘*Alice in Wonderland*’ whose language is like an iceberg with implicit meanings surpassing in manifold ways the explicit meanings of the language. It was a perfect device to draw the readers’ attention to connotations and not to explicit meaning via creating a very sophisticated context, for example: *rocking-horse-fly* = horse-fly + rocking-horse; *bread-and-butterfly* = bread-and-butter + butterfly; *snap-dragon-fly* = Snapdragon + dragonfly; *slithy* = lithe + slimy.

The third wave of popularity of blends started in the second part of the twentieth century. And again it was prompted by a very dynamic evolution of technology and economy in the Anglo-Saxon world. This period witnessed a lot of discoveries and break-throughs which brought the necessity to somehow assess the phenomena of the world. As we know any blend means more than a combination of what its constituent parts express and always contains an evaluating tint of meaning. A critical connotation is evident in the following blends: *indigomania* = indigo children + mania; *cocacolonization* = coca-cola + colonization; *videot* = video + idiot; *Euroshima* = Europe + Hiroshima.

Nevertheless, blends do not always express irony; they often imply sarcasm, disbelief, and cynical assessment as well. This is especially evident with respect to the references to new discoveries, especially of genetic engineering and new ambiguous inventions: *electret* = electricity + magnet; *windoor* = window + door; *reprography* = reproduce + photography; *stagflation* = stagnation + inflation; *glasphalt* = glass + asphalt; *liger* = lion + tiger; *leopon* = leopard + lion; *wholphin* = whale + dolphin; *tigon* = tiger + lion or *liger* = lion + tiger; *zorse* = zebra + horse; *horbra* = horse + zebra; *cattalo* = cattle + buffalo; *enormouse* = enormous + mouse; *cockapoo* = cocker spaniel + poodle.

The language also fixes dubious discoveries in hybrid flora: *potamo* = *potato* + *tomato*; *grapear* = grape + pear; *glutose* = glucose + fructose; *garlion* = garlic + onion; *citrange* = citron + orange; *applemon* = apple + lemon; *sexting* = sending text + sexual content; *wall-jack* = fraudulently access Facebook + posts to wall; *complisult* = compliment + insult; *globesity* = global + obesity (from Twitter) (Cook 2016). The new blends include many phenomena that are socially equivocal: *glamping* = glamorous + camping; *sleepiphany* = sleep + epiphany; *Movember* = moustache + November; *entreponeur* = entrepreneur + porn; *subtweet* = subliminal + tweet (Dictionary 2016); *carbage* = car + garbage; *chugger* = charity + mugger, *vortal* = vertical + portal; *glocal* = global + local; *jeggings* = jeans + leggings; and *staycation* (stay-at-home + vacation); *mockumentary* = mock + documentary; *simulcast* = simultaneous + podcast; *Blizzaster* (blizzard + disaster); *textonym* = text + antonym. It is obvious that the language is not ready to include all of them into the vocabulary but the blends make the speech very expressive and attract the readers’ attention. One of such blends, namely, ‘*prestitute*’ was coined by Paul C. Robertson and as such it embodies all the connotations.

Blends often emerge during the periods of active integration of a given society into some new global environment. In the Russian language this process occurred in the nineteenth century when the Russian society made an effort to become a serf-free country and streamed to new democratic values. Nikolay Leskov in his novel 'The Tale of Cross-eyed Lefty from Tula and the Steel Flea' made an extensive use of blends: нимфозория = нимфа + инфузория; мелкоскоп = микроскоп + мелкий; губернянька = губернантка + нянька; гульвар = бульвар + гулять; верояции = вариации + вероятность; долбица умножения = долбить + таблица умножения; преламут = перламутр + преломлять свет; бюстра = бюсты + люстра. In our opinion, in the Russian language the blends have a much more critical and sarcastic meaning than in English.

The second wave corresponds to the period of Perestroika and the blends of this time are often verging on vulgar slang in desire to unmask the reality: дуροкраты = дураки + демократы; коммутанты = коммунисты + мутанты; крадоначальник = крадет + градоначальник (Khrushcheva 2011: 143–145); базарник = базар + рыночник, дерьмократы = дерьмо + демократы; выходимец = выйти + проходимец; гениалиссимус = гений + генералиссимус; идеепродавец = идея + хриstopродавец; кемерунец = Кемерово + камерунец; нуворишки = нувориши + воришки; пропаганец = пропагандист + поганец; трезвятники = трезвость + стервятники; мифописец = миф + летописец; фальшивонапитчик = фальшивомонетчик + напитки; западохульник = Запад + богохульник; кремледворец = Кремль + царедворец; крокодилер = крокодил + дилер; паучеризаторы = от паучий + ваучер + приватизация + организаторы.

From our point of view one can deduce a typical atmosphere in the society at the time when new big waves of blends emerge. For example, in terms of English blends of recent times, compiled with reference to the Neologisms Database of English Words and used in many courses of Rice University, one can present the American society in the following way: firstly, the public is absolutely scared of many things. One can prove this by a great number of blends formed from 'Armageddon': Auckgeddon = Auckland + Armageddon; Bramageddon = bra + donating + Armageddon; Farmageddon = farm + Armageddon (horror park in a countryside); Infogeddon = information + Armageddon (lots of frightening scandals because of mass media leaks); econogeddon/moneygeddon = economy/money + Armageddon (permanent scare of financial crises); jobageddon = job + Armageddon (scary of losing one's job); aquageddon = aqua + Armageddon; snowageddon = snow + Armageddon; starmageddon = star + Armageddon; stormageddon = storm + Armageddon (frights, connected with natural phenomena); stupid-geddon = stupid + Armageddon (low opinion about authorities); disastrophe = disaster + catastrophe; fempire = female + vampire.

Another characteristic feature is the American public's significant dependence on social communication through mobiles and internet and a substantial number of dangers awaiting people in this sphere: sexting = sending text + sexual content; wall-jack = fraudulently access Facebook + posts to wall; Neature = neat + nature (nature exploration through video); twatch = Twitter + watch and twatching = Twitter + watching; Mocial = mobile + social (many-faced social media); (shift register error which can give a word 'good' instead of 4663) (Carey 2016); Twiple = Twitter + people (parties for Twitter subscribers, mainly, virtual ones); Twittership = Twitter + friendship/relationship; eppraise = electronic + appraisal (via Net assessment of real estate).

If we add new blends from innovative discoveries sphere (glasphalt, liger, leopon, wholphin, tigon, zorse, horbra, cattalo, enor-mouse, cockapoo, potamo, grapear, glutose, garlion, citrange, applemon, humalin, complimagra *etc.*) we will get quite a surrealistic picture, weighing on an average American (of 10–35 years old).

The situation with Russian blends is quite different. There are no virtual otherworldly, or extramundane threats. Everything is realistic, imposed from outside world with the help of dishonest politicians and greatly detested by the society. First of all, people are disillusioned and reject the so-called liberal values, forming new blends: *попозиционерка* = *поползновения* + *оппозиционер*, *либераст* = *либеральный* + *педераст*; *оппозаст* = *оппозиционный* + *педераст*; *толераст* = *толерантный* + *педераст*; *майдауны* = *майдан* + *дауны*; *крестоповал* = *повалить* + *кресты*; *секстремистки* из FEMEN = *секс* + *экстремистки*; *гейропеец* = *гей* + *Европа*; *человолк* = *человек* + *волк*; *собакалипсис* = *собака* + *апокалипсис*; *экономикадзе* = *экономика* + *камикадзе*; *путанесса* = *путана* + *поэтесса*; *незагармоничный* = *заграничный* + *негармоничный*.

Secondly, people are quite cynical about the state of the Russian (former Soviet) society. Alexander Zinoviev, an outstanding Russian philosopher and logician, created some very expressive blends, reflecting the emotions in the USSR and during the time of *Perestroika* as well as the reaction to the social and economic situation in the country. Let us give just a few examples: *Гомо советикус* (*Homo Soveticus*) = *гомо сапиенс* + *советский*; *горбачевизм* = *Горбачев* + *капитализм*; *глобальный человекник* = *человек* + *муравейник*; *катастройка* = *катастрофа* + *перестройка*; «*несовершенно-взрослые*» = *несовершеннолетние* + *взрослые*.

Thirdly, they reflect the realities of a bleak period in the country's development in a very straightforward way: *отсиденты* = *отсидеть* + *диссиденты*; *свободоносчик* = *свободоно* + *доносчик*; *дурократы* = *дураки* + *бюрократы*; *мапулечка* = *мама* + *папулечка*; *хрущоба* = *Хрущев* + *трущоба*; *алконавт* = *алкоголик* + *космонавт*; *стрекозел* = *стрекоза* + *козел*; *выходимец* = *выйти* + *проходимец*; *трезвятники* = *трезвость* + *стервятники*; *фальшивонапитчик* = *фальшивомонетчик* + *напитки*; *гомерзик* = *гомик* + *мерзкий*; *демозавр* = *демократ* + *динозавр*; *досидент* = *досидеть* в *тюрьме* + *диссидент*.

Taking into account the above-mentioned information we can conclude that the vocabulary of a language reflects changes in social and economic environment. The new linguistic word-building model, such as blending, reflects the shifts in the attitude towards modern values, laws, and social environment as well as the general atmosphere in the society and the attitude towards imposed values and laws.

Moreover, the changes in the vocabulary indirectly correspond to the cyclic pattern of changes in the technological and socio-political spheres of a country. The quick development and integration into a new world environment gives an impulse to new word-formation models as it is obvious in case of blends.

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The Grand Theories of Integration Process and the Development of Global Communication Networks*

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The article considers the role and value of grand theories as a basis for the study of integration processes and global communication networks. The authors also consider the role of these theories in the study of globalization and regionalization.

Keywords: *integration, global networks, integration of theory, federalism, functionalism, neo-federalism, neo-functionalism.*

In the first half of the twentieth century regional association of different levels consistently associated with military, political, and trade organizations, as evidenced by the activities of the League of Nations in the sphere of sovereignty and collective security, etc.

However, after the Second World War the issues of economic cooperation came to the forefront and integration unions started to appear in the international arena along with free trade zones, regional banks, and the like, which primarily relied on the productive forces along with the simultaneous liberalization of economic relations.

Meanwhile, in the developing countries the process was, on the contrary, protectionist in its nature, which expressed in the desire to protect the newly acquired independence and was manifested in the form of sub-regional cooperation (ASEAN¹, ECOWAS², etc.).

The present stage of development of theoretical studies of integration processes is associated with events in the world politics between the second half of the 1980s and early 1990s. The main reason for the intensified research activity was the collapse of the bipolar world order after the Soviet system disintegration. At the same time one also observed an accelerated economic growth in the periphery countries, with the result that China, India, and several other countries began to compete with the strongest economies of the world. Their amplification has led to increasing political ambitions and dissatisfaction with the policy implemented by the United States and brought the conviction of the need for an integration of blocks under the regional leaders in order to build a new balance of power in international relations. All this has significantly contributed to the expansion of the scope and a quantitative growth of research in the field of integration processes.

Today the integration stands as one of the defining trends of current development of international relations system and of the world in general. 'Integration' (Latin *integratio*) means a 'restoration' and 'uniting of individual parts into an entity'. The term 'integration' may have different meanings depending on the application and branch of knowledge.

* This study has been supported by the Russian Science Foundation (Project No. 15-18-30063).

¹ Association of South-East Asia.

² The Economic Community of West African State.

In the present paper we focus on the term ‘political integration’ and define it as ‘a political process leading to the unification of various states and other political forces to coordinate and consolidate their activities’ (Kosov and Fokina 2009: 187).

Political science investigates the processes of political integration from the viewpoint of different theories, which one can divide into three levels according to the level of specificity and concreteness of the concepts and propositions: grand, middle-range, and micro-range theories. Each level is based on the development of alternative paradigms (*e.g.*, realism/neorealism, liberalism/neoliberalism, etc.).

In order to understand the ideological foundations of the theoretical study of the processes of integration, let us present an historical outline of the origin of two classic grand theories of federalism and functionalism since many new approaches contain theoretical foundations of federalism / functionalism yet are guided by small- or middle-range theoretical constructs oriented at the contemporary practice of political integration and global communication networks.

The first attempts to study the phenomenon of political integration ideologically originate in Europe of the early 1920s. They are connected with the end of World War I in 1918 which brought about the necessity, perceived both by societies and by the political elites, to develop new forms of peaceful coexistence. In that period, the need for theoretical understanding of the events as well as the political elites’ urge for an expert advice led to the emergence of the pan-European movement characterized by a critical attitude towards national statehood. The debate over the indicated issue and its scientific systematization gave birth to two theories: federalism and functionalism.

Federalism

The theory of federalism emerged in the situation of the crisis of nation-states after the events in the global political life and, in particular, on the European continent. The French political leader Jean Monnet together with the Italian politician Altiero Spinelli developed the theory of separation of power between the national and supranational level. Prominent politicians and top officials of the post-war European countries (French President Francois Mitterrand, the first German chancellor Konrad Adenauer and others) supported this idea.

The federalists based their research on the ideas that the final stage of the political integration processes is the emergence of the state with federal structure. According to the theorists of federalism, such pattern of integration allows creating an efficient system of cooperation between federal subjects and central government. Thus, the two levels of government – central and administrative-territorial (national and territorial) – act as the basic elements of a federation. In this situation, the central government concentrates the powers for the solution of general problems, while the authorities of federal subjects have certain powers in the matters of local importance.

The theory launched sharp debates in the scientific community regarding the issue of the degree of centralization within the federal framework. The discussion helped to define several types of federal structure, depending on the degree of interaction between the two levels of government. At the same time they took account of such factors as the level of democratic governance, the development of political pluralism, etc. that could contribute to the emergence of distinct types of federations: centralist, balanced, and decentralist. One should note that the centralist type of federal structure gained the largest support among the advocates and critics of the theory of federalism (Avdonin 2007: 3).

Another bright theory is the theory of neo-federalism. American political scientist John Pinder combined theoretical analysis on the issues of the European integration and prepared practical recommendations, thus laying the foundation of the theory (Pinder 1991) which is based on the idea of moving towards supranational decisions. Another well-known representative of neo-federalism is Amitai Etzioni, who considers the formation of the 'political community' as the main goal of integration. The 'political community' must have the following components: the control over the means of coercion, the presence of the decision-making center, and a common orientation of the citizens of the community.

Functionalism

Functionalists also criticized the idea of the nation-state, but unlike their opponents, they considered as an alternative to the federation the system of international institutions whose form and content depend on the functions they fulfil. The main ideas of the functionalists were formulated in the 1940s by the creator of this approach, the English scientist David Mitrany, and referred rather to the principles of international co-operation than to the integration of the European continent (Pinder 1991).

The proponents of functionalism determined the expansion of non-political tasks as a prerequisite for international cooperation. Thus, according to Mitrany's concept of 'spillover' interaction, initially states integrate in certain areas and then, these partially integrated states gain a necessity for further integration in related field, which in turn leads to the emergence of special supranational coordinating institutions and subsequent acceleration of political integration processes.

Functionalism was instrumental for the creation and development of the United Nations and a number of its specific institutions. Nevertheless, functionalism had a significant disadvantage since it simplified the notion of political integration, which, according to this approach must simply follow the economic one. The political integration in the European Union has shown that actually the need for the transfer of sovereign powers to a supranational body is the key to the process of integrative cooperation.

The next step in the study of political integration became the neo-functional approach of the 1960 and 1970s. The most outstanding representatives of this approach are Ernst Haas, Karl Deutsch, Leon N. Lindberg and others. The neofunctional theorists adhered to the fundamental functionalist ideas which they further elaborated and expanded.

Neo-functionalism became widespread in the USA and is manifested in two methodological alternatives. One of them is the communication theory of the American political scientist Karl Deutsch focuses on the analysis of the integrating communities within a broader context of international relations. Another theory, directly associated with the works of Ernst Haas, focuses on the analysis of regional political integration.

Deutsch defined the social communication as a basis for integration which is the relationship between interdependent subjects co-producing a certain system product, which they will be deprived of if separated (Deutsch 1978: 198). From his point of view, the international integration is accompanied by the convergence not only of the states but of the societies as well. The determining factor for the former is the legal implementation, while for the latter the most important is the emergence of 'community feeling' formed in the process of intensive communication as well as the existence of institutions and practical tools aimed at ensuring 'peaceful change' in the long term (Deutsch 1957: 5).

Thus, within the international integration one can find some legally arranged political organizations as well as the associations of states united by 'a sense of community', which, from Deutsch's point of view, are qualitatively at a higher developmental level than the treaty relations between states which are fragile by their nature.

The neofunctional approach of Ernst Haas contained a more specific analysis of political integration based not only on Mitrany's functionalism, but also on the analysis of political practice. He considered the specific actions of political actors of the integrating states as the main driving forces of integration. Haas determined political integration as the process when the political actors of several individual national systems tend to reorient their loyalty, goals, and political activities towards a new center, whose institutions have jurisdiction or apply for its extension in relation to the existing national states' (Haas 1958: 16).

Thus, to ensure their interests the participants of this process can use the supranational political level, which is superior to the one of the nation-state. At the same time, there is a gradual transformation of national interests in the direction of supranational alliances.

Another element of the neofunctional theory by Ernst Haas, is the concept of spillover process. This concept implies that a fruitful cooperation in one area inevitably has an impact on related areas and gradually expands its range, making the integrative interaction more stable and long-lasting. The neofunctional theory of political integration has gained a wide popularity while the ideas based on it served as the major analytical models of many research projects. However, optimism dynamic development of the neofunctional analysis was not combined with the actual political practice and the stagnation of the European Economic Community (EEC), of the 1970s, because of the divergent policies primarily of the integrating states. All this has affected the occurrence of the neo-functionalism critics while reducing its impact on the views of researchers' integration processes.

During the period of crisis of the neofunctional theory another representative of the American political science – Stanley Hoffman – became the main competitor for Ernst Haas and his followers and came up with the idea of inter-state approach to the study of political integration.

Stanley Hoffman was critical of the neofunctionalist idea about the decisive significance of supranational bodies in the process of political integration. He also emphasized that the supporters of neofunctional approach did not take into account the external factors and the impact of the national security interests of state members of the integration process. Hoffman's idea relied on the basic theoretical concepts of international relations and considered the process of integration as a process of interaction between states to ensure their own national interests.

According to Hoffman, the integration process depends on the states' willingness to delegate a part of their sovereignty to supranational bodies. This very factor is determinant for the development of positive dynamics of integration. Within the interstate approach one distinguishes two areas of integration cooperation: a 'high' level (foreign policy and security issues) and a 'low' one (economic, social, and humanitarian sphere, *etc.*) (Avdonin 2007: 5). The 'low' area of integration comprises the main areas of cooperation allowing an intensive cooperation between states on mutually beneficial terms while the 'high' area of integration has certain limitations in the coordination of national interests and national security.

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To summarize, we can say that the theories of federalism/neo-federalism and of functionalism/neo-functionalism have become classic theories and served as the basis for fur-

ther comprehension of integration. The origins of new theories associate with the emerging in the 1980s modern forms of cooperation among states at different levels as well as with changing international conditions and approaches in international cooperation and with the formation of new institutional relationships at all levels of regional integration.

The emergence of supranational actors at the contemporary international geopolitic arena concentrating certain sovereign functions of national states and their increasing influence on the global political and economic environment brought the qualitative content of globalization to a new level.

For a long period globalization has been considered the basis for the development of a modern system of international relations while the processes of regionalization have been regarded as secondary. However, finally, it turned out that the regionalization processes underlie the emergence of qualitatively new forms of institutional relations and thus, foster the origins of regional groupings, the latter being able to act as centres of power. Through the increasing cooperation in various spheres, the emerging regional systems become the centres of attraction in the region. The emerging association, gradually moving from economic to political cooperation, can acquire a transnational nature of global network links.

One should note that on the one hand, the emergence of global communication networks provides new opportunities for all actors of the international relations, on the other hand, the emerging dependence of the sovereign states on the trends and tendencies in international affairs may adversely affect the national consciousness, first of all, of the small nations and states.

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The Social Functions of Sport: a Theoretical Approach to the Interplay of Emerging Powers, National Identity, and Global Sport Events

Alexander Lenger and Florian Schumacher

Many social scientists see Brazil, Russia, India, China, and South Africa as emerging powers. Analyzing to what extent these countries have the size, the resources, and the will to achieve great power status they find that all these countries are the largest countries with the biggest economies in their regions and play an important role in the global polity. The effects of symbolic power accumulation, however, are frequently ignored and significantly underestimated. The paper contributes to the discussion on emerging powers by analyzing global symbolic power formation. Therefore, a field of global symbolism, namely the global field of sport is reviewed. Sport in general can be seen as a mechanism to strengthen the national identity of any country and its vision of itself. Hence, the paper argues that the investment into sport is a useful strategy to improve citizens' self-perception as an emerging power and to gain support for their 'expanding' politics. Furthermore, it argues that the power status of emerging powers can be read off from the supply and success in international and global sport events. Consequently, it is not of great surprise that emerging countries have started hosting major sport event recently (Olympic Summer Games 2008 and Olympic Winter Games 2022 in China; Soccer World Championship 2010 in South Africa, Commonwealth Games 2010 and Cricket World Cup 2011 in India; Olympic Winter Games 2014 and the FIFA World Cup 2018 in Russia, FIFA World Cup 2014 and the Olympic Summer Games 2016 in Brazil).

Keywords: *globalization, international relations, emerging powers, collective identity, nation building, symbolic power, sport, Olympic Games, FIFA World Cup.*

1. Introduction

The process of globalization is constantly changing the existing world order, namely, it transforms the status and the role of the nation-state crucially (Giddens 1985; Appadurai 1996; Beck 2000; Kiss 2010). Consequently since the beginning of the 1990s the consciousness of the world and therefore of other countries and other cultures has increased decisively. Nation-states nowadays are not only focused inwards by controlling the internal issues of national societies like national security or social welfare, more and more they face outwards to the distance and compete with other countries on every level of interaction: not only in the sector of the world economy or global politics but also in the sector of transnational culture. Global sport events fashion among transnational cultures' symbolic

Globalistics and Globalization Studies 2016 231–248

icons. Recently, hosting global sport events has become a symbolic not only of a strong national identity but also a symbol of the capability in acting globally (Senn 1999; Black 2007; Cornelissen 2010; Jinxia 2010; Schaffer and Smith 2000). With the fact that a country is able to organize a sports mega-event like the Olympic Games or a FIFA World Cup it shows the world its power on several sectors: the economic and administrative power by providing an adequate infrastructure (stadiums, public transportation, and accommodation), the political power by providing security for a huge number of guests, the cultural power by presenting the nation itself as good and friendly hosts, *etc.* (Short 2008: 323–324).

Sport in general can be seen as a mechanism to strengthen the national identity of any country and its vision of itself (Tomlinson 1986; Bairner 2001). Hence, this paper argues that the investment into sport is a useful strategy to improve citizens' self-perception as an emerging power and to gain support for their 'expanding' politics. Furthermore, it argues that the power status of emerging powers can be read off from the supply and success in international and global sport events (Cornelissen 2010: 3014).

Therefore, a field of global symbolism, namely the 'field of sport' (Schirato 2007) is reviewed. Traditionally, there are seven dimensions of power identified in international relations (Renard 2009: 24–26), divided into natural determinants (geography, population, and resources) and social factors (economy, military, diplomacy, and identity). However, most scholars mainly focus on the first six factors (domestic sociopolitical, international political, population, economic, agriculture, energy, technology, environmental resources and quality) (*e.g.*, Kennedy 1987; Treverton and Jones 2005). The question of how to influence and strengthen strategic soft factors like the perception of national identity and what can be done to support the general image of an emerging power abroad and at home has been to minor interest in academia (*e.g.* Tomlinson 2000). To overcome the image of a regional power, the status as an emerging global power has somehow to be anchored in the general perception of their citizens and sport is one way to do so (Bairner 2001; Jinxia 2010).

To analyze the phenomenon of global symbolic power, the paper is structured as follows: in Section 2 the social functions of sport are highlighted. Section 3 then analyzes the internal perspective of sport while Section 4 focuses on the external perspective of sport. Section 5 concludes the paper.

2. The Social Functions of Sport

The image of building social cohesion through sports can be traced back to England in the eighteenth century (Hoberman 1993, 1997; Guttmann 1994; Standeven 1994: 241; Bairner 2001: 13; Giulianotti and Robertson 2009). Although sport was based on the principles of physical capacity, competition, and the challenge of records, it was also conceptualized as a tool of education in the first English public schools. Following up on the notion that sport is an element of common activity with the potential of self-forming groups and group identities, it mediates social rules and the idea of respect towards other group members. At a later date sport was used in a related way for disciplinary issues of industrial workers and for socialization (respectively 'civilization') of postcolonial societies in India and Africa (Schirato 2007: 63–70; Whannel 1998; Bose 2006: 47, 57; Guttmann 1994: 39, 63–70). Thus, sport in general can be seen as a tool to overcome the barriers within national societies (Giulianotti and Robertson 2009: ch. 5).

Despite a number of different ideas of transnationalism and conceptions of transnational communities across all borders of nation-states (Appadurai 1996), the traditional idea of nation-states as a container-model still is quite realistic for most countries (Giddens 1985: 119). The modern idea of the nation-state which contains society must be regarded as the basic structure of the contemporary world (Beck 2000; Kiss 2010). In this national context it is widely accepted that sport can function as an element of uniting differences as well as for the transgression of local communalism (Maguire 2005; Tomlinson and Young 2006b).

Recognizing that sport is both connected to a uniting and bonding source of power between different peoples, social classes, religions, nations, *etc.*, while being founded on the idea of competition and therefore linked to the idea of division and separation of people, it can be argued that sport seems to be a universal language, a cultural tool, for bridging the gaps of unequally developed states and continents.¹ Major sport events like the world championships in football in Germany 2006 or in South Africa 2010 were enacted as big party events where different people should meet and get to know each other.

Accordingly, those events are always accompanied by mottos linked to nations. For example the FIFA World Cup 2006 in Germany was themed ‘World Cup – A Time to Make Friends’ and the FIFA World Cup 2010 in South Africa ‘Ke Nako. Celebrate Africa’s Humanity’. These events are presentations of the nation not only to their own citizens but especially to the rest of the world. The crucial points are not so much the real social problems in a society or the differences between different ethnic groups in a society but the idea of overcoming those differences and present a nation from two different perspectives: A ‘true’ and ‘authentic’ national identity (often a national cliché) is presented on the one side. On the other side, the nation is shown as an open-minded, friendly and communicative entity.

From such a point of view sport is seen as some kind of ‘lingua franca’ which can be decrypted by the poor and the rich, not depending on the color of the skin, the religious context or the national culture (for an overview on global inequality see Boatcă 2015; Lenger and Schumacher 2015). Sport events can be held across all national borders and beyond political systems because on the playing fields of sport every participant truly is equal since they all meet under the same objective rules and circumstances (Black 2007: 266). Consequently, sport has a transnational, transgressing potential (Giulianotti and Robertson 2009: 134–147).

In contrast, however, the instrumentalization of sport through nation-states is omnipresent. National success in global sport events conveys the people national pride and the faith in their national strength and national power. Since sport takes place on an assumed ‘neutral’ ground, collective identities can be linked to it and polarizations can easily take place: You always have the ‘good us’ against the ‘bad others’ (Bairner 2001: 174–175). In this opposition it seems to be impossible to give a categorical statement about the phe-

¹ Accordingly, the United Nations (2003) highlight the potential of sport affecting the lives of individuals, nations, and civilizations across the globe: ‘The world of sport presents a natural partnership for the United Nations system. By its very nature sport is about participation. It is about inclusion and citizenship. Sport brings individuals and communities together, highlighting commonalities and bridging cultural or ethnic divides. Sport provides a forum to learn skills such as discipline, confidence and leadership and it teaches core principles such as tolerance, cooperation and respect. Sport teaches the value of effort and how to manage victory, as well as defeat. When these positive aspects of sport are emphasized, sport becomes a powerful vehicle through which the United Nations can work towards achieving its goals’.

nomenon of sport: depending on the specific context sport is linked to it can be disuniting on the one hand or universal on the other. Sport can be a factor of nationalism as well as a factor of transnationalism or globalization.

The twofold function of sport as an element of uniting as well as an element of dissociation constitutes the theoretical background of this paper. In what follows the impacts of global sport events on two different directions will be described. These events cause a number of internal effects to national societies as well as on the international or intercultural level in the external or global relations between nation-states. On the internal level, sport contributes to social cohesion. On the external level, the competition is about gaining reputation in the existing international world order. Especially some rising nations of the Global South which are summarized with the conception of the emerging powers are more and more interested in the role of hosts for global sport events to show and underline their rising and growing status in the changing world order.

The Internal Perspective: National Identity and Global Sport Events

Being the host country of – for example – the Olympic Games or a FIFA World Cup does not only demonstrate the world the ability, the culture, and the power of the hosting nation, it also has effects on the national identity of the hosting society (Short 2008).

In general, big sport events often are directly connected to nation-building processes and constructions of national identity (Anderson 1983; Hobsbawm and Ranger 1983; Yu 2010): The 1954 ‘Wunder von Bern’ often is seen as the emotional birth of the Federal Republic of Germany. The South African triumph in the rugby world cup in 1995 when the white ‘Springboks’ carried their black president Nelson Mandela on their shoulders and Mandela vice versa put on the rugby dress can also be regarded as a symbol of national identity.

Sport Events and the Social Construction of Imagined Communities

Theoretically, two different concepts of the nation exist: From a *subjective perspective*, the belonging to a nation rests on the free will of an individual. Consequently, the nation is conceptualized as a community open to everyone (*cf.* Renan 1996 [1882]). While this voluntary concept is closely linked to the liberal ideas of the French Revolution, the *objective perspective* in contrast is linked to the idea of a cultural nation or people's nation (von Herder 1784–1791). An essential argument for this second view is the assumption that a designated group of people have a specific attribute in common given by nature. This is used as some kind of social substrate, in other words, a group of people can be organized as a collective subject. Accordingly, the national community does not result from a common subjective political idea of will but rather from objective attributes like a common history, a common culture, a common ethnicity or a common language (Hall 1991).

In the twentieth century, concepts of the nations developed in front of Neo-Marxist theories (Poulantzas 1978; Balibar and Wallerstein 1991) as well as on the background of the process of modernization (Gellner 1983, 1997). Against the background of the post-colonial nations in Africa and Asia, Benedict Anderson (1983) developed the concept of the ‘Imagined Communities’ which can be regarded as a change of paradigm. As the established common criteria for communities like history, culture or language fail for these ‘new’ nations, Anderson suggested a less dogmatic definition for the nation as an ‘imagined community’. Instead of searching for a number of definitive criteria for the perma-

nence of national communities, he let the nations define themselves endogenously. Hence for the multicultural, multiethnic and multilingual postcolonial nations, he does not try to identify a single collective criterion which can be regarded as the foundation of the nation. Rather he asks the more general question of how communities as imaginations are constituted in the mind of their citizens. In contrast to European nations, postcolonial nations are not established on a collective idea or common base. They are just founded on the existence of a former colonial territory. Consequently, the term 'nation-building' emerged in the theories of the nation-states (Hobsbawm and Ranger 1983). This term describes the formation process of a nation-state resulting from nothing else than a community feeling. If nations cannot be defined by a fundamental core, the criteria of affiliation can only be an imagined feeling of inclusion and exclusion. So the question of national identity becomes the crucial question at hand. If nations can be comprehended as cultural constructions of communality, they can only be viewed by their internal perspective of imagined collectivity. Thus, the analysis has to focus on the issue how the concept of the nation as an 'imagined community' is constructed and reproduced within big sport events.

Collective Memory and the Lieux de Mémoire

To approach this question Maurice Halbwachs' theory of the *Collective Memory* and especially the refined concept by the German archeologist Jan Assmann can be adapted to the question of national identification in sports (Halbwachs 1980, 1992; Assmann 2011). Assmann replaces the term of the 'collective memory' by the term of the 'cultural memory'. His extension of the concept focuses on the aspect of the objectivity of culture which Halbwachs did not regard as a central point. So Assmann's extended concept is based on the trilogy memory, culture, and community. Starting from the idea of a cultural memory retention and memory are not so much seen as individual phenomena but rather are social, respectively collective phenomena. Collective patterns of thought and interpretation of social processes, events, memory and identity are essentially shaped through the context of societies. Thus, cultural and collective interpretations of the past, the present and the future are channeled to the collective memory of a group of people. Consequently, the entries to the collective memories of nations are directly linked to national identities. They evoke and generate common associations and emotions. The active constructive process of memory connects historical and current facts with statements and emotions and thus gives those facts social sense and social meanings. It is the task of the collective memory to explain the present: to organize and define the nation to a collective mind. To put it into simple words: It is the task of the collective memory to create a collective identity. Thus, the collective identity of a nation can be regarded as the link between the individual and the society, between personal experience and collective knowledge, as well as between past and future.

Resting on this concept, the French historian Pierre Nora (1999–2010) regards memories as real or imagined places, so-called *Lieux de Mémoire*. *Lieux de Mémoire* represents common national memories and emotions, triumphs and defeats, joy and sadness, overall the idea of the imagined nation. For the construction of communality and identity different items are useful: demonstrative images or meaningful events are important if we want to find out who we are and how we identify ourselves as a group. Specific national institutions in a broader sense like schools, cultural institutes, national galleries, national museums as well as national teams in sports frequently are constructed as cultural symbols. Thereby national memorials, flags, hymns, popular traditional songs, literature, sport events and their insignia are widely used instruments to link individuals to a community

and generate a feeling of a common identity. The *Lieux de Mémoire* calls up and satisfies the social and the emotional needs for orientation and collectivity. To trigger the process of identity formation, national myths must be embodied in events and persons. They also must be connected to people's everyday life and must contain well known and positive messages of a society.

Hence, sports allow for communication between social classes bridging social inequality and differences between different members of society. Such a function is of utmost importance since emerging powers in particular struggle with the problem of social inequality and the problem of missing participation of lower classes. Thus, by recognizing the potential of sport to create social cohesion, global sport events must be analyzed in more detail.

The External Perspective: Emerging Powers and the Global Competition of Nation States

The second interest of the paper is the influence and significance spread out from the fact that global sport events are hosted by nation-states.² This can be very clearly shown by a number of rising nations which are summarized as the emerging powers in the current world order (Cornelissen 2010; Jinxia 2010). These nations like Brazil, Russia, India, China or South Africa have shown up on the global sphere of sports since the 1990s and have started hosting global sport events just recently. Hereinafter the modified role of these states in the world order will be approached by outlining the theoretical conception of the emerging powers in a first step, focusing on the altered function of the nation-state in a second step, and highlighting the link between sports and international relations in a third step.

The Emergence of New Powers: BRICSA

Since the beginning of the 1970s, the current world order has changed through the expectations of the process of globalization on all sectors of international relations and issues of societies (Renard 2009: 13–20; Grinin and Korotayev 2010; Tausch and Heshmati 2011). Hermann Schwengel (2008) outlines three basic steps in the history of the emerging powers since the 1970s which are closely linked to the power structure of the world and to the process of globalization: In the 1970s, a new kind of flexible global capitalism emerged. The changes in the two decades until 1990 were limited to the economic sector. The economic integration in the world system increased dramatically as well as the quotas of import and export of products in a number of societies. Schwengel analyses this process as a process of quantity not so much as a process of quality because this change was mostly limited to the economic sector and can be regarded as a new dimension of the worldwide capitalism. In the sector of politics, however, the global landscape was clearly dominated by the two block system of the Cold War between the Soviet Union and the United States of America. In this tight political situation the emergence of a third player on the global agenda was not possible. Nevertheless, some commercial city-states like Singapore and Hong Kong and some 'Tiger States' like Taiwan and South Korea arose. These tiger economies, however, were commercial centers 'under the umbrella of American hegemony' (Schwengel 2008).

After the fall of the Berlin Wall and the decline of the Eastern Bloc the political situation changed completely. The USA until today must be regarded as the only remaining

² Even though the Olympic Games are officially hosted by a town and not by a national state we assume a national dimension with every global sport event.

super power in the world but without any equivalent. Instead of the two-bloc-system nowadays we are confronted with a number of regional centers of powers like Brazil, Russia, India or China simply called BRIC today (O'Neill 2001, 2009; Schwengel 2008; Renard 2009; Martinez-Diaz and Woods 2009). Moreover, instead of the 'stable' system of the Cold War we are confronted with a diffuse and multipolar system including different and changing centers of powers today (Chase-Dunn 2014). In this context the role of the EU and of a number of other more or less emerging states like South Africa, South Korea, Thailand or Japan cannot be conclusively determined. In the current situation of globalization, Eric Hobsbawm points out, it is the first time for two centuries that the world does neither have a working international system nor a stable international structure (Hobsbawm 1990).

Thus, new global alliances are established following individual national economic and strategic interests in a multipolar world. The first-ever BRIC summit meeting of the leading emerging powers, held in June 2009 in Yekaterinburg, clearly represents the change in the world order (O'Neill 2009; for overviews on emerging powers see OECD 2008; Pieterse and Rehbein 2008, 2009; Renard 2009). Building new economic and strategic alliances the BRIC nations are economically catching up with the G-7 and are expected to overtake it in less than two decades and are likely to be the new driving forces in the global economy. A few years ago Goldman Sachs made the prediction that China will overtake the USA as the leading economy followed by India, Brazil, and Russia and that the combined economies of BRIC countries could outperform those six leading countries in monetary terms by 2050. A broad body of literature giving evidence that Brazil (Sotero and Armijo 2007; Lattimore and Kowalski 2008), Russia (Tarr 2008), India (Rusko and Sasikumar 2007; Grinin 2013), China (Liang 2007; Rusko and Sasikumar 2007; Cheng and Yang 2012; Grinin 2013), and South Africa (Kowalski, Lattimore, and Bottini 2008) will be very likely the leading global powers by the middle of the twenty-first century. Thus, we assume that those countries until today have reached enough economic, political, military and cultural power to play a major role in world politics.

Globalization and the Altered Role of the Nation-State

The current situation can be described as a third phase of globalization, that is as a period of inner globalization and the emergence of new powers (Schwengel 2008). Hence the national societies have to find their place in the processes of globalization which fundamentally affect their traditional ideas of local identities and global expectations (*Ibid.*: 4–5). Under the impressions of worldwide changes caused by globalization in the last four decades, two contradictory positions have been pointed out: some authors hold the position that the nation-state still must be viewed as the fundament of the world system and forecast the idea of the nation a great future (Mann 1986, 1993, 1997) while others expect the decline of a world constructed of nations and national societies (Hall 1991; Appadurai 1996; Pieterse 2004; Grinin 2012). Appadurai, for example, argues that cultures today more and more transcend nation-states. In his concept of different kinds of '-scapes' he does not only see the economic sector to be transnational but also social areas like technology through the internet, ethnology through migration and tourism or ideas and ideologies through the worldwide media. While in some globalization theories the dissolution of boundaries is posed as the end of the nation-state other more skeptical conceptions only expect the nation-state to change. Beck (2000) expects the traditional nation-states to transform into a single transnational entity which is dominated by the civil society. Other

authors like Hall (1991) or Pieterse (2004) consider the backside of globalization and consequently identify a process of deglobalization. In opposition to the global ideas of transgressions of boundaries in all sectors the reinforcement of local identities is recognized. Starting from these observations, Robertson (1995) developed the concept of 'glocalisation' which considers both aspects in the process of globalization: the side of the globality as well as the opposite side of locality. Regardless of whether the status of the nation-states is weakened or strengthened in the process of globalization in this current situation of a multipolar world system with different emerging centers of power the role of the nation state has definitely changed.

Ernest Gellner (1983, 1997), in his famous conception of the nation-state and modernity, traces the idea of the nation-state from agrarian societies to modern societies. He argues that modern societies are dominated by a capitalist economy which generates a need for a well-educated flexible workforce. The modern nation-state hence is based on well-educated people and strong regulations of all social sectors by administrations. With these elements, the sovereign nation-state claims not only the dominance over its citizens but also over its territory. This dominance is not so much dominance of oppression but of integration. The state monopoly above all is bounded inward. The traditional role of the nation-state consequently is found in the aspects like the regulation of the population by the establishment of a health system or in security issues like the undisputed power over legislative (jurisdiction) and executive (police).

With the changes of globalization at hand the domination of limited national territories or peoples not only become more and more difficult but also become basically insufficient. Nation-states successfully taking part in the global competition are not only able to control their own territory and their own people but also to shine outwards all over the globe. With the establishment of new information technologies like the internet and the existence of a global public sphere, the place of action has been transferred from a limited local point to a global sphere (with Appadurai it can be named a global mediascape). The sovereign nation-state within the last two decades has been transformed from a national welfare state to a global competitive state. Thereby the radius of action for nation-states has been dramatically enlarged. With every political action nation states today not only must be perceived as local players but also as global actors.

It has been pointed out before that empirical data indicates that the BRICSAs are emerging powers (*cf.* Grinin and Korotayev 2010). A glance at the share of the global gross domestic product, for example, shows that in 1995 they accumulated approximately 8 per cent of the global GDP; ten years later their share was already reaching 10 per cent, and in 2009 their share was hitting 15.5 per cent of global GDP, representing over 20 per cent of global GDP at Purchasing Power Parity (Renard 2009; Wilson and Purushothaman 2003). In fact, it is expected that China will catch up earlier with the United States. According to Jim O'Neill, the BRIC economies will reach equal real GDP levels with the EU by 2040 (O'Neill 2001).

However, it is important to acknowledge that there is a fundamental distinction between an emerging economy and an emerging power. Unfortunately, a detailed description of the economic, political, militaristic, population developments of emerging powers is beyond the scope of the paper (for an excellent overview see Renard 2009; for indicators of globalization see Drener *et al.* 2010; Heshmati and Lee 2010). Here, we assume that there is enough empirical evidence to treat China, Brazil, Russia, India, and South Africa

as emerging powers. There are many hard indicators that could be used to measure the power of countries like quantity of natural resources, level of urbanization or the level of technological advancement. However, to discover who the real emerging powers today are also the numerous non-traditional indicators of power, like soft power, the (self-)perception of power, or life satisfaction and happiness have to be included. Thus, it can be demonstrated that both India and China have been putting efforts into promoting its soft power in recent years, India through Bollywood Movies and China through hosting the Olympic Games. Thus, following this notion we want to highlight a development that seems to us as striking as obvious at the same time. All emerging powers will host or are hosting major sport events recently demonstrating that the international competition among nations have reached the cultural sector as well.

The Politics of Global Sport Events

The importance of sports mega-events³ has been recognized increasingly in a globalized world (Tomlinson and Young 2006b; Miller *et al.* 2001). The cultural-political and economic significance of such events has also been highlighted sufficiently (Simson and Jennings 1992; Sugden and Tomlinson 1998; Tomlinson 1996, 2000; Roche 2001). Nevertheless, the function of sports in its form as a global media event – transporting symbolic values – has not been understood sufficiently (Giulianotti and Robertson 2009: 63–73, 92–95; Tomlinson and Young 2006a: 4).

As pointed out before, the Yekaterinburg summit gives clear evidence that the BRIC nations are already seeking a greater role in the global (financial) institutions and the international monetary system (Khan and Roy 2011). To support their rising global status and to gain their citizens' support, those leading emerging powers have started to invest into sport and global sport events. Since there are high symbolic revenues it is not surprising that all rising nations compete intensively to host the next Olympic Games or FIFA World Cups. However, it is widely known that international sport is characterized by political and economic inequalities, unbalanced relationships and persisting conflicts (Cornelissen 2010). Moreover, within the sociology of sport it has been argued that the symbolic importance and sportive power of nations is reflected by the success in winning medals and titles therefore represented by medal tables of the Olympic Games or number of world cup titles, nowadays called 'sportive nationalism' (Hoberman 1993, 2004). Pierre Coubertin, for example, explicitly claimed that triumphant athletes promote national prestige and states that winning medals is the global accepted symbolic indicator for success in sport (Hoberman 2004: 185). Stamm and Lamprecht (2000) provide empirical evidence that the power structure of nations correlates to success in Olympic Games. The sportive success then is readily seen as a symbolic power in the existing world order (Jütting 2001). However, it has seldom been recognized that hosting these major sport events actually represents a much more important indicator for the symbolic power of a nation (*e.g.*, Schirato 2007: 75–81). From the perspective of the organizers, the realization of a major sport event does not only represent the integration into the global community but also the competitive advantage of a country. Frequently, it can be argued that the independent observer might have the impression that the success within the field of sport correlates directly to political, cultural, and organizational resources of a society.

³ In line with Tomlinson and Young (2006a) global sport events are defined as 'an event that has come to involve the majority of the nations of the world, that is transmitted globally, that foregrounds the sculptured and commodified body and orchestrates a physical display of the body politic, and that attracts large and regular followings of on-site spectators for the live contest or event'.

Accordingly, being much more than ‘propaganda for tourism’ (Krüger 2004) these motives emerge particularly apparent at the XI Olympic Games (Berlin 1936) before World War II and at the XXII (Moscow 1980) and XXIII (Los Angeles 1984) Olympic Games during the Cold War when the competition of social systems and cultures bore the markings of an arms race (for a detailed survey of the following see Hook 2002; Tomlinson and Young 2006a). However, the core of our argumentation says that even after the breakdown of socialism the competition of systems has not declined but rather persists represented, for example, in international sports (Das 2006; Palat 2008). Following up this argument the Olympic Games 1988 in Seoul represent the success of the rising Asian dragons and the Olympic Games 2008, 2014, 2016, 2018, and 2022 the increased importance of emerging powers like China, Russia, Brazil and South Korea.

Table 1. Host Cities and Countries of the Olympic Games

Year	Place	Country
1	2	3
1896	Athens	Greece
1900	Paris	France
1904	Saint Louis	USA
1908	London	UK
1912	Stockholm	Sweden
1920	Antwerp	Belgium
1924	Paris	France
1924	Chamonix	France
1928	Amsterdam	Netherlands
1928	St. Moritz	Switzerland
1932	Los Angeles	USA
1932	Lake Placid	USA
1936	Berlin	Germany
1936	Garmisch-Part.enkirchen	Germany
1948	London	UK
1948	St. Moritz	Switzerland
1952	Helsinki	Finland
1952	Oslo	Norway
1956	Melbourne/Stockholm	Australia/Sweden
1956	Cortina d'Ampezzo	Italy
1960	Rome	Italy
1960	Squaw Valley	USA
1964	Tokyo	Japan
1964	Innsbruck	Austria
1968	Mexico-City	Mexico
1968	Grenoble	France
1972	Munich	Germany
1972	Sapporo	Japan
1976	Montreal	Canada
1976	Innsbruck	Austria
1980	Moscow	Soviet Union
1980	Lake Placid	USA

1	2	3
1984	Los Angeles	USA
1984	Sarajevo	Yugoslavia
1988	Seoul	Republic of Korea
1988	Calgary	Canada
1992	Barcelona	Spain
1992	Albertville	France
1994	Lillehammer	Norway
1996	Atlanta	USA
1998	Nagano	Japan
2000	Sydney	Australia
2002	Salt Lake City	USA
2004	Athens	Greece
2006	Torino	Italy
2008	Beijing	China
2010	Vancouver	Canada
2012	London	UK
2014	Sochi	Russia
2016	Rio	Brazil
2018	Pyeongchang	South Korea
2020	Tokyo	Japan
2022	Beijing	China

Source: <http://www.olympic.org/en/content/Olympic-Games>.

Table 1 gives clear evidence of this phenomenon: While being a global event it has been hosted only in the Western World in the first half of the twentieth century. It was not before 1956 that the Games arrived in the Southern hemisphere for the first time. But even then beside Mexico in 1968 and South Korea in 1988 it has been only already industrialized nations hosting the Summer Games. However, the emerging powers represented through China (2008) and Russia (2014) started hosting the Games (Jinxia 2010). More striking is that Brazil 2016, South Korea 2018, and China 2022 are the next hosts.

Table 2. FIFA World Cup (1930–2022)

1930 Uruguay	1982 Spain
1934 Italy	1986 Mexico
1938 France	1990 Italy
1950 Brazil	1994 USA
1954 Switzerland	1998 France
1958 Sweden	2002 South Korea and Japan
1962 Chile	2006 Germany
1966 England	2010 South Africa
1970 Mexico	2014 Brazil
1974 Germany	2018 Russia
1978 Argentina	2022 Qatar

Source: www.fifa.org.

In contrast, hosting the FIFA World Cup frequently changed between the Global North and the Global South.⁴ There are two correlating reasons for this. First, soccer was less important, therefore, investments were not that profitable. More precisely since soccer is the sport of the poor and lower classes, the Olympic Games represent sports closely connected to the upper classes, respectively elites. Accordingly, the ruling classes traditionally had more interest in the promotion of nationalism through the Olympic Games rather than through Soccer World Championships or other team sports events like basketball (the sport of the black), football, or handball. This perception, however, changed drastically during the second half of the twentieth century which is the reason why hosting a FIFA World Cup today represents a high symbolic value.⁵ Consequently, also nations not traditionally interested in soccer like the USA in 1994, South Korea and Japan in 2002, or Qatar in 2022 started hosting the FIFA World Cup thereby representing the new importance of such an event.

Table 3 shows the list of medals providing important information. First, the run for medals definitely represents the Cold War during the second half of the twentieth century. While the USA has won ten times after WWII, the USSR was successful seventeen times. Second there is a pretty clear correlation between hosting the Games and winning the Games. This, of course, can only be explained by the extraordinary efforts put into sports before such an event. A very good example again is China which only won its own Olympic Games in 2008 and is ranking 8th in the all-time Olympic Games medal table. Third, relatively small countries like Germany and Norway are extremely successful in the Olympic Winter Games thus demonstrating that Winter Games are much less representative and symbolic than Summer Games.

Table 3. All-time Olympic Games Medal Table

1896	Athens	USA/Greece	1968	Grenoble	Norway
1900	Paris	France	1972	Munich	USSR
1904	Saint Louis	USA	1972	Sapporo	USSR
1908	London	UK	1976	Montreal	USSR
1912	Stockholm	Sweden	1976	Innsbruck	USSR
1920	Antwerp	USA	1980	Moscow	USSR
1924	Paris	USA	1980	Lake Placid	USSR/GDR
1924	Chamonix	Norway	1984	Los Angeles	USA
1928	Amsterdam	USA	1984	Sarajevo	USSR/GDR
1928	St. Moritz	Norway	1988	Seoul	USSR
1932	Los Angeles	USA	1988	Calgary	USSR
1932	Lake Placid	USA	1992	Barcelona	CIS
1936	Berlin	Germany	1992	Albertville	Germany
1936	Garmisch-Partenkir.	Norway	1994	Lillehammer	Russia/Norway
1948	London	USA	1996	Atlanta	USA
1948	St. Moritz	Norway/Sweden	1998	Nagano	Germany
1952	Helsinki	USA	2000	Sydney	USA

⁴ In fact, Richard Cashman (2004) argues that World Cup Football is perceived as European, South American and African while Olympic Games are perceived as truly global.

⁵ For example even after winning the World Cup in 1966 neither the *Mirror* nor the *Sun* did mention it on the front-page. In contrast, in 2006 every match England played was a front-page lead for the *Mirror* and the *Sun* and the *Times* ran a daily 16-page World Cup supplement (Lisle 2010).

1952	Oslo	USSR	2002	Salt Lake City	Germany/Norway
1956	Melbourne/Stockholm	USSR	2004	Athens	USA
1956	Cortina d'Ampezzo	USSR	2006	Torino	Germany
1960	Rome	USSR	2008	Beijing	China/USA
1960	Squaw Valley	USSR	2010	Vancouver	Canada/USA
1964	Tokyo	USA/USSR	2012	London	USA
1964	Innsbruck	USSR	2014	Sochi	Russia
1968	Mexico-City	USA			

The effect of television was even more important for the external marketing function of global sport events (Lisle 2010). The 1936 Summer Olympics in Berlin were the first Games to be broadcast on television (though only to a local audience). The 1956 Winter Games were the first internationally televised Olympic Games, and the 1960 Winter Games in Squaw Valley had their broadcasting rights sold for the first time to specialized television broadcasting networks CBS (paid US\$ 394,000) and EBU (US\$ 660,000). Consequently, viewership increased exponentially from the 1960s until the end of the century. This was due to the use of satellites to broadcast live television worldwide in 1964, and the introduction of color television in 1968. Global audience estimates for the 1968 Mexico Games was 600 million, whereas at the Los Angeles Games of 1984, the audience numbers had increased to 900 million; that number swelled to 3.5 billion at the 1992 Summer Olympics in Barcelona.

Conclusion

It has been the goal of the paper to highlight a field of global competition and symbolism, namely the sphere of sport. Traditionally, in international relations there are seven dimensions of power identified, divided into natural determinants (geography, population, and resources) and social factors (economy, military, diplomacy, and identity). However, while many scholars focus mainly on the hard factors of global power the symbolic dimension of power somehow has been of minor interest in academia. Therefore, the question how to influence and strengthen the strategic soft factors like the perception of national identity and what can be done to support the general image of an emerging power abroad and at home has to be explored in more detail. Within the paper it has been argued that to overcome the image of a regional power, the status of an emerging global power has somehow to be anchored in the general perception of their citizens and shaping global sport events is a way to do so bearing low costs and high revenues.

To clarify our central argument the twofold social function of sport has been highlighted first. It has been argued that sport has two overlapping social meanings. On the one hand it has an internal function to create social cohesion among society. On the other hand there is some kind of external function promoting and advertising the power of a nation abroad. Following up on the concept of emerging powers hosting global sport events has been analyzed to illustrate the symbolic dimension of sport within international relations. Moreover, we have given empirical evidence that global sport events represent the contemporary structure of international power.

However, we are arguing that sport is much more than a 'proxy war' in international competition. Rather we want to highlight the fact that it plays a crucial role for establishing, setting and modifying the self-perception of emerging powers and therefore become a substantial element of the modern globalization process. Due to the twofold social func-

tion there are four reasons why global sport events matter: First, and paradoxically, because sport is not of any 'vital importance'. Precisely because sport can function as an alternative for global competition without bearing the huge costs of a war, a space race, an economic embargo, *etc.*, it is the ideal field for a proxy war about hierarchical positions in the world. Second, the field of sport is truly global and universal. That is to say it creates a global playing field where international comparisons can take place easily. Third, sport operates under equal rules and is seemingly free of power asymmetries, in other words it assumes a fair competition indicating the real global position of nation-states. Finally, global sport events are global media events attracting the attention of the world without bearing additional costs.

To sum up, global sport events are an important factor for shaping the emerging world order. This is possible because sport has two complementary effects. First, it creates a positive reputation of the power states against outer countries. Second, it creates social cohesion among nations. Until there exists no other tool to delegate global competition on a symbolic level, global sport events will keep their function of creating and preserving international symbolic power.

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The Empirical Analysis of Voting Results in the UN General Assembly*

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In this paper we present our quantitative data analysis of voting dynamics in the UN General Assembly within the period from 1946 to 2014. The obtained results reveal several phases in the development of relations between different countries. The analysis also shows that nowadays there are two key players on the world scene which are completely different to each other in every way. They are the USA and the group of BRICS nations (other countries' voting corresponds either with USA or with BRICS). The results can be used to identify the trends in the sphere of international relations.

Keywords: *voting, the United Nations, consistency criterion, synchronization.*

Introduction

Experts in the sphere of international relations carefully study and analyze the dynamics of interstate interactions, integration and disintegration processes, international tensions and interstate alliances.

This analysis is mainly based on the study and interpretation of specific events in political history. The interpretation crucially depends on the researcher's political views. However, it is better to use hard data in order to increase the reliability of the analysis. One of the reliable quantitative information sources in international politics is statistical data and the UN General Assembly voting figures. Since the establishment of the United Nations in 1946, there have been held more than 5,393 voting procedures (with an average of 78 procedures per year). This data helps to determine patterns in the sphere of international politics, and to identify the dynamics of integration and disintegration processes. In this article we present the aforementioned analysis.

Sources of Information and Methods of Analysis

E. Voeten's data was used to determine the voting patterns in the UN GA within the period of 1946–2014 (Voeten 2013). We also used the data collected by M. A. Bailey, A. Strezhnev, E. Voeten (Bailey, Strezhnev, and Voeten 2015).

We also stuck to A. Lijphart's approach to identify the consistency criterion. The former is represented by the equation below:

$$IA = \frac{f + \frac{1}{2}g}{t} * 100\%, \quad (1)$$

where IA is the consistency criterion in the observed period, t is the total number of votes, f is the number of the votes when the two countries voted in the same way, g is the number

* The research has been supported by the Russian Foundation for Basic Research (project No. 15-06-03655).

of the votes when one country voted 'yes' or 'no', while the other countries abstained. The cases where the two countries voted in the opposite ways are not taken into account by the variable *g*.

The Voting Dynamics in the UN General Assembly

Figures 1–7 show the voting dynamics of the UN General Assembly members within the period from 1946 to 2014. Colored vertical charts show certain information about each vote. Top white section demonstrates the votes for the resolution, middle grey section demonstrates the ones abstained from voting, lower black section demonstrates the votes against the resolution. The charts follow one another in the order of voting procedures (total of 5,393 votes during 1946–2014). The x-axis contains the years when the voting procedures were held.

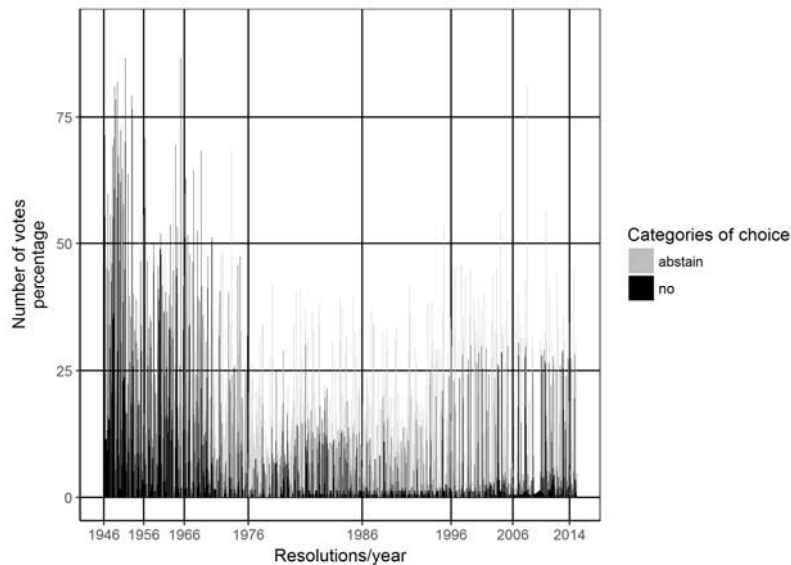


Fig. 1. Voting dynamics in the UN General Assembly, 1946–2014, %

On the basis of the data in Fig. 1, we can identify at least three periods, during which the relations between countries differed.

- the first period (1948–1970) is characterized by strong antagonism in the voting (there are more countries which voted against than the countries which abstained). This antagonism is defined by high political tension between the two blocks on the world scene.
- the second period (1970 – the end of the 1990s) is characterized by rather compromising positions between the two international political blocks (détente between the NATO and the Warsaw Pact member states and Russian foreign policy changes after the collapse of the USSR);
- the third period (from the beginning of 2000s) is characterized by growing confrontation between the USA and the BRICS nations regarding certain issues of global development, which is most likely caused by sustainable and successful development of the latter.

Figures 2–7 show the voting dynamics in the UN General Assembly.

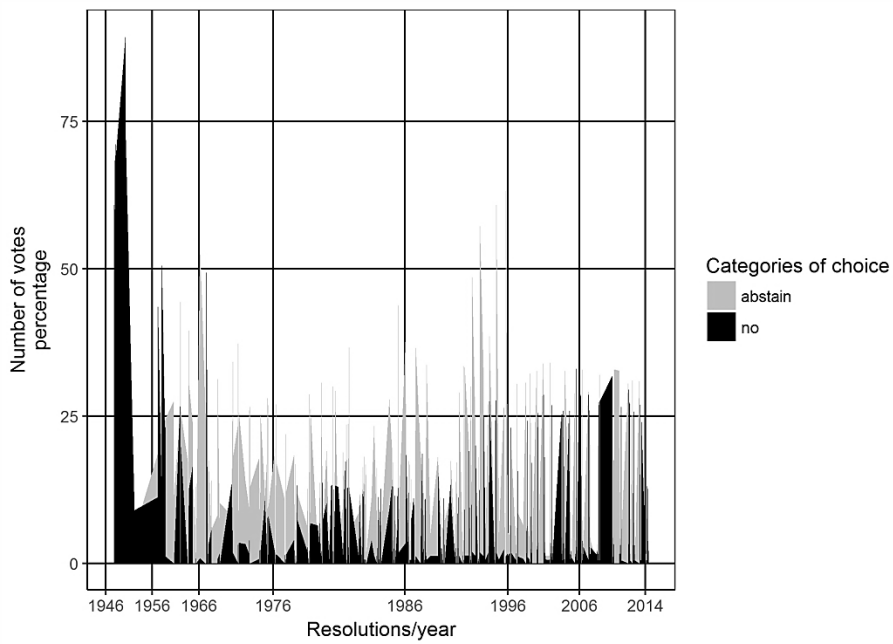


Fig. 2. Voting dynamics regarding the issue of nuclear weapons, percent, 1946–2014

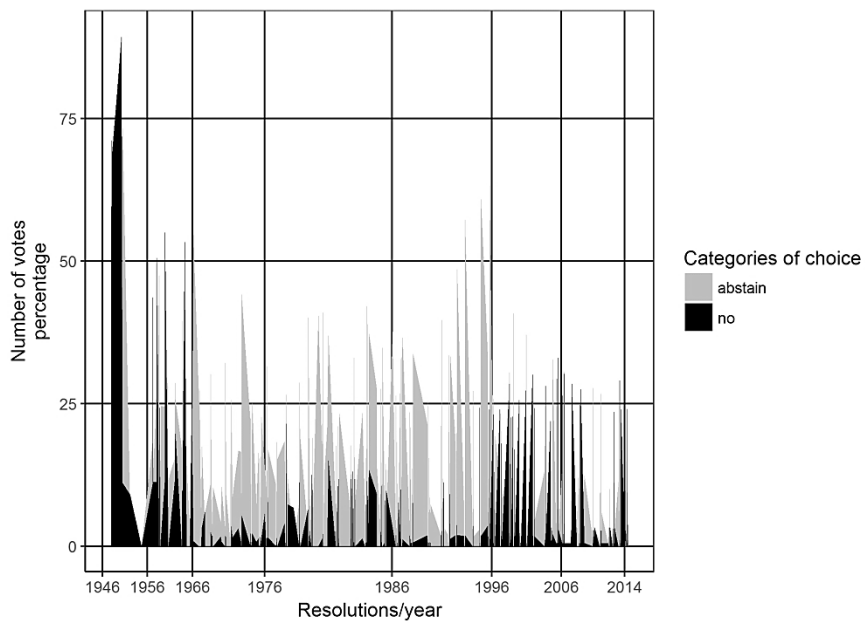


Fig. 3. Voting dynamics regarding the issue of arms control, percent, 1946–2014

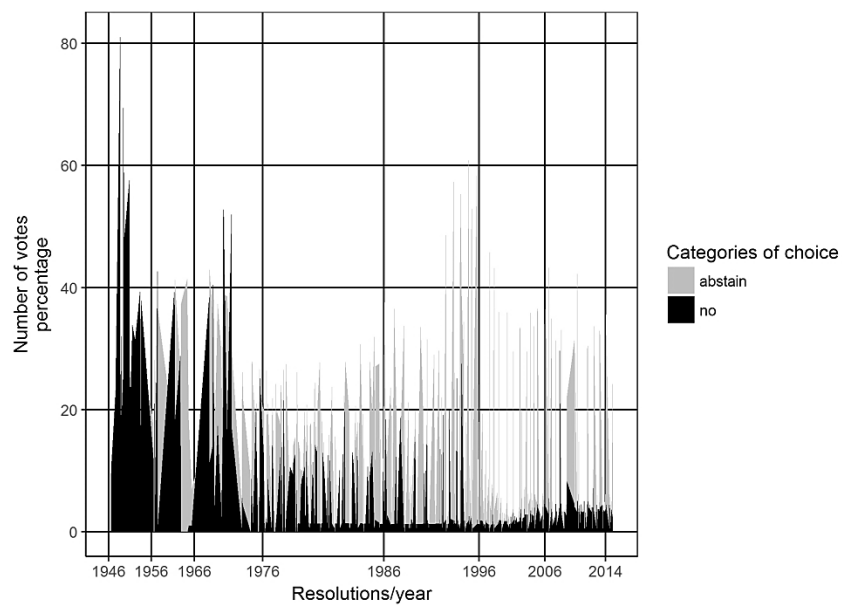


Fig. 4. Voting dynamics regarding the Palestinian Conflict issue, percent, 1946–2014

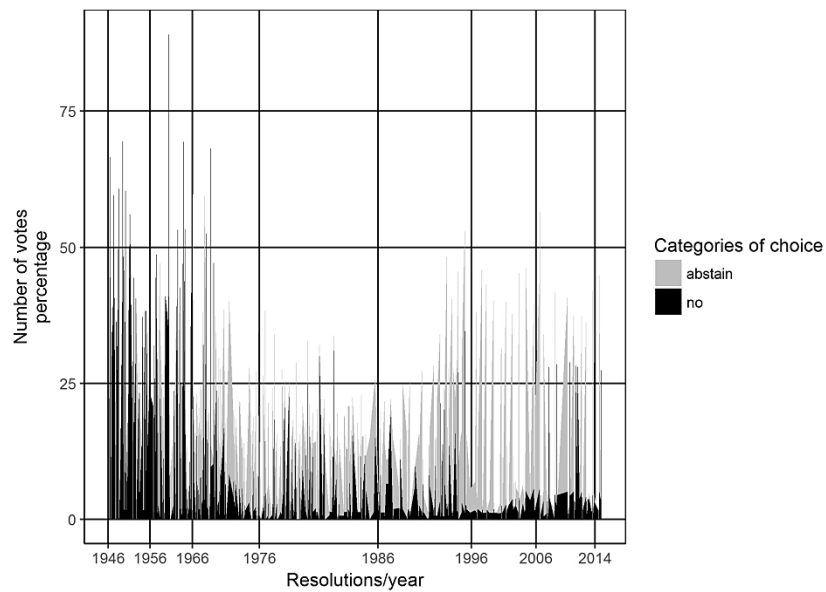


Fig. 5. Voting dynamics regarding the issue of colonialism, percent, 1946–2014

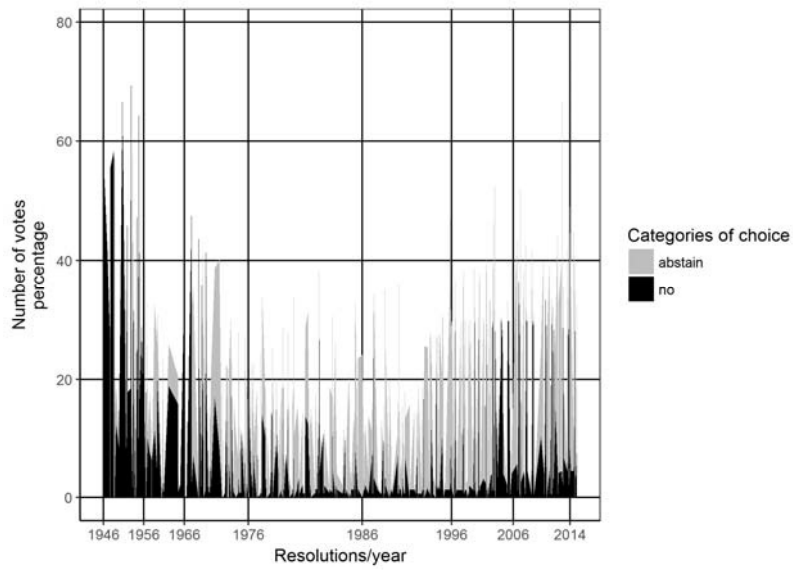


Fig. 6. Voting dynamics regarding the issues of the human rights, percent, 1946–2014

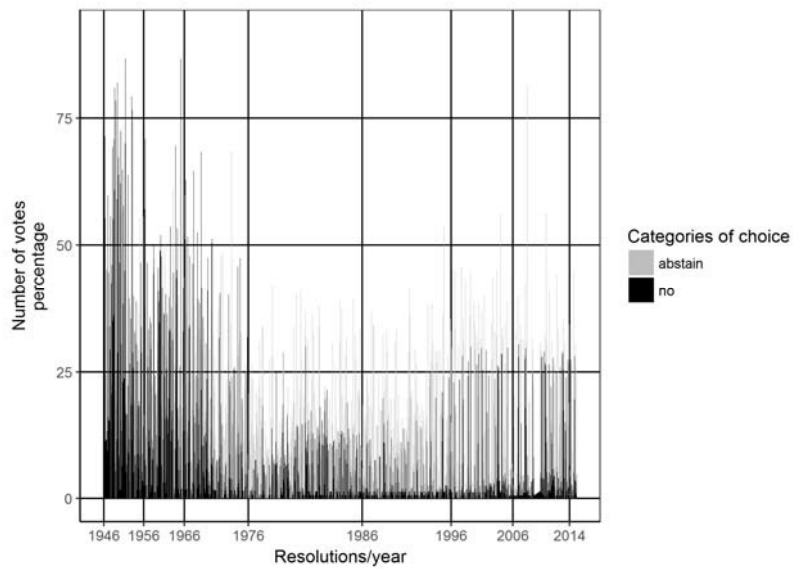


Fig. 7. Voting dynamics regarding the issues of economic development, percent, 1946–2014

It is evident that voting dynamics regarding specific topics are similar to the main trends of voting dynamics in general. However, voting dynamics regarding the issues of the Palestinian conflict are slightly different (see Fig. 4). In this case the second period mentioned above continues hitherto.

Voting Consistency Dynamics

Available data on voting allows us to analyze the consistency dynamics. This analysis is based on the consistency criterion and the Lijphart's approach (Lijphart 1963).

Figures 8–22 show the consistency criteria (IA) reflecting the voting of the US, the Soviet Union/Russian Federation, China, India, Brazil votes (if IA equals to 1, the consistency is absolute; if IA equals to 0, the countries vote in opposite ways). Consistency criterion was calculated for each year separately.

Fig. 8 shows the consistency dynamics of each BRICS nation and the United States within the period from 1946 to 2014.

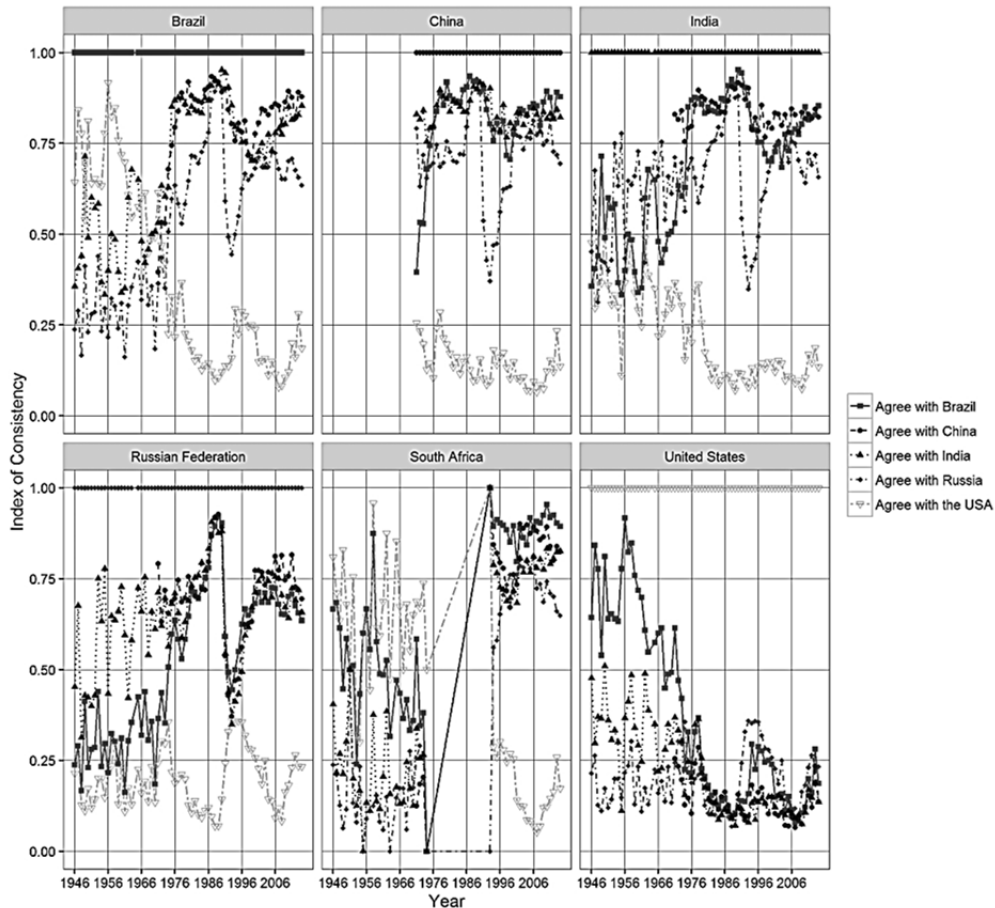


Fig. 8. The consistency dynamics of the BRICS nations and the United States, 1946–2014

Fig. 8 shows that since the second half of the 1970s, the BRICS nations' positions have considerably differed from the US position. Hitherto BRICS nations had formed a political power opposing the US.

Below one might find a detailed voting dynamics for each of the above-mentioned countries.

Despite the fact that in 1976, Brazil and the United States signed a 'Memorandum of Understanding' (US considered Brazil to be a stronghold of their policy throughout Latin America), Brazil's voting in the GA has been changing dramatically since the 1970s and often coincided with the voting of the BRICS nations. Within the period of 1990–2000 Brazil tried to distance itself from the US policy while supporting the regional initiatives such as MERCOSUR, the Union of South American Nations, Council of South American Defense and the Community of Latin American and Caribbean States. Within the period of 2000–2006 there was considerable disagreement between Brazil and the USA. During the last stage, however, the tensions have eased.

China's voting corresponds with that of BRICS nations as opposed to the USA.

After gaining its independence India was developing its own foreign policy maneuvering between the BRICS nations' and the United States' interests. Shortly after the former synchronized its voting with that of the BRICS nations rather than the United States.

South Africa is similar to India in terms of the foreign policy development: during apartheid RSA also maneuvered between the USA and the BRICS nations. South African post-apartheid foreign policy and voting corresponds with those of BRICS members (the lack of data within the period from 1975 to 1995 is due to expulsion of South Africa from the UN).

Russian foreign policy has been uneven. Until 1976 there had been contradictions between the USSR and the USA and the USSR policy regarding BRICS nations was uneven as well. Within the period from 1976 to 1990 soviet policy synchronized with that of the BRICS nations and differed from that of the USA. After the collapse of the Soviet Union (1991–1995) the opposite trend prevailed: synchronization with the USA and political separation from other BRICS countries. Some time later the trend changed drastically, and Russian foreign policy aligned with that of the BRICS nations and there were rising tensions with the US. One of the reasons for the latter might be the period of Medvedev's policy and negative image of Russia in mass media after the Russo-Georgian War in 2008.

The following figures show the level of political consistency of other countries with either the BRICS nations or the US.

Figs. 9 and 10 show the consistency criterion dynamics of some countries of the former Third World. It is apparent that during the last decades all these countries synchronized with the BRICS nations. Significant differences can be observed only within the period of 1946–1976: some countries, such as Colombia, Cuba, Egypt, Iran, Venezuela and Côte d'Ivoire started supporting BRICS' position rather than the one of the US; positions of the countries such as Indonesia, Afghanistan, Belarus, Libya and Qatar either differed from the one of the United States, or those countries maneuvered between the US position and that of the BRICS countries.

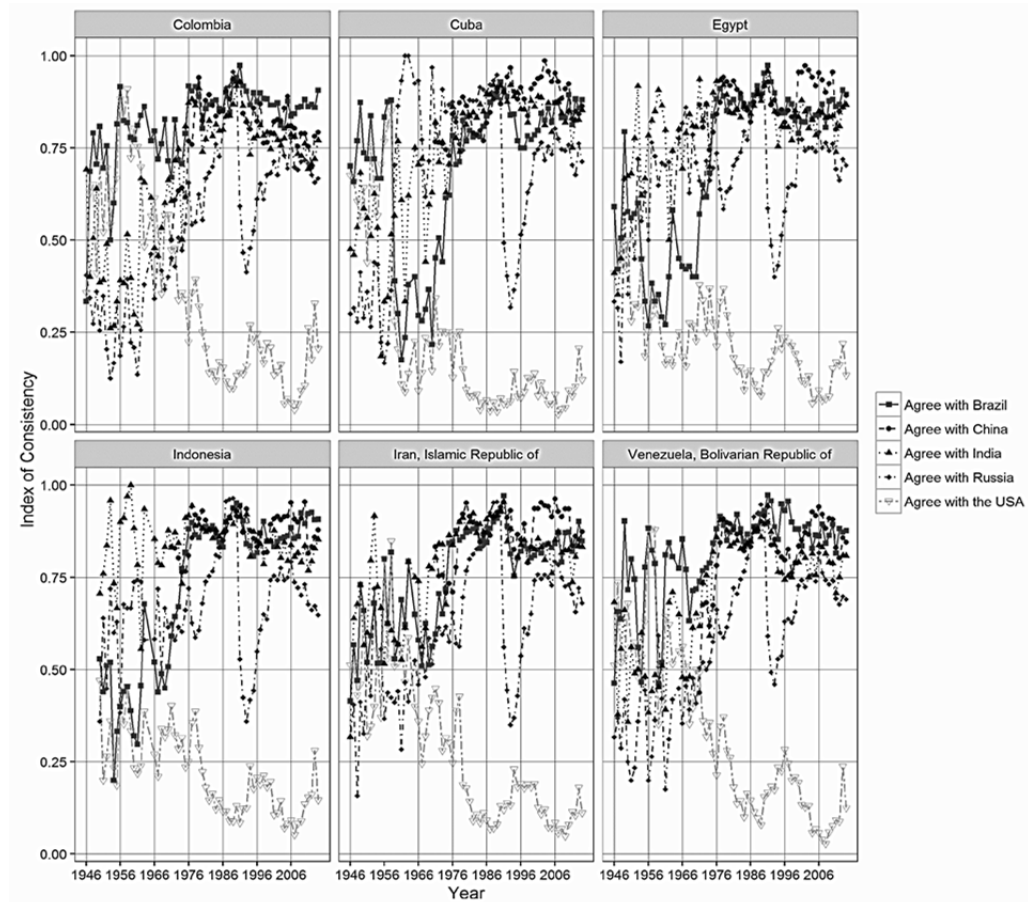


Fig. 9. Consistency criterion dynamics of some countries of the former Third world, 1946–2014

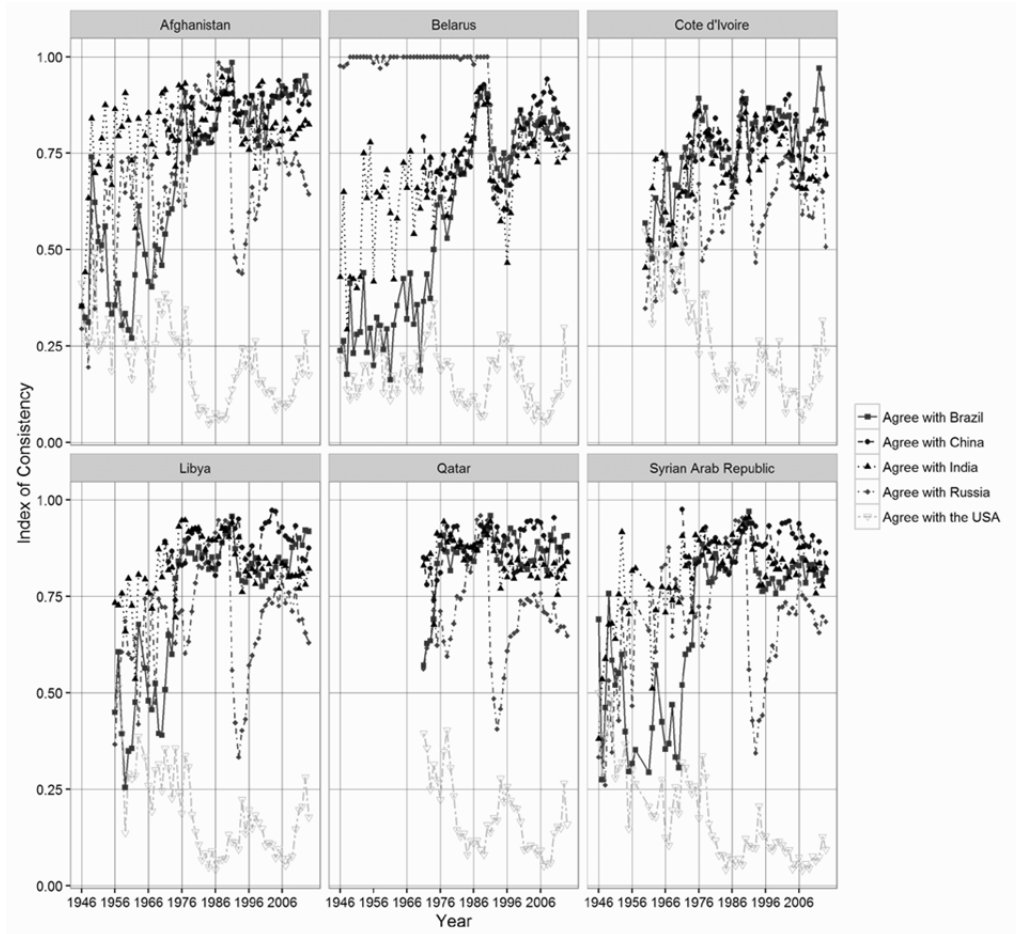


Fig. 10. Consistency criterion dynamics of some countries of the former Third world, 1946–2014

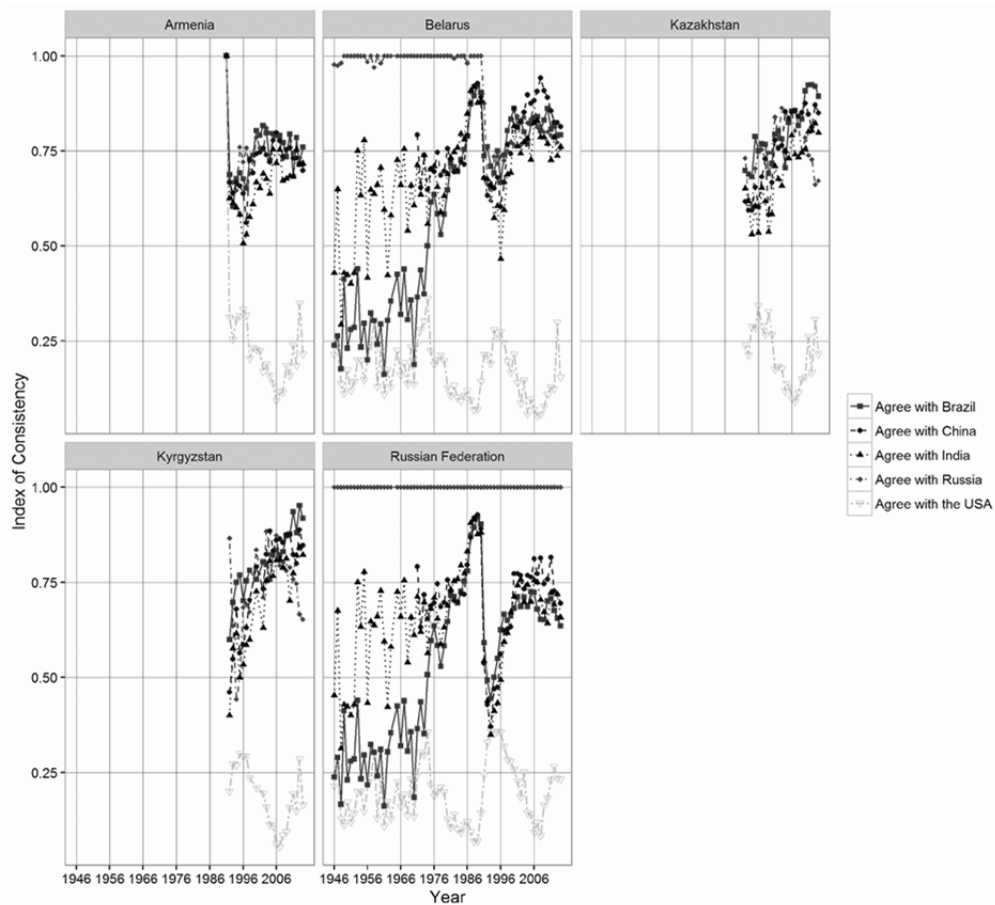


Fig. 11. Consistency criterion dynamics of the countries of the EEU, 1946–2014

Fig. 11 shows the consistency criterion dynamics of the Eurasian Economic Union member states. Since the collapse of the USSR a number of countries have tried to establish new integration unions: free trade zones, economic and political unions similar to the EU. From 2001 to 2014 there had been the Eurasian Economic Community (free-trade zone as a stage of economic integration). Eurasian Customs Union was established in 2010, Eurasian Economic Space was established in 2012 (common market as a stage of economic integration); in 2015, all these unions evolved into one of the final stages of economic, and the Eurasian Economic Union (EAEU) was established.

According to the analysis of the voting in the UN General Assembly, the members of EAEC, stick to similar positions in voting, while the voting of some CIS countries significantly differs (see Fig. 12).

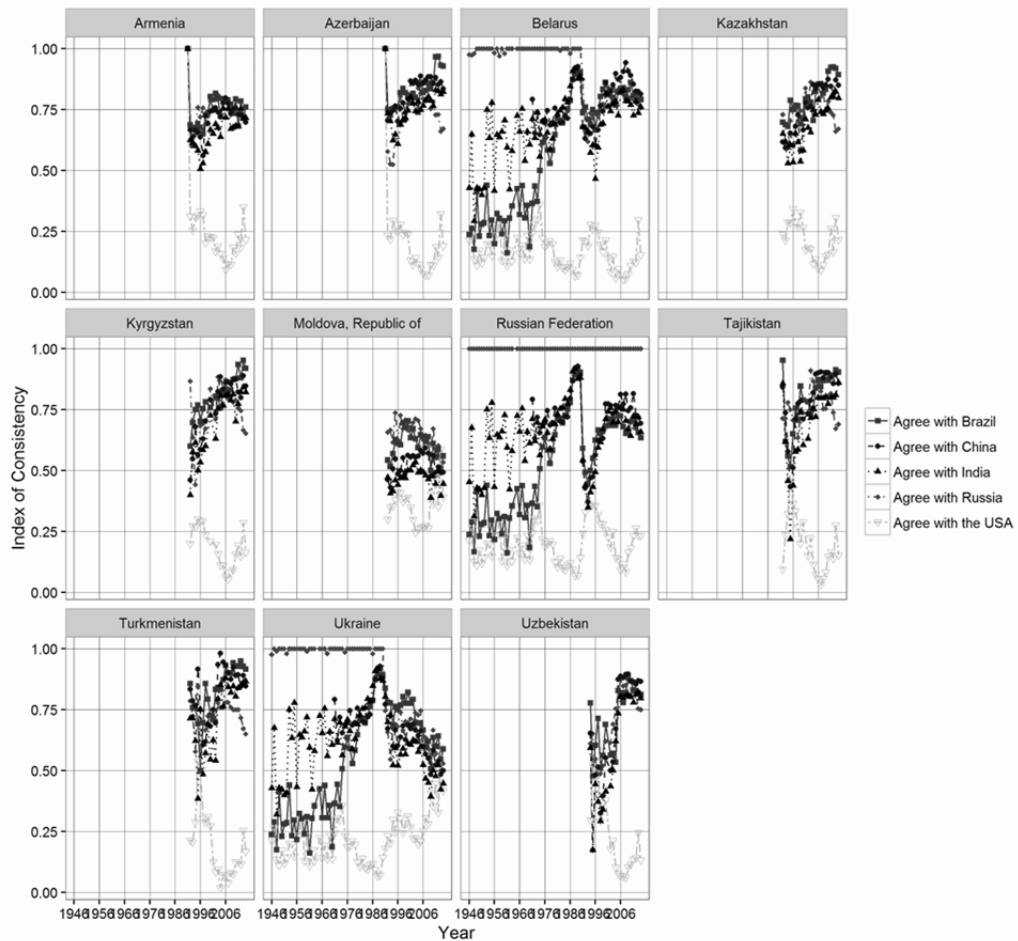


Fig. 12. Consistency criterion dynamics of the CIS members, 1946–2014

The two CIS members Moldova and Ukraine distance themselves from Russia. For more than two and a half decades there have been attempts to find balance between the position of the BRICS nations and that of the United States. Today there is a rising tension between the two CIS members (especially Ukraine) and Russia.

In addition, all the EU member states and the ones who are eager to join the EU have pursued the policy which does not correspond with the policy conducted by the BRICS countries over the last 20 years (see Figs. 13–17).

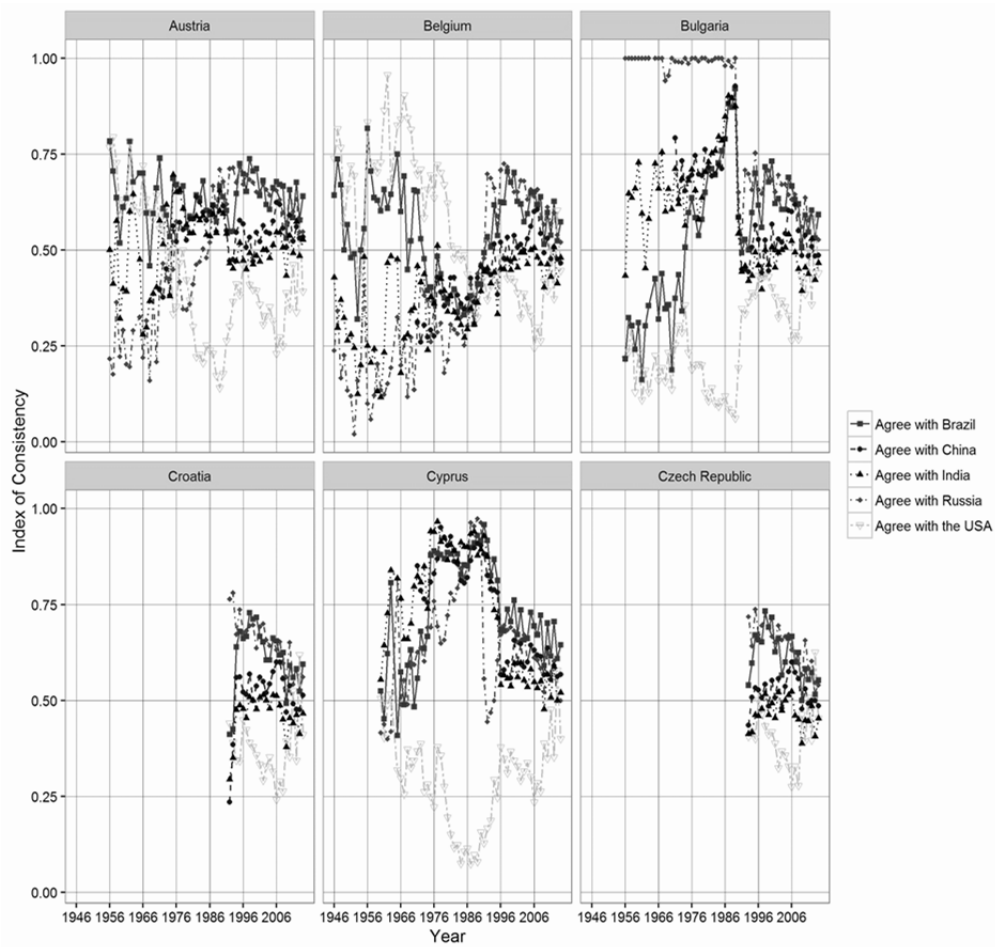


Fig. 13. Consistency criterion dynamics of the EU member states, part 1, 1946–2014

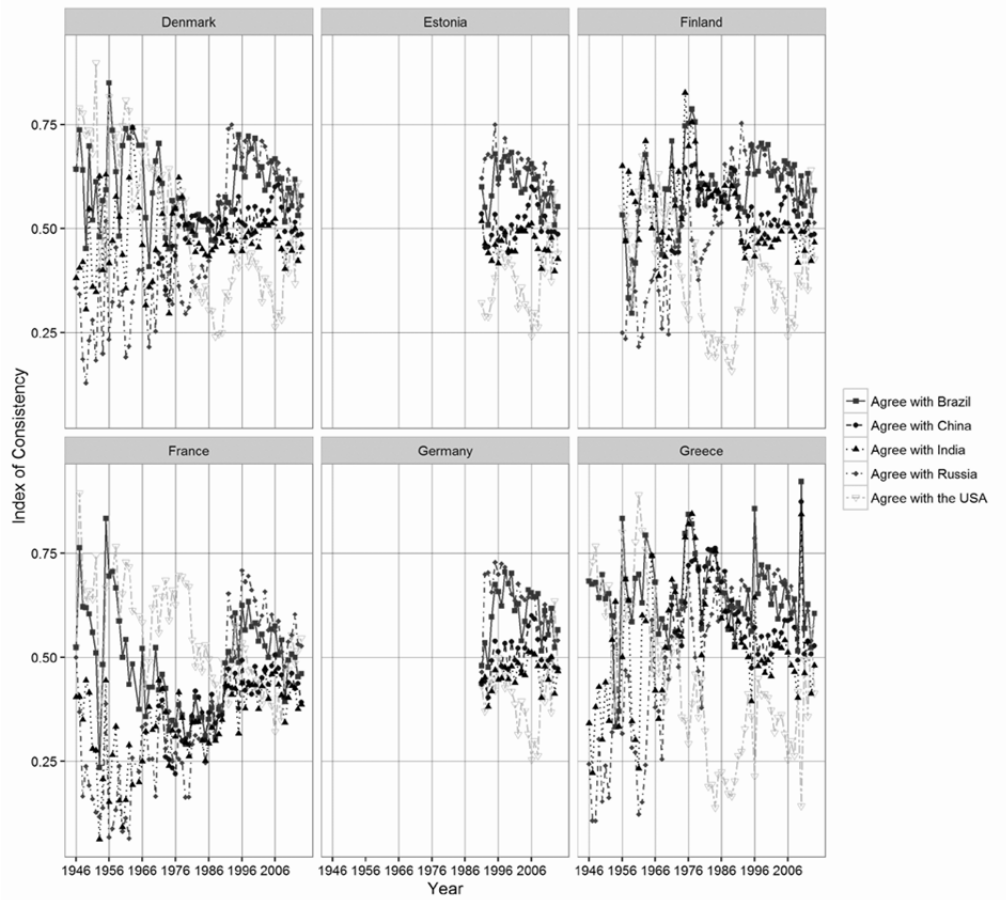


Fig. 14. Consistency criterion dynamics of the EU member states, part 2, 1946–2014

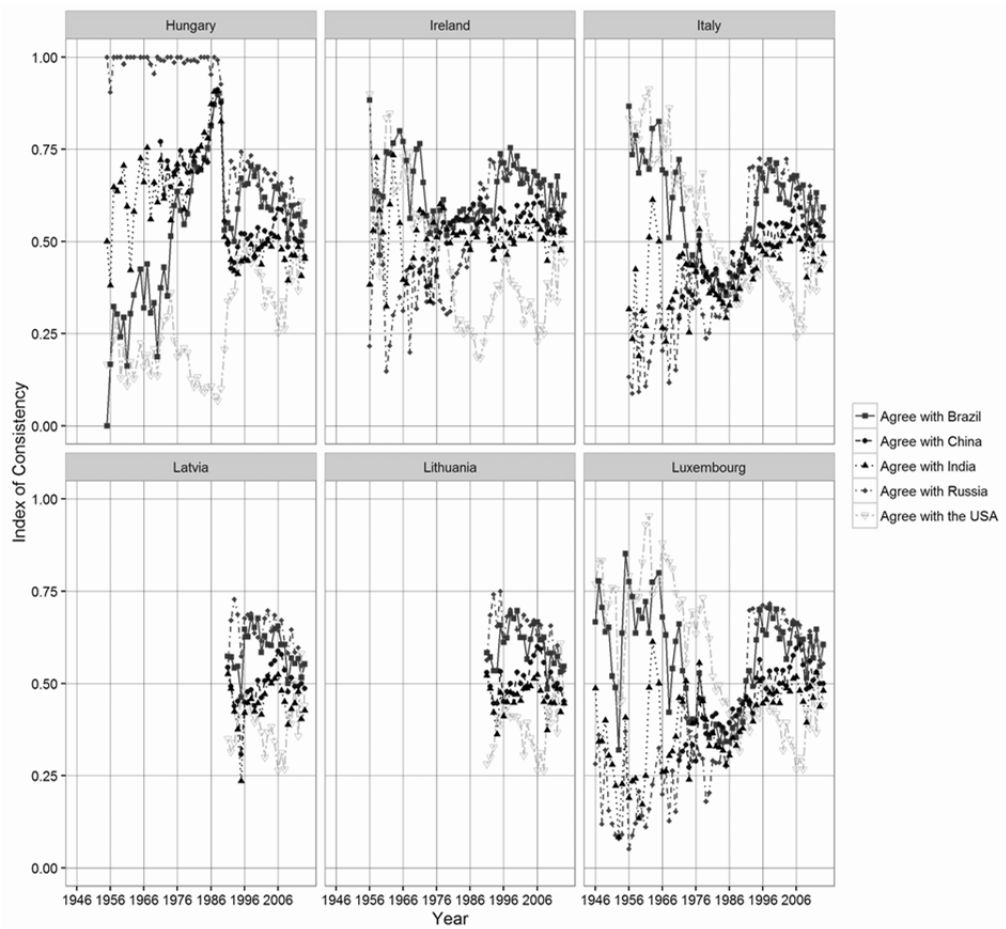


Fig. 15. Consistency criterion dynamics of the EU member states, part 3, 1946–2014

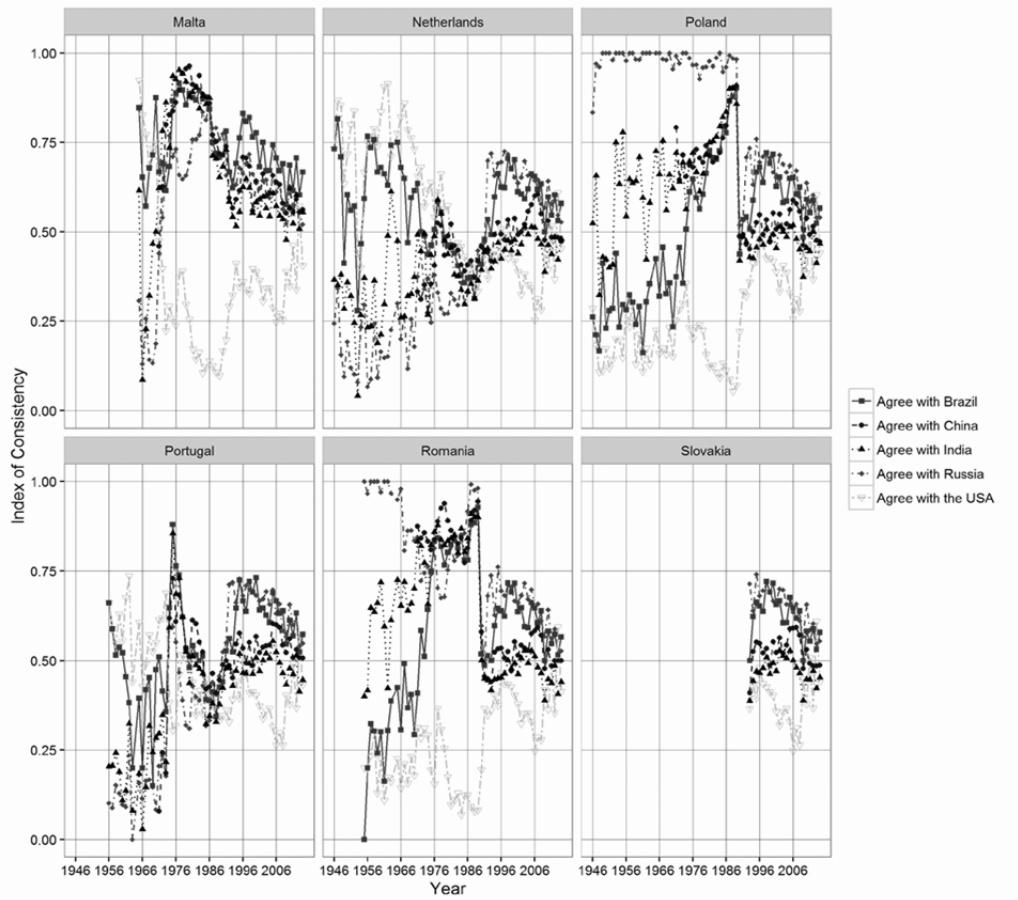


Fig. 16. Consistency criterion dynamics of the EU member states, part 4, 1946–2014

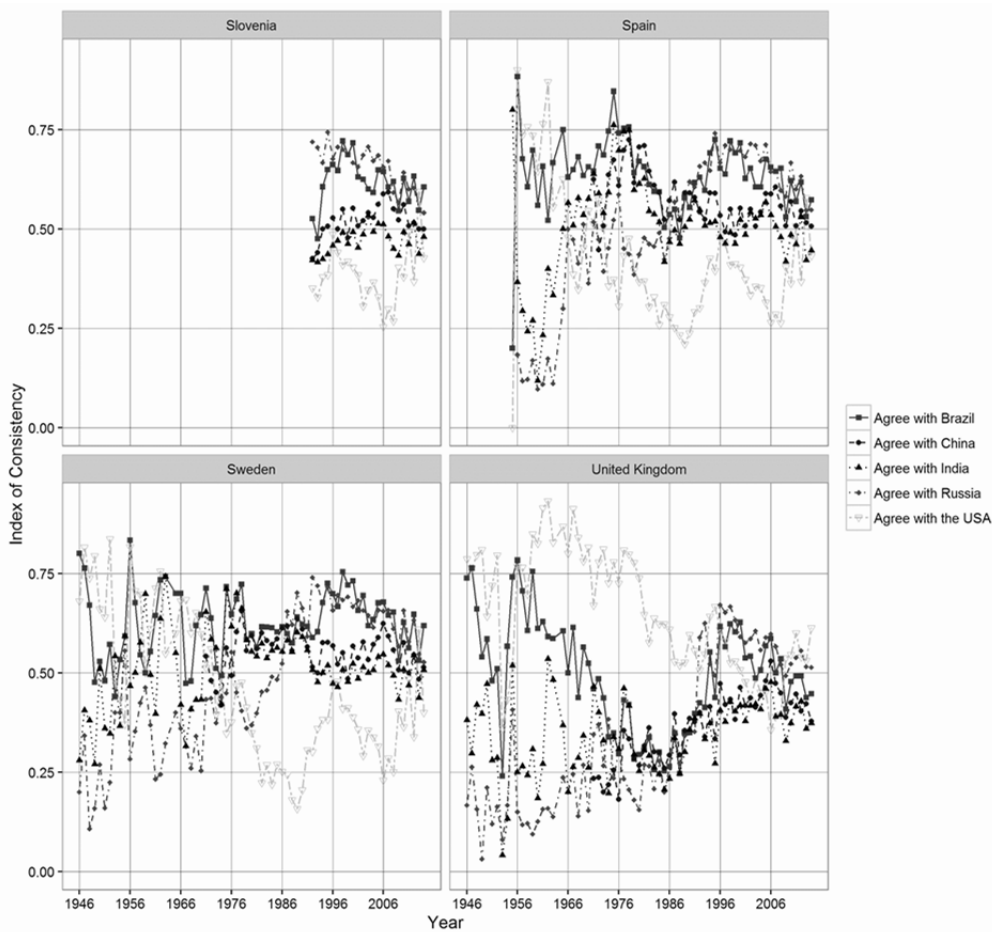


Fig. 17. Consistency criterion dynamics of the EU member states, part 5, 1946–2014

Despite the fact that all the EU members analyzed in the graphs above have almost the same consistency criterion value (regarding consistency with the United States and with the BRICS nations), we can see the following patterns:

- until the second half of the 1980s many EU member states had a high level of consistency with the US and low level of consistency with the BRICS nations. However, during the next period the situation changed drastically;
- noteworthy is the fact that in 2008 when Barack Obama became the President, the USA started gaining its lost control. The reasons for the latter are, firstly, economic difficulties encountered by the BRICS nations due to the global financial crisis, and secondly, deterioration of Russian political image after the Russo-Georgian War;
- the UK is an outlier in the EU to some extent. Its consistency criterion regarding the consistency with the United States is significantly higher than that with the BRICS nations.

Below one might find the data related to the analysis of synchronization between the NAFTA member states (see Fig. 18).

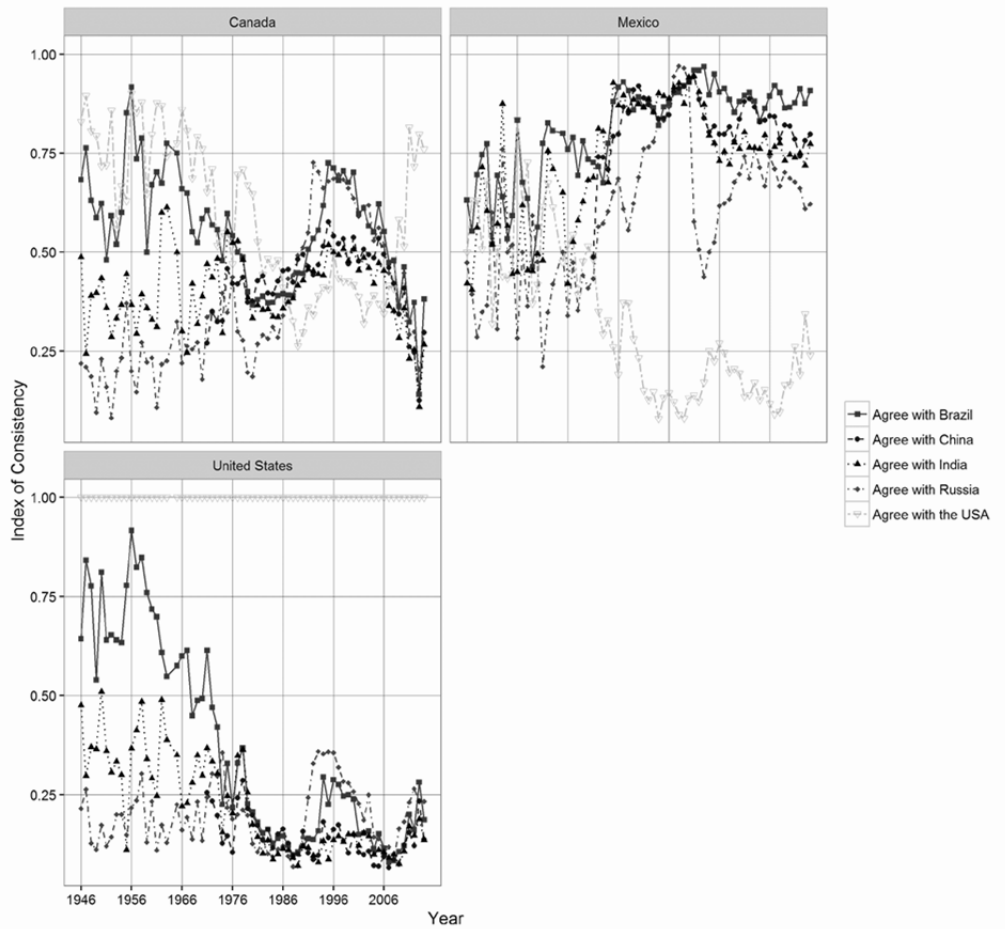


Fig. 18. Consistency criterion dynamics of NAFTA member states, 1946–2014

It is necessary to state that the North American Free Trade Zone, established in 1994, is an area of mutual interest for its member states. Thus, the member states are to demonstrate a high level of consistency while voting in the UN General Assembly. However, Canada and Mexico vote differently in the GA. Canada is a pro-American country and its voting aligns with that of the US, while Mexico's voting corresponds more with that of the BRICS nations.

Fig. 19 shows the consistency criterion of MERCOSUR member states.

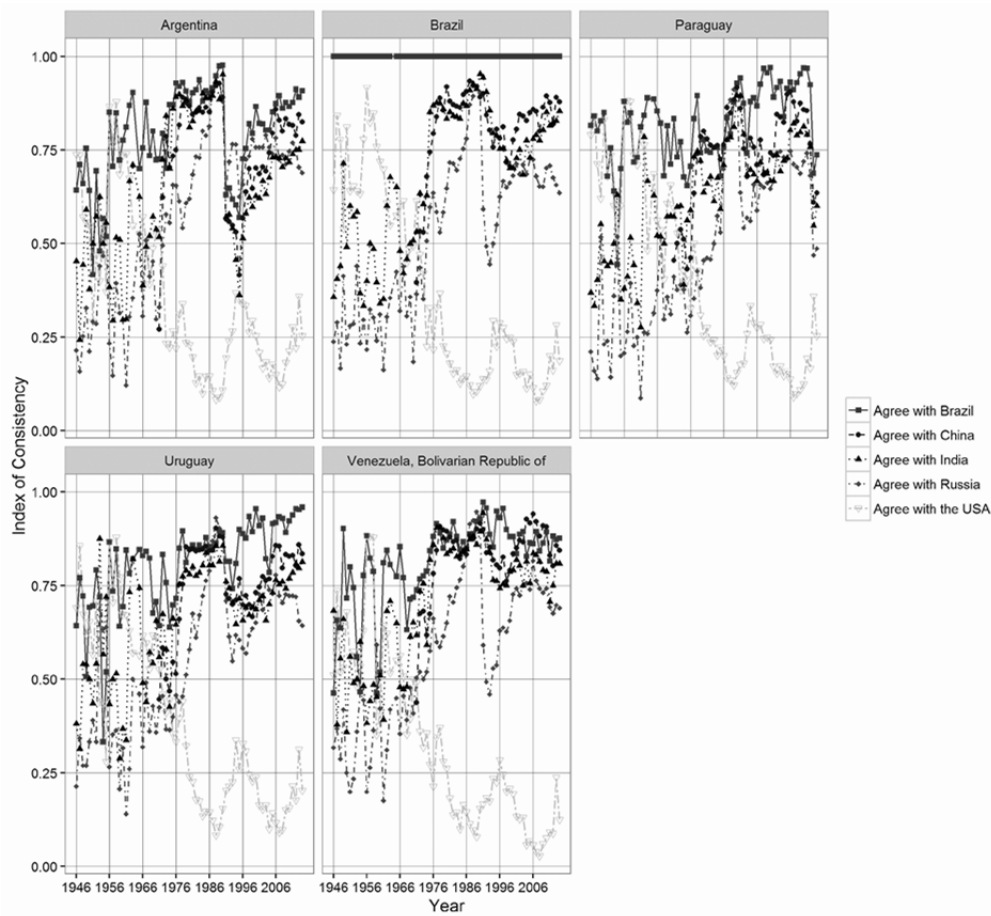


Fig. 19. Consistency criterion dynamics of MERCOSUR member states, 1946–2014

It is evident that voting dynamics of the five MERCOSUR member states corresponds almost exactly. Until 1960 voting of MERCOSUR member states was similar to one of the USA. Since 1960 the state of affairs has changed, and voting of the former has corresponded with the voting of the BRICS nations.

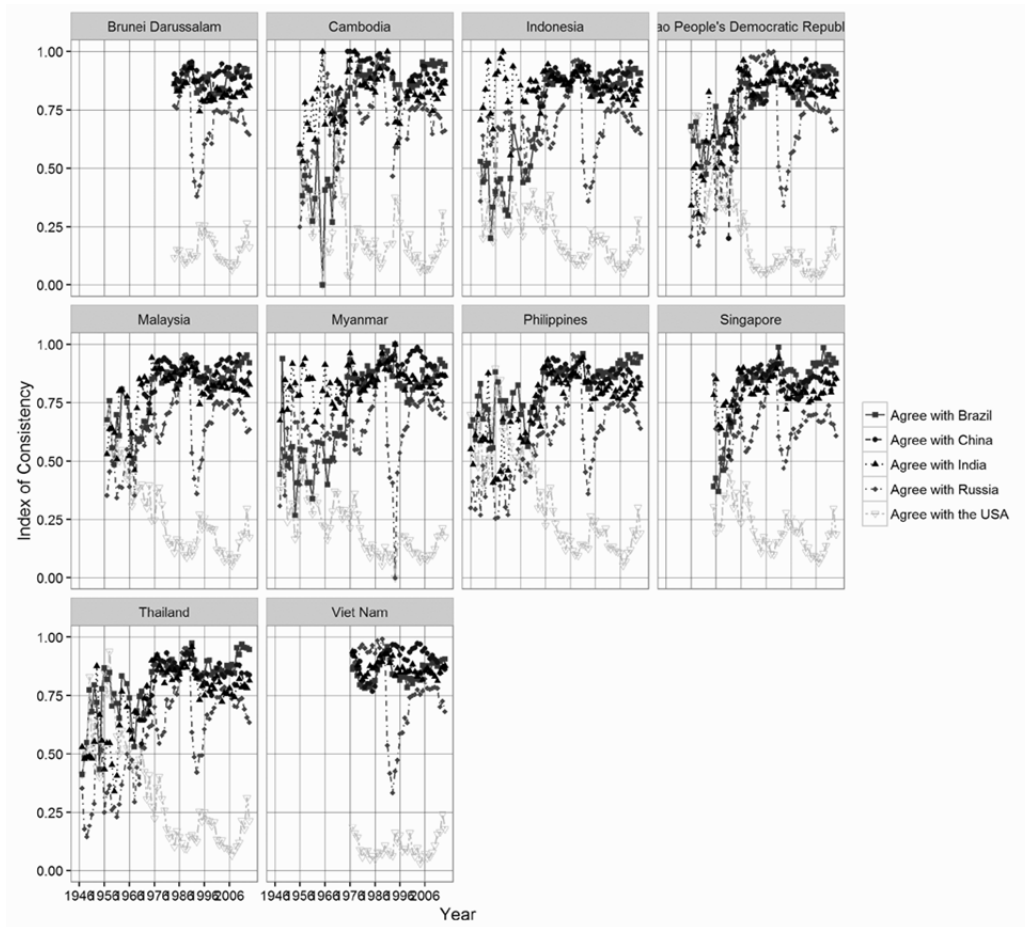


Fig. 20. Consistency criterion dynamics of the ASEAN countries, 1946–2014

As for the Asian region it is necessary to focus on ASEAN countries (see Fig. 20). Voting of the ten ASEAN countries is close to the voting of the BRICS nations, while the level of synchronization with the United States is pretty low.

Recently American establishment has tried to make global economic processes fit their interests. For example, the USA produced an idea of the Trans-Pacific Partnership, which is aimed at reducing the influence of Russia and China on the world trade. Twelve countries signed an agreement establishing the Partnership on February 4, 2016. Hence it is important to analyze member states' voting synchronization (see Fig. 21).

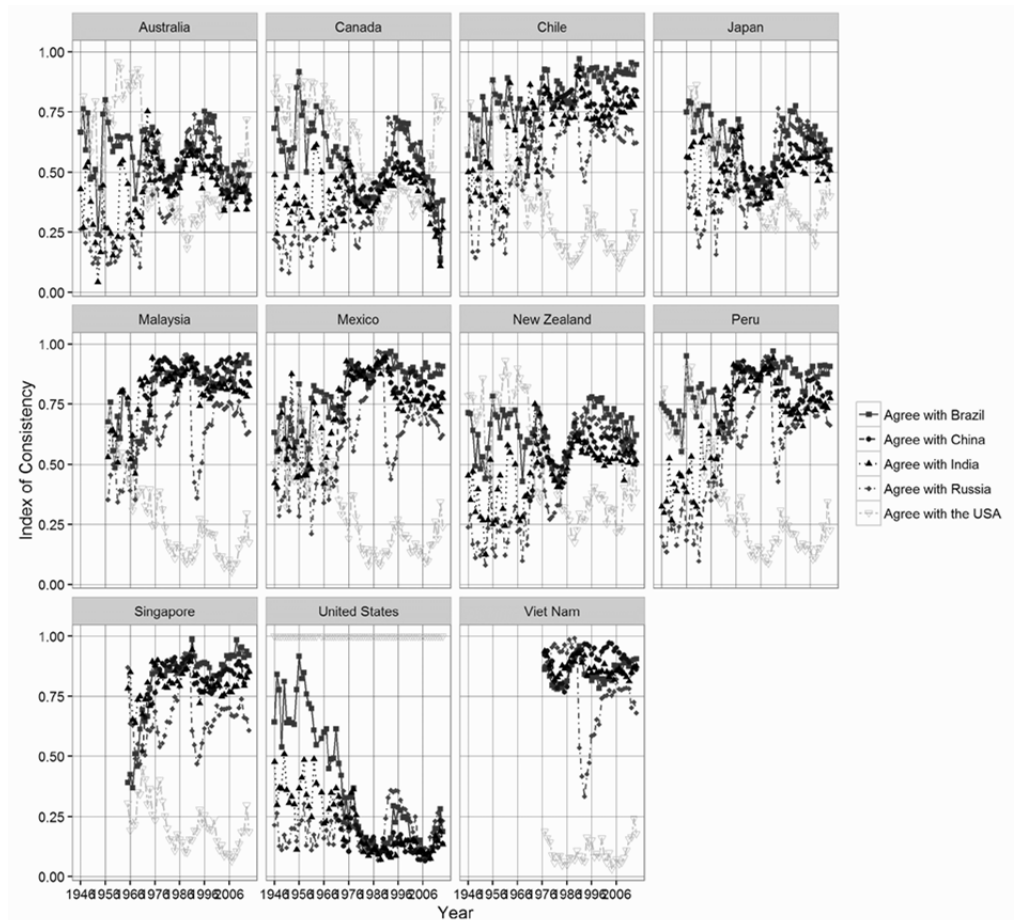


Fig. 21. Consistency criterion dynamics of the TRANS-Pacific partnership member states, 1946–2014

It is important to outline there is no common position among the above-mentioned countries:

- thus, Australia and Canada are pro-American and their positions are not close to the ones of the BRICS nations;
- Chile, Malaysia, Mexico, Peru, Singapore, Vietnam, on the contrary, have similar position to ones of the BRICS countries;
- Japan and New Zealand's positions differ depending on a particular situation.

In conclusion we analyze voting dynamics in the Group of Seven (G-7), which is considered one of the most important informal bodies on the world scene (see Fig. 22).

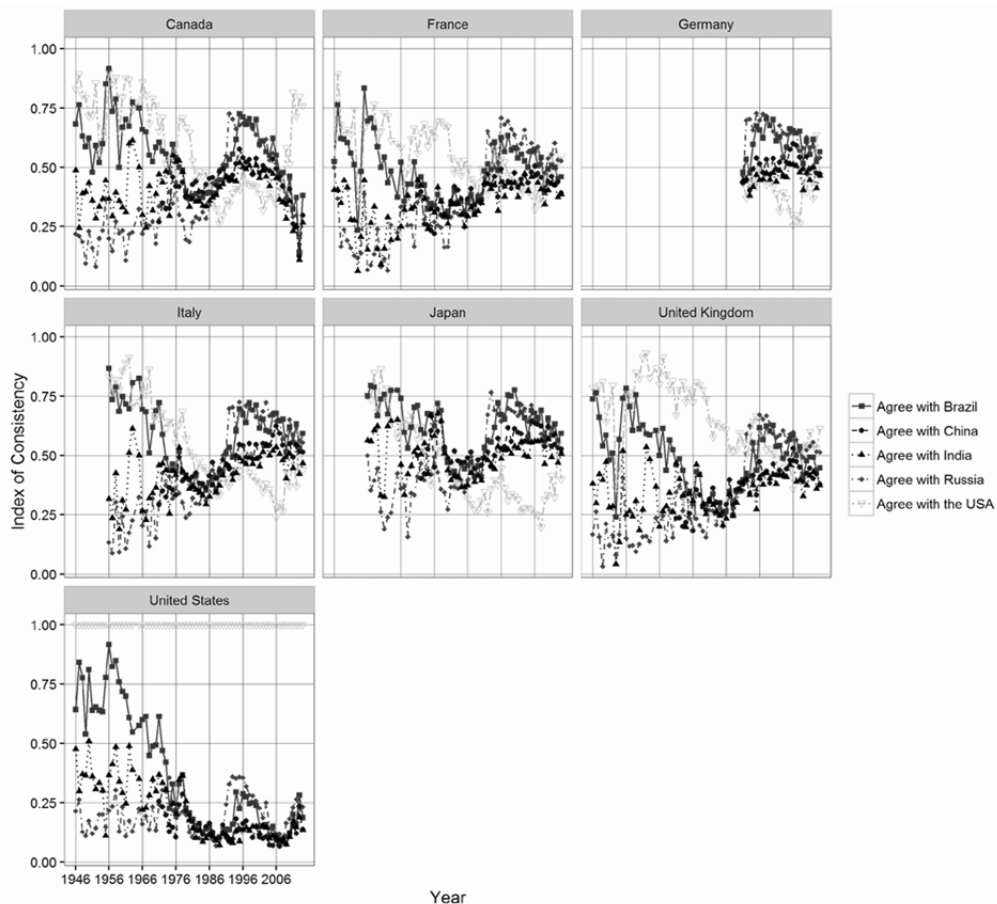


Fig. 22. Consistency criterion dynamics of the G-7 member states, 1946–2014

Apparently, over the last decades all the countries voting in the UN GA divided into two groups, ones supporting the US' position more, and ones supporting the BRICS nations' position more. Thus, voting of Canada and the UK is closer to the USA, while voting of France, Germany, Italy, Japan is closer to BRICS nations.

We can derive the following main points from the figures above:

- after the World War II the political authority of the United States has been steadily declining (within the framework of the voting processes there is less G-7 member states alignment with the United States);
- however, since 2008 the voting consistency of the G-7 member states and the United States started growing, which is caused by rising influence of the BRICS nations. The latter is definitely not hailed by the Western countries.

Thus, on the basis of statistical data of voting in the UN General Assembly, at present we can define at least two key players on the world scene, which are the BRICS nations and the USA. Their positions are completely opposite to each other. And other countries align with either the BRICS nations or the USA while voting.

Voting dynamics show the following:

- although BRICS as an association was established at the beginning of the 2000s, China, India, Brazil and the USSR voted very consistently in the UN GA within the period of the second half of the 1970s – the end of the 1980s;
- until the mid-1970s, many UN member states voted in the same way as the United States, but then the US influence in the UN went gradually down. Since 2008 however, the US influence started to rise again due to confrontation with Russia and the BRICS nations as a whole.

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Global Regionalization as a Phenomenon of Globalization

Olga Leonova

The article analyzes global regionalization as a developmental phenomenon in the global world. The author investigates this notion within the framework of Political Globalistics and interprets the global world in terms of a three-layer structure. Global regionalization is closely associated with the necessity for the subjects of the global relations to position themselves in the hierarchy of the emerging global world. Global regionalization with its peculiar features and complex character is an objective process: on the one hand, it constitutes globalization, and on the other hand, appears one of its consequences. In other words, global regionalization represents a new pattern of structuring the world society.

Keywords: *global regionalization, global regionalism, macroregion, structure of the global world, hierarchy of the global world.*

Recently, the terms ‘global regionalism’ and ‘global regionalization’ are frequently used in the scientific discourse to evaluate the general level of regionalization of international relations. However, since these phenomena have emerged in the course globalization one should consider them exactly within this context.

As Zurab Marshania describes this current trend, ‘[g]lobalization... nowadays is characterized by the establishment of regional alliances between the states with similar interests. This enables them to work together and efficiently achieve their goals’ (Marshania 2011).

We interpret ‘global regionalization’ as a regionalization (fragmentation, segmentation) of a hypothetically integrated global world, that is the formation of regions on both sub-level (within states) and macro level (planetary) of the global political structure. The macro-level processes shape the international relations ‘where the main interaction occurs between different regional groups, rather than between major individual powers or coalitions of states that are geographically distant from each other’ (Troitsky 2009: 36–37). These processes change the whole system of international relations defined by the Westphalian Treaty, as well as reconstruct the global political order in geopolitical, geo-strategic and geo-economic terms and form new global *economic* and *political* centers.

In this context, a region obviously becomes a fundamental and cornerstone notion for the theoretical and methodological analysis of global regionalization. However, there is no universally accepted definition of a region in modern science since the interpretation depends on the employed method of analysis, that is on the peculiar approach to the analysis of regional phenomena and the sphere of regional life the scholar focuses on.

The *Political Encyclopedia* defines the region as ‘a unit independent in spatial and geographic, administrative and territorial, institutional and political, economic, social, histor-

ical and cultural, ethnic and demographic terms' (Political... 1999: 333–334). This definition is extremely 'extensive' since it can describe regions with greatly varying scale, for example, from the Vologda region of the Russian Federation to the USA, Western Europe and South-East Asia. On the one hand, a region can be interpreted as a territorial community within administrative boundaries as a constituent entity of a Federation. This interpretation of the region adopted in contemporary Russian academic discourse does not contradict the interpretation employed in Western science and practice, for example, in the 'Declaration on Regionalism' adopted by the European Parliament in 1988. On the other hand, 'a region' can be considered as a relatively non-uniform area characterized by a set of uniform features including political, economic, cultural, sociological, ecological, geographical, linguistic and other aspects as well as natural environment.

However, the *Global Studies Encyclopedia* gives the following definitions of a region: '1) an area defined by physiographic, administrative or any other boundaries; 2) a large territorial formation covering several countries, or a country's large administrative division differing from other territories in its characteristics, including natural and (or) historical, relatively stable economic, geographic and other aspects...' (Mazour, Chumakov 2003: 882).

Yuri Abramov and Vladimir Kuybar define region as 'a scientific category indicating a concrete historical integrity and possessing properties of resource ... technological and ethno-cultural self-sufficiency for expanded social reproduction' (Abramov, Kuybar 2008: 249).

According to this definition, as well as the one from the *Global Studies Encyclopedia* which are both methodologically 'wide' one can attribute to this category the regions of different scales from sub-regions to macro regions. Moreover, any state can be considered as a region. Meanwhile, in contemporary scientific discourse the term 'region' is used either to refer to a domestic administrative unit (sub-region within a state) or to describe a group of states (a macro-region).

A 'sub-region' as a social, territorial, economic, and political entity has been already thoroughly investigated (see Busygina 2009; Dergachyov, Vardomsky 2009; Turovsky 2009; Fundamentals... 2007; Barygin 2007; Kosov, Fokina 2009, *etc.*) while the nature and importance of regional macro-systems in the evolution of contemporary global political sphere is still not properly examined.

Macro-region, as a rule, has a number of uniform characteristics: common supranational authorities (the European Union, the CIS), sociocultural or linguistic boundaries (the Commonwealth Nations, the Atlantic community, the Arab world, the Eastern-Slavic area, *etc.*); confessional unity (the Islamic world, Christian Civilization); general socio-economic development model (Liberal, Continental, Mediterranean, Scandinavian, *etc.*).

Globalization is closely connected with regionalization of international relations and involves the transfer of some state functions either to an international or subnational level. Global regionalization has objective reasons; the main is the necessity for the actors of the global political arena to integrate into the emerging hierarchy. As we have already noted (Leonova 2013: 166–178), this hierarchy of political actors consists of the following tiers: 1) centers of power, 2) contenders for the status 'centers of power', 3) economic, political, military and civilization poles, and 4) regional powers. Each of them has its own characteristics defining their place in the hierarchy.

According to Mikhail Troitsky (2009: 46) 'World policy increasingly takes on the attributes of a competition between regional associations, each headed by a global or a large regional power or a center of power.'

On the one hand, global regionalization is an integral characteristic of globalization. But on the other hand, it is an opposite trend constituted by intensive processes of integration throughout the globe and resulting in the association of countries, establishing regional systems. Moreover, we observe the emergence of macroregions. In scientific literature they also often speak about 'fragmentation of the world', 'territorialization of the world', and 'coalition strategy' which reflect the emerging structuring of the world, which turns into a union of macro regions (poles, centres of power, and macro-regional systems). The leading macro regions (the EU, the Asian-Pacific Region, and the so-called 'Southern Cone' in Latin America) together with a global power (the USA) are the main driving forces of globalization; and to certain extent they draw other states into the orbit of their influence. It seems a macro-regional polycentric world and multilevel hierarchical structure is gradually replacing the Westphalian international order.

Macroregions comprises large local areas of the world and represent the third (macro) tier of the global political order. At the macro level, a region is considered to be a socio-economical and politically integrated unity which formally represents itself as a supranational and transnational actor. Thus, we can say that global regionalism is based on the concept of macro-region as an integrated socioeconomic and political system, which is integrated in geo-civilizational terms, is characterized by sociocultural proximity and recognized by a number of supranational political institutions. A peculiar feature of global regionalization is its complex character along with involvement in economic interstate cooperation or economic integration of adjunct countries. Global regionalization implies a whole range of processes and interactions in the political, diplomatic, social, cultural (*e.g.*, establishment of common educational system), ecological and information spheres. Consequently, for the purposes of our study of global regionalization we take into account the following aspects that define macro-regions: economy, geography, history, ethno-confessional structure, social, cultural, demographic, educational and other aspects.

Global regionalization and global regionalism are not completely identical terms. Global regionalization is regionalization of international relations at the global level. It is a process of fragmentation of the world, its virtual division into large self-sufficient economic and political segments, followed by the integration of such segments into the global hierarchy. However, global regionalism is the result of global regionalization and a system of relations between major interstate associations of the global world and its actors.

In theoretical and methodological terms the analysis of global regionalization is based on the perception of the macro-region as a structural unit of the global world or as a subsystem of the global political space.

Macro-region is a self-sufficient economic, political, military and strategic structural unit of the global world. On the one hand, a macro-region is a structural unit of the system of the global world since it is a social and natural integrity; on the other hand, a macro-region is one of the subsystems of the global political space. The macro-region as a structural unit of the global system has three specific features.

Firstly, macro-region, though being a self-sufficient system, is not a closed system. Its specific feature of openness is manifested in its ability to share resources, energy and information with the environment. Macro-regions actively exchange raw materials, goods,

human resources, funds, technologies, ideas, *etc.* with each other and with other actors of the global world. The communication and information exchange between a macro-region and its environment is particularly intensive.

Secondly, a macro region is a non-equilibrium, i.e. unstable, system, which constantly undergoes rapid or slow changes of its main characteristics, including structure, number of elements, their quality, functions, and configuration. The balance of a macro-regional system depends strongly on the environment. The global economic crisis with their particularly severe impact on the situation in the European Union has proved this once again.

Thirdly, macro regions are dynamic systems evolving with different dynamics. For example, macro regions can evolve from a free trade area, a Customs Union to a supranational formation with common corporate institutions. The scale of macro regions can also change. Thus, having been formed as regional groupings, in course of time they can acquire more global features which can be exemplified by the EU, NATO, the OSCE and the APEC as well as the SCO, the MERCOSUR, the Cooperation Council for the Arab States of the Gulf, the Southern African Customs Union, *etc.*

The integration processes in macro regions occur in a non-synchronic manner. Thus, the economic integration is frequently far ahead of political integration. Most macro-regional associations have been formed as a result of primarily economic integration: for example, the European Coal and Steel Community (which later evolved into the European Economic Community and eventually into the European Union), the Southern Common Market (MERCOSUR), the Economic Community of West African States (ECOWAS), the Association of South East Asian Nations (ASEAN), *etc.*

We can also speak about economic integration which has qualitative parameters that can be measured and evaluated. This type of integration is well studied and described both by the foreign and Russian scholars (Handerson 1999; Herst, Tompson 1999; Germain 2000; Molle 2001; Held *et al.* 2004; Etzioni 2004; Globalization... 2002; Global... 2001; Lavut 2004; Liventsev, Kharlamova 2001, Chumakov 2005; Shishkov 2001). Here we can also mention Vladislav Inozemtsev, Nikolay Kosolapov, Ernest Kochetov, Vladimir Lapkin, Marat Cheshkov, Alexander Chumakov, *etc.* The economic integration is generally viewed as a process of creating of a complex entity at the level of national economic systems. The political integration can be interpreted as a process of establishing of an integral complex at the level of the national political systems of independent countries. At present, the political integration has reached its limits which threaten countries' national sovereignty associated with integration, as well as with their desire to keep a certain political autonomy.

There is a certain scale of economic integration consisting of the following successive stages: a free trade area, a customs union, a common market, and an economic and monetary union.

It seems impossible to work out an appropriate scale to define the degree of political integration, particularly due to the lack of quantitative indicators. Although the experience of empirical observations for the most successful integration associations, i.e. for those who moved from economic to political integration (the EU) or are in the process of such transition, enables us to single out the following stages of their evolution:

- mutual information and coordination of internal and external policies of the member countries of an integrative association;
- coordination of general policy;

- creation of a regional security system;
- formation of supranational authorities (control, coordination, and later – administration);
- adoption of a common Constitution.

The global regionalization has the following characteristics:

1. A planned positive feedback to all participants of a regional association, possible economic and political benefits from participation in a macro-regional project.
2. This process is not natural; it is planned and organized and requires a lot of preparatory work, while its participants should perceive it as an objective necessity.
3. The created system is self-sufficient, unstable, and open.
4. Asynchronous economic and political integration.
5. The presence of a regional leader who initiates integration processes and is their main engine.
6. Historical and ethno-confessional communities are not very important, but their absence can slow integration processes (due to certain conditions). Their availability can improve the dynamics of ongoing integration.
7. Coincidence of economic models of development, political systems and a dominant value system increases the chances of a successful regional integration.

Global regionalization manifests itself in the following way. First, local communities integrate and merge into a macro region. This integration is based on both internal factors (economic partnership, similar political culture and institutions, social and cultural proximity, *e.g.* an identical civilization matrix) and external factors (common reference points of external policy, interaction strategies with the global world and its actors, issues of macro-regional security, *etc.*). Second, there occurs a localization of a self-sufficient territorial economic, political, and sociocultural community with defined boundaries often coinciding with the boundaries of an individual state. Third, on the basis of integration and localization there occurs a qualitatively new geopolitical and geo-economic entity whose members (sovereign states) transfer some of its functions. The boundaries of such macro regions may coincide with the boundaries of geo-civilizations (*e.g.*, the EU) and they have close trade and investment flows within the system which increases self-sufficiency, independence from the external environment, stability, and security.

The temporary asynchronous formation of macro regions is a distinguishing characteristic of global regionalism developing within the European Union, although with some contradictions. In other macro regions, like the Asian-Pacific, Eurasian or so-called 'Southern Cone' of Latin America, one can observe a quite obvious lag between integration, localization, and transfer of states' functions to a supranational level.

In general, the formation and development of the global political sphere is accompanied by differentiation, fragmentation, and emergence of macro-regions. It is also characterized by an instable development of the global world and its possible escalation into macro-regional conflicts within the main geopolitical axis (North-South, East-West).

On the other hand, the increasing macro-regional integration and localization creates the flexible and efficient mechanisms for such communities to adapt to globalization.

Global regionalization is an objective process, which should be regarded as an integral component of globalization. Globalization has led to a search for checks and balances, and attempts to create a geopolitical equilibrium via regionalization of international relations. The contemporary global world is not reduced to the real geographical space, but has become multidimensional. Global regionalization is a consequence of globalization and leads

to fragmentation of the world into macro regions as well as formation of a hierarchical global political system consisting of poles, centers of power, contenders for the status of a 'center of power' and regional systems of global world.

Thus, the analysis of the global world social and territorial spheres and of the global political map allows defining the phenomenon of global regionalization, which clearly shows an emerging new structure of the global political order.

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The Role of BRICS in Global Politics

Olga Kolesnichenko, Alexander Rozanov, and Liu Debin

BRICS has evolved from an abstract format into an influential forum in the international arena. BRICS framework is a new experience of collective leadership that civilization develops within globalization environment. In this article we highlight the issues addressed by various stakeholders within and outside BRICS. This, in turn, will feed the overarching aim of creating a stable operating framework for BRICS for the coming decades and simultaneously lead to expected cooperation and collaboration which can be developed within the BRICS framework.

Keywords: *BRICS, partnership, globalization, cooperation, leadership.*

BRIC, and now BRICS, has evolved from an abstract format into an influential forum in the international arena and it has become not just a manifestation of globalization, but increasingly a key control lever of global processes. The idea of uniting the world largest developing economies under the term BRIC (Brazil, Russia, India, and China) belongs to James O'Neill, a well-known analyst in the field of global economic research from the leading US investment bank Goldman Sachs. In 2001, O'Neill wrote an article, 'Building Better Global Economic BRICs', in which he introduced a grouping acronym BRIC (by taking similarity to the English word 'brick' – brick). Following the logic of the abbreviation, Kazakhstan that possesses a huge growth potential could become a new member of the BRICs 'to complete the whole picture'. But firstly the Republic of South Africa joined the alliance, giving the organization a transcontinental character.

During the years of existence and development, BRICS is in a constant process of transformation. However, we must emphasize the essence of the creation of this format – the consolidation of the countries which are projected by leading analysts of the world to become the world most powerful economies in the 21st century. This also brings the understanding of the critical role of the BRICS in global processes of building a new world order through the consolidation of international efforts. Such format fulfils the function of an 'architect of globalization', laying the foundation for a new global construction, made of 'bricks', whose strength will depend on how long our common planetary home will stand. Thus, the BRICS format cannot operate in the logic of isolation of the developing world from the developed Western countries. The power of the BRICS and its civilizational mission consists in bringing the consolidated global efforts to a new level of 'strong wave' of rapidly growing economies.

Collective leadership is a new experience that civilization realises within the BRICS framework in the face of globalization. The challenge for the BRICS consists in the development of a new global model of governance which should not be unipolar but consolidated and constructive. The goal is also to avoid a negative scenario of unfolding globalization and to start a complicated merging of the global growing economies without dis-

torting or breaking the single financial and economic continuum of the world. It is important to continue following this path, and not to hamper the growing potential of the BRICS by the pole confrontation with the West.

How can one characterize the contemporary world? In the recent decade there have been numerous debates in the international academic community about the contemporary world and current world order. Some experts believe that although the US power is declining the world order remains the same since the international order is a liberal one and is based on the US leadership which is still working well. It can assimilate the rising powers, such as China, India, and Brazil. Thus, the struggle among the existing and newly-rising powers is not for its fundamental principles but for more leadership advantages within its framework. Professor from Princeton John Ikenberry, one of the leading strategist in the West, is one of the major supporters of this idea (Ikenberry 2011).

But some others believe that the world is in chaos, and anarchy is coming to Eurasia. Thus, Robert D. Kaplan, a leading figure of geopolitics in the USA, published the paper where he advises the USA and the West to get tough on China and Russia, and to prepare to engage anarchy in Eurasia. Mr. Kaplan believes that both China and Russia are revisionist powers, and they show their muscles not because they are powerful but because they are weak. At the same time, the social situation in Central Asia may bring a kind of an Arabic Spring in the near future. Thus, the Eurasian continent is in danger! (Kaplan 2016: 3–4)

So what is actually happening in the world?

1. The collapse of regional order in the Middle East and spread of terrorism all over the World. The lasting Israeli-Palestinian conflict, unrest in Iraq and Syria, the rise of ISIS (an organization banned in Russia), the Middle East order is also collapsing and will be difficult to restore. There is no clear future over the longer term.

2. The European counties are in troubles resulting from their domestic and international policies. Europe has been the strong advocate of Arabic Spring but now is trapped in the refugee crisis. Besides, the Muslim population in Europe is growing and Europe suddenly turned the weakest region for terrorist attacks, which further worsens the economic recovery and challenges the European social system.

3. The slowdown of world economy continues while the way out has not been found yet. This slowdown has spread from the developed world to emerging economies, and brings about numerous social upheavals. There is no means to stop the increasing chaos around the world in the future.

4. Diverging of great powers' strategies for the world order. The USA has found that Europe is hardly the best partner, unlike Japan and others in Asia. The European countries have no will or ability to follow the USA who, in its turn, seems to have lost its grand strategy at the moment.

5. The coming of a turning point for BRICS in the current situation. BRICS is no more a group in the original meaning and it needs to redefine its identity and objectives.

On the surface, the five BRICS nations, as a multilateral grouping, seem to have little in common. They are essentially different and this fact must be taken into account before making an attempt to converge. The five countries represent largely differing political systems: China is a one-party state; Russia's governance is highly centralized; Brazil, India, and South Africa are democracies with significant corruption levels and/or ethnic strife still to deal with. They have also reached different levels of economic development; thus, China outpaces the group in economic terms, including trade. Furthermore, the member

states differ in terms of available resources, absolute consumption, and energy intensity and have different demographic trends. Brazil has a predominantly urban population, while India is still largely rural. Russia has an ageing population while India is relatively young. Yet, in general, the five nations will greatly contribute to the growth of the world's middle class. BRICS members have essentially different statuses within the current global order. Thus, Russia and China are established global powers and have permanent membership on the UN Security Council, while India, Brazil, and South Africa only aspire to global influence and are currently qualified as regional powers.

With account of different power and national interest, a certain geopolitical divergence in a number of issues is not surprising. Thus, the broadly shared commitment of all BRICS members to the principle of non-interference has not translated into a uniform position on many international issues. For example, Russia and China oppose external intervention in Syria. On the other hand, Brazil and India have taken more nuanced positions, including voting to condemn the Syrian government's violent crackdowns on protesters.

BRICS possesses immense natural resources in some regions along with scarcity of resources in others, it also has diverse ecological environments, a large and young population base and faces myriad of socio-economic challenges. Taken together, these factors emphasize the necessity of a sustainable and inclusive growth trajectory which must be implemented through focused efforts both at the domestic and external arenas. In this context, two factors of particular relevance are globalization and climate change. Indeed, to effectively deal with both trends within the broader context of developmental challenges will require adequate and sustainable responses. At the Conference of Parties Summits, hosted by the United Nations Framework Convention on Climate Change (UNFCCC), one can observe trends which point to the necessity to re-think the multilateral frameworks for coordination and collaboration on climate change, sustainable development and inclusive growth. In fact, every member of the BRICS must cooperate within the BRICS format and beyond it in multilateral fora in order to better articulate the fundamental current requirements to enable the domestic socio-economic transformations. These steps will help effectively cope with the critical interplay described above. In turn, equity must be central to the foundations of any new framework for change, rather than an afterthought.

In an increasingly globalizing world, it is difficult for any nation to stay isolated. Some developments have cross-border ripple effects, as recently seen in both Libya and Syria. The BRICS members tend to share a apprehension of interventionist or hegemonic tendencies. Political intricacy is aggravated by the emerging important non-state actors threatening international security. A number of organizations, groups and even individuals start to significantly impact the world, and BRICS countries must position themselves as anchors of political conversations at the global high-level meetings. The political significance of BRICS is reinforced by the active participation of its five members both in international organizations (including the UN, WTO, IMF and the World Bank), informal associations (like the Non-Aligned Movement, Group of 77, G20 and APEC), and in regional organizations in Europe, Asia, Africa, and Latin America. Thus, there are objective opportunities for 'co-participation' with other countries in building a fair world order and exerting a systemic influence for setting the agenda on a wide range of issues – from global to regional, from the well-established to the relatively new.

The BRICS nations should provide a viable leadership alternative for developing nations. In order to move towards developing a meaningful role in world affairs and a more

active role in conflict resolution, BRICS should create a platform for appropriate policies and response mechanisms to address local, regional, and international political and social turbulence, as recently observed in the situation with the so called 'Arab Spring'. While the emerging multi-polar world may place the developing and 'Western' nations against each other, BRICS members do not intend to ascend to leadership of an oppositional bloc. BRICS represents a collective aspiration to influence and manage institutions of global political and economic governance, so that they reflect demographic and economic realities and not merely post World War II agreements. In the sphere of international relations, this preference translates into a fundamentally different way of operating. The Western construct of 'universal responsibility' is sometimes interpreted in a very different way in non-Western parts of the world. The BRICS nations can use their collective voice to help preserve a respect for international sovereignty in international affairs. The desire of the developed world to intervene in the domestic domain of other nations can be restrained by the creation and fostering of regional cooperative networks, which may reduce conflict and quell crises. The urgent UN Security Council reforms must be prioritized on the BRICS agenda.

In this article we highlight the issues addressed by various stakeholders within and outside BRICS which means that a substantial interest and momentum will be generated by the grouping. This, in turn, will feed the overarching aim of creating a stable operating framework for BRICS for the coming decades and simultaneously lead to expected cooperation and collaboration in other spheres of interest, which can be developed within the intra-BRICS cooperation. While these areas must not qualify the primary BRICS agenda, there must be an organically created momentum once the five focus areas as highlighted in the executive summary are addressed. Some of these spheres for cooperation are listed below.

- *Institutional flexibility*

While the BRICS nations may have different visions of the group's role and what it may mean to each of them, it stands to reason that any agreed upon agenda can best be realized if BRICS develops a coherent and sustained framework for continuous engagement. At the same time, the mechanisms of policy formulation should be dynamic and inclusive. It is crucial that flexibility should be maintained and kept central to the very idea of BRICS. The role of nodal research organizations and think tanks is essential in this respect.

- *Reviving traditional knowledge systems and practices*

Quite too often, the terms 'developed' and 'underdeveloped' are torn out of their strictly economic context and given an unjustifiably broad connotation. This bias is symptomatic of a larger gap between Western knowledge and cognitive systems and the complex realities of the developing world. It is critical for BRICS to focus on reviving indigenous knowledge and practices in a range of domains – such as traditional medicines, healthcare, agriculture and water management, and design and construction practices.

- *Sharing developmental knowledge and experience*

The knowledge and experience that BRICS accumulates in individual development journeys can be consolidated and better leveraged if actively shared and adapted throughout the whole grouping. Formal knowledge sharing institutions could be put in place. This could occur through structured knowledge banks or mutual scholarships and training programs. More pervasive channels of communication at all levels should be developed.

- *Sharing technologies and innovations*

BRICS should be more proactive in bolstering research and in, funding innovations and technology. Exchanging information on scientific and technological policies and programs, and formulating joint long-term problem oriented cooperation projects could be the first useful steps here. Joint research provide substantial opportunities in such priority fields as aeronautics and outer space research, high-speed vehicles, microelectronics and information technology, nanotechnologies, food security and sustainable agriculture, biotechnologies, medicine, finance and insurance for hedging risks, exploration of mineral resources, remote sensing, climate change, water resources and water purification technologies. BRICS must collectively foster better organizational, legal, financial, and personnel support for scientific, technical, and innovation cooperation. Starting with establishing high-tech areas/science parks and incubators, creating common technological platforms, stimulating joint investments in the development of high technologies, research and innovation centres, BRICS can create conditions to smooth the transfer of technologies to production of advanced industrial goods. At a minimum, the BRICS members can mutually benefit from documenting, standardizing, and sharing information regarding innovative practices. Similarly, members can benefit from learning the efficacy of varying financial and non-financial policy instruments now used to incentivise innovation activity. At the same time, there are already significant inward flows of technology and expertise occurring via the activities of multinational firms. The BRICS nations must collaborate in order to accelerate cross-border technology sharing and transfer. In addition to private R&D and innovation, BRICS nations can also share experiences of building links between industry and universities. They should exchange information regarding intellectual property laws, which protect IP and at the same time encourage the adoption and diffusion of new technologies. Apart from the economic benefits of such actions, BRICS can also leverage collaborative understanding and strength for shaping the TRIPS regime under the auspices of the WTO.

- *Relevant and bias-free benchmarks*

The BRICS nations need to contextualize the dominant benchmarking and ratings systems/agencies, which are Western in origin. These systems are geared towards products and services emanating from a particular context. The grouping needs to develop and popularize BRICS rating systems and benchmarks ranging from corporate governance performance assessments to capital market standards. Such benchmarks and normative guidelines could also be applied in other spheres – such as agricultural production, pharmaceuticals and corporate governance – in the context of developing economies.

- *Regional frameworks*

The BRICS nations are leaders within their own regions and surrounded by a cluster of smaller neighbours. At the geopolitical level, this discrepancy can sometimes lead to regional tensions. However, this also provides significant opportunities for the smaller neighbours to benefit from external growth and development. Synergistic regional economic and developmental frameworks should be developed, which accommodate sovereignty within a broader growth paradigm.

- *Cultural exchange*

It is now widely accepted that BRICS needs to move beyond an annual leaders meeting. This can be achieved by instituting a variety of events and people-to-people exchanges. These can be in the sphere of cultural exchanges and conducted either at the BRICS

platform or on larger international platforms, like UNESCO. In the slightly longer term, the BRICS nations need to collectively work towards a degree of standardization in educational programs and, if possible, to explore issues surrounding mutual recognition of each other's accreditation. The enhanced cooperation in sports could also provide avenues for improving cultural understanding. Formal engagement should be instituted with already existing leadership programs and bodies, like youth leadership programs and parliamentary teams. BRICS must support multilateral projects of member states' youth organizations and attempt to establish a Young Leaders Forum with regular exchanges between parliamentarians. A similar forum for media professionals and journalists could also be envisaged. Attention should be paid to travel and tourism between the member countries. Visa and travel processes could be made easier and quicker. Over time, such actions could build 'soft' links between the BRICS nations that will help bolster cooperation and collective attainment of the long-term vision.

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Part VI. ENERGY AND CLIMATE

Energy, Kondratieff Waves, Lead Economies, and Their Evolutionary Implications

William R. Thompson

One way to look at the evolution of technological innovation is to develop ways to convert various types of matter into successively greater amounts of energy to fill sails, to spin cotton or to drive automobiles and air conditioners. One approach to interpreting Kondratieff waves (K-waves), associated with the leadership long cycle research program, emphasizes the role of intermittent but clustered technological innovations primarily pioneered by a lead economy, with various significant impacts on world politics. This approach is further distinguished by asserting that the K-wave pattern is discernible back to the tenth century and the economic breakthrough of Sung Dynasty China. While K-wave behavior has many widespread manifestations, the question raised in this essay is whether explanatory power is improved by giving a greater role to energy and energy transitions in the K-wave process(es). Eight specific implications are traced, ranging from the interaction of technological innovations and energy to cosmological interpretations. Our argument reflects a general theory of the evolution of complexity in all processes predicated on energy consumption. All 'natural entities', spanning physical, biological, and cultural phenomena, extract energy for survival, maintenance and reproductive purposes or, alternatively, put for resisting entropy.

Keywords: *Kondratieff waves, long cycle, energy, energy transitions, technological innovation, lead economy, evolutionary processes.*

One sign of a 'progressive' research program is whether its key assumptions are occasionally re-examined and revised as seems appropriate. The leadership long cycle program focuses on questions of informal governance in world politics but, unlike most other similar programs, emphasizes the role of technological innovation in lead economies, leading sectors, and Kondratieff waves. There is no need to jettison this emphasis. The lead economy-long wave should remain crucial to the program's explanatory infrastructure. However, a case can be made for further elaborating how and why lead economies, technological innovation, and leading sectors are important and can best be interpreted. Elsewhere, I have argued (Thompson 2010) that technological innovation should not be divorced historically from interactions within a larger context of demographic changes, climate and disease factors. That is, technological innovation and the innovators are embedded in a larger socioeconomic fabric to which it and they respond. New technology is not an isolated, stand-alone driver. I would like to elaborate this type of

Globalistics and Globalization Studies 2016 283–302

argument further by incorporating energy considerations more explicitly as well. Rather than only emphasizing technological innovation in leader sectors *per se*, I suggest we consider the interactions of energy demands/consumption and technological innovation. It is not an either/or situation. Changes in energy sources need to be integrated with technological innovation and the technological innovation that is most important needs to be interpreted in terms of its significance for energy consumption (Goldstone 2002; Allen 2006; Griffin 2010). If we make this adjustment in core perspective, some things do not change. For instance, the indicators of technological innovation on which the research program has relied in the past do not need to change. But how they are viewed may require some adjustment. Moreover, there are also some interesting implications for speculating about future systemic leadership transitions.

In this paper, eight implications are highlighted. First, it is possible to argue that innovations in energy convertors or fuels are fundamental to the clusters of economic innovation that have been critical to long wave processes. This argument does not mean that the clusters of innovation are exclusively about energy factors but that energy considerations are closely linked to successive waves of innovation. A second implication pertains to the question of how far back in time one can trace K-waves. The leadership long cycle program finds evidence for K-waves activity back to the tenth century in the form of technological innovations in Sung Dynasty China. But it is clear that the evidence is stronger after the late eighteenth century British industrial revolution than before. One good reason is the two energy transitions that took place between the late nineteenth and early twentieth centuries. The consequences of combining clustered technological innovation with energy transitions led to economic changes that are even more pronounced than in earlier centuries.

Third, one of the main foci of the leadership long cycle research program are long waves of economic growth which come in pairs or 'twin peaks' of clustered growth spikes. Energy considerations suggest reasons for these paired clusters of growth to be uneven in impact. The first peak should be less revolutionary in impact than the second because the first innovation wave must work within the prevailing economic landscape but the second wave has the advantage of building on the first wave's innovation set.

Since the leadership long cycle research program has focused primarily on the advent of technological innovation, adding energy considerations to the mix encourages an expansion of the focus to encompass resource acquisition and transportation activities as a fourth implication. Another implication of giving more attention to energy is the distinction between relative decline in production and export shares and achieving steady states in energy consumption. The steady state focus, in which periods of non-expansion of energy consumption predominate, may be more useful than focusing on, and debating, relative decline questions. This observation leads to a sixth implication in underlining the role of lead economies in leading the way through periods of energy transition and the development of reliance on new fuels. Steady states in energy consumption suggest that the gains from energy conversion processes have been maximized. New types of energy sources are needed to expand energy consumption. The next lead economy is likely to lead the way to the new types of energy sources.

Interpreting these processes in terms of energy acquisition and consumption makes it possible to link systemic leadership to ancient processes of development which helps to generalize the nature of the activities being examined. Further help in this regard is

provided by a cosmological argument that energy consumption is the common denominator of the evolution of all natural processes. These last two implications reinforce the centrality of the processes focused upon and should help make the leadership long cycle research program seem less unorthodox overall – even while it proceeds from assumptions that are not widely accepted by scholars of world politics.

Before elaborating these implications further, it is probably helpful to first outline the leadership long cycle's perspective on Kondratieff waves (K-waves) and the role they play in the research program. Since they are an integral component to the overall theory, some of the associated components need to be introduced as well.

The K-Wave and the Leadership Long Cycle Argument¹

Forty to sixty year Kondratieff waves (K-waves) are said to be driven by a host of different factors, including prices, technological innovation, energy transitions, demographic change, war, generational changes, investment, profits, and wages.² No doubt, there is something to be said for all of these claims in that the rhythms of long-term economic growth tend to encompass multiple phenomena. We simply have failed to sort out all of the interrelationships adequately. Yet it is difficult to proceed from the assumption that everything is related to everything else (even if it is). The leadership long cycle argument makes a number of assertions about how hierarchy is established in global politics – one of which privileges clustered, radical innovations in technology as the principal driving force of the K-wave.³ This first set of assertions revolves around leading sectors which are industries built on radical innovations which have some potential of revolutionizing the way the economy is structured. Long-term growth is discontinuous and dependent on spurts in the development of these radical innovations. Radical innovations, in turn, generate new technology and industries characterized by high growth rates and alter the way old industries (characterized by slow growth rates) perform or, alternatively lead to their disappearance through Schumpeter's 'creative destruction' processes. Rapid growth on the part of the aggregate economy depends, of course, on the new, high growth sectors outperforming and more than offsetting the drag of the older, slow growth sectors.

It should be noted that these radical innovations are not simply a matter of the appearance of new hardware (Modelska 2001). Actors must learn how to cope with the implications of new technology and this takes time. Eventually, however, the effects become more routine as the new developments are assimilated, albeit unevenly around the world. Just how long this combination of hardware and perception process requires working itself out, no doubt, is somewhat variable but probably approximates a generation. One generation is first exposed to the new technology and the following generation increasingly regards it as a routine way of doing things.

Initially, these leading sector trajectories were viewed as long waves or undulations of accelerated and slow economic growth. We have moved away from that conceptualization and now embrace the notion of a sequence of S-shaped growth curves. New sectors are introduced, grow quickly at first and then level off. Long-term economic growth is still subject to sequences of fast and slow growth but the underlying mechanism is the

¹ This overview section draws to some extent on a portion of Thompson (2007b).

² See, for instance, Goldstein (1988) and Thompson (1990) for a discussion of the multiple Kondratieff wave interpretations. More recent variations include Devezas and Corredine (2001), and Rennstich (2008).

³ It shares the Schumpeterian emphasis on clustered, radical innovations with the Sussex school (Freeman and Louca 2001; Freeman and Perez 1988; Freeman and Soete 1997; Perez 2002) and Boswell and Chase-Dunn (2000).

iterative introduction of new industries to replace old ones. Each new cluster of radical technological changes possesses an S-shaped trajectory that gradually flattens as its activities are perceived to become routine or even obsolete.

The introduction of radical innovations is monopolized by a single lead economy situated at or near the top of a global technological gradient on which the world's economies are organized hierarchically. At the bottom of the gradient, subsistence activities predominate. At the top, pioneering innovations for a time produce efficiency, productivity, and monopoly profits. The very frontiers of technology are extended with each radical innovation in the ways in which commodities are produced. Technological innovation, imitation, and highly uneven diffusion makes movement up and down the gradient conceivable, but not necessarily all that likely. But as some other economies catch up eventually in harnessing the new technologies, the lead economy loses its lead.

Lead economies experience at least two waves of innovation in a process referred to as the 'twin peaks' phenomenon. The first wave (ascent) pushes a new economy to the top of the technological gradient. This highly destabilizing outcome encourages increased conflict and global warfare fought primarily among the states with economies situated near the top of the gradient. Thanks in part to the surpluses gained in the ascent wave and the consequent ability to organize a winning coalition, the lead economy's victory in the ensuing conflict is made more probable. Its resources are applied to funding capabilities of global reach (naval power later supplemented by air and space power) and coalitions of land and sea powers to defeat the most threatening adversaries.

The innovation lead in the first wave, intensive mobilization during the intensive conflict, and global war victory all combined to facilitate the lead economy's development of a second wave of clustered innovations. Most allies and rivals that participated in the global warfare emerge exhausted. The exception is the lead economy that actually profits from the conflict and extend its predominance as the premiere commercial-industrial and power with global reach. After the global war has ended, the coalition leadership in the global war has increasingly segued into something resembling systemic leadership. Yet, it is also in this immediate postwar era that other advanced economies narrow the gap with the economic leader's position. If the leader's first wave is one of ascent, the second wave of the pair is thus a catch up wave. As the system leader's capability foundation experiences relative decline after a few decades, so too does its opportunity to lead systemically.

Two other distinctive assumptions of this Kondratieff wave interpretation are that: 1) the perspective is evolutionary and 2) the K-wave pattern began to emerge faintly as early as the tenth century Sung China. No one argues that Kondratieff waves have been with us throughout recorded history. At some point, though, the long economic fluctuations with 40–60 year periodicity emerged. Only gradually were such processes likely to assume a shape that became easier to identify. In this case, the argument is that the first appearance of a paired K-wave pattern in economic innovations is found in the 10th century in Sung China which is sometimes credited with developing the first economy with modern, industrialized features. Most importantly, the expansion of maritime trade in the South China Sea and the Indian Ocean, as well as the revived use of the Silk Roads on land, facilitated the transmission of long term, paired growth impulses to the other end of Eurasia via Venetian and Genoese intermediaries. Many of the economic in-

novations that later characterized western commercial and industrialized successes can be traced back to Chinese practices (Modelski and Thompson 1996; Hobson 2004). It is possible, therefore, to analyze nine twin-peaked processes or eighteen K-waves encompassing some one thousand years between 930 and 1973 (Modelski and Thompson 1996). Obviously, the claim that there have been as many as nineteen K-waves, counting the one that still seems to be in progress, is a major departure from K-wave convention. But there is no insistence that each set was as fully manifested as more recent ones. The K-wave process emerged only gradually and became most evident only in the past few centuries – a subject to which we will return.

No assumption is made that either technological change or capitalism suddenly emerged after the British industrial revolution. Both were amply exhibited for thousands of years, especially in activities involving long-distance commerce. But it was necessary to break free of economies dominated by relatively slow-moving agricultural dynamics fixated on interactions between climate, resource endowments, and population size. Early Chinese industrialism and commerce took a step in that direction. The process was aided and abetted subsequently by trading state behavior conducted by small Italian city-states and Portugal after the early Chinese experiment had failed.⁴ Dutch, British, and U.S. innovations in commerce and industrialization of the past three to four centuries have contributed further to the increasing strength of long-term technological change rhythms.

Table 1 lists the lead economy history. Two Chinese (Northern and Southern Sung), two Italian (Genoa and Venice), a Portuguese, a Dutch, two British, and at least one U.S. set of paired innovation spurts are claimed. The radical innovations initially were largely focused on the development of the Chinese ‘national’ economy but not exclusively because trade’s significance rose in the Southern Sung era. Thereafter, the emphasis shifted to commercial innovations through the 14th K-wave and industrial innovation courtesy of the British Industrial Revolution. The intention of the table is not to capture comprehensively everything that changed in each iteration but to draw attention to some of the more illustrative and profound changes around which each K-wave was focused.

Table 1. Leading sector timing and indicators, from the 15th to 21st centuries

Lead Economy	Leading Sector Indicators	Start-up Phase	High Growth Phase
1	2	3	4
Portugal	Guinea Gold	1430–1460	1460–1494
	Indian Pepper	1494–1516	1516–1540
Netherlands	Baltic and Atlantic Trade	1540–1560	1560–1580
	Eastern Trade	1580–1609	1609–1640
Britain I	Amerasian Trade (especially sugar)	1640–1660	1660–1688

⁴ Part of China’s problem was its distinctive threat environment and long struggle with nomadic attacks. The Mongols were able to defeat Sung China in part by using some of its technological innovations against the Chinese.

1	2	3	4
	Amerasian Trade	1688–1713	1713–1740
Britain II	Cotton, Iron	1740–1763	1763–1792
	Railroads, Steam	1792–1815	1815–1850
United States I	Steel, Chemicals, Electronics	1850–1873	1873–1914
	Motor Vehicles, Aviation, Electronics	1914–1945	1945–1973
United States II?	Information Industries	1973–2000	2000–2030
	?	2030–2050	2050–2080

One outcome of this pattern of economic leadership, seemingly new to the last millennium, is the development of a global system increasingly focused on the operations and management of long distance or inter-regional trade. This global system, initially Eurasian in scope and eventually planetary wide, functioned simultaneously with the more delimited foci of various regional systems. At the head of the global system (but not necessarily any of the various regional systems) is the lead economy that surges ahead of its competitors and rivals in an ascent K-wave only to find itself in an intensive bout of global warfare of generation length. Interestingly, while periods of conflict are found in the earlier paired sets of K-waves, successive rounds of global warfare only emerged halfway through the millennium in the 1490s. Western Europe was both multipolar and characterized by repeated and unsuccessful attempts, unlike most other regions, to acquire regional hegemony that was considered as being renewed in the 1490s.⁵ As a consequence, global wars have combined and fused attempts of continental powers to assume the European hegemony with disputes over leadership at the global level. This process presumably ended in 1945 but could be transplanted to East Asia in the twenty-first century.

Ultimately, the K-wave process does not establish the world hegemony for the state possessing the lead economy. Rather, it propels the lead economy into the status of being the leading political-military-economic actor of a global system focused on long distance transactions, in marked distinction to regional power structures and attempts at territorial expansion in the home region. There is no need to equate the systemic leadership of Portugal in the sixteenth century with that of the United States in the second half of the twentieth century beyond the minimal standard that both states established themselves as the leaders in global (*i.e.* interregional) economic innovation in their respective eras. The U.S. lead in 1945 was much greater in scope than the lead established by Portugal in 1517. Therefore, it is hardly surprising that the United States had a much stronger impact on shaping the postwar institutions of world order (as symbolized by the Bretton Woods package of the Generalized Agreement on Trade and Tariffs [GATT], the International Monetary Fund [IMF], and the United Nations [UN]) than did Portugal in the early sixteenth century.⁶ In neither case was the system leader hegemonic. In both cases,

⁵ Rome, of course, had successfully unified most of what later became Western Europe but this early success was more a product of Mediterranean politics than it was 'European' politics. That is, Rome conquered the Mediterranean world and, in the process, peripheralized much of Europe to its empire centered in Italy.

⁶ Portugal essentially created a protection racket regime in the western end of the Indian Ocean in which traders paid taxes to the Portuguese to be allowed to trade. The Portuguese could aspire to little more since their technological edge resided in ocean-going ships with cannon, as opposed to commodities that could be exchanged for Asian goods.

the system leader had variable opportunities to shape the rules governing global system transactions.

The tripartite systemic leadership platform – leading sector growth (growth rates of leading sectors in the lead economy), leading sector share concentration (the lead economy's share of leading sector production among global powers), and global reach capability concentration (naval capability share) – is interrelated reciprocally. Leading sector growth leads to leading sector share concentration and global reach capabilities. Higher levels of global reach capabilities facilitate leading sector growth and leading sector share concentration. Yet, leading sector growth and share concentration also lead to military mobilization on land as well as at sea.

We have shown empirically (Reuveny and Thompson 2001, 2004) that the system leader's leading sector growth has been a systematic driver of the system leader's aggregate or national economic growth. Both of these variables, in turn, affect world economic growth positively while world economic growth influences the system leader's leading sector and national growth negatively. In some respects, then, the system leader is negatively affected by its own success. Its innovations contribute to world economic growth but as other economies improve their technological development, the advantageous position of the system leader is reduced.⁷

Eight Implications

Given the perspective outlined above, what might the increasing role of energy issues offer? Examining energy flows more closely should have payoffs for studying long economic waves or, more accurately, successive S-shaped technological growth trajectories. This is the first implication of incorporating energy into the leadership long cycle perspective. Smil (1994; see also Marchetti 1977), for instance, observes a close correspondence among Mensch's (1979) innovation cluster peaks, Schumpeter's peaks and troughs, and the introduction of new prime movers and fuels. Outlined in Table 2, Smil notes that each Kondratieff upswing was strongly influenced by the introduction of either new engines and new fuels, or both. The timing of these same early adoptions match the peaks of Mensch's (1979) innovation clusters (*i.e.* 1828 vs. 1830, 1880 vs. 1882, and 1937 vs. 1945) and the timing of Schumpeterian long wave trough center-points (1827 vs. 1828 and 1830, 1883 vs. 1882 and 1880, 1937 vs. 1945 and 1937). The midpoints of the Schumpeterian upswings are also roughly the midpoints of the prime mover/fuel eras. Smil regards this particular correspondence as more support for Mensch's argument that economic depressions stimulate new innovation waves.⁸

Finally, Smil also notes that a large number of the leading corporations in each prime mover era specialize in producing the new prime movers and associated fuels. Thus, the correspondences observed in Table 2 are hardly mysterious. Corporate activity

⁷ There are a number of other generalizations that can be made and that have been validated empirically about how the systemic leadership foundation influences other systemic processes, ranging from protectionism to the North-South cleavage (see Rasler and Thompson 1994; Reuveny and Thompson 2004; Thompson and Reuveny 2010).

⁸ See as well Freeman's Sussex School emphasis (*e.g.*, Freeman and Perez 1988) on the key ingredients that will drive successive long waves. Most have an energy basis. At the same time, it should be noted that there is no standardization of K-wave periodicity as yet. Authors put forward approximations that sometimes overlap and sometimes do not. For instance, the Schumpeterian peaks in 1800 and 1856 in Table 2 do not exactly correspond to the relevant leadership long cycle high growth phases of 1763–1792 and 1815–1850. The 1911 and 1962 Schumpeterian peaks, though, do correspond with the 1873–1914 and 1945–1973 phases.

provides the agency that links technological innovation and economic contraction and expansion. It is interesting to note, moreover, that Table 2 implicitly addresses the earlier implication about varied beats of the paired Kondratieffs. Focusing on the first column, the 1775–1830 period emphasized stationary steam engines while the 1830–1882 period stressed mobile steam engines, as found in trains and ships. The 1882–1945 period introduced internal combustion engines and steam turbines while the 1945–1990 period ushered in gas turbines. Note that engine power is substantially greater in the second period as compared to the first period when we look at these four eras as two sets of paired upswings.⁹

Table 2. Energy shifts and economic long waves, 1775–1990

Mensch Innovative Clusters Peaks	Schumpeterian Troughs	New Prime Movers and Fuels	Schumpeterian Peaks
		Stationary Steam Engines 1775–1830 (coal)	1800
1828	1827		
		Mobile Steam Engines 1830–1882 (coal)	1856
1880	1883		
		Steam Turbines and Internal Combustion Engines 1882–1945 (coal and crude oil)	1911
1937	1937		
		Gas Turbines 1945–1990 (coal, crude oil, and natural gas)	1962
	1990		

Source: Columns 1, 2, and 4 are based on Smil (1994: 240) who, in turn, drew on Mensch (1979) and Schumpeter (1939) for the peak and trough dates.

Nakicenovic (1991) sees these shifts (see Table 3) as substitution waves, with new technologies initially emerging in one era and becoming dominant in the next only to be supplanted by something else in a subsequent period. Precisely what comes next remains unclear. Natural gas sources of energy seem the most likely candidate at present but some mix of different sources will no doubt prevail. Which ones (or which mix) are selected, will depend ultimately on changes in technology that make these alternative sources more reliable, safer, and less expensive.

The Smil and Nakicenovic tables, however, are suggestive about the role of energy transitions in the K-wave process. An energy transition is ongoing but not all that well advanced. It may take place later in the century and we think the hydrocarbon era is

⁹ Of course, each successive era also represents an expansion of engine power over the preceding era as well.

coming to an end but what will replace it remains vague. Substitution is ongoing slowly. No new fuels or engines (unless computers are seen as engines of a different kind) are yet evident either. If these generalizations are accurate, several possibilities are conceivable. If energy shifts have become a necessary part of the Kondratieff wave and have stalled for various reasons, does that portend parallel distortions to the shape of the current K-wave? The Sussex school (see, *e.g.*, Freeman and Perez 1988) argues that economic depressions result when there are delays in moving from one phase to the next due to the need to overcome resistance or obstacles to the next cluster of innovations. The current, protracted energy transition ultimately may come to be seen as such a delay.

Table 3. Clusters of pervasive technologies and substitution waves

Period	1750–1820	1800–1870	1850–1940	1920–2000	1980–2060
Dominant Systems	Water power, sails, turnpikes, iron castings, textiles	Coal, canals, iron, steam power, mechanical equipment	Railways, steam ships, heavy industry, steel, dye-stuff, telegraph	Electric power, oil, cars, radio, TV, durables, petrochemicals	Gas, nuclear, aircraft, telecomm., information, photoelectronics
Emerging Systems	Mechanical equipment, coal, stationary steam, canals	Steel, city gas, indigo, telegraph, railways	Electricity, cars, trucks, radio, roads, oil, telephone, petrochemicals	Nuclear power, computers, gas, telecommunication, aircraft	Biotech., artificial intelligence, space industry and transport

Source: based on Nakicenovic (1991: 486).

Alternatively, it may be that two energy transitions (first to coal and then to petroleum) were part of the K-wave history with fairly profound implications but that did not mean that energy shifts, at least in terms of fuels and engines, has become absolutely necessary to substitutions in clustered technology. Information technology, widely presumed to underlay contemporary technological changes, represents a different type of energy shift that may prove to be as difficult to assess while it is still ongoing as the shifts to coal and petroleum no doubt were.

The second implication follows from the first one. We discern 19 K-waves going back to the 10th century and Sung China. Roughly, most of the first two-thirds of this process was caught up in making use of wind for long-distance oceanic voyages which were carried out by relatively small states located on the fringe of Europe (Genoa, Venice, Portugal, the Netherlands, Britain). The voyages were profitable but harnessing wind was hardly new. The real innovations were focused on ship building (Venice, the Netherlands), improving navigations skills, or finding new routes (the Netherlands) to the Spice Islands. As impressive, profitable, and revolutionary for their time as these Asian and American trade connections were, they still seem to suffer in comparison with the revolutionary implications of new ways to manufacture products that were developed in the second half of the 18th century. One obvious explanation for this disjuncture is that an energy transition began in the late 18th century that substantially reinforced the impact of the Kondratieff process. From an evolutionary perspective, constant relationships

are unlikely. Instead, they evolve over time, with some growing stronger and others becoming weaker. In this case, major energy transitions in the late eighteenth through early twentieth centuries served to intensify the effects and consequences of clustered technological innovations.¹⁰ The technological frontier was extended even more radically than in the past.

Another implication of giving more emphasis to the energy-technological innovation nexus is the nature of the twin peak phenomena. System leaders have tended to experience leads in innovation in sequential bursts of two upsurges, depicted in Table 4, that are separated by periods of global warfare. Hitherto, we have treated these paired innovation upsurges as equal. But in the context of interactions with energy, it takes time to transform the nature of energy conversion practices. As a consequence, the first burst in innovation tends to work within the prevailing economic landscape. The innovations may be radical but they are less likely to transform the economy to the full extent imaginable. The second one has the benefit of the earlier surge's changes and should be more revolutionary in its implications for how economic production is accomplished. Hence, the anticipated beat should not be 1–1 but, perhaps, something more like 1–1.5–2, with the second wave having a greater impact than the first. This differential beat rhythm is not a fact – merely a hypothesis taken and generalized from Griffin (2010: 123) who argues for a slow start for the British industrial revolution given the organic environment in which it began. She notes that the initial innovations relied on organic resources (horses, charcoal, and water) and then came to depend increasingly on inorganic resources (coal extracted from under the soil) with greater productivity as a result in a second surge. It may be that this differential beat is more discernible in more recent innovation surges. Nonetheless, the logic might well fit earlier growth surges too. Consider the Portuguese first growth surge based on West African pepper, slaves, and silver. Only in the second wave did the Portuguese enter the Indian Ocean. Or, the first Dutch growth surge was focused on its traditional Baltic trade. It is the second wave that is linked to the Dutch penetrating the Indian Ocean and the Spice Islands.¹¹ The initial 18th century British lead was predicated on its transportation of Asian products while the second wave was more focused on American production (*e.g.*, sugar and tobacco). It does not seem unwarranted to regard the first surge in the set to be more constrained by the environment in which the innovations occur in comparison to the second surge which can build on the first.

¹⁰ A number of efforts to model K-waves based on aggregate data have been made without a great deal of success. Part of the problem is relying on the aggregate data but another part may be that the K-wave activity simply becomes more regular and therefore empirically discernible as we move toward the current period (see, *e.g.*, Korotayev and Tsirel 2010).

¹¹ However, there are also strong incentives to re-examine Dutch energy utilization of peat and windmills. De Vries and Van de Woude (1997) make a good case for calling the 17th century Netherlands the first modern economy.

Table 4. The twin peak timing of leading sector growth surges and global war

First High Growth Surge	Global War	Second High Growth Surge
Portugal		
1460–1494	1494–1516	1516–1540
Netherlands		
1560–1580	1580–1609	1609–1640
Britain		
1660–1688	1688–1713	1713–1740
1763–1792	1792–1815	1815–1850
United States		
1873–1914	1914–1945	1945–1973

Incorporating energy obviously expands the focus on what lead economies need to do. This fourth implication is sketched in Fig. 1. Energy must have a source that can be tapped in some systematic matter.¹² Extraction and transportation from the source to production sites, therefore, becomes an important set of routines for the system leader either directly or indirectly. The focus on production sites (and commercial entrepots) is long standing and has been manifested in looking at sequences of pioneering and monopolizing leading sectors for periods of time. More storage and transportation of goods to their respective markets is the next step, followed by consumption, market share considerations, and waste associated with consumption.

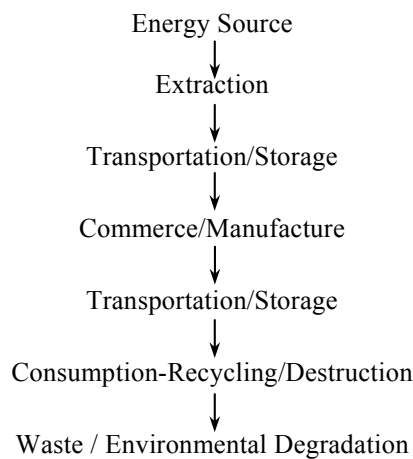


Fig. 1. Energy flows

The leadership long cycle research program has focused primarily on the middle of this energy flow process, although the stress on naval power underlines the need for coercive protection of the two transportation links in the flow. Moreover, naval navigation hardware (compasses, rudders, and so forth) have also been standard foci (Devezas and Modelski 2008). But, fortunately, Bunker and Ciccantell (2005, 2007) have already analyzed the ex-

¹² Keohane (1984: 32) argues that hegemony must control raw materials in addition to capital, markets, and competitive advantages in production. Once I thought a definitional emphasis on resource control was wrong but as long as the raw materials are focused on energy sources, I would now agree.

traction-transportation and manufacture-transportation links. They do not look at what is manufactured; rather, they stress obtaining raw materials and building a transportation infrastructure. What is needed then is a synthesis of their model, perhaps subject to modifications, into the leadership long cycle perspective. Waste is not exclusively a function of lead economy manufacture and consumption but it is likely to be a major, if not the major, source of problems associated with waste and, its corollary, environmental pollution. Were we to combine the production and consumption efforts of the lead economy and its main rivals, a lion's share of the generation of global wastes can be attributed to a small number of elite economies. Certainly, the lead economy is also a leader in waste and pollution production. Waste disposal and environmental degradation, thus, also become grist for the extended analytical mill.¹³

A fifth implication of giving more emphasis to energy is that some of the uncertainties of assessing relative decline may be eliminated. There are at least two problems that are affected. One is that it is remarkably difficult for most observers to distinguish between absolute and relative decline. Seeing no or little absolute decline, the popular reaction is what decline? Per capita income, for instance, falls in absolute decline phases but it is likely to improve in periods of relative decline. Without a clear impact on the quality of life, the notion of relative decline seems highly abstract. Relative decline is also difficult to gauge and even more difficult to assess in terms of its meaning. System leaders can enter into relative decline almost from the onset of their periods of predominance. Even so, any initial relative decline is apt to move very slowly and only pick up speed much later as competitors manage to catch up and perhaps, surpass the former leader. When other states and economies do transit past the incumbent leader, the relative decline becomes obvious. Before the point of transition, it is more nebulous even when many indicators point in the same direction.

The second problem lies with interpreting relative decline once it is recognized. How much decline makes a significant difference? If a system leader's lead diminishes by ten per cent, is that huge, modest, or minor? Of course, that assessment must be contingent on the size of the gap between a leader and its followers. The greater is the size of the gap, the more room there is for relatively insignificant decline. But we have no practice in working out a metric that tells us when relative decline has reached significant proportions and when it has yet to pass some threshold mark. That has been especially the problem with interpreting U.S. relative decline. Its initial lead was quite commanding. Its rate of decline has been slow. It continues to possess a number of advantages over its rivals. Thus, it is not surprising that observers disagree contemporaneously about whether any decline has occurred.

One of the advantages of inputting more energy into the technological innovation box is that there is less emphasis on decline and more stress on attaining a steady state phase. Ascending economies tend to increase their consumption of energy. But at some point their increasing consumption levels off due to a combination of greater energy efficiency practices and reaching a point of optimal production given the types of energy sources that are available. The attainment of the phases of steady state energy consumption are quite clear in the British and U.S. cases.

¹³ Dealing with environmental degradations could well become a leading sector of the 21st century. See as well Chase-Dunn and Hall's (1997) iteration model and subsequent revisions that include environmental degradation as a function of economic productivity.

Fig. 2 charts British consumption per capita as reported in Humphrey and Stanislaw (1979).¹⁴

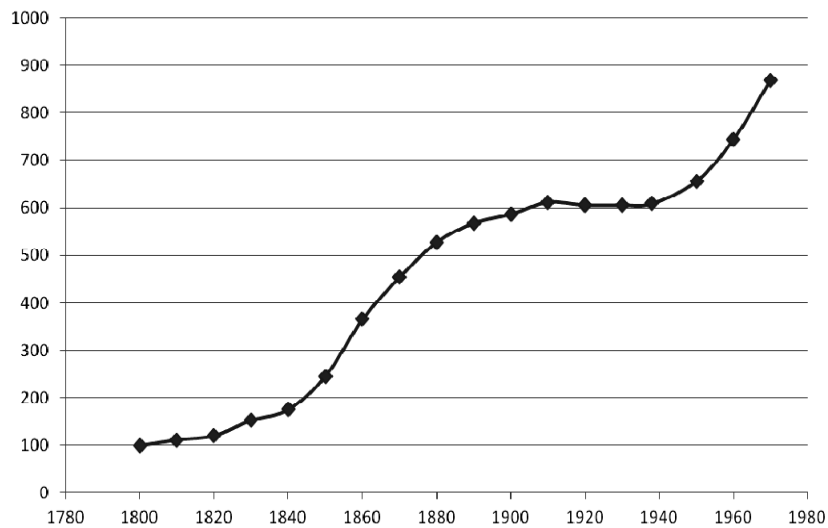


Fig. 2. British energy consumption per capita, 1800–1970

Not shown in Fig. 2 are estimates for the 18th century that suggest that energy consumption roughly doubled between 1700 and 1800 (47 to 100 on the index). Between 1800 and 1900, the increase in consumption per capita was nearly fivefold (100 in 1800 to 587 in 1900). The series peaked around 1910 and then went flat through World War II before beginning to ascend once again. The more contemporary (post-World War II) ascent, however, is associated with changes in fuel sources in a second energy transition. The flattening in the first half of the 20th century (and de-accelerating in the latter 19th century) presumably reflects the waning years of coal dependence as the principal fuel source, along with declining manufacturing activity.

Fig. 3 plots the U.S. energy consumption per capita in million BTUs.¹⁵ Between 1950 and 1975, there was a 47 per cent increase (227 in 1950 to 333 in 1975). The series peaks in 1980 at 344 and stays flat through 2005, before declining in 2009. This last decline presumably reflects the global financial meltdown and losses in economic production and is thus likely to be temporary. Yet, overall, the series appears to have flattened from the 1970s on. As in the British case, there are multiple factors at work, including declining manufacturing demands and increased efficiency, but the combination of the two figures suggests that the flattening in Fig. 3 probably also reflects the waning years of the petroleum energy regime and the attainment of a steady state status in terms of energy consumption.¹⁶

¹⁴ Humphrey and Stanislaw focus on mineral fuels and hydro-power and normalize their series in terms of 1800 = 100.

¹⁵ The data are taken from the U.S. Energy Information Administration's *Annual Energy Review, 2008* – see table 1.5 (Energy Consumption, Expenditures, and Emissions Indicators, Selected Years, 1949–2009), URL: http://www.eia.doe.gov/aer/pdf/pages/sec1_13pdf.

¹⁶ A related issue is the quite significant extent to which the U.S. trade deficits are expanded by petroleum imports.

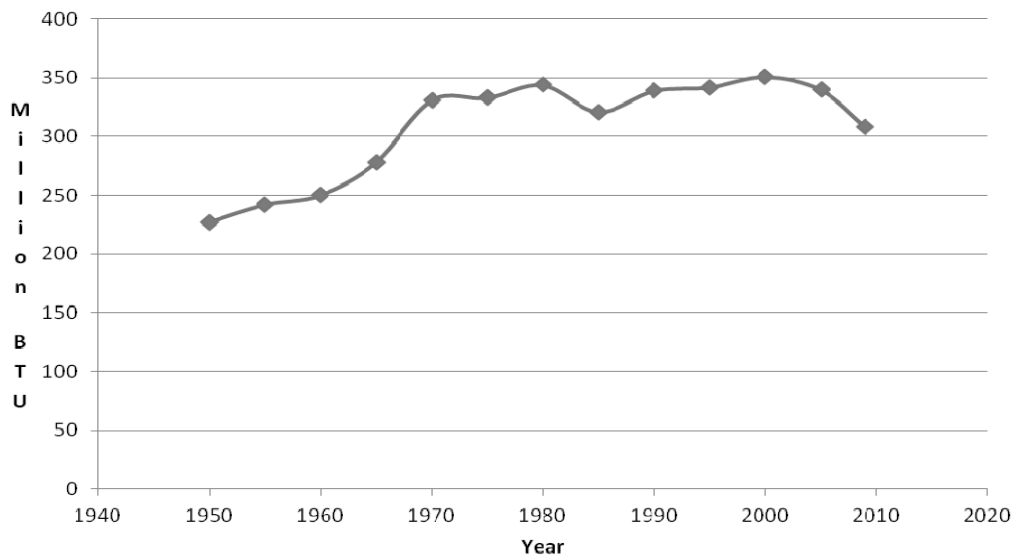


Fig. 3. The U.S. energy consumption per capita, 1950–2009

In this vein, LePoire (2009: 215) suggests that a transition to the Chinese leadership is a long way off. The Chinese energy consumption is very large but on a per capita basis is only about ten per cent of the U.S. usage. That would imply that any plot of Chinese per capita consumption would show a positive trend perhaps for a number of years into the first half of the 21st century, other things being equal, but still not catching up to the leader. The other interesting facet of the Chinese consumption is that has been heavily dependent on coal and will probably continue to be reliant on coal through at least 2050.

From these observations, one might infer that the U.S. relative decline may easily be exaggerated, as are concerns about a transition to Chinese leadership in the near future. The real question from an energy perspective is which economy or economies will lead the way in replacing petroleum, especially in terms of automobile propulsion. Since we are in the very early stages of that movement, it is probably much too soon to tell – but it hints at what we might pay most attention.

The sixth implication is that leadership and energy transitions appear to have become increasingly intertwined. It makes sense that if lead economies are the vanguard of new and increased energy supply and consumption, they would also be an important agent in ushering in new eras of energy use. This tendency did not emerge full-blown with the advent of lead economies. Only the last two lead economies, Britain and the United States, have been involved so far in the transitions depicted in Fig. 4.

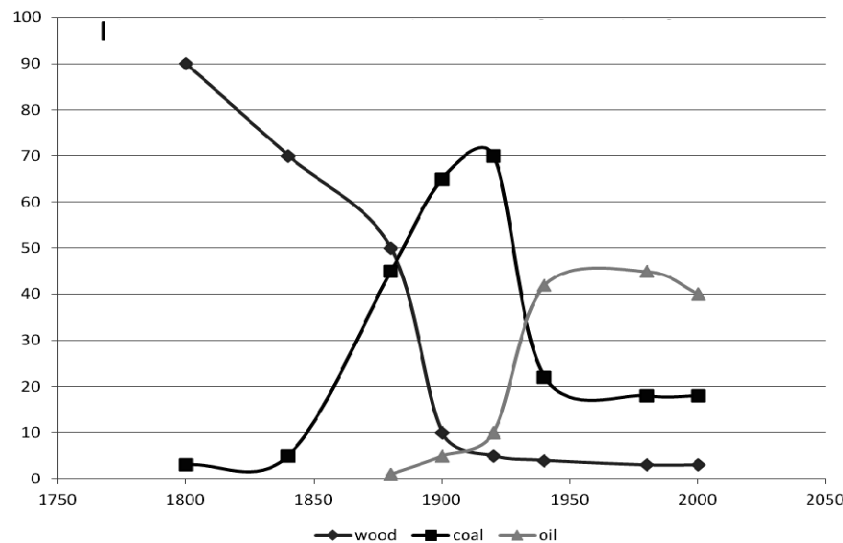


Fig. 4. Energy transitions in the United States

Britain led the shift to coal and competed intensely with the United States for control of petroleum reserves in the interwar years (Hugill 2011). By the beginning of World War II, the United States controlled some 50 per cent of the world's then known petroleum sources (Thompson 2007a).

It follows then that when we are speculating about leadership transition, it is not enough to simply look for innovation in a new wave of gadgets. We should also be looking for leadership toward a new era of energy use in which movement away from reliance on hydrocarbon sources is part of the pattern. In other words, the next lead economy will probably be the vanguard of employing alternative sources of energy – whether it be nuclear, solar, wind, natural gas, or some combination. It may also be that one reason for leadership transition is some inherent disadvantage in making the transition to the next era. Britain, for instance, was heavily committed to coal, did not possess large petroleum reserves at home, and was slow to make the switch to electricity. Given the pronounced U.S. reliance on petroleum, we may find that economies that are less dependent thanks to a lower level of development will encounter less inertia and resistance in the movement toward new energy sources.¹⁷ Alternatively, the next lead economy is likely to need to have ample access to relatively inexpensive energy resources. The question may then hinge on the distribution of resource endowments.

Recognizing systemic leadership as a vanguard of new energy consumption practices creates opportunities to link contemporary processes to both ancient and cosmological processes. Early centers of 'civilization' developed similar resource acquisition networks and innovated novel ways to expand the supply of energy by building and maintaining irrigation canals and other ways to control water use. Sumer, the initial lead

¹⁷ One area worth more exploration are the implications of the system leader's dependence on weapons platforms developed in earlier global warfare but also reflecting a dependence on the prevailing energy regime. The commitment to the petroleum fueled twentieth century ships, tanks, and planes well into the 21st century would seem to be a good example.

economy, is the example par excellence. What lead economies do is a more modern extension of older and even ancient political-economic practices and processes. We need to appreciate the continuity and to build on it analytically.

If a stronger connection to ancient developments is the seventh implication, an eighth is an intriguing link to a cosmological argument. Chaisson (2001: 120) contends that the ‘emergence, growth, and evolution of intricately complex structures’ is keyed to energy flows and governed by thermodynamic principles.

Nature's many ordered systems can now be regarded as intricately complex structures evolving through a series of instabilities. In the neighborhood of a stable (equilibrium) regime, evolution is sluggish or nonexistent because small fluctuations are continually damped; destruction of structure is the typical behavior wherein disorder rules. By contrast, near a transition (energy) threshold, evolution accelerates and the final state depends on the probability of creating a fluctuation of a given type. Once this probability becomes appreciable, the system eventually reaches a unique though dynamic steady state, in which construction of structure wherein order rules is distinctly possible. Such states are thereafter starting points for further evolution to other states sometimes characterized by even greater order and complexity (Chaisson 2001: 78).

This argument (see also Adams 1975, 1982, 2010; Spier 2005, 2010) reflects a general theory of the evolution of complexity in all processes predicated on energy consumption. All ‘natural entities’, spanning physical, biological, and cultural phenomena, extract energy for survival, maintenance and reproductive purposes or, alternatively, put for resisting entropy. Greater complexity is achieved by tapping into greater quantities of matter and energy. Table 5 offers a representative list of the ‘free energy rate density’ – an index of the amount of energy available per unit of mass – of various types of structures. All of these entities take energy from their environment to continue functioning. We are most familiar with our own participation in this fundamental process. Food allows us to live. Without food energy, we die. So it is with all other entities.¹⁸

Table 5. Some representative, estimated free energy rate densities

Structure	Average Densities
Galaxies	0.5
Stars	2
Planets	75
Plants	900
Animals	20,000
Human brains	150,000
Society	500,000

Note: The densities are expressed in erg units of energy per time per mass.

Source: based on Chaisson (2001: 139).

¹⁸ One interesting hypothesis is whether each successive lead economy is associated with significant improvements in the free energy rate density.

The attractiveness of this interpretation for our own purposes is that it provides a different way to view human efforts to improve their existence and quality of life. The basic process is one of energy acquisition and the expansion of how much energy is acquired. One way to look at the evolution of technological innovation, then, is the development of ways to convert various types of matter into successively greater amounts of energy to fill sails, to spin cotton or to drive automobiles and air conditioners. This process, over time, has moved along at different rates but is similar from the expansion of Sumer's resource acquisition network in the fourth millennium BCE to contemporary competitions to find ways to move automobiles by electricity or to convert solar energy into electricity. Political economies become successively more complex as energy densities are increased. But the process of acquiring and harnessing more and more sources of energy is not characterized by widespread innovation. It tends to occur first in one place and diffuse unevenly to other places that are in a position to emulate and, often, to improve on the initial innovations.¹⁹

This basic pattern of pioneering innovations subject to uneven diffusion has structured long-term economic growth and is most clearly discernible in the Sung-Genoa-Venice-Portugal-Netherlands-Britain-United States succession in pioneering lead economies in the modern era of the last millennium. But it is not just successive clusters of innovation that is involved but also successive increases in the flow of energy acquired and energy density. The ability to convert sources of energy into successive advances in transportation and production is what long-term economic growth is all about.²⁰ Lead economies are thus principal agents in generating new drivers for economic development and growth. We should expect each successive leader to be associated with increased free energy rate densities. The leadership long cycle research program is organized very fundamentally around this insight. If the core process being examined also fits into a larger picture of parallel patterns in growth and development from the Big Bang on, so much the better. It reinforces the belief that the research program is on the right track. At the same time it also broadens and helps to justify lengthening the track on which the research program proceeds.

Technological innovation is about many things. The argument here is not that we scrap what has been said previously about the linkages between innovation and world politics. Rather, we need to broaden the nature of the inquiry by integrating energy considerations into the long cycle weave. The two perspectives are complementary because technological innovation and energy have been highly interdependent. Greater integration should enhance our understanding of both energy, the K-wave phenomenon, and processes of world politics.

¹⁹ There are certainly exceptions to this pattern. Agriculture, for instance, was invented independently in multiple places.

²⁰ LePoire (2009: 217) offers an interesting frame on this problem by arguing for viewing history as a complex adaptive process in which succeeding phases of energy intensification over time have led to greater complexity. He thinks the succeeding phases are recognizable in five-fold expansions in energy intensity and dates them as follows: civilization (3000 BCE–400 CE), commerce (700–1720), industrialization (1720–1950), and knowledge-based (1950–?).

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Strategic Stability and the Role of the Global Energy Sphere

Yury Sayamov

The article focuses on the problem of the strategic stability in energetics, pointing out that the fight for energy sources became one of the main reasons for wars and conflicts of the past and present. It can seriously poison the mankind's future, as well, and lead to a global confrontation which may be the last in its history, if a consensus is not found how to secure needs in energy on the basis of safety and interests of all participants in the energy process. As an example of a joint search for solutions the author presents the discussion platform of the International Club of Nice 'Energy and Geopolitics' on which a new initiative was born with the support of the city and region to establish an office of the Russian Academy of Sciences aimed at the development of the scientific cooperation.

Keywords: *energy, geopolitics, strategic stability, Club of Nice.*

In the search for the answers what the emerging world order would be, the factor of energy becomes of key significance, if not the most important one. The notion of strategic stability which appeared in the general political discourse in the mid-1980s taking its origin in the joint research works on military and defense issues by Soviet and American scientists of that time, could be applied to the sphere of global energy. It is exactly about the world strategic stability when questions are considered in their complexity about the energy security including the aspects of offer, demand and delivery of energy. The security of the offer should provide owners of energy resources with the freedom of sale void of any kind of pressure, or sanctions in favor of other interested parties. The security of the demand should guarantee the respective quantity of energy resources for the payment agreed upon. The security of the delivery should cover the transport of energy resources through transit territories and countries.

The struggle for energy sources, especially for oil, became one of the main reasons for contradictions, conflicts and wars of the past and present. It can seriously threaten the humankind's future and also lead to global confrontation which may in the worst of cases become the last in human history, if a consensus is not found how to secure needs in energy on the basis of safety and with due account of interests of all participants of the energy supply including producers, consumers and transmitters.

It goes without saying that their interests differ as in any other trade activity. The producer would like to sell at a higher price whereas the buyer tries to pay less. The transmitter acting as a provider of a service would like to get more for it. This is why at the world energy markets acquiring a global character it is used the principle of the so called '*reasonable prices*' which are formed in the gap between the dumping and speculative prices. Those producing and exporting the energy strive for reasonably higher prices

Globalistics and Globalization Studies 2016 303–308

while the consumers and transmitters long for reasonably lower prices. The establishment of mutually acceptable prices is the result of bargaining, negotiations, and attainment of agreements which is a civilized and respectful approach for making positions of the parties closer to each other and it may include agreed concessions, compensatory accords and other possibilities.

The achievement of agreements on the basis of reasonable prices presupposes a reasonable behavior of participants which excludes blackmail or threat by force or its use. Geopolitical circumstances should not be used in order to force partners to not justified concessions. A mutual compromise between rivals being partners at the same time in the spirit of cooperation is ever broader understood as more profitable than the confrontation and the desire to achieve by one-sided preferences all means. It occurs in the context of the ever more obvious need and interest in the stability and predictability of world energy markets since their volatility and sharp fluctuations of prices can make suffer any participants. The growing interdependence of states in the contemporary quickly globalizing world strengthens their vulnerability from eventual abrupt disturbances in the system of the energy supply in the absence of a global regulating mechanism what makes energy resources, in particular, oil and gas, a powerful tool of world politics and international relations.

The history which, however, sometimes does not teach, testifies that starting from a very distant past all whatsoever important conflicts were in one way or another related to the fight for energy resources conducted first of all by the states which being geopolitical centers were large consumers.

By the First World War the oil was confirmed as a significant geopolitical factor of the confrontation between the Great Powers. During the Second World War one of the most important principles of the world energy geopolitics was formed – to control ways and means of the energy delivery to consumers rather than the territories where the energy resources are produced.

After the Second World War the United States of America which used to be a big world oil exporter began to import it thus creating the principle of conservation what meant the preferential use of foreign energy resources in order to safeguard the national resources for future generations or for the case of an unfavorable development of the international situation.

In the post-soviet period the energetic strategy of the United States was expanded on previously inaccessible or little accessible for them spheres previously influenced by the USSR. It enabled the United States to ever more actively use energy steering levers for their main goal of retaining the elusive world leadership and consolidating a unipolar geopolitical system with the United States at the head.

After a terrible shock and severe trials Russia like the mythological bird Phoenix arises from the ashes of perestroika. The international project 'Oil and Gas of Russia' by the Russian Association of International Cooperation together with foreign experts – French and Swiss leading specialists – helped to return the country's energetics at the world forefront, thus establishing a new structure of cooperation instead of the old non-operating mechanisms.¹

The presentation of the project in Paris brought together more than 600 leaders of the world oil and gas sector, including such key figures as the head of 'Total' Christophe de Margerie (who tragically perished in an aviation catastrophe in 2014 and whose contribution to the development of global energy is widely known). On the margins of the presenta-

¹ *Oil and Gas of Russia. History and Perspectives*. Published in Paris in French and in Russian in 1995.

tion the first agreement between Gazprom and Gas de France was signed marking a new era in the post-soviet energy relations.

Meanwhile, the structure of the global energy sector has been rapidly changing thus acquiring features of the increasing and dangerous instability. The state formations on the territories of the oil producing countries were crushed down, as it happened in Iraq and Libya, or demonized, as the current situation around Iran. It has been preceded by the introduction of international sanctions and the establishment of embargo zones against these countries. When developing a very dangerous game, its authors had better take into account that the regime of sanctions in international relations is not a norm, but an exclusive action of semi-military, sometimes even of military character which may bring the most serious negative consequences for the international cooperation.

The mistake with Al Khaida which turned finally against its creators was repeated when the Islamic fighters from another terrorist organization of 'Islamic state' (an organization banned in Russia) were supported against the legal government of Syria. As a result, a serious threat for the international security emerged, especially dangerous with the view to the fact that terrorists got access to oil sources thus, having daily around US\$ 3 million from the sale of the stolen oil to consumers rather preferring lower oil price to high moral principles. The dirty oil money permits the purchase of arms and financing of terrorist actions and military operations.

Ways and means of delivery of energy resources became less secure and reliable. Under conditions of the general global unbalance the transiters more often yield to the temptation to use their position for additional profits through rising the payments for transit, or demanding to exclusively reduce the price of energy resources for them and sometimes even falling to vulgar stealing of oil and gas from pipelines.

Anyway, the global energy became intrinsically linked and world politics. This is the main conclusion of the study 'Energy politics' conducted by an American researcher Brenda Shaffer (2016). The whole life of mankind and any human activity from production of goods to means of transport and defense heavily depend on access to energy.

In its foreword to the World Energy Issues Report 2014 the Secretary General of the World Energy Council Mr. Christoph Frei points out that this is a time of unprecedented uncertainty for the energy sector. Secure, reliable, affordable, clean and equitable energy supply is fundamental to global economic growth and human development and presents huge challenges for all. Energy demand will continue to increase, driven by non-OECD economic growth. The pressure and challenge to further develop and transform the energy system is immense. To make things more daunting, it is in the context of this uncertainty that today's policymakers and business leaders have to take critical decisions on the common future energy infrastructure (Frei 2014).

The world energy consumption increases at the background of a decreasing energy resources available which leads to international conflicts and fight for energy. The link between the global energy security and the world security in general is ever more evident, especially after the chaos forced instead of the so called 'undemocratic regimes'. War in Iraq marked bluntly as 'the war for oil', destruction of the oil state Libya and devastation of Syria produced millions of refugees invading Europe and caused the rise of the terrorist 'Islamic state' – a new illegal actor on the world oil scene. The turnover in Ukraine made the transit of energy resources through its territory not reliable while it is of vital importance for many European countries. The importance of natural gas is obviously growing also having certain implications for global security.

Meanwhile, in the period between 2000 and 2014 China's share of the world's total gross domestic product (GDP) nearly quadrupled, Russia's share tripled, India's share almost doubled, while the US share decreased by 28 percent. The USA still remains the world most powerful state, but its pretensions for the global leadership requiring a lot of hard and soft power, which the both demand a certain wealth, can continue to diminish together with the ability to influence the world in case of a prolonged steep economic decline (Lane 2015).

However, after about 30 years without vivid achievements in oil and gas production the USA successfully began to use new technologies to extract gas and oil from formations that had been considered too difficult and not profitable for exploitation. The oil produced from such formations is usually referred to as tight oil. Its output increased from 1.5 millions of barrels per day (MBD) in 2010 to 4.7 MBD in 2014 including the condensate output – the type of very light oil that turns from a gas to a liquid at the extraction. Thanks to it, the daily rate of the US crude oil output and the gas production exceeded the volumes of Saudi Arabia and Russia. The results from the development of shale resources for the American economy are estimated as a quite modest one per cent GDP growth by 2040 and seem to be not as important as their reflection lowering world oil prices. In 2015 the world oil prices went down to approximately half of the levels of the previous year. Low oil prices threaten the world energetic stability since there is a risk of a disruption in oil exporting countries suffering from the decrease of oil incomes.

Behind pharisaical deliberations on themes of freedom and democracy there is felt a hidden hope that low oil prices staying low enough for long enough can overthrow the governments of oil exporting countries which are pursuing an independent policy on the global arena.

From the Persian Gulf to Europe and Central Asia and from the United States to China there could be felt a serious concern about global energy stability and security identified as the need to protect national interests. States are increasingly adopting defense doctrines based on the control of energy resources and ways of their delivery. Some striving to indirectly control strategic energy sources engage military and covert operations thus dangerously militarizing the sphere of the global energy. As a result, the previously quite well settled and governed region of the Middle East and North Africa (MENA) is presently converted to an area of heavy military conflicts, unceasing bloodshed and tremendous losses and sufferings for the civil population, explosive for the world situation in general. Public declarations about the necessity of the 'liberalization' and 'democratization' are aimed in reality at the countries of the region rich of energy resources. However, it has been proved quite regretfully that overthrowing MENA regimes bring instead of any positive aspirations just negative results. The invasion in Iraq called 'war for oil' has led to the brutal death of its leader who securely governed the country which to a much greater extent enjoyed its oil wealth than now, being somewhere in between of the position of a failed state and of the role of a puppet in foreign hands. The similar tragic destiny was prepared by NATO's aerial bombardment of Libya for its leader brutally killed and put out to everybody's observation in the fridge of a local food store. A violent anarchy that followed, as well as the provoked outbreak of the civil war in Syria, the rise of the jihadist terrorism in the region representing one of the most dangerous contemporary threats to the world peace and security, the fall of the state in Yemen and a difficult survival of Egypt after the so called 'Arab Spring' are in the outcome of 'civilizing missions' which interfered into independent states causing just grief and devastation.

Besides the MENA region, the geopolitical impact of low oil prices was directed to diminish Russia's power and possibilities on the global scale. The United States seeking to achieve the world leadership are concerned with the rivals in the face of China and Russia. Of the two challengers to the US policy of preeminence, China is considered to be a greater threat. It already has the world's second largest economy in terms of nominal GDP and enjoys a big capacity for its economic growth. Russia represents an ever more modernized and heavily armed powerful petrostate. Relations between rivals involve heavily the energy sector not only inside the countries concerned, but much more in the areas of their influence.

Whatever the future might be, but now the power balance between America and China as the main axis of global politics and the relationship in the triangle of China, Russia and the USA is decisive for many aspects of world politics and economy including the situation in the energy sphere. Contrary to claims about the great strategic importance of US tight oil, it is having very little effect on this power balance. China has now replaced America as the world's biggest importer of crude oil, and lower oil prices add to both its current accounts surplus and its GDP growth rate. Claims about the strategic impact on Russia of US natural gas exports are also much exaggerated. US liquefied natural gas (LNG) exports will for the time being remain a minor factor in Europe's bargaining position toward Moscow. Though Poland and the Baltic states have built LNG terminals, Asia, where LNG prices are higher, is a more promising US export market than Europe. The costs of liquefaction and ocean transport make US gas more costly to produce and deliver to Europe than Russian pipeline gas. The combination of low prices and sanctions are, however, demanding a high price from Moscow. The IMF estimates that the confluence of these two factors may contract Russia's GDP by 3 to 4 per cent. Low oil prices have probably also made it easier to maintain the regime of sanctions. Anyway, there is a question, if the sanctions have in deed produced a gain in vital US interests. For the Europeans the answer is unequivocally negative.

The dream of a 'Big Europe' from the Atlantic to the Urals, as de Gaulle proclaimed, or from Brest to Vladivostok according to contemporary ideas about common historical and cultural values of the European continent was moved behind liberating the place for the following of the European Union (EU) the lead of the foreign interests from over the ocean. Entering this way the EU was consuming more than half of its demand from the Russian export in general and 80 per cent of oil and gas in particular. The EU, how paradoxically it might occur, becomes an obstacle on the way to a Big Europe able to successfully withstand serious global challenges of the contemporary world like the radicalization and pressure of Islam, like the reproduction and survival of the Europeans under conditions of a relentless migration and the forthcoming demographic explosion to the South of Sahara, like unemployment, poverty, social inequality and injustice, problems of women and youth. It is difficult not to agree with the councilor of the French government Mr. Jules Remis who is of the opinion that 'taking into account the significance of common interests it is necessary to overcome the existing differences in views rather than to continue dramatizing them. The Brussels commission, however, gives us the contrary example as for questions in its exclusive competence' (The International Affairs 2013: 94-95).

Before the question is raised who is guilty it is important to pay attention to another question: what to do. The answer might be to go back to what is uniting rather than divid-

ing, rejecting the artificially imposed spirit of confrontation and using another kind of the energy – that of the energy of knowledge with all its positive instruments.

As an example in this regard might serve the unique experience of the International Club of Nice established 15 years ago, in 2001, by scientists and specialists of the energy sphere with the support of the Mayor of Nice and the participation of the Russian Academy of Sciences. The joint work on the international scientific platform of Nice was marked with concrete positive results. In 2011, on the occasion of the 10th anniversary of Club's activities a monograph 'Energy and Geopolitics' was published in French and Russian languages, thus, representing a joint fundamental research of scientists and revealing their vision of the situation in the global energy sphere (Kostyuk and Makarov 2011).

Participants of the Club sessions were far from supporting the anti-Russian sanctions considering the creation of instability in the energy sphere as a dangerous play with fire which might have unforeseeable consequences. Attaching a great importance to the attainment of strategic stability in global energy, they were convinced that this objective can be achieved through a number of subsequent steps forward in geopolitical clusters similar as drops of quicksilver are merging with one another making a singular unit through their contacts. For this purpose it is important to revive the project of 'Big Europe' before the time does not run out and the vector of the energy cooperation does not move from the West to the East like a compass needle of a ship changing its course.

Giving way to the development of the international cooperation on the scientific platform of Nice, the Mayor of the city Mr. Christian Estrosi recently elected as the governor of the region supported the establishment in Nice of a branch of the Russian Academy of Sciences. This initiative opposes the madness of supercharging the international tension and supports the development of the scientific cooperation in the interest of the vitally important energy stability. 'The energy, – as it is pointed out in the already mentioned fundamental monograph "Energy and Geopolitics" – represents the basis for the human civilization. Social and economic challenges of the accelerating globalization are insistently demanding the vision of perspectives, possibilities and strategic priorities of the development of the antropogenic energetics covering the whole of our planet, the unity of means of transferring the energy into the forms useful for the human activity' (cited in Kostyuk and Makarov 2011: *Ibid.*: 9).

In this connection UNESCO Chairs and networks and other 'think tanks' could be considered to be able to contribute to the comprehension of uneasy processes in Europe and in the world and to the search for solutions in the context of the task of forming a new geopolitical system of international relations based on principles of peace and cooperation for sustainable development.

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Climate Change Adaptation in Developing Countries: Does Globalization Act as a Facilitator?

Mohammad Mohabbat Khan and Md. Shahriar Islam

Globalization has brought countries closer in terms of business, trade, technology, knowledge, policies and relations. Globalization, which is partly synonymous with rising international trade, has fostered rapid production, and consumption of material goods in an unprecedented scale and quantities. This has weighted the ecological footprint of human activities around the world. Thus, in this paper, analysis is presented in a manner to see the extent of such global efforts in facilitating climate change adaptation in developing countries. The paper also attempts to understand the degree of success achieved by developing countries in terms of climate change adaptation in the era of globalization. The paper presents climate change adaptation examples from few developing countries to delineate the correlation between globalization and climate change adaptation in recent times.

Keywords: *climate change adaptation, environment, globalization, governance.*

Introduction

Environment itself is inherently global, with life-sustaining ecosystems and watersheds frequently crossing national boundaries; air pollution moving across entire continents and oceans. The environment is intrinsically linked to economic development, providing natural resources that fuel growth and ecosystem services that underpin both life and livelihoods (Najam, Runnalls, and Halle 2007). It is not only that globalization impacts on the environment, but the environment influences the pace, direction and quality of globalization. This takes place because environmental resources provide fuel for economic globalization, but also because our social and policy responses to global environmental challenges constrain and influence the context in which globalization happens. The relation between the discourse of globalization and environment has enabled many scholars to devote their research to climate change adaptation and its relationship with globalization. Globalization is not new for the nations of the world. But as a scientific area of study the climate change adaptation has become prominent in the environmental studies since the world started recognizing significant changes in climate. On different occasions both developed and developing nations have agreed to work on adapting the recent climate changes and their impacts on the natural, social, economic and political environment.

Developing countries are vulnerable to extremes of normal climatic variability, and climate change is likely to increase the frequency and magnitude of some extreme weather events and disasters. Adaptation to climate change depends on current adaptive capacity

Globalistics and Globalization Studies 2016 309–320

and the development models pursued by developing countries. These countries continue to face diverse challenges in forming and implementing climate change adaptation plans. It is inevitable that natural forces will contribute to some of those challenges. But, nature is not the single source of such challenges. Having considered the variety of sources of potential challenges, both developed and developing countries have been trying to figure out successful climate change adaptation strategies for last two decades. Due to globalization such collaboration has been possible in each and every sector. Globalization has brought countries closer in terms of business, trade, technology, knowledge, policies and relations. Globalization, which is partly synonymous with rising international trade, has fostered rapid production, and consumption of material goods in an unprecedented scale and quantities. This has weighted the ecological footprint of human activities around the world. Thus, in this paper, analysis is presented in a manner to see the extent of such global efforts in facilitating climate change adaptation in developing countries. The paper also attempts to understand the degree of success achieved by developing countries in terms of climate change adaptation in the era of globalization. The paper presents climate change adaptation examples from few developing countries to delineate the correlation between globalization and climate change adaptation in recent times.

Key Conceptual Discourses on Globalization and Climate Change Adaptation

Globalization

Globalization is the cluster of technological, economic and political innovations that have drastically reduced the barriers to economic, political and cultural exchange (Drezner 2001). It is a process of expanding trade and commerce creating borderless market all over the world. Globalization is now a part and parcel of our daily life. So what exactly is globalization? Globalization is defined here as a set of economic and political structures and processes deriving from the changing character of the goods and assets that comprise the base of the international political economy – in particular, the increasing structural differentiation of those goods and assets. Globalization refers to the recent transformations of capital, labor, markets, communications, scientific and technological innovations, and ideas stretching out across the globe (Carter 2008). Charlton and Andras (2006) define globalization as a phenomenon of modernization, which describes societies characterized by progressive growth in the complexity of communications, in particular, ‘specifically to the increasing dominance of an international network of communications especially in the economy, but also in social systems such as politics, the mass media, and science and technology’ (Charlton and Andras 2006: 869). Adams, Gupta, and Mengisteab (1999) view globalization as an economic discourse that facilitates wealth creation. At the same time, they think that economic globalization can dislocate indigenous culture in least developed countries. Since the mid-1980s globalization has been accelerated considerably by two main factors. One involves technological advances that have lowered the costs of transportation, communication, and computation and the other factor has to do with the increasing liberalization of trade and capital markets. Wallerstein (1995, 1998, and 2000) sees globalization as a world system in which the world is dominated by the developed nations. Developed nations, in such a world system, seek to infuse their ideas and strategies to developing nations in the areas of production-oriented activities and other economic activities. Wallerstein (1995) as a proponent of liberalism, thinks that globalization is a

system through which developing countries would get better by installing ideas of their developed counterparts. But not all developing countries are equally engaged in globalization or in a position to benefit from it. Developing countries, except for most countries in East Asia and some in Latin America, have been rather slow to integrate with the world economy. One review, by Scholte (2000), provides a classificatory scheme of several definitions:

Globalization as internationalization: The ‘global’ in globalization is viewed ‘as simply another adjective to describe cross-border relations between countries’. It describes the growth in international exchange and interdependence.

Globalization as liberalization: Removing government imposed restrictions on movements between countries.

Globalization as universalization: Process of spreading ideas and experiences to people at all corners of the earth so that aspirations and experiences around the world become harmonized.

Globalization as westernization or modernization: The social structures of modernity (capitalism, industrialism, etc.) are spread all over the world, destroying cultures and local self-determination in the process.

Globalization as deterritorialization: Process of the ‘reconfiguration of geography, so that social space is no longer wholly mapped in terms of territorial places, territorial distances and territorial borders’.

Globalization cannot be seen only from the economic perspective. Globalization not only refers to a series of economic but also technological changes that have modified the way the world works and transfers information (Penn 2005: 4 cited in Quigley 2009). These changes could include international trade, manpower migration, knowledge management, and information exchange. Apart from such technological advancement and increased opportunities for developing countries to adopt those technologies there are some other issues which also determine the processes of globalization. Politics is one of those to be looked at. Politics is a regular feature of globalization as well (Broad 2002). Culture is another one which needs to be considered critically. International non-governmental organizations (INGOs) represent, carry out, and elaborate global principles. It means NGOs promote globalization and try to mold cultures of developing nations (Boli and Thomas 1997). Although globalization does not create a common culture in which everyone holds the same beliefs and values, it does create a single arena in which all actors pursue their goals by deliberate comparison with others, using at least some common standards as yardsticks (Nettl and Robertson 1968; Robertson 2001). Emulation takes the form of selectively incorporating ideas from a global arsenal (Robertson 1995a, 1995b). Griffin (2003) points out that globalization is asymmetric and developed nations with the help of various international organizations try to rule this world. In this process developing countries remain deprived of free and equal access to knowledge, research opportunities, economic activities and factors of production. Through globalization the developed nations have been able to access the resources of developing nations. But it is unlikely for the developing nations to have similar access to the resources in developed nations. It shows that globalization is a discourse which is used by developed nations as political, economic and cultural weapons to dominate the developing ones.

Climate Change Adaptation

Adaptation to climate change – defined as ‘adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, that moderates harm or ex-

exploits beneficial opportunities' (IPCC 2007) – represents an unprecedented challenge for the international system. Adaptation to climate change is given increasing international attention as confidence in climate change projections is getting higher. Developing countries such as Bangladesh have their own unique needs for adaptation due to high vulnerabilities. We can define adaptation to climate change as a set of organization, localization and technical changes that societies will have to implement to limit the negative effects of climate change and to maximize the beneficial ones. Possible adaptation actions include, for example, removing populations and assets from areas at risk of flooding as a result of climate change, adopting crop varieties that are more resistant and better adapted to future climates, or adjusting energy networks to expected variations in energy consumption (Hallegatte, Lecocq, and de Perthuis 2011). Adaptation to climate change has the potential to substantially reduce many of the adverse impacts of climate change. Climate change is no longer an external threat to be managed 'out there', but is an intimate element of human history – both an outcome and driver of development decisions for individuals, organizations and governments (Pelling 2011). To what extent planned adaptation measures for climate change are needed at all will depend on a variety of factors. One is an 'exposure' which is the vulnerability of a region towards climate change. Other includes 'impact', that is how much damage will be caused by climate change in a specific region. In order to address these factors there are two most important measures for climate change; 1) proactive and reactive adaptation measures and 2) adaptation and adaptive capacity.

Reactive adaptation consists in reacting *ex post* to adverse impacts of climate change when they occur. Whereas proactive adaptation consists of taking action before impacts occur to reduce vulnerability to these impacts and to limit adverse consequences or to take advantage of them. A distinction between the two measures is typically made between adaptation measures taken long before the occurrence of climate change and its impact and measures that are taken as a reaction to ongoing climate change (Konrad and Thum 2013). For example, evacuating people from a flooded zone and relocating them in a safe zone is considered to be reactive adaptation, whereas changing the land-use plan in anticipation of future flooding is considered to be proactive adaptation.

The adaptive capacity of communities is determined by their socio-economic characteristics. Enhancements of adaptive capacity represent a practical means of coping with change and uncertainties in climate, including viability and extremes. For example, air conditioning is an adaptive measure to cope with heat, providing suitable conditions for work or life and reducing medical risks. In contrast, measures that improve the general health condition of the population are a means of making the population less vulnerable to extreme temperature events. Such measures increase the adaptive capacity of the society. Enhancement of adaptive capacity is a necessary condition for reducing vulnerability, particularly for the most vulnerable regions, nations and socioeconomic groups.

Relation between Globalization and Climate Change Adaptation: Developing Countries' Perspective

Many developing countries have already experienced weather events in terms of floods, droughts, heat waves, and tropical cyclones that are more frequent or intense than previous experiences (Dai, Trenberth, and Qian 2004), and the resulting impact point to the consequences on the environment, production systems, and livelihoods from future climate

variability and change. Given the potential risks associated with climate change, a serious effort on characterizing and understanding adaptation is now underway. Analogues of adaptation in the past are complemented with policy and social science research on the present adaptive capacity of governments, civil society and markets to deal with climate perturbations. The economic costs of future adaptations are being derived by examining the differences between the economic losses associated with scenarios of technology uptake and diffusion. Among these approaches, a key issue is the identification of successful adaptations in the developing world where the greatest risk and vulnerability persists (Adger *et al.* 2003).

For successful adaptation, developing countries must consider globalization as one of the main actors which often shapes a country's social, political, economic and administrative contexts. Globalization has been the proponent of international cooperation through a wide range of bilateral and multilateral development convergences. Thus, there is a relation between globalization and climate change adaptation in developing countries. For instance, United Nations Development Program (UNDP) focuses to Community Based Adaptation (CBA) strategies in developing countries so that these countries can design the strategies of adaptation based on their needs. UNDP is advocating such approach in Bolivia, Niger, Samoa, and Kazakhstan. All these countries have been collaborating with UNDP to work on different themes. Bolivia works on climate-resilient watershed management. On the other hand, Niger and Samoa work on optimizing resource cooperation in response to climate change and addressing climate-driven coastal hazards respectively. Meanwhile, Kazakhstan's CBA approach attempts at dealing with winter irrigation to replace the declining snowfall. All these efforts may be questioned because initiatives and strategies developed by foreign donors quite infrequently bring success in developing countries. Spires, Shackletona, and Cundill (2014) point out that CBA approach has three barriers, namely, social, resource, and physical and can obstruct the way of achieving successful adaptation through community participation. On two Eastern Caribbean islands, the implementation of reforestation to combat coastal erosion was met with opposition as community members placed high value on having a sea-view and access to the beach. Implementation of sea-level rise set-back lines was found to be exceptionally slow, with a lack of direct hurricane impact being hypothesized as one of the contributing factors (Cambers 2009). This corroborates the experiences from South Africa, where community apathy in relation to climate change education was apparent (Roberts 2010). These community members had no first-hand experience of major climate change impact. Similarly lack of information about resources has not allowed the farmers of Uganda to adopt alternative strategies (Roncoli *et al.* 2011). Similarly, Bangladesh, Bhutan, Maldives, and Cambodia have been experiencing a series of climate change adaptation projects in which communities need to play a greater role. Such projects have brought little success as communities lack knowledge and skill to implement the suggestions provided by the project teams (Sovacool *et al.* 2012). Guyana has faced problems in successful adaptation of climate change due to the absence of skilled manpower (Hickey and Weis 2012). This corroborates the notion of knowledge divide created by the practice of globalization. Not surprisingly due to globalization the developing countries are suffering from knowledge divide and lack of access to similar technologies that are regularly found in the developed ones (Quigley 2009; Griffin 2003). The cases mentioned here imply that globalization provide the opportunity to international agencies to intervene in developing countries' climate change adaptation. But this has not

brought success in all instances. Rather, there are few unsuccessful ones. That means the role of globalization in building solid convergence in climate change adaptation is in doubt. Due to such questionable role of globalization discourse one can argue that globalization is not a facilitator to climate change adaptation in developing countries.

However, literature that chronicles barriers and opportunities also explores the reasons for the limited conversion of assessments and plans into action. These include behavioral and cognitive aspects (O'Brien and Wolf 2010; Nelson 2011), uncooperative governance arrangements (Amundsen *et al.* 2010; Storbjörk 2010), lack of or self-interested leadership (Anguelovski and Carmin 2011; Moser *et al.* 2012), competing planning agendas and lack of institutional coordination (Moser and Ekstrom 2010) insufficient financial and human capital and mechanisms for enabling these (Bryan *et al.* 2009; Kabubo-Mariara 2009), lack of information and data (Deressa *et al.* 2009; Hammill and Tanner 2011), historical determinacy and path-dependency (Chhetri *et al.* 2010; Abel *et al.* 2011), incorrect or incomplete diagnosis of problems (Gorddard *et al.* 2012), the widening science-policy gap associated with wicked problems and uncertainty and ambiguity (Sarewitz 2004; Dessai *et al.* 2007). All these barriers are often found in the process of climate change adaptation process in developing countries. One can note that globalization is a system in which developed countries tend to maintain the dominance over the developing ones. That is why developing countries find it difficult to globally promote their culture, trade, technologies, and political ideas. It has created a wide gap between North and South. It can be pointed out that all of those barriers to climate change adaptation are profound in developing countries only because of increasing gap between developed and developing nations.

Globalization has been the proponent of international cooperation and collaboration. Presumably globalization tends to shape the adaptation strategies in many ways as we have already discussed about the advocacy of CBA by different international donor agencies. But Laukkonen *et al.* (2009) present that successful climate change adaptation depends on the involvement of local people and their inherent ideas of dealing with potential changes. On the other hand, Smith *et al.* (2011) points to the coordination of international efforts of climate change adaptation in developing countries. Funds for climate change adaptation are coming from various sources. But lack of coordination and integration in utilization of those funds in developing countries hamper the adaptation strategies. It implies that globalization recognizes fund for adaptation in an asymmetric way. Globalization is often viewed as modernization of society, economy, politics, administration, infrastructure, and technology. Chittagong city, one of the largest cities of Bangladesh, can be mentioned as an example. Ahammad (2011) describes that Chittagong city's adaptation to climate change is often deterred by the lack of national level commitment and rapid modernization. Here rapid modernization is accompanied by rigorous misuse of land in this hilly region. People are prone to disaster like landslide. It shows that modernization through the channels of globalization neither helps to adapt necessary strategies nor presents stable natural condition. Globalization does not always provide the necessary tools to design a successful adaptation strategy. It is the social and cultural dimensions of a locality which actually determines the degree of success of each and every adaptation measures. The case of western Nepal encourages the removal of social barriers to adaptation rather than installing western ideas in a setting which may not accept it (Jones and Boyd 2011). Local knowledge is crucial in removing the social barriers. Anik and Khan (2012) point

out to the case of climate change adaptation in the north eastern region of Bangladesh. They describe the level of knowledge of the local people and initiatives they have taken to adapt climate changes. Significantly this part of Bangladesh has devised some effective adaption plans and strategies (Anik and Khan 2012). It implies that it is not always necessary to incorporate global practices in each locally devised strategy of adaptation. An inward looking strategy of adaptation can be enough to extract best out of each plan. Global convergence often confuses developing countries' governments in mapping the climate change adaptation strategy. Globalization has boosted the free market system. Due to the increase in cross-border trade and economic activities private organizations from developed countries are frequently setting up their business in developing countries. Unfortunately, institutions playing leading role in global governance have not been the strong proponents of private business organizations' involvement in climate change adaptation in developing countries. Multinational Corporations (MNC) are not frequently seen in the process of climate change adaptation (Pauw and Pegels 2013). Globalization has facilitated the growth of cross-border business through many MNCs but at the same time has neglected the role of those MNCs in managing adaptation process. They have the responsibility to the society and the environment in which they operate. Thus, they need to be incorporated in the framework of implementing adaptation plans (Biagini and Miller 2013). According to Biagini and Miller (2013) most businesses perceive consideration of climate risk in their investments and business plans to be unnecessary, technically difficult, and perhaps premature; acknowledging empirical evidence of climate effects and economic losses can be seen as politically sensitive.

Although there are a number of research suggesting localization of climate change adaptations one must recognize the fund and technical expertise, as help, from the international donor agencies. But Vidal (2012) thinks otherwise and asserts that wealthy countries have not only failed to provide cash to help poor people adapt to climate change, but much of what they have agreed to give so far has come out of existing aid budgets or in the form of loans that will need to be repaid. However, it is often observed that developing countries possesses a notable degree of distrust on the suggestions of western countries and international organizations led by western countries. It implies that globalization entails a significant level of injustice in global climate governance (Parks and Roberts 2006). Due to such kind of distrust in the actions of developed nations many developing countries have failed to capitalize the assistance from the former. For example, murderous flooding from Hurricane Mitch in Honduras, rising sea levels swamping the entire Pacific Island atoll nations and devastation from flooding among squatter settlements in Mozambique can be noted (Parks and Roberts 2006).

Discussion and Conclusion

The relationship between globalization and climate change adaptation in developing countries presents a scenario in which developing countries find themselves with a bottomless basket. Globalization typically possesses some features of neo-liberalism. The emergence of neo-liberal ideas has helped those countries which had developed strong market system for more than two centuries. Globalization has produced a world system through which developed countries have been able to enjoy neo-colonial system of trade and business. Globalization has also fostered the urban based colonization in many developing countries

as well (Atkinson and Bridge 2013). Exploitation is not only prevalent in the global governance but also present in developing countries. Emergence of MNC-based trade and business under the umbrella of globalization has been encouraging poor farmers of developing countries to sell their lands to foreign investors (Robertson and Pinstrup-Andersen 2010). It further aggravates the state of exploitation and creates a degree of distrust in international cooperation as well as aid governance.

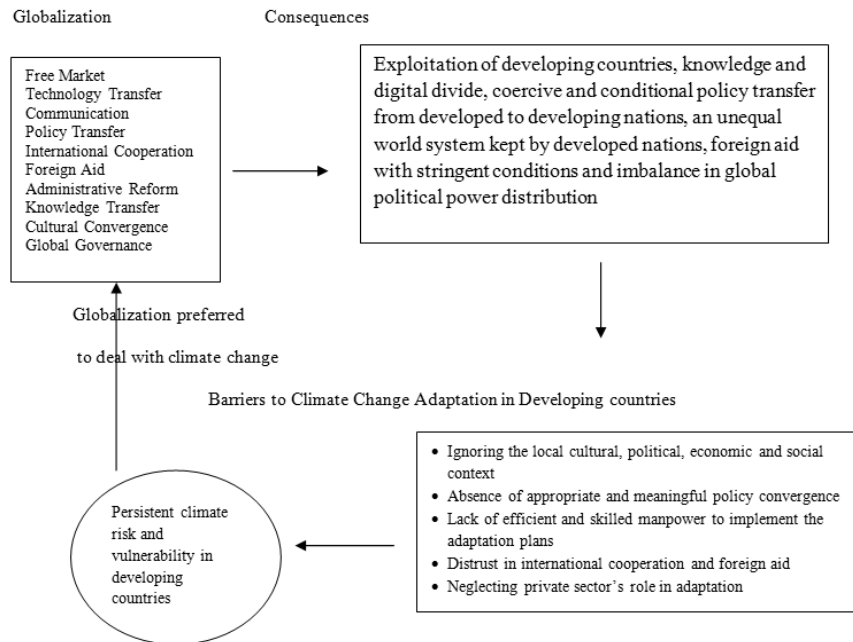


Diagram 1. A cycle showing relationship between globalization and Climate Change Adaptation in Developing countries

Source: Authors.

Diagram 1 shows what threats globalization poses to climate change adaptation in developing countries. Based on the analysis and example of some developing countries from the earlier section, the cycle of events is presented in this diagram. One can note the consequences of globalization in developing countries at the right hand corner of the diagram. The consequences significantly influence the climate change adaptation in developing countries. Diagram 1 depicts that exploitation, unequal world system, distrust in aid governance and international cooperation for adaptation, knowledge and digital divide both among the countries and also within the countries are the major consequences of globalization. Imbalance in global political participation is also needed to be recognized as powerful nations in terms of military strength and wealth often dictate the terms of United Nations (UN) and other international cooperative bodies.

It further exacerbates the condition of distrust in aid governance. Unfortunately, these consequences do not only pose multifarious problems for the poorer nations but also create some tough barriers to climate change adaptation in those nations. Governments in developing nations, burdened with political and administrative problems, tend to collaborate with international agencies' suggestions while framing climate change adaptation plans.

It means the local priorities have been overlooked in many occasions. Such plans, bypassing the local architecture of culture, politics and economy, have rarely brought success. As there is a certain degree of distrust in international donations and aid, developing countries fail to materialize meaningful policy convergence. It does not facilitate in building appropriate technology and skill at local level. Developing countries need essential manpower with such skills and knowledge. But due to persistent worldwide inequality in research and education the developing countries lack such skilled manpower. Globalization produces good results only for the developed nations in many ways. Strict barriers to trade and research have not made the developing countries' product and knowledge easily accessible to all people, countries, and cultures. That is why meaningful policy convergence is absent in terms of climate change adaptation in developing countries. Globalization has fostered the growth of MNC based trade and business all over the world. But it has failed to create a system of global governance in which those MNCs are held accountable for the absence of climate change adaptation in developing countries where most of their production facilities are located. Such failure further impedes a successful adaptation as MNC are one of the largest agricultural land acquirers in developing countries (Robertson and Pinstrup-Andersen 2010). Diagram 1 further shows that failed instances of climate change adaptation in developing countries encourage the proponents of globalization discourse. Such cycle of events impedes the 'demise' of globalization. Mostly the developed countries, who are highly concerned with the future effects of climate change, want to maintain a homogenous culture, politics and economy so that they can continuously exploit the developing countries. They would also advocate globalization as it allows the developing countries to receive funds for development and climate change adaptation. But such propaganda cannot hide the contradictory role of globalization in climate change adaptation in developing countries.

Globalization has huge implications for nation-states and governance systems, in their diversity of forms and structures. The integration of markets, the extension and complexity of climate change, and the increasing homogenization of culture and the lifestyle expectations accompanying these changes have expanded the scope of what used to be considered as primarily domestic problems while creating new challenges to governance that are only now being recognized. Nation-state and governance systems have increasingly come under scrutiny while deliberately discussing the role of globalization in shaping climate change adaptation in developing countries because the state has a greater role to play in mapping out the necessary adaptation plan in this era of globalization (Eakin and Lemos 2006).

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Shale Gas: An Energy Miracle or a Climate Disaster?

Vladimir Klimenko and Alexey Tereshin

In recent years one has witnessed an increasing interest in the shale gas issue with the greatest level of concern at different levels of society, up to the political ones. The present article analyzes data on the shale gas resources, both worldwide and in certain regions. The authors assess the possibilities of shale gas production and prospects of its use to substitute other types of energy. They also present the model of atmosphere and climate change due to emissions from additional unconventional gas production and combustion. It is shown, that to maintain stable climatic system, the production of abundant unconventional gas resources should be accompanied by the equivalent reduction of coal use.

Keywords: *unconventional gas resources, world production, atmospheric emissions, climate change.*

Introduction

The first decades of the twenty-first century were marked by several striking events in mass and energy interactions within the ‘man – environment’ system:

1) for the first time after the oil shock of the 1970s the world energy consumption increased with a rather high annual mean rate of 2.6 per cent (in previous decades it was 1.9 and 1.3 per cent respectively) (BP 2014);

2) for the first time since 1965, coal has regained the leading position in the global fuel mix (5.33 billion tons of coal equivalent (btce) in 2011), terminating a fifty-year era of oil (oil consumption in 2011 was at 5.25 btce) (*Ibid.*);

3) for the first time in the two-centuries industrial history, the energy consumption in developing countries surpassed the level of developed economies starting from 2008 (*Ibid.*);

4) for the first time the annual anthropogenic carbon dioxide emission is close to the critical value of 10 Gt (Giga=billion tons) of carbon (*Ibid.*);

5) the annual average CO₂ concentration has reached the level of 400 ppm (parts per million), which is an unprecedented amount in the last three million years (Tans and Keeling 2014; Pagani *et al.* 2010; Fedorov *et al.* 2013);

6) the global average surface air temperature increase starting from the pre-industrial period has come close to one degree Celsius (Jones *et al.* 2014), that is unprecedented through the late Holocene (last 6,000 years).

These facts remind that modern society faces the following new great challenges:

1) Are there enough natural resources on the Earth for the rapidly developing world economy?

2) Will the uncontrolled increase of anthropogenic burden on the climate system lead to fatal consequences for civilization?

Globalistics and Globalization Studies 2016 321–336

However, to conduct an adequate analysis of the present global trends one cannot ignore some positive signs of the last decade:

1) the renewable energy sources with virtually zero CO₂ emissions demonstrate the maximum growth rate among all available types of fuel (in 2000–2009 by 12 per cent per year, and the last three years by 18 per cent annually) (BP 2014);

2) for the first time in the past three decades a slightly negative trend of global air temperature is recorded (Jones *et al.* 2014).

In the early twenty-first century, probably the most significant event in the world energy industry was the wide use of a new fuel type (shale gas) in the United States (EIA 2013a). In just a few years (2007–2012), the production of this unconventional gas reached 270 billion m³ there, which allowed the country to reduce its huge gas imports, which has quite recently been the largest in the world. Despite the fact that today the extensive recovery of shale gas takes place only in the United States and Canada, many other countries have shown interest in use of this new unconventional fuel type. The peculiarity of shale gas consists in its quite a uniform distribution over the world; thus, many countries currently importing energy resources (*e.g.*, China, Poland, Ukraine, and Turkey) can hope to attain higher energy and in some cases even political independence. A notable feature of recent years is the so-called ‘shale gas euphoria’ which is typical, however, mostly of the governmental authorities, political, and business circles. Unfortunately, the discussions concerning the environmental problems related to shale gas production practically always imply only such regional aspects as allocation of large territories and soil and water pollution. However, shale gas, as well as other unconventional gas sources (first of all, coal-bed methane and tight gas), represents a huge reservoir of carbon which, if released into the atmosphere, can produce significant changes in the global carbon balance and lead to large transformations of the climate system. According to recent estimates (Mohr and Evans 2011), these processes may substantially affect global primary energy mix. In its turn, the changes in the amount and structure of the world energy consumption will have a profound influence on atmosphere and climate on a global scale. In this study we analyze global resource and environmental problems connected with increasing production of unconventional gas.

Unconventional Gas Resources

Shale gas falls under the category of so-called unconventional gas sources (Perlova 2010). According to geological indications, this category encompasses gas deposits which are held by absorption, or dissolved in water, or contained in low-permeable and deep-seated collectors. If the technology for commercial production of gas is not developed, such gas relates to unconventional gases according to technological or otherwise economic criteria if the production cost exceeds the market price. The worldwide resources of gas from unconventional sources are huge and amount to more than 4000 trillion m³, which is at least by an order of magnitude larger than the resources of natural gas. Table 1 shows the distribution of these resources according to the type of gas. One should emphasize that the data presented in Table 1 refer rather to *geological* resources, while *technically recoverable* resources may be considerably smaller and will probably change over time as additional information becomes available.

Table 1. World unconventional gas resources estimates

<i>Sources</i>	<i>Resources, trillion m³</i>
Gas hydrates	2500–21000
Coal-bed methane	200–250
Gas in deep occurrences	200–350
Tight gas	180–220
Shale gas	380–420

Source: Perlova 2010.

Gas hydrates, that is gas in frozen state in ice, account for the major part of unconventional gas sources. As we see in Table 1, the worldwide resources of methane hydrates are very large although they have been estimated rather approximately and thus may vary within an order of magnitude.

Russia, a country with a considerable part of its territory located in the permafrost zone, has favorable conditions for the availability of essential resources of gas hydrates, which was pointed out by the Soviet specialists already in the 1940s (Solovjev 2003). In the 1960s, the first deposits of gas hydrates were discovered in the northern part of the Soviet Union. The development of the Messoyakh deposit in Siberia, which started in 1969, and where attempts to extract natural gas directly from hydrates were, from the experts' view, a success for the first time (*Ibid.*), can serve as an example of gas production from hydrates.

According to recent assessments of Gazprom VNIIGAZ experts (Perlova 2010), the hydrate gas reserves available in Russia amount to around 400 trillion m³ and are located in the north of the European part and Siberia. Huge gas hydrate deposits are also available in the continental shelf of the Arctic Ocean seas.

Coal-bed methane comprises an essential part of unconventional sources of gas and predominantly refers to methane adsorbed into the solid matrix of coal.

The distribution of coal methane deposits around the world is presented in Table 2. The previously existed technology for extracting gas from coal beds did not allow gas to be produced in a purposeful manner and to be used for supplying gas for households and industry due to a low yield of gas from these beds. In recent years, the situation has somewhat changed due to the development (and some decrease in the cost) of techniques for horizontal drilling and multistage hydraulic bed fracturing (HBF).

Different kinds of coal contain different amounts of methane. Brown coals have low methane content, whereas anthracites have a large content of methane; the latter have essentially lower permeability. In Russia, coals from the Vorkuta and Kuznetsk coal basins are the most promising ones for producing gas. The main reserves of coal methane in Russia are concentrated in Siberia, where experimental commercial production of coal-bed gas has recently been organized in the Taldom area of the Kuznetsk coal field.

Table 2. Top ten countries with shale gas and coal-bed methane technically recoverable resources (trillion m³)

Rank	Shale gas		Coal-bed methane	
	Country	Resources estimate*	Country	Resources estimate**
1	China	31.6	Russia	12.6
2	Argentina	22.7	China	10.9
3	Algeria	20.0	Australia	6.7
4	United States	18.8	United States	4.5
5	Canada	16.2	Canada	3.7
6	Mexico	15.4	Indonesia	3.2
7	Australia	12.4	Ukraine	1.7
8	South Africa	11.0	Kazakhstan	1.7
9	Russia	8.1	India	1.2
10	Brazil	6.9	Poland	1.0
	WORLD	207	WORLD	49.6

* Source: EIA 2013b.

** Source: OECD/IEA 2012.

We will not dwell on the gases in low permeable collectors and deep beds, but will consider the shale gas in more detail, a fuel that has recently attracted especially keen attention not only in the economic, but also in the wide political circles of different countries.

Shale Gas Resources

Shale gas is a kind of natural gas distributed in collectors located in the shale bed layers. Individual gas reservoirs contain not large amounts of resource, but they are huge in totality, due to which special production technologies emerge.

The estimates of shale gas reserves available in different regions and countries around the world that are given in various information sources may differ considerably, which to a significant extent can be attributed to short-term and political considerations.

The most recent report prepared by the US Energy Information Administration (EIA 2013b) excluded from consideration some Middle East countries, particularly rich in traditional hydrocarbon resources. The reserves of coal methane were also not considered. According to these EIA assessments, the worldwide recoverable resources of gas (both conventional and unconventional) totaled 648 trillion m³ with shale gas accounting for 32 per cent (207 trillion m³) of them (EIA 2013b). Only high-quality formations the most promising in terms of shale gas production were taken into account in assessing the resources. The EIA experts indicate that exploratory drilling will make it possible to obtain more accurate estimates of the reserves taking into account such parameters as yield of gas from the wells and the area where production can be organized.

Thus, shale gas resources suitable for commercial production are estimated around the world (except for some Asian countries) at 207 trillion m³ (or 271 btce, which is twice as low as the conventional gas resources). However, unlike conventional natural gas, shale gas is distributed over the globe more or less uniformly, a circumstance that, of course, makes it quite attractive as a local energy resource. Its resources (in trillion m³) are estimated at 47.7 in North America, 40.5 in South America, 38.5 in Africa, and 39.8 in Asia

(mainly in China). The reserves of shale gas in Europe are estimated at 17 trillion m³ (22 btce).

According to assessments of the Russian Ministry for Economic Development, the production of unconventional gas in Europe may amount to 15 billion m³/year (around 20 million tce), a figure that in itself cannot have even the smallest effect on either the gas or the more so total energy balance of the region. In this connection it is appropriate to remind that the annual gas consumption in Europe (excluding Russia) exceeds 540 billion m³, including 180 billion m³ supplied from Russia.

The EIA report (EIA 2013b) indicates that the majority of shale deposits are located in the regions that suffer from shortage of conventional sources, in particular, in China, South America, and Europe. Therefore, shale gas could comprise a considerable share in the national energy balance of only certain countries, for example, in France (the estimated reserves amount to 3.9 trillion m³), Poland (4.2 trillion m³), Ukraine (3.6 trillion m³), and South Africa (11.0 trillion m³). It is emphasized that shale gas in South Africa which is totally deprived of traditional gas resources can be used as raw material for producing liquefied gas.

The amount of gas exported from Russia might be substituted by the shale gas produced in the nearest European neighboring states, for example, in Poland and Ukraine. But to what extent is such a prospect real?

Recently, Polish specialists have essentially lowered the data on estimated recoverable resources of shale gas in the country's interior, according to the information contained in the report of the Polish Institute of Geology published in March 2012. The recoverable resources of shale gas in Poland are now estimated at 365–768 billion m³, which is significantly smaller than the EIA assessments. In view of the fact that the consumption of gas in Poland amounts to 16.6 billion m³/year and import – 11 billion m³/year (EIA 2013a), the country can (theoretically) substitute the whole amount of imported gas by domestic production for decades. At the same time, coal accounts for a considerable share of fuel used in the energy industry of Poland, which in the future should be replaced, at least partially, by more environmentally friendly natural gas. Therefore, even with an expected growth of domestic production of shale gas, Poland will probably continue to import natural gas. Thus, the production of own shale gas will hardly give more than a somewhat diversified range of sources for importing natural gas and probably decreased import from Russia.

Nonetheless, the interest in Polish gas is quite significant. By 2012, Poland had granted more than a hundred concessions for carrying out exploration works. However, approximately 60 test wells drilled in Polish shale basins did not bring encouraging results, due to which the inspiration concerning the prospects of Polish shale gas has calmed down to a considerable extent. Moreover, three out of six major US/Canadian companies involved (Exxon Mobil, Talisman and Marathon) have pulled out of Polish gas exploration. The shares of a few independent companies specializing in European shale gas have dropped during the past two years by 70 per cent. On the other hand, sixty wells is a negligibly small number for drawing up important conclusions, while at least one hundred is needed to accurately assess the potential of the country's reserves. For comparison, 13,700 boreholes have been drilled in the single largest American shale basin of Barnett. Nevertheless, in 2014 Poland plans to become the first country in Europe to start commercial, although very limited shale gas production in the western Baltic basin.

The Ukrainian State Geological Service has recently increased its assessment of shale gas resources to 12.5 trillion m³, whereas the U.S. Geological Service has reported about

only 3.6 trillion m³. At present, Ukraine imports from Russia around 25 billion m³ of natural gas a year (BP 2014), which is nearly three times larger than the amount of import in Poland, but puts forward the objective to increase the shale gas production up to 13 billion m³ within the next decade. But we will see if Ukraine has enough courage to produce such amount of this commodity, which is still very expensive, technologically and environmentally unfriendly, to be able to completely get rid of the Russian gas import. Nonetheless, one should clearly understand that for Ukraine, as well as for Poland, production of own shale gas is one of the most important components in their struggle for national sovereignty, and there is no doubt that both countries will take every effort to fully implement their ambitious targets in this field.

In Russia, the Baltic, Baikal, Volga and Pechora, Transbaikal, and Olenek platforms are the main shale gas formations, and according to assessments carried out by Gazprom VNIIGAZ (Perlova 2010), the total geological resources of shale gas may amount to 6–8 trillion m³, which is fully consistent with the EIA recent estimate equal to 8.1 trillion m³ (EIA 2013b). Some authors give even more optimistic assessments (up to 20 trillion m³), which is only slightly smaller than the estimates made by the same authors for Europe and China (*Ibid.*). However, one should bear in mind that at present, the environmental safety and production costs rather than the resource availability are the key aspects determining possible development of this new natural resource. In this connection one should have a closer attention to the experience of the United States, who is an acknowledged pioneer in the field of shale technologies.

At present, the United States occupies the leading position not only in proven recoverable reserves but also in production of shale gas. In 2012, the production of gas in the United States totaled 681 billion m³ (Mohr and Evans 2011) with unconventional sources (coal-bed methane and shale gas) share of more than 45 per cent. The shale gas share is constantly growing which has already resulted in a significant redistribution of the world gas market between the players and a formation of surplus supply by early 2010. As a result of growing production of shale gas, the previously constructed terminals for importing liquefied gas, which remained out of service, are being refurbished for export. In our opinion, this export may soon become quite large, up to 40–50 billion m³ already before 2020, and over 160 billion m³ by 2040. No doubt, in the nearest three or four years, the United States will become a *net exporter of natural gas* and the world runner-up to Qatar in the liquefied natural gas export.

The current situation with production of shale gas is entirely different on the other side of the Atlantic. Although some EU countries announced their intent to produce gas from shale, the environment specialists shortly thereafter subjected these intentions to serious criticism. These specialists are of strong belief that HBF operations, which are an integral part of shale gas production technology, inflict irreparable damage to the environment. As a result, France has already rejected plans of shale gas production and placed focus on its nuclear power industry; exploration works have been suspended in Germany, Hungary, Romania, and the Czech Republic, and eventually in Bulgaria and Lithuania the HBF operations have been recently prohibited by law. Currently Poland, where it is predominantly politicians who make statements about such method of production, Ukraine, where this matter also has a serious political context, and the United Kingdom with a strong support from its government still remain among a few states in Europe intending to continue attempts to produce gas from shale.

Outside Europe and North America it is China, Argentina, Australia, and India who have the best perspectives to develop commercial unconventional gas production. China has the largest in the world shale gas resources (31 trillion m³ or over 15 per cent of the world total) and has already become the third, after the USA and Canada, country to commence its commercial production. China is planning to produce over 60 m³ of shale gas by 2020 and 90 billion m³ by 2030. The total unconventional gas production in China will reach 230 billion m³ by 2030 divided between coal-bed (115 billion m³), shale (85 billion m³), and tight gas (30 billion m³) (EIA 2013b).

In Russia even experimental production of shale gas is not carried out, which is by no means surprising in view of huge recoverable reserves of conventional natural gas with the cost of production currently 5–6 times lower than for shale gas. However, Russia is planning to produce some 50 billion m³ of unconventional gas by 2030 from coal-bed and tight formations deposits.

The Environmental Aspects of Shale Gas Development

For the further analysis, it is worthwhile to point out the specific features relating to the shale gas production technology. Already in the early nineteenth century it was known that shale rock did contain gas. However, this rock features high density and low permeability, and gas accumulates in small isolated ‘pockets’. The first commercial gas well in shale rock was drilled in the United States as far back as 1821 near Fredonia town in the New York State by William Hart, who is regarded in the United States as the ‘father of natural gas’. George P. Mitchell and Tom L. Word are the initiators of large-scale production of shale gas in the United States.

But it is only at the time of energy crisis in the 1970s that the US government assigned financial support for the development of shale deposits in search for new sources of fuel. The exploration works were carried out, during which four giant shale formations were discovered: Barnett, Haynesville, Fayetteville, and Marcellus, stretching for several tens of thousands of square kilometers and, supposedly, containing huge gas deposits. However, at that time these reserves were inaccessible, and the works on developing the relevant production technologies were suspended after petroleum prices had subsequently dropped in the 1980s.

Commercial production of shale gas became possible only after new technologies had emerged. The modern shale gas production technology implies drilling of one vertical well and a few horizontal boreholes with a length of up to two or three kilometers (Dmitrievskiy and Vysotskiy 2010). A mixture of water, sand, and chemical agents is then forced under pressure into the wells. After that, the gas collector walls are destructed under the effect of hydraulic fracturing, and the accessible gas is pumped back up to the surface. Horizontal drilling is carried out by means of innovating seismic modeling techniques 3D GEO, which involves a combined use of geological investigations and mapping with computer-aided data processing, including visualization. As in other gas deposits, gas migrates in natural manner from a high-pressure region to a low-pressure one; therefore, central to the gas production technology is setting up regions with variable pressure (*Ibid.*).

The theoretical background of the bed hydraulic fracturing technology was developed jointly by the members of the Academy of Sciences Sergey A. Khristianovich and Yuri P. Zheltov at the Petroleum Institute of the USSR Academy of Sciences back in 1953.

In the United States the Devon Energy Co. was the first to start a large-scale commercial production of shale gas in the Barnett Shale basin, where a horizontal well was drilled

for the first time in 2002 (Dmitrievskiy and Vysotskiy 2010). The decadal experience gained from operation of wells in the Barnett Shale, Fayetteville Shale, Marcellus Shale, and Haynessville Shale formations quite definitely revealed the following problems (*Ibid.*):

- large bodies of water must be available near the deposits for using the bed hydraulic fracturing technology: a mixture of water (7500 t), sand, and chemicals is used for making one hydraulic fracture. As a result, significant amounts of used contaminated water are accumulated near the deposits, which are not recovered by the producers in compliance with the environmental standards;

- the experience gained from development of the Barnett Shale play shows that the life cycle of shale wells is much shorter than that of the wells of conventional natural gas;

- the formulae of substances used by shale gas producing companies for hydraulic fracturing are confidential. According to the data presented in reports prepared by environmental specialists, production of shale gas entails significant contamination of ground waters by toluene, benzene, dimethylbenzene, ethylbenzene, arsenic, and other substances. It is known that some companies use a polymer-thickened salt-acid solution, and 80–300 t of chemical agents is used for making a single hydraulic fracturing operation;

- considerable losses of methane into the atmosphere occur in shale gas production, which may lead to aggravation of the greenhouse effect;

- the production of shale gas is profitable only under the conditions of stable demand and high gas prices.

The chemical mixture used by the Halliburton Co. comprises around 1.53 per cent of the total volume of solution and includes hydrochloric acid, formaldehyde, acetic anhydride, propargyl and methyl alcohols, and ammonium chloride. The Chesapeake Energy Co. uses its own composition of chemical mixture, but its amount in the hydraulic solution is much smaller and equal to 0.5 per cent. On the whole, gas producing companies use around 85 different toxic substances for producing shale gas.

There are also other environmental problems connected with shale gas production, primarily those concerned with utilizing the spent liquid after HBF. Apart from water and sand, this liquid contains various chemical additives for achieving more efficient HBF, which entails the danger of groundwater contamination. An increased probability of micro earthquakes in the places where HBF was carried out, as well as in places where the used liquid is pumped into underground cavities, for example, for utilizing it, has been confirmed scientifically. The possibility of gas leakage into the atmosphere during the well construction and operation stages relates to more long-term and least studied problems. According to the assessments presented in Howarth *et al.* 2011, the leaks into the atmosphere expected during shale gas production may comprise 4–8 per cent of the total gas yield, which is about twice as much as by production of conventional gas.

The use of shale gas instead of coal makes it possible to achieve significantly smaller amount of hazardous emissions from thermal power stations into the atmosphere. Thus, it can be assumed that the use of shale gas may entail reduction of NO_x emissions by a factor of two and complete elimination of SO₂ emissions. However, in calculating the environmental gains it is important to take into account the amount of emissions over the entire chain of production process, and the environmental gain estimated with such an approach turns to be significantly smaller, because the leaks of methane, a gas producing an extremely strong greenhouse effect, which occur during its production and transportation,

significantly amplify the total greenhouse effect. With the percentage of leaks corresponding to the upper range of existing estimates (around eight per cent of the gas yield), a power station burning shale gas becomes similar in total emissions to conventional pulverized coal-fired power stations.

Economic Aspects of Shale Gas Development

There are extremely contradictory assessments for economic indicators of the shale gas production. The Chesapeake Energy Co. is the forerunner in shale gas production in the United States, which regularly presents the main indicators of its financial activities in free access. According to the analysis of Chesapeake Energy performance indicators, the actual net cost of shale gas production in 2008 was equal to \$192.6 per 1000 m³. However, some experts argue that the real costs for producing shale gas are even higher and amount to \$212–283 per 1000 m³. Some specialists believe that the companies producing shale gas artificially report lower costs, than real net cost of shale gas.

But now we can state that as of early August 2012, the cost of shale gas production in the US deposits ranged between \$130 and 260 per 1000 m³ and that in Canada, \$140–230/1000 m³. At the same time, the consumer prices for gas in that region are at a level of around \$100/1000 m³ (EIA 2013a), which nonetheless is a factor of 2.5 lower than it was before the beginning of the ‘shale revolution’ in 2008.

But there is also another point of view. The point is that shale gas may be ‘dry’ (without admixtures) and ‘wet’ (with gas condensate containing ethane or butane). This condensate is widely used in the production of plastics, and the prices for it are higher than for gas itself, and it is exactly due to gas condensate that the producing companies get additional gain in the price. Thus, selling byproduct components makes the shale gas production profitable even with low domestic prices. As regards dry gas, its production under the currently existing conditions is still unprofitable.

Nonetheless, the US Government is quite satisfied with the currently existing gas prices, because it is exactly what is badly needed for the US economy for stimulating its growth. This is why the Government actively supports the shale projects. The low interest rate for loans is a factor stimulating investments in gas wells, despite low prices for consumers. In addition, the US power companies stake serious hopes on export of gas products and production technologies as a means for achieving better profitability. In addition, the current unprecedentedly low level of domestic prices will hardly remain and will likely start growing at a stable annual rate of 3.5 per cent already this year (EIA 2013a).

Unconventional Gas and Changes in Atmosphere and Climate

Unfortunately, discussions about the environmental problems related to shale gas production almost always imply only such regional aspects as disruption to rural communities, earthquakes and ground water pollution. However, shale gas, as well as other unconventional gas sources (coal-bed methane and tight gas), contains great amounts of carbon, which can significantly change the global carbon balance and lead to substantial changes in the climate system, if released into the atmosphere. Here we evaluate the greenhouse footprint of unconventional gas production and consumption.

Table 3. Various scenarios of natural gas production

Scenario	Resources, btce			Production peak					
	conventional	unconventional	total	conventional		unconventional		total	
				year	btce / year	year	btce / year	year	btce / year
Klimenko and Tereshin (2010a)	490		490	2045	5.8			2045	5.8
Klimenko and Tereshin (2013)	490	420	910	2045	6	2075	5.5	2065	10.0
Present study	540*	430*	970	2045	5.7	2080	5.9	2065	11.1

* Source: EIA 2013b; OECD/IEA 2012.

The predicted values of unconventional gas production are based on the estimates of unconventional gas resources given in Table 3, where the results of our earlier calculations (Klimenko and Tereshin 2010b) are presented for comparison purposes (note that calculations in Klimenko and Tereshin 2010b take into account only conventional gas resources). It is obvious that an introduction of unconventional gas sources would sharply increase the role played by natural gas in the world economy, and the peak of annual recovery would grow from 6 to roughly 11 billion tce and shift into the second half of the twenty-first century (Fig. 1). Even at the end of the current century, total gas production is expected to exceed contemporary values, while a complete depletion of these resources is expected only at the end of the twenty-second century. Natural gas will likely become the main component of the world energy balance as early as at the beginning of the 2030s. One can assume that by this time a mass production of unconventional gas will be developed in several countries outside North America and first of all in China, India, Australia, and Argentina.

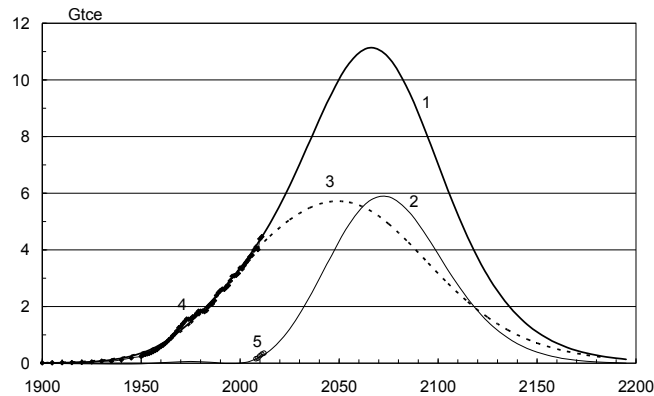


Fig. 1. Natural gas production (tentative forecast of the present study): total (1), including unconventional gas (2), conventional gas based on data from (Klimenko and Tereshin 2010b) (3), and the data of energy statistics (BP 2014; EIA 2013a, 2013b) for the total production (4) and unconventional gas production (5)

Nevertheless, from the viewpoint of possible changes in the atmospheric composition and climate, carbon dioxide emissions from combustion of both natural gas and all other fossil fuels are essential, because they depend on the total energy consumption and the world fuel mix. The results presented here are based on the genetic forecast of energy consumption (see the detailed description of the procedure in Klimenko and Tereshin 2010a, 2010b, 2013), which has proved its reliability in long-term forecasting. This method implies stabilization of the world energy consumption at the level of around 30 billion tce by the end of the current century, with the dominating role played by non-fossil sources (mostly unconventional and renewable sources (URS) – solar, wind, hydro, and bioenergy sources). Experience has shown that the long-term forecast of the energy mix represents a much more complicated problem; therefore, we will further consider two extreme scenarios and an intermediate one, namely: the whole volume of unconventional gas consumption is used to substitute either coal (Scenario 1), or URS (Scenario 2), or coal and URS in equal portions (Scenario 3).

The results of simulations presented in Fig. 2 show that the implementation of Scenario 3 would yield a path of future carbon emissions almost the same as that produced by the so-called ‘historical’ scenario whose consequences have been comprehensively discussed in our recent publications (Klimenko and Tereshin 2010a, 2010b, 2013; Khrustalev *et al.* 2008; Arzhanov *et al.* 2012) and can be characterized as causing a certain concern with the scale of upcoming climate changes. The substitution of coal with unconventional gas would lead to rapidly reaching (already in two decades) the peak of carbon emission at slightly above 9 Gt of carbon per year, while the replacement of URS causes growth of this peak almost to 12 Gt of carbon per year and shifts it to the second half of the present century.

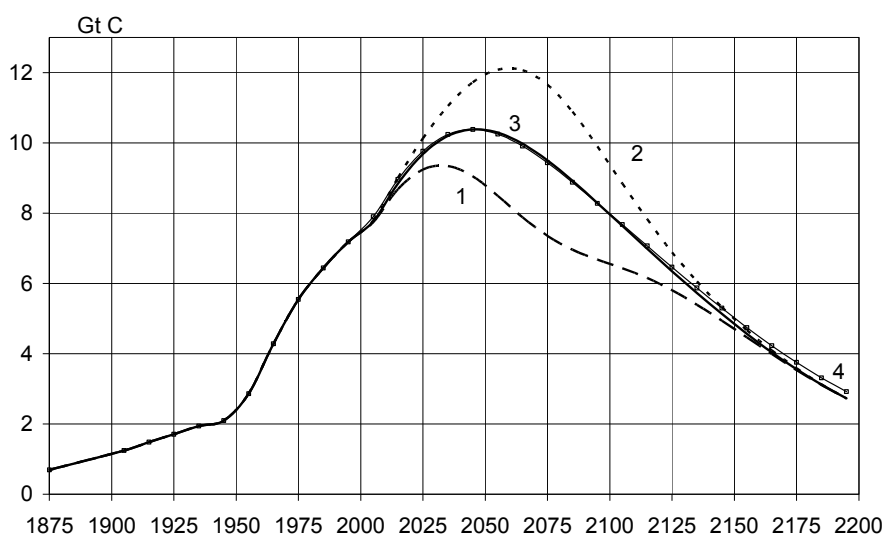


Fig. 2. CO₂ emission (recalculated to pure carbon) from fossil fuels combustion based on Scenarios 1–3 (see text for comments) compared to ‘historical’ Scenario 4 (open squares) (Klimenko and Tereshin 2010a) (4)

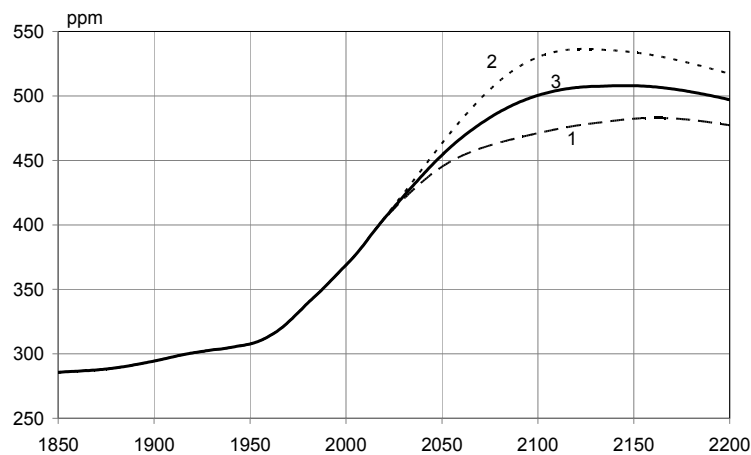


Fig. 3. The model of simulated changes of CO₂ content in the atmosphere based on Scenarios 1–3 (see text for comments)

Under different scenarios of unconventional gas resources development, the changes in the global carbon cycle are significant and they are clearly seen from the variations in carbon dioxide content in the atmosphere (Fig. 3) and the temperature response of the climate system (Fig. 4). Simulation of the global variations in atmospheric CO₂ content have been conducted by Dr. Olga V. Mikushina using the box-diffusion model of the carbon cycle; that of the surface air temperature, using the regression-analytical model of climate developed at the Moscow Power Engineering Institute (Klimenko *et al.* 1997).

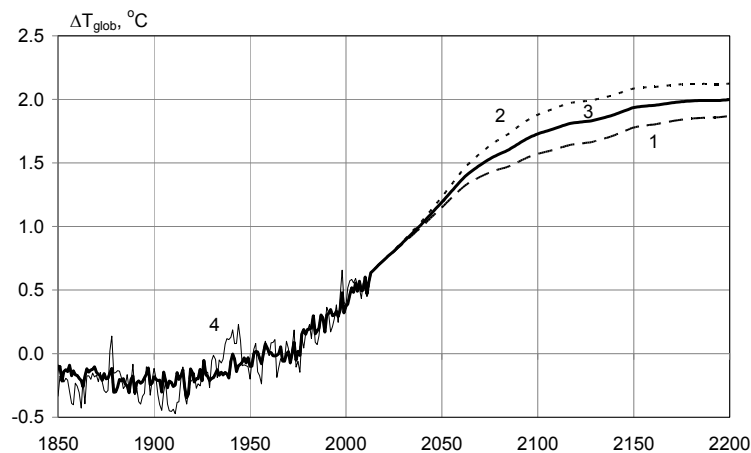


Fig. 4. The simulated mean global air temperature changes (departures from the mean values for the period from 1951 to 1980) based on Scenarios 1–3 (see text for comments) compared to instrumental data (4) (Jones *et al.* 2014)

As was mentioned above, the shale gas production is associated with significant methane leakage rate into the atmosphere, up to 4–8 per cent of total gas production, and this value

is considerably higher than in the case of conventional natural gas production. With respect to this, some researchers claim serious concerns that the release of these amounts of methane, whose greenhouse effect is 25 times stronger than that of carbon dioxide, can intensify global warming. Based on our simulations, under the assumption that technological leakages amount to six per cent of total gas production, we argue that the maximal methane release into the atmosphere from shale gas production will be reached between 2050–2120 and will account for 100–200 million tons per year, or 10–15 per cent of the estimated total emission from all its sources. This will lead to a certain increase in the methane atmospheric content and corresponding higher radiative forcing of this gas during this period by about ten per cent as compared to the basic scenario (Klimenko and Tereshin 2010a).

However, due to the anticipated decline of unconventional gas production with the respective reduction of methane emission and owing to the comparatively short lifetime of this gas in the atmosphere (12 years), the methane concentration will eventually approach the value of the basic scenario during the twenty-second century. Finally, we estimate the contribution of the additional methane due to shale gas production to the anticipated temperature response *a few hundredths of a degree Celsius*. Partial substitution of coal by unconventional gas in the world energy balance will lead to a noticeable decrease in the anthropogenic impact on the climate system, shifting it down from the critical limits of 500 ppm of CO₂ concentration and 2°C of temperature rise as compared to the pre-industrial epoch. However, a slow-down of URS growth rate and preservation of the current orientation to fossil fuels are very dangerous because both the carbon dioxide concentration and then the air temperature will exceed these critical limits well before the end of the current century and remain beyond them for *at least two or three centuries*. Under these conditions, a significant increase in the acidity of the oceanic upper layer is inevitable, and this will cause massive extinction of many marine species, first of all, corals (Knowlton 2001; Hoegh-Guldberg *et al.* 2007). This would mean an economic collapse of many developing countries where tourism and offshore fishery are the basic sources of income. For example, in Asia coral reefs alone provide about one-quarter of the annual total fish catch and food for about a billion people. In the Caribbean basin tourism is a major foreign currency earner and in some countries it accounts for up to a half of the gross domestic product. The long-term temperature departure above 2°C (or just 1.2°C above the current value) would almost inevitably cause a partial melting of the Greenland Ice Sheet and of all non-Antarctic glaciers with the following increase in the global sea level by at least two meters (Oppenheimer and Alley 2005; Jevrejeva *et al.* 2011) and local sea level rise up to three meters (Meysignac and Cazenave 2012) and a significant weakening of the meridional overturning oceanic circulation in the North Atlantic as well. The latter will likely result in significant changes in the global distribution of surface winds, rainfall and soil moisture and could lead to a global reduction of the terrestrial vegetation net primary production by several per cent (Vellinga and Wood 2002).

Conclusions

1. There is still a substantial uncertainty concerning economic and environmental aspects of mass shale gas production which leaves room for doubts and hampers its further development. Provided present resources assessments are correct, unconventional gas and, first of all, shale gas may solve some regional energy (import substitution) and environ-

mental (coal substitution) problems. However, unconventional gas cannot be regarded as an 'additional' energy source, capable to meet the growing energy demand.

2. The large-scale production of shale gas outside North America will hardly be possible in the nearest future. The pattern in which the shale gas reserves are distributed over the globe allows us to assume that it can replace to a significant extent the natural gas supplied from Russia in some European countries (Poland and Ukraine), but this is unlikely to take place until the end of the current decade. However, unconventional gas becomes increasingly important and will make up more than 50 per cent of global gas production in the second half of the current century.

3. The net cost of shale gas production is currently several times higher than that of conventional natural gas in major gas producing countries. To develop a shale gas deposit one should spend from \$3 to \$4 million per each well. Due to the specific features of shale gas production technology, the costs for maintaining shale gas wells in serviceable state are significantly higher than in traditional deposits.

4. The production of shale gas entails considerable emissions of methane into the atmosphere. Fortunately, this is not a dangerous factor aggravating the greenhouse effect even if the amount of leaks is close to their upper limit estimated at eight per cent of the yield. The expansion of shale gas production does not come in serious contradiction with the growing climate protection requirements. In addition, a substitution of coal by shale gas will result in twofold reduction of NO_x emissions and complete elimination of SO₂ emissions.

5. The shale gas problem has many aspects, of which the political aspect is undoubtedly the dominating one. As a new source of energy, shale gas is noticeably inferior to traditional natural gas not only in its consumer properties (price, environmental, and technological attractiveness), but also in the availability of resources and will not be able to seriously compete with natural gas at the global level in the nearest two to three decades. In the short term, the shale gas can become an attractive resource only at regional and local levels and only under the conditions of strong protective measures.

6. To maintain stability of the climate system, the production of abundant unconventional gas resources should be accompanied by the equivalent reduction of coal use. In this case one can view shale and other unconventional gas sources as an energy bridge over the current century yet reducing greenhouse gases emissions compared to oil and coal.

Acknowledgments

The study was supported by Ministry of Science and Education of Russia (basic and project parts), Russian National Foundation (grant No. 14-19-00765) and Russian Foundation for Basic Research (grants No. 12-08-00367, and 13-08-00872).

The authors are thankful to Dr. O. V. Mikushina for model simulations and A. O. Morozova for collecting data.

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Part V. FUTURE AND FORECASTS

The Sixth Kondratieff Wave and the Cybernetic Revolution

Leonid Grinin and Anton Grinin

In the present paper, on the basis of the theory of production principles and production revolutions, we reveal the interrelation between K-waves and major technological breakthroughs in history and make forecasts about features of the sixth Kondratieff wave in the light of the Cybernetic Revolution that, from our point of view, started in the 1950s. We assume that the sixth K-wave in the 2030s and 2040s will merge with the final phase of the Cybernetic Revolution (which we call a phase of self-regulating systems). This period will be characterized by the breakthrough in medical technologies which will be capable to combine many other technologies into a single complex of MANBRIC-technologies (med-bio-nano-robo-info-cognitive technologies). The article offers some forecasts concerning the development of these technologies.

Keywords: *production revolutions, production principle, Industrial Revolution, Cybernetic Revolution, self-regulating systems, Kondratieff waves, fourth K-wave, fifth K-wave, sixth K-wave, World System, center, periphery, medicine, biotechnologies, nanotechnologies, robotics, cognitive technologies.*

I. Production Principles, Production Revolutions and K-Waves

According to our theory (Grinin 2007a, 2007b, 2012b, 2013; Grinin and Grinin 2013a, 2013b), the whole historical process can be most adequately divided into four large periods, on the basis of the change of major developmental stages of the world productive forces, which we call production principles. *The production principle is a concept which designates very large qualitative stages of development of the world productive forces in the historical process. It is a system of the unknown before forms of production and technologies surpassing the previous ones fundamentally (in opportunities, scales, productivity, efficiency, product nomenclature, etc.).*

We single out four **production principles**:

- 1. Hunter-Gatherer.**
- 2. Craft-Agrarian.**
- 3. Trade-Industrial.**
- 4. Scientific-Cybernetic.**

Among all various technological and production changes that took place in history the following three production revolutions had the most comprehensive and far-reaching consequences for society:

Globalistics and Globalization Studies 2016 337–355

1. **Agrarian** or Agricultural Revolution. Its result is the transition to systematic production of food and, on this base, to the complex social division of labor. This revolution is also connected with the use of new power sources (animal power) and materials.

2. **Industrial**, or Production Revolution as a result of which the main production concentrated in the industry and began to be carried out by means of machines and mechanisms, and at that not only the replacement of manual labor by machines occurred, but also biological energy was replaced by water and steam energy.

3. **Cybernetic** Revolution which have led to the emergence of powerful information technologies, and in future will stimulate transition to wide use of self-regulating systems.

Structural model of production revolutions. Within the proposed theory we suggest a fundamentally new idea that each production revolution has an internal cycle of the same type and, in our opinion, includes three phases: two *innovative* (initial and final) and one *modernization* phase (Grinin and Grinin 2013a, 2013b; see Fig. 1). At the initial *innovative* phase new advanced technologies emerge which spread in other societies and territories after a while. As a result of the final *innovative* phase of a production revolution the new production principle reaches its peak.

Between these phases there is the *modernization* phase – a long and very important period of distribution, enrichment, diversification of the production principle's new technologies (which appeared in the initial innovative phase) when conditions for a final innovative breakthrough are created.¹

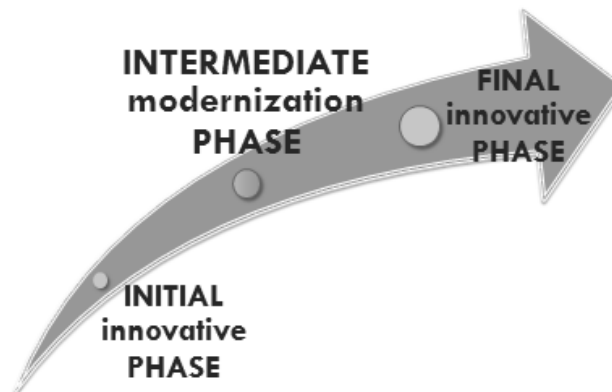


Fig. 1. Phases of production revolutions

Thus, the cycle of each production revolution looks as follows: *the initial innovative phase* (emergence of a new revolutionizing production sector) – *the modernization phase* (diffusion, synthesis and improvement of new technologies) – *the final innovative phase* (when new technologies acquire their mature characteristics).

The scheme of *innovative* phases of production revolutions in our theory looks as follows (modernization phases are omitted).

Agrarian Revolution: **the initial** phase – the transition to primitive manual (hoe) agriculture and animal husbandry (started about 12,000–9,000 BP); **the final** – transition to

¹ For example, in the modernization phase of the Agrarian Revolution local varieties of plants and breeds of animals borrowed from other places were created.

irrigation agriculture (or plow agriculture without irrigation) (this began approximately 5.5 thousand years ago).

Industrial Revolution: the initial phase starts in the fifteenth century with the development of navigation, water-powered equipment and mechanization, with qualitative growth of labor division in the manufacturing, and also other processes; *the final phase* – the industrial revolution between the eighteenth and the first third of the nineteenth century, connected with the introduction of various machines and steam energy.

Cybernetic Revolution: the initial (scientific and information) phase dated back to the 1950–1990s. The breakthrough occurred in automation, energy production, synthetic materials, space technologies, exploration of space and sea, agriculture, but especially in creation of electronic control facilities, communication and information. *The final innovative phase (of self-regulating systems)* will begin in the 2030s or 2040s and will last till the 2060s or 2070s.

Each of production revolutions means the transition to a fundamentally new production system; the beginning of each production revolution marks the borders between corresponding production principles.

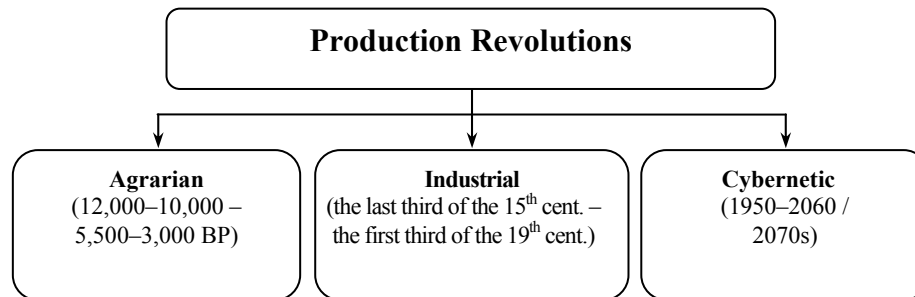


Fig. 2. Production revolutions in history

Structure of the Production Principle

Development of the production principle is a period of genesis, growth and maturity of new forms, systems and paradigms of organization of economic management, which surpass many times the former ones in major parameters.

The principle of production is a six-phase cycle. Its first three stages correspond to three phases of the production revolution. The subsequent three (post-revolutionary) stages are a period of the maximization of the potentials of the new forms of production in structural, systemic, and spatial sense:

1. *The phase of the production revolution's beginning.* A new, not yet developed principle of production emerges.

2. *The phase of primary modernization* – diffusion and strengthening of the production principle.

3. *The phase of completion of the production revolution.* The production principle acquires advanced characteristics.

The first three phases of the production principle still present an incomplete production principle.

4. *The phase of maturity and expansion of the production principle* with wide geographic and sectoral diffusion of new technologies that brings the production principle to mature forms; there also occur certain transformations in social and economic spheres.

5. *The phase of absolute domination of the production principle.* The final worldwide victory of the production principle, intensification of technologies which bring opportunities to the limits beyond which crisis features appear.

6. *The stage of non-system phenomena, or preparatory* (for the transition to a new production principle) *phase.* The intensification leads to emergence of non-system elements which prepare the birth of a new production principle. (When, under favorable conditions, these elements form a system, in some societies the transition to a new production principle will begin and the cycle will repeat at a new level.)

The last three phases of the production principle characterize its mature features.

Table 1. Chronology of the production principle's phases

No	Production Principle	1 st phase	2 nd phase	3 rd phase	4 th phase	5 th phase	6 th phase	Total Production Principle
1.	Hunter-Gatherer	40,000–30,000 (38,000–28,000 BC)	30,000–22,000 (28,000–20,000 BC)	22,000–17,000 (20,000–15,000 BC)	17,000–14,000 (15,000–12,000 BC)	14,000–11,500 (12,000–9,500 BC)	11,500–10,000 (9,500–8,000 BC)	40,000–10,000 (38,000–8000 BC)
		10	8	5	3	2.5	1.5	30
2.	Craft-Agrarian	10,000–7,300 (8,000–5,300 BC)	7,300–5,000 (5,300–3,000 BC)	5,000–3,500 (3,000–1500 BC)	3500–2200 (1500–200 BC)	2200–1200 (200 BC – 800 AD)	800–1430 AD	10,000–570 (8,000 BC – 1430 AD)
		2.7	2.3	1.5	1.3	1.0	0.6	9.4
3.	Trade-Industrial	1430–1600	1600–1730	1730–1830	1830–1890	1890–1929	1929–1955	1430–1955
		0.17	0.13	0.1	0.06	0.04	0.025	0.525
4.	Scientific-Cybernetic	1955–1995/ 2000	1995–2030/40	2030/40–2055/70	2055/70–2070/90	2070/90–2080/105	2080/2105–2090/2115	1955–2090/ 2115
		0.04–0.045	0.035–0.04	0.025–0.03	0.015–0.02	0.01–0.015	0.01	0.135–0.160

Note: Figures before the brackets – absolute scale (BP), figures in the brackets – BCE. Chronology in the table is simplified (a more detailed chronology see in Grinin 2006b, 2009; Grinin and Korotayev 2013). The duration of phases (in thousand years) is marked by the bold-face type. Duration of phases of the scientific-cybernetic production principle is hypothetical. The duration of the scientific-cybernetic production principle is also given in Fig. 3.

As is clear, the scientific-cybernetic production principle is at the beginning of its development. Only its first phase finished, and in the mid-1990s the second started. The second

phase is proceeding now and will last till the early 2030s. The third phase is likely to begin approximately in the 2030s or the 2040s. At this particular time the final phase of the Cybernetic Revolution should start. The end of the scientific-cybernetic production principle will fall on the early 22nd century (for more details see Grinin 2006b).

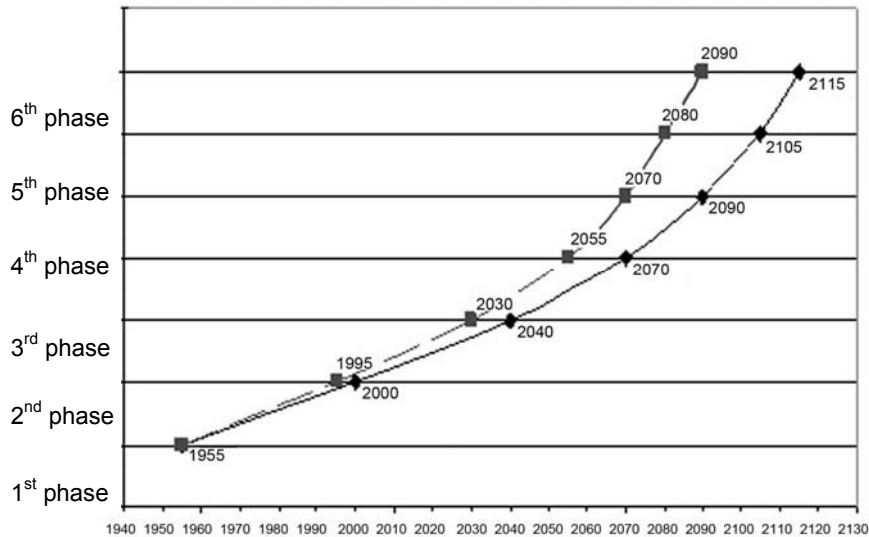


Fig. 3. Development of the scientific-cybernetic production principle

Note: The dashed line depicts one of the scenarios of expected development of the scientific-cybernetic production principle and corresponds to the dates before the slash in the fifth column of Table 1.

The industrial production principle as a cycle, consisting of K-Waves. We have established a close correlation between production principle cycles and Kondratieff cycles (for more details see Grinin 2012a, 2013). Taking into account that K-waves arose only at a certain level of economic development of societies, we can consider *K-waves as a specific mechanism connected with the emergence and development of the industrial-trade production principle and the way of expanded reproduction of industrial economy*. Given that each new K-wave does not just repeat the wave motion, but is based on a new technological mode, *K-waves in a certain aspect can be treated as phases of the development of the industrial production principle and the first phases of development of the scientific-cybernetic production principle*.

In the mentioned articles (Grinin 2012a, 2013) it has been shown that the first three K-waves are connected with the industrial production principle. The special attention is paid to the correlation between the duration of the industrial production principle phases and the duration of K-wave phases. Certainly, there can be no direct duration equivalence of both K-waves and their phases, on the one hand, and the industrial production principle phases, on the other, due to the different duration of the industrial production principle phases (that is within the principle of production's cycle its phases differ in duration, but their duration proportions remain the same in each production principle [Grinin 2006b, 2009]). However, we have succeeded in establishing a more complex ratio according to which *at the average one K-wave corresponds to one phase of the industrial production principle*. In general, we found out that three and a half waves coincide with three and

a half phases of the industrial principle of production! It is clearly seen in Table 2. Such a correlation is not coincidental, as innovative development of the industrial production principle is realized through long Kondratieff cycles which are largely defined by large-scale innovations.

Table 2. Periods of the industrial production principle and Kondratieff waves

Phases of Industrial Production Principle	The Third Phase, 1730–1830 ≈ 100 years	The Fourth Phase, 1830–1890 ≈ 60 years	The Fifth Phase, 1890–1929 ≈ 40 years	The Sixth Phase, 1929–1955 ≈ 25 years	Total: ≈ 225 years, from 1760 – 195 years
The Phase of the K-wave	Zero (B-Phase) / The First Wave (A-Phase), 1760–1817 – about 60 years	The End of the First Wave / The Second Wave, 1817–1895 – more than 75 years	The Third Wave, The Upward Phase, 1895–1928 – more than 35 years	Third wave, The Downward Phase, 1929–1947 – about 20 years	About 190 years
The Phase of K-wave	B-Phase of the Zero Wave, ² 1760–1787	The Second half of the Downward Phase, 1817–1849	The Upward Phase, 1895–1928	The Downward Phase, 1929–1947	
The Phase of K-wave	The Upward Phase, 1787–1817	The Upward Phase, 1849–1873			
The Phase of K-wave		The Downward Phase, 1873–1895			

Note: For simplicity, we take concrete years for the beginning and the end of the periods, though such a transition obviously lasts for a certain period of time.

II. The Cybernetic Revolution, Scientific-Cybernetic Production Principle, the Fourth, Fifth and Sixth K-Waves

The production revolution which began in the 1950s and is still proceeding, causes powerful acceleration of scientific and technological progress. Taking into account expected changes in the next 50 years, this revolution deserves to be called ‘Cybernetic’ (see our explanation below). The initial phase of this revolution (the 1950s – the 1990s) can be referred to as a *scientific-informational* as it was characterized by the transition to scientific methods of planning, forecasting, marketing, logistics, production managements, distribution and circulation of resources, and communication. The most radical changes took place in the sphere of informatics and information technologies. The final phase will begin approximately in the 2030s or the 2040s and will last until the 2070s. We called this phase a ‘phase of self-regulating systems’ (see below). Now we are in the intermediate (modernization) phase which will last until the 2030s. It is characterized by powerful improvement and diffusion of innovations made at the initial phase in particular by a wide proliferation of easy-to-handle computers, means of communication, and formation of macrosector of services

² We took as the beginning a zero K-wave which downward phase coincided with the beginning of the Industrial Revolution, i.e. the 1760s (as we know, it is downward phases that are especially rich in innovations).

among which information and financial services took the major place. At the same time the innovations necessary to start the final phase of the Cybernetic Revolution are being prepared.

The Cybernetic Revolution *is a great technological breakthrough from the industrial production principle towards production and services based on the operation of self-regulating systems*. In general, it will become the revolution of *self-regulating systems* (see Grinin 2006a, 2007b, 2012b, 2013; Grinin and Grinin 2013a, 2013b).

Table 3 demonstrates the connection between three phases of the scientific-cybernetic production principle (which coincide with three phases of the Cybernetic Revolution) and three Kondratieff waves (the fourth, fifth and sixth). Correlation is here even stronger than between the first three K-waves and the industrial production principle phases, due to the shorter duration of the scientific-cybernetic production principle phases in comparison with those of the industrial production principle.³

Table 3. The scientific-cybernetic production principle (initial phases) and Kondratieff waves

Phases of the Scientific Cybernetic Production Principle	The first phase (initial phase of the Cybernetic Revolution) 1955–1995 ≈ 40 years	The second phase (middle phase of the Cybernetic Revolution) 1995 – the 2030s/40s. ≈ 35–50 years	The third phase (final phase of ‘self-regulating systems’ of the Cybernetic Revolution) the 2030s/40s–2055/70s ≈25–40 years	Total: ≈ 100–120 years
K-Wave and Their Phases	The Fourth Wave, 1947 – 1982/1991 ≈ 35–45 years	The Fifth Wave, 1982/1991 – the 2020s. The beginning of the upward phase of the sixth wave (2020–2050s) ≈ 30–40 years	The sixth wave, 2020 – 2060/70s. The end of the upward phase and downward phase (the latter ≈ 2050 – 2060/70s) ≈ 40–50 years	About 110–120 years
K-Wave and Their Phases	Upward phase, 1947 – 1969/1974s	Downward phase of the fifth wave, 2007–2020s		
K-Wave and Their Phases	Downward phase, 1969/1974 – 1982/1991	Upward phase of the sixth wave, 2020 – 2050s.		
K-Wave and Their Phases	The fifth wave, 1982/1991 – 2020s, upward phase, 1982/1991 – 2007			

Taking the theory of production principles into account, we have also revised the sequence of change of the major (leading) production sectors during the change of K-waves (Grinin 2012a).⁴

³ The reason for the shorter duration is the general acceleration of historical development.

⁴ During the table compiling we took into account ideas and works cohering with the theories which explain the nature and pulsation of K-waves by changing of technological ways and/or *techno-economic paradigms*: Mensch 1979;

Table 4. K-waves, technological modes and leading macrosectors

Kondratieff Wave	Date	A New Mode	Leading Macrosector	Production Principle and Number of Its Phase
First	1780–1840s	The textile industry	Factory (consumer) industry	Industrial, 3
Second	1840–1890s	Railway lines, coal, steel	Mining industry and primary heavy industry and transport	Industrial, 4
Third	1890–1940s	Electricity, chemical industry and heavy engineering	Secondary heavy industry and mechanic engineering	Industrial, 5/6
Fourth	1940-e – the early 1980s	Automobile manufacturing, manmade materials, electronics	General services	Industrial, 6, Scientific-Cybernetic, 1
Fifth	1980s – ~2020	Micro-electronics, personal computers	Highly-qualified services	Scientific-Cybernetic, 1/2
Sixth	2020/30s – 2050/60s	<i>MANBRIC-technologies</i> (medical-additive-nano-bio-robo-info-cognitive)	Medical human services	Scientific-Cybernetic, 2/3

Peculiarities of the fourth K-wave in connection with the beginning of the Cybernetic Revolution. The fourth K-wave (the second half of the 1940s – 1980s) fell on the initial phase of the Cybernetic Revolution. The beginning of a new production revolution is a special period which is connected with the fast transition to a more advanced technological component of economy. All accumulated innovations and a large number of new innovations generate a new system that has a real synergetic effect. It would appear reasonable that *an upward phase of the K-wave coinciding with the beginning of a production revolution can appear more powerful than A-phases of other K-waves.*⁵ That was the feature of the upswing A-phase of the fourth K-wave (1947–1974) which coincided with the scientific-information phase of the Cybernetic Revolution. As a result a denser than usual cluster of innovations (in comparison with the second, third and fifth waves) was formed during that period. All this also explains why in the 1950s and 1960s the economic growth rates of the World System were higher, than in A-phases of the third and fifth K-waves. The downswing phase of the fourth K-wave (the 1970s – 1980s) in its turn also fell on the last period of the initial phase of the Cybernetic Revolution. This explains in many respects why this downswing phase was shorter than those of the other K-waves.

The fifth K-wave and the delay of the new wave of innovations. It was expected that the 1990s and the 2000s would bring a radically new wave of innovations, comparable in their revolutionary character with the computer technologies, capable to create a new technological mode. Those directions which had already appeared and the ones, which are now supposed to become a basis for the sixth K-wave, were considered to be a breakthrough. However, it was the development and diversification of already existing digital

Kleinknecht 1981, 1987; Dickson 1983; Dosi 1984; Freeman 1987; Tylecote 1992; Glazyev 1993; Mayevsky 1997; Modelski and Thompson 1996; Modelski 2001, 2006; Yakovets 2001; Freeman and Louçã 2001; Ayres 2006; Kleinknecht and van der Panne 2006; Dator 2006; Hirooka 2006; Papenhausen 2008; see also Lazurenko 1992; Glazyev 2009; Polterovich 2009; Perez 2002.

⁵ Therefore, it appears reasonable that A-phase of the sixth K-wave can also make a great progress, as it will coincide with the beginning of the Cybernetic Revolution final phase. Thus, the sixth wave is to have a stronger manifestation than the fifth one. We will return to this point below.

electronic technologies and rapid development of financial technologies that became a basis for the fifth K-wave. Those innovations which were really created during the fifth K-wave as, for example, energy technologies, still have a small share in the general energy, and, above all, they do not grow properly. Some researchers believe that from 1970s up to the present is the time of the decelerating scientific and technological progress (see discussion about it in Brener 2006; see also Maddison 2007). Polterovich (2009) also suggests a notion of a technological pause. But, in general, the mentioned technological delay is, in our opinion, insufficiently explained. We believe that taking features of the intermediate modernization phase of a production revolution (that is the second phase of the production principle) into account can help explain this. Functionally it is less innovative; rather during this phase earlier innovations are widely spread and improved. As regards the 1990s – 2020s (the intermediate phase of the Cybernetic Revolution) the question is that the launch of a new innovative breakthrough demands that the developing countries reach the level of the developed ones, and the political component of the world catches up with the economic one; all this needs changes of the structure of societies and global relations (see about some aspects Grinin and Korotayev 2010b). Thus, the delayed *introduction of innovations of the new generation* is explained, first, by the fact that the center cannot endlessly surpass the periphery in development, that is the gap between developed and developing countries could not increase all the time. Secondly, economy cannot constantly surpass the political and other components, as this causes very strong disproportions and deformations. And the appearance of new general-purpose technologies, certainly, would accelerate economic development and increase disparities. Thirdly, introduction and distribution of the new basic technologies do not occur naturally, but only within the appropriate social political environment (see Grinin 2012a, 2013; see also Perez 2002). In order for basic innovations to be suitable for business, structural changes in political and social spheres are necessary, eventually promoting their synergy and wide implementation in the world of business.

Thus, the delay is caused by difficulties of changing political and social institutions on the regional and even global scale, and also (and, perhaps, first of all) within the international economic institutions. The latter can change only thanks to the strong political will of the main players, which is difficult to execute in the framework of the modern political institutions. These institutions rather can change under the conditions of depressive development (and probable aggravation of the foreign relations) compelling to reorganization and breakage of the conventional institutions that could hardly be changed due to the lack of courage and opportunities under ordinary conditions.

The above said explains as well the reasons of different rates of development of the center and periphery of the World System during the fifth K-wave (for more details see Grinin 2013; see also Grinin and Korotayev 2010a). The periphery was expected to catch up with the center due to the faster rates of its development and slowdown of the center development. However, one should not expect continuous crisis-free development of the periphery – a crisis will come later and probably in other forms. Without slowdown of the development of the periphery and serious changes full harmonization of the economic and political component will not happen. Consequently, it might be supposed that in the next decade (approximately by 2020–2025) the growth rates of the peripheral economies can also slow down, and internal problems will aggravate that, as said above, can stimulate structural changes in the peripheral countries and strengthen international

tension. Thus, we suppose that in the next 10–15 years the world will face serious and painful changes.

As is known, among researchers there is no agreement about periodization of the Kondratieff waves (about this see Korotayev and Grinin 2012). We believe that at present we witness the downward phase of the fifth K-wave which will last till the early or the mid-2020s. However, for example, Leo Nefiodow in his contribution to this yearbook and the other works (Nefiodow 1996; Nefiodow and Nefiodow 2014) argues that the sixth K-wave began in the late 1990s. Thus, according to Nefiodow's logic, now we observe an upward phase (however, the crisis of 2008–2014 and prospects for the next years contradict this), and in the 2020s the downward phase should come.

III. Characteristics of the Cybernetic Revolution

What are self-regulating systems and why are they so important? Self-regulating systems are systems that can regulate themselves, responding in a pre-programmed and intelligent way to the feedback from the environment. These are the systems that operate with a small or completely without human intervention. Today there are many self-regulating systems around us, for example, the artificial Earth satellites, pilotless planes, navigators laying the route for a driver. Another good example is life-supporting systems (such as medical ventilation apparatus or artificial hearts). They can regulate a number of parameters, choose the most suitable mode of operation and detect critical situations. There are also special programs that determine the value of stocks and other securities, react to the change of their prices, buy and sell them, carry out thousands of operations in a day and fix a profit. A great number of self-regulating systems has been created. But they are mostly technical and informational systems (as robots or computer programs). During the final phase of the Cybernetic Revolution there will be a lot of self-regulating systems connected with biology and bionics, physiology and medicine, agriculture and environment. The number of such systems as well as their complexity and their autonomy will dramatically increase. Besides, they will essentially reduce energy and resource consumption. The very human life will become organized to a greater extent by such self-regulating systems (*e.g.*, by monitoring of health, regimen, regulation of or recommendation concerning the exertions, control over the patients' condition, prevention of illegal actions, *etc.*).

Thus, we designate the modern revolution 'Cybernetic', because its main sense is the wide creation and distribution of self-regulating autonomous systems. Cybernetics, as is well-known, is a science of regulatory systems. Its main principles are quite suitable for the description of self-regulating systems (see, *e.g.*, Wiener 1948; Ashby 1956; Foerster and Zopf 1962; Umpleby and Dent 1999; Tesler 2004).

As a result, the opportunity to control various natural, social and production processes without direct human intervention (that is impossible or extremely limited now) will increase. At the fourth phase (*of maturity and expansion*) of the scientific cybernetic production principle (the 2070s and 2080s) the achievements of the Cybernetic Revolution will become quite systemic and wide-scale in its final phase (for more details see Grinin 2006a).

Below we single out the most important characteristics of the Cybernetic Revolution. One can observe them today, but they will realize in mature and mass forms only in the future. These features are closely interconnected and corroborating each other (for more details see Grinin and Grinin 2013a, 2013b).

Group of self-regulating properties:

1. Transition to self-regulating systems of various types and nature and qualitatively growing controllability of systems and processes.
2. Transition to the control over deeper and more fundamental processes and levels (up to subatomic particles), using tiny particles as building blocks (as is clearly seen in nano- and biotechnologies).
3. Control over humans activities to eliminate the negative influence of the so-called human factor, and control the lack of human attention in order to prevent dangerous situations (e.g., in transport) as well as to prevent human beings from using means of high-risk in unlawful or disease state (e.g., not allowing driving a vehicle while under the influence of alcohol or drugs).

The group of attributes of task-aware adaptation of materials and systems:

1. Radical increase in systems' abilities to choose optimal regimes for different objectives and tasks.
2. Individualization as trend of technology. The opportunities of self-regulation will allow choosing a particular decision for the variety of individual tasks, orders and requests (e.g., with 3D- and 4D-printers and choosing of programs adapted to specific individual needs). We also expect a rapid increase in the market of cosmetic corrections and plastic surgery of any kinds and other private orders to change individual organisms.⁶
3. Resource and energy saving in many spheres.
4. Increasing opportunities in the synthesis of materials with previously lacking properties in biological and bionic (techno-biological) systems (as in Chemistry).
5. Miniaturization and micro-miniaturization as a trend of the constantly decreasing size of particles, mechanisms, electronic devices, implants, etc.

Various directions of development should generate a system cluster of innovations.⁷

Medicine as a sphere of the initial technological breakthrough and the emergence of MANBRIC-technology complex. It is worth remembering that the Industrial Revolution began in a rather narrow area of cotton textile manufactory and was connected with the solution of quite concrete problems – at first, liquidation of the gap between spinning and weaving, and then, after increasing weavers' productivity, searching of the ways to mechanize spinning. However, the solution of these narrow tasks caused explosion of innovations conditioned by the existence of a large number of the major elements of machine production (including abundant mechanisms, primitive steam-engines, quite a high volume of coal production, etc.) which gave an impulse to the development of the Industrial Revolution. In a similar way, we assume that the Cybernetic Revolution will start first in a certain area. Given the general vector of scientific achievements and technological development and taking into account that a future breakthrough area should be highly commercially attractive and have a wide market, we predict that the final phase (of self-regulating systems) of this revolution will begin somewhere at the intersection of medicine and many other technologies. Certainly, it is almost impossible to predict the concrete course of innovations. However, the general vector of breakthrough can be defined as a rapid growth of *opportunities for correction or even modification of the human biological nature*. In other words,

⁶ Even now this market is growing rapidly, and in the future it will run up to hundreds billion dollars.

⁷ So, for example, resources and energy saving can be carried out via the choice of the optimal modes by autonomous systems that fulfil concrete goals and tasks and *vice versa*, the choice of an optimal mode will depend on the level of energy and materials consumption, and the budget of a consumer.

it will be possible to extend our opportunities to alter a human body, perhaps, to some extent, its genome; to widen sharply our opportunities of minimally invasive influence and operations instead of the modern surgical ones; to use extensively means of cultivating separate biological materials, bodies or their parts and elements for regeneration and rehabilitation of an organism, and also artificial analogues of biological material (bodies, receptors), *etc.*

This will make it possible to *radically expand the opportunities to prolong the life and improve its biological quality*. It will be the technologies intended for common use in the form of a mass market service. Certainly, it will take a rather long period (about two or three decades) from the first steps in that direction (in the 2030–2040s) to their common use.

The drivers of the final phase of the Cybernetic Revolution will be medicine, bio- and nano-technologies, robotics, IT, cognitive sciences, which will together form a sophisticated system of self-regulating production. We can denote this complex as **MANBRIC-technologies**. As is known, there is the widely used abbreviation of NBIC-technology (or convergence), that is nano-bio-information and cognitive (see Lynch 2004; Dator 2006; Akayev 2012). However, we believe that this complex will be larger.

It should be noted that Leo Nefiodow has been writing about medicine as the leading technology of the sixth Kondratieff wave for a long time (Nefiodow 1996; Nefiodow and Nefiodow 2014; also in this volume). In general, we support his approaches (including the ideas about a new type of medicine), but it is important to point out that Nefiodow believes that it is biotechnologies that will become an integrated core of a new mode. However, we suppose that the leading role of biotechnologies will be, first of all, in their possibility to solve the major medical problems.⁸ That is why, it makes sense to speak about medicine as the core of a new technological paradigm. Besides, Nefiodow practically does not mention nanotechnology that will be of great importance in terms of the development of biotechnologies and medicine (they are supposed to play a crucial role in the fight against cancer; at the same time nanotechnologies will play a crucial role in other spheres too, in particular in energy and resources saving). It is difficult to agree with his opinion that psychosocial health, which, in his opinion, cover not only psychotherapeutic, psychological and psychiatric services, but also numerous measures of people's health improvement that is capable to reduce, in his terms, social entropy, will be the second leading mode. The problems of this social entropy which he points out (corruption, growth of small and large crime, drug addiction, loss of moral guide, divorces, growth of violence, *etc.*) have always existed in society; many of them even had a greater share than today. Social changes can be really extremely important for creation of starting conditions for a long-term upswing and its keeping (for more details see Grinin and Korotayev 2014 in this issue). However, it is production and/or commercial technologies that represent the driving force of the K-Waves upward phases.

Thus, we suppose the following:

1. Medicine will be the first sphere to start the final phase of the Cybernetic Revolution, but, later on, self-regulating systems development will cover the most diverse areas of production, services and life.

2. We treat medicine in a broad sense, because it will include (and already actively includes) for its purposes a great number of other scientific branches (*e.g.*, the use of robots

⁸ We agree with Nefiodow that it is also necessary to include in this complex food, pharmaceuticals and ecology (see Grinin and Grinin 2013a, 2013b).

in surgery and care of patients, information technologies in remote medical treatment, neural interfaces for treatment of mental illness and brain research; gene therapy and engineering, nanotechnologies for creation of artificial immunity and biochips which monitor organisms; new materials for growing artificial organs and many other things to become a powerful sector of economy).

3. The medical sphere has unique opportunities to combine the abovementioned technologies into a single system.

4. There are also some demographic and economic reasons why the phase of self-regulating systems will start in medicine:

– Increase in average life expectancy and population ageing will favor not only the growth of medical opportunities to maintain health, but also allow the extension of working age, as population ageing will be accompanied by the lack of working-age population;

– People, in general, are always ready to spend money on health and beauty. However, the growth of the world middle class and the cultural standard of people implies much greater willingness and solvency in this terms;

– Medical corporations usually do not impede technological progress, but, on the contrary, are interested in it.

Thus, today medicine is a very important sector of the economy, and tomorrow it will become even more powerful.

In the present article we confined ourselves to a short description of the spheres which represent a new, in a broad sense, medical system or realm of medicine, creating a complex of technologies and their application with other perspective directions.

Surgery. Robots have become widely used in surgeries (see Fig. 4). The da Vinci robot has become especially popular. In the future, an increasing number of surgical operations will be performed with less involvement of professionals. Many simple surgeries will need no human participation at all.

Robots can perform a wide range of surgeries because of:

- easy access to the zone of surgery;
- small scars;
- superhuman accuracy;
- no hand tremor;
- possibility to control a robot at a distance via Internet.

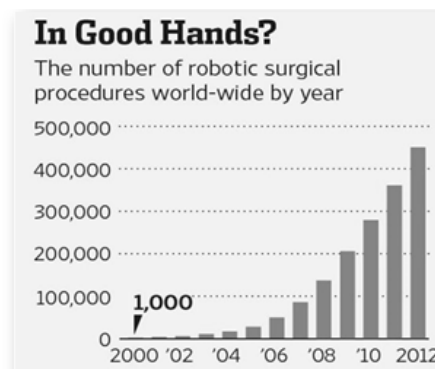


Fig. 4. Robots in surgery

Source: Pinkerton 2013.

Biochips represent a new trend of combining medical and nanobiotechnologies. Biochips are able to register a wide range of physiological changes and respond to them or perform specific actions. In the long term, biochips will permit a continuous control of a person's health. There are many biochips in medicine today. For example, cardio-chips which are connected to the heart cells, register all necessary indices, and transmit them to devices. Some biochips are so small in size that can be placed into a cell or tiny spheres of lipids, liposomes. They can be used for different purposes, for example, for targeted drug delivery.

Artificial organs are the key to resolving the urgent lack of enough donor organs. In medicine scientists already use or work to design different artificial organs: skin, retina, trachea, vessels, heart, ear, eye, limbs, liver, lungs, pancreas, bladder, ovaries. This will definitely increase life expectancy and can have various consequences. The artificial womb, for example, can provide an opportunity to have children for people irrespective of age and, perhaps, even gender.

Artificial immune system is an autonomous intellectual system against diseases and pathogenic organisms. For example, a nanorobot can travel through the body and collect pathogenic organisms into a special module, where they are decomposed. Organic compounds are further used by human organism.

Gene therapy is an explosively developing sector. It is a powerful tool for correcting hereditary diseases as well as developing new abilities that an organism lacked before. In our view, the crucial breakthroughs in gene therapy will be made in the treatment of genetic disorders and sport medicine.

Neural interfaces are an interaction between brain and computer systems that can be realized via electrode contact with head skin or via electrodes implanted into the brain. The implementation of neural interfaces is already wide-spread. They have developed neural interfaces that allow prosthetic devices to be moved via brain signals. Today, scanning techniques have been developed that allow studying brain signals. This gives an opportunity to reproduce any brain response.

So the final phase of the Cybernetic Revolution:

- will create various self-regulating systems;
- will start in medicine, which in the conjuncture with other fields will create the revolutionizing system of MBNRIC (med-bio-nano-robo-info-cognitive) technologies;
- will improve the quality of life particularly of old people and disabled persons;
- will increase average life expectancy (up to 100 years);
- will lead to the emergence of opportunities to correct and modify human biology itself.

However, the final phase of the Cybernetic Revolution will have ambiguous consequences. On the one hand, vigorous growth of production volume will be expected. On the other hand, due to the diffusion of various self-regulating systems the number of specialists needed in different spheres will decrease. For instance, due to the development of self-regulation and remote medical care the number of doctors will significantly diminish.

The possibilities of medicine will hugely increase. At the same time the emergence of opportunities to radically change the human organism may bring about unprecedented ethical issues and seriously damage such vital aspects as family, gender, and morals. That is why it is very important to search for some optimal social, legal and other means before-

hand. Then those changes will not be completely unexpected and their negative consequences could be minimized.

IV. The Phase of Self-Regulating Systems and the Sixth K-Wave

A-Phase of the sixth K-wave: acceleration to enter the final phase of the cybernetic revolution

The sixth K-wave will probably begin approximately in the 2020s. Meanwhile the final phase of the Cybernetic Revolution has to begin later, at least, in the 2030–2040s. Thus, we suppose, that a new technological mode will not develop in a necessary form even by the 2020s (thus, the innovative pause will take longer than expected). However, it should be kept in mind that the beginning of the K-wave upswing phase is never directly caused by new technologies. This beginning is synchronized with the start of the medium-term business cycle's upswing. And the upswing takes place as a result of the levelling of proportions in economy, the accumulation of resources and other impulses that improve demand and conjuncture. One should remember, that the beginning of the second K-wave was connected with the discovery of gold deposits in California and Australia, the third wave with the increase in prices for wheat, the fourth one with the post-war reconstruction, the fifth one with the economic reforms in the UK and the USA. And then, given an upswing, a new technological mode (which could not completely – if at all – realize its potential) facilitates overcoming of cyclic crises and allows further growth.

Consequently, some conjunctural events will also stimulate an upward impulse of the sixth K-wave. And, for example, the rapid growth of the underdeveloped world regions (such as Tropical Africa, the Islamic East, and some Latin American countries) or new financial and organizational technologies can become a primary impulse. Naturally, there will also appear some technical and technological innovations which, however, will not form a new mode yet. Besides, we suppose that financial technologies have not finished yet its expansion in the world. If we can modify and secure them somehow, they will be able to spread into various regions which underuse them now. One should not forget that large-scale application of such technologies demands essential changes in the legal and other systems, which is absolutely necessary for developmental levelling in the world. Taking into account a delay of the new generation of technologies, the period of the 2020s may resemble the 1980s. In other words, it will be neither a growth recession, nor a rise, but rather an accelerated development (with stronger development in some regions and continuous depression in others).

Then, given the above mentioned favorable conditions, during this wave the final phase of the Cybernetic Revolution will begin. In such a situation it is possible to assume that the sixth K-wave's A-phase (the 2020–2050s) will have much stronger manifestation and last longer than that of the fifth one due to more dense combination of technological generations. And since the Cybernetic Revolution will evolve, the sixth K-wave's downward B-phase (2050 – the 2060/70s), is expected to be not so depressive, as those during the third or fifth waves. In general, during this K-wave (2020 – the 2060/70s) the Scientific and Information Revolution will come to an end, and the scientific and cybernetic production principle will acquire its mature shape.

Another scenario. The final phase of the Cybernetic Revolution can begin later – not in the 2030s, but in the 2040s. In this case the A-phase of the sixth wave will terminate

before the beginning of the regulating systems revolution; therefore, it will not be based on fundamentally new technologies and will not become so powerful as is supposed in the previous scenario. The final phase of the Cybernetic Revolution in this case will coincide with the B-phase of the sixth wave (as it was the case with the zero wave during the Industrial Revolution, 1760–1787) and at the A-phase of the seventh wave. In this case the emergence of the seventh wave is highly possible. The B-phase of the sixth wave should be rather short due to the emergence of a new generation of technologies, and the A-phase of the seventh wave – rather long and powerful.

The end of the Cybernetic Revolution and disappearance of K-waves

The sixth K-wave (about 2020 – the 2060/70s), like the first K-wave, will proceed generally during completion of the production revolution. However, there is an important difference. During the first K-wave the duration of the one phase of the industrial production principle significantly exceeded the duration of the whole K-wave. But now one phase of the K-wave will exceed the duration of one phase of production principle. This alone should essentially modify the course of the sixth K-wave; the seventh wave will be feebly expressed or will not occur at all (on the possibility of the other variant see above). Such a forecast is based also on the fact that the end of the Cybernetic Revolution and distribution of its results will promote integration of the World System and considerably increasing influence of new universal regulation mechanisms. It is quite reasonable, considering the fact that the coming final phase of the revolution will be the revolution of the regulating systems. Thus, the management of the economy should reach a new level. *So, K-waves appear at a certain stage of social evolution and are likely to disappear at its certain stage.*

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Providing the Balance of Technological and Social Changes in Real-Time Regime Plus the Economic Growth*

Valentina Bondarenko

In this article, the author argues and proves that the causes of the crisis in the world can only be understood through the prism of the world-view approach. It is also stated that the problems pertaining to socio-economic and technological progress, acceleration of economic growth and formation of a new model cannot be resolved within the framework of the existing development paradigm. The author reasonably and objectively proves that the world undergoes the most difficult stage of transition from one to another development paradigm, and substantiates the possibility of proceeding to a new development paradigm. In order to realize such paradigm-oriented transition and to reach the objectively set development goal speedily, the author sets forth a proposal to develop and realize the mega-project for building a new life model and the mechanisms of its realization – that is, coordination, at each local level, between the state, societal and business interests with interests of any given particular individual. Balance of technological and social changes is a basis for transition to the new model of the economic growth.

Keywords: *systemic crisis, worldview, new cognition methodology, new development paradigm, megaproject, economic growth.*

Introduction

There is a long list of reasons and factors being seen as responsible for declining economic growth, no matter which country or region is analysed (see, e.g., Korotayev, Tsirel 2010; Grinin, Korotayev 2010a, 2010b, 2011, 2014a, 2014b, 2014c, 2015; Korotayev, Zinkina, Bogevolnov 2011; Grinin, Korotayev, Malkov 2010; Grinin, Tsirel, Korotayev 2015). But are these listed or yet-to-be-found reasons and factors the root causes that really hold back the economies of most countries in the world? Or are they consequences of some deep-lying processes, reflecting the effects of objective patterns of development that are still concealed from researchers – despite the fact that famous economists wrote about the increasing uncertainty in economy and politics? (Friedman 1956; Krugman 1979; Bernanke 1984). Nowadays, many people see the number one reason in the ineffective modelling of further economic growth as there are no visible ways to reverse this trend, and no solutions have come up for any of the problems. Ben Bernanke, the former Chairman of the US Federal Reserve System (FRS), stated that a victorious war or vigorous preparation for such a war could be the best ways to lead the American economy out of the growing crisis

*The work has been done with the support from the Russian Humanities Foundation (project № 14-02-00330).

(Polunin 2015). The Russian academic literature features debates on the need for a shift to a different model of economic growth in Russia (Kudrin and Gurvich 2014).

Therefore, we keep insisting on the following. The existing model of economic development cannot be changed before objective reasons for the origin and roll-out of the global systemic crisis have been convincingly identified. Understanding these reasons, the society will be able to arrive at a model that will ensure a radical positive breakthrough in all aspects of human life and lay the groundwork for transition to crisis-free development or, at least, proactive crisis management.

There are a lot of scientists in the world who have addressed these highly challenging issues in their research work. Consider, for example, the well-known reports to the Club of Rome. However, not a single country around the globe can boast of a long-term strategic crisis management plan or vision of the future.

Thus, we have to note that today, more than ever, there is a pressing need for a new attitude to the crisis that we observe both in Russia and globally. The search for a new evolutionary model and a new concept of human development becomes inevitable.

Regularities of the Human-System Development

More than thirty years ago, in an attempt to throw some light on the inconsistencies of the Soviet Union's economy, we concluded that the then existing economic theories and scientific knowledge in general had run out of their explanatory capabilities in the search of ways to overcome negative developments. The main reason behind it is that so far scientific knowledge, including economic knowledge, has been gained through acquisition and processing of empirical evidence of the past and subjective judgement based on data interpretation. Thus, if we take a look at references to present-day textbooks, for example, macroeconomics course books, then we will find that they are totally based on the content that dates back to the second or third quarters of last century (*e.g.*, Romer 2015). The author of another book on the theory of economic growth writes, 'In the theory of growth, just as in macroeconomics and mainstream economic theory, research is closely linked to, conclusions verified and confirmed through empirical developments, or it is questioned, disproved and often initiated by empirical studies'. In other words, all these reflections are very much based in a constant forward projection of given data, interpreted not only with unchanged means but also without changing the methodology.

Empirics of economic growth have expanded the range of countries and periods under study and revealed material gaps between the basics of neoclassical economics and reality. There is a fair amount of such factors and determinants that impact on long-term growth, and their list is neither definitive nor exhaustive. Among other factors and determinants, determinants defined by subjective behaviour of people, society and government are of major significance. Considering the objectives defined by new empirics, the theory of economic growth is focused on the search for models that can help to explain the impact of subjective (behavioural and institutional) parameters on long-term growth... However, the progression of empirical studies has given rise to certain questions being addressed to the fundamental theory with no answers found. Furthermore, persistent inconsistency with previous stylized facts has been revealed and required clarification, and additional determinants of growth have emerged beyond the core theory. Ultimately, the key driver of sustainable growth in the neoclassical

model, *i. e.* technological progress seen as a 'black box' of a kind, requires increasingly more explanation (Sharaev 2006: 23–24).

This is why it has become quite obvious that in order to resolve the existing problems and identify the source of inconsistencies in systemic development, it is necessary, in terms of political economy, to find the only possible form of production relations, or human connected with production, distribution, exchange and consumption of social benefits, and with thereto relevant and new adequate productive forces. Since then, we have been looking for a way of theoretical thinking (in terms of political economy) and methodological tools that would help to see the objective (and free from empirical lay-ups) picture of the human-society development. This, in turn, would enable us to identify objective reasons behind the origin of crises and to suggest a possible model of human relations that might be adequate to technological advancements that break into the life of the human society at an incredible speed. This is achieved through the application of the worldview approach.

The worldview approach is based upon:

- The identification of the goal of development of humankind on the Earth, which is the human being with a multitude of needs and the satisfaction of her or his highest-level human need, which is evolving into a spiritually, intellectually and physically perfect human being with a high level of consciousness;
- The identification of the need for applying a holistic, systemic and interdisciplinary approach to all aspects of the human society development;
- The identification of a single measure for all and any processes and phenomena, which is the time;
- The identification of a single criteria to assess the development of humankind, *i. e.* the time between the need to achieve the common goal of the development and the reality where the human society finds itself at every moment, in any form of presentation, and each particular person in relation to this goal. Within this perspective, if the time between arising of a particular person's need and the fulfilment of this need tends to shrink, the humankind demonstrates correct and effective progression toward the goal.

Thus, our search has resulted in a new methodology of cognition, helping us to identify some regular patterns of the development of human society.

Since ancient times, the goal of development of human society and humanity has been a focus of research for experts from various disciplines of science and spiritual knowledge. For example, back in 1784, Immanuel Kant, a German philosopher and the founding father of classical German Philosophy at the turning point of the Age of Enlightenment and Romanticism, treated in his article titled 'Idea for a Universal History from a Cosmopolitan Point of View' world history as a goal-oriented process. He was looking for a way to subject history to a rule of law, and he believed that this law of history must by all means be the law of development. Immanuel Kant saw the solution of this problem in connecting history to the goal it had been originally committed to, which could make history regular in nature. Subjecting history to law means making it move towards a goal. In other words, he suggested understanding history in a teleological way. He suggested making an attempt to discover, in the meaningless course of human routine, the purpose of nature which could potentially underlie the history of human beings, living without a plan of their own. According to Kant, the ultimate purpose of the world's existence is to fully develop the rational inborn abilities of the human being (Kant 1963–1966: 8).

The authors of the reports to the Club of Rome have also endeavoured to formulate the goal of the global society's sustainable development and, based on that, offer new ideas for reshaping the international order (RIO) and find a new ideal form of social organization of people (Tinbergen 1976). A special attention is given to this issue in the Fifth Report to the Club of Rome titled 'Goals for Mankind'. In this report, global problems are analysed in terms of a system of goals and values, which suggests a revolutionary transition from quantitative to qualitative analysis. In the opinion of the authors, led by Ervin Laszlo, this requires the goals of global development to be formulated and presented to the global community (Laszlo *et al.* 1977).

Governed by the challenge of formulating the goals of global development, Ervin Laszlo and his working group in the course of their study analysed the 'atlas of goals' both at the national and transnational levels, representing various regions, countries, churches, multinational corporations, the UN, and other international organizations. They interviewed numerous people from a great variety of areas of human activity, and proposed four global goals. The first and foremost is to ensure global security, *i. e.* to stop the arms race, prevent wars and conflicts, and repudiate the violence. The second important goal is to resolve the food crisis on a global scale. According to the researchers, the achievement of this goal must eliminate famine and create a world system capable of satisfying the humankind's need for food. The third goal suggests the creation of a system for global control over employment of energy resources and raw materials, which will facilitate the transition to sustainable and environmentally friendly energy consumption, control over technologies and promotion of efficient management of natural resources. And the fourth goal is the global development toward a better quality of life and social justice in terms of the distribution of both physical and spiritual wealth (Laszlo *et al.* 1977).

To achieve this goal, the authors offered several scenarios of the 'global solidarity revolution'. They hope that scientists, religious leaders and business representatives of one country could have influence on their peers from other countries, and then they, all together, could address critical issues and work out general solutions. Unfortunately, first, these calls for coordinated efforts could hardly be heard while the existing model of humankind development is at work. Second, in view of the systemic approach to the development of human society, as a result of simultaneous setting of multiple goals, none of them might fail in achievement, and such pattern is well known from history.

I also set the task to identify the initially specified goal of the human-system development. That is, the task was to find the goal that cannot serve a means to attain the higher objective within the framework of the earthly human existence. At the same time, this goal must signify the start (reverse connection) of the qualitatively new spiral of development for the entire system as well as for each of its sub-systems. Hence, if any socio-economic and political system may be analysed through the prism of the realization of the ultimate goal, then such goal is of the planetary, global nature. Moreover, if the current practice of socio-economic and political development in any country of the global community is juxtaposed with the ultimate goal, then we can identify the redundant or missing link in the mechanism of the realization of this goal, finding the least time-consuming and hence the most efficient and stable way to its attainment.

As evidenced by the studies, such goal can be represented only by the human being and attainment of the Supreme Reason. Otherwise, development would go along entirely

the opposite path, ending in a deadlock and retrogress, so that everything would have to be started anew, or even be brought to the catastrophic finale, the apocalypse.

The second component of the new methodological tool-kit, represented, as said above, by the integrity, systemic nature and cross-disciplinary approach, is based on the premise that the world is a unity, and the laws of the nature and society are the same anywhere. The world, being an integral system, can only be understood when all sciences and spiritual knowledge are unified into a single systemic, integral and cross-disciplinary or, rather, trans-disciplinary knowledge. For the sake of justice, it should be noted that scholars and scientists have learned already to borrow or combine different disciplines with the spiritual knowledge while cognizing some processes or phenomena.

And, finally, using the only possible index to measure and compare all processes and phenomena – that is the time, and the only criteria for efficiency of the human-system development – that is on the one part, the time between the need to attain the single development goal, and on the other part – the reality, in which, at any given moment, the society and each human individual find themselves in relation to such goal, would provide us with the entirely new understanding of the human-system development.

Today, the humanity is distributed over the time-lines between the origin of the need for implementation of the goal and satisfaction of such need in various points and within various time domains. The greater the distance between human communities, regions, countries and systems on this vector of time, the harder, if not impossible, is to establish a dialogue between them and to ensure peace. When civilizations, peoples, nations, large and small communities and individuals find themselves in *different linear and spherical time domains*, they have different levels of consciousness, which prevents them from ever aligning their interests and understanding. This underlies the origin and aggravation of all woes of humankind. And this makes communities migrating around the globe in search of a better life. This implies that the crisis in global development, wars, terrorism, riots, man-made and natural disasters and all other negative developments stem from deep-lying laws that are common for both nature and humankind. Moreover, as long as people live in different linear and spherical time domains, there will be a semblance that the planet is inhabited by numerous co-existing local civilizations different from one another (Bondarenko 2014a). This is why it is extremely important to set a new direction to the development of humankind so that all people on Earth are equally ‘in-between’. In this case, the level of consciousness of each individual will be brought in harmony with other people's levels of consciousness, and they will be able to coordinate their interests in identifying a model for their existence. Hence we will comprehend and realize faster that we all live towards the objective goal of attaining perfection. In all other cases, as we set out in previous articles and would like to emphasize again, development may result in a totally different, opposite scenario: dead end, reverse development to start anew, or a catastrophic finale, of ‘apocalypse’.

We should give due credit to those scientists who address the issue of determining the development goals and even emphasize that, ‘like a living creature, a nation cannot exist without a goal and orientation. Planning does exist, but the question is: how are things planned, to who's benefit and based in which methodology?... The goals of development must refer to human qualities...’ (Buzgalin 2015)

Two Paradigms of Human Society Development

The worldview approach based on the application of all provisions of the new methodological tools makes it clear that for many centuries of the human-society development there have been two major paradigms (Fig. 1):

– **Paradigm 1** implies a direct relationship between production and consumption, which is short in terms of time and space. It originated when everything was produced with manual labour that was in the possession of the humankind, and all produce was consumed soon afterwards. This is the pre-industrial type of production for one's own needs and on a made-to-order basis for a particular consumer at the level of a household (craftsmen). Therefore, the time between arising of a particular person's need and the satisfaction thereof was the shortest. But since the goal was not recognized, the manufacturing capabilities were limited, and the range of needs was narrow, undeveloped and inaccessible for most of the population, then the development was challenged by some troublesome times, food riots, epidemics, uprisings and wars, a great number of deaths, demographic and environmental disasters, urban destruction and decay, downturn in trade and crafts, etc. (see, e.g., Turchin 2003; Turchin, Korotayev 2006; Turchin, Nefedov 2009; Korotayev, Khaltourina 2006; Korotayev, Malkov, Khaltourina 2006; Korotayev 2014; Korotayev *et al.* 2011; Korotayev, Malkov, Grinin 2014). The human society development towards the goal was spontaneous, either approaching it or moving away from it.

– **Paradigm 2** implies that the relationship between production and consumption is mediated. This development paradigm originated at the outset of technological developments, division of labour, emerging markets, diffusion of middlemen and the universal equivalent for exchange of deliverables, *i.e.* money. Progressive geographical expansion and development of foreign trade brought about the transformation of the first direct development paradigm into the second mediated one. Its development was accelerated by the transition to industrial technologies. The flow of production was formed. Domestic and foreign trade was evolving, too, featuring geographical expansion to a global scale. Production and trade were focused on mass markets to achieve the only goal, namely generating as much profit as possible. Demand from the abstract end-consumer is met through a spontaneous, archaic, market-based form of communication, mediated by the extension of time and space. The needs of individuals are not considered. Under these conditions, uncertainty of consumption resulted in the emergence of an increasingly growing disproportion between the time of production and the time of circulation of goods and money and, finally, caused them to grow utterly desynchronized. The time of circulation exceeds manifold the time of production. A huge gap appeared between the dynamics of physical and monetary factors of production. The development towards the goal is spontaneous with evolution followed by involution, and vice versa (see, e.g., Grinin, Korotayev, and Malkov 2010). Therefore, cycles and crises, chaos and complexity, and all other negative events in human society development, being the result of this kind of development. They are, repeating themselves, but on a greater scale and with greater probability of a catastrophe in the final stage. Moreover, the increase in the time of circulation of goods and money compared to the time of their production is the underlying reason for inefficient use of all, including human, resources, or for non-recoverable losses.

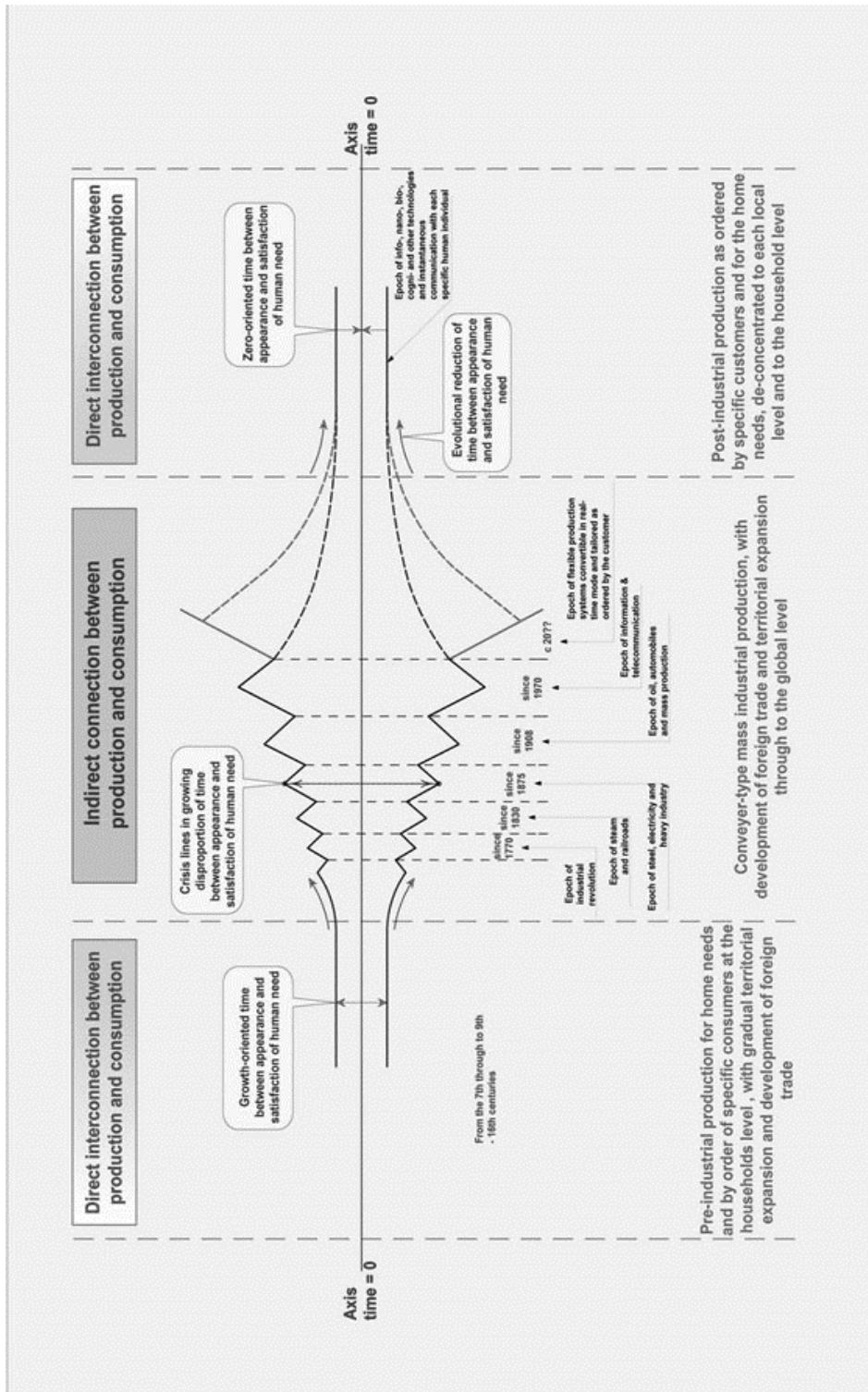


Fig. 1. Representation of the human society development

Combating the financial crisis with the tools of monetary policy only aggravates this gap in the movement of the real product and money, and makes for a greater disproportion between the time of production and the time of circulation of goods and money. This is exactly why Raghuram Rajan, President of the Reserve Bank of India, believes that the monetary policy of the advanced countries creates an environment similar to the one that triggered the Great Depression 80 years ago. Raghuram Rajan presented this outlook at the International Conference on Economics held by the London Business School in late June 2015. Rajan's words become even weightier, considering his predictions for the 2007–2008 crisis back in 2005 and his record of service. For example, before taking over leadership of India's central bank, he worked as a chief economist with the IMF and is a recognized authority in the world of economics. 'I am concerned that in order to accelerate economic development we are slowly drifting into the same problems that existed in the 1930s', Raghuram Rajan said while speaking from the platform during the conference in London. 'I think this is a universal problem. This is not just a problem of advanced or emerging markets. It is all much broader and more complex' (Manukov 2015).

When speaking about the problems driving the world to a new Great Depression, Rajan refers to the efforts made by the central banks of many developed countries to spur sluggish economies after a financial crisis through ultra-low interest rates and quantitative easing (QE). The US, Japanese and European banks have resorted to these measures in recent years. Raghuram Rajan fears that quantitative easing programs may cause the developing countries to retaliate to maintain their share in the markets, as it was the case in the 1930s. He says, '[t]he problem is that while trying to achieve growth through QE out of nothing, we do not create this growth but take it away from one another' (Manukov 2015). All the more so as the US FRS 'created' several trillions of dollars for the three QE waves. They have not demonstrated any spill-over effects yet since the velocity of money is still lagging behind the pre-crises levels (Manukov 2015). Thus, the fears expressed by Raghuram Rajan that the world may be slipping into a new Great Depression are reasonable.

In other words, the financial crisis is, in the chain pattern, increasingly transforming into the economic, political and, ultimately, systemic crises. This is the dominant model today.

The present-day systemic crisis is the peak, agony and inevitable decline of this development paradigm. That is, the model of human relations based on indirect relationship between production and consumption has worked itself out and nowadays constitutes the objective basis and source of almost all major adverse events.

Let us provide a few examples on certain phenomena. Poverty and inequality, emergence of the Bretton Woods System, creation of controlled chaos systems and systems for manipulation of human consciousness, economic slowdown, rise in prices and inflation, de-industrialisation, terrorism and corruption, some 'natural' anomalies and disasters, information and real wars with numerous victims and losses of property – all these are links of the same chain, a product of the mediated development model. The recent events in Ukraine, the EU, the USA, Russia and other countries of the world are the yield of this development paradigm. The factor of time in this paradigm of human relations plays the most negative role.

Any attempts and real efforts that have been recently made to reshape the existing model of development, *e.g.*, through renunciation of the Bretton Woods System and

the dollar as the only world currency, will only lead to greater disproportions. Thus, in its efforts to create an equivalent of western international financial structures, today China has taken part in the establishment of a BRICS international bank, a currency pool, and a bank for Asian infrastructure development, and emerges as one of the world's leaders in terms of its influence in Asia and other parts of the world (see, *e.g.*, Grinin, Tsirel, Korotayev 2015). China is already using its holdings of gold and foreign exchange to assist the weak and struggling nations, to which China is going to extend loans. For instance, China provides support to Venezuela and Argentina, and makes similar promises to Russia – meaning that China is strengthening its position as a lender of last resort for many countries, thus reshaping dramatically the global economy. Even though the Western supremacy in the world economy may or may not be terminated, under these conditions there is no guarantee that the Chinese supremacy will not occur. If the Yuan, which accounts for over 80 % of all trading operations and more than 90 % of all international transactions worth hundreds trillion dollars, becomes the world reserve currency, there is no guarantee that China, like the USA, will not begin printing national money without any limits. Once it ceases to be the world's factory supplying its goods to all destinations on the planet, China may replace them with the only commodity, *i.e.* money, and make for another Bretton Woods System or a greater gap between real products and money. The disproportions will increase whose consequences are rather obvious.

The same negative consequences will result from evolvement of the existing development model, *e.g.* consolidation of BRICS, the Eurasian Union or any other union, since the new environment with a common global market based on the consolidated space offering free movement of goods, services, capital and labour, will not allow to become new powerful centers of economic development. Why? Because it maintains and enhances the lack of balance between the time of circulation of goods and money and the time of their production. And secondly, because today all countries have different 'in-between' time positions, *i.e.* at different levels of development compared to the objective development goal, and they will never be able to get their interests coordinated.

The Balance of Technological and Social Changes – the Basis for Transition to the New Model of Economic Growth

So we can see that the existing paradigm of human development represents mediated relationships between people that are not consistent with the present era of hypervelocities, digital, info-, cogno-, nano- and other technologies of the 21st century, and the employment of these technologies is not yet intended for implementation of the objective goal of the human society development.

And here is the objective reason why the interests of nation, business and communities become too different in the vast 'in-between' domain, and they do not match the interests of an individual. At the moment the world objectively finds itself in the most challenging time period, the period of transition from one development paradigm to another (Fig. 2). According to Christopher Coker, Professor of International Relations at the London School of Economics (LSE) and philosopher of war, '[n]obody wants to live in the days when the world order is breaking down. These are really dangerous times' (Coker 2015).

The highest priority is now seen in the need for driving the development toward the objective goal not by trial and error, but in a conscious manner. It turns out that we really need a new model of development. But what should it be like? When offering their version

of a new model, some scientists think, for example, ‘that this model must combine strategic planning and self-organized markets, and a continuously growing private sector supported by the government. The key element of this concept is harmonization of interests’ (Buzgalin 2015). To substantiate these suggestions, examples from Asian and Scandinavian experience are given.

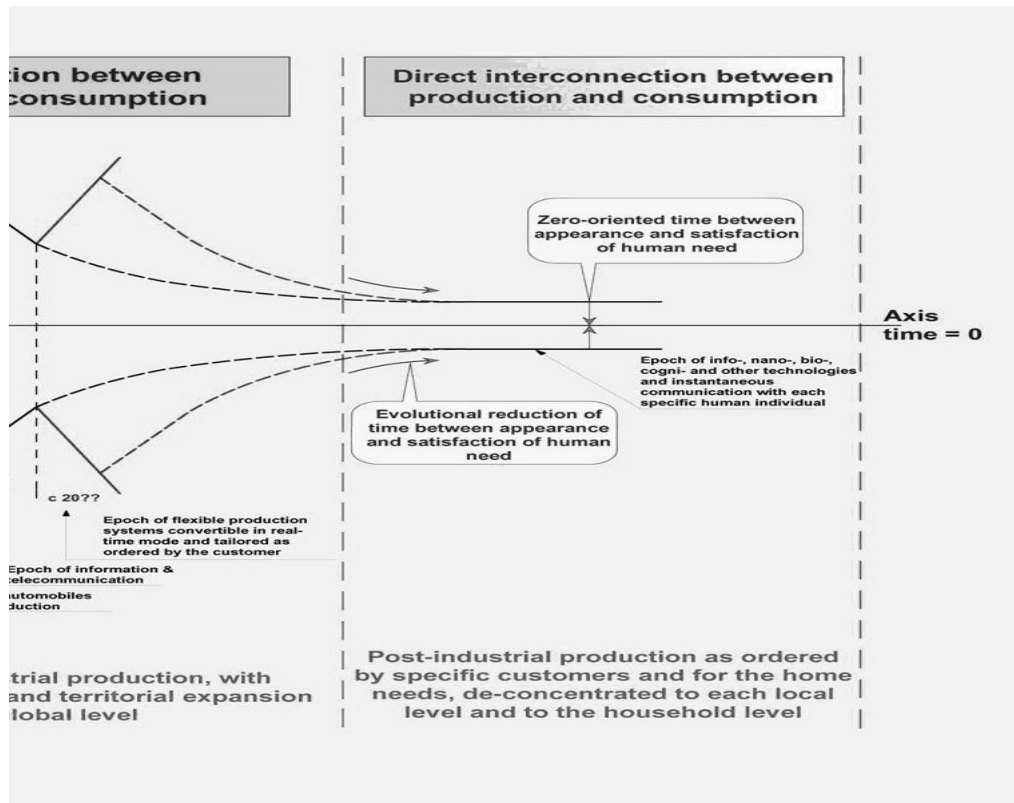


Fig. 2. Representation of transition to the new (first) development paradigm

But are the above-cited suggestions really correct? As for the Chinese experience, we should note as follows: yes, indeed, we witnessed a Chinese economic miracle called a socialist market economy. As some researchers of China suppose, this economy incorporates the systemic approach and determines the way a modern economy can and must develop. But our studies based on the worldview approach have shown (we mentioned it in our previous section) that the Chinese economy is not quite effective. Let us refer to facts. For example, in 2009–2013, USD 6.8 trillion of investment was wasted because of the Chinese government’s endeavours to stimulate economic growth and hyperactivity of the construction industry. This is what research conducted by the National Development and Reform Commission and the Academy of Macroeconomic Research showed. During this period, nearly half of all investments in the Chinese economy were ‘ineffective’, as pointed out by the authors. Evidence of this can be found, for example, in ghost cities with empty high-rise buildings (Fig. 3), unused motorways and abandoned steelworks

(Nevelsky 2014; Grinin, Tsirel, Korotayev 2015). Similar examples of inefficient use of all resources, including human resources, can be found in every country of the world, including Russia.



Fig. 3. New ghost cities with empty high-rise buildings

Let us return to China. While demonstrating a very high level of income inequality and inevitable reorientation from foreign trade to the domestic market, the growth rates of the Chinese economy are going down dramatically. ‘Persistent slowdown of the Chinese economy within the next years may lower global economic growth below the level of 2 %, which is interpreted as a recession, Ruchir Sharma, Head of Emerging Markets at Morgan Stanley Investment Management, one of the world's largest investment banks explains: “The next global recession will be made in China,” he predicted in his interview to Bloomberg. According to Sharma, “over the next couple of years, China is likely to be the biggest source of vulnerability for the global economy”’ (Los 2015). This is confirmed by many other facts as well. For example, ‘Chinese corporate debt is estimated at USD 16.1 trillion, or 160 % of GDP, which is twice as much compared to the USA. Experts see the reason for such a big debt in Beijing's endeavours to stabilize economic growth. Wang Tao, Chief China Economist at UBS (Switzerland), whom the agency quotes, believes that the current situation may lead to “a crash landing” of the Chinese economy. He emphasizes that over the past few years Chinese officials have been trying to stimulate capital inflows into the real economy. But now corporate incomes slow down as the prices decrease, which makes debt repayment even harder’ (IA lenta.ru 2015). Let us give another example. On July 27, 2015, for the second time in the past month, the Chinese stock market tumbled by 8.5 %. This marked the record-breaking fall of the Chinese indices in the past eight years... (IA Interfax 2015) These facts fully confirm our implications for the lack of effectiveness of the Chinese model (Grinin, Tsirel, and Korotayev 2015).

As for the Scandinavian economic model, many economists point out that, firstly, it suggests the largest extent of government interventions in the national economy, the highest level of GDP redistribution through the national budget, and at the same time the low-

est level of corruption, bureaucracy and abuse. Secondly, this exists because the Scandinavian system is based on truly democratic principles, when the government acts transparently and is controlled by a network of civil society institutions. As far as the Scandinavian economic model is concerned, using the worldview approach we can state the following: on the one hand, redistribution-based relations not directly related to labour input, which these countries are so proud of, ultimately suppress motivation to increase labour productivity and cause decay of personality. On the other hand, there is, for example, Iceland that was recognized in 2007 as the best country of the world to live in, but in terms of area and population this country is equal to our municipalities, although, unlike them, Iceland is financially autonomous. Moreover, with the use of information technologies Iceland, peacefully and without a revolution, shifted to direct and open democracy. That is, they managed to get individual interests of each particular person taken into account, and captured this decision in the new Constitution. The first line of the fundamental law says, 'We, the people who inhabit Iceland, wish to create a just society where every person has equal opportunity'. This is the preamble of the Constitution (IA RSP 2013).

Therefore, we can conclude that the existing model of development represents mediated relations between people, which, on the one part, are not consistent with the present era of hypervelocities, digital, info-, cogno-, nano- and other technologies as we have said before, and, on the other hand, it is rather ineffective and tends to exhaust all types of resources. All this multiplies as long as the development towards the objective goal occurs by trial and error, unconsciously, or as the model is denied. Or it occurs in a conscious way, but to the benefit of a limited number of people and their individual goals. This is why transition to another path of development is of the highest priority. But this path must make for development towards the objective goal in a conscious way, through evolutionary, irreversible and continuous minimization of the 'in-between' time, and full achievement of the goal.

The worldview approach not only enables us to objectively see the virtual inevitability of transition back to direct relationships that are typical of the first development paradigm, but also the way to shape another model of human relations and arrangement of life provided that the objective development goal is met. It only becomes possible with the emergence of digital and other technologies of the 21st century, through which production aims to meet the needs of each particular person again, and no excess produce is left, and with digital equality in terms of access to wealth in its full diversity. Only digital equality between particular people, equal access to wealth based on ordering, as well as coordination of people's interests at each local level through self-management, will allow eliminating all systemic shortfalls in social and economic development of each country. This condition, being the only one possible, will ensure security of the person, his/her neighbourhood, region, country and the world as a whole.

This is the only way to solve the complex tasks of coordinating the joint activity of all economic agents and optimising their relationships in a fundamentally new social environment. Thus, transition to the direct relationship between production and consumption makes it possible to exclude the root cause of the systemic crisis and shift to an evolutionary path towards the development goal.

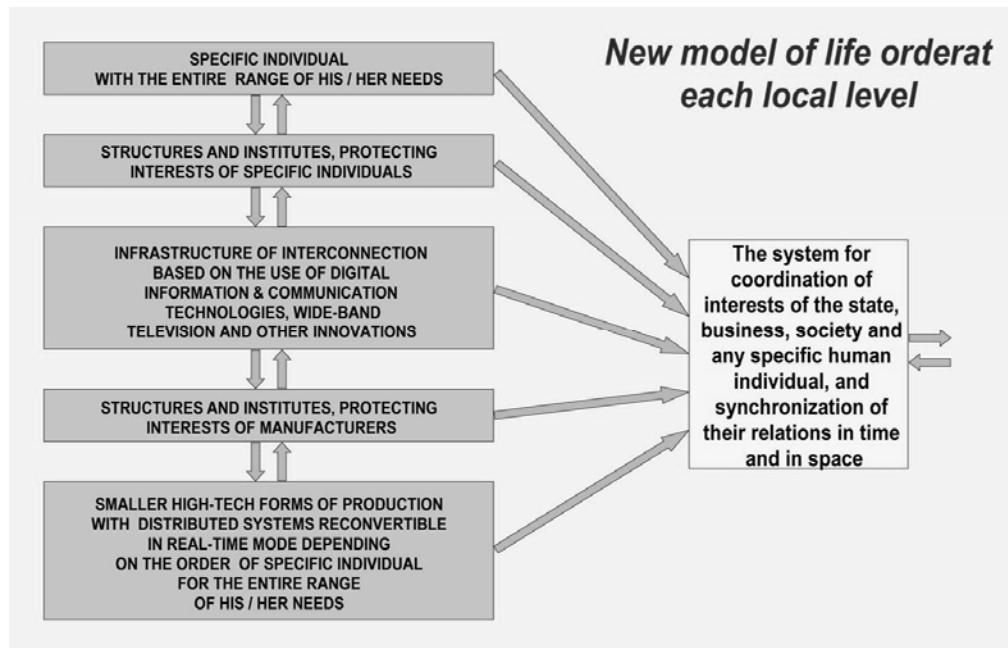


Fig. 4. Representation of a new model of living arrangement

Here is a diagram of a new model of living arrangement (Fig. 4). This is a new model of relations, and it must develop at each local level simultaneously. Information technologies adequate to these relations will allow creating a mechanism for coordination of the interests of the government (self-governing authorities), society and business with the interests of individuals towards the sole goal of creating an environment where each individual would be able to attain perfection. It is not without reason that Ervin Laszlo emphasizes in one of his articles that ‘deliberate movement towards a well-organized system of cooperative communities that are focused on the common goals of maintaining the system of life on the planet is vital necessity’ (Laszlo 2012). More details on this model of living arrangement can be found in other works of the author of this article (Bondarenko 2014b, 2015a, 2015b).

Using the existing and future digital additive technologies, any physical thing could be produced almost instantly. Wide availability of digital technologies in industry is already challenging the traditional business models specific to the mediated model of development, since digital production rests on personalisation, that is, production for a ‘single-person market’.

These examples are fully indicative of the fact that the paradigm of human relations based on a mediated relationship between production and consumption has run dry with regard to flow, or mass, non-targeted production. This model is very costly and rather inefficient, it has caused most of those negative and (in some cases) catastrophic consequences that we are witnessing today.

That is, we already find evidence of the laws of the human society development identified theoretically through the worldview approach in life.

At the same time, there is another side of the digital revolution in industry and other areas, which increases the time between the need to achieve the objective development goal and today's reality dictated by the model of living arrangement. In other words, transition to a new unmediated paradigm of development will occur sooner or later, but it alone does not guarantee that this will happen to the benefit of a particular person for him/her to attain perfection.

Thus, for example, US military experts engineered a technology for cooking food under combat conditions using a 3D printer. American scientists, with the participation of a research team from the Massachusetts Institute of Technology, have designed a 3D printer capable of producing food according to pre-defined parameters. These parameters include calories, proteins, carbohydrates and vitamins, they consider preferences of soldiers and allow a bigger choice of food in the combat ration. Therefore, by using the 3D printing technology the US military seek to improve combat readiness, extend its potential and enhance military unit effectiveness.

Another example. Today, in the light of the ongoing crisis and deterioration of purchasing power, the existing retail sector, as one of the key elements of the mediated development paradigm, is looking out for new ways to expand its impact and influence consumers. Previously, NLP technologies were used to influence the customer, thus boosting sales and generating profit. Nowadays digital technologies have replaced them. They do not only include interactive digital assistants used for promotional purposes, but also 3D printers in e-commerce to print goods in a specially equipped delivery truck while on the way to customers (Fig. 5), promotion of cyber and wearable technologies, and technologies offering to carry your physical presence over into the virtual world using mirror touch screens.

The need for such systems is supported by the fact that 'the time lag between the receipt of an order and delivery of goods to the customer potentially decreases the level of customer satisfaction and has a negative impact on revenues' (Quirk 2015).

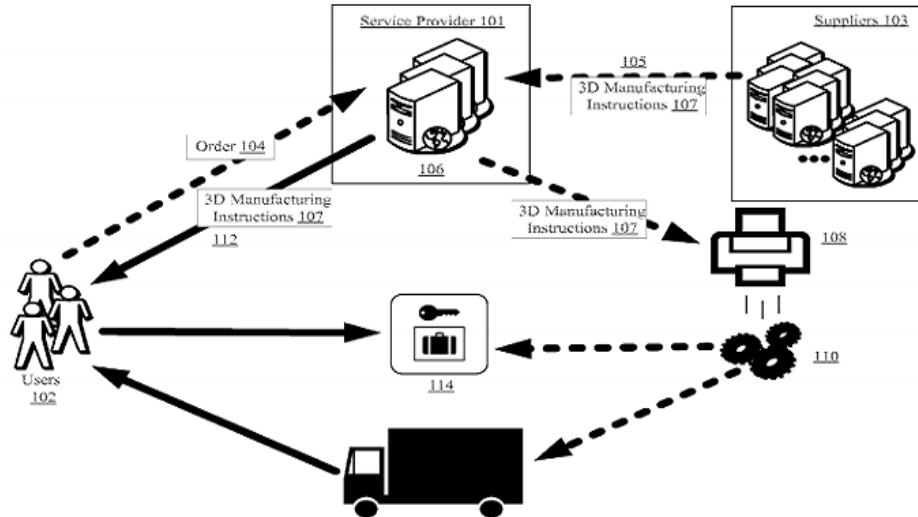


Fig. 5. 3D printing of goods in a specially equipped delivery truck while on the way to customers

On the one hand, this means a decrease in the demand for warehouse premises but, on the other hand, the stock of goods will become endless. That is, flow production of goods is drawing towards trade. Thus, the mediated development paradigm is supplied with new capabilities to survive on.

However, the greatest hazard about prolonging the agony of the mediated development paradigm does not belong to the aforementioned digital technologies. The hazard is that retailing becomes subject to virtual-reality technologies, promotion of wearable technologies, and technologies offering to carry your physical presence over into the virtual world using mirror touch screens (Bird 2015), and it becomes capable of influencing the mind of each customer individually. The Internet of Things (IoT) is gaining ground. This is a network that enables physical objects to communicate without requiring human interaction and mind.

In retail, these technologies pursue the same objective of having impact on the human being so as to get the person trapped and promote sales. Digital technologies allow remembering the customer's search queries, which makes software more personalised when used often (Sinha-Roy and Richwine 2015).

According to recent research conducted by ResponseTap, 73 per cent of respondents representing the business community stated the information on individual purchasing experiences was of great importance. These days dominance is potentially assigned not to the Internet that offers human-to-human interaction, but the Internet of Things. The inventors of these systems believe that pretty soon big customer data are likely to transform to super data. Using them, the IoT technologies will be able to collect and interpret information, and send findings directly to marketing specialists. As we can see, all this predetermines artificial intelligence surpassing that of humans.

Therefore, if we take a look at the retail sector, we can see that we are here also moving towards our own 'singularity'. We refer to the point where the time between the origin of the need for some product and availability of this product for purchasing tends to zero, where the digital and physical retail worlds converge, and the borders disappear completely; when traditional stores become as 'smart' as their Internet peers (or even 'smarter'); when purchasing data and history are instantly registered and stored by the system; and the level of Artificial Intelligence impresses customers all over, regardless where they decide to pick and buy products. Soon there will be no borders between offline and online trading, as the 'retail singularity' or, rather, technological singularity in commerce would sweep off all such borders on the way (Rees 2015). Is not what the American scientist Vernor Vinge wrote about in 1993 in his article 'The Coming Technological Singularity: How to Survive in the Post-Human Era', a topic also looked at by other scientists (Vinge 1993; Hanson 1998], including Russian researchers (Novoselov 2001). According to Vinge, 'singularity' is to occur as soon as 'in thirty years (*i.e.* in 2023), when technologies allow for superhuman intelligence creation. Shortly afterwards, the age of human supremacy will inevitably come to an end'. Whatever the case, according to Vinge (and, by the way, Stephen Hawking and other prominent scientists, as well), we still have a long way to go to Apocalypse. But is it really only about moving to apocalypse? Whether Vinge and Stephen Hawking are right or not, we will uncover below.

A similar situation that shows that the world stands on the brink of technological singularity is observed when 'smart' cities of the future are created. The first smart city appeared in South Korea. This largest project for construction of a 'smart' city is called

Songdo. It is located on a man-made island. This grand project is being implemented by Cisco, 3M, Posco E&C and United Technology (IA Mico. Technologi 2014).

Songdo was conceived to become an important business hub in North-East Asia, and the developers expect the city to attract many companies that wish to engage in trading and business activities in this region. Similar objectives are set when designing smart city concepts in other regions of the world. Such projects are included in the urban development plans of China and India. Traditional cities and towns are growing “smarter”, as well. A new smart city called Innopolis is being created near Kazan in Russia. The developers pursue the same goal, *i.e.* to develop high-tech business (Shchukin 2015).

But what makes smart cities different? All life-support systems in each building of a smart city intercommunicate through a single centre. A variety of robots and automated solutions are everywhere, including garbage collection, cleaning of skyscraper windows, traffic control, trading, *etc.* All this is done by smart machines, not people.

A single network may power a fridge and a multi-cooker, traffic lights at an intersection and, say, automatic equipment at a power plant. City objects start living on their own with minimum human intervention. The weather station registers precipitation and a fall of temperature, while the signal from it is transmitted to the air conditioning system in every office making it adapt to a new regime, and the coffee machine makes hot coffee to meet you because your car has already communicated your arrival at the parking place. We can provide many more images, but we should not forget that it is not about an individual's way of life. It is rather about a streamlined housing and utilities infrastructure, security and life-support systems, *etc.* In other words, the purpose of smart cities is to create an environment for businesses and scientists who invent high-tech systems, and to try out the smart city technologies for the sake of their subsequent roll-out in order to generate profit, but not the people who will inhabit them.

This is why the smart city concept can boast of both supporters and critics today. The critics say that a smart city offers a human being a good many opportunities, but at the same time it makes him/her a small dot on a huge screen that displays where the person is, and what he/she is doing at any moment of time. According to Adam Greenfield, the author of ‘Against the Smart City’, the concept of a city as a huge high-performance robot is attractive for major IT companies, like IBM and Cisco, which look forward to big municipal contracts. It is of no use to individuals and communities (Beresneva 2014).

Using the example of Songdo, experts began to discuss another problem of a smart city, apart from continuous monitoring of every person, when the Control Centre provides images of people at every corner of the city, 24 hours a day, seven days a week. It is the risk of so-called digital inequality. It turns out that complete integration into the urban environment is only available for a person who owns an advanced gadget with all applications installed. Citizens who do not have up-to-date smart phones for whatever reason become deprived of most of their rights and find themselves disconnected from the vast majority of crucial processes. For example, in a smart city they will not be able to choose to make a payment either online or in the same old way through a bank office. They will not be able to buy a train ticket at a booking office or take advantage of any other opportunities.

During the Future Cities Summit held in early December 2014 in London, many reports were made on new technologies destined to change the living standards of the cities and their inhabitants, and quite a few smart city projects were presented, but there was also

enough criticism of the idea itself. It may be worth taking notice of the opinion expressed by Jonathan Rez from the University of New South Wales quoted by *The Guardian*. ‘Architects engaged in the planning of cities of the future should employ psychologists and ethnographers as part of their teams’, he says. ‘What is a city if not people?’ (Beresneva 2014).

Finally, experts are apprehensive about situations that may occur once the software is out of order. How will such a city carry on without the Internet or in case of a power blackout?

Besides, Russia demonstrates currently a discernible trend towards the ideas of a digital revolution. We can imagine how dangerous these digital technologies, nano-, bio- and cognitive technologies, virtual reality, development of the Internet of Things, creation of smart cities, and other artificial intelligence technologies are. Digital inequality will become more severe, and other adverse effects will show up, if these technologies are widely used not just within the existing paradigm of development, but also the new one, and if the humankind does not recognize the objective development goal.

This problem could only be solved if ‘technological singularity’ is complemented with a singularity in shaping a new model of living arrangement. Combined, they will allow achieving a ‘humanistic singularity’ or, rather, accelerating penetration into the area of ‘singularity’, where the time between the achievement of the development goal and the reality for each particular person and society will tend to zero in every possible way. Most regrettably, nobody addresses the need for remaking the fundamentals of the human society, *i.e.* the creation of a new model of human relations, a new model of living arrangements that would be adequate to the technologies of the 21st century.

The Paths to Attaining the Balance of Technological and Social Changes

The most important thing that we have derived from the worldview approach is that it helps to define the fundamental concept of the new model of living arrangement and to substantiate the need for and possibility of the development and implementation of the MEGAPROJECT titled ‘The Territory of Advanced Development: for the Good of the People’. The core idea of the Megaproject in solving the strategic goals is to build up a new basis at each local level in any country of the world simultaneously, *i.e.* new direct human relations adequate to the technologies of the 21st century, and a mechanism for their implementation through real-time coordination of the interests of the government, community and business with the interests of an individual. This is the shortest practicable way to the desired future. Why? Because while every individual represents being a customer and a consumer of all the goods, at the same time represents the government, business or civil society, and as the time between the arising of the need for achievement of the goal and the fulfilment of this need decreases, the interests will increasingly match.

One of the examples of well-coordinated interests is the launch of the online project Active Citizen in Moscow, which is at its early stage of development as of yet (IA Mos.ru 2015). The Project invites every Muscovite to take part in urban management and helps authorities to make the decisions that most inhabitants of the capital city look forward to. The initiators of the Project believe that having experienced the effect of online referendum once, Muscovites will never refuse from the service voluntarily and will not let the authorities to wind it down.

When addressing the tactical tasks of the Megaproject, the key issue is the following:

1. For Russia: the project can be developed by scientists from all institutes of the Russian Academy of Sciences, which is a motivation for the further existence of the RAS. In this connection, we should remember the GOELRO megaproject (the early 1920s) for the throughout electrification of Russia, which was accomplished most efficiently and successfully.

2. Globally: an international interdisciplinary team of scientists and practitioners could be created to develop the Megaproject with the involvement of the global intellectual community in the development of the proposed model where people are united by a network, possibly under the auspices of the UN. Given that in September 2015 in New York the international community has approved a new set of goals for sustainable development for the next 15 years and the Sustainable Development Agenda (UN 2015), it is crucial for all humankind that from the very beginning this set of goals should be considered as part of the objective development goal, now that the global demographic development and scarcity of natural resources are increasingly problematic (*Ibidem*).

3. The pilot project should also be implemented under the auspices of the United Nations locally in different countries, and, once tested and improved, the transfer of the new model of living arrangement to the entire world should be ensured. The collective shaping of a new model of living arrangement is the message Russia could send out to the world. The project could be integrated into the UN Sustainable Development Agenda. It could be part of sections like the one regarding social contracts, for example. This will help to ensure social protection and not only to provide basic public services in the fields of healthcare, education, power, water supply and sewage, but also to make available the access to the entire circle of physical and spiritual human needs for each particular individual, not for all people in an abstract way. Moreover, implementation of this project will allow to achieve the whole set of goals previously approved by the UN for the first time in history, as well as to guarantee the respect of human rights set out in the Universal Declaration of Human Rights adopted by the United Nations General Assembly back in 1948.

4. The proposed project may also become an integral part of a new global infrastructure of the United Nations, a forum aimed not only at stimulating investment in infrastructure to ensure sustainable development, but also at effective investment management with minimum resources and maximum result, which will ensure overall implementation of the ideas for protection and conservation of our planet and natural resources, biodiversity and climate.

5. If the project is supported by the UN, the Technology Facilitation Mechanism stipulated in the Agenda will apply, which opens new horizons and facilitates the development, transfer and extensive use of corresponding technologies. It is not a coincidence that we have already written in our book titled 'Forecasting Future: a New Paradigm' (published in 2008) that the issue of the UN transformation as an institution for coordinating the interests of humankind at a global level is extremely important. The key objective of the UN, or any other institution established under the UN, will be the provision of a dedicated structure to accumulate all knowledge, from the origin of humankind to the present day, and especially the knowledge received from the future. From this database of scientific and technical information, one will be able to retrieve any piece of knowledge for the purpose of building technological connections between the origin of a particular person's need and its fulfilment in any point of the planet, which ensures increasing synchronization of

all processes in space and their continuous decrease in time. The missing knowledge dictated the need to continue the R&D in the respective spheres (Fetisov and Bondarenko 2008).

6. The UN-supported partnership of the government, business, society and an individual brought together in the pursuit of common goals at each national and supranational level gives hope that the theory and practice of solving the issue of sustainable development will coincide in time and space. Most importantly, when considering the interests of each human being, there is real hope that the effective resolution of challenges faced by any country of the world is subject to every inhabitant, and efforts will be made to facilitate it.

Conclusion

The change of development paradigm is an objective process. However, the outcomes of this change may vary depending on the dominant model of living arrangement that will be the first to achieve 'singularity', *i.e.* the point of no return.

Model option 1. The development occurs in a conscious way in the interests of a limited group of people towards their goal. There is a discernible trend for 'technological singularity' that stems from artificial intelligence and technologies for manipulation and control of human consciousness. The ultimate goal is to take control over the world. It does not match the objective development goal. The future where the time of achievement of the objective goal equals zero will never happen. We are edging towards an apocalypse.

Model option 2. Goals may be chosen in a conscious or unconscious way, and intrinsically they may constitute subgoals of a higher goal, *i.e.* the objective goal of development. Simultaneously, a limited group of people set their own goals. The two groups are moving in different directions. The development towards the objective goals occurs by trial and error. Therefore, in this case the future is uncertain, *i.e.* the time of achievement of goal 'singularity' may or may not come. But this will be much extended in time and accompanied by significant human and resource losses, and may also lead to an apocalypse.

Model option 3. The development occurs in a conscious way towards the objective goal and in the interests of each particular human being living on the Earth. Focus on the interests of an individual and coordination of these interests in real time through production at request without unnecessary produce is the only possible prerequisite for sustainable development toward the goal. In this case, technological singularity is synchronized with singularity in shaping new human relations, and their understanding of the need for evolutionary and irreversible progression towards the point where the time of goal achievement equals zero.

Thus, the new development paradigm and the benefits of the digital revolution in industry, all other areas and everyday life will only do the humankind good if there is simultaneous creation of a new model of human relations objectively aimed at development for the sake of a particular person and his/her attaining the Supreme Intelligence. In all other options, mankind is headed towards an apocalypse. It is not without reason that Ervin Laszlo notes in his article 'Global Bifurcation: The Decision Window' that '[w]e have reached a watershed in our social and cultural evolution. The sciences of systems tell us that when complex open systems ... approach a condition of critical instability, they face a moment of truth: they either transform or break down' (Laszlo 2011).

This is why it is important to comprehend that a change in the development paradigm will cause the creation of a real-time mechanism for coordination of the interests of the government, society, business and an individual through production at request without unnecessary produce as the only possible prerequisite for sustainable development towards the goal. Given that, the prerequisite for balanced technological and socio-economic changes in real time as the basis for eliminating the root cause of the crisis is to recognize and accept objectivity of the human society development goal, which is the creation of an environment where every individual would be able to attain perfection!

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From Millennium Development Goals to Sustainable Development Goals

Ilya Ilyin, Arkady Ursul, Tatyana Ursul, and Midegue Dugarova

This article investigates the transition from the Millennium Development Goals (MDG) to Sustainable Development Goals (SDGs). The authors have set an objective to demonstrate that sustainable development as a future form of development of civilization from the very beginning had a 'target orientation' and anticipated realization and staging of the whole hierarchy of objectives needed for the establishment of an effective global governance. In the future, global development in its 'anthropogenic' aspect will be to implement the goals and principles of SD, which will be updated with each new stage of the implementation of this kind of socio-natural evolution.

The paper argues the position that the concept of SD should be radically transformed into a 'global dimension'. Attention is drawn to the fact that Russia recognized another distant, but very important in the conceptual and theoretical perspective, global goal of 'sustainable transition' – formation of the noosphere.

Keywords: *biosphere, ecological problems, global development, global governance, MDGs, noosphere, SDGs, security, sustainable development, UN.*

Introduction

After the United Nations conference on environment and development (UNCED) held in Rio de Janeiro in 1992, humanity set a goal of transferring from spontaneous and unregulated development to conscious and purposeful socio-natural sustainable development, which is the main way of survival. The sustainable development (further denoted as SD), which is supposed to become rationally directed at the planetary scale, is understood as the most reasonable and safe type of socio-natural evolution, aiming at maintenance of civilization and biosphere, their co-existence and co-evolution.

The book *Our Common Future*, also known as the Brundtland Report and devoted to justifying the need for transition to sustainable development, gave the following definition of SD referring to the future: 'Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs'. In fact, this definition contains the main goal of transition to sustainable development – survival and securing human existence for indefinite long-term future. The notion of global sustainability also implies ensuring equity with regard to generations, so that the future world is comfortably habitable for the future generations. Along with this, sustainability in a broad sense, as emphasized in many UN documents, should serve as a fundamental principle for all aspects of development and in every society.

The preservation of biosphere and its co-evolution with civilization will create the fundamental conditions and perspectives that will form a completely new 'nature – socie-

ty' system which implements a sustainable development strategy ensuring our common future on the planet and outside its boundaries – in perspective of space exploration. Preservation of the Earth biosphere also counts as one of the main goals of transition to SD. But not only it is a goal, but if achieved, it is a natural foundation for sustainable development as a consecutively evolving new socio-natural global process. The most acceptable scenario of the future of our planet and mankind living on it involves the preservation of the biosphere as the natural basis of existence of all living and intelligent organisms. If taking globally – coordinated actions manages to preserve the biosphere, there will be a real possibility of the survival of civilization and its permanent development, not only in the next few centuries, but also for the indefinite future.

The problematics of transition from MDGs to SDGs is very urgent and important and this article continues the topic that has been discussed in an earlier article published in the journal (Mironenko *et al.* 2015).

Towards Establishment of SDGs by 2030

Sustainable Development Goals (SDGs) are a continuation of the Millennium Development Goals (MDGs), which allocated eight priority goals for international development. The development of MDGs was based on eight chapters of the UN Millennium Declaration, signed in September 2000. They were adopted by the UN member-states and had to be mostly achieved by 2015. One of the main features of the MDGs is their focus on a limited set of specific targets and human development goals: eradicating poverty and hunger, achieving universal access to primary education, reducing child and maternal mortality and improving maternal health, promoting gender equality and empowering women, combat HIV / AIDS, malaria and other diseases, ensuring environmental sustainability and creating global partnership for development. MDGs concerned eight development areas, which, by the way, were not formally bound to SD (except for the environmental goals).

The UN's directory believes that impressive success has been achieved in reaching many of the global development goals, expressed in the Millennium Development Goals. As it was mentioned by the UN Secretary General Ban Ki-moon in a foreword to 'The Millennium Development Goals Report 2015':

The global mobilization behind the Millennium Development Goals has produced the most successful anti-poverty movement in history. The landmark commitment entered into by world leaders in the year 2000 – to 'spare no effort to free our fellow men, women and children from the abject and dehumanizing conditions of extreme poverty' – was translated into an inspiring framework of eight goals and, then, into wide-ranging practical steps that have enabled people across the world to improve their lives and their future prospects. The MDGs helped to lift more than one billion people out of extreme poverty, to make inroads against hunger, to enable more girls to attend school than ever before and to protect our planet. They generated new and innovative partnerships, galvanized public opinion and showed the immense value of setting ambitious goals. By putting people and their immediate needs at the forefront, the MDGs reshaped decision-making in developed and developing countries alike.

As it is believed in the UN, MDGs have become one of the most successful global campaigns to fight poverty in human history. These goals have gained extraordinary popu-

larity, helping to set global and national priorities and directing the action at the local level, increasing awareness and forming a vision of the future, while remaining comprehensive framework for the development activities at the global level. The MDGs aimed at reducing poverty, improving access to safe drinking water and improving the lives of 200 million slum dwellers are already met. The share of children enrolled in primary school has increased while maintaining parity between boys and girls. Child mortality has reduced dramatically, and targeted investments in the fight against malaria, HIV/AIDS and tuberculosis have saved millions of lives.

And yet it is quite an optimistic point of view, since the achievement of the MDGs took place with great difficulties and inconsistency and not in all countries (Ovcharova 2015). Also, the implementation of the MDGs was uneven: some countries have already achieved many of them, while the others have not started any of them yet. The most spectacular success on this way was achieved in China and India. But in Africa, in least developed countries, in the developing landlocked countries and small-island developing states, this success was very insignificant. Some of the Millennium Development Goals, allocated in the Millennium Declaration have not been achieved, in particular goals relating to maternal, newborn, and reproductive health. Continuing the Millennium Development Goals beyond 2015, the SDGs are built on the foundations laid by the MDGs, concluding number of goals mentioned there, especially in terms of helping the most vulnerable countries, but at the same time the SDGs will also respond to the new global challenges and risks (Ovcharova 2015).

SDGs, adopted in Agenda-2030, include 17 goals for sustainable development and 169 related targets, complex and indivisible that create a set of global priorities and parameters of sustainability.

Table 1. Millennium Development Goals and Sustainable Development Goals

Millennium Development Goals (2000–2015)	Sustainable Development Goals (2016–2030)
1	2
<ol style="list-style-type: none"> 1. To eradicate extreme poverty and hunger. 2. To achieve universal primary education. 3. To promote gender equality and empower women. 4. To reduce child mortality. 5. To improve maternal health. 6. To combat HIV/AIDS, malaria, and other diseases. 7. To ensure environmental sustainability. 8. To develop a global partnership for development. 	<ol style="list-style-type: none"> 1. To end poverty in all its forms everywhere. 2. To end hunger, achieve food security and improved nutrition and promote sustainable agriculture. 3. To ensure healthy lives and promote well-being for all at all ages. 4. To ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. 5. To achieve gender equality and empower all women and girls. 6. To ensure availability and sustainable management of water and sanitation for all. 7. To ensure access to affordable, reliable, sustainable and clean energy for all. 8. To promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all. 9. To build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.

1	2
	<p>10. To reduce inequality within and among countries. To make cities and human settlements inclusive, safe, resilient and sustainable.</p> <p>11. To ensure sustainable consumption and production patterns.</p> <p>12. To take urgent action to combat climate change and its impacts.</p> <p>13. To conserve and sustainably use the oceans, seas and marine resources for sustainable development.</p> <p>14. To protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.</p> <p>15. To promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.</p> <p>To strengthen the means of implementation and revitalize the global partnership for sustainable development</p>

The approach to the establishment of the SDGs was framed not only by logical considerations, but also by those considerations regarding negotiation and consensus processes and anticipated development of a common framework and a system of universal goals applicable to all countries, taking into account different national circumstances, capacities, needs, priorities, and in accordance with national objectives, strategies and priorities of SD. The most common and priority goals of sustainable development, which will bring the maximum benefit to both present and future generations, are already included in Agenda 2030.

This Agenda also recognizes the importance of regional and sub-regional factors, interaction in the field of sustainable development, as regional and sub-regional programs will contribute to the effective implementation of sustainable development strategies into specific actions at national levels. In this regard, all the UN Member States are expected to develop a long term national programs covering all aspects of the implementation of the new Agenda for SD as soon as possible. These strategies are meant to support the transition to sustainable development and be based on existing planning instruments such as national development strategies and sustainable development strategies, depending on the circumstances. Moreover, it is assumed that both general and other SD concepts will evolve over time, taking into account emerging issues and new research methodologies.

While analyzing the SDGs expressed in the Agenda-2030, one gets the impression that there has not yet been any significant ideological and conceptual renovation, and even more – no theoretical innovation breakthrough. Implicitly, it is assumed that the desired concept of SD for the whole world has already been created, and the only problem left is its implementation, only changing the development goals after some period of time (apparently, it will be a fifteen-year period). Changing the SDGs in the long run, of course, does affect the general understanding of sustainable development and the prospects for its implementation, but it is also important to pay special attention to the conceptual transformations affecting the actors' worldview on the movement towards global sustainability.

Meanwhile, the imperfection of the modern concept of SD appears to be one of the serious reasons why humankind cannot move fast enough in the direction of its survival, which depends not only on environmental factors, which is clearly demonstrated by current aggravated geopolitical situation, which has led to new alignment forces in the world. Some researchers point out the narrowness of the three-pillar approach to SD and offer to convert it into a more comprehensive theory (Ott and Thapa 2003). American scientist Robert W. Kates also believes that the current concept of sustainable development needs further expansion and development, and environmental component must be regarded as no less important than the others (Kates *et al.* 2005). The author sees the model of sustainable development (including its environmental, economic and social pillars) as a set of clear and transparent principles of social and natural approaches to development, including the protection of natural resources and awareness of responsibility for future generations.

The first report by the UN System Task Team on the post-2015 development agenda 'Realizing the Future We Want' was released in June 2012, during the discussions of the agenda, broadly launched several years before 2015. This report featured not three, but already four fundamental dimensions of global vision of sustainable development strategy, namely: inclusive social development, inclusive economic development, environmental sustainability and peace and security.

The fourth dimension turned out to be of extreme importance. Indeed, as mentioned in this report, at least one fifth of the world population lives in countries affected by violence, political conflicts, insecurity and social vulnerability. Moreover, none of the countries experiencing high levels of violence or vulnerability has achieved at least one of the MDGs. The level of poverty in countries with extremely high level of violence is more than 20 percentage points above the average. A much higher level of malnutrition, lack of education, high level of infant mortality, high share of households consisting of unmarried women with young children, a lack of clean drinking water and basic sanitation services are also observed in the vulnerable and conflict-affected countries.

It is pertinent to note, the SDGs already failed to implement a four-dimensional vision of the SD, as all the goals expressed have already been distributed among 'regular' three dimensions. And in this regard, at least it seems strange that the goal to achieve international peace and security was not included in the SDGs, and for this goal the United Nations Organization was initially established. At the UN Sustainable Development Summit, the President of Belarus, Alexander Lukashenko as well as many other guests started his speech with the issue of global peace and security, because one of the key obstacles of implementing the SD strategy has always been the abundance of military conflicts and crises, which significantly undermine the progress made. The issues of peace and security, including freedom from political persecution, discrimination and all forms of violence, are crucial to the development and are one of its main components. One can only assume why such a goal was not included in the SDGs, although it is clear that SD should be the safest type of human development, ensuring its continuing existence. It is important to analyze the security problem from the standpoint of global and interdisciplinary research and to ensure the formation of a unified methodology issues and concepts of security studies in connection with the expanded interpretation of sustainable development. After all, security and development (referring to the progressive development) are guiding principles for the higher forms of material systems (Ursul A., Ursul T., and Ivanov 2014).

Ensuring peace and security aims to save and preserve a particular object (primarily the individual, society and the state), while sustainable development aims at its further, but safe progressive development. Merging into a single system providing various types of security and non-regressive forms of development turns a real multi-vector development into the safest progressive evolution, and security, in turn, begins to be provided through sustainable development in its broadest sense.

Shaping a global world is associated with the emergence of new threats and dangers of planetary scale, which can cause man-made global catastrophe. There is a need for exposure to globalization and other global processes through sustainable development, focused on comprehensive security and the survival of civilization. Moreover, in the above mentioned report 'Realizing the Future We Want' the main task of the United Nations Development Program for the period after 2015 was seen in the fact that globalization becomes a positive force for all peoples of the world for present and future generations. It was noted that globalization offers great opportunities, but its benefit is currently distributed very unevenly. Constant aspiration to improve the material well-being threatens to exceed the capabilities of the resource base without a radical shift towards more sustainable patterns of consumption, production and use of resources. And remaining inequalities in the distribution of income and resources, and competition for scarce resources are key causes of conflict, famine, insecurity and violence, which, in turn, hinder human development and efforts to achieve SD.

In the future global world with sustainable development, the national and global security will be mainly provided not through the defense, as it is in the present, but mainly through the SD as the most secure development that will contribute to the consolidation of positive and reduce the negative effects of global trends and development (Ilyin, Ursul A., and Ursul T. 2015). In the transition to sustainable development, the security ceases to be only one of the conditions of development, but becomes its necessary part. However, it also works in the opposite direction: the development, which is in this case non-regressive, is an essential component of security that derives its expression in the form of the phrase 'security through sustainable development', acting as the main conceptual idea of Russia's national security for the foreseeable future, and not only for our country, that has made an important step on the way to secure a sustainable future, but also for the entire world community (Ilyin, Ursul A., and Ursul T. 2015).

The implementation of the development program after 2015 will significantly depend on the governance efficiency at the national, local and municipal levels. Increased negative trends, challenges and dangers are now associated with chaotic deployment of globalization and other global processes; and, what is now becoming evident, it is necessary to establish effective global governance to promote SDGs. Global governance is becoming the new mechanism of the further development of civilization, which can ensure its further progressive development, prevent crises and disasters, acute global problems and increased negative trends on a planetary scale.

The content, methods and social technologies that all together form the SDGs, can be heavily criticized in the same manner they repeatedly voiced criticism over the MDGs. Nevertheless, the adoption of the SDGs and especially their implementation should have a positive impact on the future of all mankind, to make it more acceptable and safe for everyone.

SDGs as Continuation and Development of the MDGs

Today the concept of the MDGs may seem to be pretentious, especially after the adoption of SDGs. It became apparent that those goals would not only grow in number, but also they would not once undergo radical transformations this century, not to mention the millennium. However, since the adoption of these goals for the first time took place at the turn of the millennium, it seemed that the name 'MDGs' looked very good and promising. SDGs, continuing the 'target' approach does not claim to actually span for thousand years, it seems to be more appropriate, not only in terms of the name but also in terms of adopted goals and targets.

It is worth mentioning that a new agenda on SD joined the 'traditional' approach to the SD strategy, which was typical for the first three summits on sustainable development since 1992, and used 'target' approach outlined in the MDGs at the Millennium Summit as well. A specific monitoring process had been organized for each of these documents, and related reports and other materials had been published, as if they were two unrelated processes. It is possible that up to a certain point in time the UN leadership for a long time had not realized the very close relations between these processes, but then realized the necessity of their unification.

The integration of these two approaches to the vision of the future development was outlined in Paragraph 246 of the outcome document of the Rio + 20 'The Future We Want'. A connection between this document (and in general all the 'Rio process') and the Millennium Development Goals, adopted at the Earth Summit in 2000, is indicated there. The paragraph says:

We recognize that the development of goals could also be useful for pursuing focused and coherent action on sustainable development. ... The goals should address and incorporate in a balanced way all three dimensions of sustainable development and their interlinkages. They should be coherent with and integrated into the United Nations development agenda beyond 2015, thus contributing to the achievement of sustainable development and serving as a driver for implementation and mainstreaming of sustainable development in the United Nations system as a whole. The development of these goals should not divert focus or effort from the achievement of the Millennium Development Goals.

Paragraph 249 of this document states that the movement towards SD 'needs to be coordinated and coherent with the processes to consider the post-2015 development agenda'. Therefore, these two paragraphs of the final 'Rio + 20' outcome document together laid the foundation of the unification of the development program, expressed in the SDGs and the final report 'Future We Want'. Also during the Rio + 20 conference, it was agreed that 'sustainable development goals should be action oriented, concise and easy to communicate, limited in number, aspirational, global in nature and universally applicable to all countries while taking into account different national realities, capacities and levels of development and respecting national policies and priorities'.

SDGs unlike the MDGs are much more complex and significantly affect the concept of development aid. A distinctive feature of the adopted Agenda 2030 is the fact that it affects not only developing countries but also the already developed ones. In order to achieve these goals it is necessary that the developed states not only provide the develop-

ing ones with financial aid, but also take political decisions and steps to reform its own institutions. On the eve of the adoption of the Agenda, the Sustainable Development Solutions Network established by the UN Secretary General, prepared a report that analyzed how developed countries fulfilled the criteria of sustainable development (Kroll 2015). The report showed that only five states (Sweden, Norway, Denmark, Finland, and Switzerland) had already achieved all of the 17 SDGs, while the rest of the countries were left behind. The most serious challenges for the developed countries include: sustainable growth and employment for all, sustainable consumption, climate change mitigation and income equality.

Inclusion of the SDG number 10 ‘To reduce inequality within and among countries’ is not only the consequence of heated debates over increased inequality, but also an indicator that shows that the international community is to find a new balance between the concepts of the welfare state and the liberal state. A number of studies, particularly conducted by the Oxfam Group in 2015, proved that without significant government regulation, as well as without a carefully thought-out framework conditions created by the state, social inequality would continue to increasingly hamper sustainable economic growth which will result in the uncontrolled social problems in both developing and already developed countries. However, while the developed countries need reforms most obviously in the social sector, the developing countries first need to establish economic freedom.

As it was mentioned before, the key peculiarity of the newly adopted Goals is to re-evaluate the concept of development aid. Previously, with the emergence of the concept of development aid or financing for development, and up to this day, it was assumed that the global community was divided into two groups – the developed countries and developing countries, and that the first group has to provide the second one with financial aid in order to enable developing countries to move into the category of developed, thus, implying that development aid is only a temporary set of measures.

But decades of such practice have shown that this approach to development aid is impossible. It was found out that financing for development indeed improves living conditions and alleviates suffering of millions of people, but it does not radically change the entire situation, and does not solve the backlog and weak economic development issue (Easterly 2001). This conclusion is confirmed by the experience of transition of some developing countries into the group of developed countries, which is basically explained by a number of other reasons and not development aid. As a result of active discussions and practice of development aid one can see that financing for development is only a supporting element while the key to successful growth and development of society (as reflected in Agenda 2030) lies in the effective state policy and the proper functioning of international institutions and organizations, in the first place – financial and trade organization. Addis Ababa Action Agenda of the Third International Conference on Financing for Development pays close attention to the functioning of such institutions.

In addition to the abovementioned, one should note that the approach to development aid has also changed in different ways. Many experts point out that in the new millennium, not only states play the key role in the movement towards SD, but also individuals, corporations and companies that invest considerably in the third world countries development (Kharas 2007). Consequently, the SDGs have been developed not only for governments and heads of state, but also for other players – companies, private foundations, philanthro-

pists, and so on. The number of actors in this ‘sustainability process’ has also increased due to the implementation of the South-South cooperation projects, which do not replace, but complement North-South cooperation and are implemented by those developing countries that are not part of the Development Assistance Committee of the OECD. So, at the 70th UN General Assembly, China announced its intention to invest up to \$12 bln into the least developed countries until 2030.

Since the adoption of the MDGs the ideas of what measures should be attributed to the process of development assistance and which are not have also changed, as the economic development of developing countries is influenced by a combination of factors, such as foreign direct investment, debt relief, credit system, *etc.* Therefore, the OECD has introduced the concept of ‘total official support for sustainable development’ which covers a large number of sources of financing developing countries than the notion of ‘official development assistance’, that has been used up to the present day.

The new concept of evaluating the efficiency of development can lead to the creation of new tools for the states to monitor their own development. However, it is too early to draw conclusions whether such categories as ‘social equality’ or ‘environmental protection in the near future’ may be equal in importance to economic indicators when assessing the development of the state.

It still remains unclear how the UN and OECD will cooperate. In the past few decades, the United Nations took responsibility for the development of action agenda and for goals establishment, while the OECD was responsible for the development of applied issues and statistics. But given the increasing number of actors of the development aid as well as the increasing number of Goals and evaluation indicators, the commitments that the United Nations will have to take also grow in number.

The MDGs had previously been criticized for several reasons, but one can hardly overstate or overestimate the potential of the SDGs. Firstly, the MDGs contradicted themselves (Goal number three ‘To promote gender equality and empower women’ cannot be possible without realization of the Goals number two ‘To achieve universal primary education’, because in certain aspects these two goals correspond to each other). Secondly, the included targets are utopian for some states since only a complete solution of the problem and not a relative progress was recognized as a success. Because of this position, the promotion of a number of African countries to the path to sustainable development is left without proper assessment (Easterly 2009). The mismatch between the official statements and the implementation of the Action Plan into practice is often subjected to criticism, for example in terms of increased funding for developing countries from developed ones, addressing critical issues and challenges in the near future. For example, China has agreed to invest heavily in the development of non-least developed countries which are commercially advantageous for national business. Such criticism is valid for a number of other developed countries. Another example is the reduction in funding of camps for the Syrian refugees in recent months, which also does not meet the statements of officials.

Some Differences between the MDGs and the SDGs

The UN Task Team on the Post-2015 Development Agenda identified in 2012 advantages and shortcomings of the MDGs. Due to the concentration on the performance of a small number of problems, some of the components of the MDGs were underestimated. At the

stage of implementation, it became clear that some targets were not delivered properly. For example, in some areas the demographic changes were underestimated as well as the respective scope of social problems (*e.g.*, the share of urban population living in slums) were also underestimated. Moreover, the emphasis on global goals led to the disregard of national circumstances and differences in the initial conditions of different nations. This caused the failure, even in the cases when the achieved results have been significant, but did not provide the achievement of global goals, as is the case with the African countries.

In addition, the MDGs did not address issues of manufacturing employment, violence against women, social protection, inequality, social exclusion, biodiversity, chronic malnutrition and an increase in non-communicable diseases, reproductive health and the challenges associated with demographic dynamics, peace and security, governance, rule of law and human rights. The MDGs paid insufficient attention to the exposure to natural disasters and other external crises, which caused gaps in the achievement of the MDGs.

Several goals and targets related to the global partnership for development were identified inaccurately, thereby weakening the responsibility of the promised international support in the implementation of the MDG framework. Many of the commitments made by the international community, remained unfulfilled. Important obstacles on the path to sustainable and inclusive development remain in many developing countries: lack of access to financing for development sources, export markets, technologies and medicines. The global economic and financial crisis of 2008–2009 and its aftermath have revealed serious shortcomings of multilateral mechanisms to minimize and overcome the shocks caused by the instability of world markets.

Here, still continuing to identify differences between SDGs and MDGs, we do not lay claim to completeness, and we only dwell on some of them, which seemed to us the most obvious and significant. In fact, this is the setting of the problem (and the same research can be conducted in the future regarding the Agenda-1992 and Agenda-2030). Now we are going to highlight the following differences between the two documents:

1. First of all, let us pay attention to the fact that the MDGs mainly concentrated on development in its broad sense, while the SDGs only focused on Sustainable Development. And this is quite significant: now the SDGs are going to the full extent implement the strategy of sustainable development, but not only because there is a greater number of just the Goals. No less important is the fact that the change of the term ‘development’ to the concept of ‘sustainable development’ means that the action and efforts on the continuation of unsustainable development will no longer be promoted. Although in fact the MDGs actually ‘worked’ mostly for the SD, however, formally it was not their main goal to focus on this type of development and this made the poor informed population believe that everything is as usual, that society only needs to operate a little better and fairer.

2. The MDGs until 2015 have been developed and adopted for the development of the world community on the way to solve global problems such as hunger, extreme poverty, gender and social inequality, and so on (MDG 4 ‘To reduce child mortality’, MDG 5 ‘To combat HIV / AIDS, malaria and other diseases’), while the SDGs seek to completely solve them (SDG 5 ‘To achieve gender equality ...’, SDG1 ‘To end poverty... everywhere...’ *etc.*). The final solution to the problems requires full concentration on the task of empowerment of the poorest and most inaccessible countries.

3. The SDGs are more universal. The MDGs related only to developing countries, while the SDGs are applicable to all countries in the world, regardless of their level of so-

cio-economic development. Therefore, all states face both common and individual challenges in the implementation of many aspects of sustainable development strategies.

4. A number of SDGs continue MDGs dividing the already established goals into targets, highlighting the ones of the utmost priority. However, the SDGs are more extensive than the MDGs. In contrast to the eight MDGs, 17 SDGs go beyond the issues of poverty, health and environment. Agenda-2030 focuses on democratic governance, access to justice and the integrity of the person (SDG 16), as well as on the revitalization of global partnership for sustainable development (SDG 17). Thus, the Legal Research Center also affects issues related to human rights, including political, cultural, economic, social and civil rights and the right of development.

5. SDGs take into consideration all the three pillars of the fight against hunger recognized by the 'Hunger Project', which were largely ignored by the MDGs – empowering women, mobilizing everyone, and partnering with local government. The SDGs address these crucial components much more effectively, with far stronger gender goals, people's participation and government 'at all levels'.

6. We also call attention to the division of the goals related to hunger and poverty. The MDG concepts of hunger and poverty are linked together: the MDG 1 'To eradicate extreme poverty and hunger', suggesting that the solution to one problem solves another automatically. Since then, the food problem has been studied from different positions and prospects and now the SDGs divide problems of poverty and food security.

7. In contrast to the MDGs, the SDGs, in some way, do tackle the issues of maintaining peace and security, but only in certain spheres. Inclusion of the peace-keeping process into the list of priorities for the sustainable development (ensure food security, make cities and towns safe, promote the establishment of peace and free from social societies barriers for sustainable development) – is an important step towards achieving the goals, which was not mentioned in the MDGs. Over the past 15 years the world has witnessed that peaceful and reasonably well-governed countries prosper. After 2015, it is expected that a significant part of the population living in extreme poverty will inhabit mainly the states which are somehow affected by armed conflicts. However, as already mentioned above, the problem of peace and security, unfortunately, did not become one of the most important of the MDGs, meanwhile we consider it to be of utmost importance.

8. It is important to pay attention to the problems of monitoring, evaluation and reporting. The Millennium Declaration says nothing about monitoring, assessment and reporting of realization of the MDGs. In contrast, SDG 17, Task 18 mentions the problem saying that

By 2020, enhance capacity-building support to developing countries, including for least developed countries and small island developing States, to increase significantly the availability of high-quality, timely and reliable data disaggregated by income, gender, age, race, ethnicity, migratory status, disability, geographic location and other characteristics relevant in national contexts.

9. The MDGs focused on quantitative indicators with regard to access to education (and then only to the primary one), not noticing the fall of the level of education in certain countries and entire regions. SDGs are the first attempt of the international community to put into focus the quality of education, learning process and the role of education in achieving a more humane and sustainable world.

By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development (SDG 4, Task 7).

The Formation of Noosphere as a Sustainable Development Goal

Already adopted in Russia 'Concept for the Transition of the Russian Federation to Sustainable Development' claims that 'in the long run the movement towards sustainable development of humankind will lead to the formation of the sphere of mind (noosphere) as predicted by Vladimir Vernadsky when moral values and knowledge of a Human living in harmony with environment, will become a measure for national and individual wealth'. This point of the Concept means that two decades ago Russia set another, still distant but very important in the long term, global goal of transition to the SD – the emergence of the noosphere. And it is very important to understand in which direction the humankind should move to achieve SD, which should lead to the deployment of a global process of noospheric genesis.

The main goals of sustainable development in the long run focus on the survival of civilization and preservation of biosphere, which are the necessary conditions for the formation of mind-sphere and are an integral part of this process and one of the main sustainable development goals in an even more distant period of time.

As early as in the first half of the twentieth century Vernadsky and two French scientists Edouard Le Roy and Pierre Teilhard de Chardin put forth the idea of formation of a mind-sphere – the noosphere – as a key direction for the further human development, which should rationalize the civilization processes and ensure the survival of humanity. Vernadsky views the noospheric genesis not only as social and moral and intellectual transformations, but also as natural continuation of biospheric and geological evolution, in which humanity plays the role of the major geological force (Vernadsky 2012).

If we assume that the ultimate goal of transition to sustainable development is the emergence of the noosphere, it is necessary to form the first conceptual and theoretical model of the mind-sphere, and then determine an optimal path to achieve it. The peculiarity of the noospheric-futurological approach to the study of the future, including implementation of the sustainable development strategy, consists in setting moral and fair intelligence and intellectual and spiritual factors as a top priority in the coming transformations.

It is the noosphere that is considered as a hypothetical future state of the world and at the same time as a global process, implemented through the SD of society and its interaction with environment, with collective human intelligence, named as 'the noospheric intelligence' taking the leading role, guiding evolution of civilization in progressive and safe direction. Sustainable development from the perspective of the 'noospheric goal' becomes global evolution that can be managed, focused on building up the sphere of the mind as a new qualitative state and the outcome of civilizational development.

If we consider noospherogenesis as a transition process from sustainable development to civilizational noosphere, we can assess possibilities of various forms of mind and rational management of these processes. Formation of the noospheric civilization does not only mean making ethical intelligence a priority in social development, but it also means that this ethical intelligence obtains new forms and qualities that the mind has never pos-

essed before. And the main mechanism of outpacing implementation of the sustainable development strategy will also be the collective human intelligence of a global scale, which can be significantly transformed during the genesis of the noosphere, turning into an advancing noospheric intelligence. The noosphere which is formed through the transition to sustainable development and establishment of global information-oriented society will demonstrate many of the positive features of a human and humanity (Ilyin and Ursul 2014).

Conclusion

Obviously without formulation of the most important and priority tasks towards the SD it makes no sense to talk about establishment of global governance, although global governance can be used for different tasks as well. SDGs in the first place will have to affect and in a balanced way cover at least three basic components (economic, social and ecological spheres) of sustainable development and their interdependence.

Global governance will be implemented in different ways and in different directions, for example, with the help of economic, political, environmental and other social tools and actions. Speaking about global governance, it is appropriate to note that, in its entirety, this phenomenon may appear to the fullest extent only in the future, when globalization enters its following and not necessarily 'final' stage, by which we mean a controlled transition to sustainable development on a global scale. Moreover, globalization as the transition to SD and the formation of global governance are very closely linked, and progress in one field will stimulate progress in another one. However, it is important to note that today we only have an initial simplified and one-sided concept of SD, which is not quite adequate since it primarily highlights environmental aspects of development and their interconnections with economic and social spheres. Now one needs a substantially more integrated and holistic approach to the development of concepts and strategies for sustainable development that would provide account not only of the environmental and social costs of economic growth as it is now largely emphasized.

It became evident that the concept of SD should not be reduced to the 'triad' of environment, economy and social sphere, at least not in its modern manifestation. These three 'dimensions' of the future transition to SD should be significantly expanded, turning 'the phase space transition to SD' into a kind of expanding an n -dimensional space, in which there will also emerge some other dimensions, such as outer space or information (as we will need to assess in what way a sustainable society interacts with the information-oriented society and other patterns of modern civilization and the future of civilization).

The new model of civilization turned out to be, on the one hand, more promising, because only with its help our civilization can survive and persist. But, on the other hand, being created only on conceptual and theoretical level, this model is less than a system and does not include many more components in terms of development and security that characterize the modern developmental model, referred to as a model of unsustainable development (USD). These components 'pull back' movement in the right, but simplified and not yet systemic direction. Building a sustainable future confronts the threat posed by long non-work areas (they are continuing to be developed in the framework of the model of USD) and they significantly hamper progress towards SD.

In fact, it is necessary to develop a theoretical and methodological concept, and then a theory of a new type of human development with transition to global sustainability acting

as a global strategy for further safe existence and development of our civilization. The transition to sustainable development will contribute to the resolution of the main socio-natural contradiction between the growing needs of the global community and the inability of the biosphere to satisfy these needs. Sustainable development is becoming more and more comprehensive, global and safest type of the socio-economic development. And in the broadest sense of SD is a non-regressive type of evolution that eliminates or reduces to an acceptable level danger for humanity and biosphere with the purpose of their preservation and further mutual co-evolution.

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Globalistics and Globalization Studies 2016 395–400

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