

CONVENED BY GEORGE P. SHULTZ

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# GOVERNANCE IN AN **EMERGING** NEW WORLD

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RUSSIA IN AN EMERGING WORLD

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Michael McFaul, and  
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A PUBLICATION OF THE HOOVER INSTITUTION



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## A Letter from the Conveners

Sharp changes are afoot throughout the globe. Demographics are shifting, technology is advancing at unprecedented rates, and these changes are being felt everywhere.

How should we develop strategies to deal with this emerging new world? We can begin by understanding it.

First, there is the changing composition of the world population, which will have a profound impact on societies. Developed countries are experiencing falling fertility and increasing life expectancy. As working-age populations shrink and pensions and care costs for the elderly rise, it becomes harder for governments to afford other productive investments.

At the same time, high fertility rates in Africa and South Asia are causing both working-age and total populations to grow, but that growth outpaces economic performance. And these parts of the world already face growing impacts from natural disasters, human and agricultural diseases, and resource scarcities.

Taken together, we are seeing a global movement of peoples, matching the transformative movement of goods and of capital in recent decades—and encouraging a populist turn in world politics.

Second, the information and communications revolution is making governance everywhere more difficult. An analogue is the introduction of the printing press: as the price of that technology declined by 99 percent, the volume grew exponentially. But that process took ten times longer in the 15th, 16th, and 17th centuries than we see today. Information is everywhere—some accurate, some inaccurate, such that entire categories of news or intelligence appear less trustworthy. The “population” of Facebook now exceeds the population of the largest nation state. We have ceaseless and instantaneous communication to everybody, anybody, at any time. These tools can be used to enlighten, and they can also be used to distort, intimidate, divide, and oppress.

On the one hand, autocrats increasingly are empowered by this electronic revolution, enabled to manipulate technologies to solidify their rule in ways far beyond their fondest dreams in times past. Yet individuals can now reach others with similar concerns around the earth. People can easily discover what is going on, organize around it, and take collective action.

At present, many countries seek to govern over diversity by attempting to suppress it, which exacerbates the problem by reducing trust in institutions. Elsewhere we see governments unable to lead, trapped in short-term reactions to the vocal interests that most effectively capture democratic infrastructures. Both approaches are untenable. The problem of governing over diversity has taken on new dimensions.

Third is automation and artificial intelligence. In the last century, machines performed as instructed, and that “third industrial revolution” completely changed patterns of work, notably in manufacturing. But machines can now be designed to learn from experience, by trial and error. Technology will improve productivity, but workplace disruption will accelerate—felt not only by call center responders and truck drivers but also by accountants, by radiologists and lawyers, even by computer programmers.

All history displays this process of change. What is different today is the speed. In the early 20th century, American farm workers fell from half the population to less than five percent alongside the mechanization of agriculture. Our K-12 education systems helped to navigate this disruption by making sure the next generation could grow up capable of leaving the farm and becoming productive urban workers. With the speed of artificial intelligence, it’s not just the children of displaced workers but the workers themselves who will need a fresh start.

Underlying the urgency of this task is the reality that there are now 6.9 million “unfilled jobs” in America. Filling them and transitioning workers displaced by advancing technology to new jobs will test both education (particularly K-12, where the United States continues to fall behind) and flexibility of workers to pursue new occupations. Clearly, community colleges and similarly nimble institutions can help.

The fourth trend is fundamental change in the technological means of production, which allows goods to be produced near where they will be used and may unsettle the international order. More sophisticated use of robotics

alongside human colleagues, plus additive manufacturing and unexpected changes in the distribution of energy supplies, have implications for our security and our economy as well as those of many other trade-oriented nations who may face a new and unexpected deglobalization.

This ability to produce customized goods in smaller quantities cheaply may, for example, lead to a gradual loss of cost-of-labor advantages. Today, 68 percent of Bangladeshi women work in sewing, and 4.5 million Vietnamese work in clothing production. Localized advanced manufacturing could block this traditional route to industrialization and economic development. Robots have been around for years, but robotics on a grand scale is just getting started: China today is the world's biggest buyer of robots but has only 49 per 10,000 workers; South Korea has 531.

These advances also diffuse military power. Ubiquitous sensors, inexpensive and autonomous drones, nanoexplosives, and cheaper access to space through microsattellites all empower smaller states and even individuals, closing the gap between incumbent powers like the United States and prospective challengers. The proliferation of low-cost, high-performance weaponry enabled by advances in navigation and manufacturing diminishes the once-paramount powers of conventional military assets like aircraft carriers and fighter jets. This is a new global challenge, and it threatens to undermine U.S. global military dominance, unless we can harness the new technologies to serve our own purposes. As we conduct ourselves throughout the world, we need to be cognizant that our words and deeds are not revealed to be backed by empty threats.

Meanwhile, other countries will face these common challenges in their own way, shaped by their own capabilities and vulnerabilities. And many of the world's strongest nations today—our allies and otherwise—will struggle more than we will. The more we can understand other countries' situations, the stronger our foundation for constructive international engagement.

This is why we have set off on this new project on Governance in an Emerging New World. Sam Nunn has said that we've got to have a balance between optimism about what we can do with technology and realism about the dark side. So we aim to understand these changes and inform strategies that both address the challenges and take advantage of the opportunities afforded by these transformations.

To do so, we are convening a series of papers and meetings examining how these technological, demographic, and societal changes are affecting the United States (our democracy, our economy, and our national security) and countries and regions around the world, including Russia, China, Latin America, Africa, and Europe. We will also examine the cross-cutting challenges posed by climate change and nuclear weapons.

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We begin, here, by considering the impact of changing demographics and advancing technology on Russia. Faced with an aging and shrinking population and a weak economy, Russia's future appears uncertain. How will Russia take on the challenges posed by an aging and declining population while attempting to exploit the economic and military potential of advancing technologies? An assessment of the strengths and weaknesses of the Russian Federation as it addresses the coming demographic, economic, and technological challenges can be a first step toward the development of a strategy to deal with Russia in the emerging new world. We have asked experts, from the United States and Russia, to offer their thoughts on what the impacts and way forward may be:

David Holloway, a senior fellow at the Freeman Spogli Institute of International Studies, explains how Russian President Vladimir Putin has focused his governance efforts on preserving stability rather than modernizing. Although he speaks of the need to grow and adapt to this new world, will he take the necessary steps to do so?

Princeton University professor and Hoover Institution senior fellow Stephen Kotkin sees a continued turn towards greater authoritarian rule in Russia, with the Putin administration wielding new technologies in the service of its own military and political ambitions. But it remains to be seen whether an inherently brittle regime such as Russia's can overcome the looming technological and social challenges.

Michael McFaul, director of the Freeman Spogli Institute and former US ambassador to Moscow, observes that active political decisions and policies, such as weakening property rights and the rule of law, have prevented Russia from realizing its full technological and economic potential. Those choices, not historic or cultural forces, remain the chief obstacles to Russian innovation.

Finally, we turn to the Russian perspective: former Russian foreign minister Igor Ivanov considers the need for a new international system of governance to address the migration of people and technological revolutions. Anatoly Vishnevsky, of Russia's National Research University Higher School of Economics, explains how we are seeing hemispheric demographic trends—an ageing one to the north and a rapidly growing one to the south. And Moscow-based Primakov National Research Institute of World Economy and International Relations scholar Ivan Danilin questions whether Russia can keep up with the military technological superiority of the United States and China.

Each of the authors came together this fall for a campus roundtable at the Hoover Institution to discuss their ideas, to challenge each other's perspectives, and to carry that conversation to the broader Stanford University and Silicon Valley community. We therefore conclude this examination of Russia in an emerging world with summary observations of their discussion, prepared by us and Hoover research analysts David Fedor and James Cunningham. And we extend our thanks to our colleagues from across the Hoover Institution who are working diligently to support these convenings.



**George P. Shultz**

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# Emerging Technologies and Their Impact on International Relations and Global Security

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Looking at international relations and security (IR&S) and foreign policy (FP) issues through the eyes of an innovation studies researcher presents a dialectic challenge. On the one hand, it is always restricted by the natural lack of knowledge about IR&S theories and facts; on the other, it may reveal some hidden tendencies on the crossroads between technology and IR&S/FP. In the case of emerging technologies,<sup>1</sup> this problem is further aggravated by the fact that most of them are in the relatively early stage of development. Considering these two problems, the text below should be considered as a trend- and problem-identifying effort rather than a scrupulous analysis of already clear and formed events and processes.

IR&S were always strongly influenced by emerging technologies and disruptive innovations – both directly (weapons, technology alliances in support of FP goals, etc.) and indirectly (economic and defense potentials, soft power and other).<sup>2</sup> Be it new means of transportation and communications, nuclear arsenals or drugs against HIV, technology, like gravitation in physics, is constructing or reshaping spaces of IR&S/FP and influencing the pace of processes.

The current situation in technology development is challenging for IR&S. Not considering high-tech advances in traditional weaponry, like hypersonic missiles, we witness the rise and multiplication of emerging technologies with potentially transformative effects for the economy, politics, culture – and IR&S.

Among the most well-known<sup>3</sup> are several umbrella high-tech domains: Artificial Intelligence (AI) and associated group of digital technologies like Internet of Things (IoT) and Big Data, blockchain, quantum computing, advanced robotics, self-driving cars and other autonomous systems, additive manufacturing (3D-printing), social networks, the new generation of biotech and genetic engineering and many others. Technology-driven transformations of IR&S could be analyzed from three points of view:

- Technology-centric, where IR&S impacts are considered via the prism of emerging technologies' features and trajectories

(analogous to a “technology-push” approach in innovation studies).

- IR&S actor-centric, with the focus on challenges arising for elites and states, as well as for other actors (“demand pull”).
- Problem-centric – analyzing possible impacts of emerging technologies on some of the most important IR&S challenges and trends.

## Technology Futures

The new generation of emerging technologies are moving fast and step by step transforming our lives and IR&S. However, except for a few cases (drones, some cyber issues), review of their impact on IR&S still deals with *potential futures*, rather than actual scenarios, and is concentrated on what is *technologically possible*, rather than on what is politically or defense/security rational or desirable from a dominating paradigm (although in the era of tech “booms,” the line between these two realms appears to be blurry).

Undoubtedly, the most transformative potential for the IR&S (as well as for global economy) is offered by AI<sup>4</sup> and, to a lesser extent, the IoT – with some supportive advanced Information Technologies (IT). We can envision at least several layers of it.

The most obvious is in the defense, security and intelligence area, where smart and interconnected systems may cause critical superiority and projection of power. Partly this is also true for classic diplomacy and foreign policy, where AI- and IT-enhanced activities may eventually cause higher speed and better national interest realization. There is an open question whether newcomers, using some “killer” – most disruptive – technologies may reverse the existing balance of power. From a current perspective, this group of solutions seems to be status-quo enhancers, since all of them require significant competences, investments and technology/industrial base.

Amid supporting leadership of the “haves,” these technologies also form several major IR&S challenges.

Most important come from speedy and sophisticated algorithms of advanced AI/IoT<sup>5</sup>. Ignoring theoretically



possible but unlikely scenarios of Skynet or *The Matrix*-style machine domination, we see the higher reliance of humans on machines in different important IR&S processes, with step-by-step delegation to AI of some key IR&S responsibilities. One challenge here is the ethics of the process – which will inevitably ignite both intra- and international debates. The other is that due to the greater speed of AI/IoT processes, the synchronization and efficiency of eventual human/socio-technology systems will be reduced, while the faults will become more likely - because decision-makers, defense and security personnel and other human part of these new systems are and will be just humans. Thus, growing reliance on AI/ IoT may cause problems of losing control over and/or growing number of faults in important, even critical IR&S processes – reinforced by the rising phantom menaces (see later) of emerging technologies. This may lead to major IR&S and FP dilemmas, including diplomatic tensions or even FP/military conflicts. Hopefully, this group of risks would be actual only for a transit period between current state and future digitalized IR&S, but this transit period may be quite lengthy due to inertia of institutions, psychology and other limitations.

Growing delegation of decision-making to machines in defense, and in future also in FP and other areas contains some other international challenges. Aside from a gap between “haves” and “have-nots” (which has historically proved to be a conflict provocative factor) this is about general peace and stability issues. Nuclear non-deployment between superpowers during the Cold War illustrated that in a situation where defense systems indicate attacks, human decision-makers and operators of critical “doom machines” proved to be very conflict- and strike-avoidant in their actions. Whether it would be so in a world of fighting AI swarms and killer robotic systems, which follow digital logic and predefined algorithms, or able to gain some own experience - and not consider broader political, ethical and humanitarian issues – is still an open question.<sup>6</sup> Similarly unclear is whether the disruptive consequences of mistakes in an era of emerging technology warfare would be less or more if human decision-makers and IT-specialists provide a possibility of this broader spectrum of factors for AI algorithms.

On the contrary, the most debated threats – like devastating cyber-terror, a cyber-Cold War, digital Pearl Harbor or cyber-Hobbesian realm – looks highly unlikely from a system perspective. This is because at least much of the new cyber arsenals (excluding cyber espionage and, to a much lesser extent, cyber-sabotage) amid defensive high-tech solutions may be offset by growing interdependence of economies. Smart infrastructures (Smart Cities, Smart Grids, Smart Roads, etc.), e-government and digitalization of other processes and objects may create, if not seamless, then still globalizing

cyber spaces. Altogether with further development of global value chains this makes any major conflict irrational. This pro-peace stance may paradoxically be supported by the development of cyber weapons. Possible asymmetric responses, massive cyber retaliation attacks, strong and almost unpredictable rebound effects of any malicious offensive cyber actions will, in our eyes, play a role in a new cyber-deterrence, codes of conduct and other rational behaviors. Stuxnet, alleged hacking or infiltrations of malicious software in infrastructure, banking and other systems, mutually proclaimed by Western and Russian officials, may signal not a dark cyber future, but of a relative immaturity and yet small scope of diffusion of AI/IoT in economies.

An important technology-driven IR&S trend is rising public exposure and national/international community engagement in IR&S processes by the means of social networks, mobile internet solutions and some other technologies.

To some extent this process is just a further realization of trends, set by electronic media at least 50 years ago, but the demographic change plays a growing role in this process. The 3<sup>rd</sup> generation of Internet users and 1<sup>st</sup> “smartphone generation” may have a totally different view of policy and politics, presumably much more as a kind of an app or interactive “e-content,” enhanced by number of “views” or “likes,” then a distant “serious life,” determined by “responsible” and powerful political heavyweights, bearing some great IR&S wisdoms. The most visible part of this trend is Twitter diplomacy<sup>7</sup> and, partly, content wars between Russia and Western officials and media, but it is also well illustrated by the popularity of digital whistleblowers like Edward Snowden or Julian Assange.

Another issue is e-political mobilization (the new and more “serious” incarnation of flash mobs?), demonstrated in the Arab Spring revolutions, “Occupy” movements, 2016 anti-Trump events and other cases.

From a formal point of view, we may see a rise of direct democracy in IR&S and beyond, where personal engagement of a citizen is enhanced by the convenient and familiar Internet means, while the practice and culture of engagement is supported by already existing social and consumer practices (i.e. Facebook/Twitter and Amazon/Alibaba as responsible citizen generators). In this realm democracy and IR&S realizes itself as a kind of an affordable online-service.

Rising IR&S public e-engagement, however, poses some important questions (which are true also for general politics).

The most obvious is a problem of opinion manipulations using Big Data and AI. The role of Cambridge Analytica in the Donald Trump campaign and multiple other

cases, including alleged Russian infiltration in the 2016 US elections (actual or otherwise), shows that this problem is real. Amid the classic impact on national FP and security elites, we may theoretically envision the rise of influence and lobbying power of different IR&S actors – from digital corporate giants or foreign powers to some new opinion leaders or proactive communities. The other challenge, also brilliantly demonstrated in Henry Kissinger's *World Order*, is no less important: from violent minority domination or polarization of positions (enhanced by a so-called alignment dilemma in social networks)<sup>8</sup> up to challenges for long-term optimal decision-making by elites, dependent on the number of "likes."<sup>9</sup>

The final block of the most important emerging technologies in IR&S consists of drones (for the purpose of this article, defined as distantly operated robotized systems) and advanced robotics/autonomous weapon systems (AWS, including Lethal AWS known as "killer robots").

Not mentioning already reviewed AI challenges, one of the most important issues associated with further developments in this area is the rising acceptability of war.<sup>10</sup> Use of drones and (L)AWS presents almost zero risk to military personnel – and theoretically may result in lesser military and civilian casualties on the opposite side due to more targeted use (in comparison with bombers or tanks). Thus it represents a next step in the humanization of war for public opinion, public alienation *from* war (in line with extensive use of aviation and high-precision weaponry in small wars) and gamification of war. And let us not forget that even the most advanced drones and (L)AWS cost less than jets, tanks and other major military hardware. Altogether, these factors lower the psychological threshold for engagement in military actions, supporting major international ethical debates and provoking some limited IR destabilization. The extensive use of these technologies also stimulates further differentiation of conflicts (war, limited operations, humanitarian intervention, etc.) in order to raise their legitimation and ease of engagement.

Separately it should be noted that emerging technology offers enhancement of terrorism and extremism – with potentially important, if not disruptive international effects. Critical digital vulnerabilities together with the ease of creating malicious software, rising affordability of commercial "kits" that could be used to prepare chemical, bio- or bacterial weapons even in the kitchen, 3D-printed plastic guns, children's drones with explosives and other striking cases indicate that at least security and at worst IR stability may be challenged in the very near future – even without the most sophisticated and costly solutions. But the scope and novelty of these threats are questionable. To create a really powerful and disastrous Internet virus, one still needs a team of highly competent professionals and a large number of

working hours. Bio- and bacterial weapons are deadly, but not that convenient and not always successful – as shown by the US anthrax attacks and general history of pandemics.<sup>11</sup> 3D-guns or drone attacks pose a major public security problem but are not more dangerous than heavy-duty trucks or regular explosives in the hands of terrorists.

And on the contrary, less obvious risks may be more threatening or disruptive. The most visible illustration of a "collateral" emerging technology risk is modern terror itself, which more and more appears to be an electronic media and (now) Internet phenomenon. The core of it is not the terrorist act itself, but its coverage and emotional effects on the audience – be it fear influencing decision-making and national strategies, or inspiration for recruitment and support of followers.<sup>12</sup> From this point of view, the riskiest effects of emerging technologies are still in the future. For now they may even be jammed on the analytic's "radars" by impressive, but secondary solutions.

### **In Search of Strategy: Russia and other international actors in the emerging technologies realm**

The basic interests of major international actors (not counting terrorist groups and other "disruptive" forces) in the emerging technologies realm are quite predictable and may be grouped in four basic strategies, defined by resource and competences availability, economy and national innovation system development and general foreign and defense policy factors.

- **Technology and innovation superiority.** This approach supposes mutually enhancing advanced development of both defense-related and commercial emerging technologies sectors, where the latter guarantees a broader leadership – be it global market-winning high-tech solutions, standards, digital platforms, rise of multinationals and soft power, or defense applications of civilian technology (reversed spin-off).<sup>13</sup> The key actor here is still the USA (Third Offset Strategy,<sup>14</sup> DoD-supported technology and innovation institutes of the National Network for Manufacturing Innovations,<sup>15</sup> other DoD, DARPA, InQTel, IARPA and HS-ARPA actions). The same strategy but in a catching-up logic is realized by China (illustrative is the case of the "Made in China 2025" program).<sup>16</sup>
- **Selective symmetric/asymmetric response.** For nations with a limited resource/competitive base, achieving selective leadership or parity in emerging technologies in a few important areas may guarantee nullification of opponents' superiority (a kind of "tech-deterrence") and/or support ambitions for correction, rebalance or revision of regional or world orders. The

problem here, however, is linked to a focus of efforts: it could be balanced, with support of both defense and commercial development, or only defense. Russia fits the second case, despite extensive efforts to support commercial emerging technologies and innovations in the last 10 years. This is mostly explained by persisting challenges of suboptimal economic institutionalisation and national innovation system and (presumably) uncritical extrapolation of the 1950s-1960s experience – with its leading role of the defense and security community in development of breakthrough technologies. This imbalanced approach in current global settings, where R&D expenditures and diversity of technologies in the commercial sector dwarfs any defense actions,<sup>17</sup> seem to be less sustainable in a long-term perspective, while still relevant if reduced to some very specific IR&S tasks. A good illustration is robotics and drones: not considering prospective startups, the Russian robotics industry still lags behind all advanced nations both in volumetric and technological dimensions, while several defense developments – also positioned as a “response” to the West – seem to be moving faster.<sup>18</sup> A more balanced approach is demonstrated by India, despite its strategy also being challenged by general economic and institutional limitations.

- **Asymmetric disruptive response.**

This strategy is realized mostly by non-state actors. Setting aside terrorist groups, we should mention here NGOs, multinationals and some other actors. As a result, there is a potential to reshape, if not “reboot”, the global system.

In general, all strategies and their exact realizations could be placed on a double-digit matrix (see below).

	<b>Enhancement of current power</b>	<b>Asymmetric advantage (game-changers)</b>	<b>Disruption (unknown and/or unpredictable)</b>
<b>Global IR&amp;S actors (Superpowers and Emerging Challengers)</b>			
<b>Regional IR&amp;S actors (states)</b>			
<b>Non-state IR&amp;S actors</b> <i>Multinational corporations, NGOs, sub-states, alternative (terror nets, communities, etc.)</i>			

### Emerging Technologies as problem-setters

Actor’s strategies, the specifics of emerging technologies

and the stage of their development (the eve of technological revolution) brings to life a set of important IR&S problem and challenges.

**Arms race(s) and neo-proliferation.** Considering the superiority issue, a new form of arms or dual-use tech-race seems to be inevitable – everyone dreams of being on the cutting edge and/or obtaining ultimate *wunderwaffe*. Especially troublesome is the regional level, where tensions sometimes are much more acute, than that of the superpowers. This “democratization of destruction”<sup>19</sup> poses even more risks since new solutions are neither regulated by international norms, nor are as complex or costly as nuclear and missile technologies. Meanwhile, the expected unilateral nature of other limited attempts to prevent emerging technology transfer and proliferation to opponents (new COCOMs) may cause some major international trade turbulences and other negative effects.

**Dissemination/loss of power.** Innovation and technology are important for IR&S because they provide power to those who control them. This is why proliferation is such a troublesome issue for the established powers. But emerging technologies may cause further redistribution of power towards non-state elites and IR&S actors.<sup>20</sup> It could be said that constant appeals in IR&S discussions to terror networks, NGOs, multinationals, internet-enhanced global communities and other new actors from a Freudian point of view signal the fear of power loss from established elites and the supporting expert community. However dubious in its radical form and in medium-term perspective, a post-Westphalian IR&S system realizes itself step-by-step. For example, multinational corporations are already comparable with medium-sized economies, influencing some IR&S actions via lobbying and economic power. Other actors are much weaker. But modern terrorism – symbiotic with electronic media and the internet – indicates that emerging technologies may change this in the future. These ideas are partly supported by recommendations<sup>21</sup> to redistribute security (and possible other IR&S issues) to other national, sub-national (regions – which already have FPs) and private entities.

**Degradation of confidence,**<sup>22</sup> preventing actors from resolving the most troubling contradictions and realizing fruitful cooperation. One of the reasons is information asymmetry, enhanced by the uncertainties of the technological development and ubiquitous nature of emerging technologies. This problem results also in the rise of phantom menaces, inspired by technology-induced fears. One of the best example seem to be discussions over hybrid wars and Russian cyber infiltrations. Whatever the initial reason, the scope of alleged attacks and other actions seem to be a strong exaggeration, explained by hysteria and perceptions of what is possible, rather than what is technically feasible and politically rational. And

classic geopolitical, economic, international and other tensions between different parties only inflame debates and suspicions.

**International rules and regulations.** There is a rise of global anxiety over major IR&S risks, posed by the emerging technologies, including humanitarian aspects. In this realm the formation of new institutions and norms,<sup>23</sup> whether fixed or informal (like “gentlemen’s agreements”), for the normalization and securitization of their development becomes crucial. As for now efforts are minor – for example UN expert discussions on drones.<sup>24</sup> The problem is that the challenges of emerging technologies (due to the early stage of development) are often not taken seriously, while regulation attempts sometimes appear to be part of a more complex IR&S game, discrediting the process. For example, some regulation activities may be aimed at legally binding the technological development of superior nations or losing their control over critical technologies. This could be the case of Russian attempts to regulate the Internet since the 1990s and some other efforts. Historically the global and international normative and institutional system of IR&S proved to be very adaptive, so eventually there will be an inevitable change of IR&S institutions and norms, as well as diplomatic communication and coordination mechanisms. Hopefully this change will appear *before* some major technology-induced crisis occurs, and at an acceptable price for all actors and the global community.

An open question is **power and neo-colonialism in the emerging technology era.** Despite rising research, development and innovation competences and high-tech industries in emerging and other developing nations, most science and technology advances still appear in a very small number of advanced nations. Be it development of AI, biotech, robotics or 3D printing, except for China (in some areas) other nations mostly play the role of technology acceptors or, at best, niche leaders. Extrapolating current technology, innovation and economic trends, we can forecast both the Matthew effect in the emerging technology realm, and growing reliance of the majority of nations on the technology exports and services of a small group of leader economies. Since liaisons and interdependence between the provider and consumer of most important technologies are strong, it could be converted into IR&S influence or “red lines”. And even if this influence would be distributed among a set of IR&S actors, including multinational corporations, in the realm of a new technological revolution we may face a much more complicated and subtle domination/submission and power lines in IR&S. However easy would be that yoke and however light the burden, this adds some new accents to an old question about power and dependence, especially in the North-South relations.

The vaguest but most troublesome issue can be labeled (after Donald Rumsfeld’s famous saying) as “**unknown unknowns**” – i.e. unintended disruptive consequences of some emerging technologies in the hands of some revisionist or counter-system actor. Even being hypothetical, this possibility should be kept in mind as a classical “joker” or “black swan” scenario.

### Recommendations for Russian Foreign Policy

Despite de facto formulated strategies, most nations – and Russia is no exception – appear to be surprisingly unprepared for the future. One problem is that decision-makers either seem to treat ongoing IR&S changes driven by emerging technologies as business-as-usual (BAU) or, conversely, exaggerate some of its prospects and effects while ignoring others. This factor is aggravated by high level of uncertainties, related to the emerging technologies and associated IR&S changes, and inertia of national and global institutions and actor’s cultures and practices.

Not mentioning the obvious necessity of further national S&T development, in a more balanced way, the above mentioned limits indicate that the first block of Russia’s actions in the area of emerging technologies and IR&S should deal with lowering information asymmetries and the formulation of a more concise and elaborated strategy, including future global actions and transformation of actorship.<sup>25</sup>

An initial and most important step here should be the support of a cross-disciplinary internationalized expert community, which may play a triple role:

- Source of important information and analytics in support of S&T and IR&S policy measures. These efforts should be international from the very beginning – and not be viewed as “Russian analytics.” Firstly, because Russia needs to use extensive global talent and competence pool in emerging technologies. Secondly, since Russia wants to form a more safe and secure future for emerging technologies in IR&S, it should not be the only “customer,” but rather an initiator of community building and part of a more global concert of concerned nations. The key importance of this activity is explained by the fact that as for now both the scope and essence of problems and trends and the needed actions seem to be unclear or doubtful for all policy actors. Let us mention that since this task goes well beyond established Russian foresight practices or Science and Technology Councils, more traditional for Russia, serious efforts for planning and institutionalization of this policy action are needed.

- Overcoming the gap of trust and confidence-building in a bilateral and multilateral dialogue – even without (considering the current situation) compromising confrontational FP rhetoric of Russia and the West. Cold-war practices, despite their formally distant nature, proved the importance of both science diplomacy and prominent scientists' actions for peace (from Pugwash Conferences on Science and World Affairs to the achievements of nuclear scientists in formulating pro-peace public positions both in the USA and USSR, and the role of IR experts in informal dialogue of superpowers).
- In perspective, enhancing the role of the S&T community as a collective actor in further global discussions on emerging technology IR&S impacts, and the formation of global political actions above the existing network and results of expert discussions. Modern protest actions of concerned science and innovation communities against LAWS<sup>26</sup> and some other facts indicate that at least to some extent these process will match rising global awareness. Some support for this scenario may appear from already existing self-regulation practices of research (especially in bio-research) and corporate communities.<sup>27</sup>

Considering some technical dimensions of this process, an important block of activities is linked to the enhancement of Russia's international science and technology cooperation practices and programs – both on the established lines (mostly with Germany and other Western European S&T institutions), and on relatively new or weaker ones (USA, Japan and RoK, BRIICS, other Asian and Latin American).

Paradoxically, in the current geopolitical setting an important factor of success in all these areas should be the depoliticization and moderate alienation of actions from official diplomatic and, especially, security institutions. Among entities on the Russian side best positioned for the tasks of expertise and network building, may be named both the Russian Academy of Sciences and some of the largest universities. On the international side their first counterparts are also clear – foreign Science Academies and societies (like the Helmholtz association in Germany), the largest S&T centers (like French CNRF) and universities.

Considering the global nature of emerging technologies and their IR&S impacts, the second block of Russian activities relates to initializing discussions and consequent actions to form new global institutions, norms and, possibly, IOs for the securitization of emerging technologies' IR&S dimension.<sup>28</sup> (Taking distant Cold War analogues, anew OSCE and UNCTAD). Here relatively weak Russian S&T positions which prevent the country

from realization of a full-scale superiority strategy, paradoxically appear to be a positive policy factor, since Russia could not face suspicions of hegemonic ambitions in this area.

Amid (once again) important confidence building measures<sup>29</sup> and rising diplomatic coalitions, Russia needs to focus on innovative approaches and solutions: in line with Ashby's Law of Requisite Variety, emerging technologies in the IR&S area need new principles and architecture of global governance subsystem. Several requirements are already seen, while others are still to be defined.

Among the former is engagement with a much broader spectrum of actors<sup>30</sup> – reflecting the complex nature of emerging technologies and arising IR&S problems. Aside from the above-mentioned organized S&T community, critical is the participation of corporate entities, the technology and innovation community, regional governments, NGOs, etc. Since there have been relatively successful actions of this kind, despite being more limited in scope – like the UN Global Compact – this proposition does not seem fantastic.

In a long-term perspective there is also a place for emerging technology use in global institutional and normative processes. In the most futuristic view we can envision the use of advanced internet and AI-platforms in support of national/international discussions, expert/public engagement and rising awareness, blockchain diplomacy (secure dialogue results and Smart Contracts for the resulting agreements and codes of conduct – instead of "paper treaties") and more.<sup>31</sup>

Effective Russian diplomatic efforts require also aligning emerging technology regulation with general international discussions, for example, on Grand Challenges, reforms of major existing IOs, etc. Only in a broader context can these actions become globally important and successful.

For Russia, the formation of new global regimes and institutions, as well as the harmonization of emerging technologies development is unavoidable and necessary, considering both the asymmetry of potential and major disruption risks. But this goal is important for all other actors as well – considering possible IR&S challenges of emerging technologies, as well as humanitarian, environmental and other threats. Despite history giving us few reasons for optimism, the global community still has a chance to prevent disastrous scenarios *before*, rather than *after* major disruptions happen. Special responsibility here lies with the expert community, which, presumably, must take a stand to instigate further diplomatic actions and broader discussions.

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<sup>6</sup> Altmann J., Sauer F. Op.Cit.

<sup>7</sup> *Digital Diplomacy: Theory and Practice*. Ed.by Bjola C., Holmes M. - N.Y.: Routledge, 2015; see also: Kluz A., Firtlej M. The Impact of Technology on Foreign Affairs: Five Challenges // *Foreign Policy Association*. 2015. Dec.22. URL: <https://foreignpolicyblogs.com/2015/12/22/the-impact-of-technology-on-foreign-affairs-five-challenges/>

<sup>8</sup> Bakshy E., Messing S., Adamic L.A. Exposure to ideologically diverse news and opinion on Facebook // *Science*. 2015. V. 348. P. 1130-1132

<sup>9</sup> See on this problem: Kissinger H. *World Order*. N.Y.: Penguin Books, 2015; Kluz A., Firtlej M. Op.cit.

<sup>10</sup> Partly is shown in discussion on: Drones: The Future of War? Chatham House. 2013. Apr.8. URL: <https://www.chathamhouse.org/events/view/189617>

<sup>11</sup> See from this case an informative and challenging book by Sonia Shah: Shah S. *Pandemic: Tracking Contagions, from Cholera to Ebola and Beyond*. N.Y.: Sarah Crichton Books, 2016

<sup>12</sup> See, for example: Nacos B.L. Terrorism—A Global Challenge // United Nations University Global Seminar Second Shimane-Yamaguchi Session. 5-8 August 2006 Terrorism/Counterterrorism and Media in the Age of Global Communication. URL: [http://archive.unu.edu/gs/files/2006/shimane/Nacos\\_text\\_en.pdf](http://archive.unu.edu/gs/files/2006/shimane/Nacos_text_en.pdf); Hoffman B. *Inside terrorism*. N.Y.: Columbia University Press, 2006.

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<sup>15</sup> See brief review and analysis in: Otrasyevye instrumenty innovacionnoj politiki [Industrial instruments of Innovation Policies] (in Russian). Ed.by N.Ivanova. Moscow: IMEMO, 2016. P. URL: 30-34 [https://www.imemo.ru/files/File/ru/publ/2016/2016\\_023.pdf](https://www.imemo.ru/files/File/ru/publ/2016/2016_023.pdf)

<sup>16</sup> See: Made in China -2025. The State Council. The of People's Republic of China. URL: <http://english.gov.cn/2016special/madeinchina2025/>; Kennedy S. Made in China 2025. Center for Strategic and International Studies. June 1, 2015. URL: <https://www.csis.org/analysis/made-china-2025>; Danilin I., Glotova M.China Searching New Ways of Development: Can Technology Innovation Solve All the Problems? // Conference Paper. ISA International Conference 2017, Hong Kong. University of Hong Kong (HKU), Hong Kong. 2017. June 15th - 17th. URL: <http://web.isanet.org/Web/Conferences/HKU2017-s/Archive/a2192261-bf28-43e5-950c-016c16387978.pdf>

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<sup>18</sup> Vladimiru Putinu pokazali boevogo robota-avatara v dejstvii [Vladimir Putin was shown the fighting robot avatar in action] (in Russian) // *Russia Today*. 2015. Jan. 20. URL: <https://www.youtube.com/watch?v=UPh7uFMLmSw>; Stanavov A. Zheleznaja gvardija: samye opasnye boevye roboty Rossii [Iron Guard: the most dangerous combat robots of Russia] (in Russian) // *RIA Novosti*. 2017. Oct.15. URL: [https://ria.ru/defense\\_safety/20171015/1506649786.html](https://ria.ru/defense_safety/20171015/1506649786.html)

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<sup>23</sup> See also: Garcia D. Future arms, technologies, and international law: Preventive security governance // European Journal of International Security. 2016. Vol. 1. Part 1, pp. 94–111.

<sup>24</sup> See official Web-site of the UN expert group on LAWS: 2017 Group of Governmental Experts on Lethal Autonomous Weapons Systems (LAWS). United Nations Office at Geneva. URL: [https://www.unog.ch/80256EE600585943/\(httpPages\)/F027DAA4966EB9C7C12580CD0039D7B5?OpenDocument](https://www.unog.ch/80256EE600585943/(httpPages)/F027DAA4966EB9C7C12580CD0039D7B5?OpenDocument). See also: Jacobson B.R. Lethal Autonomous Weapons Systems: Mapping the GGE Debate. DiploFoundation. Policy Papers and Briefs – 8, 2017. URL: [https://www.diplomacy.edu/sites/default/files/Policy\\_papers\\_briefs\\_08\\_BRJ.pdf](https://www.diplomacy.edu/sites/default/files/Policy_papers_briefs_08_BRJ.pdf)

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<sup>28</sup> See also: Kaspersen A., Eide E.B., Shetler-Jones P. Op.Cit.; Kluz A., Firlej M. Op.Cit.

<sup>29</sup> On the importance of mutual confidence in AI area see some hints at: Simonte T. Op.cit.

<sup>30</sup> Schaub H. Rise of Sub-State Actors in Digital Diplomacy // The Brookings Institution. 2014. Sept. 23. URL: <https://www.brookings.edu/blog/techtank/2014/09/23/rise-of-sub-state-actors-in-digital-diplomacy/>; Kaspersen A. Should we ban weapons that don't even exist yet? World Economic Forum. 2016. Jul. 20. URL: <https://www.weforum.org/agenda/2016/07/should-we-ban-weapons-that-dont-even-exist-yet>; Eide E.B. Op.Cit.; Guéhenno J.-M. Op.cit.; Kaspersen A., Eide E.B., Shetler-Jones P. Op.Cit.; Fey M. 3D Printing and International Security. Risks and Challenges of an Emerging Technology. Peace Research

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# Russia and the Solecism of Power

By David Holloway, Stanford Freeman Spogli Institute

For it is the solecism of power, to think to command the end, and yet not to endure the mean.

– Francis Bacon, *Of Empire* (1625)

## Introduction

Nearly every discussion about Russia raises three questions: Who is to blame? What is to be done? And where is Russia heading? This paper focuses on the third question, though the other two cannot be ignored entirely.

Now is a particularly appropriate time to ask where Russia is headed, for the world is undergoing profound and rapid transformation at several levels. We are witnessing dramatic technological changes – the use of 3D printing to produce guns is one topical example. More broadly, as our debates about Artificial Intelligence (AI) demonstrate, we are conscious that technological change will create new possibilities that inspire both great hope and great fear. There are, besides, unsettling changes in the international economic and political order. And to add to that, we confront demographic shifts and climate change, which are likely to acquire growing significance in the longer term. These processes of change and transformation – technological, economic, demographic, and climatic – present great challenges for governance at all levels. How can we direct these processes to our advantage while avoiding the dangers that they create? How will Russia respond?

## The Stabilization of Russia

Over the last thirty years Russia has undergone its own profound and dramatic crisis of governance. Its borders have changed; it has lost almost a quarter of the territory it had as the Soviet Union. Its population has been cut in half, from 293 million in 1991 to 146 million in 2018. (The annexation of Crimea added two million.) Its demography has changed: ethnic Russians, who made up about 50 percent of the Soviet population, are close to 80 percent of the population of the Russian Federation. The collapse of the system of central planning created an economic crisis in which GDP dropped by close to 50 percent between 1989 and 1998. Economic inequality has widened enormously in Russia since the fall of the Soviet Union, more so than in the states of Central Europe. Russia now has a Gini coefficient comparable to that of the United States.

The transition from central planning to a market economy was a traumatic experience for the society. The statistics on life expectancy register that trauma. Life expectancy for men fell from 64.84 years in 1987 to 57.55 in 1994; by 2016 it had recovered to 66.51 years. For women it fell from 74.53 years in 1988 to 71.2 in 1993; by 2016 it stood at 76.93 years. The OECD has explained these figures as a consequence of the impact of the economic transition in the 1990s and a rise in “risk-increasing behavior,” such as drinking and smoking, among men.

From the very beginning of his presidency, Vladimir Putin's response to the crisis of the 1990s has been to strengthen the Russian state by recreating the “vertical of power” at home and reinstating Russia as a great power in world politics. There has been success on both of these counts. A combination of sound economic policy and rising oil prices ended the downward spiral of the economy and restored Russian GDP to its 1989 level by 2006–7. Inflation was brought largely under control in the early years of this century, and wages and pensions began to be paid with regularity. There was a steady rise in *per capita* income. Life expectancy, as noted above, began to improve. Economic stabilization has been a major goal of Putin's policies, and his success in the early 2000s has been a major source of his political support. When Boris Yeltsin stepped down as president in 1999, his approval rating was 2 percent; Putin's rating has not fallen below 60 percent. Putin's popularity has been personal. The government's approval rating has been consistently below Putin's, sometimes by over 20 points.

Putin's rule has been personal too and has shifted steadily toward authoritarianism, largely eradicating the democratic initiatives that had emerged in the 1990s. The legislature now provides an ineffectual counterweight to the executive; opposition leaders have been muzzled; the subjects of the federation have lost much of their autonomy; the security services, which are not subject to democratic control, have acquired a central role in government; the mass media are largely controlled by the government; there is a high level of corruption (Russia ranks 135 out of 180 states, according to Transparency International); and the rule of law is weak. Stabilization has been achieved under Putin, but the political cost has been high.

Russia did not opt for the path of (more or less graceful) post-imperial decline that the British and French followed



after World War II. On the contrary, Russia, in the eyes of its new leaders, was a great power – even “condemned” to be a great power – by virtue of its size and its Eurasian geography, its status as a nuclear superpower, its role in saving Europe from Napoleon and Hitler, not to mention its contributions to the cultural and spiritual richness of humanity. Russia was weak, of course, in the 1990s, though it still had a strategic nuclear deterrent, and that, according to Putin, “enabled us to maintain our national sovereignty during the extremely difficult 1990s, when, to be frank, we didn’t have anything else to argue with.” Russia now invoked its national interests, not the class interests of the Soviet period or the human interests of the Gorbachev years. In the context of geopolitics, the enlargement of the European Union, and more especially of NATO, were seen as unfriendly actions, threatening Russia’s status as a great power.

Putin’s assertion of Russian power has been popular at home – especially the annexation of Crimea. Russian policies in Ukraine and Russian hacking in elections have, however, contributed to a sharp downturn in relations with the West and in particular with the United States. Sanctions have been imposed on Russia, causing economic harm. Are Russia’s domestic and foreign policies in contradiction with each other? One answer might be that the economic losses are outweighed by the gain in legitimacy that comes from the assertion of Russian power in the face of a hostile West.

A more serious question is whether the institutions and instruments through which stabilization has been achieved – the Putin system, if you like – are now inhibiting modernization of the economy. Modernization has been a goal of policy under Putin, but it has been a secondary to stabilization. Now, however, the Russian economy is performing much less well than it did in the early years of the century. Alexei Kudrin, a former finance minister, has argued in a report requested by Putin, that Russia is in a lengthy period of slow growth, not only as a result of lower oil prices and sanctions, but more fundamentally because of institutional and structural problems in Russia itself.<sup>1</sup> The demographic crisis and technological backwardness are part of the problem, in Kudrin’s view, but he has argued that broad reforms are needed in government administration, in the education system, and especially in the judicial system, so that disputes can be resolved without bribes or pressure on judges; an independent judiciary is the most important thing. These are not trivial recommendations and they would run up against entrenched interests in the Putin system.

Kudrin’s diagnosis of Russia’s condition raises a serious question. Can the Putin system provide both stability and growth? Modernizers argue that reform must take precedence because without it the system will become unstable and Russia will lose its status as a great power.

Opponents fear that the state might unravel again, as it did in 1990-1991; they point to the travails of liberal democracy worldwide to discredit it; and they worry that democracy might limit sovereignty by subjecting Russia to Western normative dictates.<sup>2</sup>

### The Demographic Challenge

Russia faces a demographic crisis. Its population is declining and is projected to continue falling. The latest UN estimate of Russia’s population in 2050 is 132.7 million, a significant drop from 146 million today. (These estimates change over time; the 2009 UN estimate for 2050 was 116 million.) Life expectancy stagnated after 1960, and after the collapse of the Soviet Union it began to decline, as noted above. The fertility rate dropped to the replacement figure of 2.1 births per woman in 1970 and stabilized at just below that rate until it fell to 1.25 after the Soviet collapse. It has since returned to 1.7, still well below the replacement rate. There is now an echo of the low birthrate in the 1990s in the fall in the number of births in 2016/17.

The demographic crisis has been a matter of concern to the Russian government, which has sought to raise the fertility rate by offering incentives to families so that women have more children and mothers are able to work. Among the measures adopted are: payments to mothers, mortgages for families with children, parental leave, childcare services, kindergartens, day nurseries etc. These measures will be continued, Putin announced in his 1 March 2018 address to the Federal Assembly.<sup>3</sup>

An important reason for the government’s concern has been the decline of the working-age population. Putin drew attention to this in his address. The working-age population fell by one million in 2017. Kudrin estimated that between 2015 and 2030 the number of people in the younger generation (20-39) would decline by 10.1 million, while the older generation (40-59) would increase by only 3.2 million. One way to deal with this, he suggested, was by gradually raising the pension age for women from 55 to 63 and for men from 60 to 65. By his calculation this would increase the working-age population by about nine million in 2030.

The Russian government adopted this proposal in June 2018. If enacted into law, it would go fully into effect for men in 2028 and for women in 2034. This would increase the working-age population by keeping people at work for longer. It would also reduce the amount to be paid by the state for pensions – an argument made by Putin to justify the new policy. The law, which had its first parliamentary reading in July, has elicited widespread public protest in the form of a petition against the bill and demonstrations in many cities. Among the slogans displayed were: “Pension off Putin” and “We want to live on our pensions, not die at work.” Putin’s approval

rating fell from 79 percent in May to 67 percent in July, a drop explained by some commentators as a reaction to the proposed new law. On 29 August he modified the law by proposing that the retirement age for women be raised to 60 not 63.

According to a report published in 2015 by the Russian Presidential Academy of National Economy and Public Administration, the number of people aged 20-40 will fall by half in the next 20 years, while in ten years the number of people aged 20-30 will drop by almost 50 percent. In other words, the number of people with the greatest potential for childbirth and active work is declining steeply. As the report points out, "the current generation, while still abundant, is called to resolve two tasks which are generally hard to resolve at the same time – to give birth to a large number of children and to build a new modern economy." Raising the pension age will expand the working-age population but will do little or nothing to increase the birth rate.

Between 1991 and 2015 11.8 million people migrated to Russia, and 5.3 million emigrated – a net gain of 6.5 million. Most of the immigrants came from the former Soviet Union, from countries that have demographic profiles similar to Russia's. That flow has slowed down now. It is unlikely that immigration will solve the Russian demographic crisis, unless the pattern of immigration changes significantly. As the Presidential Academy's report concludes, "there is no hope of fully solving the potential demographic crisis in Russia by relying mainly on immigration." The Russian government has simplified entry into Russia for temporary workers. The number of permits issued per year reached a high of 3.75 million in 2014, falling to just over 1.5 million in 2016. These workers mainly perform low-skilled jobs.

### **The Information and Communications Revolution**

The Soviet Union made serious efforts to prevent its citizens from gaining access to information it did not want them to have. All published materials were subject to censorship. Very large sums were spent on jamming foreign radio stations. Access to xerox machines was limited to prevent the spread of dissident ideas. Samizdat was painstakingly produced on typewriters with a few carbon copies. That all began to change in the late 1980s and soon the citizens of the Soviet Union (and then Russia) had access to a bewildering array of information from domestic and foreign sources. With the advent of the internet that access increased greatly. (About 75 percent of Russians have access to the internet, the same as the percentage of Americans.) Social media have created a new form of communication connecting Russians with one another and with people outside Russia. (47 percent of Russian internet users used social media in January 2018 compared with 71 percent of American internet users.)

The move from a closed to an open society was an important break with the Soviet past. It offered the prospect of a lively public sphere in which well-informed citizens could conduct debates about politics and policy. Yet the transition from a closed to an open society has been complex and incomplete. It has raised questions about ownership and control of the media and about the role of the media in society. After a period in which media outlets were privately owned, they have come increasingly under state control. The overwhelming majority of the mass media – television and national newspapers – propagate the government line to a greater or lesser degree. Reporters without Borders ranks Russia 148<sup>th</sup> out of 180 countries in terms of press freedom (the US ranks 45<sup>th</sup> and China 176<sup>th</sup>). There are independent voices, but their independence is conditional on the good will of the government and could be ended, though the authorities may well think that some kind of outlet or safety valve is needed. There are also growing restrictions on the internet. Russians have the opportunity to be far better informed about their own society and about the world than their Soviet predecessors did, but Russia has not become an open society.

There are two other points to note. The first is the use of the new media for offensive purposes in foreign policy. The very connectedness of our world makes that possible on a much wider scale than ever before. Russia has made cyberattacks of different kinds on countries that used to be part of the Soviet Union (Estonia, Lithuania, Georgia, Ukraine, Kyrgyzstan, and Kazakhstan) as well as on Germany, France, the Netherlands, and the United States, as well as other countries. These attacks can be classified as technical and psychological. They can be used to disrupt services, to acquire information, and to spread disinformation and propaganda. Russian interference in American elections has become a major issue in relations between the two countries, and a particularly toxic one because it looks like a concerted effort by Russia to undermine American political institutions.

The second point to note is that we are still coming to grips with the social and political consequences of the new media, not just in Russia but in the United States too. What are the implications of the internet and social media for democracy? Do they encourage serious discussion and debate, or discourage it? If we don't have editors who assess what stories should be covered and how they should be reported, will we be able to distinguish reliable reporting from fake news? Do social media make us more open to being manipulated by the stories that we are confronted with, whether they are true or not? What are the implications of the new technologies for privacy? Are the social media a "liberation technology" or an instrument of state surveillance and repression, or both? We have not come to terms with these new technologies

and their impact on our notions of the private/public distinction, on civil society, the public sphere, and the legitimacy of political institutions. The new technologies greatly increase our capacity to communicate with one another, but they also enhance the state's capacity to carry out surveillance – visit any *Stasi* museum and see how primitive their collection and analysis methods were, compared to what can be done today.

### Automation and Artificial Intelligence

The number of multifunction robots per 10,000 workers in the economy has been used as an index of the degree to which manufacturing industry in a country is automated. The world average in 2016 was 74. The highest number was 631 for South Korea. The United States had 189 multifunction robots per 10,000 workers, while Russia had three. Kudrin pointed to this in his report as an indicator of Russian technological backwardness, and it is surely a surprising one because automation is an obvious response to a declining working-age population.

Kudrin pointed to other indicators of technological backwardness. In a long-term strategy drawn up by the government in 2007 it was planned that the number of enterprises engaged in innovation should rise to 40-50 percent of the total by 2020; by 2014 the percentage was 9.9, compared with 8.5 in 2007. Similarly, the share of innovative production was to rise to 25-25 percent from 5.5 percent in 2007, but in 2014 the figure was 8.7 percent. In Kudrin's words, "We set goals but we don't advance toward them." Another important indicator is expenditure on science (state and private). In 2007 it was 1.12 percent of GDP and supposed to rise to 3 percent by 2020, but in 2014 it was still only 1.13 percent. There has been, in other words, a significant and consistent gap between purposeful rhetoric and practical results in this area.

There are several explanations for Russia's technological backwardness in Kudrin's report: the risks of innovating have to be added to the existing risks of doing business in Russia; there is a prevailing short-term planning horizon in business, and that discourages innovation; economic activity is overregulated, and subject to pressure from law enforcement (viz. security) agencies; and selective state support for innovations has not always been well-advised. Kudrin's main point, however, was that Russia had to focus on becoming a technological power: the technological challenges facing Russia were a greater threat to the country than the geopolitical or military challenges. If the country did not focus on the technological challenge, Russia's defense potential would decline and that would threaten the country's sovereignty. Putin echoed this sentiment in his March 2018 address: "Technological backwardness and

dependency mean a lowering of the country's security and economic opportunities and, as a result, a loss of sovereignty."

In the discussion of new technology and its importance AI, broadly defined, occupies a central position. "AI is the future, not only for Russia, but for all of humankind," Putin told an audience of school children in 2017. "It comes with colossal opportunities, but also threats that are difficult to predict. Whoever becomes the leader in this sphere will become the ruler of the world." This is frequently quoted in the Western press, but quite what it means is unclear. Putin gave a slightly fuller picture in his address to the Federal Assembly when he said it was necessary to introduce legislation that would "remove all the barriers to the development and wide application of robot technology, artificial intelligence, unmanned aerial transport, electronic trade, and the technology for processing big data." This is an obvious area for Russia to pursue, but the US and China are normally listed as the dominant powers in AI. Whether Russia can overcome the obstacles to technological innovation in this area remains to be seen.

The one area in which modernization appears to have taken place is in the military. The State Armament Program 2020, adopted in 2010, has resulted in a significant increase in the share of modern equipment in the Armed Forces. Earlier this year Putin signed the State Armament Program 2027, and it seems clear that this will devote high priority to UAVs (drones) and robotic systems of various kinds. The Ministry of Defense has a research center for robot technology. In 2013 it created a Russian equivalent of DARPA, and earlier this year it set up a "technopolis" on the Black Sea to do research on advanced technologies, including AI, for military purposes. The Ministry is funding projects in machine learning and autonomous systems.

There seem to be two different conceptions of the proper relationship between civilian and military technology. One favors a strong technological base on which the defense sector can draw; the other would be closer to the Soviet model – a strong defense sector with the hope of spin-off to the economy more generally.

### Deglobalization

After the collapse of the Soviet system, Russia and the other former communist states abandoned central planning and created market economies with private property. They opened themselves up to trade flows, capital flows, information flows, and to migration. They aspired to become part of the global economy and to function as "normal" states in the international system. This gave globalization an enormous boost and strengthened the liberal international order created after World War II.

Russia's early efforts at integration exposed the economy to external shocks that resulted in the financial crisis of 1998. Russia devalued the ruble and defaulted on its sovereign debt. Putin's economic program was, nevertheless, to continue the policy of integrating Russia into the world economy. This proved successful during his first two terms, when the economy grew at just under 7 percent a year. Russia was growing wealthier and stronger through its engagement with the international economy while also circumscribing foreign investment in ways that limited foreign influence on Russian politics. It also began to use energy as an instrument of pressure abroad.

The financial crisis of 2008 resulted in a shift in policy. The initial Russian reaction was to deepen integration into the global economy, but the ultimate effect was to push Russia in the direction of deglobalization. The conditions supporting Russian policy in the early 2000s no longer applied. Hydrocarbon exports were not providing the same stimulus to the economy: the rate of growth fell to 1 percent from 2009 to 2013. New technologies – shale fracking and LNG transportation – were changing the energy market. And the EU responded to Russian efforts to use energy as a political instrument.

In his third term Putin adopted a darker view of globalization, as something that could have damaging effects on the Russian state. The demonstrations that preceded and followed his election in 2012 may have reinforced that view, since he blamed them on Hillary Clinton's intervention in Russian politics. Globalization ran the risk of affecting the cohesion of the Russian state, in part because of the attractions of the West for wealthy Russians. The government laid increasing emphasis on Russian spiritual values – as well as economic progress – as a way of legitimating the state.

Putin's policy after 2012 was not a rejection of globalization, but rather a more cautious approach to it. The sanctions placed on Russia after the annexation of Crimea in 2014 enhanced the degree of deglobalization. The effects have been damaging to Russia's economic growth, though the effects have not been uniform, and they are difficult to evaluate. Russia took its own step toward deglobalization by limiting the import of food from the EU in response to sanctions, and that apparently has helped Russian agriculture.

Deglobalization may have advantages for Putin's vision of Russia. It can be seen as enhancing sovereignty, as strengthening the state, or at any rate reducing the vulnerabilities that are seen to follow from globalization – the creation of important foreign economic interests in the state, flows of information and the propagation of Western values, and the imposition of international norms. In his March 2018 address Putin noted that Russia was working with its partners to develop the Shanghai

Cooperation Organization, the BRICS, the Collective Security Treaty Organization, and making a useful contribution to the UN, the Group of 20, and APEC. It is not autarky that Putin is seeking, but rather controlled participation in a global order not dominated by the United States. The most attractive alternative may be what has been called globalization 2.0, globalization with a Chinese cast. The question is whether China can supply what Russia needs in the way of investment.

Globalization and deglobalization for Russia are driven more by economic and especially political factors than by innovations in technology. There is, however, the question whether new technologies such as additive manufacturing will contribute to deglobalization. It may be that 3D printing will slow down the trade in machinery and components, because it will be possible to create such products without importing materials, as long as those materials are at hand. That could certainly be helpful in reducing Russia's lack of advanced machinery, but Russian exports are predominantly in the energy and raw materials sectors, and additive manufacturing may not affect those sectors as much as machine building.

### Climate Change

Climate change is an especially complex topic for Russia, which covers one eighth of the inhabited surface of the earth, spanning eleven time zones and stretching from desert in the south to Arctic tundra. The effects of climate change will therefore vary across the country as a whole. Russia signed the Kyoto Protocol and has signed (though not yet ratified) the Paris Agreement on climate change. Russia's economic development depends upon extracting oil and gas from under the ground. It is a far less serious emitter of greenhouse gases (GHG) than the Soviet Union, though it still ranks as the fifth largest emitter in the world and one of the largest per capita. It can afford to do little and still meet its emission pledges for 2020-2030, which amount to 25-35 percent of the 1990 level. 1990 was the last full year of the Soviet Union's existence, before the collapse of its heavy industry. It is also the base year for the Paris Agreement commitments. Russia will have little difficulty in meeting its GHG emission goals.

For this reason, Russia has exhibited a certain complacency about climate change. Besides, it has been benefiting from the effects of climate change in the Arctic region, where new opportunities for shipping and mining have been opening up. Putin told the International Arctic Forum in 2017 that 10 percent of Russia's GDP was linked to the Arctic region and that climate change raised the region's economic potential. In his address to the Federal Assembly this year he spoke of the Northern Sea Route as the key to developing the Russian Arctic and the regions of the Far East. By 2025, he said, the traffic on the route would have grown

tenfold in terms of tonnage. Russia would have to build up the appropriate infrastructure to make this a global, competitive transport artery. Climate change has turned the Arctic into a region of geopolitical importance.

This, however, is far too rosy a picture of the impact of climate change on Russia. According to a government official speaking in 2017, there was for years “a public image that climate change only meant rising temperatures.” That had changed, he said, as a result of unexpected natural disasters in various parts of the country: storms in Moscow; river flooding in the south; forest fires in various parts of the country. More and more people are being confronted by the extreme weather effects of climate change. This has led to a greater awareness of the complex effects of climate change. There has apparently been a shift away from the simple view that climate change is automatically good for Russia because it is a northern country.

Climate scientists in Russia and outside have welcomed the signs of a shift in attitude and a readiness to adopt plans for adaptation to climate change. They remain, nonetheless, extremely critical of Russian policy for its complacent attitude and for its unwillingness to develop a plan for moving to a low-carbon economy. They have noted the government’s recent failure to acknowledge clearly the anthropomorphic origins of climate change and to focus on protection against extreme weather events rather than on the reduction of GHG emissions. They believe the government is not paying enough attention to actions needed to sustain the absorptive capacity of Russian forests and is not investing seriously in renewable energy. The government appears to regard the Paris Agreement, with some nervousness, as a step along the way to a global low-carbon economy, which would obviously create difficulties for Russia, which relies heavily for its economic well-being on the export of oil, gas, metals and mineral resources.

## Conclusions

First, the Putin regime has been devoted to stability rather than modernization. It has endorsed the latter rhetorically, but there has been a serious disjuncture between the stated goals of modernization and the seriousness with which they are pursued.

Second, Kudrin’s analysis illuminates the difference between the system as it exists and the changes needed to create the basis for higher economic growth. Many critics share these views, though many would argue that a purely technocratic approach will not work, that democratic reform is needed as well.

Third, Putin appears to recognize the issue, or at least to pay lip service to it. “The speed of technological change is growing rapidly, is rising sharply,” he told

the Federal Assembly in March. “Whoever exploits this technological wave will move far out in front. Those who cannot do that will be overwhelmed, drowned, by this wave.” There is of course the possibility that he really will follow through on the implications of this statement. It is perhaps more likely that he will attempt to muddle through by taking some measures to enhance growth and innovation, without radical changes of the kind Kudrin has advocated. In other words, he will try to combine stability and growth. So far, however, Putin has not matched his words on modernization with actions. This looks like an old story: the goals are clear, but the means for achieving them are either unavailable or unpalatable. As Francis Bacon wrote four centuries ago, “it is common with princes ... to will contradictories. For it is the solecism of power, to think to command the end, and yet not to endure the mean.”

<sup>1</sup> Aleksei Kudrin, “Ustoichivyi ekonomicheskii rost: model' dlia Rossii – vystuplenie na Gaidarovskom forume 1-01-2017,” no pagination. At Aleksei Kudrin, official site: akudrin.ru.

<sup>2</sup> Lilia Sheftsova, “Russia’s system of power defies any rational explanation,” *Financial Times*, 12 February 2018.

<sup>3</sup> Poslanie Prezidenta Federal'nomu Sobraniuu, 1 March 2018. At kremlin.ru. No pagination.

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# New Challenges in Global Politics: A Russian Perspective

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The world is going through a very complicated and dangerous period in its development. One does not need to be an expert on global politics or have access to exclusive sources of information to arrive at this obvious conclusion – all you have to do is flick through the latest issue of a newspaper or watch the news on TV.

The picture might be clearer and more understandable if humanity faced a historic challenge that would directly affect our common destiny. However, the reality of the matter is that, as we approach the end of the second decade of the 21<sup>st</sup> century, we are all being forced to address a variety of threats: from international terrorism to global warming; from an imbalanced world financial system to another round of the nuclear arms race, etc.

The situation is additionally complicated by the fact different countries have different priorities when it comes to threats and challenges. Some view managing migration as the key issue, while others focus primarily on challenges to economic development. Environmental problems and political radicalism affect countries differently; and the involvement of the latter in global economic and financial processes varies as well. Hence, it is so difficult to talk about a common agenda for the humanity, let alone to agree on a common action plan, even for the near future.

This discussion should be started by addressing the current situation in the world and the reasons behind it. Now, let me share a few considerations on the subject even though I make no claims to absolute truth.

## **The World We Live In**

After the end of the Cold War, international relations entered a transitional period which continues up to this day. The first hints at the coming of a new era in global politics emerged back in the late 1980s and early 1990s: the bipolar world was on its way out; the global socialist system was collapsing; and the processes of globalization and a new information revolution started their triumphant march around the planet. For several objective and subjective reasons, the old system of international relations largely withstood the pressure of change and underwent only minor changes.

Hardly anybody was preparing for the emerging situation; in fact, few realized the sheer scale of the coming change. This is why tactics overshadowed strategy for many brilliant and sophisticated politicians, and the opportunity to secure short-term victories with little effort proved an irresistible temptation. As a result, the United States found itself involved in the building a unipolar world, which came at price both for the US and for its numerous targets. On the contrary, Europe became fixated on resolving its internal problems, thus losing a considerable share of its clout in global politics. China was setting itself long-term goals and biding its time: the country was in no hurry to share the responsibility for maintaining global stability. Russia was too busy struggling to survive to care all that much about overhauling the system of international relations.

Nevertheless, all these multi-vectored and sometimes incompatible aspirations of the great powers were gradually eroding the foundations of the world order that had emerged after World War II. In this new reality, the world order that had prevailed until that point could no longer stand up to the emerging regional crises and to the new security threats and challenges, including those posed by non-state actors. Year after year, one step at a time, the fundamental principles of international law were undermined and international organizations, including the United Nations, were losing their status. The volatility and unpredictability of the global economy increased dramatically: the prices of the key raw materials skyrocketed; the financial markets and global exchange rates became plagued by wild instability; and entire financial and industrial empires were rendered bankrupt.

It is not that these politicians and state officials failed to notice the alarming symptoms of the impending collapse of the world order: by the turn of the century, those symptoms had grown too obvious to be overlooked. However, attempts to regain control over global politics proved inconsistent, selective and poorly coordinated.

Proposals were put forward to reform the United Nations and the Organization for Security and Co-Operation in Europe (OSCE). Efforts were made to somehow strengthen the G8. The G20 was set up, followed by BRICS

and the Shanghai Cooperation Organisation (SCO). The International Monetary Fund (IMF) and the World Bank launched slow reforms. Negotiations began on the trans-Atlantic and trans-Pacific integration projects . . . However, none of these initiatives could reverse the overall trend towards greater instability and chaos in global politics and economy.

What did not change were the increasingly obsolescent "pillars" of the world order inherited from the second half of the 20<sup>th</sup> century: the main international organizations and institutions (from the United Nations and the World Bank to NATO and the OSCE); the fundamental principles of public international law; and the traditional approaches of the great powers to resolving foreign policy issues, which provoked a sharp increase in tensions between the West and Russia. Year in and year out, the costs of preserving the obviously outdated mechanisms of global governance continued to grow, but the parties preferred to put up with this. We may say that, for the key players in the global political arena, the risks associated with maintaining the status quo were smaller than those associated with any possible change.

Now that the second decade of the 21<sup>st</sup> century is ending, it will no longer be possible to freeze the current system of international relations for another 20 or 30 years. We have reached the bifurcation point and must now elevate the international system to a new qualitative level that would change the essence and meaning of the very political structure of international relations.

The question is: what shape will this transition take? It may prove to be evolutionary, implemented through a series of consistent and interrelated reforms supported by a broad international consensus. Or it may be revolutionary, dismantling most existing international institutions in the process and resulting in the construction of a new world order on the ruins of the current one. It is hardly worth mentioning which of the two options would be preferable for us all.

One thing is obvious: the longer we linger at the bifurcation point trying to postpone the transition to a new world order, the more dearly this transition will eventually cost us all. We are running out of time for a proper transformation.

### **New Security Threats**

As we mentioned above, these days every country has to deal with a range of security threats and challenges. Some of these threats were inherited from the past, while others have emerged in front of our very eyes; some challenges already affect our daily lives directly, while others are only looming on the horizon. An important place among these diverse challenges is occupied by numerous economic, social and political problems which are related, one way or another, to the

development of new technologies, the rapidly changing global demography, and the cumulative pressure that humanity is heaping on the environment.

The international community may have devised certain mechanisms to help it resolve political, military and economic problems, but it has proved unprepared for the new risks. As Sir Winston Churchill aptly put it, "Generals always fight the last war." Similarly, politicians tend to focus on conventional threats, those which they feel and understand better than new challenges.

Lest I should come across as an inveterate pessimist, I do concede that the changes taking place in the world create new opportunities as well as risks. For example, new technologies are rather a common asset than a common curse. Our average life expectancy is much longer than that of the previous generations, and we have greater opportunities for self-realization. Today, we have broader social contacts than our ancestors did. We enjoy access to various sources of information. We travel more often and generally live fuller, more vibrant and interesting lives. Our contemporaries stand a lower chance of dying in an armed conflict or revolution, starving to death or succumbing to a deadly mass epidemic. It is unlikely that any of us would want to find ourselves living back in the early 20<sup>th</sup> century, not to mention the Middle Ages.

Still, there is no denying the obvious fact that the new technology poses many fundamental questions for humanity that have yet to be answered. Nothing in this life comes for free – everything has a price, including the rapid technological progress of the past few decades. Improving living standards and increased leisure time result in the greater incidence of mental disorders, while the frequent downside of social and geographical mobility is the erosion of traditional values and social institutions, including the fundamental institution of the traditional family.

The accelerating processes of automation and robotization may aggravate the problem of unemployment, making hundreds of millions of people redundant in the economy of tomorrow. On the other hand, educational requirements will grow significantly in this environment, and it is becoming increasingly difficult for traditional universities to adequately prepare potential graduates for the new economy. At the same time, we are observing a dramatic increase in inequality around the world: both in developed and developing countries. New technologies are one of the factors that allow enormous wealth and colossal resources to make arbitrary decisions that affect the fate of millions in the hands of a few "chosen ones."

In politics, the information and communication revolution is changing the mechanisms of political mobilization,

rendering traditional party systems – and political parties as such – obsolete. New technologies have the potential to help us secure a breakthrough in the development of political democracy, but, in reality, they are more often abused by irresponsible right- and left-wing populists. Unfortunately, the first ones to avail of the new opportunities provided by this revolution are usually political extremists; serious political discussions take a back seat to smear campaigns designed to discredit the opponent by any possible means, and expert opinions are pushed to the side-lines of political discourse. We are observing the establishment of fundamentally new mechanisms and algorithms for manipulating public opinion, the successful imposition of oversimplified ideas and stereotypes on society, the constant and frequently effective attempts to erase the lines between truth and lies, between information and propaganda.

The impact of new technologies on the system of international relations is extremely controversial. On the one hand, technological progress is conducive to the expansion of cooperation between countries, peoples, regions, private sector and civil society institutions. Entirely new opportunities emerge for what sociologists refer to as “upward social mobility,” both for individuals and for entire countries. People know each other better than they did just a few decades ago, and we have every right to call ourselves unified humankind.

On the other hand, new technologies contribute to reducing the stability and predictability of world politics, both at the global and regional levels. Unfortunately, new technological solutions often end up in the hands of the most irresponsible and unprincipled political and economic actors, from stock-exchange gamblers and financial swindlers to international terrorists and leaders of transnational mafia groups. Responsible players are playing catch-up in this race, their reactions are delayed and often inadequate (in part because their priorities are still largely determined by the conventional agenda inherited from the previous century).

New technologies pose particularly significant challenges to international security. Suffice it to mention the threats emanating from cyberspace, which are often compared to those posed by nuclear weapons. It is no coincidence that Washington is seriously considering the possibility of a nuclear strike in response to a cyberattack. At the same time, cyberthreats are also considerably different from nuclear threats. Nuclear weapons have always been, and remain, under the control of a handful of “select” countries, whose number is growing very slowly and under sharp criticism from the international community. Cyberweapons are very “democratic” in that they can be created and used by any government and even by non-state actors. Moreover, due to the specifics of this new type of weapon, non-state actors like transnational corporations, international organizations, public

associations and network structures often have far more powerful resources at their disposal than governments.

What is more, the purpose for the creation and deployment of nuclear weapons was not their actual use, but rather to deter potential adversaries. The fear of global nuclear warfare ensured that the nuclear powers acted with extreme caution and the utmost responsibility. It is different with cyberweapons: few believe today that their application could cause an immediate threat to humanity. Therefore, the temptation to use such weapons may prove too great. What is more, should a nuclear weapon be used, no one would have any doubts as to who exactly had started the nuclear war. Cyberweapons are largely anonymous; a cyberattack can be mounted from virtually anywhere on the planet, and the perpetrator may go unidentified and thus unpunished.

If no measures are taken, cyberspace will increasingly resemble a huge and constantly growing stream of “muddy waters” in which everyone, including terrorists, can angle for their “fish” without fear of prosecution for their actions. Cyberthreats do not affect national security alone: they are real both for private sector and for everyone who uses modern digital technologies. The global damage from cybercrime in 2016 exceeded \$400 billion, and the figure continues to grow rapidly. The cumulative effect of this complex danger has increased sharply and has taken on a new quality, necessitating an urgent collective assessment of the situation on the part of the international community.

Another feature of the current situation is the fact that humanity is faced with numerous new security issues in addition to the many unresolved old, “traditional” problems – the political confrontation between the East and the West, the renewed arms race, the escalating nuclear proliferation situation, continuing territorial disputes, etc. The new agenda requires urgent action, but the old one is not going to just disappear either. This further complicates the situation in the world, impeding unity and intensifying global uncertainty.

As the numerous unresolved problems of the past century worsen, many countries, including Russia, increasingly perceive new technologies through the prism of the new threats and challenges they generate rather than the new opportunities they create. Anti-globalization sentiments and the feeling of nostalgia for the understandable and predictable world of the past are growing more pronounced everywhere.

One can often hear that countries can protect themselves from the negative consequences of unpredictable fluctuations in the global economy and politics by limiting their involvement in global processes. Isolationism is peddled as patriotism, and ineptitude in



matters of global politics and economy is presented as little short of a principled position. However, isolationism has no future in the modern world. Any country that chooses to embrace it is bound to lose the opportunity to influence globalization processes, but will still experience their negative consequences.

Similarly, it is difficult to agree with the view that anyone stands to benefit from the reduced controllability of the international system, an increase in contradictions between different centres of power, or the emergence of regional conflicts. Further erosion of the world order, growing chaos and uncertainty in global politics would be strategically disastrous for everyone, including Russia.

It is clear that the pace of technological change will only increase with time. The number of global political actors will continue to grow, as will the impact of political processes on each and every one of us. It is safe to predict that the ongoing demographic processes will stimulate competition for resources. The massively growing migration flows will become a permanent factor of social and cultural tensions around the world. New technological opportunities will create additional incentives for political extremism, religious fundamentalism and international terrorism.

Together, in the next two to three decades these and other alarming trends could destroy the current system of international relations, its regulatory and legislative framework, regional and global organizations, international regimes and universal notions of what is just and unjust, legitimate and illegitimate, acceptable and unacceptable when it comes to global politics.

In such a scenario, it would no longer be about further development, but rather about the sheer physical survival of humanity in the totally new environment. The clash of two opposite trends – rapid technological changes and the equally rapid increase in instability and chaos in global politics – could prove fatal for everyone by the middle of this century.

### **What Can I Do?**

The international community is facing the truly historic mission of regaining control over the modern world on a fundamentally new technological basis and building a new world order by the end of the century. This grandiose task is comparable with the programme to overhaul the world that was developed in the middle of the 20<sup>th</sup> century by the countries that had emerged victorious from World War II.

To give the founding fathers of the post-war world order justice, their design lasted for seven decades: it withstood such tests as the Cold War, the fall of European colonial empires and the disintegration of the Soviet Union. However, the victors in World War II were

primarily pursuing their own goals. The world order of the 21<sup>st</sup> century will only be legitimate (and therefore effective) if the entire international community – including governments rich and poor, the private sector, international organizations, experts and civil society institutions – is involved in creating and maintaining.

It is clear that the ongoing transformation of global politics will be a complex, painful and, in many ways, dangerous process. This is true of any fundamental transformation. Only those countries and societies that manage to deal with the coming change in the most appropriate manner, anticipate the short- and long-term consequences, and make a realistic assessment of their role in the future world will be able to mitigate the risks, avoid obvious threats and seamlessly integrate into the new world order.

Over the past decades, we have witnessed, and to some extent been involved in, several attempts to rearrange the world order, including those with due account of the changing technological basis. Some 30 years ago, the USSR proclaimed the ideas of “universal human values,” “balance of interests,” “reasonable sufficiency,” “common European home,” etc. Those ideas seem romantic and naïve today; the world proved unprepared for such a radical revision of the principles of international relations, and so lost its chance to enter the 21<sup>st</sup> century with an overhauled world order.

After the desintegration of the Soviet Union, the United States and its allies attempted to restore control over the international system based on the principles of a “unipolar world.” I do acknowledge the good intentions of the authors of this strategy: they sincerely believed in the benefits of the America’s “enlightened” hegemony not only for the interests of the United States itself, but also for the good of other international actors.

However, today we all know that not only did the attempts to build a “unipolar world” fail, they also triggered a number of additional problems that the international community is trying to cope with to this day. Incidentally, the idea of unipolarity is being actively thwarted by modern technologies, which consistently undermine rigid hierarchies in global politics and economy.

The concept of a “multipolar world” as a more stable, reliable, and fair structure than a “unipolar world” started gaining popularity in the early 21<sup>st</sup> century. However, in the modern situation of universal interdependence, global production chains, world-scale finance, transcontinental migrations, and the globalization of education, science and technology, one can hardly believe in the possibility of this kind of “multipolarity.” Relations between countries and peoples are increasingly determined by countless specific accords,

private agreements, common technical standards and harmonized regulatory practices, rather than by fateful strategic partnerships.

We have been talking multipolarity for two decades now, but still cannot implement the concept. The potential participants in the 21<sup>st</sup> century's "global concert" are too disparate, their mutual relations are too asymmetrical, the foundations of the traditional hierarchy in global politics are too much undermined, and the role of non-state actors has become too great.

The "new bipolarity" concept, which implies building a new world order around U.S.–China relations, appears to be even less promising. The old Soviet–American bipolar world can be replicated neither now nor in the future, for the simple reason that the current international system does not include the notion of "confrontation between two socioeconomic systems" divided by irreconcilable ideological contradictions. Besides, most of the problems of the 21<sup>st</sup> century are to be found within individual states, rather than between them. Instability is usually generated by non-state actors in opposition to the existing international rules and norms.

History teaches us that humanity's transition from one world order to another is always accompanied by the accumulation of new production technologies; as a rule, such transitions are spurred by wars and revolutions. The critical mass of new technologies for the next civilizational breakthrough has already been accumulated. But a new cycle of wars and revolutions may prove fatal – not only for individual countries, but also for humanity as a whole. It is, therefore, extremely important to break the wheel of world history, to advance to a new level of global civilizational development without waiting for another world-scale cataclysm.

It will be yet more difficult to achieve now that the possibilities for imposing something from the outside on societies, governments, social or ethnic groups and even individuals are shrinking rapidly. The only path left open to us is that of persistent negotiations, difficult compromises, and possibly voluntary commitments and gradual evolution. In any case, the new world order will be unable to replace the current system of global politics: rather, the former will gradually sprout through the latter, not unlike blades of grass sprouting through asphalt. The chances of success appear to be higher if we can follow a few basic principles.

First, regaining control requires a joint effort from the entire international community. The past three decades have demonstrated that attempts to build a new world order with the sole effort and in the sole interest of an "elite club," be it NATO, the G7 or a "coalition of like-minded individuals," are doomed. The relevant discussion should be launched within the United Nations,

the only universal and unconditionally legitimate global organization. In fact, the United Nations would itself benefit from this, receiving a new lease of life through elaborated reforms.

Second, the new world order should be based on unconditional respect for the sovereignty of all countries large and small, rich and poor, in the West and in the East. Any "double standards" here are the rust that will inevitably corrode the structure of the new world order, no matter how strong that structure may appear. There is much to be said against nation states as the main subjects of global politics, but these are the only "bricks" we have to construct the new world order.

Third, it is necessary to reinstate the universal recognition and unambiguous interpretation of the fundamental notions of international law, which are indispensable to a uniform system of global politics. The process of taking stock of, re-evaluating and modifying existing norms will certainly prove difficult, painstaking and slow. The sooner we start this process, the better for all concerned.

Fourth, security issues today go hand in hand with problems of development, both at the regional and global levels. The most vivid example of this synergy is the current migration crisis, which is rooted not only in international terrorism and civil wars, but also in the numerous burning social and economic problems experienced by many Middle Eastern and African countries. The new world order should encompass a set of international regimes that could be used for the effective global and regional management of raw materials, energy, water, food, information and human resources. Just as security in the 21<sup>st</sup> century cannot be unilateral or exclusive, economic development and social harmony cannot be confined to individual countries or regions.

Fifth, there is an urgent need to develop mechanisms for the effective interaction between governments, the private sector and civil society in addressing the common challenges facing humanity. The fundamental interests of individuals, governments, business and the international community are inseparable, and we must stand up for them together. With them being very important, nation states will hardly be able to tackle the new challenges to security and development single-handedly.

Sixth, we need to reach a qualitatively new level of expert analysis as applied to the creation of a new world order. Unfortunately, many leading analytical centres whose mission it is to help politicians "look beyond" current events have found themselves hostage to the negative political situation. Their work often demonstrates a high degree of political or ideological bias and indicates an inability or unwillingness to engage in advanced

strategic analysis. This situation needs to be addressed, as the role of experts and analysts is currently more important than ever before.

Seventh, we must realize that the objective of regaining control over the contemporary world is extremely urgent. The world is approaching a "point of no return," where reversing the destabilization processes will be extremely difficult, if possible at all. As crisis situations continue to accumulate, the global security and development environment continues to disintegrate, decision makers refrain (consciously or unconsciously) from long-overdue but painful measures, and actors pursue immediate interests and goals, the consequences may be truly tragic. Moreover, the scale of these consequences would overshadow many of the current disagreements and contradictions, making them seem small and unimportant.

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# Technology and Governance in Russia: Possibilities

By Stephen Kotkin, Hoover Institution and Princeton University

This paper will ruminate in a highly preliminary way on the possibility of change in Russian governance as a result of disruptions in technology. No such momentous changes are on the horizon at the moment. That said, history moves in surprising ways, and unintended consequences are the norm. Technological disruption, too, usually brings change in unforeseen directions. Whatever happens, it will not happen the precise way we might anticipate. We shall begin with background remarks about Russian governance and Russian ingenuity, and then briefly explore 1) demographics and robotics; 2) new communications technologies and domestic politics; and 3) alternative energy and political alternatives. Omitted here are important areas such as additive manufacturing (so-called 3-D printing), which has the potential to upend global trade as we know it, and agricultural bioengineering, which could reduce or even end scarcity, in effect also driving deglobalization. Be that as it may, today the main trend is toward militarization and authoritarian enhancement.

## Observations on Governance in Russia

Russia is a middle income country with an undiversified and stagnant economy, having largely squandered the fruits of its impressive 2000s economic revival. The country has immense Soviet legacies, for better and for worse. The Soviet inheritance, along with additional investments, has enabled Russia to become a conventional military great-power again, with the world's largest nuclear arsenal as well as a veto at the UN security council. Russia is a military power because it prioritizes being one (unlike, say, Germany or Japan, which have far larger economies). Russia also inherited scientific technological prowess, which to an extent it maintains despite changes and corrosion since Soviet times. Furthermore, even after the loss of vast territories as a result of the Soviet dissolution, it retains a challenging but also empowering geography, impinging on Europe, the Middle East, East Asia, and the Arctic. In geopolitical terms, much of Russia's political class came to detest the 1991 settlement of the Cold War that was imposed when, by its own doing, Russia was flat on its back. (The settlement's implications emerged more clearly over time, it must be said.) Predictably, Russian power has undergone a revival, and now it possesses not only

motive but also the means to force adjustments in the 1991 settlement.

Today, as in the past, Russia has an authoritarian political regime, some might even say a kind of gangster state, dressed in democratic decoration. Russia's economy is no longer planned, that is, state-managed without legal market mechanisms as in the Soviet period, but four-fifths of its largest companies are state-owned, third in the world behind only China and the UAE. There is an astonishingly corrupt side to the state ownership and state regulation of the economy. Many government officials are involved in self-dealing almost exclusively. The sprawling interior ministry is considered as especially corrupt. Russia's middle class largely consists of managers of state-owned corporations and officials who work for the state – that is, dependent not independent people. But the Russian state can confound analysts who truck in binaries. All too many analysts predict Russia's pending economic collapse, because of falling oil prices and rising sanctions, and get surprised at the success of Russia's macroeconomic policies (for two decades now). Russia manages to be overflowing with both corruption and professionalism; formal institutions and informal practices; gangsters and sophisticated technocratic elites. There is considerable state capacity in the ministry of finance as well as the state bank, not to mention the diplomatic corps. There is also an outsized, simultaneously corrupt and professional, security service.

Russian politics to a significant degree can be understood as a mostly behind-the-scenes contest between the security services, on one side, and the finance and economic ministries, on another. That is, Russian politics is largely a struggle between those who emphasize the need to gird against perceived threats and prioritize “stability,” versus those who prioritize development, between those who see the outside world as almost exclusively menace and those who see it as primarily opportunity. Of course, security and development can be compatible. We should not assume that these two general groups in Russia are always diametrically opposed, even though they often clash. Members of each wing share the other's core concerns to an extent. Both groups see themselves as fiercely patriotic. Too often, however, security is allowed to override internal

development, opportunity is viewed as a Trojan Horse, and economic expertise is reduced to macroeconomic stability, rather than development. That is where Russia, once again, finds itself today. Development is blocked, in the name of security and stability, which actually translates into regime preservation. The latter ends up trumping all other concerns. What results is a debilitating conflation between personal regime preservation and national interests. As a result, there is a great deal of grievance and worry – inside the state apparatus, let alone in the society.

Despite a surface stability even in the face of blocked development and gangster politics, Russia's authoritarian regime is less stable than it appears. Perhaps the main sources of instability are, firstly, the circumstance that authoritarian regimes tend to hollow themselves out over time and, secondly, the state's absence of a clear and lawful succession mechanism at the top. To simplify a bit, instability emerges from the very success of authoritarianism, whose repression and censorship squeeze out political alternatives and suppress or distort accurate information about society. Much pressure is let out by allowing or forcing emigration (exit rather than voice), but a whole society cannot emigrate. The suppression of alternatives has the effect of exacerbating the already acute succession question that bedevils almost all authoritarian regimes. Authoritarian regimes degrade their own institutions and governance performance, by emasculating their judiciaries and legislatures, and failing to control their own executive officials. The regimes leave themselves with less and less resilience in their drive for more and more control.

Authoritarian regimes – and Russia is no exception – tend to be all-powerful yet fundamentally brittle. (By contrast, democracies are feckless yet resilient.) They elicit low levels of trust from the populations in whose name they rule (a circumstance that, in a crisis, can be fatal). And they invite destabilizing intrigue, whether from ambition and survivalism (or both), in anticipation of pending all-or-nothing moments of political succession when a change in ruler can threaten elites' wealth, freedom, and lives.

### **Icarus – Ingenuity**

Today's Russia suffers a severe high-education, low-human-capital paradox. In 2012, it came in just 21<sup>st</sup> in patents registered under the Patent Cooperation Treaty, the convention associated with the World Intellectual Property Organization. This put it behind Austria, even though Russia has a population more than 15 times greater than that of Austria. Russia was earning 35 times fewer international patents per university graduate than Austria.<sup>1</sup> "Once a scientific powerhouse," in the words of one scholar writing in 2015, "Russia has experienced over the past 25 years a dramatic decline of its research and development capacities and is now lagging far

behind other industrialized nations in terms of scientific output."<sup>2</sup> This downward trend has in part been arrested more recently with massive state investments in scientific laboratories. But Russia faces ongoing brain-drain, largely provoked by its authoritarian political system. Since 1991, more than 5 million Russians have departed for new lives abroad beyond the territory of the former Soviet Union, a stunning loss of human capital. Fewer than one-third of researchers in Russia are age 30 to 50, while a quarter are beyond 70.<sup>3</sup>

But let us begin with an American documentary film – *Icarus*, which won the Oscar for best documentary in 2017. In Greek mythology, Daedalus, while imprisoned in his own invention (the Labyrinth), fabricated two sets of wings out of feathers affixed to a wooden frame with wax, one pair of which he gave to his son Icarus for a trial. The idea was that father and son would escape the Labyrinth. Even though his father had warned him that flying too close to the sun would cause the wax adhesive to melt, Icarus, intoxicated with his newfound ability to fly, did just that. The feathers detached, and Icarus fell to his death in the sea below. The film that took its title from this story of hubris relies upon the whistleblowing of Grigory Rodchenkov to explore Russia's audacious illegal doping practices in the 2014 Winter Olympics, which were held in Sochi. Rodchenkov had served as the Russian anti-doping laboratory's director; an independent investigation corroborated his charges. He exposed a state-sponsored scheme whereby a Russian lab switched out the urine samples of athletes that had been contaminated with performance enhancing drugs for clean samples even though the bottles containing the samples were tamper-proof.<sup>4</sup>

The documentary on cheating seems to reconfirm the increasingly blackened image of Russia. Against the considerable evidence, including electronic files, the Russian government denied official involvement in the doping scheme, but Russian hackers tied to military intelligence stole and released internal emails of the world anti-doping agency to try to discredit its probe. Within weeks of each other, Vyacheslav Sinev, former chairman of the executive board of the Russian Anti-Doping Agency (RUSADA), died aged 58, and Russia's anti-doping chief (Nikita Kamaev) died aged 52. At the time, Russian Sports Minister Vitaly Mutko said, "It's a very unexpected death. He [Kamaev] seemed healthy and everything was fine."<sup>5</sup> Rodchenkov, a mastermind of Russian state-sponsored doping (before he flipped), has a Ph.D. in analytical chemistry, and admitted that for Russian athletes he had invented a cocktail of banned anabolic steroids that could go undetected. When this failed, the Russian state found a more ingenious solution.<sup>6</sup> Herein lies the documentary's bigger lesson.

For the Sochi Olympics, the Swiss company Berlinger designed the sample bottles such that once they had

been sealed, they could not be opened without breaking the cap, meaning that any attempted change of their contents could not escape detection. The caps had unique seven-digit numbers so no substitute caps could be used for broken ones. Moreover, athletes' names were not included on the sample bottles. But Russian sports officials had also collected clean urine samples from every athlete many months before they had begun doping for the Olympics, and officials had the athletes snap and send photos of their official Olympic urine sample forms (showing the unique seven-digit numbers) to identify every cheating athlete's sample. Most impressively, the Russian security services designed a way to open the bottles without destroying the caps.

In sum, the documentary's tale of tawdry Russian cheating is also one of impressive Russian ingenuity. One could argue that too much of Russia's ingenuity is devoted to burnishing the regime's image by hook or by crook, rather than to developing the country for the long-term. That said, it would be foolish to underestimate Russia. To this day, the Swiss company does not know how Russia's FSB (successor to the KGB) managed to open the bottles.

### Demographics and Robotics

Russia's suffers a debilitating combination of low fertility and high mortality. Its death rate for males rose steadily between 1960 and 2005; alcoholism served as one of the principal causes. (In fact, the male death rate uptick slowed briefly during Gorbachev's anti-alcohol campaign.)<sup>7</sup> Russia's demographic situation has alarmed its leaders. True, the secular decline in Russia's natural rate of population was reversed in 2009, but that reversal has ended.<sup>8</sup> Russia's population as of January 1, 2018 was estimated at 146,880,432 (this includes the 2.3 million people of Crimea, which is not internationally recognized as part of Russia). Controlling for territorial shifts, this represents an increase of just 76,060 from the previous year, thanks to a net migration gain of 211,878. The natural population declined by 135,818 over the year. Russia has still not regained its 1991 population level (148,689,000). Moreover, the U.N. currently forecasts a total population in Russia of just 132.7 million by 2050.

Russia's demographic problems *could* turn out to be a blessing. But will they?

Without immigrants, Russia is poised to experience great labor shortfalls. Immigration has averaged around a quarter million people in recent years and has not exceeded half a million per year since the mid-1990s.<sup>9</sup> Immigrants come to Russia predominantly from the former Soviet republics, which are suffering its own demographic shortfalls, especially in the critical cohort of 15 to 29 year - olds (those most likely to migrate). And Russia must compete for Slavs from Ukraine with Poland. (Somewhere between 1 and 2 million Ukrainians are working in Poland.) Lately, Russia has attempted to

incentivize legal ethnic Russian immigration from the former Soviet republics. New rules were introduced (2014) for citizens of former Soviet countries to obtain Russian citizenship provided they spoke the language and could prove Russian ethnicity. Non-Russian immigrants from Central Asia and the Caucasus – as opposed to guest workers – remain low in number. Migrant workers in Russia peaked at 7 million, an estimated 3 million of them illegals, before a crackdown in 2012, which was followed by the ruble crash in 2014.<sup>10</sup> Temporary labor migrants (mostly Armenians, Uzbeks, Tajiks, Kyrgyz) are not popular in Russian society, even if the regime understands their necessity to the economy.

The implications of demography for the Russian economy are far-reaching. A large generational cohort is dying off, while a far smaller one is coming of age. Economy Minister Maksim Oreshkin explained in September 2017 that the birth rate cratered to its lowest point in 1999, and that this "small" generation was now beginning to enter the workforce. He predicted that "we are going to lose approximately 800,000 working-age people from the demographic structure every year" for the foreseeable future.<sup>11</sup> On current trends, Russia's workforce could shrink from 85 million to 65 million by 2050 – a severe blow to GDP.<sup>12</sup> Demographers have grimly projected Russia's maximum economic growth range at between 1 and 2 percent.<sup>13</sup>

Since 2010, the number of pensioners has risen by almost 4 million, while the number of people employed has been stagnating for several years.<sup>14</sup> Today there are just 1.7 employed people per pension recipient, and the number of pensioners in Russia could equal the number of people in work by 2044, according to government projections, which would imperil the state budget, on top of the fact that there is already a labor shortfall. Accordingly, the Russian regime has felt severe pressure to raise the retirement age. Back in 2005, Putin said, "I am against increasing the pension age, and while I am president, no such decision will be made." But in June 2018 (on the first day of the World Cup) the Russian government announced a proposed increase in the retirement age for women from 55 to 63, and men from 60 to 65. After a backlash, the President felt compelled to backtrack, slightly, lowering the new age for females to 60, while holding firm on that for males.<sup>15</sup> In Russia when workers begin reach the age to begin collecting their state pensions, and exercising a right to free public transport, they mostly continue to work for wages, but pensions provide supplemental income. State pensions average just 13,342 rubles (under \$200) per month, but for many people this is crucial. (Fully 30 percent of Russians receive an old-age pension.) Moreover, because life expectancy for men is a mere 67.5 (77.6 for women), many fear never seeing the pension money if the age limit is raised.<sup>16</sup> Be that as it may, although the unpopular pension reforms were enacted, they promise no relief for the labor shortages.

Older workers, in any case, are often ill-suited to jobs based upon new technologies. The regime's pension reform dilemma – which has degraded Putin's favorability ratings, to the extent such ratings can be trusted – is self-created, for on the eve of every election since 1996, the government has raised the amount of pension benefits, but all along the way, the government has not been as aggressive in investing in new human capital (education and health care).<sup>17</sup> On the contrary, the government, for political reasons, has driven into exile a very large number of people it helped educate, hemorrhaging human capital (the shortage of highly skilled workers is great). Moreover, severe pressure on the state budget (a deficit in seven of eight years between 2009 and 2016, and a spending down of the fund) is leading some analysts to forecast a decline of 20 percent in education spending and 25 percent in health care spending over the years 2017-2019.<sup>18</sup>

What could rescue the situation for Russia? Higher productivity is the other solution (besides expanding the workforce) for the labor shortages. Russia's labor productivity is dismally low by comparison to other industrialized countries, with much room for improvement. Paradoxically, if Russia were to make use of robots, its productivity problems could be solved and its demographic shortfall could become a strength, because workers displaced by robotization would face less competition for other jobs.

Many Eastern European factories are already automated, but Russia lags very far behind them. The Russian association of Robots (founded in 2015) has as few indigenous members the companies Promobot, Hamster, and Abagy. (The other two members are Kawasaki and ThyssenKrupp.) Widespread use of robots on production lines in Russia seems far off. The International Federation of Robotics has published comparative data on the number of installed multifunction robots in manufacturing per 10,000 workers for 2016. South Korea comes in first at 639. Germany is Europe's leader at 309. The United States stands at 189. The world average is 74. China is listed at 68 (up from 25 just three years earlier. Russia? Three.<sup>19</sup>

Today, Russian robotics are seen predominantly in the military, where Russia has been deploying unmanned drones for some time.<sup>20</sup> Recently, the Russian armed forces showcased the "Uran-9," a heavy unmanned ground vehicle for remote reconnaissance and combat support armed with a 7.62mm machine gun and anti-tank guided missiles. It is just one of numerous unmanned combat vehicles being developed, alongside a roboticized medium and small-range missile defense system, AI-infused cruise missiles, and more. It remains to be seen how viable these unmanned vehicles are in actual combat, and whether they might even be turned against their battlefield deployers by hackers.<sup>21</sup> Meanwhile, Russia is boasting about mass production

of an android army. "The serial production of combat robots for the Russian armed forces may start already this year," defense minister Sergei Shoigu stated in mid-March 2018 at a domestic technology gathering dubbed "Russia: the Country of Possibilities." This work is led by, among others, the Russian Foundation for Advanced Research (created in 2012 and roughly analogous to the American Defense Advanced Research Projects Agency or DARPA). Russia's Foundation for Advanced Research in March 2018 proposed that the Ministry of Defense standardize AI research around four areas: image recognition, speech recognition, control of autonomous military systems, and information support for weapons' life-cycles.<sup>22</sup>

Beyond the obvious military application, however, it is unclear the extent to which Russia's civilian economy is poised to take advantage of robotics. As MIT professor emeritus Loren Graham has pointed out, Russians invented lasers (two Soviet scientists got the Nobel for it), performed pioneering work on computers, and detailed the possibility of fracking in scientific journals, but all these innovations were developed and commercialized in other countries.<sup>23</sup> Russia has the science, and to an extent the financing, and even in many ways the entrepreneurial spirit, but the country lacks the appropriate institutions and investment climate. Small- and medium-sized businesses comprise only 18 percent of GDP, less than half the ratio in successful economies.<sup>24</sup> Russia's hemorrhage of human capital has not helped.<sup>25</sup>

In April 2018, the Skolkovo Institute for Science and Technology held its 6<sup>th</sup> International Robotics Forum, focused on driverless transport and medical robotics. Once optimistically heralded as Russia's Silicon Valley, Skolkovo is a state-sponsored technopark founded in 2010 that seeks to marry research and industry.<sup>26</sup> As then President Dmitry Medvedev stated in a 2009 speech to the Federal Assembly setting out the vision: "To sum up, an inefficient economy, semi-Soviet social sphere, fragile democracy, negative demographic trends, and unstable Caucasus represent very big problems, even for a country such as Russia. . . Achieving leadership by relying on oil and gas markets is impossible."<sup>27</sup>

For the Skolkovo Innovation project, Medvedev's administration chose open land (some 600 acres) outside Moscow, not the site of any of the country's long-standing scientific universities, and proclaimed five clusters: biomedical, nuclear, space, IT, and energy. The project devoured enormous sums of state funding in its early years, much of it misappropriated, which uncharacteristically for Russia led to indictments.<sup>28</sup> (Medvedev had highlighted the imperative to battle corruption as a strong motivation to launch the innovation project; the arrests came after Putin had returned to the presidency.) Skolkovo had even been touted as a possible site for a 2014 G-8 meeting, but

its lagging construction killed that idea, and, in the event, Russia was evicted from the group for its illegal annexation of Crimea. No major companies have emerged from Skolkovo. Skolkovo's ambitions appear to have been scaled back.<sup>29</sup>

One could argue that a successful Russian Skolkovo Innovation Center already exists – in Israel. How many émigrés from Russia form a part of Israel's high-tech sector is hard to say. Russian immigration to Israel in the 1990s doubled that country's population of engineers and scientists, but many Russian-born engineers in Israel could only find employment as service workers, housemaids, and welders.<sup>30</sup> Either way, they do not work in Russia.

There is another, even more interesting geopolitical inflection to Russian robotics: back in April 2015, the government announced a partnership between the Skolkovo Foundation and China's Cybertech Investment Group for a joint robotics center (in China) and a joint robotics startup incubator (in Russia). (The highly rated Chinese venture firm was begun by a Chinese-born returnee from Silicon Valley.)<sup>31</sup> Whether anything has come of this partnership is difficult to establish. China is Russia's greatest present and long-term external challenge.

### Information Technology and Domestic Politics

We are long past the heady days of predictions that the Internet and new communications technologies would prove unmanageable for authoritarian regimes, and usher in democracy. To be sure, technology-enabled activism is real, and can empower groups that are merely basic tech savvy. But that has severe limits in countries without the rule of law. Authoritarian regimes can and do shut down the citizen activism with arrests, hefty fines and jail terms, expulsion from employment or school, and deportation. More than that even, authoritarian regimes have shown they too can be tech savvy, using new technology for enhanced policing via face recognition, surveillance of social media accounts, and fake account entrapment.<sup>32</sup> Arguably, the principal change in governance from new information technology has been enhancement of the authoritarian toolkit.

No matter how much technology they bring to bear, self-styled activists and political opposition cannot run candidates, let alone register political parties. Often regimes just eliminate direct elections, as happened in Russia under Putin. In the first period of his presidency (2000-2008), appointment replaced election for positions in the upper house of parliament and governorships, while direct elections to the lower house of parliament were replaced with party lists voting. Following the mass protests of 2011-12, when President Putin announced he had decided (on his own) to become president again, some direct elections were reinstated after the mass protests of 2011-12 (direct district-based elections

to the lower house of parliament; some gubernatorial elections). But even when there are elections, candidate nomination–registration processes facilitate state control over candidates. The Kremlin has gone so far as to undermine independent powers of regional elites, let alone of any self-styled opposition.

Even basic forms of citizen self-organization have been bottled up. Russia once had an estimated 277,000 NGOs (in 2008), but the number declined significantly after, in 2012, the regime introduced a law requiring that NGOs receiving foreign funding register as foreign agents. (The Constitutional Court upheld the law's compatibility with the constitution.)<sup>33</sup> The regime has also stepped up its creation of NGOs, sometimes mocking called government NGOs, which engage in imitations of election monitoring or human rights monitoring. They persecute and repress political opposition and freedom of speech. A June 2014 amendment to the "foreign agents" law allowed the justice ministry to register NGOs as foreign agents without their knowledge, if it determined that they were receiving foreign money or engaging in politics. Criticism of the "foreign agents" law itself qualifies as political activity under the law.<sup>34</sup> In parallel, Putin's regime introduced an "undesirable organizations" law, which authorizes a ban at the regime's discretion.

Perhaps, however, technological disruption is changing the very forms of citizenship and governance? Technology has massive promise for enhanced government performance, including offering new metrics for assessing government performance. We are seeing alternative citizen databases for measuring and holding government officials to account. Outside of showcases such as Estonia, however, technology is disrupting government practice and citizenship much less than it is reshaping the private sector and daily life. Estonia's borderless, blockchained governance and citizenship model can be overhyped.<sup>35</sup> Nationalism has not disappeared from Estonia, let alone from countries that are still not "virtual." On the contrary, Estonia is using e-governance to advertise itself among nations. The country has been on a multidecade crusade to buttress its cultural identity and language and rid itself of many ethnic Russians who arrived during Soviet times. That said, Estonia's impressive digital advances show how government can be made to work better – in an unambiguously rule-of-law setting.

The assertion, meanwhile, that the world has entered a "Networked Age" whereby "all humanity is connected beneath the surface like the giant colonies of aspen trees in Colorado that are actually all one organism," is unsupported by the evidence. Exhortations to policymakers to adopt a "network mindset" (connectedness, sharing, engagement), instead of a chessboard emphasis on states and sovereignty, self-



interest and coercion, betray the extent to which this has not happened.<sup>36</sup> Networks have not and cannot replace competing states. To a great extent, increasing interconnectedness has helped reinforce nativism and authoritarianism. This also happened during the world's first globalization in the period 1850s–1930s.

Just as in the 1930s, moreover, repressive states, with Russia in the forefront, have shown themselves capable of interdicting the spread of information and ideas they oppose, and of crafting, disseminating, and controlling effective narratives on their own behalf. The instruments they wield – once again, developed in the free countries of the West – seem even more powerful than those previously (such as photography, motion pictures, radio). Indeed, social media have become weapons for the state-sponsored and rogue-actor dissemination of lies and confusion on the broadest imaginable scale. We need to be careful not to exaggerate the lasting effects of this malign activity – after all, radio (broadcast directly into people's homes) caused a panic about the end of truth and the advantages of authoritarianism. But we can hazard a guess that the Internet in the precise form we know it today cannot and will not last, given its utter anonymity, breathtaking lack of security, and facilitation of theft, surveillance, smears, and lies.

### Alternative Energy and Political Alternatives

Saudi Arabia, famously, has been investing in alternative energy sources and attempting to diversify an economy far more dependent on hydrocarbons than Russia's. Back in 2000, none other than Sheikh Ahmed Zaki Yamani, the former oil minister of Saudi Arabia, stated in an interview that "Thirty years from now there will be a huge amount of oil – and no buyers. Oil will be left in the ground. The Stone Age came to an end, not because we had a lack of stones, and the oil age will come to an end not because we have a lack of oil."

No longer are doomsday clairvoyants foreseeing a coming peak in oil supply. Prognosticators have turned to predicting a possible peak in demand for oil, but their guesses vary greatly. One think tank in London (Carbon Tracker) and a risk consultancy in Norway pinpoint the turnaround 2023. By contrast, BP published a study predicting demand will begin to decline between 2035 and 2040. The International Energy Agency believes that demand for oil will continue to grow through into the 2040s even as it publishes scenarios for a drop-off in demand beginning already in the 2020s under climate change agitation. The wide range of estimates should give cause for skepticism. But investors are already making their bets based upon a sense of whether hydrocarbon-energy companies are prepared, or not, for a transition to renewables at some point. This alone hastens the possibility that the predictions of sooner rather than later might be borne out.<sup>37</sup> No one knows when renewables might begin to replace hydrocarbons

on such a scale that it constitutes a fundamental shift in the global energy regime. If that shift does occur, it is likely to occur very rapidly, like a self-fulfilling prophecy or bank run, as investors doubt the future returns on massive upfront investments in finding and exploiting new oil and gas fields and sinking capital into new power plants or other energy delivers that are based upon hydrocarbons.

Russia's three largest corporations are suppliers of oil and gas. The ruble moves with oil markets (as the Russian Central Bank knows all too well) – only when the world crude price is above \$60/barrel is the real ruble-dollar exchange rate higher than the inflation-adjusted exchange rate.<sup>38</sup> The country boasts the world's largest reserves of natural gas and the second largest of coal. Oil and gas account directly for around one-quarter of Russia's GDP (the share has not eclipsed 26.5 percent for the past quarter century). One could make the argument that indirect measurements would significantly increase the proportion. For example, Russia imports around 60 percent of its consumer products and pays for them with export earnings – and the latter are predominantly oil and gas. This means that the role of oil and gas in the economy is greater than indicated by nominal GDP contribution. Petrodollars underwrite investments and spending in many other sectors of the economy. Still more consequentially, More than half of Russian federal government revenues (including 40 percent just from oil).

Authoritarian regimes do not depend on economic growth per se. It is a fallacy that there is some kind of bargain between the regime and the people, who supposedly accept limitations on their freedom in exchange for improved lifestyles: if economic growth stagnates, the populace lacks mechanisms to punish the regime's failure. The regime, for its part, does not admit it failed to fulfill the "bargain" and step aside; it ramps up its repression and manipulation. But such regimes do face a significant crisis when they run out of cash flow. The best sources for cash flow for authoritarian regimes are resources that are plentiful and easily extracted, such as diamonds, precious metals and minerals, or fossil fuels. Russia's political system is utterly dependent on hydrocarbons for its cash flow. With oil and gas generating gushers of cash, the exploited can emancipate themselves from the exploited. But a new global energy regime would likely upend Russian politics. The regime would run out of money and lose its ability to buy-off elites, who are difficult to manage even with full coffers, as well as the wider populace. Another way to put the matter is that the more regimes are dependent for revenues not on resources but on their people (through taxation), the more those regimes face an imperative to treat their people like genuine citizens.

Today, renewables claim a relatively small fraction of global energy share. The likelihood that renewables

could overturn the existing hydrocarbon energy regime is, as noted above, a matter of considerable speculation and debate. If it happens, and if it happens sooner rather than later, the implications for Russia governance are immense.

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President Putin, on September 1, 2017, the first day of school, was shown on national TV speaking with teenagers in jeans in provincial Yaroslavl and stating that “Artificial intelligence is the future, not only for Russia, but for all humankind. It comes with colossal opportunities, but also threats that are difficult to predict. Whoever becomes the leader in this sphere will become the ruler of the world.”<sup>39</sup> And yet, the AI/machine learning market in the country was under \$12 million in 2017 (according to the Russian tech website *cnews.ru*). When Putin speaks of AI, he appears to mean almost entirely military AI. Here, Russia looks able to compete.<sup>40</sup>

So far, at least, predictions of disruption to authoritarian rule have proven wrong. Perhaps the much-predicted disruption of authoritarianism is still coming? Perhaps Russia’s authoritarian government will be forced to engage in political liberalization and rule-of-law reforms in order to compete? There is no empirical cause to answer yes, as the trend has been a strengthening and emboldening of authoritarianism, alongside the ongoing militarization. Paradoxically, though, the stronger authoritarianism gets, the more brittle it becomes. But just how robust the leading democracies are also remains to be seen. The peril to Russia of economic stagnation and misgovernance remains relative to the performance of its great power rivals.

<sup>1</sup> Nicholas Eberstadt, “Putin’s Hollowed-Out Homeland,” *WSJ*, May 7, 2014: <https://www.wsj.com/articles/nicholas-eberstadt-putins-hollowed-out-homeland-1399504005?tesla=y&tesla=y>

<sup>2</sup> Quirin Schiermeier, “Russian Science Minister Explains Radical Restructure,” *Nature*, Jan. 26, 2015: <http://www.nature.com/news/russian-science-minister-explains-radical-restructure-1.16776>

<sup>3</sup> Judy Twigg, “Russia Is Losing Its Best and Brightest,” *National Interest*, June 13, 2016: [http://nationalinterest.org/feature/russia-losing-its-best-brightest-16572?Led Gudkov, the head of the Russian polling organization Levada Center, has noted of the exodus, “People who are leaving today are more liberally oriented, more intelligent, better educated, and consequently, we are left with a rather inert, passive mass with opportunistic attitudes.” New York Times, May 12 and 13, 2016: <https://www.nytimes.com/2016/05/13/sports/russia-doping-sochi-olympics-2014.html>; <https://www.nytimes.com/interactive/2016/05/13/sports/russia-doping-sochi-olympics-2014.html?action=click&contentCollection=Sports&module=RelatedCoverage&region=Marginalia&pgtype=article>. By way of background, Athletes competing in major international competitions must submit a urine sample for testing, which is divided into two bottles: the](http://nationalinterest.org/feature/russia-losing-its-best-brightest-16572?Led%20Gudkov,%20the%20head%20of%20the%20Russian%20polling%20organization%20Levada%20Center,%20has%20noted%20of%20the%20exodus,%20%E2%80%9CPeople%20who%20are%20leaving%20today%20are%20more%20liberally%20oriented,%20more%20intelligent,%20better%20educated,%20and%20consequently,%20we%20are%20left%20with%20a%20rather%20inert,%20passive%20mass%20with%20opportunistic%20attitudes.%E2%80%9C%20New%20York%20Times,%20May%2012%20and%2013,%202016%3A%20https%3A%2F%2Fwww.nytimes.com%2F2016%2F05%2F13%2Fsports%2Frussia-doping-sochi-olympics-2014.html%3Bhttps%3A%2F%2Fwww.nytimes.com%2Finteractive%2F2016%2F05%2F13%2Fsports%2Frussia-doping-sochi-olympics-2014.html?action=click&contentCollection=Sports&module=RelatedCoverage&region=Marginalia&pgtype=article)

A bottle, which is immediately tested; and the B bottle, which is stored for up to 10 years, in case the athlete’s performance subsequently falls under suspicion.

<sup>5</sup> The International Olympic Committee “banned” Russia from the 2018 Winter Olympics, but granted eligibility to Russian athletes. (The “Olympic Athletes from Russia,” 169 in total, constituted one of the largest contingents in 2018.) The infamous lab building in Sochi became a popular pub during the World Cup, featuring a yellow drink called “B Sample” (the substitute clean urine ones) made up of tequila, Sambuca, and Tabasco.

<sup>6</sup> To accelerate absorption of the steroids in the blood and shorten the detection window, Rodchenkov would dissolve the banned substances in alcohol — Chivas whiskey for men, Martini vermouth for women. But in 2014, Russia notched the highest number of athletes caught by testing. Rodchenkov blamed the athletes for mixing in their own choice performance-enhancing substances.

<sup>7</sup> “Smertnost’ v Rossii skvoz’ prizmu privatizatsii,” *Demoscope*, Feb. 2-15, 2009: <http://www.demoscope.ru/weekly/2009/0363/lisa01.php>

<sup>8</sup> Russia’s population declined by more than 5 million from 1990 to 2010, and then grew by 1.3 million in the next five years, for a net decrease of 3.7 million.

<sup>9</sup> Tom Balmforth, “Another Worrying Sign For Russia’s Dire Demographics,” *Radio Free Europe* (September 27, 2017), <https://www.rferl.org/a/russia-population-decline-labor-oreshkin/28760413.html>

<sup>10</sup> <https://www.newsru.com/russia/23nov2010/migranty.html>

<sup>11</sup> <https://www.rferl.org/a/russia-population-decline-labor-oreshkin/28760413.html>. Even the good news is problematic. As Nicholas Eberstadt of AEI noted, “Russia’s present modest surfeit of births over deaths comes entirely from historically Muslim areas like Chechnya and Dagestan, and from heavily tribal regions like the Tuva Republic.” Nicholas Eberstadt, “Putin’s Hollowed-Out Homeland,” *Wall Street Journal*, May 7, 2014: <https://www.wsj.com/articles/nicholas-eberstadt-putins-hollowed-out-homeland-1399504005?tesla=y&tesla=y>

<sup>12</sup> <https://www.bloomberg.com/news/articles/2018-04-05/world-war-still-haunts-putin-as-population-decline-taxes-economy>

<sup>13</sup> Nicholas Eberstadt, Hans Groth, Judy Twiff, *Addressing Russia’s Mounting Human Resources Crisis*, American Enterprise Institute (February 2013); *Critical 10 Years: Demographic Policies of the Russian Federation: Success and Challenges*, Russian Presidential Academy of National Economy and Public Administration (RANEPA) (2015): <https://www.wilsoncenter.org/sites/default/files/10%20Critical%20years%20english%20version.pdf#page=13&zoom=page-actual,-208,115>

<sup>14</sup> Martin Brand, “Carrot and Stick: How It Was Possible to Raise the Retirement Age in Russia,” *Russian Analytical Digest*, Oct. 8, 2018.

<sup>15</sup> Finance Minister Anton Siluanov observed that the president’s concession would cost the budget 500 billion rubles (\$7.3 billion) over six years. Andeei Kolsenikov, “Saving Colonel Putin: Why Russia’s Pension Reform Just Got More Expensive,” *Moscow Times*, (Aug. 31, 2018): <https://carnegie.ru/2018/08/31/saving-colonel-putin-why-russia-s-pension-reform-just-got-more-expensive-pub-77151>

<sup>16</sup> “Rossiane stali dol’she zhit!” (Sept. 11, 2017): [lenta.ru/](http://lenta.ru/)

news/2017/09/11/zhizn/ . Russia's gender lifespan disparity is the widest in the world.

<sup>17</sup> Sarah Wilson Sokhey, "Buying Support? Putin's Popularity and the Russian Welfare State," FPRI (Feb. 2018): [https://www.fpri.org/wp-content/uploads/2018/02/SokheyRPE2.pdf?utm\\_source=Test+List&utm\\_campaign=8dd81ae9f2-EMAIL\\_CAMPAIGN\\_2017\\_12\\_28&utm\\_medium=email&utm\\_term=0\\_fa689ca428-8dd81ae9f2](https://www.fpri.org/wp-content/uploads/2018/02/SokheyRPE2.pdf?utm_source=Test+List&utm_campaign=8dd81ae9f2-EMAIL_CAMPAIGN_2017_12_28&utm_medium=email&utm_term=0_fa689ca428-8dd81ae9f2)

<sup>18</sup> Andrey Movchan, "Pensions and Security: Russian Budget Reveals Government Priorities," Carnegie Moscow Center, Dec. 15, 2017: <http://carnegie.ru/commentary/66454>

<sup>19</sup> The world average was 66 in 2015, and the trend is clearly steeply upward: <https://ifr.org/ifr-press-releases/news/robot-density-rises-globally> . Aleksei Kudrin gives a figure of 2 for Russia, but these appear to be earlier data (for South Korea, he has 478). Kudrin, "Ustoichiviy ekonomicheskii rost: model' dlia Rossii – vystuplenie na Gaidarovskom forume 1-01-2017": <https://akudrin.ru/news/ustoychivyy-ekonomicheskii-rost-model-dlya-rossii-vystuplenie-na-gaidarovskom-forume-13-01-2016>

<sup>20</sup> See also the US "Jason" paper, "Perspectives on Research in Artificial Intelligence and Artificial General Intelligence Relevant to DoD" (Jan. 2017): <https://fas.org/irp/agency/dod/jason/aidod.pdf>

<sup>21</sup> Samuel Bendett, "Russia Is Poised to Surprise the U.S. in Battlefield Robotics," *Defense One*, Jan. 25., 2018: <https://www.defenseone.com/ideas/2018/01/russia-poised-surprise-us-battlefield-robotics/145439/> As a former CIA analysts has written, "Russian systems – like practically all combat UGVs – are vulnerable to enemy fire such a heavy machine guns, rocket-propelled grenades, mines, IEDS or mortars that can target their sensors and cameras or engines and locomotion devices, not to mention the actual armaments themselves, which are not protected to any significant degree." Samuel Bennett, "Is Russia Building an Army of Robots," *National Interest*, March 19, 2018: <https://nationalinterest.org/blog/the-buzz/russia-building-army-robots-2496>

<sup>22</sup> <https://ria.ru/technology/20180320/1516808875.htm>

<sup>23</sup> Leon Neyfakh, "Russian Science is Amazing. So Why Hasn't It Taken over the World?" *Boston Globe*, Jan. 4, 2015.

<sup>24</sup> Andrey Movchan, *Decline, Not Collapse: The Bleak Prospects for Russia's Economy*, Carnegie Moscow Center (February 2017), 11, <http://carnegie.ru/2017/02/02/decline-not-collapse-bleak-prospects-for-russia-s-economy-pub-67865> , 10.

<sup>25</sup> "The Short Life and Speedy Death of Russia's Silicon Valley," *Foreign Policy*, May 6, 2015:

<https://foreignpolicy.com/2015/05/06/the-short-life-and-speedy-death-of-russias-silicon-valley-medvedev-go-russia-skolkovo/>

<sup>26</sup> A. Blagoveshenskii, "Viktor Veksel'berg predolizhil Skolkovo zapuskat' odin Google v god," *Rossiskaia gazeta*, July 1, 2010.

<sup>27</sup> Medvedev, "Go Russia!" (Sept. 2009): <http://en.kremlin.ru/events/president/news/5413>

<sup>28</sup> "The Skolkovo setup is a very corruption-encouraging environment," noted Ivan Ninenko, deputy head of Transparency International Russia. "Skolkovo Office Searched in Corruption Probe," *Moscow Times*, April 19, 2013: <https://themoscowtimes.com/articles/solkovo-office-searched-in-corruption-probe-23399>

<sup>29</sup> Mike Butcher, "Chill out — Russia's Skolkovo project attempts a re-boot with a new venture fund," *Tech Crunch*, June 9, 2017: <https://techcrunch.com/2017/06/09/chill-out-russias-skolkovo-project-attempts-a-re-boot-with-a-new-venture-fund/>

<sup>30</sup> Rachel M. Friedberg, "The Impact of Mass Migration on the Israeli Labor Market," *Quarterly Journal of Economics*, 116/4 (2001): 1373-408.

<sup>31</sup> The Russia deal is not featured among the cases on their website: <http://www.cybernaut.com.cn/en/cases.shtml>

<sup>32</sup> Evgeny Morozov, *The Net Delusion: The Dark Side of Internet Freedom* (New York: Public Affairs, 2011).

<sup>33</sup> Lisa McIntosh Sundstrom, *Funding Civil Society: Foreign Assistance and NGO Development in Russia* (Stanford, CA: Stanford University, 2006)

<sup>34</sup> Elena Mukhametshina and Ol'ga Churakova, "Kritika zakona ob inostrannykh agentakh stala povodom dlia priznaniia agentom," *Vedomosti*, May 10, 2016.

<sup>35</sup> Nathan Heller, "Digital Republic," *New Yorker*, Dec. 18-27, 2017.

<sup>36</sup> Anne-Marie Slaughter, *The Chessboard and the Web: Strategies of Connection in a Networked World* (New Haven, CT: Yale University, 2017).

<sup>37</sup> Sarah Kent, "Could Oil Demand Peak in Just Five Years?" *Wall Street Journal*, Sept. 10, 2018.

<sup>38</sup> Andrey Movchan, "Just an Oil Company? The True Extent of Russia's Dependency on Oil and Gas," Carnegie Moscow Center, Sept. 14, 2015: <https://carnegie.ru/commentary/61272>

<sup>39</sup> "Putin Talks Power of Artificial Intelligence", MSN, September 12, 2017, available at <https://www.msn.com/en-gb/news/world/putin-talks-power-of-artificial-intelligence/vp-AARPZU>

<sup>40</sup> As the US Defense Intelligence Agency noted, "The Russian military has built on the military doctrine, structure, and capabilities of the former Soviet Union, and although still dependent on many of the older Soviet platforms, the Russians have modernized their military strategy, doctrine, and tactics to include use of asymmetric weapons like cyber and indirect action such as was observed in Ukraine." *Russia Military Power: Building a Military to Support Great Power Aspirations*, Defense Intelligence Agency (2017), 46: <http://www.dia.mil/Portals/27/Documents/News/Military%20Power%20Publications/Russia%20Military%20Power%20Report%202017.pdf?ver=2017-06-28-144235-937> . At the same time, Dmitry Gorenburg has observed that the Ministry of Defense tends to buy what the military-industrial complex is good at producing, not what the armed forces always need in terms of combat equipment.

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# The Missed Opportunity of Technological Breakthrough in Putin's Russia

By Michael McFaul, Stanford University

Russians are richer today than they have ever been in their thousand-year history. Today, Russians enjoy a GDP-per capita of \$11,9500, down from a 2013 peak of \$16,000, but moving in the right direction again. Between 2000 and 2008, Russia's GDP grew by 83%, productivity grew by 70%, Russia's share in the world economy grew fourfold, from 0.6% to 2.7%, real wages increased by 3.4 times, and real pensions increased by 2.8 times.<sup>1</sup> The lives of Russians also have improved considerably regarding non-monetary indicators measured by various indexes.<sup>2</sup> After a horrendous dip in life expectancy, especially among men, after the collapse of the Soviet Union, the numbers for both men and women have been climbing steadily since 2004 and have now reached their highest levels ever.<sup>3</sup> The Russian political system has moved in an autocratic direction for the last two decades, but individual freedoms remain high compared to earlier centuries in Russian history.

But have Russians maximized their potential for personal prosperity and well-being? The question of course is a hypothetical, but the answer most certainly seems no. Russians could be much richer today -- the Russian economy as a whole could be much bigger and stronger -- had Russian leaders created the permissive conditions for technological innovation and investment. Given Russia's rich human capital endowments, Russia is underperforming. Russia should be one of the technological centers of the world; a second Silicon Valley. But so far, that potential has not been realized. None of the largest tech companies in the world are Russian. Russia produces few international patents. Automation in Russian companies is far behind advanced industrial economies.<sup>4</sup> Russians have failed to realize this potential, not because of cultural, historical, and geographical factors, but because of decisions -- mostly political decisions -- taken by post-Soviet leaders, including first and foremost Vladimir Putin. Russians are well off today, but could be so much more prosperous. Politics are to blame.

To develop this argument about how politics have held back Russian economic development particularly through stifling technological innovation and investment, this paper proceeds in seven parts. Part one considers the legacies of the Soviet Union as a possible explanation

for Russia's current conditions. Parts two and three examine more proximate causes of Russia's economic development, focusing in particular on how the emergence of new political and legal institutions first stimulated and later stifled the growth of the high-tech sector. Part four explores the pernicious effect of some technological investments in the Putin era. Part five discusses the Medvedev era, when the development of high-tech became a national priority. Part six examines the negative consequences for high-tech innovation and investment in the current Putin era. Part seven concludes.

## The Mixed Soviet Legacy for Technological Innovation

For most centuries, Russia has lagged behind other European countries regarding economic and technological development.<sup>5</sup> During the Soviet period, communist dictatorship did succeed in transforming Russia and the rest of the USSR from an agrarian to an industrial economy. At times, including most prominently in the 1930s, the Soviet system even seemed to outperform European economies. During the final decades of the communist era, however, the Soviet economy fell back behind the capitalist economies in Europe and elsewhere in the world. The Soviet system's inability to innovate played a central role in the country's relative economic decline. The communist regime could command peasants to become factory workers and thereby drive industrialization, albeit a very inefficient and corrupt form of industrialization. But the Soviet regime could not command people to become entrepreneurs or invent technologies, or found companies needed to prosper in the post-industrial age. Economic stagnation, as well as ideas to combat it, played a central role in the Soviet Union's collapse.

However, not all of the Soviet inheritance was negative for Russia's future economic potential in a post-industrial era. Most importantly, the Soviet system did make major investments in education and science. Cold War competition with the United States required the Soviet regime to make massive investments in military technologies. Even as Soviet citizens endured major shortages in consumer goods and basic living standards, the Soviet government produced some of the most advanced rockets, nuclear warheads, tanks, radars, and communication systems in the world. To become a

military superpower in the twentieth century, the Soviet system invested heavily in scientific education, especially in the hard sciences. By the time of the Soviet collapse, literacy rates in Russia crept close to a hundred percent.<sup>6</sup> Soviet universities and institutes produced tens of thousands of PhDs in all fields, but especially in the hard sciences.<sup>7</sup> This rich human capital should have given Russia a real advantage in the post-industrial era.

### **Russia's Transition from a Command Economy to a Market Economy**

The transition from communism to capitalism produced an economic depression in every country in Europe and Eurasia. The degree and length of this transitional economic contraction, however, varied considerably in the post-communist world. Contrary to initial expectations, those countries that made the quickest transition to democracy also returned to economic growth the fastest.<sup>8</sup> Russia was in the middle of the pack.

Russia's imperfect and partial transition to democracy and markets in the 1990s produced a mix of positive and negative factors for the development of technology in Russia. The biggest initial impact of new political freedoms was a massive brain drain. Tens of thousands of smart, well-trained engineers and scientists moved to countries where they could exploit their talents most effectively. Israel was the biggest beneficiary.<sup>9</sup> But the United States, and the Silicon Valley in particular also benefited from the Soviet and Russian emigration.

And yet, not every talented innovator or technologist left Russia. The legalization of private property and market prices eventually created the permissive conditions for Russian tech companies to emerge. Some grew directly out the Soviet military industrial complex, including Klimov, Elvis Plus, Khrunichev, and MCST Elbrus. In other high-tech sectors, defense conversion occurred not at the enterprise level but at the individual-level, as employees of Soviet military enterprises left and converted themselves to work as employees for private companies – foreign and domestic – or started their own firms.

During this era, Russian companies never produced hardware products – computers, chips, or phones – to compete with Western and Asian companies. But several Russian internet, software-driven companies did withstand tremendous competition from Google, Facebook, and others to survive. The search engine company, Yandex, competes with Google for market share in Russia and a few other countries. Mail.ru managed to compete under market conditions with Gmail and Yahoo. V Kontakte and Odnoklassniki have survived Facebook's global ascendancy. And Kaspersky not only emerged as Russia's largest cybersecurity company, but even managed to secure some market share in the United States and around the world before Russian interference in the 2016

residential election brought new scrutiny to its relations with the Russian government. In the wake of the Soviet Union's collapse, Russia's high-tech companies started well behind their competitors in the United States and Asia but demonstrated a resilience to compete on par with many other European countries. And unlike their Chinese counterparts, these companies formed and grew largely without the benefit of state protection or subsidies. A decade ago, the possibility of Russia emerging as a technology hub in the global economy seemed real.

### **Political Impediments to Technological Innovation**

In 1999, the Russian economy grew for the first time ever since independence in 1992. Painful economic policy reforms from earlier in the decade provided the predicate for this growth, as did some important additional Kremlin decisions during Putin's first years in office.<sup>10</sup> After his election in 2000, Putin cut individual tax rates to a flat rate of 13%, cut corporate taxes to the maximum tax rate of 24%, and introduced regulatory, banking, and land reforms.<sup>11</sup> These reforms contributed to economic growth, even if the main drivers of Russia's economic recovery were increasing oil and gas prices. In addition, domestic consumption of consumer goods, as well as rapid expansion of transportation, construction, and telecommunications also contributed to this extraordinary period of Russian economic expansion.<sup>12</sup> Russia sustained an annual growth rate of seven percent from 2000 until the worldwide financial crash in 2008.

During Putin's first two terms as president, high-tech firms and high-tech investment played only a marginal role in stimulating economic growth. Most growth came from raw materials exports, which in turn fueled domestic consumption.<sup>13</sup> During this period, many economists – both in Russia and the West – warned of Russia's reliance on the export of raw materials; the “Dutch curse” for some, the “oil curse” for others.<sup>14</sup> Russia had to use this period of economic growth and government revenue windfalls to stimulate the emergence of a high-tech sector, or so many argued at the time.

Putin did not listen. On the contrary, after an initial spurt of pro-market reforms in the first years of his presidency, Putin showed little inclination to create friendly conditions for private sector development of any kind, including the high-tech sectors. To his credit, he allowed the technocrats in his government and the Central Bank to maintain sound fiscal and monetary policies. But Putin pumped the brakes on pursuing those hard, complex institutional reforms needed to stimulate the formation of new firms and new investment. Rule of law reforms ground to a halt. Privatization stopped. And then most dramatically, in October 2003, Putin undermined an already weak commitment to secure property rights when he arrested Russia's richest businessman at the time, Mikhail Khodorkovsky, and stripped him of his most

valuable assets in his Yukos oil company. Eventually, those assets ended up in Rosneft, a state-owned enterprise run by Putin's close confidant, Igor Sechin. Other acts of asset stripping and redistribution occurred, sometimes involving Western investors. Insecure property rights in turn scared away investment.

More generally, Putin weakened institutional checks on his executive power.<sup>15</sup> He seized control of Russia's major independent television networks, constrained the autonomy of political parties and non-governmental organizations, and with the arrest of Khodorkovsky scared away private sector involvement in politics. Putin also undermined the autonomy of regional governments, including doing away with direct elections for governors in 2004. By the end of his second term, Putin had consolidated an autocratic regime.

The coincidence of new economic growth and growing autocracy in Russia in the 2000s created the false impression that a strong hand in the Kremlin and an alleged strong Russian state were responsible for economic development. Putin's popularity was most certainly fueled by this impression. It was a spurious correlation.<sup>16</sup> Russian growth during this period was impressive, but actually lagged behind most other post-communist countries. Russians were doing well, but could have been doing much better. As Andrei Illarionov wrote in 2007, "In a comparison with the 15 former Soviet republics, Russia is now third to last when it comes to economic growth."<sup>17</sup>

The genuine private sector suffered generally, but the high-tech sector suffered to an even greater degree. Venture capitalists like the rule of law. Foreign investors fear arbitrary redistributions of property. Some industries have to invest locally in Russia to do grow. If you are an oil company, you have to invest where the oil is. That's why Exxon-Mobil stayed engaged in Russia during this era. If you sell perishable consumer products, you often have to manufacture locally. That's why Pepsi made a major investment in purchasing Wimm-Bill-Dann in 2011. But if you are making products based on software, in which the main factor endowments are brains, you can be located anywhere. You are not required to be physically in Russia. Nor are those Russians working in the high-tech sector required to stay in Russia. They can move their greatest asset – their own knowledge and intellect – in one flight.

And that's what has happened.<sup>18</sup> Few high-tech firms – foreign or domestic – made major new investments in Russia in the Putin era, while many Russians working in this sector emigrated to the Silicon Valley and other technological hubs outside of Russia.

### **State Investments in Pernicious Technologies**

Some high-tech enterprises, however, experienced real growth in the Putin era – those associated with the military. Putin reversed years of decline and invested heavily

in the Russian military industrial complex. He invested billions to modernize both Russia's conventional and nuclear weapons. Over time, these industries recovered well enough to increase exports substantially. Last year, Russia was the second largest arms exporter in the world, just behind the United States. Putin's government also invested heavily in Russia's intelligence services, including signals intelligence (SIGINT), propelling Russia back to superpower status in this domain along with the United States and China. Putin also invested billions into new propaganda instruments, including conventional platforms like television – RT – digital – Sputnik and Russia Direct – and print – Russia Beyond the Headlines – as well as new innovative modalities for spreading Kremlin information and disinformation such as the Internet Research Agency. The results of these technological investments have been on display during Russian military interventions in Ukraine and Syria, Russian cyber attacks on Estonia in 2007, Georgia in 2008, Ukraine in 2014, and Russian disinformation campaigns during elections in democracies, including most dramatically during the U.S. 2016 presidential election.<sup>19</sup>

### **The Medvedev Mini-Interregnum**

Between 2008-2012, Dmitry Medvedev served as Russia's president, while Putin served as prime minister. During this four-year period, the basic trajectory of Russia's economic and political policies did not change. Medvedev, however, did tweak some policies and aspired to pursue even greater changes regarding the development of Russia's high-tech sector.

In his public speeches and private comments, Medvedev expressed concern about Russia's continued dependence on raw material exports as the driver of Russian economic growth. He wanted to develop other sectors of the economy, especially the high-tech sector. To do so, Medvedev understood that political modernization would facilitate economic modernization. Medvedev stated bluntly, "Today we are building new institutions based on the fundamental principles of full democracy...This democracy requires no additional definition. This democracy is effective and is based on the principles of the market economy, supremacy of the law, and government that is accountable to the rest of society. We are fully aware that no undemocratic country has ever become truly prosperous, and this for the simple reason that it is better to have freedom than not to have it."<sup>20</sup> Medvedev also ridiculed a Russian "culture of legal nihilism that in its cynicism has no equal anywhere on the European continent."<sup>21</sup> And Medvedev took some small steps towards greater accountable government, including most dramatically creating the Ministry of Open Government Affairs headed by Russian entrepreneur, Mikhail Abyzov, and joining the international Open Government Partnership, "a partnership that connects governments, reformers and civil society leaders around

the world to make their governments more transparent, inclusive and accountable." Rhetorically, Medvedev also signaled that Russia is open for business and pledged to improve governance to attract more foreign investment.

In parallel to these broad strokes on the need for political modernization and strengthening of the rule of law, Medvedev launched several concrete projects aimed at stimulating Russia's knowledge economy for high-tech sectors. Skolkovo was his most ambitious project. At Skolkovo, a region outside of Moscow, Medvedev hoped to build from scratch an ecosystem similar to the Silicon Valley, designed to encourage entrepreneurship and innovation among Russian companies and foreign investors. Medvedev first announced the idea of Skolkovo in November 2009 and formally launched the project the following year. In the summer of 2010, Medvedev traveled to the Bay Area to learn firsthand about the necessary factors that combined to stimulate the emergence of Silicon Valley, including the important but frequently forgotten role that government support for research and development has played and continues to play in the Valley as a whole and at Stanford University in particular. He visited several major companies, including Cisco, Apple, and Twitter, and left California even more excited about the possibilities of building something similar in Russia.

To catch up again in this new sector of the global economy, Medvedev's government offered tax breaks and state funding to companies – foreign and domestic – who agreed to locate or relocate to Skolkovo. Some major American companies were first movers, including Cisco, which relocated its Russia and CIS headquarters to Skolkovo,<sup>22</sup> and Boeing, which announced the creation of its innovative and research training center at Skolkovo in 2013, and then opened that center in 2016.<sup>23</sup> Today, there are roughly 5,000 resident companies at Skolkovo.<sup>24</sup> Understanding the importance of Stanford to the development of Silicon Valley, Medvedev provided new resources to a business school located at Skolkovo, called Moscow School of Management Skolkovo, and started from scratch the Skolkovo Institute for Science and Technology, or Skoltech. To jumpstart Skoltech's emergence, the Russian government signed a two hundred million dollars plus cooperative agreement with MIT, to bring MIT professors and researchers to the new campus. The first president of Skoltech was MIT professor and aerospace engineer Edward Crawley. In 2015, Skoltech graduated its first class. Today, Skoltech boasts 200 professors, 205 postdocs and researchers, and 1,200 Master's and PhD students.<sup>25</sup>

During the Medvedev years, other companies focused on investing in high-tech were established and/or promoted. Rusnano, for instance, is a government-owned joint stock company that invests in nanotechnology and other high-tech projects. Rusnano was founded in

2007 as a state corporation – the Russian Corporation of Nanotechnologies – but then became a more independent joint stock company Rusnano in 2011, and emerged under the leadership of Anatoly Chubais as one of Russia's largest technology investors, taking positions in both Russian and foreign companies. According to their website, "total volume [of investments] over the last 10 years is in excess of 190 billion rubles. As of the end of 2016, the revenue of portfolio companies in which RUSNANO was an investor amounted to 369 billion rubles a year, and the total output of the entire Russian nanoindustry was about 1,580 billion rubles."<sup>26</sup> Several other private Russian VC funds also appeared or grew during this period, including Digital Sky Technologies (DST Global), Fort Ross Ventures, Almaz Capital, Bright Capital, Runa Capital, and Flint Capital.

Russian research and development in cutting-edge technologies remained well behind the United States and other innovation leaders. For instance, regarding artificial intelligence, China and the United States, not Russia, were considered the world's superpowers.<sup>27</sup> And the internet economy in Russia contributed roughly 2.6% of Russia's GDP by 2015, below the average of G-20 countries, but accelerating at a faster rate than many.<sup>28</sup> During these Medvedev years, there was a sense of potential, a belief that Russia's tremendous intellectual resources might help the country emerge as a winner in the post-industrial era.

### Doubling Down on Putinism

Putin's reelection in the spring of 2012 tampered this enthusiasm for Russia's high-tech potential, both for actions he took and actions he did not take. Regarding new Putin policies, several served to stifle economic growth in general and high-tech in particular. After winning reelection in March 2012, Putin further constrained autonomous political activity. He made demonstrations harder to organize, arrested opposition leaders, and pushed off the airwaves or into political exile many in the independent media.<sup>29</sup> His government also constrained even further non-governmental activities, especially by criminalizing the receipt of foreign funds. The Russian government also forced USAID to close and eventually outlawed several other Western NGOs and foundations.<sup>30</sup> After protests in 2011–2012, the Russian government started blocking certain websites and passed laws regulating content on the internet.<sup>31</sup> One new draconian law compels Western social media companies to store their data on Russian citizens in Russia. As a result, LinkedIn pulled out, assessing that the risk to their integrity was greater than any economic reward. Other social media companies such as Facebook, Google, and Twitter remain in negotiations with Russian authorities over the implementation of this law.<sup>32</sup> In 2017, Putin adopted a *Strategy for Developing the Information Society in Russia*, which provided further constraints on information on the internet. More generally, Putin also expanded the role

of the state in the economy, including increasing state ownership, which by some estimates now hovers around 60 percent, again weakening the permissive conditions for entrepreneurship and private investment. Corruption continues to stifle economic growth and discourage investment. In 2013, Putin withdrew from the Open Government Partnership.<sup>33</sup> In 2018, after his reelection for a fourth term, Putin dissolved the Russian Ministry of Open Government Affairs.<sup>34</sup>

Putin's foreign policies also directly impacted in a negative way Russia's high-tech sector and international economic integration more generally. In response to Putin's decision to annex Crimea and support separatists in eastern Ukraine, the United States, the European Union and several other countries imposed the most severe economic sanctions against Russia or the Soviet Union ever. These sanctions implemented by the United States, Europe, and other countries have produced negative effects on the Russian economy. Starting in the third quarter of 2014, the Russian economy contracted for nine consecutive quarters; sanctions contributed to this decline.<sup>35</sup> By some estimates, sanctions were responsible for one and a half percent of GDP contraction in 2014.<sup>36</sup> Others assess that the impact of sanctions, independent of falling oil prices, was as much as 2-2.5% for the first few years after Russia's intervention in Ukraine.<sup>37</sup> Hardest hit were Russian companies and banks seeking to raise capital on international markets. In turn, according to the EBRD's chief economist, Sergey Guriev, "Russia's inability to borrow has led to a dramatic depreciation of the ruble and a fall in real incomes and wages."<sup>38</sup> Capital outflows had also been steady for years and then accelerated after sanctions, jumping from \$61 billion in 2013 to \$151.5 billion in 2014.<sup>39</sup> In the wake of sanctions, foreign direct investment also slowed, though numbers are now moving slowly in positive direction again. Some planned future investment has been cancelled, including most dramatically Exxon-Mobil's decision to suspend its joint investment projects with Rosneft, at one time estimated to total \$500 billion. Other potential foreign investments, which did not occur because of sanctions, are harder to track—it's hard to measure a non-event—but anecdotally Western investors and companies doing business in Russia have stated publicly and privately that uncertainty about future sanctions has squelched interest in attracting new investors to the Russian market. Most of those already in Russia will fight to stay; those who may have thought about investing in Russia market are now looking for less risky opportunities. Putin's belligerent foreign policies also have accelerated Russia's brain drain; "In 2014, the number of Russian emigrants topped 300,000 for the first time since the early 1990s."<sup>40</sup> And those leaving are not unskilled laborers, but Russia's best and brightest – the very educated labor force needed to grow Russia's high-tech sector.

In addition to these domestic and foreign actions, which weakened the incentives for technological innovation and investment, Putin also signaled a disinterest in Medvedev's high-tech agenda. State spending on Skolkovo has come under greater scrutiny. Viktor Vekselberg, Skolkovo's chairman, had his offices raided. Pavel Durov left Russia, becoming a citizen of a small Caribbean nation of St. Kitts and Nevis, after he had lost control of his company, Vkontakte, to an investment firm closely tied to the Kremlin.<sup>41</sup> Durov is the most high-profile high-tech entrepreneur to flee Russia recently, but tens of thousands have followed his example.

Episodically, Putin has signaled in words his understanding of the need for the Russian economy to modernize and diversify. Some pockets of innovation continue to occur.<sup>42</sup> Some conditions for business have improved.<sup>43</sup> However, Putin values control over innovation; vertical instead of horizontal arrangements. He is willing to sacrifice economic dynamism for stability (as defined by him). As former deputy finance minister, Sergey Aleksashenko has written, "Putin has never believed in the power of competition and private initiative. He did not see these factors as contributing to the growth of the Russian economy, and at the same time he was certain that state officials were best placed to determine the country's long-term economic interests."<sup>44</sup> A political leader with such an orientation will never foster the conditions for high-tech entrepreneurship.

### Chinese Dreams, Russian Realities

Putin believes there is an alternative model. Instead of Silicon Valley (a place that he has never visited), Putin seeks inspiration and support for Russia's economic development in Beijing. Putin and his current team of economic advisors believe that Russia can replicate China's success in state-led development.<sup>45</sup> This new fascination of the Chinese model harkens to the late Soviet period when Gorbachev and advisors also hoped to emulate the Chinese economic miracle.<sup>46</sup> Regarding trade and investment opportunities, Putin is more interested in China than the United States these days.<sup>47</sup> Moscow and Beijing have entered into several arrangements to spur economic growth through technological cooperation.<sup>48</sup>

China's growth over the last three decades has indeed been miraculous. Through the implementation of prudent, patient market reforms, Chinese leaders have pulled more people out of poverty in three decades than ever witnessed before in world history. Most of that growth was stimulated by the transition from an agrarian based economy to an industrial economy during a period of market reforms. It was the opening of the Chinese economy, not autocracy, that spurred this growth, but that nuance is often lost in those celebrating the virtues of a "strong hand" for economic development. The Chinese government as well as firms connected to the state also



have made major investments in scientific knowledge that has allowed China to race ahead of more advanced industrialized economies in artificial intelligence, robotics, big data, and tele-communications.<sup>49</sup> The Chinese government also has demonstrated an ability to nurture new high-tech firms in the post-industrial age, including Tencent, Huawei, Alibaba and Baidu. Putin would love to emulate these Chinese achievements.

Can Russia follow the China model? The evidence so far suggests no.

<sup>1</sup> Alexey Kudrin, Evsey Gurvich, "A new growth model for the Russian economy," *Russian Journal of Economics*, 1, 1, (March 2015) pp. 30-54, <https://www.sciencedirect.com/science/article/pii/S2405473915000033>

<sup>2</sup> See "Human Development Index Trends, 1990-2017," United Nations Development Programme, Human Development Reports, <http://hdr.undp.org/en/composite/trends>; 2018 Social Progress Index, *The Social Progress Imperative*, <https://www.socialprogress.org/>; and "Россия поднялась на семь позиций в индексе социального прогресса Deloitte," *Kommersant*, December 20, 2018, <https://www.kommersant.ru/doc/3745980>

<sup>3</sup> Life expectancy at birth, total years, *The World Bank*, <https://data.worldbank.org/indicator/SP.DYN.LE00.IN>

<sup>4</sup> IFR International Federation of Robotics, *Robot Density Rises Globally*, <https://ifr.org/ifr-press-releases/news/robot-density-rises-globally>.

<sup>5</sup> Alexander Gerschenkron, *Economic Backwardness in Historical Perspective: A Book of Essays* (Harvard, 1963)

<sup>6</sup> The literacy rate was 97.9% in 1989, according to the World Bank. See Literacy Rate, Adult Total, *The World Bank*, <https://data.worldbank.org/indicator/SE.ADT.LITR.ZS?end=2016&locations=RU&start=1970&view=chart>

<sup>7</sup> Soviet Union Higher Education, *Country Data*, <http://www.country-data.com/cgi-bin/query/r-12568.html>

<sup>8</sup> Joel Hellman, "Winners Take All: The Politics of Partial Reform in Postcommunist Transitions." *World Politics* 50: 2 (1998) pp. 203-234.

<sup>9</sup> Dan Senor and Saul Singer, *Start-up Nation: The Story of Israel's Economic Miracle* (New York, Twelve, 2009).

<sup>10</sup> Chris Miller, *Putinomix: Power and Money in Resurgent Russia* (Durham: UNC Press, 2018)

<sup>11</sup> Alexander Pogorletskiy and Fritz Söllner. "The Russian Tax Reform." *Intereconomics* 37.3 (2002) pp.156-161, <https://archive.intereconomics.eu/downloads/getfile.php?id=219>

<sup>12</sup> Keith Crane, Shanthi Nataraj, Patrick Johnston, Gursel Rafig oglu Alieyev. *Russia's Medium-Term Economic Prospects* (Santa Monica: RAND, 2016).

<sup>13</sup> According to estimates by Evsey Gurvich and Ilya Prilepsky, an oil price increase of 1% in real terms led to an increase in domestic demand of 0.22%. See Gurvich and Prilepskiy, "How to secure external sustainability of the Russian economy," *Voprosy*

*Ekonomiki*, 9 (2013), pp. 4-39; and Alexey Kudrin, Evsey Gurvich, "A new growth model for the Russian economy," *Russian Journal of Economics*, 1:1 (March 2015) pp. 30-54, <https://www.sciencedirect.com/science/article/pii/S2405473915000033>

<sup>14</sup> Vladimir Mau, "Lessons of the Spanish Empire," *Russia in Global Affairs*, July 30, 2015, [http://eng.globalaffairs.ru/number/n\\_5343](http://eng.globalaffairs.ru/number/n_5343); Anders Åslund, "Russian Resources: Curse or Rents?" *Eurasian Geography and Economics*, 46:8 (2005) pp. 610-617. 10.2747/1538-7216.46.8.610

<sup>15</sup> Michael McFaul, "Choosing Autocracy: Revolution, Institutional Inertia, and Actors in the Erosion of Russian Democracy," *Comparative Politics*, 50: 3 (April 2018).

<sup>16</sup> Timothy Frye, "Slapping the grabbing hand: credible commitment and property rights in Russia." (2003); and Michael McFaul and Kathryn Stoner-Weiss, "The Myth of the Authoritarian Model: How Putin's Crackdown Hurt Russia," (with Kathryn Stoner-Weiss), *Foreign Affairs*, 87: 1 (Winter 2007), pp. 68-8

<sup>17</sup> "A Climate of Fear: Former Putin Advisor Discusses Brutality against Russian Opposition," *Spiegel*, April 23, 2007, <http://www.spiegel.de/international/world/a-climate-of-fear-former-putin-advisor-discusses-brutality-against-russian-opposition-a-478817.html>

<sup>18</sup> Judith Twigg, Russia Is Losing Its Best and Brightest: Highly educated Russians are racing for the exits—but does Putin care? *The National Interest*, June 13, 2016, <https://nationalinterest.org/feature/russia-losing-its-best-brightest-16572>

<sup>19</sup> Michael Isikoff, and David Corn. *Russian Roulette: The Inside Story of Putin's War on America and the Election of Donald Trump*. (New York: Twelve, 2018).

<sup>20</sup> Robert Coalson, "Russia: Medvedev No Democratic Alternative," *Radio Free Europe*, February 8, 2008, <https://www.rferl.org/a/1079448.html>

<sup>21</sup> Ibid.

<sup>22</sup> "Cisco Systems relocating Russia-CIS headquarters to Skolkovo," *Skolkovo*, July 9, 2015, <https://sk.ru/news/b/articles/archive/2015/07/09/cisco-systems-relocating-russiacis-headquarters-to-skolkovo.aspx>

<sup>23</sup> Авиационный учебный и научно-исследовательский центр, *Boeing Website*, <https://www.boeing.ru/skolkovo/>

<sup>24</sup> Benjamin Quenelle, "Putin's Toughest Challenge: A High-Tech Future For Russia," *Worldcrunch*, March 16, 2018, <https://www.worldcrunch.com/tech-science/putin39s-toughest-challenge-a-high-tech-future-for-russia>

<sup>25</sup> Sklotech, *5 Steps into the Future*, (Moscow, 2018).

<sup>26</sup> About Rusnano Group, *Rusnano website*, <http://en.rusnano.com/about>

<sup>27</sup> Kai-Fu Lee, *AI Superpowers: China, Silicon Valley and the New World Order*, (New York, HMH, 2018)

<sup>28</sup> G.I. Adbrakhmanova, G.G. Kovaleva, and S.M. Plaskin, *Approaches to Defining the Measuring the Internet Economy*, (Moscow, Basic Research Programs Working Papers, Higher School of Economics, 2016), p. 25. This paper discusses in detail the difficulties of estimating the size of the internet economy.

<sup>29</sup> Gleb Bryanski, "Russia's Putin signs anti-protest law before rally," *Reuters*, June 8, 2012, <http://www.reuters.com/article/us-russia-protests-idUSBRE8570ZH20120608>. For instance, Dozhd TV, Russia's most successful independent television network, was pushed off the air. Lenta.ru, Russia's largest internet news organization at the time, was shut down and forced to reconstitute as Meduza in Latvia.

<sup>30</sup> Владимир Федоренко, "В "стоп-лист" НКО вошли Фонд Сороса и Всемирный конгресс украинцев", *Риа Новости*, July 7, 2015. <https://ria.ru/society/20150707/1118850670.html>

<sup>31</sup> For a comprehensive list of all restrictions, see Sergey Aleksashenko, *Putin's Counterrevolution: How Putin's Autocracy Undercut Russia's Economy and Chances for Democracy* (Washington, Brookings Institution Press, 2018) chapter three.

<sup>32</sup> Julia Ioffe, "Russian Money in Silicon Valley," *The Atlantic*, November 9, 2017, <https://www.theatlantic.com/international/archive/2017/11/yuri-milner-paradise-papers/545483/>

<sup>33</sup> "Russia withdraws from Open Government Partnership. Too much transparency?" *Open Government Partnership*, May 20, 2013, <https://www.opengovpartnership.org/stories/russia-withdraws-open-government-partnership-too-much-transparency>

<sup>34</sup> "Putin signs decrees on appointing new Russian cabinet members," *Tass*, May 18, 2018, <http://tass.com/politics/1005075>

<sup>35</sup> "39 Russia Economic Report," *The World Bank*, May 2018, p. 4. <http://pubdocs.worldbank.org/en/162681527086868170/RER-39-Eng.pdf>

<sup>36</sup> Isolating the independent causal impact of sanctions is difficult to measure, especially when energy prices were also declining at the same time. One and a half percent is a conservative estimate suggested by Russia's own prime minister, Dmitry Medvedev. "Russian economy shrinks 2% as sanctions bite – Medvedev," *BBC News*, April 21, 2015, <https://www.bbc.com/news/world-europe-32396792> The IMF estimates "sanctions and counter-sanctions could initially reduce real GDP by 1 to 1½ percent. Prolonged sanctions, could lead to a cumulative output loss over the medium term of up to 9 percent of GDP") Russia Country Report #15/211, *International Monetary Fund*, August 2015, <https://www.imf.org/external/pubs/ft/scr/2015/cr15211.pdf>

<sup>37</sup> Evsey Gurvich, "Как правильно и как неправильно отвечать на санкции," *Vedomosti*, May 16, 2018, <https://www.vedomosti.ru/opinion/articles/2018/05/16/769605-otvechat-sanktsii>

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<sup>38</sup> Sergei Guriev, "Russia's Constrained Economy," *Foreign Affairs*, (May/June 2016), <https://www.foreignaffairs.com/articles/russia-fsu/2016-04-18/russias-constrained-economy>

<sup>39</sup> "UPDATE 1-Russia's capital outflows reach record \$151.5 bln in 2014 as sanctions, oil slump hit," *Reuters*, January 16, 2015, <https://www.reuters.com/article/russia-capital-outflows-idUSL6N0UV3S320150116>

<sup>40</sup> Crane et al, *Russia's Medium-Term Economic Prospects*, p. 48

<sup>41</sup> Natasha Bertrand, "The founder of 'Russia's Facebook' explains how the Kremlin took his company away," *Business Insider*, May 18, 2015, <https://www.businessinsider.com/the-founder-of-russias-facebook-explains-how-the-kremlin-took-his-company-away-2015-5>

<sup>42</sup> For instance, in an effort to modernize the government and provide its citizens with online services, the Russian government recently approved the creation of a "digital profile" for each citizen, as part of its new program called "digital economy". A person's digital profile would have metadata on different legal records, such as person's property and taxes, and would simplify and speed up government services. In addition, commercial organizations such as banks might get access to these digital profiles. Such a database of digital profiles should be completed by 2023 "Профиль в цифрах: как будет работать база данных о россиянах в 2023 году," *RBK*, September 20, 2018, [https://www.rbc.ru/technology\\_and\\_media/20/09/2018/5ba262ef9a7947c2ab193522?from=main&utm\\_source=Morning+Bell&utm\\_campaign=e546317a3e-EMAIL\\_CAMPAIGN\\_2018\\_09\\_20\\_07\\_13&utm\\_medium=email&utm\\_term=0\\_f6fe1bf625-e546317a3e-73322681](https://www.rbc.ru/technology_and_media/20/09/2018/5ba262ef9a7947c2ab193522?from=main&utm_source=Morning+Bell&utm_campaign=e546317a3e-EMAIL_CAMPAIGN_2018_09_20_07_13&utm_medium=email&utm_term=0_f6fe1bf625-e546317a3e-73322681)

<sup>43</sup> In the World Bank's "Ease of Doing Business," Russia has risen up the ranks considerably during Putin's third term.

<sup>44</sup> Aleksashenko, *Putin's Counterrevolution*, p. 384.

<sup>45</sup> "Sergei Glazyev: Our economy is increasingly lagging behind the world average level," *Moscow Economic Forum*, February 19, 2017, <http://en.me-forum.ru/media/news/433/>

<sup>46</sup> Miller, Chris. *The struggle to save the Soviet economy: Mikhail Gorbachev and the collapse of the USSR*. UNC Press Books, 2016.

<sup>47</sup> Alexander Lukin, *China and Russia: The New Rapprochement* (Cambridge: Polity Press, 2018) pp. 138-162.

<sup>48</sup> One example is the Sino-Russian high-tech innovation park, which a Russian firm Russia-China Investment Fund and China's Tus-Holdings are considering. The two firms already announced joint technology investment plans with \$1.28 billion invested in the Russian Tushino Project Technology Park. See "Russia-China to invest in hi-tech development," *Reuters*, September 10, 2018, <https://www.reuters.com/article/us-russia-china-investment/russia-china-to-invest-in-hi-tech-development-idUSKCN1LR03F>

<sup>49</sup> Lee, *AI Superpowers*.

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# The Influence of Current Demographic Processes on International Relations and International Security: The Russian Take

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One of the key developments in 20<sup>th</sup> and 21<sup>st</sup> century history has been the demographic revolution, or demographic transition, which radically changed the course of fundamental demographic processes involving the birth rate, mortality and migration. These changes have had, and continue to have, a significant effect on all aspects of life in modern and developing societies, including their economies, social relations, culture and political life. In addition, they greatly influence the crucial sphere of international relations, and create unprecedented challenges for international security.

Demographic change affects the international situation both directly and indirectly, through the social processes experienced by all societies which embrace this change.

## The Population Explosion and the Change in the Global Power Balance

The direct and obvious influence of demographic processes on the international situation is caused by the very existence of the global population explosion, unprecedented in speed and scale and characterized by extreme geographical irregularity. The demographic masses of different countries and regions are changing at a breakneck speed, affecting the global power balance. This, in turn, logically affects the entire system of international relations.

The Earth's population in the early 20<sup>th</sup> century was around 1.7 billion people. Within a single century, that figure grew by 4.5 billion. The current global population stands at 7.6 billion; the World Bank estimates that only 1.2 billion live in rich countries, where the annual per capita GDP exceeds \$12,000. The population size of these countries has stabilized, whereas elsewhere in the world it continues to grow. As a result, the global population may exceed 11 billion people by the end of the century, and the population of the countries that are considered rich today will account for only a tiny proportion of this figure (see Figure 1).

Countries with giant populations emerge as new influential actors in the global political arena; new power centres emerge, as do new risks and threats to international security.

International actors are sovereign states. In the mid-20<sup>th</sup> century, the combined population of the world's 20 largest countries stood at 1.9 billion people, or 74.4 percent of the global population.<sup>1</sup> The top 20 countries included eight European countries, the United States and Japan, which together accounted for a quarter (25.3 percent) of the global population. The demographic weight of the leading 20 countries has not changed much since: in 2015, they accounted for 70.3 percent of the global population. The composition of the top 20 countries changed considerably, however: only two European countries, the United States, and Japan remained on the list, and their combined demographic weight dropped to 9.1 percent. The United Nations forecasts that by the middle of the 21<sup>st</sup> century, the global North will only be represented by the United States, Russia, and Japan on that list (making up 6.5 percent of the global population), and that by the end of the century, only the United States will remain, accounting for 4 percent of the global population (see Table 1).

Until recently, the rich and developed countries – members of the notional global North – believed themselves to be the owners of the world and main drivers of the world order. Today, they are increasingly turning into a demographic minority. The global South, for its part, with its rapidly growing population, is also developing economically. Yesterday's "backward" agricultural countries are increasingly modernizing their economies, embracing the centuries of economic, social and technological experience accumulated by Europe, and in a number of instances, rapidly building their military potential. They remain much poorer than the countries of the North in terms of per-capita GDP, but huge populations allow their centralized governments to concentrate their combined resources, which are compatible with the resources of the wealthiest

countries. The population of China is much poorer than that of any developed country; nevertheless, in terms of the combined GDP, China has long secured its status as the world's second-largest economy.

The rapid change in the global power balance jeopardizes and erodes the *de facto* world order established after World War II, as well as the post-war perceptions of superpowers, power poles, hotbeds of tension confrontation, etc. This change is largely caused by the global population explosion, which testifies to the enormous influence of demographic processes on international relations and international security.

However, despite the unquestionable importance of qualitative correlations as applied to population size, economic potential or military might, they are not the key factor determining the behaviour of international actors. Of much greater significance are social processes in each separate country that impact government policies, including foreign policies. The countries currently going through the demographic revolution may differ immensely, but fundamental demographic shifts set them on roughly the same inevitable course of social change. This involves the emergence of risk factors endangering international security.

### **The Demographic Revolution and Threats to International Security**

Since the second half of the 20<sup>th</sup> century, the countries representing the global South, where the population explosion is taking place, have been increasingly involved in modernization processes. The multifaceted change born of modernization dictates the course and intensity of social processes which, in turn, determine the state of developing societies. The driving forces behind this change, and its very essence, cannot be reduced to pure demography. In fact, modernization itself, with its varied success stories and failures from one country to another, is largely influenced by economic, social and political factors. Demographic factors are but one of the groups of factors stimulating modernization, accelerating or inhibiting modernization processes. Nevertheless, demography should not be neglected: fundamental demographic change is intertwined with and exerts significant influence on economic, social and other changes, so it must be regarded as a major factor influencing the state of society and government policies and generating risk factors that affect international security.

### **The Changing Age Composition as a Risk Factor**

The irreversible change in a population's age composition, or population ageing, as it is known to those who study demographics, is one of the most obvious consequences of the demographic revolution. It should be noted that population ageing manifests itself

in the late phases of the demographic revolution, with the onset of low birth rates in response to the reduction in mortality. At present, this situation is pertinent to all developed countries, but not to the developing world. The fact that the decreasing birth rate lags behind the reduction in mortality results in younger age groups accounting for an extremely high proportion of the total population.

One consequence of this is that different country groups and regions become polarized in terms of their age composition. In wealthy countries, the median age stood at 40.4 years in 2015 (with one half the population south of the figure and the other north of it). In low-income countries, the figure stood at just 18.3 years. Half the population of the least developed countries (as defined by the United Nations), with a total population of around 1 billion people, currently has a median age of under 20. The median age of the African population stands at 19.4 years. The median age in the continent's largest countries is 17.9 years in Nigeria, 16.8 years in the Democratic Republic of the Congo, and 17.3 years in Tanzania. The median age of the global population is below 30 years, while that of the European population is nearing 42 years (see Figure 2).

In the countries with the lowest median age, over a third of the adult population is made up by adolescents and young people aged between 15 and 25. The figure is twice as high in low-income countries as in high-income ones. It is also fairly high in medium-income countries but is still lower than that for low-income countries and is evidently decreasing (see Figure 4).

The huge number of young people and adolescents, essentially children, often poorly educated or not educated at all, growing up in poor countries with high levels of unemployment, possessing no tangible future and zero life experience, are easily manipulated with catchy slogans appealing to blind faith rather than rational thinking. Hence the political term "youth bulge," which is associated with a high risk of political upheavals and the emergence of extremist political regimes whose existence jeopardizes the current international security system.

### **Rapid Urbanization as a Risk Factor**

Urbanization is normally not associated with the demographic revolution: it is viewed as an independent process determined primarily by economic factors. However, back in the 1970s, Wilbur Zelinsky postulated a mobility transition as an organic part of the demographic revolution.<sup>2</sup> Traditional agricultural societies are characterized by low mobility; their members are unlikely to leave their agriculture-centred households and migrate *en masse*. The reduction in mortality, which is a trigger of demographic revolutions, results in areas with

restricted land resources having excessive populations. These excessive human resources are then forced to seek jobs outside the agricultural sector. This, in turn, requires an increase in the population's professional and social skills, which inevitably results in higher territorial mobility. The entire society thus comes into motion; new growth points for non-agricultural trades sprout up in existing or newly established cities, which turn into new focal points for economic activity and, by extension, for the migrating population.

This process has only been able to happen thanks to the emergence of the historically new sociodemographic phenomenon of *en-masse* individual voluntary migration (also known as migration transition). The phenomenon was first recorded in Europe, and became quite widespread in the 18<sup>th</sup> century, ultimately facilitating pan-European urbanization. While the process of urbanization was gradual in Europe, it was not without its difficulties and would result in the emergence of marginalized urban strata accountable for significant social tensions and upheavals.

The European legacy is now a thing of the past. But history keeps repeating itself on a much larger scale in developing countries that are living through their own version of the population explosion. These countries are experiencing their own version of the mobility revolution and migration transition, which have resulted in skyrocketing levels of internal migration related to urbanization. Unlike the piecemeal European urbanization process, which took place over the course of several centuries, third-world urbanization is explosive. The urban population of developing countries grew tenfold between 1950 and 2015 (an increase of 2.7 billion people), mostly thanks to rural residents' migration to cities. In 2008, the global urban population exceeded the rural population for the first time in history (see Figure 5). The global increase in the rural population has effectively stopped, with the demographic increase bleeding to cities.

The incredibly fast and massive urbanization processes in ill-prepared, poor, and until recently predominantly agricultural countries resulted in the emergence of densely populated, marginalized city suburbs. These countries are still only partly urban: they have not got to the point of negating their agricultural heritage completely, as evidenced by the way they are living their newly urbanized lives. Even though the new city dwellers normally copycat the habits of established residents, they take some time to embrace the urban system of values (which itself is fairly novel in countries that have only just undergone urbanization). This cultural duality affects the stability of the newcomers' social behaviour, which does little to help social and political stability in many developing countries.

### The Conflict of Cultures as a Risk Factor

Any developing country embracing modernization is bound to experience a crisis in its traditional culture. The cultural matrix of peasant communities, which are characterized by low mobility, takes serious hits when confronted with the new technology- and knowledge-driven economy and the lifestyle of educated and dynamic city dwellers, both of which are essential to the urban environment. We should not underestimate the direct contribution of demographic change to the emergence and development of this conflict.

The main avenue for restoration of the demographic balance disturbed by the decline in mortality is to reduce fertility. This requires a radical revision of socially accepted behavioural norms as applied to the family. Cultural regulation of family affairs affects a broad range of personal issues, including the distribution of gender- and age-specific roles, the schemes of interaction between men and women and between parents and children, sexual and family morals, societal attitudes towards reproduction and upbringing of offspring, and so on. This regulation, which determines the daily behaviour of people, forms a very important part of any cultural system. The demographic revolution overhauls the established behavioural formats and demands a complete revision of the targets and mechanisms of cultural regulations. No transition from old standards to new ones is ever conflict-free: it inevitably splits society into two groups: supporters of the old standards and proponents of the new ones. This split affects each and every household to varying degrees, exacerbating the overall conflict within the cultures of modernizing societies. And cultural conflicts do tend, under certain circumstances, to transform into political ones.

All things considered, the changes caused by the demographic revolution interact with economic and social transformations, which change the landscape of the contemporary world. Demography contributes significantly to the burden of difficult problems facing developing countries that are only just embracing modernization. The unprecedented explosive population growth and the population's growing mobility are confronted by limited economic resources and restricted throughput capacity of social lifts. Urbanization and the continuing development of non-agricultural economic sectors are increasingly becoming the natural answer to worsening economic and social problems, but those problems are growing too fast, reducing the effectiveness of the responsive measures and hampering the search for a remedy. Efforts aimed at reducing the birth rate to curb population growth and thus hinder the exacerbation of the problems at hand result in the emergence of cultural conflicts and are frequently resisted.

All this affects the state and stability of societies undergoing modernization. Such societies are increasingly swayed by the emergent marginal urban strata, which themselves are a product of ongoing modernization. Millions of young and arguably immature people, who are suffering from a cultural identity crisis, have no prospects, and are unsatisfied with their position in society, fall prey to assorted radical utopian ideologies or fundamentalist religious movements that wield significant mobilization resources. This is fertile soil for individual or collective international terrorism, but it may also breed more serious international threats. Many overpopulated poor countries are experiencing increasing internal tensions and political instability, which may result in foreign policy disputes. Foreign political rhetoric already plays a major part in the domestic politics of many countries, sometimes leading to actual confrontations and military conflicts. Changes to the global demographic balance and the emergence of giant states with unlimited human resources in the absence of sufficient internal stability multiplies threats to international security.

### **International Migration and International Security**

The experience of Europe in the 18<sup>th</sup> and 19<sup>th</sup> centuries demonstrates that demographic transition as part of the greater demographic revolution facilitated not just internal migration and urbanization, but also mass international migration, which relied on the same incentives and newly acquired social characteristics as did individual internal migration. The newly acquired mobility of Europeans, combined with the development of means of transportation, paved the way for unprecedented intercontinental migration flows, which served as an effective response to the European population explosion of the 19<sup>th</sup> century and, in the process, resulted in the emergence of new states that reshaped the political map and the global balance of powers.

The current demographic revolution, which is global in nature, is proceeding according to the same scenario. New city dwellers in Asia, Africa, and Latin America are no longer low-mobility rural dwellers who cannot imagine leaving their village home for good and seeking a new life in a world of seemingly limitless opportunities. Migration from rural areas to cities is a lesson in public mobility, but it is also a predictor of international migration drives, whose size keeps growing.

The direction of these drives is obvious: people are moving from poorer countries to wealthier ones. Between 1950 and 2015, a total of 126 million people migrated to high-income countries; the United Nations' moderate, fairly conservative forecast predicts that another 184 million will follow suit by the end of the 21<sup>st</sup> century. The combined tally stands at 310 million, while the population

of the wealthy countries amounted to 1.1 billion in 2000 and the tiny growth that it has demonstrated is mostly thanks to the incoming migrants.<sup>3</sup>

The poor developing countries are becoming richer thanks to their modernization efforts. One would imagine that this would put a break on immigration. However, if a decline in immigration does happen, it is only when a certain income threshold is hit. Before that happens, growing incomes actually facilitate immigration from developing countries (see Figure 6). This increase may continue for a long period of time, because incomes in poor countries do not rise overnight.

The population of Africa is growing particularly rapidly. Between 1990 and 2015, the population of Europe stayed roughly the same, whereas the population of Asia grew by 37 percent and the population of Latin America grew by 42 percent. To compare, the African population rose by 88 percent. It should also be noted that Africa remains the poorest continent in the world. The internal mobility of the African population was rather high 25 years ago and has not increased much since. On the other hand, the number of migrants to countries outside Africa has doubled to over 16 million, becoming comparable to the number of migrants within the continent (see Figure 7), and is projected to grow further.

It would appear that modern-day international migration trends do not affect intergovernmental relations in any significant way. Hence the tendency to exclude these from the list of priority problems facing international relations, or indeed from the list of threats to international security. They are more likely to be discussed as an issue pertaining to the domestic policy of host countries. The tables may turn, however, as the growing scale of these problems affects opinions over time.

The host countries representing the global North are growing increasingly worried about the rising influx of immigrants. Negative public sentiments against migrants are on the rise, which is also affecting international relations, albeit indirectly, as evidenced by Brexit and the tensions among other EU countries owing to the refusal of some to accept Syrian refugees.

However, it is not up to the host countries to resolve the situation. Rather, it is the task of the countries from which migration originates. The South's migration pressure on the North, currently manifested in the massive influx of individual voluntary migrants, is merely a reflection of the global demographic imbalance. Migration historically acts as a demographic pressure valve in the history of humanity, one that helps to regulate the size of the population, even though the mechanisms involved may vary. There were times when migration took the form of a relatively peaceful resettlement on unoccupied lands; in other instances, some people would be driven out by

others over protracted periods of time. In some cases, however, migration came in the form of devastating and bloody military invasions. Even the conquest of the New World in the 18<sup>th</sup> and 19<sup>th</sup> centuries, mainly carried out through individual migration of the modern type, was accompanied by the extermination of local populations and the introduction of exported slaves.

At first glance, this scenario is impossible in the contemporary world. However, the aforementioned information illustrating the inevitability of social and political instability in developing societies experiencing a population explosion leaves little room for optimism. The global South is sitting on a powder keg that may detonate at any moment; it periodically experiences moments of political turbulence, which are fraught with high risks. The South's demographic pressure on the North might take various forms, from terror attacks to political and military pressure, which is potentially capable of massively reshaping the global political

map and throwing civilization as we know it, with all its achievements, back down the historical timeline.

<sup>1</sup> The USSR is not listed, but Russia and Ukraine are.

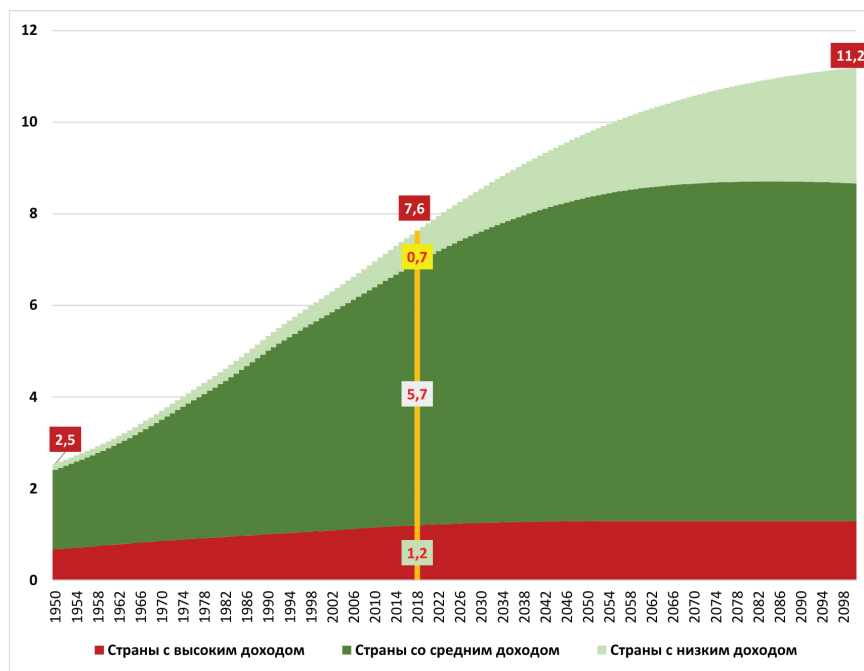
<sup>2</sup> Zelinsky W. The Hypothesis of the mobility transition // Geographical Review. 1971. Vol. 61. No.

<sup>3</sup> UN Population Division. World Population Prospects: The 2017 Revision, DVD Edition.

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## Supporting Data

Figure 1. Global Population by Groups of Countries with Different Income Levels, Billion People



Страны с низким доходом	Low-income countries
Страны со средним доходом	Middle-income countries
Страны с высоким доходом	High-income countries

Source: UN Population Division. World Population Prospects: The 2017 Revision, DVD Edition.

Table 1. The World's 20 Largest Countries by Population in 1950, 2015, 2050 and 2100, million people

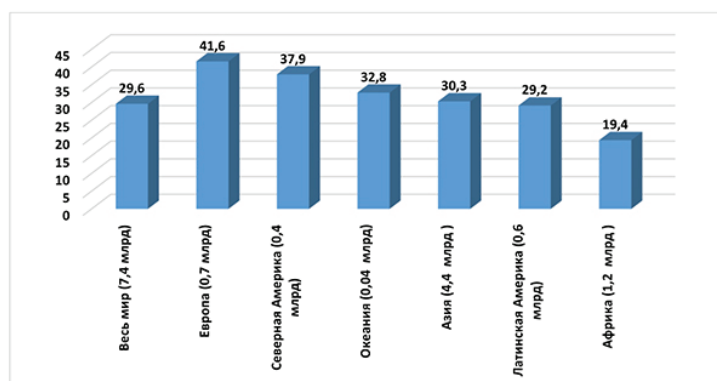
	1950		2015		2050		2100	
1	China	545	China	1397	India	1659	India	1517
2	India	372	India	1309	China	1364	China	1021
3	<b>United States</b>	158	<b>United States</b>	320	Nigeria	411	Nigeria	794
4	<b>Russia</b>	103	Indonesia	258	<b>United States</b>	390	<b>United States</b>	447
5	<b>Japan</b>	83	Brazil	206	Indonesia	322	Democratic Republic of the Congo	379
6	Indonesia	77	Pakistan	189	Pakistan	307	Pakistan	352
7	<b>Germany</b>	68	Nigeria	181	Brazil	233	Indonesia	306
8	Brazil	54	Bangladesh	161	Bangladesh	202	Tanzania	304
9	<b>UK</b>	51	<b>Russia</b>	144	Democratic Republic of the Congo	197	Ethiopia	250
10	<b>Italy</b>	46	<b>Japan</b>	128	Ethiopia	191	Uganda	214
11	Bangladesh	44	Mexico	126	Mexico	164	Egypt	199
12	<b>France</b>	42	Philippines	102	Egypt	153	Niger	192
13	Pakistan	41	Ethiopia	100	Philippines	151	Brazil	190
14	<b>Ukraine</b>	37	Egypt	94	Tanzania	138	Bangladesh	174
15	Nigeria	37	Vietnam	94	<b>Russia</b>	133	Philippines	173
16	<b>Spain</b>	28	<b>Germany</b>	82	Vietnam	115	Angola	173
17	Mexico	28	Iran	79	<b>Japan</b>	109	Iraq	156
18	Vietnam	27	Turkey	78	Uganda	106	Mexico	151
19	<b>Poland</b>	25	Democratic Republic of the Congo	76	Turkey	96	Kenya	142
20	Egypt	22	Thailand	69	Kenya	95	Sudan	139
	<b>74.4% of the world's population</b>		<b>70.3% of the world's population</b>		<b>66.9% of the world's population</b>		<b>65.0% of the world's population</b>	

Source: UN Population Division. *World Population Prospects: The 2017 Revision, DVD Edition*.

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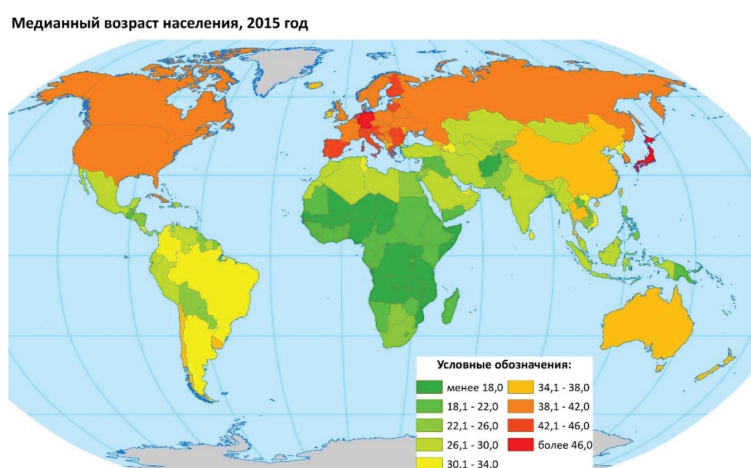
Figure 2. Median Age of the World's Largest Regions, Years



Весь мир (7,4 млрд)	World (7.4 billion)
Европа (0,7 млрд)	Europe (0.7 billion)
Северная Америка (0,4 млрд)	North America (0.4 billion)
Океания (0,04 млрд)	Oceania (0.04 billion)
Азия (4,4 млрд)	Asia (4.4 billion)
Латинская Америка (0,6 млрд)	Latin America (0.6 billion)
Африка (1,2 млрд)	Africa (1.2 billion)

Source: UN Population Division. *World Population Prospects: The 2017 Revision, DVD Edition*. File POP/5.

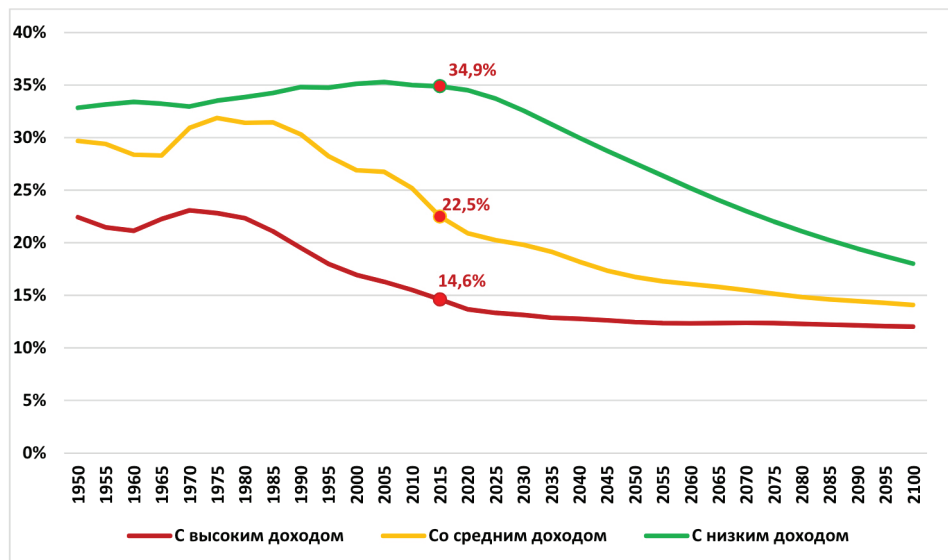
Figure 3. Median Age of the Population by Country in 2015



Медианный возраст населения, 2015 год	Median age of the population, 2015
Условные обозначения:	Key
менее 18,0	under 18.0
Более 46,0	Over 46.0

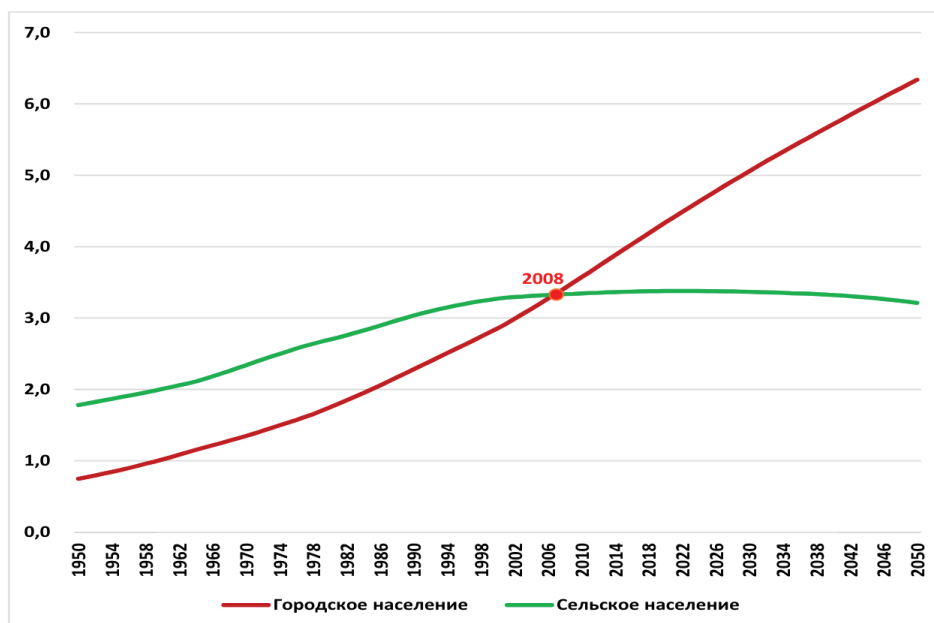
Source: UN Department of Economic and Social Affairs, Population Division (2015). *World Population Prospects: The 2015 Revision, DVD Edition*.

Figure 4. Share of People Age 15 to 24 in the Total Adult Population (Age 15 and Over)



С высоким доходом	High income
Со средним доходом	Medium income
С низким доходом	Low income

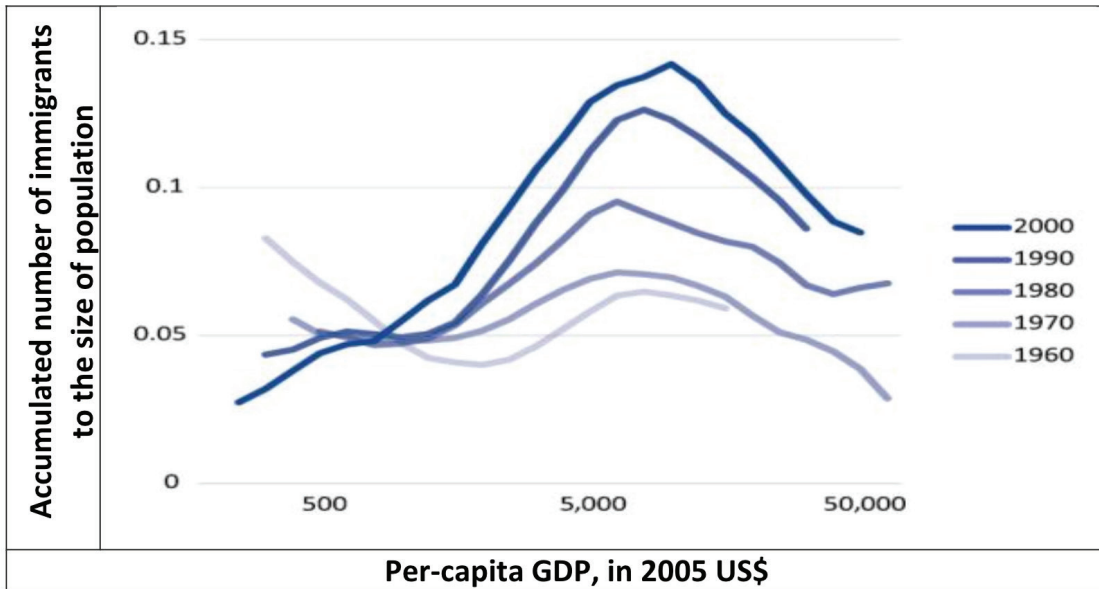
Figure 5. Global Urban and Rural Populations, Billions



Городское население	Urban population
Сельское население	Rural population

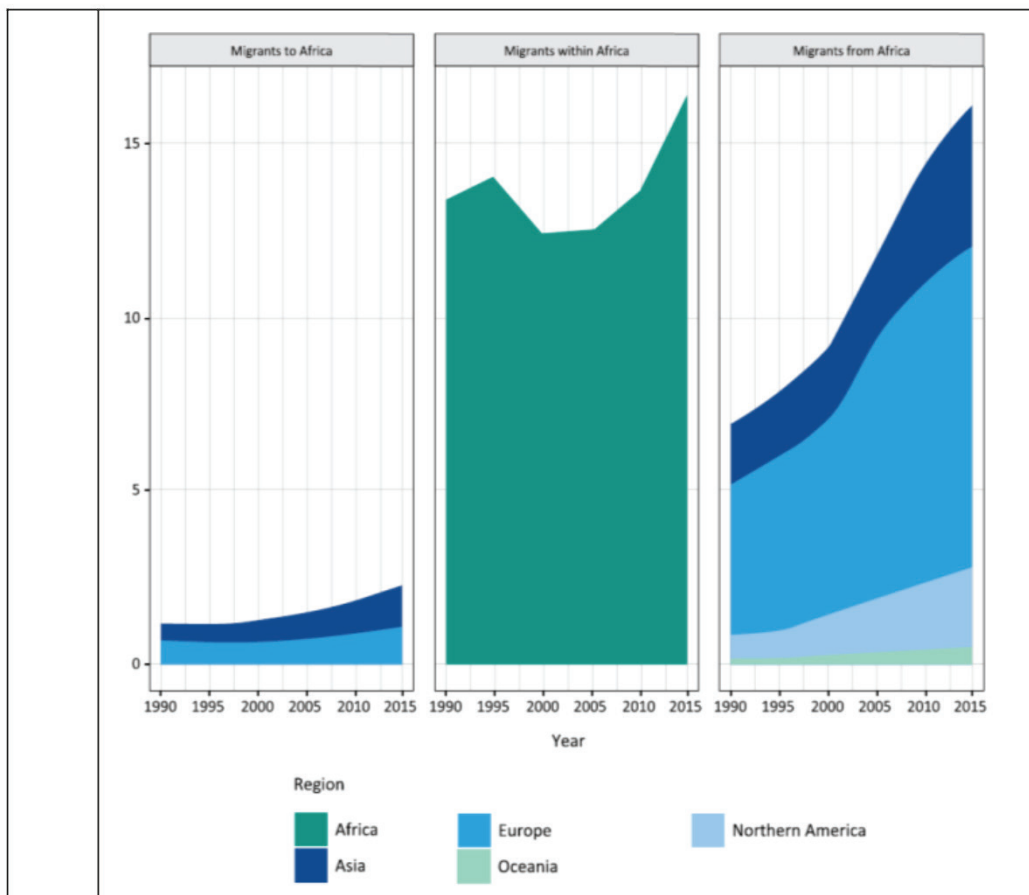
Source: UN Population Division. World Urbanization Prospects: The 2014 Revision, CD-ROM Edition.

Figure 6. Share of Immigrants in Total Population by Per-Capita GDP



Source: World Migration Report 2018. International Organization for Migration, 2017, p. 156.

Figure 7. International Migration Flows in Africa, 1990–2015



Source: World Migration Report 2018. International Organization for Migration, 2017, p. 45.

# Backgrounder: Russia's Economic and Demographic Health

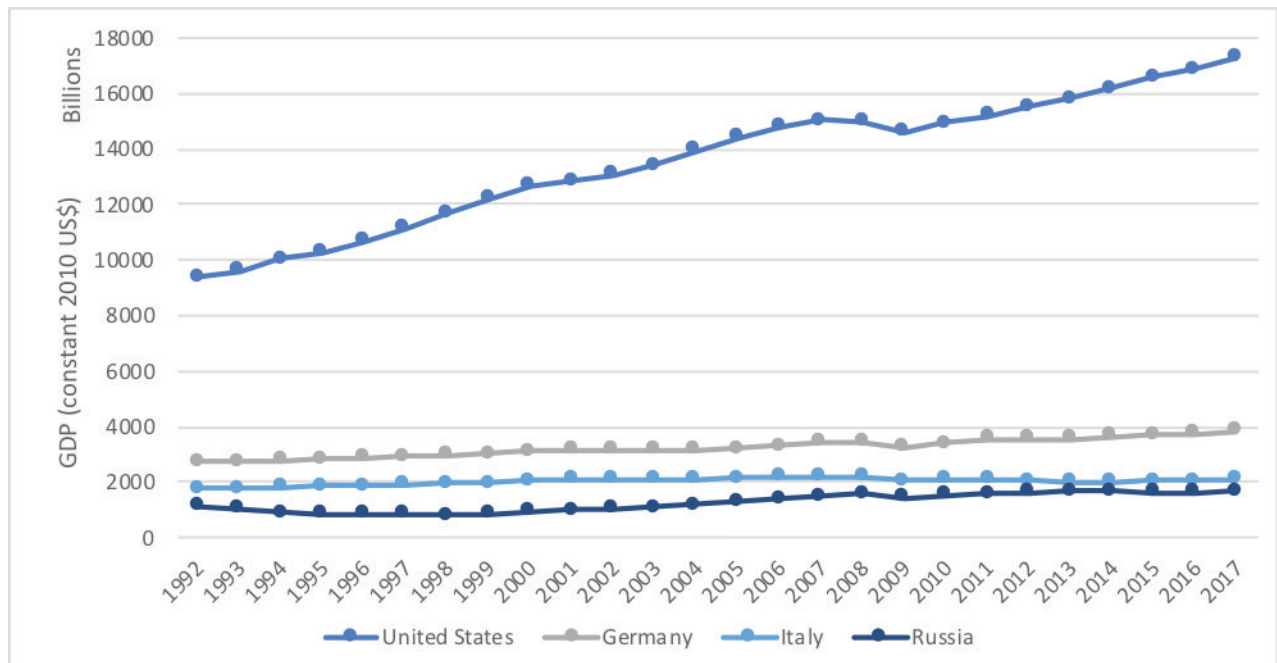
By James Cunningham, Hoover Institution

Russia's significance on the world stage and its military strength bely a host of internal problems, particularly economic and demographic. A snapshot of the country today reveals a weak economy coming out of a multiyear recession, an aging and unhealthy population, and a negative demographic outlook.

## The Economy

Russia's economy is slowly recovering from its recent recession. Beginning its downturn in 2014, the economy hit its nadir in early 2016 but has since gained some positive momentum.<sup>1</sup> Last year, it experienced its first full year of growth since 2014, and inflation slowed.<sup>2</sup> However, by comparison not only to the United States but also to European powers, Russia is relatively weak economically and has consistently been so since the fall of the Soviet Union.

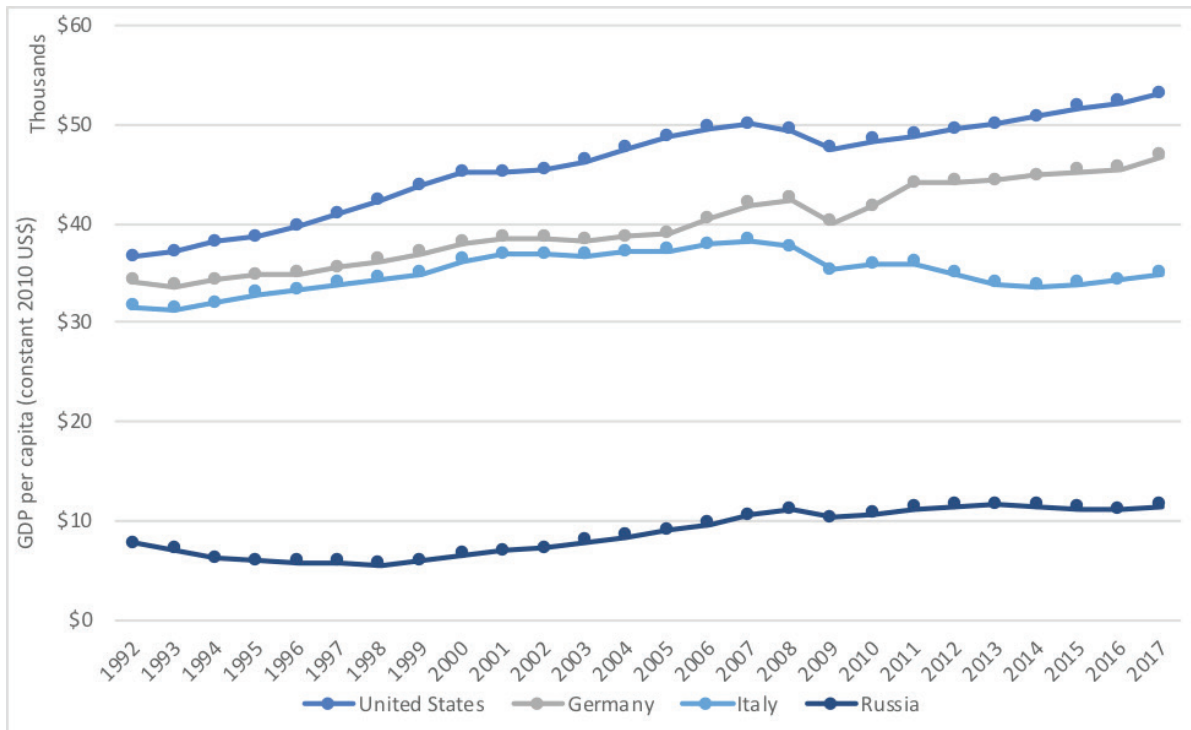
Figure 1: GDP of the United States, Germany, Italy, and Russia<sup>3</sup>



## Major Indicators

With a gross domestic product (GDP) of approximately \$1.5 trillion, Russia had the 11th largest economy in 2017. <sup>4</sup> But its output remains less than 50 percent of Germany's, as it has since 1992.

Russia's GDP per capita has similarly remained relatively low, clocking in at 33 percent of Italy's (see Figure 2). These may be crude measures, but, as both charts show, they reflect Russia's weakness when compared to its neighbors to the west.

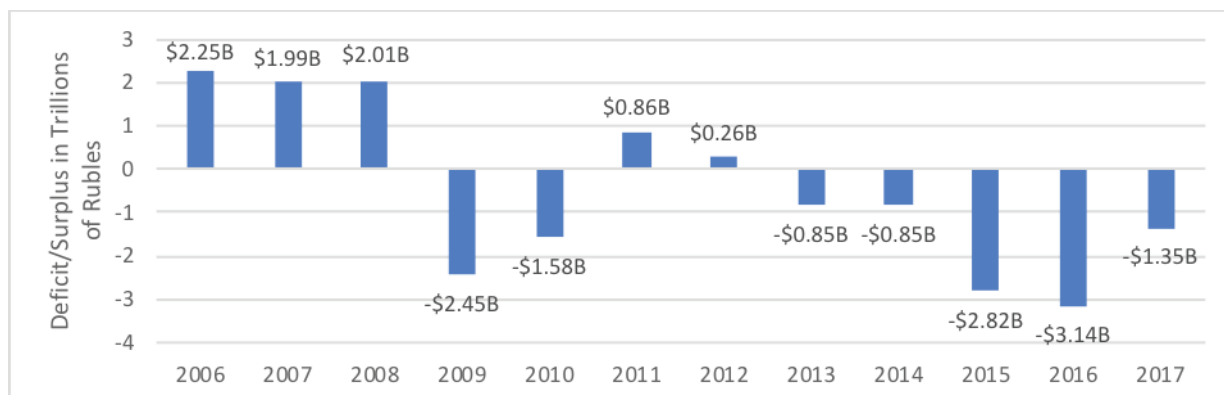
Figure 2: GDP per Capita of the United States, Germany, Italy, and Russia<sup>5</sup>

During the recession, household real incomes dropped 15 percent from their peak in 2013 to late 2016.<sup>6</sup> Moreover, measures of Russia's net private wealth—a revealing metric of a nation's relative economic power—show it to be a 2nd-class power. Russia's \$1.8 trillion in private wealth pales in comparison to Italy's \$10.8 trillion, Germany's \$13.7 trillion, or the United States' \$93.6 trillion.<sup>7</sup> While its private wealth has grown from a mere \$317 billion in 2000, Russia has, again, been a consistently small economic power in comparison to its potential adversaries.

The collapse of the ruble is worth noting as well; its value against the US dollar decreased by 50 percent between 2014 and the beginning of 2017.<sup>8</sup> Though it strengthened some in 2017, at roughly 66 rubles to the dollar in September 2018, the ruble remains half as strong as it was at the beginning of 2014.<sup>9</sup>

#### Fiscal Health

The federal government has run a deficit since 2013, as shown in Figure 3. The Kremlin drained its Reserve Fund—down from \$92 billion in 2014 to \$16.5 billion in mid-2017—to pay for the national budget over the past three years and merged its sovereign wealth funds to fund future commitments.<sup>10</sup> The budget deficit grew to as much as 3.56 percent of GDP in 2016 but dropped to about 1.4 percent in 2017.<sup>11</sup> Focused on capping the deficit, the government cut spending, including reducing the military budget by about 5 percent in 2017.<sup>12</sup> One analyst at the Carnegie Moscow Center predicts that education spending will decrease 20 percent in the three-year period of 2017 through 2019 and healthcare spending will drop 25 percent in that time.<sup>13</sup>

Figure 3: Russian Surplus/Deficit in Trillions of Rubles<sup>14</sup>

### *Economic Composition and Health*

Russia's economy suffers from a few major weaknesses, including increasing nationalization and dependence on hydrocarbons and trade. Government and state-owned companies increasingly dominate the economy with little prospect for economic reform. According to one Russian business newspaper, only 30 percent of the GDP in 2016 was attributable to the private sector.<sup>15</sup>

In general, Russia is unusually dependent upon trade for economic growth, as it makes up as much as 30 percent of GDP—twice the developed-countries average.<sup>16</sup> However, it is worth noting that tradable sectors contributed only 0.2 percent of the GDP growth in 2017.<sup>17</sup> Unsurprisingly, energy exports account for a significant portion of Russia's exports: crude petroleum makes up 28 percent of its exports, refined petroleum 16 percent, petroleum gas 6 percent, and coal almost 4 percent.<sup>18</sup> Revenues from exports of goods have declined from a peak of \$527 billion in 2012 to \$281.8 billion in 2016, and revenues from service exports decreased from \$70.1 billion in 2013 to \$50.6 billion in 2016. However, due to the GDP contraction, export revenues as a percentage of GDP only decreased by 1.2 percent in that interval.<sup>19</sup>

The Russian economy, dominated by large, often-government owned or operated industries, is somewhat outdated and uncompetitive. Small- and medium-sized businesses generate only 18 percent of GDP, less than half that of successful economies.<sup>20</sup> Although Russia inherited a substantial civilian industrial base from the Soviet Union, it has underinvested in it, leaving as much as 40 percent of it obsolete.<sup>21</sup> Fixed capital investment in manufacturing has decreased every year since 2014.<sup>22</sup> In 2015, Russia utilized only 66 percent of its production capacity, down from a 2007 peak of 72 percent. Over that same interval, the manufacturing industry's capital utilization ratio dropped from 69 percent to 62 percent.<sup>23</sup> Moreover, only 10.7 percent of Russia's exports of manufactured goods are high-technology goods.<sup>24</sup>

On the high-tech front, Russia has hastened the pace of its digital revolution, expanding broadband penetration and high-speed Internet access. It is not, however, a leader in digital technologies. According to the World Bank, it lacks "high-level ICT [information, communication, technology] skills," and businesses have not leveraged these technologies to their full extent.<sup>25</sup> However, the Kremlin has adopted certain pro-digital transformation policies, such as a "Digital Economy" program, to address this shortfall,<sup>26</sup> and the World Bank estimates a successful transformation could yield over \$38 billion in productivity gains by 2025 and create as many as 13 million new jobs, placing it among the "world's digital economy leaders."<sup>27</sup>

The World Economic Forum, in its annual Global Competitiveness Index, ranked Russia as the 38<sup>th</sup> most competitive economy out of 137. The respondents to the WEF's survey saw little good in Russia: it ranked 57<sup>th</sup> in technological readiness, 83<sup>rd</sup> in the health of its public and private institutions, and 107<sup>th</sup> in financial market development.<sup>28</sup> The few redeeming factors were market size, education, and infrastructure.

### *Economic Outlook*

Rebounding oil prices have helped drive Russia's recent positive economic momentum, and its central bank is replenishing its currency reserves. But the economy's and the Kremlin's dependence on oil and gas—by one measure they account for 60 percent of export revenue and 50 percent of the tax base<sup>29</sup>—inject uncertainty into the long-term outlook. Although the government has done its best, through strict austerity and monetary policies, to weather recent shocks and buttress the system against perturbations,<sup>30</sup> the World Bank still projects that a 15 percent drop in the price of oil would drive down projected Russian economic expansion from 1.3 percent to 1 percent 2018 and from 1.4 to 1.2 in 2019.<sup>31</sup> Looming trade wars further contribute to the uncertainty; Russia's trade-heavy economy is vulnerable to policy changes.

General improvement since mid-2016, as the World Bank argues, "masks underlying disparities and remaining vulnerabilities,"<sup>32</sup> including negative growth in real disposable income, a decreasing economically-secure portion of the population—down to 46.3 percent in 2016—and high unemployment. Economic inequality appears to be growing, not just between socio-economic classes but also among regions. While major cities, such as Moscow and St. Petersburg, register low unemployment rates, less urbanized areas suffer from unemployment as high as 27 percent, as in Ingushetia in the North Caucasus.<sup>33</sup>

Moreover, Russia is losing high-quality talent, particularly in scientific and technical fields. As demographer Judy Twigg puts it, "Russia's chief sustainable comparative advantage—its brainpower—is drifting away."<sup>34</sup> The scientific community has felt the impact of the emigration surge, leaving an old, hollowed-out cohort of researchers: fewer than one third of researchers in Russia are age 30–50 while a quarter are over 70, no small feat given Russia's low life expectancy.<sup>35</sup> This

emigration has second-order effects too: when highly-educated researchers leave, they tend to depress educational attainment in their home country, perhaps due to a smaller supply of mentors to cultivate young talent.<sup>36</sup>

Partly a result of that effect, in the words of science journalist Quirin Schiermeier, “Once a scientific powerhouse, Russia has experienced over the past 25 years a dramatic decline of its research and development capacities and is now lagging far behind other industrialized nations in terms of scientific output.”<sup>37</sup> The brain drain is driven in part by politics, that is educated urbanites fleeing the corruption and oppression of the Putin regime, but also by the pursuit of better economic opportunities, safety, and healthcare.<sup>38</sup> Led Gudkov, the head of Russian polling organization the Levada Center, sums up the challenge neatly: “People who are leaving today are more liberally oriented, more intelligent, better educated, and consequently, we are left with a rather inert, passive mass with opportunistic attitudes.”<sup>39</sup> He adds that this remaining class may be just what Putin’s Kremlin desires for political control.

Russia’s demographic outlook will likely further limit its prospects for long-term growth. The combination of a decreasing working-age population and a decreasing productivity appear bound to depress growth potential. Coupled with increased unit labor costs, projections for Russia’s maximum growth range from 1 to 2 percent.<sup>40</sup>

In sum, a brief overview Russia’s economic health tells the story of a large but poor state, heavily dependent on trade and energy exports, with a challenging fiscal situation. A closer look at the country’s internal health, particularly its demography and human resources, tells an even grimmer tale.

## Demographics

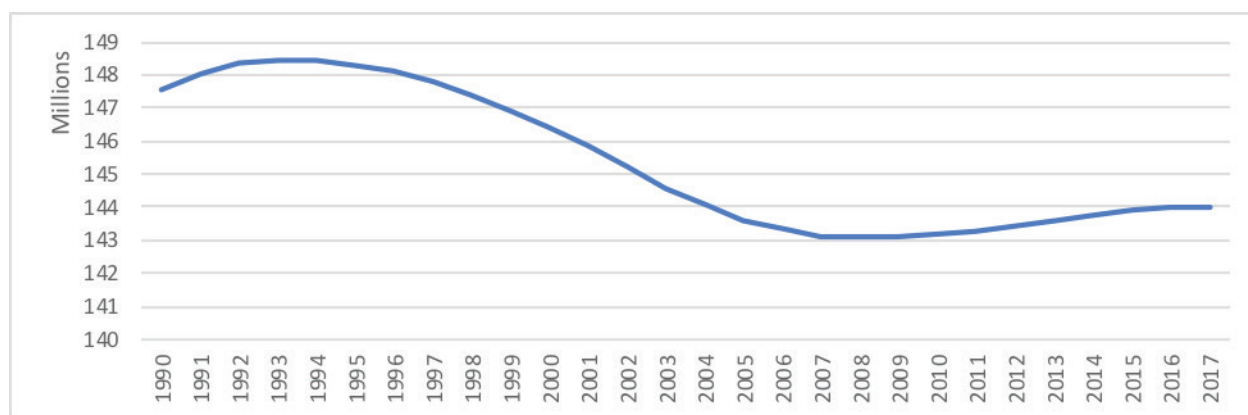
The fall of the Soviet Union precipitated what American Enterprise Institute scholar Nicholas Eberstadt has called the “era of post-Communist depopulation.”<sup>41</sup> This era saw Russia’s population shrink by over 5 million people in two decades, from 1990 to 2010, but then reverse course in the ensuing five years, increasing by 1.3 million people for a net decrease of 3.7 million.<sup>42</sup> In that time, Russia’s fertility rate dropped to as low as 1.25 births per women, and life expectancy for males reached a nadir of 59 years. At the same time, Russian mortality rates climbed due in large part to alcohol and drug abuse, accidents, and poor healthcare. In the coming years, Russia will feel the effects of that era, as its population will shrink and age and both its working-age and childbearing-age populations will decrease. From a human capital and resources perspective, Russia is no longer a knowledge producer. That is, it is not a leader in scientific research or intellectual property generation, and there are no signs that will change.

Vladimir Putin’s government implemented pro-natal policies in the late aughts in an effort to reverse some of the negative demographic trends. While those policies achieved some successes, they mitigated some of the problems, not solved them altogether. The result is that Russia has and will continue to suffer from a human resources crisis. Its economy will likely suffer—fewer and older workers will likely dampen both growth and modernization opportunities—and its national wealth will be increasingly devoted to taking care of an older society.<sup>43</sup>

### *The Post-Soviet Era*

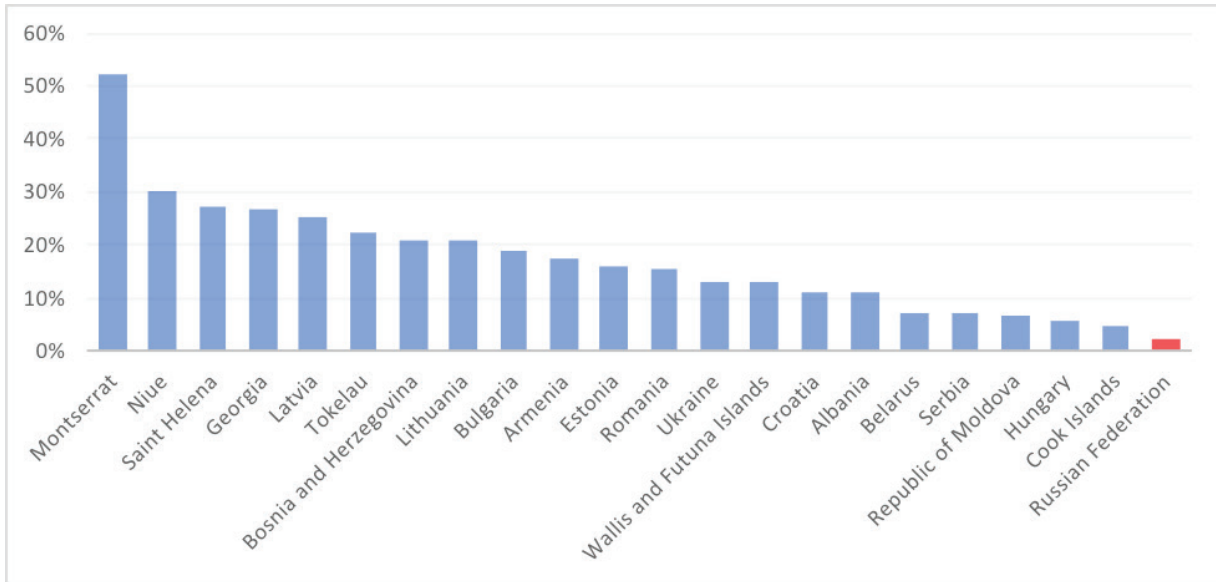
Following the collapse of the Soviet Union, Russia’s population briefly increased before beginning a nearly 15-year decline in 1994. From 1994 to 2008, the population shrunk by 5.3 million people, but it began to increase slowly in 2009. The total population remains about 3.5 million people smaller than it was in 1990 (see Figure 4).

Figure 4: Russian Population, 1990-2017<sup>44</sup>



From 1990 to 2015, according to the United Nations Population Division, Russia's population decreased by 3.7 million people, or 2.5 percent. This was the 22<sup>nd</sup> largest percentage decrease in the world during that time (see Figure 5).

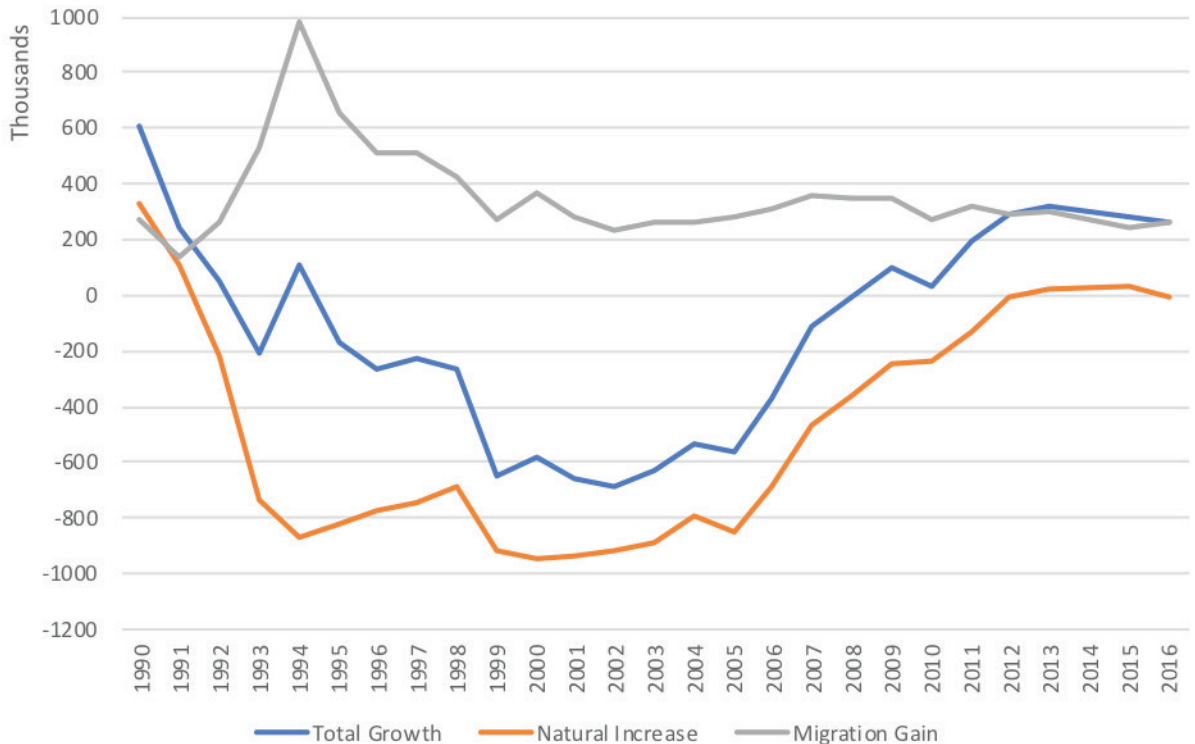
Figure 5: Percentage Decrease in Total Population, 1990–2015<sup>45</sup>



As Russia's own Federal State Statistics Service (FSS) has recorded, a net natural decrease in population size drove the post-1990 contraction. That is, during that time, deaths exceeded births, sometimes by nearly a million a year. In the early 1990s, an increased number of immigrants mitigated the effects of this net natural decrease in population size as the dissolution of the Soviet Union and significant political changes and reforms in neighboring countries generated an increase in immigration into Russia. That influx peaked in 1994 when roughly one million migrants, composed primarily of Russian speakers from a diverse set of ethnic groups, entered Russia.<sup>46</sup>

Figure 6 below depicts the interplay of natural population increases and net migration, analyzing Russia's population change from 1990 to 2015. Note that it uses data from the FSS, which differs slightly from the UN Population Division's.

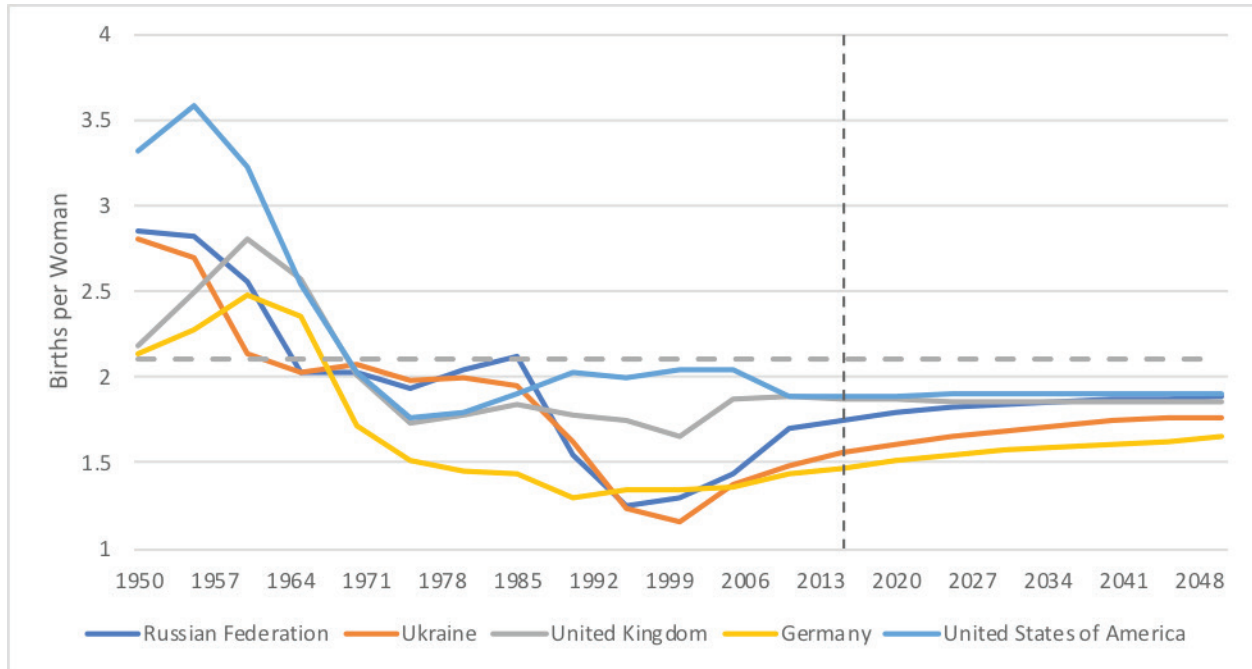
Figure 6: Components of Population Change, 1990–2016<sup>47</sup>





The significant drop in net natural increase was the result, in large part, of low fertility rates; Russia's fertility rate had been below the replacement rate of 2.1 since 1970, but it fell to as low as 1.25 births per woman in the 1990s.<sup>48</sup> It has since rebounded to roughly 1.7, placing Russia alongside much of the West but still below replacement, as shown in Figure 7. However, total births across Russia dropped by almost 11 percent from 2016 to 2017; only 1.69 million births were recorded last year, the lowest level in a decade.<sup>49</sup>

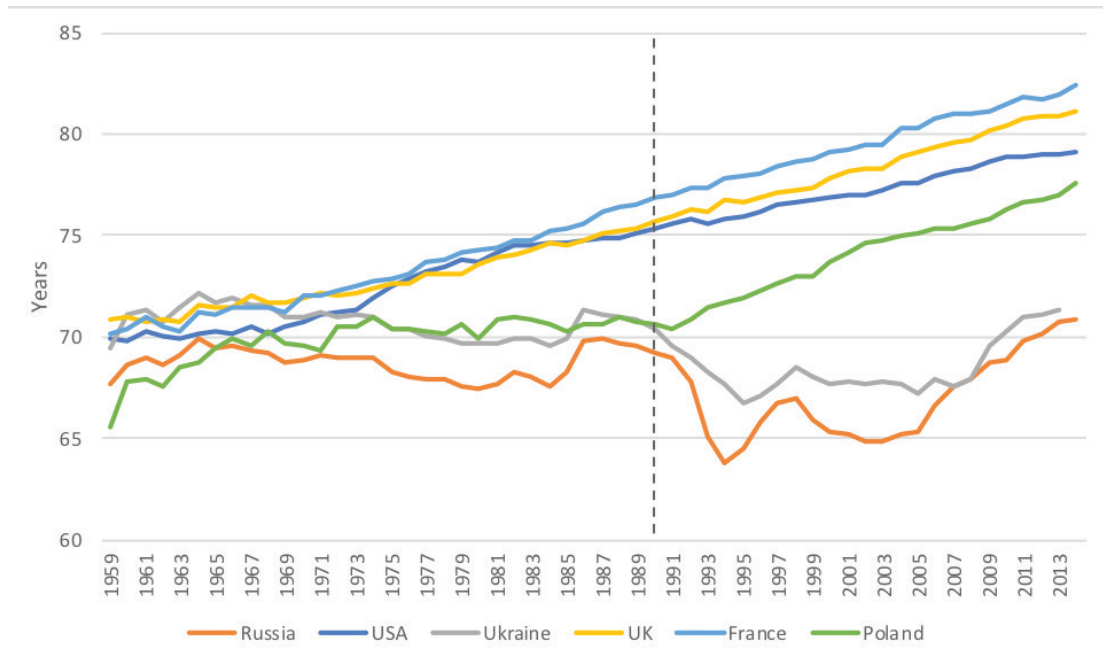
Figure 7: Selected Fertility Rates (births per woman)<sup>50</sup>



Alongside the drop in fertility rates, post-Soviet Russians also saw their life expectancies decline. According to the UN, male life expectancy at birth hit a low of just under 59 in 2005 and has since climbed to roughly 65 years old. Women tend to have a much higher life expectancy in Russia: theirs grew from 72 to 76 in that time. Together, Russians have a life expectancy of 70 years, nine years below USA's and 13 below Japan's.<sup>51</sup> In fact, Russia keeps such prodigious company as Iraq (69 years), Bangladesh (71 years), and Libya (71.5).<sup>52</sup>

The Human Mortality Database has a slightly more optimistic estimate of Russia's life expectancy than the UN does by about a year, but, as shown in Figure 8, it still shows Russia's deficit when compared to western nations. The different trajectories of Russia and Ukraine, on the one hand, and Poland on the other are telling; Poland saw its life expectancy climb precipitously following its break from the Soviet Bloc, whereas Russia and Ukraine fared worse.

Figure 8: Life Expectancy at Birth<sup>53</sup>



Indeed, the gap between Russia and former Soviet states that have since joined the European Union—the EU members since 2004—exists in other matters of societal health.

Mortality

Russia's mortality patterns place it in the company of third-world countries, not developed powers. It continues to have unusually high rates of death from cardiovascular diseases and accidents, attributed in large part to drug and alcohol abuse, poor working conditions, and poor healthcare. By contrast, the post-2004 EU members have gotten much healthier. As shown in Figure 9, in 2012, Russia's age-standardized death rate was twice that of the original, pre-2004 EU members and 50 percent more than that of post-2004 members. In other words, where other former Soviet states have grown healthier in the post-Soviet era, Russia has not. As a result, according to the World Bank, Russia had the 12<sup>th</sup> highest crude death rate in 2015 at 13 per 1000 people.<sup>54</sup>

Figure 9: Age-standardized Death Rates for Russia and EU Members<sup>55</sup>

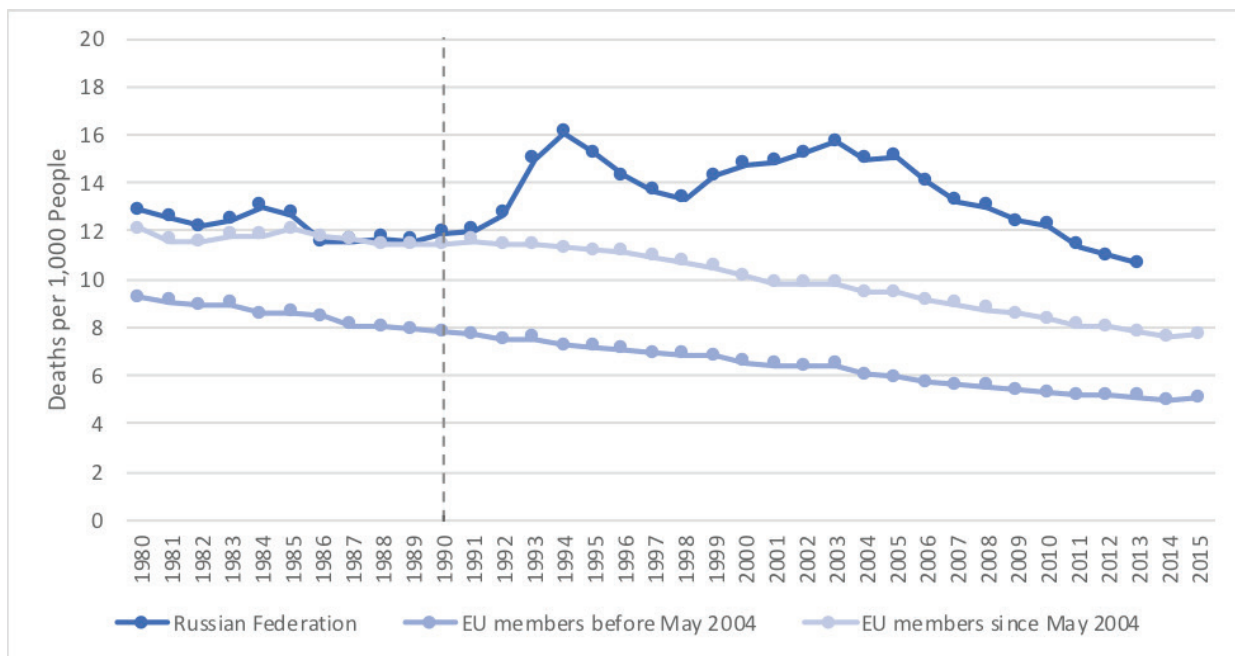
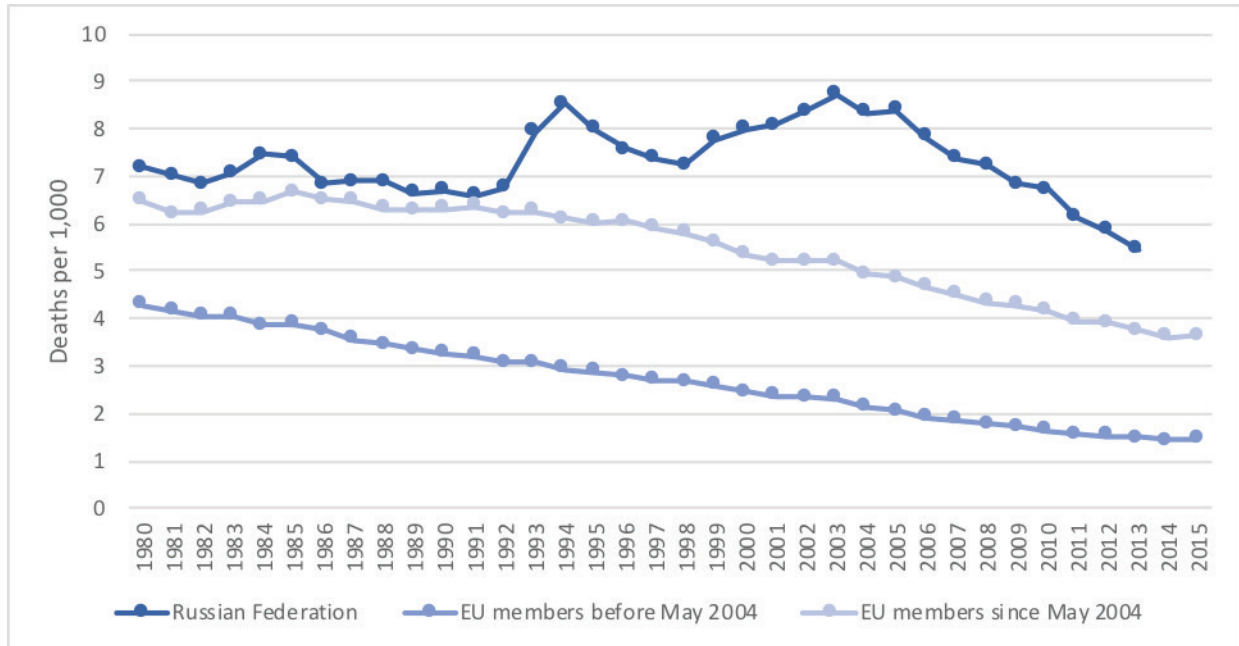
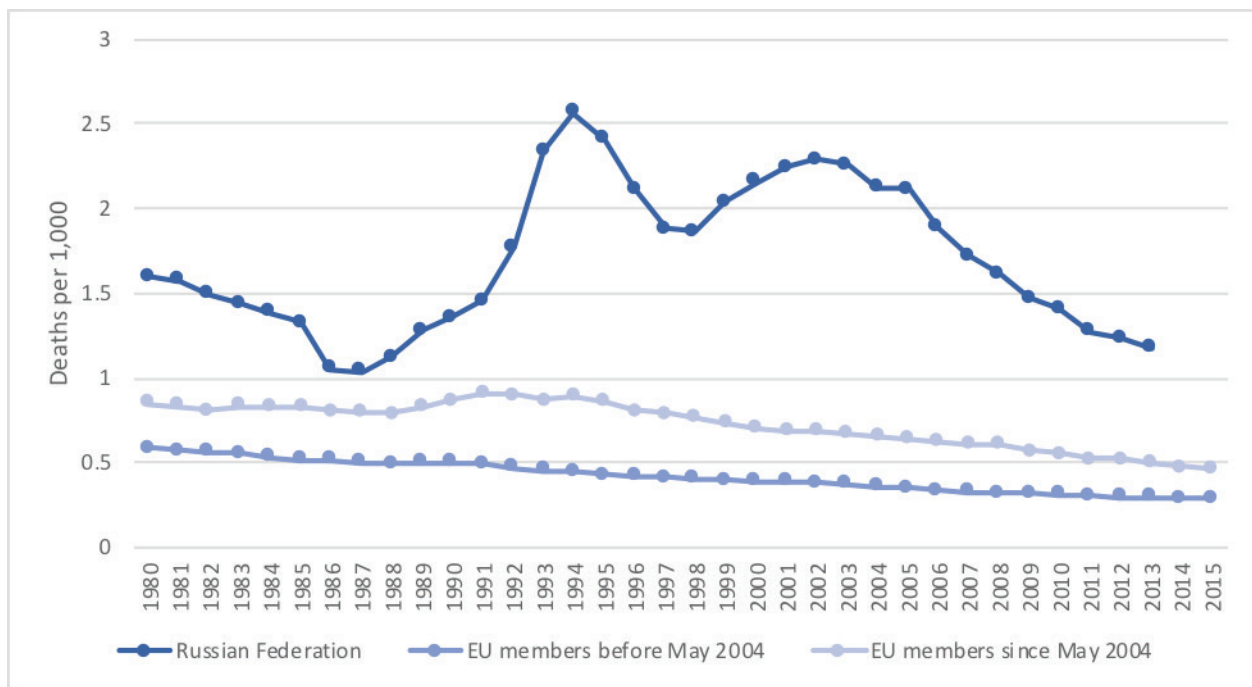
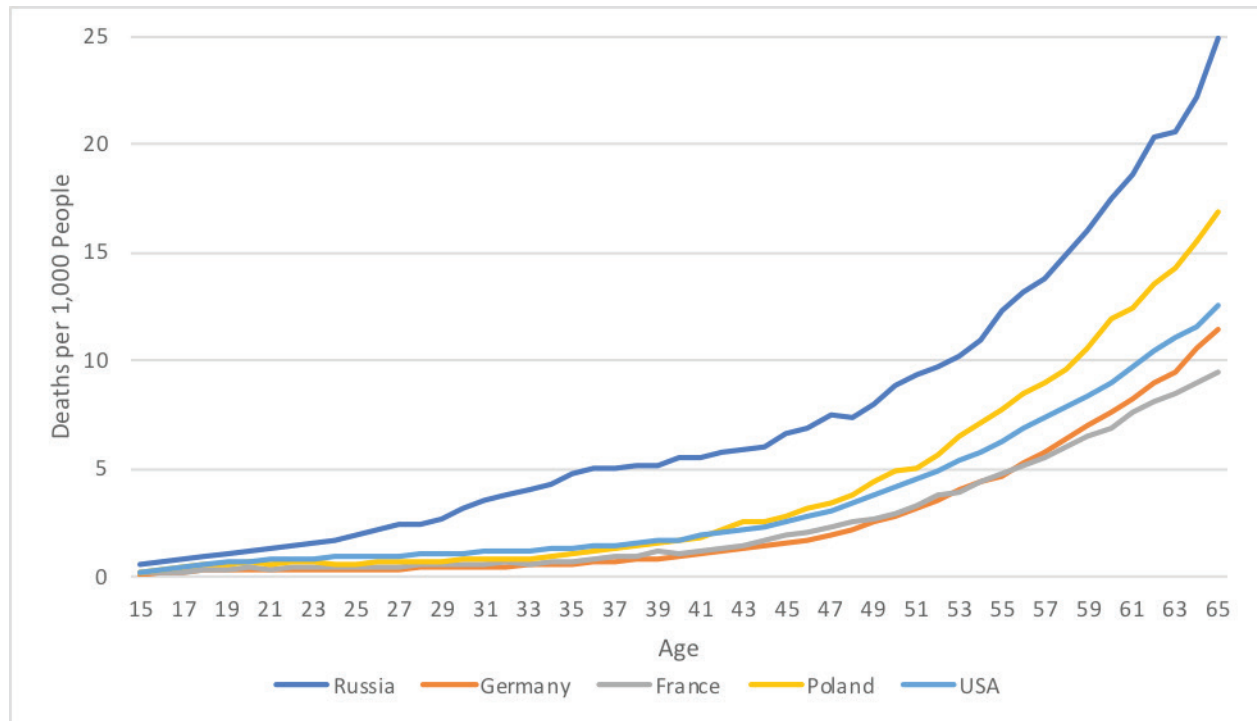


Figure 10: Age-Standardized Mortality from Diseases of the Circulatory System<sup>56</sup>Figure 11: Age-Standardized Mortality from External Causes, Injury, and Poison<sup>57</sup>

Cardiovascular disease and violent deaths—those with external causes such as injuries—drive the high death rate, as depicted in Figures 10 and 11. In 2011, Russians' mortality rate from external causes was 250 percent that of former Soviet states.<sup>58</sup>

Russia's abnormally high mortality rates result in Russians dying more often at younger ages than in other developed countries. The Human Mortality Database calculates death rates at every age for selected countries, and their data show that in 2014—the most recent available year—Russians at all ages had a higher chance of dying than their counterparts in the West (see Figure 12). Russians in their 20s die at a rate five times higher than Germans of the same age cohort and twice as high as Americans. Russian men are even worse off than the general population; they are almost six times more likely to die in their 20s than German men.

Figure 12: Selected Countries' Death Rates at Ages 15 to 65 in 2014<sup>59</sup>

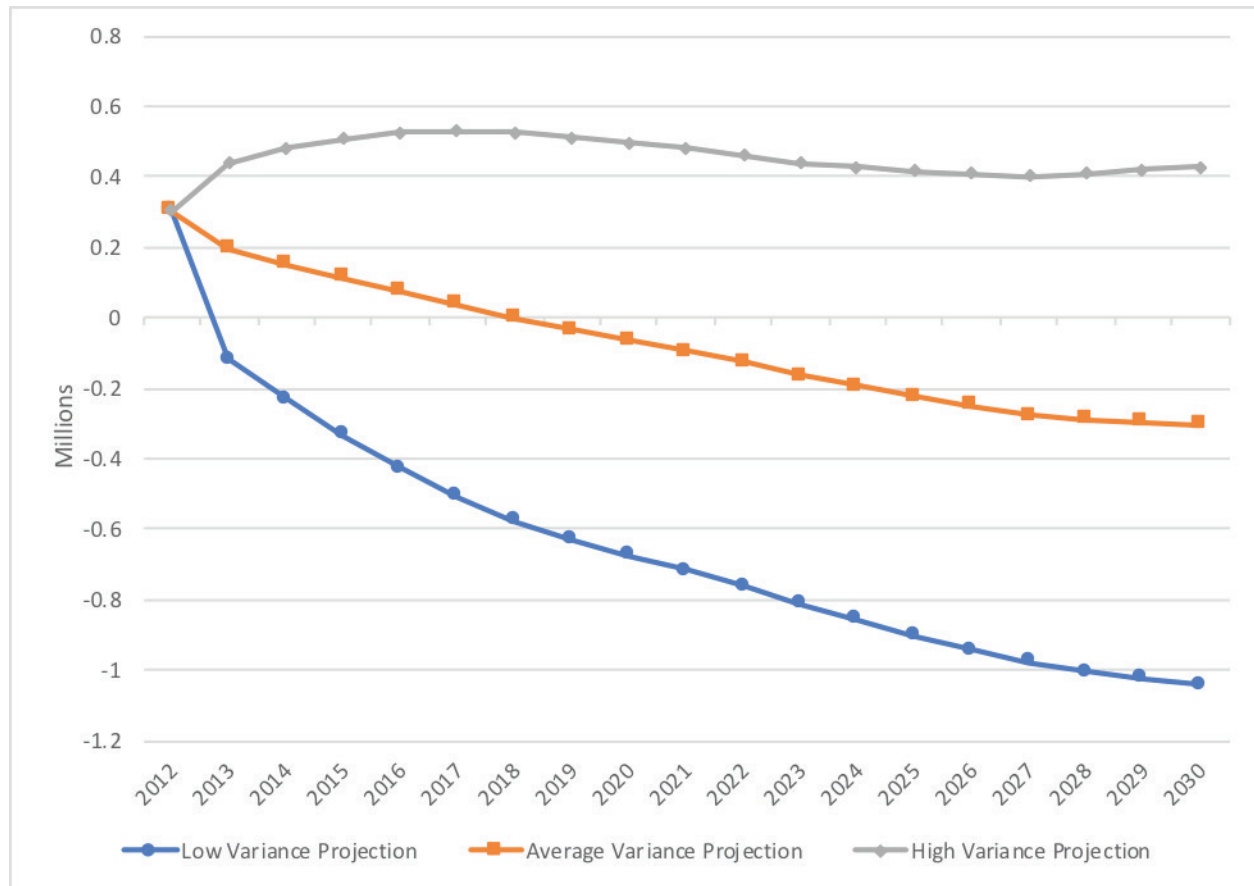


The extent of Russia's public health problems can be seen in an interesting data point from Eberstadt and Groth: in 2009, 20-year-old Russian men had a 50 percent chance of living to 65, while European men had a roughly 90 percent chance.<sup>60</sup> Although Russian mortality patterns have improved in recent years, as the charts above show, they remain significantly worse than those of other developed nations.

### Demographic Outlook

But what does this mean for Russia's future? Is the "era of post-Communist depopulation" over? And what of its human resources; will Russia have a strong base of human capital from which to draw as it continues to vie for global power?

Recent fertility and life expectancy increases are positive signs, but the future does not look promising. Russia's total population is expected to shrink in the coming years. The Russian FSS produced three projections for its population growth from 2012 to 2030: one high, one low, and one middle-of-the-road, depicted in Figure 13. Only the most optimistic projection has the population growing through 2030.

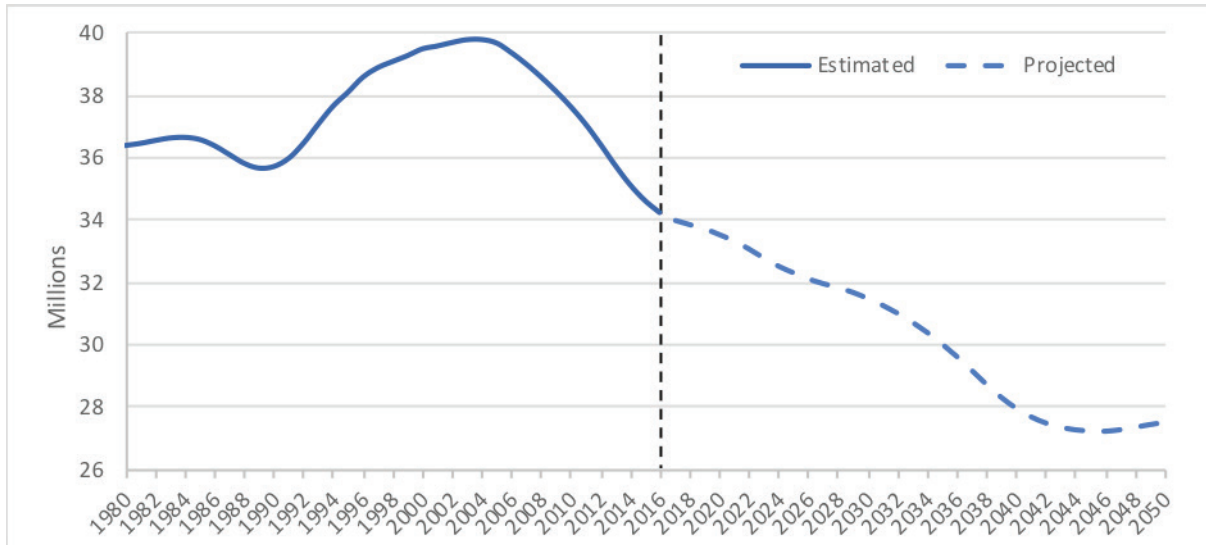
Figure 13: Russian Projections for Russian Population Change<sup>61</sup>

However that “high variance” projection depends on ahistorical levels of immigration. It sees the population increase naturally through 2021 before deaths begin outnumbering births, resulting in a natural decrease of 100,000 people a year. At the same time, the model projects immigration increasing to over half a million migrants a year by the late 2020s. Russia has received on average about 250,000 immigrants in recent years and has not surpassed 500,000 immigrants per year since the mid-1990s. In other words, the only way in which Russia’s FSS envisions the population growing is by assuming a dramatic, two-fold increase in immigration. Even the “average variance” model, which expects the population to decrease every year from 2019 through 2030, depends on abnormally high levels of immigration to counteract the significant natural decrease in the population.

The UN Population Division and the US Census Bureau also predict the population will shrink, and Putin warned in 2012 that Russia’s population could fall from 143 million to 107 million by 2050.<sup>62</sup> As the FSS models show, at current trends, Russia will need to increase its net migration rate significantly to avoid further depopulation. But the primary source of migration into Russia is the Commonwealth of Independent States—Ukraine, Belarus, Azerbaijan, and Tajikistan, among others—and each of these is experiencing similar demographic challenges of their own. Their cohort of young laborers age 15 to 29, who are the most likely to migrate, is decreasing.<sup>63</sup> So Russia’s primary migrant pool is shrinking alongside its own population.

Russia is also in the midst of a long-term “mother slump,” a decrease in the number of women of childbearing age—a slump expected to last until 2050. The population of women of prime childbearing-age, 20 to 29, will decline by 50 percent from 2016 to 2024 (note that all of them are already born) and by 31 percent by 2050.<sup>64</sup> More broadly, Russia’s total number of women of childbearing age—all women age 15 to 49—is expected to steadily decline until just before 2050, as shown in Figure 14. Even if the fertility rate remains at its current apex, fewer mothers will mean even fewer births.

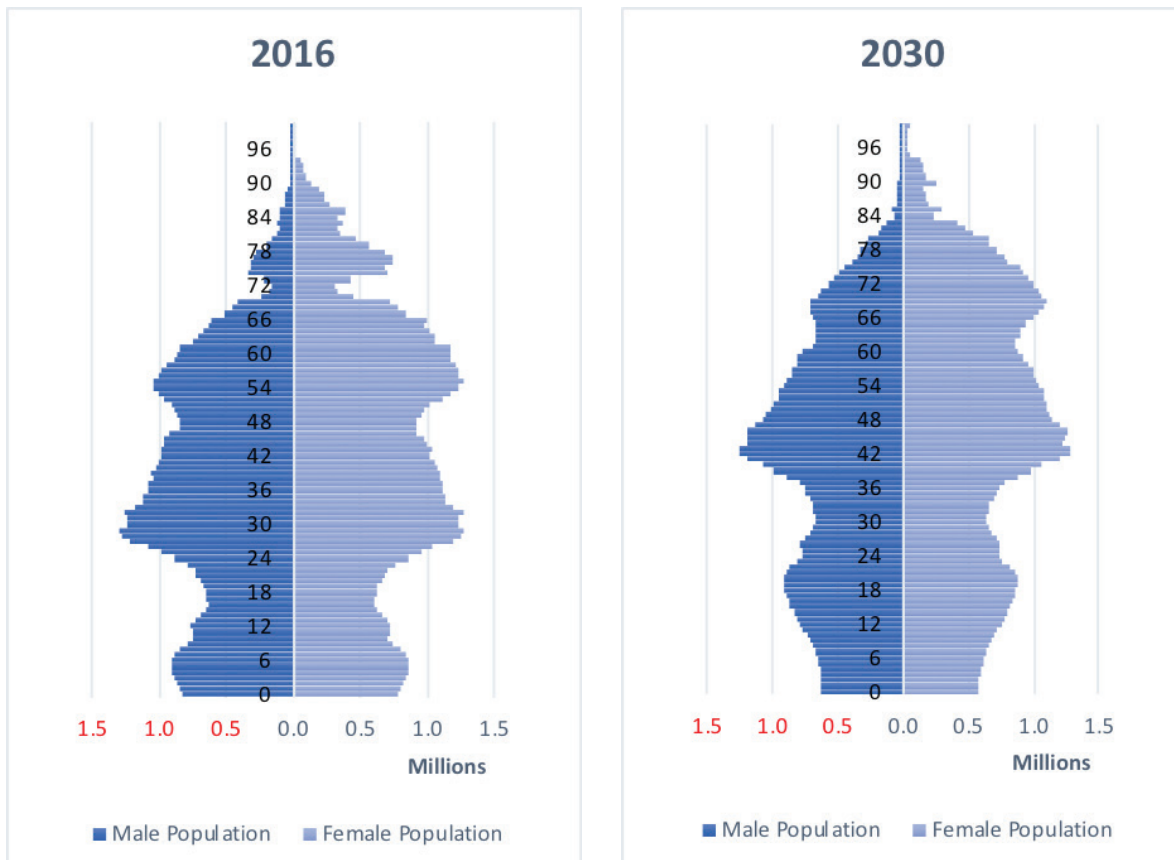
Figure 14: Russian Women of Childbearing-Age (15–49)<sup>65</sup>



Not only will the population decrease, but it will also age and see its working-age component shrink as well, two factors that could limit Russia's productive capacities and burden its economy. Adele Hayutin reports that "Russia's median age has increased gradually from 31 in 1970 to 39 in 2015" and will likely continue to do so until it hits a peak of 44 in 20 years.<sup>66</sup> This climb has been and will continue to be low and slow, and Russia will likely continue to have a lower median age than other aging countries. The low median age is due in part to Russia's low life expectancy, which limits the number of elderly people.

However, the proportion of the population over the age of 64 will likely be a burden. The US Census Bureau projects that Russia's population, as shown in Figure 15, is getting increasingly top-heavy. The UN Population Division meanwhile calculates Russia's old-age dependency as 19.4 percent in 2015, growing to 31 percent in 2030.<sup>67</sup>

Figure 15: Estimated and Projected Russian Population Structure, 2016 and 2030<sup>68</sup>

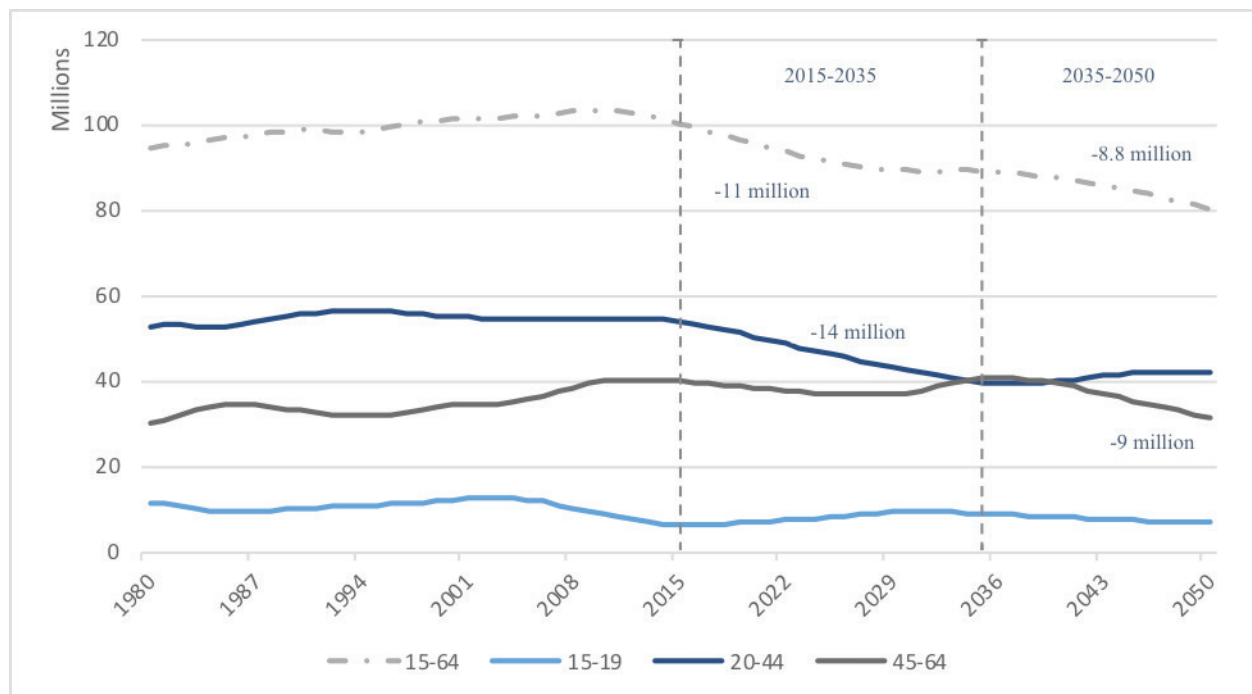


It is worth noting the gender disparity in Russia's population structure. There are many more women than men in Russia, especially at older ages and even at all ages above 40. Recall that female life expectancy is roughly 10 years higher than male's; in the upper age brackets there is a bountiful supply of women. Russia's retirement age for women, though, is 55. This could be seen as wasting a bountiful labor supply. There are 21.5 million women between the age of 55 and 79 and there will be 23.3 million in that age bracket in 2030, or 17 percent of the population. Protests and popular opposition notwithstanding, the government's current proposal to increase retirement ages could yield serious benefits for Russia's workforce.<sup>69</sup>

Having more available workers would be particularly beneficial considering Russia's working-age population is also shrinking. The UN defines the working-age population as all men and women between the ages of 15 and 64. It projects that the working-age population will decline by 11 percent by 2030 and 24 percent in the next 40 years.<sup>70</sup> The Russian government and statistical service define the working-age population as all men age 16 to 59 and all women age 16 to 54. By this definition, the working-age population will decline by 8.1 percent by 2030.<sup>71</sup>

Adele Hayutin observes that "the projected decline will occur in waves, starting with the youngest potential workers age 20–44," who will decline by 14 million workers from 2015 to 2035.<sup>72</sup> From then to 2050, the upper working-age bracket—age 44 to 64—will decline by 9 million workers.<sup>73</sup> Figure 16 depicts this pattern, using data from the UN Population Division.

Figure 16: Working Age Population by Age Group<sup>74</sup>

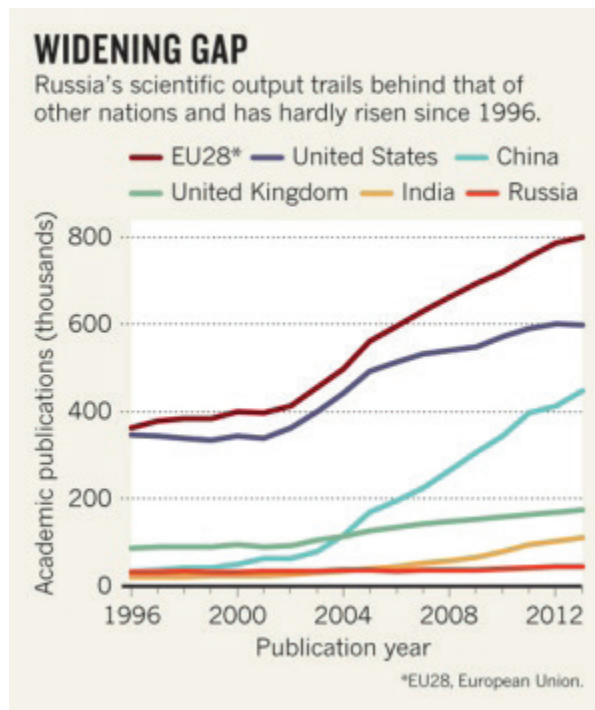


“A Knowledge-Poor Economy”

Nick Eberstadt has described Russia as performing “like a knowledge-poor economy.”<sup>75</sup> That is, Russia faces not only a quantitative demographic crisis but a qualitative one as well. Eberstadt outlines a few telling indicators: in 1990 Russia accounted for nearly 9 percent of working age college graduates; that portion will be 3 percent in 2030. Despite hosting roughly 2 percent of the world’s population and 3 percent of its GDP, “Russia generates only just over 1 percent of the globe’s service exports—which is essentially a trade in human skills.”<sup>76</sup> Its share of the global market in “knowledge-intensive sectors,” such as IT and computer exports, is similar to the Philippines’.<sup>77</sup>

This is perhaps surprising because Russia is still a highly-educated society: 54 percent of Russian adults age 25 to 64 have completed at least tertiary education, 19 percentage points higher than the OECD average.<sup>78</sup> However, despite its high-levels of educational attainment, Russia is not a knowledge-producing power. It produces a small fraction of the number of academic papers on science that the EU, US, and China do (see Figure 17).

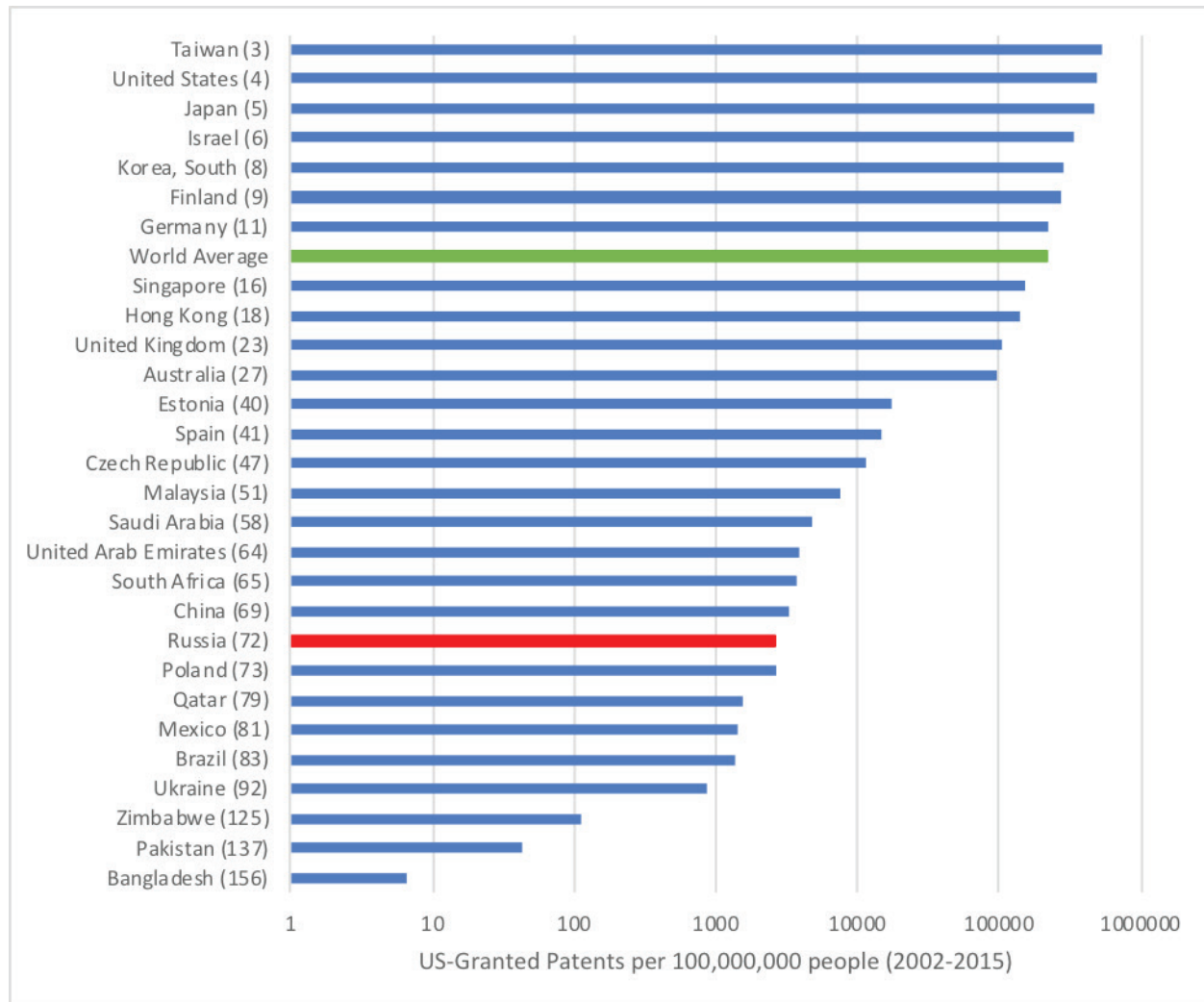
Figure 17: Output of Academic Scientific Papers<sup>79</sup>



In addition, from 2002 to 2015, Russia received only 0.1 percent of the total patents awarded by the US Patent and Trade Office (PTO).<sup>80</sup> Of 3.19 million patents awarded to 187 countries, 3,782 went to Russia, ranking it as the 26<sup>th</sup> highest produced of new intellectual property. By comparison, that is fewer patents than both Alabama and New Mexico received; in sum 39 US states produced more patents than Russia did. Adjusted for population size, Russia was granted the 72<sup>nd</sup> most patents with about 2,655 per 100 million people—the world average was 214,222 (see Figure 18).



Figure 18: International Patents Granted by the US Patent and Trade Office per 100 Million People (2002–2015)



### What Are the Likely Effects?

These collected demographic issues will affect the spectrum of the economic system. A report from the Russian Presidential Academy of National Economy and Public Administration says the worse-case scenario for Russian demographics “will likely affect all aspects of socioeconomic development,” and the shrinking working-age population will endanger “projected economic growth, investment appeal, and structural modernization of the economy [emphasis theirs].”<sup>81</sup> The aging workforce could likely diminish the supply of highly-trained and qualified workers; industrial and engineering modernization efforts may suffer as a result. An older population also means higher healthcare costs and increased demand on a pension system that is already overstressed. One Russian scholar predicts that maintaining Russia’s pension system will cost 0.2 percent of GDP a year.<sup>82</sup> From a national security standpoint, the draft-age population (age 18 to 27) will not grow in the next 35 years, placing additional strain on a military already struggling with a dearth of quality personnel. The combined result of these factors will make it harder for the Kremlin to live up to its social obligations. In a country with an already-unsteady sociopolitical system, that challenge could have a destabilizing political effect.

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- <sup>3</sup> The World Bank, *DataBank: World Development Indicators* (accessed September 20, 2018).
- <sup>4</sup> The World Bank, *GDP Ranking* (accessed September 20, 2018), <https://data.worldbank.org/data-catalog/GDP-ranking-table>
- <sup>5</sup> The World Bank, *DataBank: World Development Indicators* (accessed September 20, 2018)
- <sup>6</sup> Andrey Movchan, *Decline, Not Collapse: The Bleak Prospects for Russia's Economy*, Carnegie Moscow Center (February 2017), 11, <http://carnegie.ru/2017/02/02/decline-not-collapse-bleak-prospects-for-russia-s-economy-pub-67865>
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- <sup>9</sup> Trading Economics, "XE Currency Charts: USD to RUB," (accessed September 2018), <http://www.xe.com/currencycharts/?from=USD&to=RUB&view=5Y>
- <sup>10</sup> Anna Andrianova and Olga Tanas, "Russia Eyes a \$90 Billion Sovereign Wealth Fund," *Bloomberg* (June 19, 2017), <https://www.bloomberg.com/news/articles/2017-06-19/russia-to-discuss-merging-wealth-funds-into-90-7-billion-coffer>; and "Russia's Reserve Fund Ceases to Exist," *Moscow Times* (January 11, 2018), <https://themoscowtimes.com/articles/russias-reserve-fund-ceases-to-exist-60157>
- <sup>11</sup> "Russian FinMin says 2016 budget deficit at 3.56 pct/GDP," *Reuters* (January 12, 2017) <https://www.reuters.com/article/russia-budget/russian-finmin-says-2016-budget-deficit-at-3-56-pct-gdp-idUSR4N1EP00V>
- <sup>12</sup> Mark Galeotti, "The truth about Russia's defence budget," European Council on Foreign Relations (March 24, 2017), [http://www.ecfr.eu/article/commentary\\_the\\_truth\\_about\\_russias\\_defence\\_budget\\_7255](http://www.ecfr.eu/article/commentary_the_truth_about_russias_defence_budget_7255)
- <sup>13</sup> Andrey Movchan, *Pensions and Security: Russian Budget Reveals Government Priorities*, Carnegie Moscow Center (December 15, 2017) <http://carnegie.ru/commentary/66454>
- <sup>14</sup> "Consolidated Budget of the Russian Federation," Ministry of Finance of the Russian Federation (Accessed September 2018) [http://old.minfin.ru/en/statistics/conbud/?id\\_38=25648](http://old.minfin.ru/en/statistics/conbud/?id_38=25648)
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- <sup>17</sup> The World Bank, "Modest Growth Ahead," *Russia Economic Report*, No. 39 (May 2018), iv, <http://pubdocs.worldbank.org/en/162681527086868170/RER-39-Eng.pdf>
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- <sup>19</sup> "Country Statistical Profile: Russian Federation," OECD (February 2018) [http://www.oecd-ilibrary.org/economics/country-statistical-profile-russian-federation\\_20752288-table-rus](http://www.oecd-ilibrary.org/economics/country-statistical-profile-russian-federation_20752288-table-rus)
- <sup>20</sup> *Decline, Not Collapse: The Bleak Prospects for Russia's Economy*, 10.
- <sup>21</sup> *Decline, Not Collapse: The Bleak Prospects for Russia's Economy*, 13.
- <sup>22</sup> The World Bank, "Russia's Recovery: How Strong Are Its Shoots," 17.
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- <sup>29</sup> "Russia Is Returning to Growth. (Just in Time for an Election.)."
- <sup>30</sup> For an interesting comparison between the economic policies of the government of Vladimir Putin and of the Soviet leadership in the late 1980s, see Chris Miller, "Why Putin's Economy Survives," *The Wall Street Journal* (December 29, 2016), <https://www.wsj.com/articles/why-putins-economy-survives-1483020001>
- <sup>31</sup> The World Bank, "From Recession to Recovery," *Russia Economic Report*, No. 37 (May 2017), 10, <http://documents.worldbank.org/curated/en/782451497437509084/pdf/116237-WP-P161778-PUBLIC-RERengforweb.pdf>
- <sup>32</sup> The World Bank, "Russia's Recovery: How Strong Are Its Shoots," 5.
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- <sup>40</sup> On the low side, see The World Bank, "From Recession to Recovery," 11; for a more positive estimate, see "Russia Is Returning to Growth. (Just in Time for an Election.)."
- <sup>41</sup> See Nicholas Eberstadt, Hans Groth, Judy Twiff, *Addressing*

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<sup>43</sup> For a more detailed discussion of the potential effects of Russia's demographic challenges, see *Critical 10 Years: Demographic Policies of the Russian Federation: Success and Challenges*, Russian Presidential Academy of National Economy and Public Administration (RANEP) (2015) <https://www.wilsoncenter.org/sites/default/files/10%20Critical%20years%20english%20version.pdf#page=13&zoom=page-actual,-208,115>

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<sup>45</sup> United Nations Population Division, "Total Population by Sex (thousands)."

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<sup>49</sup> "Birth Rate Hits 10-Year Low in Russia," *The Moscow Times* (January 29, 2018), <https://themoscowtimes.com/news/birth-rate-hits-10-year-low-russia-60321>

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<sup>51</sup> Hayutin, Figures 1 and 2.

<sup>52</sup> United Nations Population Division, "Life expectancy, e(x), at exact age x (years)," *World Population Prospects: The 2017 Revision*, <https://esa.un.org/unpd/wpp/DataQuery/>

<sup>53</sup> Human Mortality Database, "Life Expectancy at Birth," (accessed October 2017), [http://www.mortality.org/cgi-bin/hmd/hmd\\_download.php](http://www.mortality.org/cgi-bin/hmd/hmd_download.php)

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<sup>58</sup> A study from the Russian Presidential Academy of National Economy and Public Administration (RANEP) identifies the three primary reasons for Russia's higher mortality from circulatory diseases as: 1) high level of alcohol consumption; 2) one of the world's highest tobacco consumption rates; 3) poor management and care, including prevention, diagnosis, and treatment. *Critical 10 Years: Demographic Policies of the Russian Federation: Success and Challenges*, 21.

<sup>59</sup> Human Mortality Database, "Death Rates," (accessed December 2017), [http://www.mortality.org/cgi-bin/hmd/hmd\\_download.php](http://www.mortality.org/cgi-bin/hmd/hmd_download.php)

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<sup>70</sup> United Nations Population Division, "Population by Age and Sex (thousands)."

<sup>71</sup> US Census Bureau, "Population by Single-Year Age Groups."

<sup>72</sup> Hayutin, 2.

<sup>73</sup> *Ibid.*

<sup>74</sup> Hayutin and United Nations Population Division, "Population by Age and Sex (thousands)."

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<sup>77</sup> *Ibid.*

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<sup>81</sup> *Critical 10 Years: Demographic Policies of the Russian Federation: Success and Challenges*, 28

<sup>82</sup> *Ibid.*, 29.

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# Observations from the Roundtable



Advancing technologies and demographics portend disruption in Russia, as in many other parts of the world, but volatility has been the rule rather than the exception in this historic power. The fall of the Soviet Union left modern Russia in a state of disrepair. Its economy collapsed alongside its government. Its population decreased, and fertility plummeted. To those living in Russia at the time, it was deeply destabilizing.

A decade later, Russia's future looked brighter. Its economy rebounded in the 2000s, driven by the country's oil and gas industry. President Vladimir Putin brought stability back to Moscow. But President Putin began instituting regressive policies, and the country suffered from the financial crisis of 2008 and the collapse in the Ruble and oil prices. The imposition of sanctions in 2014, in response to Russia's aggressive actions in Ukraine, further darkened the country's outlook.

Now Russia faces a bleak demographic future: a shrinking working-age population and an aging society. It has a weak, low-tech, slowly growing economy and is ruled by an autocratic regime. Meanwhile it faces the uncertain effects from a changing climate. But it could also be said that Russians today live better than they have for much of their history, and compared to the 1990s, Russia is stable.

Former Russian Foreign Minister Igor Ivanov writes that the world is at a "bifurcation point." He argues the existing international system cannot last, and the transition to a new one will be either evolutionary—slow and steady—or revolutionary—swift and painful. How will Russia adapt to the rapidly changing world?

On October 3, 2018, former secretary of state and Hoover Institution distinguished fellow George Shultz convened a discussion of that question. It addressed how Russia will react to changing demographics, the spread of information and communications, emerging technologies—such as artificial intelligence—and new means of producing goods near where they are needed. It further considered the role of Russia's nuclear weapons and climate change in Russia's future. What follows reviews the primary conclusions drawn from that discussion and from the papers included in this booklet. It assesses the problems—Russia's poor demographics, its second-tier high-tech sector, and its authoritarian system—and considers the implications for U.S. strategy in dealing with Russia.

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The papers prepared for the roundtable describe two competing impulses within Russia's government: the desire to ensure stability and the urge to modernize and grow. Stephen Kotkin explains, "Russian politics is largely a struggle between those who emphasize the need to gird against perceived threats and prioritize 'stability,' versus those who prioritize development, between those who see the outside world as almost exclusively menace and those who see it as primarily opportunity." In other words, the security services desire security while the finance and economic ministries advocate for development. The security services usually win.

It is important to recall that President Putin sits atop a fractious and volatile government, especially at the elite level. He does not have unitary authority over the state—a large portion of his edicts and policies are not implemented. Some high-level figures urge reforms to address the country's demographic and technological outlook, such as former finance minister Alexei Kudrin. Others may support the basic structure of the existing Russian regime and its policies but object to Putin's personal leadership of it.

However, President Putin tends to back his security services. Former U.S. ambassador to Russia Michael McFaul writes that "Putin values control over innovation; vertical instead of horizontal arrangements." While Putin speaks of the need to innovate, Russian policy does not back his words, as David Holloway explains.

If Russia will trend towards stability, what role can it play in the emerging world? What is the Putin administration doing to mitigate the challenges of demographic changes and new technologies? Can Russia have both stability and growth?

## Demographics

Russia's working-age population is steadily declining and will continue to fall for decades. As a result of high mortality rates and an echo of the steep post-USSR fertility drop, Russia is losing a million workers a year. It is also experiencing

“brain drain:” many of those leaving are young and well-educated while many of the in-migrants to Russia are low-skilled. As Russia loses the young and educated, it loses scientific expertise. In their absence, it moves in the direction of a petrostate. It is notable, for example, how many Russians work in Silicon Valley or in the flourishing high-tech sector in Israel. Other countries are reaping the benefits of the historic Russian talent for science and mathematics, suggesting that Russia's problems are rooted in its policies and institutions, not its human capital.

While Russia's population ages, much of the developing world is growing more populous. Much of Russia looks warily upon this “youth bulge”—the glut of young people emerging primarily in the Southern Hemisphere—seeing a mass of potential extremists or a potential dilution of Russia's cultural homogeneity. There appears to be little prospect for immigration to offset Russia's demographic dynamics.

The government has taken steps to address its high mortality rates, low fertility, low life expectancy, and aging population. Life expectancy at birth for men has climbed to over 66 years, but there remains a significant gender disparity; female life expectancy is over 10 years higher. An anti-smoking campaign increased public health awareness and banned smoking in public places, but the next phase—increasing taxes on tobacco products—has stalled. Pro-natal policies implemented in the late-2000s may have helped raise fertility rates. And most notably, the government's proposal to raise the pension age was met with protests across the country. The final decision on raising the retirement age for women represents a compromise.

### Advanced Technology

In principle, advanced technology could help offset Russia's loss of workers by increasing productivity. Moreover, if Russia were to incorporate more advanced manufacturing technologies and robotics, its shrinking workforce might reveal itself as a blessing rather than a curse. The country might side-step the potential employment disruption such technologies may cause. But the Putin administration chooses to focus on “stability” and “security” rather than adopting the policies and making the investments that would foster development and deployment of advanced technologies (additive manufacturing, automation, robotics, AI) on a large scale into the economy.

Recent efforts to foster a more dynamic science and technology industry have had mixed results, as seen in the Skolkovo Innovation Center. Although the effort yielded new educational institutions, Skolkovo has failed to approach a Silicon Valley or MIT of Russia despite major investment. However, Russia can count some successes; Yandex, for example, is the lone search engine in the world to compete with Google without substantial government support.

Russian policy choices have hindered the development of the high-tech sector. The government has followed the traditional Russian top-down approach—as opposed to the more organic, bottom-up approach seen in Silicon Valley. The industry suffers from overregulation and pressure from security agencies. The Putin regime has undermined property rights, failed to reform the rule of law, moved away from democratic institutions, and incurred the wrath of the international system through its foreign policy. Foreign investors do not want to invest in Russia—unlike in the oil and gas industry, American tech investors and companies are not obligated to have a presence in Russia—and even Russians themselves do not want to invest there. All told, Russia would seem to lack the institutions, investment climate, culture of entrepreneurship, and rule of law conducive to a vibrant commercial technology sector.

Instead, high-tech investment centers on military technology. In the United States and China, commercial industries and the military work together to strengthen each country's technological base. Not so in Russia. It is not clear that investing in military technology, absent a parallel supporting and mutually reinforcing commercial industry, will allow Russia to compete with the United States or China. Although Russia and China have explored military technology cooperation, Russia fears becoming a junior partner—or worse yet a client state—to China. China arguably represents the most serious long-term security threat to the Russian state.

But Russia's military investments have given it effective, asymmetric capabilities, including high-end air and missile defense, cyber capabilities, long-range artillery, and autonomous weapons—to say nothing of its nuclear arsenal. As during the Cold War, Russia will continue to compete with the United States in priority areas, stealing, purchasing, or developing those technologies it views as necessary. And those technologies developed by the military may yet yield civilian benefits; after the fall of the Soviet Union, for example, the majority of high-quality civilian goods came from the military industrial complex. Another problem is that these new technologies, armed drones and cyber in particular, lower the threshold for conflict. At the extreme end of the spectrum, cyber interference in nuclear command and control and early warning systems could potentially lead to use of nuclear weapons. All of the authors spoke of the importance of renewed communications between the United States and Russia, particularly between the two militaries and between technical experts, to reduce the risk of conflict resulting from misperception and miscommunication.

The United States and Russia should reconsider cooperative measures to address common security threats, beginning with discrete, accessible steps.

In sum, Vladimir Putin's rhetoric does not match his actions. He speaks of the need to innovate, saying that a country that rules in AI will rule the future, but has not implemented policies to do so. To the contrary, his faith in central planning and distrust of private initiative—manifest in Russia's top-down approach—will likely prevent a commercial high-tech sector from flourishing in Russia, and as a consequence Russia will have difficulty competing with the United States and China in military technology.

### Information and Communications Revolution

Technological developments that might undermine non-democratic regimes can empower those regimes if they master the technologies, and Russia has done so. It harnessed the networked age to promote nativism and the Putin regime's goals. Traditional media are largely under government control, and there are growing restrictions on the internet. Three quarters of Russians have internet access. They are connected to each other and to people outside Russia. That connection informs and empowers individuals, and to some extent allows them to organize, but on balance Russian authorities and security services use these tools to greater effect for surveillance and repression.

Russia has conducted cyber attacks of various kinds, including interfering in elections, against the United States, European countries—especially the Baltics—Ukraine, and Georgia. As discussed above regarding military technology, Russian investment in cyber capabilities has yielded a significant offset capability, to which U.S. business and government institutions should respond first with a stronger defense—against those threats that can be defended against. For those threats which cannot be satisfactorily defended against, the U.S. government should build deterrence by establishing real-time reporting systems and defining conduct thresholds and intended responses.

### The Economy

The Putin regime's commitment to stability at the cost of economic and technological development inhibits growth, as discussed previously. Substantial reforms to the rule of law, property rights, and the judiciary are necessary to promote investment.

Russia's GDP is lower than that of Italy and it has a per capita GDP on par with Portugal. State enterprises represent some 60% of the economy, and the country relies heavily on hydrocarbon exports, which account for more than half of government revenue. The demographic outlook outlined here also constrains Russia's economy. As it loses workers and highly-educated young people, Russia appears poised for no more than 1% annual GDP growth for years to come, of which technological change might be expected to contribute half.

But as is often the case with Russia, it is important to ask: compared to what? Russia's economy may appear weak, but it seems sturdy compared to the recent past. International sanctions have hurt its economy, but President Putin enjoys popular support.

Authoritarian regimes, such as Russia's, depend on cash flow—revenue to the government—for their legitimacy and survival. They tend to thrive when given resources to guarantee steady revenue. If the global energy market moves to a low-carbon future, Russia could seek to leverage its natural gas reserves as a bridge fuel and lean on its zero-carbon civilian nuclear power technologies—the two primary areas of strength in Russia's energy sector. If hydrocarbon demand peaks earlier than expected, President Putin may find himself in need of new cash sources. He may need to depend more on taxation for sustained revenue, with potential consequences for authoritarian rule.

### Climate Change

Traditionally, Russian leaders have put a positive spin on a warming climate. It could, for example, open access to the resource-rich Arctic and allow for agricultural productivity growth. More recent analyses have cast doubt on this rosy assessment, flagging the potential for new natural disasters, changing disease vectors affecting public health, and degradation of existing infrastructure. A changing climate brings widespread costs and demands adaptation. Will the Russian state have the resources and institutions to respond to these novel challenges? Responses to common climate challenges—for example genetic engineering of new drought- and heat-tolerant plants, better public health information sharing, or dealing with an opening Arctic—are promising substantive areas for U.S.-Russian interaction during a period of sensitive relations.

## Conclusion

These papers and subsequent discussions set out to understand Russia's participation in the emerging new world. In some respects, Russia appears to lack the basis for a large role: it has institutional obstacles to commercial technological development; it has an aging society with low fertility; it is losing many of its best and brightest; and it continually antagonizes foreign powers through cyber malfeasance. It could decline toward dependence on China. However, Russia has always been a paradoxical country, a nation seemingly in perpetual decline and yet a permanent fixture in geopolitics.

The volatility of the post-Soviet Union era still impacts domestic politics today. The stability President Putin has brought is highly valued; although public opinion polls in Russia can be suspect, his popularity soared after the intervention in Ukraine and has remained high. Yet the regime appears unstable in the longer term. It struggles to implement domestic policies and faced opposition in its major effort to address the problems brought on by its adverse demographics. Beyond its borders, Russia tends to emphasize the use of broad multinational institutions, in particular the UN, to address matters of international affairs, preferring institutions that operate only by consensus, where it can control the outcome, and opposing "coalitions of the willing."

Russia generates the economic outlook of a middle power but acts like a great one and aspires to be greater still. And behind all these issues sits Russia's nuclear stockpile, the largest in the world alongside the United States'.

The United States should work to reopen lines of communication and cooperation with Russia. The way forward is not a grand bargain but discrete, concrete steps to build trust necessary for more consequential steps. Nongovernmental relationships should play a role. Scientific and researcher exchanges and student programs could help the two countries navigate the future of new, developing technologies, such as artificial intelligence. Track II diplomacy and similar programs—which flourished just a decade ago—could establish open communication, while military-to-military exchanges would lessen the risk of catastrophe.

The Russian system is not conducive to sustainable technological development. Its population is getting older and hemorrhaging talent. Its hydrocarbon-driven economy faces an uncertain future. Russia appears headed towards a significant decline, but it has a long history of mastering its circumstances. Despite an underdeveloped high-tech industry, Russia finds a way—as it did during the Soviet era—to compete with the United States in areas that its government considers priorities. It tends to think not in terms of costs and efficiency, as we so often do, but in terms of objectives. That approach has allowed it to achieve its highest priority objectives.

When the West looks at Russia, it sees a nation in decline. But when Russia looks back, it sees a West in decline, which the Putin administration strives to outlast. Here again the question of compared to what arises: Russia compares itself to the United States, to the West, and to China and seeks to survive as a great power.

George Shultz has observed that Russia is a major power, armed with the most dangerous weapons on earth. It will always be important, so the United States must figure out how to work with Russia constructively. It has been done before, and it can be done today even in a new and changing world.





## About

New and rapid societal and technological changes are complicating governance around the globe and challenging traditional thinking. Demographic changes and migration are having a profound effect as some populations age and shrink while other countries expand. The information and communications revolution is making governance much more difficult and heightening the impact of diversity. Emerging technologies, especially artificial intelligence and automation, are bringing about a new industrial revolution, disrupting workforces and increasing military capabilities of both states and non-state actors. And new means of production such as additive manufacturing and automation are changing how, where, and what we produce. These changes are coming quickly, faster than governments have historically been able to respond.

Led by Hoover Distinguished Fellow George P. Shultz, his Project on Governance in an Emerging New World aims to understand these changes and inform strategies that both address the challenges and take advantage of the opportunities afforded by these dramatic shifts.

The project features a series of papers and events addressing how these changes are affecting democratic processes, the economy, and national security of the United States, and how they are affecting countries and regions, including Russia, China, Europe, Africa, and Latin America. A set of essays by the participants accompanies each event and provides thoughtful analysis of the challenges and opportunities.



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