The Economic Dimension of Russia’s Modernization

Philip Hanson
Modernization is Russia's oldest tradition. Peter the Great pursued it; Count Witte pursued it; and so did Joseph Stalin. Russia has changed, but its economy has not become modern. These days Russia is, in World Bank parlance, an upper-middle-income country. Its GDP per employed person in 2009 was much less than half that of Germany or Italy and less than a third that of the US. Now the leadership has raised the modernization banner again. What exactly are they trying to achieve? How are they going about it? What, within the next decade or so, are their chances of success? What does the campaign mean for the outside world? Before trying to answer those questions some background on Russian growth prospects will be offered. They provide the setting for the modernization campaign.

1. The Prospect of Slower Growth

There is widespread agreement that Russia is emerging from the global financial crisis without much chance of a return to its pre-crisis rate of growth. Having been seen as one of a fast-growing group of emerging economies, it now looks likely to lag behind the likes of Brazil, China and India.

In the inter-crisis boom period, 1998-2008, Russian output growth benefited from growing inputs of labour and capital and substantial growth in total factor productivity (TFP). Professor Masaaki Kuboniwa has carried out one of the best growth accounting exercises for post-communist Russia. He used quarterly data and adjusted his measures of both capital and labour inputs for the degree of utilisation. For the boom period between the third quarter of 1998 and the middle of 2008, he estimated that the average GDP growth rate of 7.6 percent per annum was made up 3.0 percentage points by growth of capital in use, 0.5 percentage points by rising labour inputs employed and no less than 4 percentage points by rising TFP.

In an earlier, more primitive exercise along similar lines, I also found a high role for TFP in accounting for Russian boom-period growth. I offered circumstantial evidence there that shifts in resource allocation between sectors made a substantial contribution to gains in aggregate factor productivity, and that productivity gains from the import of advanced foreign machinery were very likely also important. With machinery imports accounting for about three-quarters of all equipment investment, it is probably the case that most new equipment brought into use embodies higher levels of technology than had previously been the norm in Russia.

1 Author's calculations from IMF World Economic Outlook October 2010 database and, for Russia, employment data from Rosstat, www.gks.ru/bgd/regl/b10_01/IssWWW.exe/Stg/d12/3-2.htm. The figures are (in '000 PPP $): Russia 30.5; Germany 69.9; Italy 75.5; US 100.9.
2 M. KUBONIWA, Russian Growth Path and TFP Change in Light of the Estimation of Production Function Using Quarterly Data, Hitotsubashi University Russian Research Center, Working Paper No. 30, February 2011. The missing 0.1 percent is the error term.
Then things changed. In the course of the global crisis, Russia experienced four quarters of recession, from mid-2008 to mid-2009. This was not an especially prolonged decline, and the state’s accumulated financial reserves helped the country to weather the storm. Even so, Russian GDP fell by 7.9 percent between 2008 and 2009 – the largest year-on-year fall for any G-20 nation. This was not in any direct sense attributable to its dependence on oil. Other major oil-exporting countries had either very modest declines or reduced rates of increase. Nor was it the common experience of large emerging economies. They mostly experienced some slowdown in growth but no absolute decline.

The recovery so far has been modest: a 4 percent growth of GDP in 2010. Independent analysts do not see a return to rapid growth in at least the medium term. For an economy that grew at about 7 percent a year between the 1998 and 2008 crises, Russia now attracts strikingly modest growth forecasts for the next 5-10 years. The IMF projects about 4 percent average annual GDP growth for 2010-2015. The Russian investment bank Uralsib projects an average rate of 3.2 percent to 2020. Two years ago I projected 4-5 percent for 2010-2020. The Russian government is not, officially, more optimistic: the MinEkon innovation-scenario projection to 2020 entails around 4 percent average annual growth of GDP.

There are three main reasons for projecting such a slowdown. In comparison with the inter-crisis period, a strong growth of cheap foreign loans looks less likely (despite quantitative easing in the US), as debt is unwound after the financial crisis. A sustained, strong rise in the oil price looks less likely to resume as Europe and North America experience slower growth. And the number of people available for employment in Russia has begun to decline. In 1998-2008, even though the total population was declining, the population of working age was still rising. MinEkon expects the employed workforce to fall from 67.7 million this year to 64.6 mn in 2020. That is a rate of decline of 0.5 percent per annum. In the inter-crisis period employment was rising at close to 1 percent a year.

The decline in the workforce takes the form of a steep drop in the number of young people entering the labour force. This will have two knock-on effects. First, as the population cohorts most amenable to education and training shrink, the rate of improvement in human capital will, other things equal, slow down. Second, the rate at
which resources shift from less to more productive uses is also likely to decline because one of the principal ways in which that shift occurs is through the retirement of older workers from ‘old’ industries and the recruitment of young people to newer lines of activity. These are the considerations that lie behind the – at first sight – surprisingly modest growth forecasts for Russia.

2. Modernizatsiya: What the Leadership Says It Wants

To judge from the speeches and writings of Prime Minister Putin, President Medvedev and presidential aide Vladislav Surkov, what is sought is mainly, though not exclusively, rapid economic and technological catching up with the most advanced countries⁸. Organizational nomenclature helps to identify what is involved. Both Putin and Medvedev chair commissions that are aimed at promoting modernization in some sense. Putin’s is the Government Commission on High Technologies and Innovations. Medvedev’s is the slightly broader-sounding Presidential Commission on Modernization and the Technological Development of Russia. Russia’s outstanding economic administrator, Anatoli Chubais, is a member of both, and there are other overlaps⁹. The most conspicuous initiatives, including the plan to develop a ‘Russian Silicon Valley’ at Skolkovo, have come from the presidential commission.

Talk about the desirability of a more diversified economy has been heard for several years. There are elements of it in ‘Putin’s Plan’, officially launched in 2008. This was a declaration of ambitions for the Russian economy and Russia’s place in the world, with 2020 as the target year. Russia was to become the fifth largest economy in the world (measured in international dollars at purchasing power parity) by 2020, but the implicit assumption was that this would happen mainly through an extrapolation of existing trends¹⁰. That earlier plan contained some ‘modernization’ ambitions. The share of industrial output defined as ‘innovative’ in 2005 was declared to have been 2.5 percent; this was to be raised to 25-35 percent by 2020. But the planners also assumed that energy prices would go on rising¹¹. As a Russian commentator has observed, the plan was dead on arrival¹².

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⁸ For a combative statement of Surkov’s views, see M. GLIKIN - N. KOSTENKO interview with Surkov, “Chudo vozmozhno” – Vladislav Surkov, perviy zamrukovoditelya administratsii prezidenta, zampredsedatelya komissii po modernizatsii, in «Vedomosti», February 15, 2010. Surkov argues there that political liberalization must be gradual and for the time being a ‘consolidated state’ is necessary for Russian economic advance.


¹⁰ C.G. GADDY - A.C. KUCHINS, Putin’s Plan, in «The Washington Quarterly», Vol. 31, No. 2, Spring 2008, pp. 117-129. On this basis, Russia was the seventh largest economy in 2009 and is projected by the IMF to be the sixth largest in 2015 – but with a reduced share of global GDP. See Annex 1.

¹¹ Kontseptsiya dolgosrochnogo sotsial’no-ekonomicheskogo razvitiya Rossiiskoi Federatsii, of March 12, 2008, posted at the time on the Ministry of Economic development (MinEkon) website.

A heightened priority for something called ‘modernization’ can be traced back to Medvedev’s September 2009 blog, “Go, Russia!”\(^{13}\). This was read by many as a rallying cry for a broad social, political and economic liberalization. The emphasis, however, is economic. The President asked, “[S]hould a primitive economy based on raw materials and endemic corruption accompany us into the future?”

He went on to say the following:

In the coming decades Russia should become a country whose prosperity is ensured not so much thanks to commodities but by intellectual resources: the so-called intelligent economy, creating unique knowledge, exporting new technologies and innovative products.

He listed five priority areas for technological advance: energy efficiency, the nuclear industry, information technology, space technology and ‘some kinds’ of medical equipment and medicines.

Since that internet posting the emphasis, both from Medvedev and from Putin, has been on Russia diversifying its economy, becoming more technologically advanced and being more innovative. The original ‘Putin Plan’ is being revised under the supervision of first deputy Prime Minister Igor Shuvalov. Two alternative development strategies to the year 2020 are being prepared and discussed within the government and the presidential administration. They are an ‘innovation’ scenario and an ‘energy-raw materials’ scenario\(^{14}\). The labels declare up front which is to be chosen. However, there are complications in the debate on strategy, to which we shall return. Before we review the obstacles and the choices that face Russian policy-makers, it will be useful to consider briefly the meaning of words like ‘innovation’ and ‘technological progress’ in economics. That will help to identify the policy issues.

3. Modernization: What Economics Has to Say, and the Implications for Russia

3.1 The Economic Understanding of Innovation

In the advanced countries average levels of material prosperity and (closely related to those levels) output per person employed are now vastly above what they were in 1950. The levels in 1950 were, in turn, vastly above those that could be observed a century earlier. The principal source of these increases over long periods of time is the introduction of new, less costly, ways of making given products and the intro-


duction of new products. We noted in the introductory section that there are also currently very large productivity and per capita GDP differences between an upper-middle income country like Russia and advanced economies in Western Europe and North America. These, too, are due in part to differences in the average technological levels of production in the different regions.

When a country’s labour productivity level rises over time, the influences producing that rise can be separated – conceptually, at least – into different categories. Only one of these is ‘technological progress proper’, but it is almost certainly, in the long run, the most important. The categories include, in no particular order, the following:

- Economies of scale in at least some lines of production.
- New natural-resource discoveries.
- Increases in capital available per worker at a given technological level.
- Shifts of capital, labour and land from less productive to more productive uses. This might be assisted by increased specialization and gains from international trade.
- Increased skills and know-how within the workforce.
- The development, introduction and diffusion of new products and processes – new, that is, to the economy in question, not necessarily new in a global sense. This is the technological innovation process.

These influences interact with one another. Assessing their separate contributions to growth is problematic, but some tentative measurements are possible. ‘Growth accounting’ is one approach. The results of one growth accounting exercise for Russia, by Masaaki Kuboniwa, were described above. In its simplest form, growth accounting separates the rate of output growth of an industry, a sector or a whole economy over a period of time into the part attributable to the increase (if any) in labour inputs, the part attributable to the growth of capital stock and a residual. The residual, or growth in total factor productivity incorporates, in principle, all the above influences save that of the growth of capital stock.

For a medium-developed, emerging economy, much of the gain in productivity comes from (a) capital and labour shifting out of less productive activities into lines of production in which their productivity is higher and (b) from introducing, and then spreading more widely, products and processes already introduced and to varying degrees diffused in more advanced economies.

The introduction and diffusion of products and processes new to the economy can come about through importing equipment, through licensing patented technology and the acquisition of unpatented know-how, through the entry of foreign

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15 Measuring welfare and productivity gains from the introduction of new products is problematic; strictly speaking, only productivity gains from new processes are measurable.
16 In this discussion we focus on long-term, trend growth and ignore cyclical fluctuations.
firms and through copying (including piracy). In both of these lines of development – resource shifts and adoption of foreign technology – improvements in human capital (education, training and know-how) play a part. The successful assimilation of advanced technology requires the skill and know-how at least to operate the imported equipment and, at most, to replicate it, adapt it and improve upon it.

How does a country that is behind the world technological frontier catch up? Mostly, it will be from these forms of absorption rather than from original research, development and introduction into commercial production of products and processes new to the world as a whole. More than anything else, it can be argued, it is this catching-up with a technological backlog that allows emerging economies to grow faster than mature, advanced economies.\footnote{This insight was developed into a general theory of international economic growth by S. GOMULKA, \textit{Inventive Activity, Diffusion and the Stages of Economic Growth}, Aarhus University Press, 1970.}

To be able to exploit and adapt foreign technology requires skills and training and, in some cases, research experience, even if those assimilating the foreign technology are not themselves contributing innovation at the global leading edge. So investment in education is one \textit{desideratum}.\footnote{See, for example, the chapter on product market regulation in OECD, \textit{Economic Survey of the Russian Federation}, Paris, 2009.}

There is no reason why a middle-income country that is engaged in catching up the most advanced economies should not be the source of some world-level innovation. Most of its productivity gains will come from assimilating foreign technology. Still, there may be some capacity also for \textit{de novo} innovation. The requirements for this, so far as skills, education and research experience are concerned, are much the same as for successful assimilation of technology of foreign origin.

In any case, well-working economic institutions are also needed. If a country, whether advanced or catching-up, has competitive labour, capital and product markets, with freedom of entry and exit, this helps technological progress. In an open, competitive environment, keeping up with the latest technology is a condition of survival for a firm. New products and processes, whether foreign in origin or home-grown, spread through an industry rapidly. Conversely, if the environment is not competitive, incumbent firms can survive with outdated technology, coexisting perhaps with more advanced businesses but protected by regulations, by crony relations with the political authorities or a variety of other barriers to competition. This holds back the growth of productivity.

\subsection*{3.2 Implications for Russia}

The Russian business environment, notoriously, is riddled with impediments to competition. But the effects of corruption, political patronage and hidden subsi-
dies are not spread evenly across sectors. Even on the international stage a few Russian firms are notable for innovation. In its 50 most innovative firms of 2010 the magazine «Fast Company» included two: Yandex (search engines) and Kaspersky Lab (anti-virus software)\(^ {19} \).

If Russia has problems with innovation (and we shall see that it does), they do not hold back every single Russian firm. It is striking, though, that these two companies are private, post-communist, de novo firms. They have Soviet roots but only in the sense that their founders (Arkady Volozh of Yandex and Natalya Kasperskaya and Eugene Kaspersky of Kaspersky Lab) graduated in mathematics and closely related disciplines in Soviet higher educational institutions. Their companies have benefited from the Soviet Union’s strong traditions in mathematics\(^ {20} \). They did not however carry Soviet-era baggage in the sense of starting with a bloated workforce and a tangle of government connexions, and they are not the products of state support. They are in an industry that barely existed in Soviet times. They are subject to international competition both in Russia and abroad.

Firms such as these are the exception. The Russian economy as a whole is comparatively short of nimble small and medium-sized firms and heavily encumbered with barriers to competition. Those barriers include multiple networks of corrupt relations between business and the state. When such an economy is comfortably provided with marketable reserves of oil, gas, coal, timber and metals, turning it into a technological dynamo is not going to be easy.

4. Challenges Facing Russia’s Modernization Campaigners

The most succinct statement of Russia’s modernization problem is by Yulia Latynina.

> Why is modernization impossible in Russia? Because there can be no nanotechnologies in the Byzantine Empire\(^ {21} \).

This sums up the scepticism of the liberals. A corrupt society in which many business incumbents cut deals with state officials to undermine rivals, in which property rights are not secure and courts are not independent cannot, they argue, provide the incentives to introduce new products and processes in order to sur-

\(^ {19} \) www.fastcompany.com, accessed February 17, 2011. The listing is by no means confined to internet businesses. Nissan came fourth, and Burberry and Marks & Spencer also featured in the top 50. Kaspersky is credited with mobilising some of Russia’s best computer hackers to devise anti-virus programs.

\(^ {20} \) http://company.yandex.ru/about/people; www.moscowtopnews.com/?area=listByTag&id=498 of June 1, 2009; www.Kaspersky.com/directors, all accessed February 20, 2011; Information Age, June 17, 2009. Kaspersky graduated from the Institute of Cryptography, Telecommunications and Computer Science, which was co-sponsored by the KGB and the Soviet ministry of defence.

\(^ {21} \) On the «Ekho Moskvy radio station», October 10, 2009.
vive and increase market share. Only open competition on a level playing field can reliably create this pressure.

This is not the only challenge facing the modernisers. The main challenges are:

- A poor business environment, not favourable to investment
- A weak science and technology base
- An economic structure that has only a modest demand for R&D.

4.1 The Challenge of the Business Environment

By international standards, Russia's business environment is poor, even for a medium-developed country. Perhaps the most systematic and informative assessment of a country's business environment is to be found in the World Bank's annual scoring and ranking of 180-plus countries on the 'ease of doing business'. In the 2011 report, Russia is ranked 123rd out of 183 countries (See next page, Table 1, column 2). It is true that this puts it a few places above India and Brazil, but on the whole the business environment score tends to be higher, the higher is per capita GDP or gross national income (GNI). Russia is, on these measures, a more developed country than either India or Brazil, as column 1 of the table shows. Of 46 upper-middle-income countries included in the ranking, Russia comes 38th on the ease of doing business. It comes far below China, Mexico or Turkey in this ranking of business environment yet, as the table shows, they are all appreciably poorer countries.

The 'ease of doing business' ranking is based in large part on survey evidence, not of opinions but of companies' experience of the costs involved in starting a business, dealing with construction permits, registering property, getting credit, protecting investors, paying taxes, trading across borders, enforcing contracts and closing a business. In short, there is hard evidence that Russia has, particularly for its level of development, an unusually difficult business environment; this is not merely a matter of perceptions.

That is probably the main reason why Russia's investment ratio (the final column of Table 1) is so modest. The Russian share of investment in GDP is far below that of China and, on these data, significantly below that of the much poorer India\textsuperscript{22}.

\textsuperscript{22} Unfortunately these ratios include changes in inventories. Cross-country comparative data on the share of gross fixed capital formation alone in GDP are not readily available. According to recent reports, in Russia in 2010 that share was 20.5 percent (Interfax from Krasnoyarsk, citing Finance Minister Kudrin, February 18, 2011). Whether the binding constraint that has kept that ratio so low is the business environment or a shortage of credit is a matter of dispute.
Modernizing Russia: Internal and External Implications and Challenges

Table 1 - Selected emerging economies, 2008-11: development level and indicators of business environment, inventive activity, tertiary education and investment effort

<table>
<thead>
<tr>
<th></th>
<th>Per cap GNI '000 PPP $ 2009</th>
<th>EODB 2011 worst = 183</th>
<th>percent intl. Patents 2010</th>
<th>N. Univ’s in top 300 2010</th>
<th>GCF/GDP 2008 percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>10.2</td>
<td>127</td>
<td>0.3</td>
<td>2</td>
<td>20</td>
</tr>
<tr>
<td>China</td>
<td>6.89</td>
<td>79</td>
<td>7.28</td>
<td>9</td>
<td>44</td>
</tr>
<tr>
<td>India</td>
<td>3.25</td>
<td>134</td>
<td>0.74</td>
<td>4</td>
<td>28</td>
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<tr>
<td>Mexico</td>
<td>14.1</td>
<td>35</td>
<td>0.13</td>
<td>1</td>
<td>27</td>
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<tr>
<td>Russia</td>
<td>18.35</td>
<td>123</td>
<td>0.41</td>
<td>2</td>
<td>25</td>
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<tr>
<td>Turkey</td>
<td>13.71</td>
<td>65</td>
<td>0.24</td>
<td>0</td>
<td>22</td>
</tr>
</tbody>
</table>

Notes: EODB = ranking of the ease of doing business, among 183 countries, based on data for 2010; GCF/GDP = Gross capital formation as percent of GDP; GCF includes change in inventories. The number of Universities in the world’s top 300 for China includes Hong Kong (3 of the 9).
Sources: IMF World Economic Outlook database; World Bank (http://doingbusiness.org); World Intellectual Property Organization (www.wipo.org); QS (http://www.topuniversities.com).

4.2 The Comparative Weakness of Russian Science

The second source of difficulty for the modernization project is the comparative weakness of Russian science and education. This observation surprises many people who associated the Soviet Union with achievements in mathematics, physics, rocketry, nuclear power and aerospace. But times have changed, and even the past was never quite what it was cracked up to be. The Soviet Union never, in fact, performed well in the development of new products and processes, given the huge number of research scientists and engineers it deployed. Where it did have some strength was in military-related research. The military-industrial research effort, however, has decayed dramatically.

The consequences show up in levels of inventive activity. The shares of selected emerging economies in the global total of international patent applications are shown in the third column of Table 1 (Background data are in Annex, Table A2.) All are, understandably, modest, but China’s share stands out. Russia’s is, in comparative terms, moderate.

The next column shows the number of universities ranked in the world’s top 300 by QS. There are other university ranking schemes on offer, but as far as this group of countries is concerned, the pictures they give are not radically different. Again, Russia’s place is modest: on a par with Brazil, below India and well below China.

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Russia’s modest position in recent inventive activity, as proxied by international patent applications in 2010, is a snapshot. The video is even less encouraging. Compared with the other emerging economies in Table 1, Russian international patent applications have stagnated in the past decade. See Figure 1.

Figure 1 - International patent applications in 2009 & 2010 as a multiple of international patent applications in 2000 & 2001, selected emerging economies


What has been happening in Russian research, development and innovation? The short answer is: decay.

Fundamental science is in poor shape. Pure science was a prestigious and relatively well-rewarded occupation in Soviet times. It is no longer. Science graduates tend either to emigrate or to work in Russia outside the research community. Working scientists in Russia now are concentrated in the older age groups. In a period when careers in research are built internationally, with spells of work in a variety of countries and close collaboration in multinational teams, and when funding for research projects is by open competition subject to peer evaluation, fundamental science is in poor shape.

24 Fundamental science can be thought of as curiosity-oriented and papyrocentric (focused on the publication of results). Applied science is mission-oriented (it has some practical solution to a practical problem in view) and papyrophobic (secretive about the results until they have been patented or otherwise protected from copying). Famously, curiosity-oriented research can open up new practical possibilities, but it is not targeted at doing so; it is therefore usually state-financed.
assessment, Russian science is relatively closed to the outside world and funding is only to a limited degree by peer-reviewed competition.

The problem has been highlighted by a campaign conducted by a substantial, and growing, number of Russian-born scientists in permanent research posts outside Russia. They have called for drastic reform and international opening-up of Russian fundamental science, first in an open letter to the Russian President and Prime Minister in September 2009 and later in a reform proposal. The campaigners call, not for an attempt to stem the brain drain or to attract back the émigré scientists, but for measures to connect Russian science to the outside world by establishing projects in Russia that would be funded by international, peer-reviewed competition and would be attractive to foreign scientists to take part in. These would make basic-research careers in Russia more attractive. As things stand, the environment is not conducive to leading-edge work. Konstantin Novoselov, co-laureate of the Nobel physics prize in 2010, was asked after the award whether he would like to return to Russia to work. He said:

I wouldn’t rule out working in Russia if it were integrated into the global scientific community. But today it is somewhat isolated from the rest of the world. Also, Russian science is centralized and very bureaucratic. Many scientists and my colleagues would not find it comfortable to work in such a system.

This state of affairs in basic science is not conducive to a healthy development of applied science, research and development.

4.3 An Economy with a Weak Demand for New Technology

An economy’s main strengths, so far as tradeable goods and services are concerned, show up in its net exports. Russia is an exporter mainly of raw materials and lightly-processed products: oil, gas and metals especially. It is true that it

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26 The Oxford physicist Dr Andrei Starinets, one of the campaign’s main organisers, kindly described to me, in a conversation on October 5, 2010, how the campaign had developed and what response (very little in the way of direct, official communication) there had been. It so happens that on the day of our meeting the Nobel prize for physics was awarded to two other expatriate Russian scientists working in the UK: Andrei Geim and Konstantin Novoselov (http://www.bbc.co.uk/news/world-11476301).
28 Oil, oil products, gas, coal, coke, ores, unworked timber, iron and steel, copper, unprocessed nickel and unprocessed aluminium accounted for 75 percent of all the country’s merchandise ex-
also exports military aircraft and nuclear reactors, but for the most part its export profile is not high-tech.

Russia’s economy therefore is dominated by industries that are not research-intensive. This does not mean that the oil industry, for example, does not employ advanced equipment or that it is immune to innovation; far from it. But its ratio of R&D spending to sales is much less than that for information and communication technology, aerospace or pharmaceuticals: these are research-intensive, as measured by that ratio. To put it another way, the Russian economy is dominated by economic activities that have a comparatively limited demand for R&D.

Anatolii Chubais, the boss of Rosnanotech and a member of both presidential and governmental modernization commissions, set this point out in detail at the 11 February 2010 meeting of the presidential commission. He said that 73 percent of Russian industrial output came from industries whose ratio of R&D spending to sales was less than 3 percent. This dominant segment of the economy, he suggested, was weak in its assimilation of existing advanced technology. The economy as a whole was not generating wholly new technology because it lacked the activities that generated leading-edge R&D. Here, he told the President, Rosnano was ready to help, in part by bringing in foreign partners in cooperation with venture capital funds.

There is however another reason for the weakness of Russian domestic demand for R&D and innovation: the barriers to competition that have been described above. These are intimately connected with the political elite’s corrupt entanglement with the business world. Therefore anyone, even the enormously resourceful Chubais, who tries to use state machinery to boost technological advance has got a problem.

Meanwhile, as Chubais acknowledged, the Russian state finances and carries out an unhealthily large proportion of national R&D. Precise comparisons on this score are difficult. Russian official statistics imply that federal budget spending in 2009 accounted for 45 percent of total R&D. They also show the number of R&D entities that belong to the state increasing between 2000 and 2009 while the number belonging to enterprises (including state-controlled enterprises) fell; and they show the number of research scientists and technicians falling over the same period from 501,000 to 429,000.

These numbers are not closely comparable to those available for advanced economies but they strongly suggest that an unusually high proportion of R&D...
activity is state-funded (and probably also state-implemented) in Russia and that the numbers engaged in research and development are heading – from a moderniser’s point of view – in the wrong direction.

Nor does the Russian R&D effort loom particularly large. For what the official Russian numbers are worth, Russia’s R&D spending as a share of GDP is by international standards modest: 1.24 percent in 2009. This is a share higher than the 2008 OECD-estimated share for Italy (1.19 percent), but well below the OECD average of 2.33 percent32.

5. The Recent Policy Debate in Russia about Modernization

If the Russian authorities really wish to sell the modernization idea to the Russian business community, they have a task ahead of them. At the 2010 Krasnoyarsk Economic Forum, attended by some 800 business people, economists and officials, a poll was taken of opinions on the modernization campaign. To the question, “Do you understand what the authorities [vlast’] want from you when they talk about modernization?” 70 percent said they did not. To the question, “Do you believe in modernization?” 52 percent said “no”33.

Liberal economists argued from the start that the emphasis on innovating at the global leading-edge was misconceived. Russia’s first task was to reduce its technology lag by absorbing existing technology from abroad more rapidly. They also argued that the fundamental obstacle to rapid modernization was precisely the poor business environment of Russia: the weakness of the rule of law and protection of property rights and the corrupt entanglement of politics with business. How have modernization policies and policy debates evolved in Russia?

5.1 Adjusting the Concept of Modernization

Anatolii Chubais sought at an early stage to bring the modernization policy back to basics. He did so in a powerful presentation to the presidential commission in early 2010. He defined modernization as the assimilation of existing technology and innovation as the creation of products and processes new to the world market34. He made it clear that both should be on the agenda, not just world-level innovation, and that Russia had few enterprises that were either up-to-date or innovative. He also stressed that too much Russian R&D was state-financed, and contrasted Russia’s very modest business finance of research with the large and rapidly rising volume of such support in China.

34 Ibidem, see note 24.
At that meeting President Medvedev nonetheless proceeded in a rather Soviet fashion. He called on the bosses of a number of large companies, invited for the occasion (he said) because all had received state support in the past, to spend more on research. Finance Minister Aleksei Kudrin repeated his standard message that little could be expected from the state budget. Medvedev called for higher business spending on R&D, and offered some state co-financing.

This basic idea, of the desirability of allocating more resources to applied research, has subsequently evolved in several directions. One is reminiscent of Soviet planning. Almost a year after the meeting just mentioned, the Minister for Economic Development, Elvira Nabiullina, was reporting to the presidential commission on a monitoring exercise focussed on the R&D-spending-to-sales ratios of 22 state-controlled enterprises. They had been set targets for these ratios.

Medvedev was reported as saying that he would sack bosses of those state-controlled enterprises that failed to meet their innovation targets. ‘Innovation’ here apparently means R&D spending. The old state-planning error of using inputs as a measure of outcomes was being re-invented. It is not clear whether the top policy-makers have grasped the need for Russia to focus on assimilating other people’s technology first.

Official pronouncements can combine free-market pieties with quasi-Soviet practicalities. Deputy economy minister Fomichev, interviewed in February 2011, observed that innovation requires competition, a level playing field and a favourable business climate. These liberal sentiments, however, were part of an exposition of policies that aimed at getting 40-50 percent of Russian enterprises [presumably in the industrial sector] engaged in ‘innovation’ by 2020. Forty-seven large companies with state participation had been told to come up with innovation plans, comparing themselves with analogous foreign companies.

One can understand the difficulty of proposing a radical overhaul of the present economic system. In the absence of such an overhaul, resort to Soviet-era methods is logical. The snag is that they do not work.

5.2 Skolkovo: Another Silicon Valley or Another Potemkin Village?

The Skolkovo project also has a back-to-the-future air about it. The idea is to establish near Moscow a cluster of research and production units that would be dedicated to innovation, a ‘Russian Silicon Valley’. This is not intended in fact to be de-

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voted entirely to IT, but to be a center for R&D and innovation more generally. The idea is to have a more attractive tax and administrative environment than the Russian norm, to have simplified visa and employment requirements, and to attract foreign high-tech companies and researchers. The sceptical reaction of one expatriate Russian Nobel laureate has already been described.

Foreign commercial interest nonetheless has been apparent. Siemens, Cisco, Intel and others have committed themselves to investment there. The Skolkovo Foundation is headed by Viktor Veksel’berg, the boss of the Renova group, who had earlier acquired two Swiss-based high-tech companies, Oerlikon and Sulzer.39

With its foreign links and with a major role for Anatolii Chubais, the Skolkovo project cannot be dismissed as just another Soviet-style anachronism. All the same, it does raise questions. It recalls the Soviet science city of Akademgorodok, created near Novosibirsk. The notion that a special, non-standard environment is needed to promote technological change is odd. Perhaps a privileged enclave can achieve something, but the Skolkovo idea could also be seen as an indictment of the ‘standard’ Russian business environment. It could be argued that the real challenge, capable of yielding far larger benefits, is to change the norm. Russian sceptics see in Skolkovo only another big government project, ripe for plunder and embezzlement.

Some foreign investors are, as Chubais has observed, more optimistic about Russian modernization than their Russian counterparts. This just might, of course, reflect the fact that Russians know more about their own country. On the other hand, Chubais is the ultimate can-do manager: anyone who can unbundle and partially privatise the Russian electricity industry in the midst of Putin’s re-assertion of state control deserves a hearing even for apparently over-optimistic assessments.

5.3 The Finance Minister, the Budget and the Innovation Scenario

In the course of re-working Russia’s growth strategy, MinEkon has drafted ‘innovation’ and ‘energy-raw materials’ scenarios that entail average annual GDP growth rates to 2030 of about 4 percent and just under 3 percent, respectively. The MinEkon ‘innovation’ scenario, at any rate according to Finance Minister Kudrin, includes levels of state investment that, on the MinEkon assumption of an oil price ‘up to’ $100 by barrel, would mean the federal budget would be in deficit to the tune of 2 percent of GDP for the next 10-15 years. This, Kudrin argued,
was not feasible. Russia, being so heavily dependent on the oil price, could not safely maintain a public debt in excess of 30 percent of GDP.

Kudrin’s position is that public administration in Russia is weak; money allotted to infrastructure spending gets stolen; the Russian state has raised pensions substantially and has a Rbl 1 trillion hole in the state pension fund (which is being filled up from the budget); and is committed to major spending for the 2014 Winter Olympics at Sochi and the 2018 Football World Cup. The last thing the public finances need is another surge of spending, this time on research and research facilities. Modernization, he observed, needs a higher rate of investment, and that in turn requires an improved investment climate.

Kudrin is a deputy Prime Minister. Therefore he will not express his scepticism as forcefully as independent commentators like Sergei Aleksashenko or Yevgenii Yasin. But he is saying, in effect, the same thing: Russia needs a liberalized economy if it is to progress; top-down, state-heavy modernization programs will not work.

6. Implications for the Future

6.1 Implications for Russia

It would be unduly dogmatic to maintain that the Russian modernization campaign cannot possibly produce any improvements in economic performance at all. It is not promising, however. Its proponents are engaged in yet another Russian exercise in transformation from above. They neglect the fundamental deficiencies of Russian economic institutions: the weak rule of law and the impediments to competition created by the pervasive networks of corrupt relations between businessmen and officials. But that does not mean there will be no impact at all.

Faster growth is possible, but it will probably require an increase in the growth rate of investment and therefore (again, other things equal) a faster growth of capital stock, as well as an acceleration in the rate of assimilation of foreign technology. These in turn would be facilitated by a real liberalization of the economy. The part that current modernization policies could play in reanimating the economy looks small.

http://www1.minfin.ru/ru/press/speech/index.php?id4=12087. The Uralisib projection is in C. WEAFER, Russia: Towards Greater Pragmatism, cit. The reasons why these and other projections are so far below the growth rates of the inter-crisis period are discussed in the final section.
6.2 What Does Russia’s Modernization Campaign Mean for the Outside World?

The 2008-2009 crisis showed the Russian leaders that their economy was more fragile than they had supposed. The search for a new model of growth has led them to see more advantages than they had previously envisaged in cooperative relations with the rest of the world. Europe is their main trading partner and the West more broadly is their main source of imported machinery and know-how. The conclusion was that more openness in foreign economic policy was desirable. That conclusion has been reinforced by a new experience: having trouble making the budget balance.

Together these concerns have been behind such moves as the reduction in the number of enterprises deemed strategic and therefore not normally open to foreign direct investment; the renewed pursuit of joint ventures with foreign firms in offshore oil and gas development; and the launching of a new wave of privatization. The Skolkovo project is itself an example of opening up to the outside world. These developments are welcome. They facilitate business and human contact across Russian borders and provide opportunities for Western investors. Still, they have their limitations, and those limitations are set by the unreconstructed business climate in Russia. The new privatization program involves sales only of minority stakes in what will remain state-controlled entities. The participation of foreign high-tech companies in Skolkovo and other research-based developments may indeed yield new products and processes from Russian research. But these may well get to be commercialised abroad by the foreign partner, and not in Russia.

One indicator is the experience of Western companies in Russia. Before the global crisis IKEA, BP and the Norwegian telecoms company Telenor all experienced severe difficulties with corrupt officials and purchasable courts; also with devious local partners exploiting their connexions with those officials and courts. All have done well in Russia and have every inducement to stay, despite the hassles. But there is no clear sign yet that the environment in which they operate in Russia has changed.

Since the start of the modernization campaign and the new opening-up, IKEA has not resumed its investment program, suspended in 2009; BP is once again at loggerheads with its Russian partners in TNK-BP; and Telenor is once again engaged in a serious battle with its Russian partners in Vimpelcom.

42 Several Russian liberal economists have suggested that this is a likely outcome. See (e.g.) S. ALEKSASHENKO, Nevynosimaya nereal’nost’ bytiya bez tovarov premium-klassa vgoszakupkah, in «Vedomosti», February 25, 2011.

Conclusions

Russian policy-makers have embarked on a campaign to accelerate technological change in Russia. Initially the campaign was over-ambitious: it was all about Russia generating products and processes new to the world. The language and the planning have become somewhat more realistic, giving greater emphasis to the assimilation of existing advanced technology from other countries. That has prompted the Russian leadership to take measures that open the economy up rather more to foreign business.

Fundamental obstacles remain: the weakness of competition and property rights in Russia; the decayed state of Russian science; and an economic structure that does not generate a high demand for research, development and innovation. Of these, the first is the most fundamental. It seems also to be quite durable. Existing ‘oligarch-nomenklatura clans’ stand to benefit from the present arrangements. Therefore Russia’s economy is unlikely to become genuinely open, competitive and rule-based without a change in the political order. That will not come easily or quickly; indeed a struggle over the political order could bring a period of disarray that would be worse for the economy (for a time) than the status quo.

Meanwhile the West stands to gain commercially and perhaps also in foreign policy from Russia's adoption of a more cooperative economic stance. One sign of sustained progress in economic cooperation would be Russia’s accession, at last, to the World Trade Organization. Russia’s willingness to cut the deals required would testify to the depth of the new cooperative attitude. And membership would do something – albeit only gently and at the margin – to make the Russian economy a more rule-governed place.
## ANNEX

### Some Background Data

Table A1 - The world’s leading economies by absolute size, 2009 and 2015 projected (percent of world GDP in international dollars at purchasing power parity)

<table>
<thead>
<tr>
<th>Country</th>
<th>2009 percent world product</th>
<th>Country</th>
<th>2015 projected percent world product</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>20.422</td>
<td>United States</td>
<td>18.361</td>
</tr>
<tr>
<td>China</td>
<td>12.556</td>
<td>China</td>
<td>16.957</td>
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<tr>
<td>Japan</td>
<td>5.958</td>
<td>India</td>
<td>6.280</td>
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<td>India</td>
<td>5.051</td>
<td>Japan</td>
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<td>Germany</td>
<td>4.020</td>
<td>Germany</td>
<td>3.417</td>
</tr>
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<td>United Kingdom</td>
<td>3.066</td>
<td>Russia</td>
<td>2.961</td>
</tr>
<tr>
<td>Russia</td>
<td>3.022</td>
<td>Brazil</td>
<td>2.874</td>
</tr>
<tr>
<td>France</td>
<td>3.020</td>
<td>United Kingdom</td>
<td>2.740</td>
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<tr>
<td>Brazil</td>
<td>2.884</td>
<td>France</td>
<td>2.623</td>
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<tr>
<td>Italy</td>
<td>2.493</td>
<td>Italy</td>
<td>2.076</td>
</tr>
</tbody>
</table>

Source: IMF World Economic Outlook Database of October 2010.

Table A2 - Numbers of international patent applications by country of origin, selected emerging economies, selected years, 2000-2010

<table>
<thead>
<tr>
<th>Country</th>
<th>2000</th>
<th>2001</th>
<th>2008</th>
<th>2009</th>
<th>2010 est</th>
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<tr>
<td>Brazil</td>
<td>178</td>
<td>173</td>
<td>472</td>
<td>493</td>
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<td>6120</td>
<td>7900</td>
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<td>295</td>
<td>1072</td>
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<td>Russia</td>
<td>530</td>
<td>554</td>
<td>763</td>
<td>711</td>
<td>560</td>
</tr>
<tr>
<td>Turkey</td>
<td>72</td>
<td>76</td>
<td>392</td>
<td>389</td>
<td>401</td>
</tr>
</tbody>
</table>

Notes: 2010 data are preliminary. ‘Country of origin’ is based on the address of the first-named researcher making the application.