

The Innovative Potential of the Russian Economy

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Abstract

Since President Medvedev launched his modernisation drive with his article, “Forward Russia!”, the topic of innovation has come to the forefront of Russian policy discussion and is now focused to a large extent on one specific project, the development of the Skolkovo “innovation center”. The goal of building this “town of the future” has to some extent served to draw attention away from the more general issue, the overall state of Russia’s potential for research and innovation. The realization of a single project with the explicit goal of creating “a favorable environment for the concentration of intellectual capital able to generate innovations” is unlikely to have much impact on the innovation potential of the wider economy and society, as many have observed.¹ This article provides an overview of the current state of the Russian research and development (R&D) system and its potential to foster innovation. It ends with some reflections on the modernisation project and Skolkovo’s role within it.

The Soviet R&D Legacy

As of 2010, it is debatable whether Russia possesses a National Innovation System (NIS) in the normally understood sense of a coherent set of inter-related institutions promoting innovation as a natural outcome of their day-to-day functioning. Institutions and practices in the sphere of R&D still retain many features of the former Soviet system and it is not possible to understand the present-day situation without briefly first exploring the Soviet legacy.

Features of the Soviet R&D system included the organizational separation of research from production, the dominant role not only in basic research but also in much applied work of the USSR Academy of Sciences, which played a central role in the overall science policy of the country, and the relatively modest role in R&D of the higher educational sector.² In the business sector, all enterprises were state owned and most R&D was undertaken by specialised applied research institutes, generally organizationally separate from the enterprises, which themselves undertook little research. The Soviet R&D system was heavily militarized and successive attempts to transfer technology from the military sector to the civilian economy met with little success. The USSR had a very substantial R&D system in terms of the number of people employed and reported spending on research as a share of economic output at levels high

by international standards, although later reassessment moderated these claims.³

In the USSR the innovation process was always understood, implicitly by government officials and often explicitly by economists, as a linear process, i.e. new products and processes are developed on the basis of ideas and inventions originating in basic and applied research, after which they are “introduced” into the sphere of production and then diffused more widely. Only in the very final years did some analysts become aware of the work of the late Chris Freeman and other Western science policy specialists who challenged the linear model and argued for a richer understanding involving feedback relationships.

The Current System: State Dominance

Research undertaken by Russian and Western economists and science policy specialists reveals that, notwithstanding reform measures, the Russian R&D system still retains many Soviet characteristics.⁴ There is still organizational fragmentation, with the majority of R&D organizations being remote from the business sector. Within the latter, company R&D facilities tend to be weakly developed, even in some large corporations. The Russian Academy of Sciences, largely unreformed, still occupies a dominant position. Almost three-quarters of all research organizations remain in state ownership and employ 78 per cent of R&D personnel; 14 per

1 <http://www.i-gorod.com/future>, accessed 25 October 2010. This is the website of the Fund for the Development of the Innovation Center “Skolkovo”. It is worth noting that the English version of the mission of the center, on the same website, reads “to create a special environment that will concentrate intellectual resources and encourage free creativity and scientific inquiry.”

2 See Zaleski, E.; Kozłowski, J.P.; Wienert, H.; Davies, R.W.; Berry, M.J.; and Amann, R. (1969), *Science Policy in the USSR*, OECD, Paris.

3 Note, the Center for Science Research and Statistics, Moscow, has reassessed Russia’s 1990 R&D spending using OECD methods and arrived at a figure of just over 2 per cent of GDP.

4 See Dezhina, I.G. and Saltykov, B.G. (2005), “The National Innovation System in the Making and the Development of Small Business in Russia”, *Studies on Russian Economic Development*, 16, 2:184–190; Radosevic, Slavo (2003), “Patterns of preservation, restructuring and survival: science and technology policy in Russia in the post-Soviet Era”, *Research Policy*, vol. 32, pp.1105–1124.

cent are fully private and employ less than 10 per cent of personnel.⁵ Foreign participation is modest: barely 1.5 per cent of research organizations are foreign owned or joint ventures with foreign companies and they employ only 2 per cent of all personnel.

Relating to this dominance of state property, R&D still tends to be undertaken by very large research institutes with only a minor role for small organizations. Thus, in 2008, less than 4 per cent of all research organizations employed one thousand people or more, but they employed 53 per cent of all R&D personnel and accounted for 44 per cent of total R&D performed by expenditure.

In financing R&D, budget spending predominates, with only a modest contribution from the private sector. In this respect Russia differs markedly from most OECD member countries. Thus in 2008 65 per cent of R&D funding was from government sources, compared with 29 per cent from business, but in the USA the proportions were reversed: government 27 per cent, business 68 per cent.⁶ Grant funding on a competitive basis plays a very modest role. A positive initiative of the early 1990s was the creation of the Russian Foundation for Fundamental Research (RFFI) and the Russian Foundation for Research in the Humanities (RGNF). However, the volume of funding allocated by these bodies accounts for less than two per cent of all R&D expenditure. State dominance and budget funding can be explained in part by the fact that the Russian R&D system is still oriented heavily to military needs. Over half of all scientists still work in the defence industry, notwithstanding its sharp contraction in scale since the collapse of the USSR, and some 35–40 per cent of expenditure on R&D is for military purposes, admittedly down from the approximately 70 per cent level of Soviet times.

In the USSR the higher education system played a limited role in R&D, with many university staff not undertaking research. In recent times the government has been actively seeking to enhance the research contribution of universities, but there is a long way to go. In total funding of R&D the higher education sector accounts for a mere 6–7 per cent, almost the same as the share as in the USSR, and only 12 per cent of all teaching staff are categorized as researchers. Of the total number of universities and other higher educational establishments, almost half of do not participate in research activity.

A major problem of the R&D system is the demographics of research personnel. In 1990 Russia had more than 1,225,000 researchers; by 2008 the number had fallen to 376,000, a striking contraction which shows little sign of coming to an end. To make matters worse, there is an unfavorable age distribution. Over half of all researchers are over the age of fifty and one quarter over the male retirement age of sixty. In the Academy of Sciences the average age of researchers is exceptionally high and thirty per cent are over the male retirement age. However, one positive development of recent years has been an increase in the share of researchers under the age of thirty: 10.6 per cent of all researchers in 2000, but 17.8 per cent in 2008, including almost 20 per cent in the higher education sector. Of the total number of researchers, 42 per cent are women, but of doctors of science only 22 per cent. Russian science is dominated by elderly male scientists and relations of authority and patronage are prevalent. Cultural factors help to explain why talented young scientists, like the two recent Nobel prize winners, Konstantin Novoselov and Andre Geim, often prefer to work abroad. In the words of Geim, Russia has “neither the facilities nor the conditions” and there was an unacceptable “level of bureaucracy, corruption and idiocracy.”⁷

Explaining Limited Innovation

Why is innovation so limited? Part of the answer may be the institutional and attitudinal legacies from the planned economy, but there are other more immediate causal factors. The structure of the Russian economy, dominated by resource-based sectors, is not conducive to vibrant innovation as the demand for new technologies and goods is not strong, and is focused on a limited range of activities. To make matters worse, as underlined by international rankings, such as that of the World Economic Forum, the Russian economy exhibits only weak competition, for which the structure of the economy is clearly a determining factor.⁸ There is an unhelpful circularity: Russia needs a more diversified economy and for this needs change and innovation, as the leadership appreciates, but a precondition for innovation is the existence of a more competitive and diversified economy.

The Role of Skolkovo

How can the development of Skolkovo help to change this unsatisfactory situation? It will be a privileged island

5 Data on the scale and structure of the R&D system from, Center for Science Research and Statistics, *Nauka v Rossii v tsifrakh: 2009*, Moscow.

6 UNESCO data: <http://stats.uis.unesco.org>, accessed 25 October 2010.

7 Amos, Howard (2010), “Nobel Winners Tell Why Russia Lacks Allure”, *The Moscow Times*, 21 October.

8 In the 2010–11 Global Competitiveness Index of the World Economic Forum, Russia is ranked 63rd of the 139 countries covered, behind such emerging economies as Turkey, Brazil, India, Indonesia and China.

of innovative activity working to its own rules, overseen, during its formative years at least, by the President and his modernizing supporters. The hope appears to be that it will provide examples of best practices, which will then be diffused more widely so that over time the innovative capability of the economy more widely will be enhanced. But this is not the first time that “cities of the future” have been created in Russia in the hope that they will secure accelerated scientific and technological development. Examples include the closed cities of the nuclear industry, such as Arzamas, which focused research talent to develop the atomic bomb, the “science cities” such as Dubna, Troitsk and Obninsk in the Moscow region, Akademgorodok in Novosibirsk, and Zelenograd near Moscow, the home base of Soviet microelectronics. It is hardly surprising that some of the existing science cities show little enthusiasm for Skolkovo, fearing, not without justice, that they will be deprived of resources and status.⁹ But these centers, privileged in their early development, had only a modest impact on the wider economy and society. And over time, inevitably, they aged and lost their dynamism, which is probably why they were sidelined when Medvedev decided to develop a new innovation center. But Skolkovo can be seen in another way, as simply a *symbol* of modernity, a bid by the Medvedev-Putin tandem to put Russia in the ranks of truly modern, innovative, countries. It is telling that the Skolkovo Fund website has a graphic illustrating “technopolises” of the world, located in the USA, UK, Finland, France, Japan and Korea. The message is clear, with Skolkovo, Russia will join this elite group.

The opportunity costs of Skolkovo are already becoming apparent. In the draft budget for 2011 Skolkovo will receive 15 billion roubles, a significant sum, equal to almost half the total funding that will be allocated to

the Russian Academy of Sciences. The RFFI, RFGN, and the so-called “Bortnik fund” to support the R&D activities of small enterprises, generally regarded as an effective institution, will see their funding reduced in real terms.

Looking Ahead

So, what is the way forward? The eminent Finnish Russia expert, Pekka Sutela, is surely right: it is not innovation that should be the current priority, but imitation.¹⁰ One could also add investment, above all private, as state investment is ineffective. In comparison to most emerging economies showing healthy growth, the share of GDP devoted to investment is relatively low in Russia and financial intermediation is underdeveloped. There is plenty of scope for the modernisation of the industrial base by importing existing technologies or promoting foreign direct investment. This will permit the manufacture of more modern, higher quality, competitive goods. The experience of other emerging economies indicates that this will promote competition, which will drive change and boost the demand for innovation. In time this will help to diversify the economy, but there are also real possibilities of going up the value chain in resource-based sectors, a potential comparative advantage of resource-rich Russia. Meanwhile, the R&D system can be modernized, the university capability strengthened, the small business sector fostered, and the essential framework conditions adopted to form over time a genuine National Innovation System. In Russia, not for the first time, we see an attempt with Skolkovo to take a leap forward, to narrow a developmental gap by “extraordinary” means. But, as with earlier attempts, success is likely to be elusive and the costs may prove high.

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9 In the draft federal budget for 2011 allocations to support existing “*naukogrady*” have been cut by 22 per cent compared with the 2010 level.

10 Sutela, Pekka (2008), “The four i-words—a fifth one”, Bank of Finland Institute for Economics in Transition, *Focus/Opinion*, no.1. The Skolkovo project itself can be regarded as an example of imitation, indicating that in principle this path is not ruled out.