

Fredrik Westerlund

Russian science: In peril but out of focus

In recent years, the Russian government has stressed the importance of modernisation and moving towards an innovation-based economy. This might sound promising for Russian science, but it does not necessarily imply a focus on research and development (R&D). Innovation is not merely modern jargon for R&D. A scientist or an engineer is not always an entrepreneur. R&D and innovation are closely related but there are fundamental differences. In Russia's current modernisation programme, the scientist is cast in a supporting role, while the entrepreneur is the leading actor.

Modernisation and science have gone hand in hand throughout Russian history. One of the results of the efforts of Tsar Peter the Great to modernise the country was the creation of the Academy of Sciences in 1725. During the Soviet era, scientists took centre stage as a basis for building a modern society. As the economy stagnated in the late 1970s, it was all the more evident that science was lagging behind science in the West in a number of key areas. This situation was exacerbated during the chaotic years after the dissolution of the Soviet Union, when Russian R&D fell into disarray.

Modernisation has once again come to the fore in Russia, epitomised by President Dmitrii Medvedev's call for technological change in September 2009. In his programme, *Russia, forward!*, Medvedev has stressed the need to diversify the economy by developing domestic high-technology industries. The government has also taken several steps to promote domestic R&D. It has merged a number of research institutes into national research centres and initiated several

ambitious R&D programmes, for instance, in nanotechnology and in biotechnology. According to World Bank data, government spending on R&D doubled in the period 2005 to 2008. In 2010, the government established a Commission on High Technology and Innovation, headed by Prime Minister Vladimir Putin, with the development of a unified R&D policy as one of its main tasks.

Does the modernisation drive imply a renewed focus on R&D? Are scientists and engineers once again intended to lead the way in Russian society? Arguably, the answer to these questions is no. Even though Russia is making visible efforts to improve its scientific output, the main focus is on innovation and commercialisation rather than basic R&D. The establishment of the Skolkovo innovation centre in 2010 bears witness to the Russian government's priority of stimulating the development of new high-technology products. It is not new technologies as such that are in demand, but consumer goods suitable for high-volume production. R&D is closely related to innovation but not synonymous with it, and it is even further from commercialisation and developing business concepts. Rather, science and technology research is the basis for innovation and commercialisation. Directing funding to the latter would most likely mean fewer resources for basic research.

Is the Russian government's emphasis on innovation and commercialisation rather than R&D optimal? Two FOI studies of Russian high-technology R&D efforts – in nanotechnology and biotechnology, respectively – indicate that this is the case.

Even though it started as late as 2007, the Russian government has become a world leader in nanotechnology research investment. However, the level of private funding remains low and Russia has so far not been able to compete in research publications and patenting with the leading nanotechnology nations. The report [Russian Nanotechnology R&D: Thinking Big about Small-scale Science](#) (FOI 2011) argues that Russia's only comparative strength is in international cooperation. However, even this advantage is not without blemishes. Russia has so far not primarily cooperated with the leading countries.

Another prioritised scientific field is biotechnology. Russia inherited a solid base in biotechnology R&D from the Soviet military biological weapons programme. Building on this, the pharmaceutical industry and medical technology are now among the five areas in which Russia aims to become a leader according to Medvedev's *Russia, forward!* programme. Nonetheless, success has so far eluded Russia in this field too. According to Roger Roffey's [Biotechnology in Russia: Why is it not a Success Story?](#) (FOI 2010), Russia lags far behind the world's leading nations in research output – including in publication citations and patenting – and even further behind in biotechnology R&D spending. Furthermore, many leading scientists have gone abroad or abandoned biotechnology to work in other research disciplines and funding is still based on block funding to institutes rather than performance in research.

Russia is still underperforming in nanotechnology and biotechnology R&D, most notably because of its aging workforce and a scientific infrastructure in dire need of investment. The real problem,

however, is the fact that the quantity and quality of entrepreneurs is poor. They are not capable of leading the modernisation of Russia. Studies reveal that the main problem for these industries is the poor rate of innovation and commercialisation.

It is a formidable challenge to stimulate entrepreneurship in Russia. The low level of non-governmental investment in science, innovation and commercialisation stems to a large extent from the poor business climate. Important reasons for this are weak legal support, extensive red tape, rampant corruption, an underdeveloped financial sector and an industrial policy that is ill-suited to small and medium-sized enterprises. Rather than being part of the solution, the Russian government is often part of the problem.

The Skolkovo project – an attempt to create an incubator for innovation and modernisation – is a case in point and highlight the fact that favourable conditions are generally not to be found in Russia. Improving conditions for entrepreneurs demands political will and courage as well as perseverance. In the meantime, Russian scientists and engineers will continue to have a hard time, while the government's emphasis remains on the entrepreneurs and businessmen. In 2011, the prospects look bleak not only for Russian R&D, but also for building an environment conducive to an innovation-driven economy.

Fredrik Westerlund

Please visit www.foi.se/russia to find out more about FOI's Russia Project