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Features of the Advancement of Science as an Integral Part of the National Innovation System in Modern Russia

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Abstract

The study explores current tendencies in science and innovation in Russia and gives an assessment of perspectives for optimization of the national innovation system. The paper reviews the main trends in the development of science and innovation in the modern world. A comparative analysis of the historical experience in science and innovation in Russia is made that reveals the dominating role of the state and the military character of the national innovation system. The evaluation of the current national innovation system shows the inclination of the Russian state to preserve the traditional system. Extrapolation of the results of the current policy, even to the near future, indicates further degradation of the national innovation system is likely. The findings of the study demonstrate the need to work out a strategy for development of the national innovation system in which the government will have to energize other parts of the innovation system, such as private companies, entrepreneurs, and universities, and create an open and competitive environment with free access to resources for every participant to achieve the full potential of the national innovation system.

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Keywords: innovation, national innovation system, science

1. Introduction

The paper deals with the Russian government policy in the field of science and innovation development. The study focuses on the analysis of traditional principles of science and technology policy in Russia as well as their transformation in post-Soviet Russia. The analysis also aims to reveal the main contradictions and problems related to the implementation of the government's policy toward innovation development to find the historical and cultural roots of their formation.

Current science of science treats the process of scientific knowledge and innovation as a complex system with a number of interacting factors which give rise to new ideas and knowledge. This knowledge in turn may contribute to the development of new products, processes, organizations, and the opening of new markets (Schumpeter, 1939; Schumpeter, 1967). Today many researchers, when analyzing the process of obtaining new knowledge (primarily,

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knowledge about how to change the world) and innovations use the system approach developed by Freeman, Lundvall, and Nelson (Freeman, 1987; Lundvall, 1992;Lundvall, 1998; Lundvall, 1999; Lundvall, 2003; Nelson, 1988), known as the national innovation system (NIS) concept. Several, recent papers have been written on the analysis of the innovation policy of modern Russia that apply the methodology based on the NIS concept (Ivanov, 2011; Ivanov, 2004; Golichenko, 2006). At the same time, there are new contributions that give parallels between science and innovations in modern Russia, in the Soviet Union and in the pre-Soviet Russian Empire. The American historian of science, Loren Graham (Graham, 1998), wrote about the negative effect of "Lysenkoism" on Russian genetics. Later, Graham together with the Russian science theorist I.Dezhina, analyzed the formative stages of the Russian scientific system during the 1990-2000 transitory period (Graham, 2008). Still there are few studies that show the historical, cultural and institutional trends of development that are still impacting the shaping of the Russian scientific and innovation policy.

This paper attempts to answer the following questions:

- What are the principal cultural and institutional trends in the development of modern science as a key element of national innovation systems?
- What historical, cultural and institutional factors play a major role in shaping the specific character of the Russian national innovation system?
- What main principles of Russia's strategic development could provide competitiveness of the national innovation system?

The results of the research will contribute to the understanding of the features of national innovation systems which have been formed under the influence of historical, cultural and institutional trends of the development of nations and states. The proposed conclusions could be integrated into the national strategy of shaping and operating Russia's innovation system.

The structure of the paper is as follows:

Section 1 – Introduction and rationale of the research.

Section 2 – Theoretical framework of the research based on the concept of the national innovation system.

Section 3 – Methodology of the research.

Section 4 – Overviews the modern development trends in science and innovation.

Section 5 – Historical process of the formation of cultural and institutional differences between research and innovation policies in Western Europe and Russia that includes a comparative analysis of the major goal sets in the development of science and innovation in pre-revolutionary Russia and the USSR.

Section 6 – Specific strategy for innovation development in Russia today and possible approaches for increasing the efficiency of Russia's innovation system.

2. Theoretical framework of research. National innovation system and cultural aspects of scientific and innovative performance

In this paper science is seen as a system of activities used to reveal new true knowledge. This is how scientific realism, which we will draw on (Hacking, 1983), treats the goal setting of science.

Since the end of the 19th century, science has been closely associated with the development of technology (Habermas, 2003). Further development of applied and basic scientific research is inconceivable without creating appropriate technical means for their implementation. In addition, science has become increasingly dependent on staffing and financial support of its activities on the part of the organizations concerned (public and private companies, educational institutions, employers, etc.). This interaction is initially established within the boundaries of particular nation-states. The concept of national innovation systems (NIS) has been proposed to consider the interaction of various institutions that have a significant impact on the development of science, engineering and technology (Freeman, 1987; Lundvall, 1992; Lundvall, 1998; Lundvall, 1999; Lundvall, 2003; Lundvall, 2007; Nelson, 1988). Within the NIS concept the national innovation system is treated as a system consisting of elements and relationships which interact in production, dissemination and application of new and economically useful knowledge (Lundvall, 1992). The theory helps organize and specify the analysis and provide the basis for rational action (Lundvall, 1992). The concept of national innovation systems investigates the relationships between