The impact of national competitiveness on innovation activity in the economy: the Russian Federation

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Abstract. The paper investigates the relationship between the level of development of competitiveness of the Russian economy and its innovation activity in 2011-2020. This paper uses economic and mathematical modelling techniques to verify the hypothesis about the existence of a direct (statistically relevant) correlation between the level of national competitiveness and the four indicators characterising innovation activity in Russia. The study shows a clear direct (statistically relevant) correlation between the level of competitiveness of the Russian economy and the share of organisations providing technological innovation, innovative goods, works and services, by constituent entities of the Russian Federation.

Keywords: national competitiveness, innovation activity, WEF, correlation analysis, Russian economy.

JEL codes: C12; C10; O17

Introduction

The theory of national competitiveness finally developed in the late 1990s. Its major was Porter's concept. According this concept, factor productivity determines the level of national competitiveness. Morover, the ultimate goal of increasing national competitiveness is improvement of the population quality of life (Porter, 1998).

National competitiveness can generally be defined as a country's ability, on the one hand, to produce goods and services meeting the international market requirements and, on the other hand, to increase the welfare of its population through growing of real income.

This approach to defining of national competitiveness and its determinants is one of the key factors in the shift from pure theory to real political and economic decision-making or policymaking, which are the very concept of national competitiveness. For example, the EU's Lisbon Strategy is based on the recognition of the need to improve competitiveness, and achieving a high position in the World Economic Forum's global competitiveness rankings is becoming part of the socio-economic development strategies of entire countries (e.g. Kazakhstan) (Shkiotov, 2018).

Now, almost a quarter of a century later, the topic of national competitiveness still attracts the attention of economists. On the one hand, it is the result of strong criticism of M. Porter's concept (Cho, 1998), which is still debated in academia, and, on the other hand, it is the result of the fundamental transformation of global and local economies, influenced by digitalisation.

A review of recent publications in the field of national competitiveness shows the shift of the interest of researchers to applied work on the technological component of national competitiveness. Thus, Ollo-López & Aramendía-Muneta (2012) note the direct impact of ICT on a country's competitiveness and level of innovation; a study by Androniceanu et al. (2020) use correlation analysis to link competitiveness, innovation and quality of life in EU countries; a study of a large hotel chain in India (Danurdara, Darmawan & Kalsum, 2021) also confirms the link between digital innovation and business competitiveness; the same link, but at the level of national economies, is verified by Fonseca & Lima (2015) and Khyareh & Rostami (2022).

The purpose of this study is to verify the correlation between the level of national competitiveness and innovation activity in the economy, on example of the Russian Federation.

The choice of the research objective is not incidental. According to the rankings of The Global Competitiveness Report (WEF), recently the Russian economy achieved significant progress of national competitiveness level (see Table 1). There is an issue about the dependence of the improvement in Russia's competitive position in this ranking on the level of innovation activity in the economy.

Methods

We based our study on the methodology described in detail in the work of Shkiotov S., Markin M. (Shkiotov, Markin et al., 2020).

The main hypothesis of the study considers a direct (statistically relevant) link between the level of national competitiveness and innovation activity in the Russian economy.

The additional hypothesis of the study considers a direct (statistically relevant) link between innovation performance and innovation activity in the Russian economy. It allows us to understand the dependence of assessment of the level of innovative development of the economy in Russia and international practice.

Indices characterizing innovation activity in Russia:

- Level of innovation activity of organisations by Russian entities, 2011-2020 (INN_ORG)

- Share of organizations providing technological innovation in the total number of organisations surveyed, by constituent entities of the Russian Federation, 2011-20 (VES_INN);

- Share of innovative goods, works and services in the total volume of shipped goods, works and services, by constituent entities of the Russian Federation, 2011-20 (TOV_INN);

- Volume of innovative goods, works, services, by constituent entities of the Russian Federation, 2011-20 (Q_TOV_INN).

Indices characterizing the level of national competitiveness:

- The Global Competitiveness Index (GCI), 2011-2020.

Indices characterising the level of innovative capacity of the economy:

- Global Innovation Index (GII), 2011-2020.

All data provided by Federal State Statistics Service, The Global Information Technology Report 2011-2019 (Network Readiness Index 2020-2021); The Global Competitiveness Report 2011-2019.

Sampling countries: the Russian Federation.

Research method is correlation analysis. During this study, a significance level of 5% was assigned to test the validity of the correlation coefficient.

Table 1 provides the background of the analysis.

Table 1 – Data for correlation analysis for the Russian economy, 2011-2020

Years	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Global Competitiveness Index (GCI), scores	4.2	4.2	4.2	4.2	4.4	4.4	4.5	4.6	6.3	N/A
Global Innovation Index (GII), scores	35.85	37.9	37.20	39.14	39.32	38.50	38.76	37.90	37.62	35.63

Source: World Economic Forum, 2011-2020

Results

The results of the correlation analysis and their visual interpretation are presented in Table 2 and Figures 1-2.
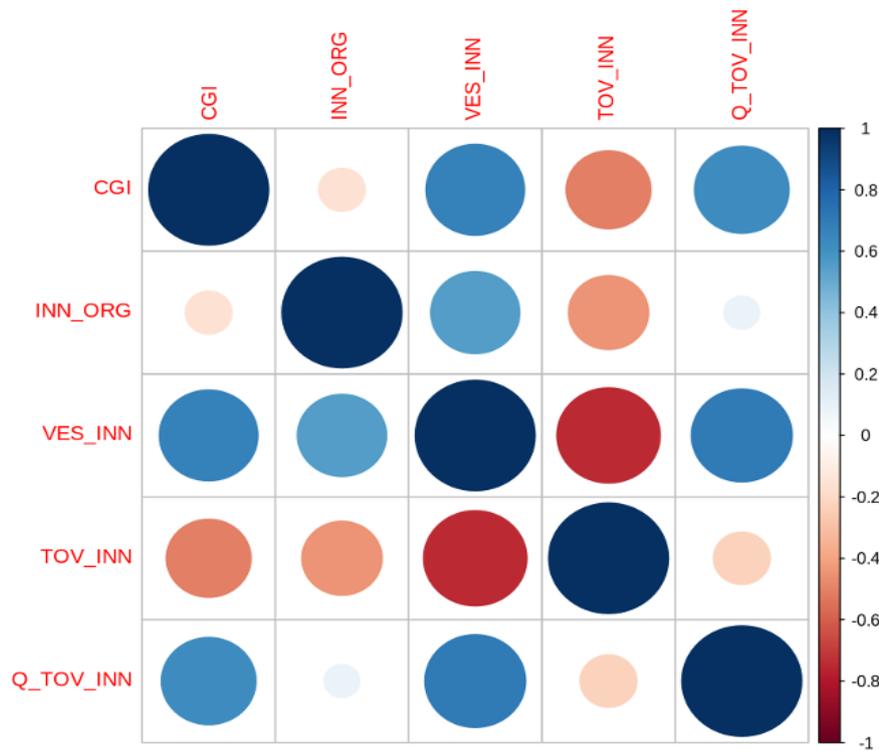
Figure 1. Scatter chart on the Global Competitiveness Index of the Russian economy (GCI) and innovation activity in the economy, 2011-2020

Source: composed by author
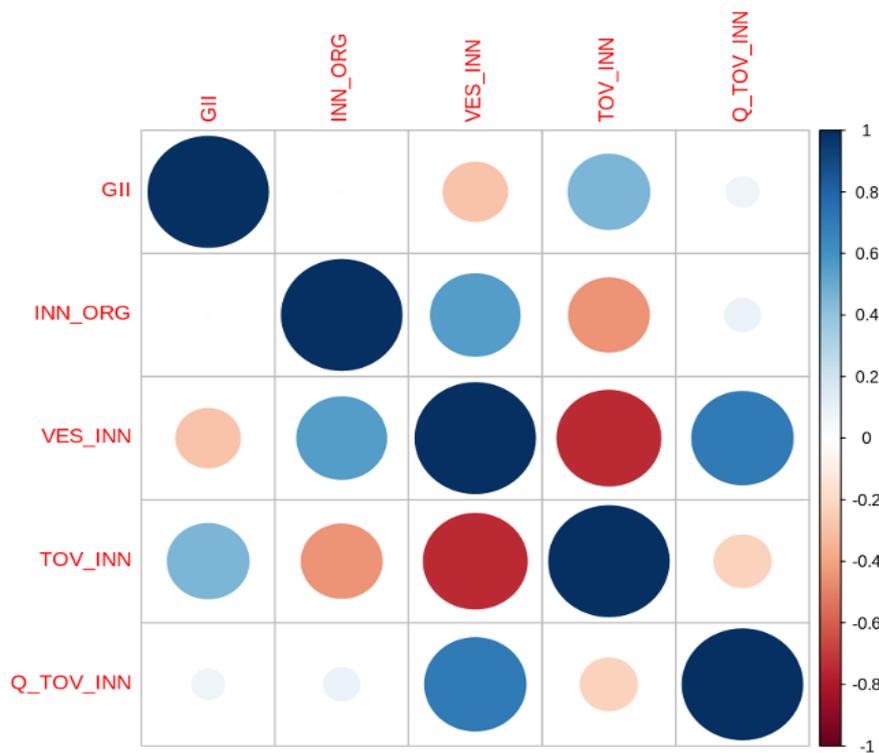
Figure 2. Scatter chart on Global Innovation Index of innovation capacity (GII) and innovation activity in the Russian economy, 2011-2020

Source: composed by author

Table 2 – Results of correlation analysis

	Level of innovation activity of organisations	The share of organisations providing the technological innovation	Share of innovative goods, works and services in the total volume of goods shipped	Volume of innovative goods, works, services, by constituent entities of the Russian Federation, 2011-2020
Global Competitiveness Index (GCI)	None	0.6770629 Strong linear	None	0.6236655 Strong linear
Global Innovation Index (GII)	None	None	None	None

Source: composed by author

Discussion

Generally, the results obtained for the Russian economy confirm the conclusions of López & Aramendía-Muneta (2012); Androniceanu et al. (2020); Fonseca & Lima (2015); Khyareh & Rostami (2022) about the existence of a direct (statistically relevant) correlation between the level of economic competitiveness and innovation activity.

The supplementary hypothesis proposed in the study was not supported by the data provided.

Conclusions

Table 2 shows a clear direct (statistically relevant) correlation between the level of competitiveness of the Russian economy and the share of organisations providing technological innovation, innovative goods, works and services, by constituent entities of the Russian Federation.

The controversial results of the study can be explained by the limitations of the model used (insufficient sampling for correlation analysis; changing methodology for data collection and assessment of complex indicators such as GCI, GII; uncertainty in the conceptual framework (differences in understanding of innovation and national competitiveness phenomena).

Therefore, the hypotheses and results derived will draw attention to applied research on competitiveness of economics of Russia.

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