

# Technological Breakthrough and the Role of the State

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## Abstract:

Creating and ensuring sustainable development is impossible without active innovation in all areas of social production. Today, our country has achieved high and even record-breaking indicators in certain industries. All this happens, including through innovation. Technological competition is a key factor in the global competition between the States. However, technological pessimism remains the prevailing sentiment among groups of domestic experts. It is aggravated by the sanctions policy of Western countries and the risks of further isolation. Thus, further breakthrough development of the Russian economy is possible only with comprehensive support from the state and a systematic orientation towards the creation of an innovative economy.

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## I. INTRODUCTION

The "raw-material nation" is a key stereotype about Russia that has developed at the international level. At the same time, there are examples of successful investment projects in the country, the government attempts to stimulate large-scale businesses on innovative developments, and several development institutions. However, it seems that the process is not entirely clear: which way to move and what resources for innovative development do we really possess.

Meanwhile, today the economic links between the manufacturer and the buyer are becoming extremely short. One can enter the world market directly through globalized platforms. All transactions are digitized and transformed into cryptocurrency. The confrontation between the US dollar and the Chinese yuan has reached its peak. In such an infrastructure, only the most competitive industries and products remain in the market. The integration into global economic chains attests to the recognition and evaluation of goods in

terms of quality and value. In this context, state practices of manipulating the national economies through the prohibition schemes are leveled, as the mechanisms of commodity-money relations become virtual and transnational.

## II. METHODS

The works of domestic and foreign scientists on the problems of state regulation of the economy; assessing the degree of government intervention; the establishment and development of an innovative economy and the role of the state in this process; the laws of the Russian Federation, the decrees of the President and resolutions of the Government of the Russian Federation, regulatory legal acts of constituent entities of the Russian Federation served as a theoretical and methodological basis for the study. The source materials include the reports of the Ministry of Economic Development of the Russian Federation, the reports of various funds to support innovative entrepreneurship, the data from the Federal State Statistics Service of the Russian Federation, and the author's developments.

The methodological basis was a systematic approach that allowed ensuring the complexity and focus of the research. The researchers also used analytical, abstract-logical, economic-statistical, monographic and experimental research methods.

## III. RESULTS

Russia has one of the largest innovative economies in the world, as evidenced by the following data: 109 million Internet users (ranks 8th in the world), one of the three largest Alibaba markets, 99% of the population using the Internet (in the age group of 19 to 29 years), monthly mobile Internet traffic in Russia for the price of 1 coffee cup at Starbucks. At the same time, there is still enormous potential for further growth: 1st place in the share of residents with higher education, the average salary of a software engineer in the Russian Federation is 5 times lower than in the USA, Russian programmers won 50% of the Google Code Jam competitions since 2003.

The authors conducted a SWOT analysis of the innovation environment in Russia, the results of which are presented in table 1.

**Table 1.** SWOT analysis of the innovation environment in Russia

<u><b>Strengths</b></u>	<u><b>Opportunities</b></u>
<ul style="list-style-type: none"> <li>• The presence of an innovative environment; scientific and technological heritage.</li> <li>• National brands, developed intelligent technologies and markets.</li> <li>• The presence of innovation-oriented companies with the development of budgeting and marketing.</li> <li>• Preservation of the loyal foreign partners, affordable sales markets.</li> <li>• Infrastructure for interaction with the national business (business associations, development institutions).</li> <li>• "Sanction-based" incentive to optimize a</li> </ul>	<ul style="list-style-type: none"> <li>• Reliance on the international division of labor; integration of its know-how into technological chains in the conditions of changing markets.</li> <li>• Building a national innovation system (NIS) based on network communications with centralization elements.</li> <li>• Maximum coverage of the domestic innovation market in terms of supply and demand.</li> <li>• Mastering venture mechanisms, legal and tax incentives.</li> <li>• Using funds of the Russian Pension Fund for the capitalization of venture capital funds (1-</li> </ul>

country's development strategy. • Support for the innovative development at the level of political rhetoric (to compensate for losses from the sanctions regime).	2%).
<p><b><u>Weaknesses</u></b></p> <ul style="list-style-type: none"> <li>• Weak macroeconomic institutions under the time constraints for strategic reversal.</li> <li>• Restrictions on the choice of external partners, technological chains and markets, including for cooperation with the Russian defense industry.</li> <li>• Lack of managerial and financial resources from the state and business, lack of international legal levers.</li> <li>• No economic justification for digitalization, a qualitative transition to another level with digitalization, which results in the growing share of companies' transaction costs (from 50% to 75%).</li> <li>• Poorly integrated innovations in the domestic market, which are mainly export-oriented, to the countries with developed investment schemes.</li> <li>• Weak technological expertise.</li> <li>• Generational gaps (pre-retirement age of the scientific personnel).</li> <li>• Innovative growth is not supported by a cultural environment that does not provide universally valid patterns and landmarks.</li> </ul>	<p><b><u>Threats</u></b></p> <ul style="list-style-type: none"> <li>• Negative scenario: crisis development, financial and credit hunger, a combination of internal and external pressure on the business, the drain of capital and brains, as well as venture projects.</li> <li>• Isolation, sectoral sanctions, the difficulty of international contacts, the seizure of foreign assets abroad, claims on foreign debt, exclusion from the markets of Asia, Africa, South America.</li> <li>• Purchase of Russian innovation projects by other countries, which will lead to the omission of national financial flows.</li> <li>• The development of the innovation sphere requires a certain restructuring of the economic system, which may lead to a loss of state stability.</li> </ul>

Today, the Russian innovation market is showing historically strong growth. At the same time, the digital economy will play one of the key roles in the future growth of the country's economy – thus, the potential effect on GDP from the economy digitalization by 2025 will amount to 4.1-8.9 trillion

rubles, representing 19-34% of the total forecasted GDP growth [4].

Despite the fact that the Russian Federation is not among the leading countries in terms of the share of digital economy in the national GDP, the Russian Federation occupies a leading position by the number

of Internet users (1st place in Europe, 6th in the world) and the availability of cellular services and broadband access (2nd and 10th respectively), with the potential for a slight increase in Internet penetration (Russia – 76%, in the EU – 84%) and mobile Internet penetration (Russia – 46%, EU – 63%).

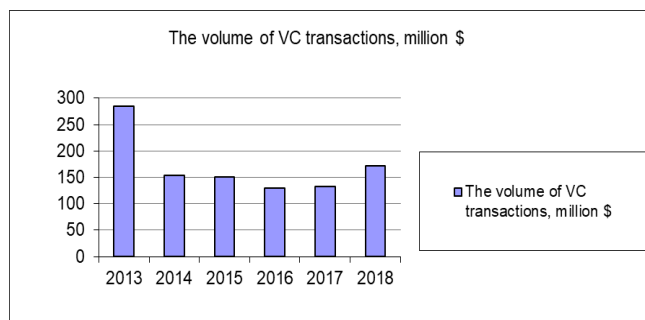
At the same time, other indicators of the economy's digitalization show greater growth potential compared to the level of Internet penetration. For example, access to digital services in Russia and the European Union on a number of indicators: the share of electronic commerce in the total retail volume (Russia – 4%, EU – 7%), the share of organizations using CRM systems (Russia – 13%, EU – 26%), the percentage of citizens who made purchases online (Russia – 29%, EU – 57%), the percentage of citizens who received public services using Internet services (Russia – 29%, EU – 48%), penetration of mobile Internet (Russia – 46%, EU – 63%), penetration of smartphones (Russia – 60%, EU – 62%), Internet penetration (Russia – 76%, EU – 84%). Thus, the Russian Federation has the necessary prerequisites for the active growth of an innovative economy [3; 5].

State support programs for the development of the innovation sector are actively implemented in the Russian Federation. For example, the large-scale program "Digital Economy" will be implemented in 2018-2024, which will provide financing for the areas of information infrastructure, information security, big data, neuro-technologies, quantum technologies, wireless communication technologies, robotics, sensors, etc. The total funding will amount to 522 billion rubles (\$ 7.8 billion).

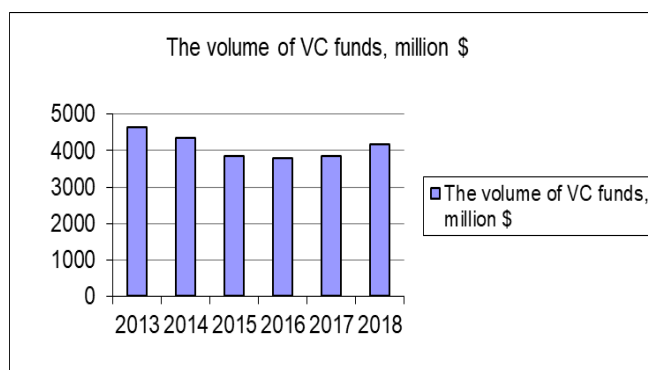
In addition to direct government funding of the innovation sector, the state is actively working on the development of the digital ecosystem. For instance, the country is implementing the largest digital projects, including the creation of a federal procurement unit, a unified digital environment for medical institutions in Moscow (EMIAS), and the launch of urban portals (for

example, the Moscow portals "Our City" and "Active Citizen").

In 2018, for the first time in 5 years, the Russian venture capital market showed a 30% increase compared to 2017 with a total volume of \$ 172 million.



**Figure 1.** The volume of VC transactions, million \$



**Figure 2.** The volume of VC funds, million \$

In 2018, the Russian venture capital market showed positive dynamics: its volume almost doubled and amounted to \$ 440.5 million (compared to \$ 243.7 million in the previous). Significant growth (by 81%) is due to the continuing improvement in the macroeconomic situation in Russia.

The dynamics of recent years indicate a resurgent interest in venture capital investments. At the end of 2018, the number of venture capital funds amounted to 260 (compared to 194 in 2017 and 177 in 2016 respectively). The number of transactions has been growing for the fourth consecutive year: in 2018, the total number of transactions was 214, in 2017 – 205, in 2016 – 184, in 2015 – 180.

The average transaction size continues to grow: in 2018, it almost doubled and amounted to \$ 2.7 million (against \$ 1.5 million and \$ 1.1 million in 2017 and 2016). The leader is the segment of transactions at the expansion stage, where the average size of investments has grown 2.2 times – from 2.8 to 6.1 million US dollars. The average size of seed-transactions has increased significantly (1.6 times – from 0.5 to 0.8 million US dollars) along with transactions at early stages (1.4 times – from 0.8 to 1.1 million US dollars). The average size of investments at the startup stage remained unchanged (\$ 0.8 million in both 2017 and 2018) [4].

Special Investment Contract (SPIC) is an agreement between an industrial investor and the state, which establishes guarantees of tax and regulatory conditions stability, measures of state support for the project, investor obligations to create (or modernize) and master the production of industrial products.

Currently, more than two dozen SPICs have been concluded for investment projects in the field of Pharmacy and medicine; Machine tool industry; Automotive industry Mechanical engineering; Chemical complex; Aviation industry; Agricultural and special engineering; Metallurgy.

SPIC provides the following measures for support investors:

- Guaranteed stabilization of the regulatory conditions and tax burden for investors;
- Possibility of zeroing the regional income tax rate to be credited to the budgets of constituent entities of the Russian Federation, as well as zeroing the federal component of the income tax rate;
- Accelerated depreciation in respect of products manufactured as part of the implementation of SPIC.

The minimum investment in SPIC is 750 million rubles. The validity of SPIC does not exceed 10 years.

The Industrial Development Fund acts as the operator

for concluding SPICs, regulated by the Federal Law "On Industrial Policy in the Russian Federation". The territory of advanced social and economic development (TOR) is part of the Russian Federation territory with a special legal regime for entrepreneurial and other activities established to create favorable conditions, including for attracting investments.

The Russian tax legislation also has some features in terms of stimulating long-term investments:

1. If the investor-Russian company fulfills the conditions of the "Provisions for strategic participation" in the capital of the company paying dividends (continuous ownership of at least 50% of the shares (interests) for at least 365 calendar days), the corresponding dividend payments are taxed at a rate of 0% ;
2. The investor's profit from the sale of shares (interests) of the Russian companies is also taxed at a rate of 0%, provided that on the date of shares (interests) sale they have continuously belonged to the investor for more than 5 years. Moreover, if the companies' shares belong to the high-tech (innovative) sector of the economy, the required period of continuous ownership is reduced to 1 year [6-9].

In addition, the Tax Code provides for tax features of joint investment activities implemented in the form of an investment partnership agreement.

In accordance with Russian law, an investment partnership is not recognized as a legal entity, which excludes the possibility of double taxation of the participants' profits. The investment partnership income and costs accounting is carried out by the managing partner, who determines the actual profit (loss) from the activity based on the results of each reporting (tax) period.

Profit (loss) is distributed among the partners in proportion to the share of the investment partnership established by the contract. After that, each participant independently pays corporate income tax, as well as



corporate property tax. The income in the form of dividends on securities and the share in the authorized capital of organizations is not taken into account when determining the profit of an investment partnership [10-13].

The related incomes are included in income from the equity participation of participants in an investment partnership. The remuneration of the managing partner for conducting general affairs is not subject to the value-added tax.

To date, the investment community has agreed on an approach to clarify the taxation of investment partnerships operating in the field of direct and venture investments.

The amendments presuppose special tax regulation if the activities of the investment partnership are aimed at earning profit from long-term investments (in the current version of the draft law, at least 80 percent of transactions should be transactions with securities not traded on the organized securities market), as well as a ban on making real estate contribution.

In this case, the participants will have an opportunity to reduce the profit from operations within an investment partnership by the amount of contribution to the common cause [14-25]. The relevant bill is currently under review for agreement by government authorities.

#### IV. DISCUSSION

Robotization, digitalization, big data, artificial intelligence are examples of technologies that are rapidly changing the modern world [26-32]. The need to make a technological breakthrough and achieve Russia's global leadership in technology markets requires stimulating not only the supply of technological innovations but also the demand for them. To develop and support promising markets and technologies in Russia, the authorities launched the National Technology Initiative (NTI) and Digital Economy (CE) programs. At the same time, people's

unpreparedness (due to mistrust, fear, etc.) to use new technologies can block the development of the corresponding domestic markets.

The National Technological Initiative (NTI) is a long-term program of private-state partnership to promote the development of promising markets based on high-tech solutions that will determine the development of the global and Russian economies in the next 15-20 years. The implementation of these programs started in 2016 (<http://www.nti2035.ru/>).

Digital economy (DE) is a national program aimed at implementing a comprehensive digital transformation of the economy and social sphere of Russia by 2024. Its implementation started in 2018 (<https://dataeconomy.ru/>).

The regulators do not see the difference between traditional investment models and venture models in relation to innovation. Therefore, the "right to mistake" (which is part of the search process) is excluded. It was not possible to create venture funds at state-owned companies. Moreover, there is no powerful technological expertise [33-42].

First development institutions appeared in Russia in the mid-2000s, the period of "catching up with modernization": Skolkovo, Rusnano, RVC, VEB-innovations, and others.

However, state-owned investment companies and development funds, as the main customers, are generally guided by their own counterparties. The existing tender system is restricted to a limited number of participants. Thus, entry into the pool of counterparties is limited [43-50].

Innovative businesses and startups hardly integrate into the internal chains of "large players". Therefore, there is no significant breakthrough due to the resources of state-owned companies. Experts note only minor progress in this direction. However, according to authors, it is worth considering certain successful examples of the Russian innovative

companies.

Yandex is a Russian Internet giant in the field of search services, which is also developing its own ecosystem of various services (Yandex.Market, Yandex.Taxi, Yandex.Zen, etc.). The company was founded in 2000, in 2011 an IPO was conducted on NASDAQ with a total valuation of the company at more than \$ 8 billion. By the end of 2017, it was the largest search service in Russia and 4th in the world [2].

Mail.ru is a Russian provider of multimedia services, one of the largest players in the Russian Internet market. The company was founded in 2005, in 2010 an IPO was held on the London Stock Exchange with a total valuation of the company at \$ 5.7 billion. By the end of 2017, it was the largest Internet company in the field of social networks (vk, Odnoklassniki) and games.

Tinkoff Bank is a Russian online financial service provider with no retail outlets. The bank was founded in 2006, in 2013 an IPO was held on the London Stock Exchange with a total valuation of the bank at \$ 3.2 billion. By the end of 2017, the bank was the world's largest independent online bank [2].

Kaspersky Lab is the largest Russian developer of cyber threat protection systems. The company was founded in 1997; by the end of 2017 it was one of the largest manufacturers of software solutions for protecting end devices in the world, it has offices in 30 countries of the world [2].

Transas is a Russian manufacturer of marine simulators and electronic navigation systems. The company was founded in 1990, in 2018 it was sold to the Finnish public company Wartsila for 220 million euros. At the end of 2017, Transas occupies 45% of the global market for marine simulators and 35% of the global market for electronic navigation systems.

At the same time, companies representing new areas of the innovation sector are also actively developing in Russia:

Double Data – helps Russian business (banks, insurance, retailers, FMCG) to effectively use open data from social networks and other sources to prevent cybercrime, evaluate borrowers and increase the effectiveness of marketing strategies. Top 3 credit bureaus of the Russian Federation, 2 of 3 top consulting companies and leading world advertising agencies work with Double Data. Today 25 of the top 30 Russian banks (Alfa-Bank, Tinkov, Rosbank) are Double Data customers.

Vocord is a leading developer of biometric identification systems and intelligent video surveillance technologies. VOCORD systems have been implemented in more than 2000 projects of commercial and state organizations and in more than 70 projects of the Safe City class in Russia and abroad, including in Dixy and Magnit retailers, the sports complex MSC Arena Omsk, in the project for ensuring security in the cities of Sochi, Kazan, Rostov-on-Don and other cities of Russia and the CIS countries.

The company "Digital" ("Tsifra") is developing solutions in the field of industrial Internet of things, predictive analytics and artificial intelligence. Today more than 120 enterprises in Russia use the solutions of the "Digital" company including both private companies and enterprises with state participation (including MIC).

Signum (Winnun) is a software platform for the industrial Internet of things (Industry 4.0). The solution is aimed at optimizing the operation of industrial equipment and its maintenance, due to which companies using Winnun increase production productivity and output (up to 40%), as well as reduce operating costs (up to 50%).

Eligovision – project development and commercialization of the framework and visual augmented reality application environment EV Toolbox. The list of company's customers includes Norilsk Nickel, Disney, Hyundai, Johnson & Johnson, Autodesk, Mail.ru, etc.

Viserra develops solutions in the field of developing interactive systems of the visual communications software products for architects, which allows you converting drawings to interactive 3D. The company has completed more than 200 projects since 2008. Customers include Digital October, National Geographic, Gazprom, Siemens, Autodesk, etc.

Eidos develops medical simulators for teaching doctors how to perform laparoscopic and endoscopic operations, as well as for rehearsing operations in complex cases. Systems are successfully sold on the Russian and foreign markets, the company is one of the five world leaders in the market of medical simulators.

Group-IB – the company is developing a set of software and hardware solutions that can provide protection against cyber threats as well as detect attacks at an early stage. The company's experts participate in more than 80% of investigations of especially high-profile high-tech crimes and interact with the Ministry of Internal Affairs of Russia, the FSB of Russia, the Investigative Committee of Russia and the Ministry of Foreign Affairs of Russia (examples of investigations are organized criminal groups Cron, Carberp, Hameleon, Hodprot, Hermes, etc.). In 2017, the company was declared the leader of the Russian cyber threat research market according to IDC.

Infovotch company has developed an integrated platform for monitoring corporate information and its employees with the following functionalities: 1) Complex multi-level analysis and control of information in centralized and distributed data warehouses, 2) Management of information exchange via Internet channels, 3) Protection from external influences, aimed at gaining access to information; 4) The possibility of applying uniform information security policies inside and outside the organization. The main direction of development is the accuracy of information classification; inclusion in the controlled

perimeter of external data exchange flows – intercepting data from corporate mobile devices, scanning publications on social networks; as well as automatic calculation of damage for each incident of information leakage, its theft, collusion detection, commercial bribery and others. The company's customers include SvyazBank, Transneft, Raiffeisen Bank, Gazprom, e-on, Beeline, etc.

And this is only a part of new innovative companies whose role in the country's economy is growing at a faster pace [51-55].

## V. CONCLUSION

Thus, the Russian Federation has the necessary prerequisites and potential for the active growth of an innovative economy. Last year (2018) was a turning point due to the beginning of the intensified search for maximum strategies on the part of the business and new opportunities for entering global markets in connection with the digitalization and virtualization of the economy. The main challenge is to overcome the "viscosity of the environment" revealed by innovators who tried working through Skolkovo, Rusnano, RVC, VEB Innovations and other large companies with a large share of state participation. Apparently, they work for their counterparties, and the entry into the pool of counterparties is limited. The authors consider this fact a major reason for the lack of noticeable technical breakthroughs since the creation of Skolkovo.

At the same time, Russia is ready to offer the world breakthrough technological developments in such areas as the military-industrial complex and nuclear energy, the IT industry, additive technologies and new materials, agriculture and food industry, geological exploration, construction, and education. A breakthrough at the global level is possible provided that innovative companies, even small and medium-sized businesses, independently integrate into the global economic chains (on example, via a franchise) of popular brands, including foreign brands.



However, the authors believe that in this case, the state should not become an outside observer-regulator. The experience of the leading countries of invasive development is clearly demonstrated by the fact that at the stage of formation and subsequent development of the innovation market, state regulation and participation has a decisive role since it alone allows withstanding external threats and most safely undergoing a change in technological structures.

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