Demography of Russian IT companies: regional features

Digital technologies are a key driver of economic growth, innovation and productivity, and they are transforming many sectors of the economy and social sphere. Most of the world's leading countries identify the development of the information technology sector as a priority for national and regional development. The COVID-19 crisis has demonstrated the unconditional need to accelerate the development of digital technologies in the modern world. During the pandemic, the information technology sector became one of the main drivers of the economy. Technological solutions ensured the infrastructure and continuity of production and life processes in a remote mode.

Our work is aimed at studying the development of Russian companies in the information technology sector from the standpoint of business demography and assessing regional determinants that affect their creation and liquidation.

The sample included IT companies registered in 83 constituent entities of the Russian Federation, the Republic of Crimea and the city of Sevastopol were excluded from the calculations, since data on these entities are available only since 2014. The analyzed period is from 2010 to 2020. The data of official state statistics, the Central Bank of the Russian Federation and the performance indicators of IT companies presented in the SPARK database were used.

To assess the impact of regional characteristics on the demography of companies in the information technology industry, panel data was used as the main analysis tool - a generalized method of moments using instrumental variables (Arellano-Bond method). Models were considered where the number of IT companies created in year t in region i and the number of IT companies that ceased operations in year t in region i were used as dependent variables. Among the explanatory variables, the following groups of factors were identified:

- Availability and quality of resources:
  1. The proportion of students enrolled in educational programs of higher education - bachelor's, specialist's, master's programs, in the total population, %.
  2. The share of the employed population aged 25-64 with higher education in the total employed population of the corresponding age group, %.
  3. The share of loans granted to small and medium-sized businesses in the total volume of loans to legal entities, %.
4. The share of overdue debts of small and medium-sized businesses in the total amount of overdue debts, %.

- Demand potential:
  1. The share of high-tech industry in gross value added, %.
  2. The share of costs for technological innovation in the total volume of goods shipped, work performed, services, %.
  3. The share of costs for information and communication technologies (ICT) in the gross regional product, %.

- Institutional environment:
  1. The size of the investment potential (rating agency "Expert").
  2. The size of the investment risk of the region (rating agency "Expert").
  3. The number of economic crimes, units.

- Proximity to similar firms:
  1. The number of operating IT companies in the region, units.
  2. The number of created IT companies in the previous period, units.

In addition to the above factors, the following were also used as explanatory variables:

- Emissions of pollutants into the air from stationary sources, thousand tons.
- Dummy variable for 2020, as an indicator of the IT business's reaction to the crisis in the economy.

As a result of the study, based on the use of microeconomic data from the SPARK database, the following conclusions can be drawn. In Russia, a steady tendency has emerged to move the activity of companies operating in the field of information technology in the direction from east to west, which leads to an increase in the concentration of IT companies in a small group of regions dominated by capital centers: the cities of Moscow and St. Petersburg. This situation limits the possibilities of using the potential of information technology as a driver of regional development in about half of the Russian regions.

Regional determinants have a significant impact on the business demographics of IT companies. The creation of new IT companies is taking place more actively in regions with a more developed information technology market, a high proportion of students and innovatively active enterprises. The disappearance of IT companies significantly depends on the development of the financial infrastructure that provides access to financing and forms the cost of financial resources, and the level of development of the institutional environment, while the determinants of development in the regions of the European and Asian parts of Russia differ. It should be noted that a less developed financial infrastructure leads to the closure of IT companies in Siberia and in the eastern part of our
country faster than in the European part and in the Urals, as evidenced by the lag values with which the variables characterizing access to finance were included in model.

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