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James Okrah
Ural Federal University, Ekaterinburg, Russian Federation

EVALUATION OF THE IMPACT OF FIRM LEVEL COMPETITION ON RUSSIAN INNOVATION[1]

Abstract. Innovation is an essential component of a company's survival in this competitive world of business. Firms in free and competitive marketplaces are compelled to adopt more efficient production techniques and provide customers with new and improved products. This research examines the impact of competition on innovation in free and competitive marketplaces. The study is motivated by the Russian government's goal of increasing productivity of small and medium-sixed enterprises (SMEs) to 32% of gross domestic product. The study employed the Logit model to analyse the data from the World Bank Enterprise Survey. The findings reveal that fierce competition has a significant negative effect on innovation. Specifically, competition reduces product, process, and new product innovation by 5%, 3%, and 3.5% respectively. The step-by-step innovation model indicates that competition stimulates innovation in firms operating in contestable markets. Additionally, higher levels of competition negatively affect new product innovation. These results suggest that intense competition may impede firms' ability to innovate, particularly in the areas of product development, process improvement, and introducing new products. However, competition acts as a driving force that compels firms to innovate in order to maintain their competitiveness in the market. Consequently, increased competition may lead to a diversion of resources towards research and development (R&D), potentially limiting firms' capacity to introduce new products.

Keywords: SMEs, Russia, innovation, competition, foreign license Technology (IP), logit model, institutions

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ИССЛЕДОВАТЕЛЬСКАЯ СТАТЬЯ

Д. Окрах
Уральский федеральный университет им. первого Президента России Б. Н. Ельцина,
г. Екатеринбург, Российская Федерация

Оценка влияния конкуренции фирм на инновации в России

Аннотация. Инновации — важный фактор выживания компании в конкурентном мире бизнеса. Фирмы, действующие как на свободных, так и на конкурентных рынках, вынуждены внедрять более эффективные методы производства, чтобы предоставить потребителям новые улучшенные продукты. В данной статье рассматривается влияние конкуренции на инновации на свободных и конкурентных рынках, исходя из цели российского правительства увеличить производительность малых и средних предприятий до 32% ВВП. Для анализа данных исследования предприятий Всемирного банка была применена логит-модель. Полученные выводы свидетельствуют о существенном негативном влиянии жесткой конкуренции на инновации. В частности, конкуренция отрицательно влияет на такие показатели, как инновации в продуктах, процессах и новых продуктах, приводя к их снижению на 5%, 3% и 3,5% соответственно. Модель пошаговых инноваций показывает, что конкуренция стимулирует инновации в фирмах на состязательных рынках. Кроме того, более высокий уровень конкуренции негативно влияет на создание новых инновационных продуктов. Согласно результатам анализа, острая конкуренция может снижать способность фирм к инновациям, особенно в области разработки продуктов, улучшения процессов и внедрения новых продуктов. Однако выступая в качестве движущей силы, конкуренция заставляет компании вводить новшества, чтобы поддерживать свою конкурентоспособность на рынке. Следовательно, усиление конкуренции может привести к отвлечению ресурсов организаций на исследования и разработки (НИОКР), потенциально ограничивая возможность внедрения новых продуктов.

Ключевые слова: МСП, Россия, инновации, конкуренция, лицензии на технологии, логит-модель, институты

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Introduction

Innovation is the foundation of every healthy economy, and small and medium-sized enterprises (SMEs) play a significant role in overall economic performance, particularly in job creation and innovation. Lindsey and Teles (2017) and Mazzucato (2018) believe that major firms have evolved into rent-seekers rather than innovators. SMEs in Russia account for approximately 22 % of gross domestic product (GDP) and employ less than 30 % of the Russian workforce, whereas EU SMEs produce 58 % of the European Union GDP and employ 67 % of all private sector workers. The relevant national draft project of the Russian government advises increasing the SME share of GDP to 32.5 % by 2024, which is consistent with the goals of the SME Strategy. Russian firms' performance is high, both domestically and internationally (Panibratov & Kalotay, 2009), but their capabilities are moderate, and Russia lags far behind many of its developed North American and Western European competitors. This gap allows entrepreneurs and SMEs to step in with high-level innovative products, resulting in a high innovation rent due to decreased rivalry produced by existing international businesses.

Competition benefits not only the well-being of customers, but also the whole economy of a country. The relationship between innovation and competition is complicated. Recent research has found that strong rivalry reduces the innovation rent, resulting in lower levels of innovation (Hashmi, 2013; Romer, 1990), and the Standard IO theory predicts that competition diminishes the monopoly rents that reward successful innovators, while the step-by-step innovation model of Aghion and colleagues (Aghion et al., 1997; Aghion et al., 2001; Aghion et al., 2009) anticipates that product market competition should stimulate innovation (Porter, 1990; Canare & Francisco 2021). According to Aghion et al. (2018), increased competition leads to a large increase in research and development (R&D) investments. Consumers penalise inefficient businesses while

rewarding more efficient and innovative businesses. The question is, how much competition is sufficient? Is there any impact of foreign licensed technology on innovation?

To achieve the desired results, we examine survey data from the World Bank Enterprise Survey, using a perception-based measure of competition (Tang, 2006; Canare & Francisco, 2021). Most research on innovation-competition is done employing data from Western developed countries with less focus on other Eastern European countries. This creates a gap in understanding the effect of this innovation-competition in Eurasian countries.

Competition in Russia

The concept of innovation has a deep root in competition and societal (human) progress. Competition has different meanings to different economic systems. Each system is therefore characterised by various types of competitions. A national economy dominated by state-owned enterprises differs dramatically from an economy that encourages open competition among many producers (Mierin et al., 2019). The economic system determines the effectiveness of competition in the economy. The nature of competition in Russia is a complex one due to the nature of the institutional set up. This makes certain companies in certain industries like the railway, construction, and utility dominant on the local market and makes it difficult for private enterprises to enter the market. Abramov et al. (2017) identified that the share of state ownership in enterprises accounts for 70 % in the nuclear power industry, airports, diamond mining, and the military-industrial complex in Russia. This is called state capitalism. In this new version of state capitalism, governments own either majority or minority equity positions in companies or provide strategic support to private firms using subsidised credit and/or other protections (Musacchio et al., 2015). This type of state capitalism has its advantages and also possesses a threat to SMEs not connected to the government. It gives a certain advantage to companies with large government shares, not allowing fair competition in the market.

The transition of the Russian economic system in 1991 from a planned economy to a market economy was based on the establishment of three principles: equality of all forms of ownership, entrepreneurial freedom, and competition (Mierin et al., 2019). In light of this, the Russian government instituted the Federal Antimonopoly Service (FAS). FAS is the federal-level executive governmental organ that controls the execution of the antitrust law and related areas. FAS through its activities has stopped companies violating the antimonopoly legislation. As for the recent cases, in January 2021, FAS Russia imposed a 1.7 billion fine on these companies: Metal Rolling Service Center LLC, Enterprise Stroytechcenter LLC, A Group LLC, Uralmetallstroy LLC, Management of Equipment and Supply LLC, Metal Trading Company Kraso LLC. These companies signed anti-competitive agreement in order to maintain prices at auction. FAS also imposed a 2 billion fine on Google for violation of the antimonopoly law.

The government further supports competition through the support of SMEs through various government initiatives. The Bank of Russia has allocated 60 billion roubles to SMEs most affected by the pandemic, on preferential terms. The government aims to ensure fairness on the market and encourage individual entrepreneurs to function in the economy.

Competition and Innovation

Basic economic theory demonstrates that when firms have to compete for market shares, it leads to lower prices, higher quality goods and services, greater variety, and more innovation. Competition has a complex relationship with innovation, like the two sharp edges of a cutlass, it can be good and harmful, as indicated in the literature. According to Aghion et al. (2009), "in unlevelled sectors, competition should have a negative (short-run) "Schumpeterian effect" on laggard firms' innovation incentives: increased competition reduces laggard firms' post-innovation rents and thus their incentive to catch up with the leader." On the other hand, Fellner (1951) discovered that when competition is fierce, the innovation rent is lower. Porter (1990) argued that in a competitive environment, innovation is unavoidable, because the survival of SMEs and even multinational corporations is solely dependent on their ability to reinvent themselves in the face of competition. The findings of Bessonova and Gonchar (2019) show a clear inverted U-shaped link: laggards and leaders are more likely to upgrade process technologies when weak competition increases slightly, but less likely to do so when strong competition increases slightly. The model developed by Aghion et al. (2005) describes how competition can increase the incremental profit from innovating. Correa (2012) found a positive relationship between innovation and competition. The question therefore is how much competition is good? Dasgupta and Stiglitz (1980) pointed out that high industry concentration is not evident from lack of effective competition, and that when the concentration is small, in-

dustry levels of R&D increase with concentration. The step-by-step innovation models of Aghion et al. (2001) predict that product market competition should foster innovation in neck-and-neck sectors where firms operate at the same technological level. Market leaders tend to have an upper hand on competition due to their market shares, access to high level technology, already established status and the ability to hire the right people as compared to laggards. Even though SMEs have less advantage in competition against market leaders, they have the ability to reinvent the wheels by exploring market gaps and taking the necessary risk. Moen et al. (2018) found a significant difference where the companies experiencing both high market demand and limited competition invested significantly more in development of new products than firms in less favourable demand conditions.

Russian Innovation Economy

A lot of ground-breaking innovation has been invented in Russia; the biggest achievement is sending the first man to orbit. Russian researchers also showed remarkable performance in discovering scientific principles and inventing technologies. This feat opened the door for the current technological advancement the world is witnessing. This achievement is attributed to the high human capital in Russia. The question therefore is why is Russia not ahead in the innovation economy? All breakthrough achievements of Russian scientists were state sponsored and could not be turned into an end product for consumers. Turning scientific progress and technology inventions into economic success stories needs entrepreneurship, passion for perfection, and risk-taking investments in a globally competitive environment. When the motivation towards entrepreneurship is not internal, it is difficult for the entrepreneur to fight through the challenges. From 2018 to 2021, Russia was placed between 45th and 47th in the Global Innovation Index. Russia's inability to be part of the top ten can be attributed to its political and economic history. Using the Culture Compass, we compared Russia and two other economies to identify their level of risk avoidance.

Figure shows Russia's attitude towards risk, score for risk avoidance. The dimension Uncertainty Avoidance has to do with the way that a society deals with the fact that the future can never be known. Russian economic history has had a significant impact on management practice. Scoring 95, Russians feel very much threatened by ambiguous situations; this can be attributed to Russians communist past and the number of incidents that occurred in the 1990s that made a lot of people lose a lot of money, thereby losing interest in uncertain ventures. Experienced managers in the 1990s were classically trained in a command economy approach to management and were hesitant to deviate from the Soviet Union methods. As a result, directors who grew up in an environment of low performance pressure, ambiguous job responsibilities, and promotion through connections and privileges were unlikely to pursue risk-taking and initiative (Longenecker & Popovski, 1994). This Risk aversion has gotten

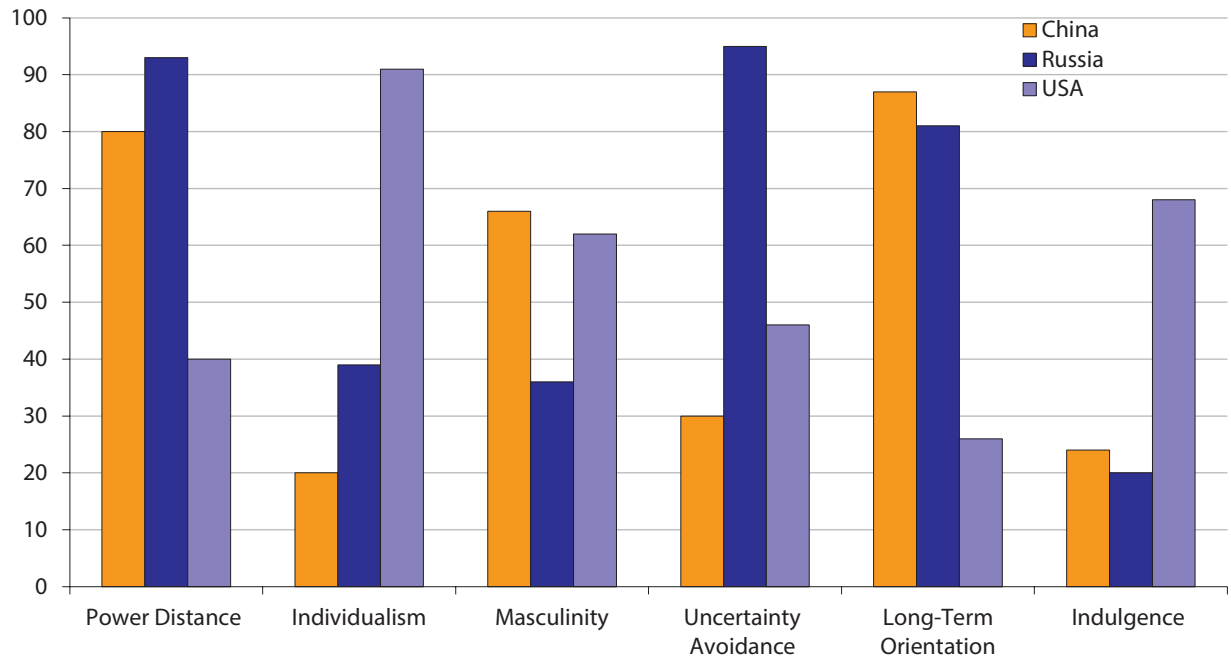

Fig. *Hofstede Cultural Insight (source: Author's Analysis using the Culture Compass)*

in the way of forming the right innovation strategy that makes companies pass up lucrative opportunities in favour of those that are safe. The US scores below average, with a low score of 46 on the Uncertainty Avoidance dimension. There is a fair degree of acceptance for new ideas, innovative products and a willingness to try something new or different, whether it pertains to technology, business practices or food. China has a low score of 30 on Uncertainty Avoidance. Chinese are adaptable and entrepreneurial. Entrepreneurship in China was intentional, Premier Li Keqiang called for "mass entrepreneurship and innovation" and made it the leading agenda of China's national economic strategy. What separates Russian bright minds from that of other innovative countries like South Korea and USA is that their attitude towards entrepreneurship is not self-driven but mostly influenced by the government. Furthermore, many Russian companies prefer to buy technology rather than develop it (Dikova et al., 2016). In modern Russia, many Russian managers continue to use antiquated strategic management tools. This tendency ignores new opportunities for improvement, resulting in low competitiveness and economic growth (Tkacheva et al., 2017).

The Russian government is actively working through the Skolkovo Innovation Centre to support entrepreneurs financially to help realise their proposed projects and ideas. This project was commissioned in 2009 by the then Russian president Dmitry Medvedev. The national innovation system approach stresses on the importance of the flow of information among people, enterprises and institutions for the innovation process (Godin, 2009). The Russian government is collaborating with universities and industries to ensure competition on the Russian market, the innovation literature has shown that innovation largely depends on the three main participants of innovation identified in the work of Henry Itzkowitz and Loet Leidesdorf. The agents of the triple helix of innovation are manifested in the interaction of the university, industry and government. This makes foreign license technologies easily accessible to SMEs and entrepreneurs. Freeman (1987) emphasised the significance of intricate links among various institutional agents in the successful implementation of economic policy.

Data

The Enterprise Surveys (ES) conduct regular firm-level surveys in developing and emerging economies with the main aim of developing reliable and comparable data sets on various aspects of firm behaviour and performance in those countries. The Enterprise Surveys are an ongoing World Bank project in collecting both objective data based on firms' experiences and enterprises' perception of the environment in which they operate. The studies are implemented using firm-level surveys and over the last 10 years have evolved into a mature product that since 2005 uses a standardised methodology of 5 implementations, sampling and quality control in most client-countries of the World Bank. The Enterprise Surveys currently cover over 130,000 firms in 125 countries, of which 107 have been surveyed following the standard methodology.

The data on variables for this research comes from the World Bank Enterprise Survey 2019. The World Bank interviewed a representative sample of the private sector composed of 1,324 business establishments from November 2018 through March 2020 across all cities in Russia. It covers several topics of the business environment as well as performance measures for each firm. Majority of the firms interviewed were small and medium scale companies. 89.8 % of the data is on SMEs in Russia distributed across a broad range of industries in both the manufacturing and service sectors. Russia defines SMEs as businesses employing fewer than 250 people, with annual revenues of under two billion roubles ($31 million), and meeting certain ownership and corporate governance rules. The present analysis is based on the Russian definition of SMEs. We cluster the data into two sets, Medium and Small Enterprises. Small enterprises have less than 50 employees and medium companies have more than 50 and less than 250 employees.

Methodology

Logit model is going to be used in estimating the results of the model. This is because the dependent variable is dichotomous, meaning that it takes the form Y [1, 0]. Using the ordinary least squares (OLS) method does not show the real effect of the model. We need to transform the dichotomous Y into a continuous variable $Y' \in (-\infty, \infty)$, so we need a link function F(Y) that takes a dichotomous Y and gives us a continuous, real-valued Y'. This link is the logit link. With the intention of improving the interpretability of the regression coefficients, we use marginal effects. The marginal effect is a measure of the instantaneous effect of a change in a specific explanatory variable on the estimated probability of the dependent variable while all other covariates are held constant. The dependent variable is represented by the following equation:

$$y = E(y/x) + \varepsilon, \quad (1)$$

where $E(y/x)$ is the conditional mean function, x is the vector of explanatory variables and $''\varepsilon$ is the error term. The conditional mean function is given by:

$$E(y/x) = F(\beta' x), \quad (2)$$

where F denotes a cumulative distribution function and denotes the parameters. Therefore,

$$Pr(y=1) = F'(\beta' x), \quad (3)$$

Marginal effects are obtained by computing the derivative of the conditional mean function with respect to given by:

$$\frac{\delta E(y/x)}{\delta x} = f'(\beta' x)\beta, \quad (4)$$

where $f(.)$ is the density function that corresponds to the cumulative function $F(.)$. In this study, where all the variables are categorical (mostly binary), we would report the difference between the estimated probability if the variable is equal to 1 and the estimated probability if the variable is equal to 0. The marginal effects are nonlinear functions of the parameter estimates and levels of the explanatory variables. To explain the results, we use the marginal effect estimates.

There are potential endogeneity issues associated with the estimation of the Model, there might be an omitted variable that affects both factors of competition and the nature of the firm, including its propensity to innovate. Given the cross-sectional nature of the dataset, we attempt to mitigate the endogeneity problem through the inclusion of regional fixed effects and also control with firm size.

Dependent Variables

Innovation is the variable of interest for our analysis. In this survey, there were four (4) items that addressed the subject of innovation, considering "new" means products, services, processes, practices and methods that are new to the firm but not necessarily new to the market or other firms and it could have been originally developed by other firms. These items asked respondents to indicate (yes or no) whether they have introduced new products or services in the last three years.

The options are:

(i) "Has this establishment introduced new or significantly improved products or services?"

(ii) "Has this establishment introduced any new or significantly improved methods for the production or supply of products or services?"

(iii) "Has this establishment introduced any new or significantly improved organisational or management practices or structures?"

(iv) "Provide technology training for staff"

(v) "Introduce a new product or new service"

(vi) "Add new features to existing products or services"

Questions (vii) and (viii) were exempted from the Russian list of interview questions.

(vii) "Take measures to reduce production cost"

(viii) "Take actions to improve production flexibility"

Xie et al. (2018) state that there are two kinds of activities which basically represent the two categories of technological innovation, namely, product innovation. Following Xie et al. (2018) and Cuijpers et al. (2011), we use item (i) as the dependent variables. Porter (1983) provides a summary of technological innovation: "Initially product design is fluid, and substantial product variety is present. Product innovation is the dominant mode of innovation and aims primarily at improving product performance. Successive product innovations ultimately yield a "dominant design" where the optimal product configuration is reached."

Independent Variables

The research employed a rarely utilised perception-based measure of competition. Tang (2006) suggested that a firm's opinion of the level of rivalry it experiences is a better measure of competition than industry-based statistics like seller concentration. A perception-based indicator assesses firm-specific competition. This is significant because enterprises, even those in the same industry, manufacture distinct products and serve various consumers. The measure of perceived competition is based on self-evaluations by representatives of manufacturing incumbent establishments, and it should be especially revealing because, in the cognitive logic of decision making, perception of competition is a first step of market interaction between newcomers and incumbents, and it should thus be regarded as a good predictor of competitive responses (Tang, 2006).

To determine the degree of competition, respondents were asked the following questions:

I. How many competitors did this establishment's main product face in this main market? The respondents are to indicate the number of competitors they perceive to have, if the number in their opinion is higher than 100 they indicate it by –4

II. Does this establishment at present use technology licensed from a foreign-owned company, excluding office software? The respondents are to

indicate (yes or no) whether they use foreign license technology.

There are certain factors which are important in the analysis of firms and innovation, and so we use these factors to control the outcome of the model. The control factors used for this research include: firm size, labour regulations, firm age, investment, financial access, education, corruption. To be able to capture the regional effect, we included gross regional product (GRP) of Russian Regions.

Results

HNC: In Table 1, all models perceive fierce competition that has a negative but significant effect on all forms of innovation except in R&D; R&D is positive but not significant. A unit increase in competition reduces product innovation, process innovation and new product innovation by 5 %, 3 % and 3.5 % respectively. The step by step innovation model indicates that competition increases innovation in neck-and-neck firms. To find out if this is the reason for the negative results, we cluster the data into two sets, Medium and Small Enterprises. In Table 2, HNC is positive for product innovation and process innovation but this effect is non-significant. HNC has a positively significant effect on R&D and higher competition has a negatively significant effect on new product innovation. A unit increase in competition increases R&D by 7 %

Table 1

General SMEs Firm Data

	Dependent variable							
	Product_Innovation Model 1		R_D Model 2		Process Innovation Model 3		New_Product Model 4	
	Est.	Marginal Effect	Est.	Marginal Effect	Est.	Marginal Effect	Est.	Marginal Effect
(Intercept)	−1.770*** (0.283)		−3.336*** (0.351)		−1.768*** (0.318)		−2.895*** (0.386)	
HNC	−0.439*** (0.168)	−0.05	0.190 (0.196)	0.020	−0.330* (0.190)	−0.030	−0.568** (0.228)	−0.035
FLT	0.602** (0.236)	0.068	1.418*** (0.233)	0.126	1.039*** (0.254)	0.093	0.868*** (0.283)	0.055
INV	0.006*** (0.002)	0.001	0.005** (0.002)	0.001	0.003 (0.002)	0.0003	0.006** (0.003)	0.0004
EDU	0.013*** (0.005)	0.0015	0.018*** (0.005)	0.001	0.012** (0.005)	0.001	0.007 (0.007)	0.0004
COR	−0.292*** (0.085)	−0.033	−0.060 (0.090)	0.001	−0.142 (0.091)	0.014	−0.172 (0.108)	−0.009
Age	0.032*** (0.007)	0.004	0.028*** (0.007)	0.002	0.003 (0.007)	0.0003	0.023*** (0.007)	0.001
ATF	0.001 (0.086)	0.0001	0.270*** (0.098)	0.024	−0.041 (0.098)	−0.004	0.082 (0.112)	0.005
Firm_S2	−0.007 (0.208)	−0.001	0.494** (0.246)	0.039	−0.132 (0.228)	−0.012	−0.180 (0.295)	−0.010
Firm_S3	0.056 (0.205)	0.006	0.728*** (0.239)	0.059	−0.373 (0.237)	−0.032	0.177 (0.270)	0.011
Location(Regional Dummies)	YES		YES		YES		YES	
Observation	1,323		1,323		1,323		1,323	
BIC	1104.85		907.72		916.29		739.42	
AIC	1027.04		829.91		838.48		661.60	
Pseudo-R^2 (McFadden)	0.10		0.19		0.13		0.09	
Pseudo-R^2 (Cragg-Uhler)	0.14		0.26		0.18		0.11	
χ^2	109.41, $p = 0.00$		183.81, $p = 0.00$		122.82, $p = 0.00$		62.02, $p = 0.00$	

Source: Author's Analysis. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.
Note: HNC = High Competition, FLT = Foreign Licensed Technology, INV = Investment, EDU = Education, COR = Corruption, ATF = Access to Finance.

Table 2

Medium Enterprises Data

Dependent variable								
	Product_Innovation Model 1		R_D Model 2		Process Innovation Model 3		New_Product Model 4	
	Est.	Marginal Effect	Est.	Marginal Effect	Est.	Marginal Effect	Est.	Marginal Effect
(Intercept)	−1.929*** (0.432)		−2.609*** (0.466)		−2.499*** (0.551)		−3.207*** (0.495)	
HNC	0.120 (0.276)	0.016	0.578** (0.286)	0.07	0.328 (0.328)	0.029	−0.705** (0.304)	−0.034
FLT	0.541 (0.333)	0.07	1.090*** (0.323)	0.143	0.849** (0.376)	0.081	0.917** (0.407)	0.060
INV	0.005 (0.003)	0.001	0.005 (0.003)	0.001	0.002 (0.004)	0.0002	0.006 (0.004)	0.0005
EDU	0.017** (0.007)	0.002	0.013* (0.008)	0.001	0.017** (0.008)	0.002	0.004 (0.010)	0.0006
COR	−0.408*** (0.146)	−0.06	−0.051 (0.138)	0.01	−0.502*** (0.188)	−0.040	−0.085 (0.135)	−0.021
Age	0.028*** (0.009)	0.004	0.028*** (0.008)	0.004	−0.006 (0.012)	−0.001	0.034*** (0.012)	0.002
ATF	0.017 (0.151)	0.002	0.410*** (0.153)	0.05	0.216 (0.184)	0.02	0.053 (0.143)	0.003
Location	Yes		Yes		Yes		Yes	
Observation	400		400		400		400	
BIC	398.52		389.69		313.87		305.02	
AIC	366.59		357.76		281.93		273.09	
Pseudo-R^2 (McFadden)	0.09		0.13		0.07		0.10	
Pseudo-R^2 (Cragg-Uhler)	0.14		0.19		0.10		0.13	
χ^2	35.47, $p = 0.00$		41.35, $p = 0.00$		19.54, $p = 0.01$		15.92, $p = 0.03$	

Source: Author's Analysis. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.
Note: HNC = High Competition, FLT = Foreign Licensed Technology, INV = Investment, EDU = Education, COR = Corruption, ATF = Access to Finance.

while it reduces new product innovation by 3.4 %. Table 3 shows a negative effect of HNC on innovation in all four Models. The obtained results confirm the work of Axarloglou (2004).

FLT: Table 1 shows a positively significant effect of FLT on innovation in the general data. A unit increase in foreign licensed technology contributes to an increase by 6.7 %, 12.6 %, 9.3 % and 5.5 % in product innovation, R&D, process innovation and new product innovation respectively. In Table 2, FLT is significantly positive in all models except in Model 1, which is positive but non-significant. The FLT effect on large companies is very high. Table 3 shows a significantly positive effect of FLT in all models. A unit increase in FLT will increase product innovation, R&D, process innovation and new product innovation by 6.9 %, 12.8 %, 10.9 % and 4.9 % respectively.

ATF: In Table 1, ATF has mixed results. In Model 2 it is significantly positive, with a unit increase, increasing R&D by 2.4 %. In Models 1 and 4, the results are negative but insignificant; in Model 3, the result is not insignificant and negative. In Table 2, all models are positive but only Model 2 is significant, with a unit increase, increasing R&D by 5 %. Table 3 has mixed results with non-significant.

Control variables results: INV in Table 1 is positively significant in all models except Model 3. In Table 2, INV is positive but insignificant in all models; in Table 3, INV is positive in all models but significant only in Model 1. EDU has similar positive results as anticipated in all models and in all tables. COR is negative in all models as indicated in the literature. Firm age has a positive effect in all models and firm size has mixed results.

Discussion

The results show that fierce competition has mixed results. The findings demonstrate that

Table 3

Small Enterprises Data

Dependent variable								
	Product_Innovation Model 1		R_D Model 2		Process Innovation Model 3		New_Product Model 4	
	Est.	Marginal Effect	Est.	Marginal Effect	Est.	Marginal Effect	Est.	Marginal Effect
(Intercept)	−1.655*** (0.344)		−3.025*** (0.438)		−1.476*** (0.364)		−3.137*** (0.499)	
HNC	−0.747*** (0.217)	−0.076	−0.188 (0.267)	−0.011	−0.671*** (0.236)	−0.062	−0.718** (0.304)	−0.036
FLT	0.691** (0.332)	0.069	1.799*** (0.334)	0.128	1.284*** (0.339)	0.109	0.964** (0.410)	0.049
INV	0.007** (0.003)	0.001	0.004 (0.003)	0.0003	0.004 (0.003)	0.0003	0.006 (0.004)	0.0003
EDU	0.011 (0.007)	0.001	0.024*** (0.007)	0.002	0.007 (0.007)	0.001	0.005 (0.010)	0.0002
COR	−0.211** (0.101)	−0.022	0.011 (0.116)	0.002	0.004 (0.103)	−0.003	−0.079 (0.136)	−0.003
Age	0.034*** (0.011)	0.004	0.021* (0.012)	0.001	0.009 (0.012)	0.001	0.035*** (0.012)	0.002
ATF	−0.032 (0.105)	−0.003	0.102 (0.129)	0.007	−0.170 (0.116)	−0.015	0.053 (0.143)	0.0027
Firm_S	−0.014 (0.215)	−0.002	0.434* (0.257)	0.031	−0.196 (0.238)	−0.017	−0.268 (0.309)	−0.014
Location	Yes		Yes		Yes		Yes	
Observation	923		923		923		923	
BIC	721.44		550.59		635.79		463.66	
AIC	653.86		483.00		568.20		396.08	
Pseudo-R^2 (McFadden)	0.12		0.22		0.16		0.11	
Pseudo-R^2 (Cragg-Uhler)	0.17		0.27		0.21		0.13	
χ^2	87.45, $p = 0.00$		125.98, $p = 0.00$		105.59, $p = 0.00$		43.27, $p = 0.00$	

Source: Author's Analysis. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.
Note: HNC = High Competition, FLT = Foreign Licensed Technology, INV = Investment, EDU = Education, COR = Corruption, ATF = Access to Finance.

fierce competition reduces SMEs incentives to innovate, this can be attributed to potential reduction in innovation rent but also the result indicates that input innovation (R&D) is increased in the presence of high level competition. When there is fierce competition, SMEs seek investments to invest more in R&D to create a new market where they can be market leaders. Competition in this case is good because it drives more investment into the development of new products, creates new avenues for employment and gives consumers improved quality products. Heavy investment in research and development will strengthen science and technology and help to rapidly develop an innovative economy. The established fact is that input innovation has the potential of accessing new untapped markets, which will increase the innovation rent that will incentivise others to innovate. Although Russia has the human capital to convert its economy into an innovative economy, due to recent events, Russia is seeing a capital and population exodus. The Russian Association for Electronic Communications (RAEC) estimates that between 50,000 and 70,000 people have already left Russia, in what the industry body is calling the "first wave" of a mass exodus of creative, entrepreneurial, and prosperous Russians. Last year, the Russian Ministry of Digital Development estimated the loss of tech workers to be between 500,000 and a million and projected it to reach 2 million by 2027. However, the special operation has shown new numbers as indicated by the RAEC, which is quite alarming. Also as indicated by the Global Innovation Index, Russia has weaknesses in firms offering formal training to employees, lack of investment

and low regulatory quality. These factors, especially Investment and Regulation, have a huge effect on SMEs. The Russian government responded to the IT migration by passing laws that will eliminate income taxes for anyone working for information technology enterprises between now and 2024 and fast track permanent residence permits for international Tech specialists.

The world is a global village and easy access to foreign technology is important to the local market. The results have indicated the positive effect of foreign licensed technology to all forms of innovation. This means that SMEs that have access to foreign licensed technologies have a competitive advantage. It potentially speeds up the innovation process. Having access to high level technology and localising the technology is essential for the long-term sustainable development of SMEs. The 2014 and the current 2022 sanctions will continue to have a long-term impeding effect on access to western technologies which will therefore have an impact on most SMEs. According to the European Commission's President Ursula von der Leyen, the technical sanctions are intended to "shut off Russia's industry from the technologies critically required today to construct a future." The majority of the world's leading chip manufacturers, including Intel, Samsung, TSMC, and Qualcomm, have ceased all business with Russia. In reaction to the sanction, the Russian President, in Presidential Decree No. 322, published on May 27, considerably expanded the ability of Russian people to continue using foreign-held intellectual property (IP) rights in Russia without the consent of the rights holder (including patents, trademarks, franchises, know-how, industrial designs, inventions, etc.) The future of the competitiveness of SMEs is on the line, because they stand to lose a lot. What can be deduced from all this is that the 22 years of enormous growth by Russian businesses has come to a pause due to numerous sanctions.

Focusing on the Local Market First

What it takes to make a great nation is determined people with the willingness to accept their present condition and the desire to make changes. Being trapped by generalised ideology and paths to innovation might not result in the same outcome but understanding the local environment and what makes it work is what true innovation is about. Success differs across countries: no two countries have reached the same level of economic success following one singular economic model due to the difference in the following institutional, political, economic and managerial factors. American success is based more on strong institutions, while that of Singapore is based on good management. A lot of countries have fallen in the trap of "innovation apparition" or "ghost chasing", the question is not how to be like them but how to explore the surroundings to achieve the very best, as in the case of Dubai. The creation of Dubai we see today was out of necessity by the leaders knowing the depletion of their oil reserve, which made them decide to innovate to make Dubai a place of relaxation. The case of Singapore is also based on a need to transform the economy through education knowing the only resource of the country was its people. The Russian market has so much potential to explore, what is left is entrepreneurs not looking so far but within their environment to create innovation that solves the immediate needs of the people. The good thing in this case is the Russian government's willingness to create an environment conducive for innovation, the call for technological sovereignty is a good starting point. The Skolkovo Centre is a good approach and the government's continuous call for inclusiveness. Finding alternative means to supply the needed technology to help SMEs, while finding a long term solution will make you independent to a certain degree.

Conclusion

This research investigated the effect of competition on innovation using data from the World Bank Enterprise Survey. We used the Logit model in analysing the data. The findings show the correlation between foreign licensed technology and innovation and also on perceived competition and innovation. The study also identified that the role played by the government through its policy influences competition. The Russian government is interested in building a self-sustaining Russia, which is a plausible move due to the scale of uncertainty in the world now.

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About the author

James Okrah — Research Engineer, Academic Department of International Economics and Management, Graduate School of Economics and Management, Ural Federal University; https://orcid.org/0000-0002-0124-1143 (19, Mira St., Ekaterinburg, 620002, Russian Federation; e-mail: jokrah6@gmail.com).

Информация об авторе

Окрах Джеймс — инженер, кафедра международной экономики и менеджмента, Институт экономики и менеджмента, Уральский федеральный университет им. первого Президента России Б. Н. Ельцина; https://orcid.org/0000-0002-0124-1143 (Российская Федерация, 620002, г. Екатеринбург, ул. Мира, 19; e-mail: jokrah6@gmail.com).

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