



Competitiveness in the FinTech Sector: Case of Russia

Evgeniy Efimov^{1*}, Ekaterina Koroleva¹, Anastasia Sukhinina¹

¹*Peter the Great St. Petersburg Polytechnic University, 29, Polytechnicheskaya Str., St. Petersburg, 195251, Russia*

Abstract. The application of innovation decisions in the financial sector led to the appearance of FinTechs, tech-driven companies that disrupt or contribute to traditional financial services. The appearance of new actors has changed the relationships between incumbents, regulators, consumers, and other actors and intensified competition in the financial sector. Building on the modified Panzar-Rosse model, we examine the competitiveness among FinTechs on the dataset of 75 FinTechs from Russia. The results show monopolistic competition, close to a monopoly among FinTechs in Russia. The revealed situation is explained by high barriers to the entry to sector and also by country features, as imperfect legislation, lack of financing of FinTechs' activity. The results of the research highlight the necessity to attract attention from policymakers to improve the competitiveness environment in the financial sector in Russia.

Keywords: Competitiveness; FinTech; Panzar–Rosse model; Tech-driven companies

1. Introduction

In the conditions of the modern economy, there is fierce competition between business entities, which forces companies not only to stop at improving existing methods but also to create completely new technologies that will contribute to the automation of processes in all spheres of society (Dobrolyubov, 2020; Pratiwi et al., 2020). The successful penetration of financial technologies into the financial sector makes one think about how widespread their development is in the future (Berawi, 2004; Gozali et al., 2020). Therefore, the competition between high-tech companies providing financial services, as a result, is a relevant topic and requires detailed study (Palmié et al., 2020; Zetzsche et al., 2020). The recent literature review by Kavuri and Milne (2019) highlights the need to estimate the changes in the financial sector. We address this gap from the perspective of estimating the competitiveness among FinTechs.

FinTechs are high-tech companies that apply innovative decisions to provide financial services and are an alternative to traditional financial institutions (Wamba et al., 2020). The goal of any commercial company is to get profit by attracting the maximum number of consumers (Hassan et al., 2018; Berthilde and Rusibana, 2020). In the case of FinTechs, this statement also applies, so we can conclude that competition plays a huge role in their development. The most talked-about (and most-funded) FinTech start-ups are meant to compete with traditional financial service providers (Stulz, 2019). The growing influence of FinTechs has been proven by increasing its quantity. In comparison with 2018, the

*Corresponding author's email: efimov.ea@edu.spbstu.ru, Tel.: +7-911-126-61-81
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quantity of FinTechs doubled at the beginning of 2021 and reached 26,045 companies (Statista, 2021). Moreover, in 2019, the investment in FinTech composed \$135.7 billion with 2,693 deals globally (KPMG, 2020). Various financial services are provided by FinTechs.

There are RegTech, payments, insurance, credits, analytics, etc. (Pantelieieva et al., 2020). According to the *Global Fintech Market (2018–2023) (2019)* report, among these segments, payment services are the main driver of growth in the global market. Moreover, there is no financial service that is not realized by FinTechs. Thus, FinTechs are expected to play a significant role in the financial sector (Giglio, 2021).

In the scientific literature, various studies have aimed to analyze the FinTech sector. The work of Nikitina et al. (2017) states that FinTechs currently cannot fully compete with representatives of the banking sector; moreover, 95% of innovative financial developments belong to professional participants in the financial sector. Koh and Koh (2019) suggest that the banking sector in the future will be represented by cooperation between FinTechs and banks. In research, Kuposov (2017) reveals that the emergence of high-tech companies contributes to increased competition. In contrast, Shkhalakhova (2018) proves that FinTechs in Russia do not pose a real threat to traditional banks due to their investment opportunities. To the best of our knowledge, no previous paper has investigated the competitiveness among FinTechs.

We use the dataset of Russian FinTechs. Despite the historical background and economic and political features, Russia is an interesting case due to the following aspects. The FinTech Adoption Index in Russia achieved 82% in 2019, exceeding the global average rate. This means that 82 of 100 people have already used the services of FinTechs. Also, Russia is in the TOP-20 countries in the Global FinTech Index (FinDexable, 2021). Also, it is among the top 20 globally in terms of the quantity of FinTechs established in the country (Laidroo and Avarmaa, 2019).

We examined the competitiveness among FinTechs in Russia. Specifically, we used the modified Panzar–Rosse model on the dataset of 75 FinTechs from 2014 to 2018. The results reveal monopolistic competition among FinTechs in Russia. Moreover, the situation is close to a monopoly. It emphasizes high barriers to entry into the financial sector (Silva et al., 2018). Barriers are connected to legislation and finance in the case of Russia. According to Claessens (2009), competition policy in the financial sector is often already behind and restrains the development of financial technologies. In the case of Russia, it can lead to crowding out small companies by large IT companies or banks oriented on digital technologies. The lack of finance also exacerbates the revealed situation. FinTechs are difficult to find investors due to high risks and the lack of protection of investors from legislation (Shashkova et al., 2020). That is why many companies prefer to register in other countries with more developed legislation e.g., Cyprus (Aparna and Nair, 2016). The results attract attention from policymakers to improve the competitiveness environment in the financial sector in Russia.

Our paper contributes to FinTech literature by being the first to investigate the competitiveness among FinTechs and thus fills the gap revealed by Kavuri and Milne (2019). We also modified the Panzar–Rosse model (Mamonov, 2010) for measuring competitiveness in the FinTech sector. The paper also contributes to FinTech literature in Russia (Kuposov, 2017; Shkhalakhova, 2018; Soloviev, 2018; Koh and Koh, 2019), which is restricted by different analyses and reviews.

The paper is structured as follows. Section 2 presents the data and methodology. We analyze and discuss our results in Section 3. Finally, Section 4 includes the main conclusions.

2. Methods

There are structural and nonstructural approaches to analyzing competitiveness in a certain sector (Bruker, 2005). The structural approach is based on the postulates of the traditional theory of industry markets, according to which the exogenous structure of the market determines the behavior of firms and their performance. This approach assumes that there is a feedback loop between concentration and competition, which enables firms to charge higher prices in highly concentrated markets. The concentration level is estimated by calculating various concentration indices (Gromacs Manual 4.5.4., 2011). Concentration is one of the main quantitative characteristics used to assess the level of competition (Kusrini and Saleh, 2009). The reduction in competition is usually the result of a decrease in concentration. Conversely, too high a concentration leads to increased market power, high interest rates, and transfer risk to financial service users. In practice, there are several specialized and general indicators that are used for calculations. These include the concentration coefficient, the Herfindahl–Hirschman index, the Hall–Tydeman index, and so on (Mamat et al., 2009).

Over time, it became apparent that the results obtained using the structured approach quite often gave false or at least controversial results (Volkov and Svetunkov, 2013). In this regard, a nonstructural approach to the analysis of competition was developed. It involves evaluation by building a series of models (Gang-Ji, 2008). Nonstructural methods emerged from the new theory of industrial organization (Mettam and Adams, 1994). They measure competition not through an exogenous market structure or proxy variable but by directly measuring a company's behavior in the marketplace. Assessing the deviation of the company's behavior from the competitive one, these models conclude about the competitive structure of the market.

The authors apply a nonstructural approach because market relations are complex; it is not enough to describe them using concentration indicators. Nonstructural models are based on the statistical theory of the equilibrium market (Rester, 2008). The level of prices in the market depends on the costs of banks as well as monopoly power. The most popular nonstructural models are Panzar–Rosse, Barros-Modesto, and Bresnahan (Chung et al., 2016).

The authors investigated competitiveness among FinTechs in Russia using the Panzar–Rosse model. The Panzar–Rosse model was first proposed in 1987 by two American scientists, J. Panzar and J. Ross, after whom it was named. The model also has another name, H-statistic, due to an indicator that is calculated to assess the level of competition. This model was used to assess the level of competition in the real sector of the economy and only later gained popularity in the banking sector (Mamonov, 2010). The model allows comparing the results with each other to assess the level of competition in separate segments and is based on the open-accessed initial data. The above advantages have identified the use of the model in the research framework.

Since the model was oriented on banks, we decided to modify it by changing the bank's income on the revenue of FinTech. Table 1 presents the initial data required for the modified Panzar–Rosse model.

Table 1 Description of variables for the modified Panzar–Rosse model

Variable	Description	Formula
P	Asset turnover indicator	Revenue to assets ratio
W1	Funding price	The ratio of interest to payment to borrowed funds
W2	Specific personnel costs	Personnel cost to assets ratio
W3	Specific volume of other expenses	Ratio of other expenses to assets
a	Amount of assets	Assets
ae	Control variable	Equity to assets ratio

The Panzar–Rosse model is supposed to estimate the following regression model:

$$\ln P = \alpha + \beta_1 \ln W_1 + \beta_2 \ln W_2 + \beta_3 \ln W_3 + \gamma \ln a + \delta \ln ae \quad (1)$$

The level of competition is assessed based on the results of the regression model by calculating the H-statistics indicator in the following way:

$$H = \sum_j \frac{\partial R}{\partial w_j} \frac{w_j}{R}, \quad (2)$$

where R is the average revenue of the company in the sector.

The H-statistics shows the measure of the influence of prices for factors of production (W1, W2, W3) on the company's revenue. The value of the H-statistics reflects the level of competition in the sector. The value of an indicator less than 0 means monopoly, between 0 and 1 means monopolistic competition, and more than 1 characterizes perfect competition. As we needed information on FinTechs, we began with identifying the FinTech population in Russia. We collected a dataset based on the FinTech map, presented at the end of 2018, composed by RusBase; it contained a total of 322 companies. To be included in our dataset, the FinTech had to be registered in Russia and had to be founded in 2001–2016; this allowed us to get necessary information about selected companies. Also, FinTechs had to fall into one of the following categories: lending, money transfers and payments, marketplace, investments, loyalty, infrastructure solutions, personal finance accounting, accounting (management, accounting, and others), and insurance. Digital banks were not included in the list of companies due to incomparable reporting. As a result, the population decreased to 75 FinTechs.

The descriptive statistics of the dependent and explanatory variables are presented in Table 2.

Table 2 Descriptive statistics of variables

Variable	Obs.	Mean	Std. Dev.	Min	Max
lnP	75	-0.21	1.80	-8.73	4.28
lnW1	75	-4.05	2.11	-10.87	-0.31
lnW2	75	-2.41	1.68	-6.75	0.72
lnW3	75	-2.00	1.80	-6.95	1.76
lna	75	13.67	2.56	8.44	19.92
lnae	75	-1.09	0.87	-4.04	-0.02

As can be seen from Table 2, the largest value of the standard deviation is presented in the variable of the natural logarithm of the number of assets and is equal to 2.56. The volatility in this variable is due to differences in company size. This suggests that even in the case of the variable with the largest standard deviation, most of the values are close to the mean; therefore, the data spreads are small. There is no particular reason for these deviations, except for the heterogeneity of the analyzed companies and essentially random characteristics. The control variable “equity to assets ratio” was chosen to be integrated into the statistical model to eliminate the scope of company activities.

Table 3 Correlation matrix

	lnP	lnW1	lnW2	lnW3	lna	lnae
lnP	1.00					
lnW1	0.01	1.00				
lnW2	0.29	-0.32	1.00			
lnW3	0.16	0.01	0.05	1.00		
lna	0.90	0.05	0.11	0.15	1.00	
lnae	-0.16	0.06	0.06	0.24	-0.14	1.00

To avoid multicollinearity of variables, we carried out the correlation matrix of the explanatory variables. The results are presented in Table 3. The explanatory variables are weakly correlated with each other. This allows us to create the previously mentioned regression model.

3. Results and Discussion

The results of creating the initial regression model are presented in Table 4. The quality of the initial model is rather high since Prob. > F (the probability of making a mistake, rejecting the null hypothesis that the model is insignificant) is less than 0.05. Therefore, the regression model is significant.

Table 4 The initial results of creating the Panzar–Rosse model

Dependent variable, model	lnP
Constant	-7.9896311 *** (0.55782921)
lnW1	0.02946927 (0.04110819)
lnW2	0.21757293 *** (0.05205272)
lnW3	0.03539427 (0.04748344)
lna	0.60975906 *** (0.0332695)
lnae	-0.13233483 (0.09902884)
No. of obs.	75
Adj. R ²	0.84970707
F stat.	84.674359 ***

Moreover, adjusted R², which is 0.8497, also confirms the high quality of the model. The coefficient of determination can also be used to estimate the regression model, but it shows the effect of all explanatory variables on the dependent variable, while the adjusted R² shows the percentage of change that is explained only by those explanatory variables that actually affect the dependent variable.

The results of the t-test show that coefficients for the variables lnW1, lnW3, and lnae are not statistically significant at the 0.05 level.

Variables lnW1, lnW3, and lnae were removed from the model one by one. The results of the final model are presented in Table 5.

Table 5 The final results of creating the Panzar–Rosse model

Dependent variable, model	lnP
Constant	-8.256135 *** 0.47126087
lnW2	0.20081717 *** 0.04848926
lna	0.62297249 *** 0.03184586
No. of obs.	75
Adj. R ²	0.85119028
F stat.	212.63968 ***

The quality of the final model is also quite high since the probability of being wrong, rejecting the null hypothesis that the regression model is insignificant, is less than 0.05 and the adjusted coefficient of determination is 0.8521. The p-values show the significance of

the coefficients for the remaining variables. In all estimations, we also control for heteroscedasticity and report robust standard errors for each coefficient estimate. Getting a statistically significant regression model allows us to calculate the H-statistic and analyze its change from 2014 to 2018 (Figure 1).

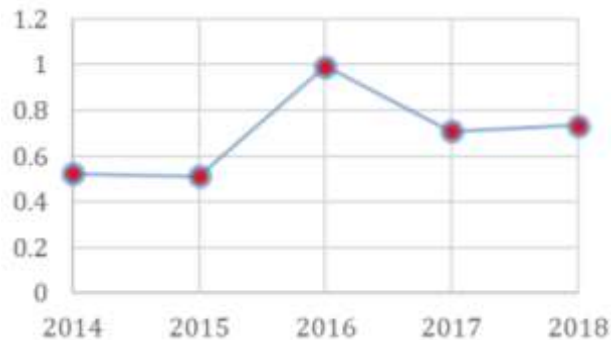


Figure 1 H-statistic for FinTechs in 2014–2018 in Russia

The period from 2014 to 2016 can be characterized as the formation of FinTech in Russia. Companies appeared and began to compete with traditional participants in the financial market. For example, peer-to-peer lending excludes banks from the entire lending process, allowing them to lend directly to other individuals or legal entities (Agosto et al., 2019). Automated robo-advisors replace trained analysts in stock selection and trading (Phoon and Koh, 2017). However, due to the high tax burden, lack of adequate funding, and mistrust on the part of users of financial services, many FinTechs find it difficult to operate for a long time and consistently make a profit, so they strive to become part of the ecosystem of a large financial institution. This fact explains the downward trend of the H indicator in the period 2016–2018.

In the future, the FinTech service market can only be represented by traditional financial institutions, and FinTechs will function until a large bank or insurance company completes the merger transaction (Baporikar, 2021). More and more FinTechs are emerging worldwide, looking to find ways to use technology to meet customer needs. Even though financial inclusion provides both development opportunities and business opportunities, there are problems that limit the actions of this circle of entrepreneurs (Petrov and Valov, 2019).

This research confirms the high monopolization of the FinTech sector in Russia. It is necessary to highlight key entry barriers and develop recommendations for their elimination. The key entry barriers are imperfection of the legislation framework and lack of finance (Lee and Shin, 2018; Greenacre, 2020). To clarify this finding, the authors interviewed the director of the digital technologies block of Bank Saint Petersburg, who agreed with the proposed barriers and added that truly outstanding innovations are instantly absorbed by incumbents. FinTechs must agree to join them because further development requires financing and access to banking operations, which can only be carried out by financial institutions licensed by the Central Bank of the Russian Federation.

As a recommendation to remove the first barrier, it was proposed to prescribe special rules for companies providing FinTech services (Koroleva et al., 2020). These provisions can be developed during the implementation of the Digital Economy program until 2024. To overcome the remaining barriers, it is necessary to attract investors and protect them at the legislation level.

4. Conclusions

New financial technologies and business models radically change the competition between financial institutions, from brand competition to competition in consumer characteristics of products and services, thereby contributing to the formation of a favorable competitive environment.

The results of the Panzar–Rosse model for the period from 2014 to 2018 showed that the FinTech sector is in the condition of monopolistic competition. However, due to the low value of the H-statistic, a monopoly may appear in the near future. The analysis of the model's results over the years confirms the results obtained using the structured approach and proves the high monopolization of the FinTech sector (Efimov et al., 2021). The correct strategy of policymakers, aimed at improving legislation and increasing the investment attractiveness of the FinTech sector, will reduce entry barriers to the FinTech sector and will lead to an increase in the level of competition in the financial market. If the recommendations for eliminating entry barriers proposed in the study are implemented, the level of competition in the financial market will increase; otherwise, FinTechs, as separately functioning companies, may disappear and become part of large incumbents.

The research involves FinTechs registered in Russia as developers of innovative technologies and financial service providers, except for incumbents. The financial statements were taken from open sources of information: reports of public companies and rusprofile.ru. As part of further research, it would be interesting to expand the dataset and include companies that operate in Russia and are registered abroad. One of the largest representatives of such companies is QIWI plc, which is registered in Cyprus. It is also possible to analyze foreign FinTech sectors to compare the degree of competition development of the industry in different countries.

In 2020, the COVID-19 crisis jeopardized the entire banking ecosystem, and the need for personalized digital solutions, a solid capital base, and visionary leadership has become more important than ever. Most FinTechs have been existing for less than 10 years, and only a few of them demonstrate operational profitability. In most cases, FinTechs rely on investor funding, which is not guaranteed in the near future, especially as revenues have dropped since the pandemic. Obviously, there will be winners and losers among both incumbents and FinTechs, so it will be useful to assess the impact of the coronavirus pandemic on the FinTech market in a few years.

Moreover, recently, FinTech development has been aimed at digitalizing incumbents and creating an ecosystem within them, so when several large players appear on the Russian market, such as Sberbank and VTB, it is possible to analyze the degree of competition among such companies, excluding the effect of obtaining income from traditional operations.

The modification of the Panzar–Rosse model proposed in the study, which allows it to be used to study competition among not only banks but also nonfinancial organizations, as well as the results of the FinTech market research, makes a significant contribution to study further and determination of development prospects.

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