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An empirical analysis of the influence of financialization on investment in Russia

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Abstract

This paper tries to estimate the impact of financialization on fixed investment in Russia. The work is carried out by using panel data based on reports of non-financial publicly listed companies for 1999–2019. The study finds that financial expenses aimed at paying interest on external financing and paying dividends — that is, focusing on shareholder value, and hence decreasing the internal funds of companies, reduce real investments. Financial incomes have shown the crowding-out effect for large companies. Financial incomes as additional "free" funds in large companies are not perceived as an opportunity to accumulate fixed assets. Managers prefer to increase financial investments instead of real ones. In small and medium-sized companies, financial incomes, however, drive the growth of physical investment. This is because small firms, at a particular stage in their lives, find it more profitable to invest in their own growth. The results from the general sample, without dividing by size, indicate that financialization in Russia clearly reduces real investment.

Keywords: financialization, investment, panel data, non-financial companies, Russian economy.
JEL classification: C23, D22, G30.

1. Introduction

Over the past few decades, there has been a significant strengthening of financial markets and institutions in the global economy. The number of financial transactions and the amount of funds invested in financial assets are constantly growing. As a result, economic policy, the behavior of individual firms, and the structure of financial markets are changing. The functioning of economic systems at both the macro and micro levels is being transformed. This process is called financialization. We use a a definition of financialization formulated by Epstein (2001, p. 1): "Financialization refers to the increasing importance of

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financial markets, financial motives, financial institutions, and financial elites in the operation of the economy and its governing institutions, both at the national and international level."

The mainstream literature — more specifically, the neoclassical one — on financialization and economic growth states that financial markets contribute to financing and to the efficient allocation of investments. However, in recent years, this thesis has been repeatedly questioned. It turns out that the impact of financialization on investment depends on institutional features, as well as on the time period in which the financial sector is strengthening.

In this paper, the effects of financialization on physical investment in Russia will be analyzed using the Post-Keynesian approach. This study seeks to find out how such parameters of financialization as interest and dividend payments, and financial incomes, affect investments in the real sector. This inquiry will be conducted for Russian publicly listed companies in the non-financial sector only.

Recent research shows that an unambiguous approach to the study of financialization is not correct. In certain circumstances, this process may increase investment, while in others it may significantly reduce it. For example, Stockhammer (2004) confirmed the negative impact of financialization in the United States, France, and the UK, but in Germany, the results were completely different. Tori and Onaran (2018) showed that financialization reduces investment for the British companies.

Nowadays, there are quite a lot of macro-studies of financialization, but few economists — like Tori and Onaran (2018) — consider this issue at the level of firms, and there are even fewer studies on Russia. Thus, it is necessary to investigate how financialization affects investment in Russia at the company level. The results could give an assessment of this process.

2. The basic aspects of analysis

Financialization is the process of strengthening the role of the financial sector and making it dominate the real one.

The effects of financialization can be observed in three ways (Palley, 2013):

(1) changing the structure and functioning of financial markets;

(2) changing the behavior of real sector companies;

(3) changing economic policy.

According to Palley (2013), financialization causes resources to flow from the real sector to the financial sector, and firms invest less in the real sector. As a result, economic growth slows, and the tendency to stagnation becomes stronger. In addition, there is reason to believe that financialization could put the economy at risk of debt deflation and a prolonged recession.

Mainstream economic theory played an important role in legitimizing financialization. First, in the sphere of relations between companies and financial markets, mainstream theory assumed that the main aim of corporate governance was to coordinate the interests of managers and financial market participants. Moreover, the theory suggests that the company's only goal is to maximize shareholder returns. Other corporate goals and the interests of other stakeholders were not taken into account (Palley, 2013).

Furthermore, neoclassical economics states that strengthening the positions of financial markets increases the efficiency of the economy due to the efficient allocation of investment. As Palley (2013) noted, the view that financial expansion increases economic efficiency can be traced to Arrow and Debreu (1954). Financial development can be perceived as the process allowing for the expansion of states of nature spanned by financial instruments. As a result, markets will price future economic outcomes more efficiently. Some economists tried to show that the situation regarding allocations of investment improved as a consequence of an expansion of financial markets (Beck and Levine, 2004; King and Levine, 1993; Levine; 2005; Gilchrist and Himmelberg, 1995). However, Arestis and Demetriades (1997) point to the unreliability of these data, since they do not take into account the institutional features of countries. Law and Singh (2014) argued that financialization has a positive effect on economic growth only up to a certain point in the development of financial markets.

The increase in the percentage of managers' compensation based on stock options has increased the motivation of company managers to maintain high stock prices in the short term by paying high dividends and making large share buybacks. The growing number of institutional investors who demand ever-rising stock prices has forced managers to raise the payout ratio (Palley, 2013). Thus, company managers are motivated by both personal interest and financial market pressure to meet shareholder expectations for higher payouts through dividends and share buybacks (changing incentives) in the short term. Both the corporation's target function and its set of constraints have changed. As a result, the share of domestic funds paid annually to financial markets has increased dramatically.

Several Post-Keynesian papers — mentioned both above and below — describe the negative impact of financialization on investment, income distribution and aggregate demand. In the process of financialization, interest and dividend payments and share repurchase of non-financial companies are increasing. As a result, companies have less funds for physical investment in the real sector.

Now we move to a consideration of those papers and lay the foundations for our own empirical analysis.

3. The Post-Keynesian model of investment as the starting point

This study will be based on the assumptions of the Keynesian investment model. The Post-Keynesian model developed by Fazzari and Mott (1986) will be considered as the base model. In their study, the authors concluded that both the capacity utilization rate and internal finances of a firm positively affect the level of investment.

The empirical model looks like this:

$$INVST = a_0 + a_1 L(SALES) + a_2 L(IFIN) + a_3 L(\text{INTEXP}) + \\ + a_4 (GPLANT), \quad (1)$$

where: *INVEST* — annual investment; *SALES* — net annual sales; *IFIN* — internal finance defined as profit after tax plus depreciation and amortization minus ordinary and preferred dividends; *INTEXP* — net annual interest expense; *GPLANT* — book value of the company's gross output; L refers to lags.

Empirical data show that cash flows are important constraints on investment. In particular, the fundamental contribution of Fazzari and Mott (1986) shows that fluctuations in internal finance, reflected by cash flows, are statistically more important for determining the level of investment than the stock market valuation.

However, the main weakness of the authors' research is the lack of indicators that reflect the financial incomes of the firm, which is an important aspect of financialization. Moreover, the researchers include interest payments, but ignore dividend payments.

Tori and Onaran (2018) investigated the impact of financialization on physical investment in the UK. The authors' merit is that they extend Fazzari and Mott's model by introducing the effects of financial incomes and payments into it.

$$\left(\frac{I}{K}\right)_{it} = \beta_0 + \beta_1 \sum_{j=1}^{2} \left(\frac{I}{K}\right)_{it-j} + \beta_2 \sum_{j=1}^{2} \left(\frac{\pi - CD}{K}\right)_{it-j} + \beta_3 \sum_{j=1}^{2} \left(\frac{S}{K}\right)_{it-j} + \\ + \beta_4 \sum_{j=1}^{2} \left(\frac{F}{K}\right)_{it-j} + \beta_3 \sum_{j=1}^{2} \left(\frac{\pi_F}{K}\right)_{it-j} + \beta_t + \varepsilon_{it}, \quad (2)$$

where: I — gross addition to fixed assets; π — operating income; CD — cash dividends; S — net sales; F — interest and dividend payments; π_F — financial incomes; K — capital.

As a result, it turned out that in addition to financial expenses caused by external financing, the total financial incomes represented by interest and dividends have a significant and, most importantly negative, impact on physical investments. This conclusion means that financial investments crowd out physical ones. Moreover, the authors evaluated the model for small and large companies and found that financial incomes have a positive impact on investment in small companies, but in large ones it remained negative.

According to the results obtained by the authors, the growing focus on external financing and internal substitution of fixed accumulation by financial activities played a fundamental role in suppressing investment. On the one hand, an increase in financial payments reduces the internal funds of non-financial companies. On the other hand, the negative crowding-out effect of financial investments on accumulation more than offsets the benefits of easing restrictions on cash flows. Financial incomes had a positive effect on investment only for small British companies (Tori and Onaran, 2018, p. 1410). Furthermore, Kuzmina and Rozmainsky (2020) applied the same methodology to Spanish firms and came to the conclusion that, even for small companies, financial incomes had a negative effect on investment.

Another revealing study on this topic is the work of Orhangazi (2008). In his research on financialization he tries to find out whether increased financial investment and increased opportunities for financial incomes crowd out real investments, changing the incentives of the firm's managers and directing funds away from real investments. In his survey he describes the process omitted in the Fazzari and Mott model, in which investments in financial assets displace real investments. The total funds available to the firm can either be invested in real assets or used to acquire financial assets. When the profit opportunities in financial markets are better than in commodity markets, this creates an incentive to invest more in financial assets and less in real ones.

The results obtained in the study indicate a negative relationship between financialization and capital accumulation, especially for large firms. The results confirm the point that financialization has negative consequences for firms' investment behavior.

As we already said, Stockhammer's (2004) research on the impact of financialization on investments has confirmed negative effects in the United States, France and UK, but it has not been possible to obtain significant results in Germany.

4. The Russian specifics

There are very few studies of financialization in Russia. So, for example, Karayev (2018) examines financialization using an agent-based stock-flow consistent model. The author models the economy with some constraints, such as the absence of exports and imports, and includes the effect of financialization. Based on the results of a computer experiment, he estimates the consequences of financialization. Dubinin (2017) considers the Russian financial system and assesses the influence of the financialization process on the country's economy. The author examines the role of Russia in the global process of financialization, and the structure of investments, but does not analyze the impact of financialization within the country on decisions made by non-financial companies regarding investments in their fixed assets. Thus, it becomes obvious that it is necessary to create a complete picture of how financialization is proceeding in Russia. This requires empirical research.

In Russia, as well as throughout the world, the role of the financial sector is increasing. Non-financial companies are increasing their presence in the financial markets by increasing the number and volume of financial transactions. However, some researchers are convinced that the potential for financialization, both internal and external, is not fully used in Russia. Despite growth, corporate borrowing by issuing bonds still remains at a rather low level. Researchers say that the lack of resilience of the Russian financial system is severely hampering financial market growth and investment in the country (Dubinin, 2017).

We should remember that until 1991 the Russian economy was part of the Soviet socialist economy and capitalist finances were therefore non-existent. Both financial markets and the system of commercial/investment banks were absent in the Soviet economy. On the other hand, the expansion of financial markets in Russia after 1991 was unstable because of the lack of relevant skills of participants and the "invasion" of insolvent and fraudulent companies into such markets (Rozmainsky, 2017, p. 149–150). In other words, to some extent, the active role of financial markets is alien to Russian economic culture to date.

Thus, there is reason to believe that the level of development of financial markets in Russia is not high enough, that is, the process of financialization may contribute to the growth of investments in fixed assets.

5. Methodology of econometric modeling

To analyze the effects of financialization, we take the model proposed by Tori and Onaran (2018) as a basis, but we modify it. We log all variables

for two reasons. First, it will take into account the non-linear relationship between the dependent and explanatory variables. Second, it will help reduce the impact of potential heteroscedasticity. Furthermore, we include in the model only the first lags of the variables, since companies are not inclined to accumulate cash, but try to realize them in the current or next reporting period. Consequently, the inclusion of second or more lags does not make sense because of their insignificant impact on investment. The initial model is presented below:

$$\ln\left(\frac{I}{K}\right)_{it} = \beta_0 + \beta_1 \ln\left(\frac{I}{K}\right)_{it-1} + \beta_2 \ln\left(\frac{\pi - div}{K}\right)_{it-1} + \beta_3 \ln\left(\frac{R}{K}\right)_{it-1} + \\ + \beta_4 \ln\left(\frac{IE}{K}\right)_{it-1} + \beta_t + \varepsilon_t, \quad (3)$$

where I represent investments, expressed in capital investments in fixed assets; K is the capital of the company used in the model to normalize the company's size; π — operating profit; div — paid dividends; $(\pi - div)$ — retained earnings; R — revenue; IE — interest expense; β_t — annual dummy used for control. It is expected to obtain positive coefficients with lags of investments, retained earnings, and revenue. The coefficient on interest expense is expected to be negative, but it may well turn out to be positive for the reasons described earlier.

In the first model (3), dividends are included only as an indicator that is introduced into the model only for calculating retained earnings. In other words, it acts as a parameter that reduces the company's "free" funds. However, dividends themselves can reflect financialization. The company may decide to pay large dividends in order to increase its shareholder value, instead of launching any investment projects. In other words, through its payment of dividends a company can demonstrate its focus on the financial sector, which is a manifestation of financialization. In this regard, we add dividends to the model:

$$\ln\left(\frac{I}{K}\right)_{it} = \beta_0 + \beta_1 \ln\left(\frac{I}{K}\right)_{it-1} + \beta_2 \ln\left(\frac{\pi - div}{K}\right)_{it-1} + \beta_3 \ln\left(\frac{R}{K}\right)_{it-1} + \\ + \beta_4 \ln\left(\frac{IE}{K}\right)_{it-1} + \beta_5 \ln\left(\frac{div}{K}\right)_{it-1} + \beta_t + \varepsilon_t. \quad (4)$$

In this case, the same coefficients are assumed as in the previous model. The coefficient of dividend is expected to be negative.

The interaction of non-financial companies with the financial sector is not limited to interest and dividend payments. They can also make non-operating investments for financial gains. Therefore, we expand the model to include financial incomes (π_F), which contain all incomes from the company's financial activities. The impact of financial incomes on physical investments is difficult to define unequivocally. On the one hand, financial incomes can increase the amount of available funds for sale, which can allow companies to increase their investments in fixed assets. On the other hand, a focus on financial investment can affect agents negatively. Financial investments are often much less risky and reversible. Moreover, they are no less profitable than physical ones. In this regard, the in-

crease in financial incomes by non-financial companies may generate a decrease in real investments. Here is the model with the effect of financial incomes:

$$\ln\left(\frac{I}{K}\right)_{it} = \beta_0 + \beta_1 \ln\left(\frac{I}{K}\right)_{it-1} + \beta_2 \ln\left(\frac{\pi - div}{K}\right)_{it-1} + \beta_3 \ln\left(\frac{R}{K}\right)_{it-1} + \\ + \beta_4 \ln\left(\frac{IE}{K}\right)_{it-1} + \beta_5 \ln\left(\frac{div}{K}\right)_{it-1} + \beta_6 \ln\left(\frac{\pi_F}{K}\right)_{it-1} + \beta_t + \varepsilon_t. \quad (5)$$

In theory, the coefficient of financial incomes could be either positive or negative, but we expect to see a negative impact.

Next, we combine the dividend and interest payments into financial expenses (FE). Thus, we get a model in which financialization is characterized by two parameters: financial expenses (interest and dividend payments) and financial incomes. The model is presented below:

$$\ln\left(\frac{I}{K}\right)_{it} = \beta_0 + \beta_1 \ln\left(\frac{I}{K}\right)_{it-1} + \beta_2 \ln\left(\frac{\pi - div}{K}\right)_{it-1} + \beta_3 \ln\left(\frac{R}{K}\right)_{it-1} + \\ + \beta_4 \ln\left(\frac{FE}{K}\right)_{it-1} + \beta_5 \ln\left(\frac{div}{K}\right)_{it-1} + \beta_6 \ln\left(\frac{\pi_F}{K}\right)_{it-1} + \beta_t + \varepsilon_t. \quad (6)$$

The coefficient for financial expenses in general, as well as individually, is expected to be negative.

We assume that financialization, and specifically the effect of financial incomes, can have different effects on large and medium and small companies. Large companies are usually more focused on the financial market and make large financial investments. In turn, medium and small companies are more focused on their own expansion and build-up of fixed assets. In this regard, we include a dummy variable (D_{big25}) to highlight large firms. It takes a value of 0, the average total assets of the company are less than the 75th percentile, and a value of 1 if greater. We get the following specification:

$$\ln\left(\frac{I}{K}\right)_{it} = \beta_0 + \beta_1 \ln\left(\frac{I}{K}\right)_{it-1} + \beta_2 \ln\left(\frac{\pi - div}{K}\right)_{it-1} + \beta_3 \ln\left(\frac{R}{K}\right)_{it-1} + \\ + \beta_4 \ln\left(\frac{FE}{K}\right)_{it-1} + \beta_5 \ln\left(\frac{\pi_F}{K}\right)_{it-1} + \beta_6 \ln\left(\frac{\pi_F}{K} D_{big25}\right)_{it-1} + \beta_t + \varepsilon_t. \quad (7)$$

The difference between this model and the previous one is that here the effect of financial incomes of small and medium-sized companies will be β_5, and for large ones, the sum is β_5 and β_6. This way we can trace the differences between the impact of financialization on physical investment in large and small companies.

In this specification, we assume that the coefficient β_6 will be negative; moreover, it will cancel out the positive effect of β_5.

6. Data description

The data was collected from the Thomson Reuters financial information database on the financial statements of publicly listed companies. The base

contains information about both standardized indicators of the balance sheet and standardized information about financial incomes and payments. This allows the most effective study of financialization, since the problem of different approaches to the formation of reporting disappears. The study uses data on all functioning and non-functioning publicly registered non-financial companies in Russia. Data are taken for 1999–2019. Earlier period was ignored due to transformation recession-inspired collapse of fixed investment (1991–1998 crisis). Descriptive statistics are presented in Appendix Table 1A.

The sample looks like an unbalanced panel data, as Russian firms often do not provide complete financial information for each year. It is important to note that the number of data gaps is quite large, which greatly complicates the study. Using a balanced sample is not advisable, as estimates can be biased. This is because a large number of companies will have to be excluded just because they did not provide complete information for all the years of operation. Moreover, only the companies that have been operating for the entire period under study will remain. Thus, the sample may turn out to be unrepresentative and give inadequate estimates. Data at the company level often suffers from outliers, and hence the need to filter such data carefully. Several steps have been taken to combat anomalies. The first step was to exclude from the study companies that did not have data on any metric for more than ten years. Secondly, 1% of observations on each side of the distribution of variables were adjusted by the Windsor method. Using this method allows for not discarding the extreme members of the selection, but rather replacing them with ones closest to them from the remaining values. Furthermore, companies with persistent negative operating income were excluded.

To exclude the presence of multicollinearity, we construct the correlation and pair correlation matrices (Tables 1–2).

Table 1
Correlation matrix.

Variables	L.capex_ln	div_ln	rev_ln	NI-div	IEln	II_ln	IE+Div
L.capex_ln	1.000						
div_ln	0.045	1.000					
rev_ln	0.109	0.298	1.000				
NI-div	0.038	0.091	0.160	1.000			
IE_ ln	0.005	–0.113	0.112	–0.207	1.000		
II_ln	–0.075	0.295	0.170	0.195	–0.036	1.000	
IE+Div	0.091	0.664	0.486	–0.011	0.339	0.263	1.000

Source: Authors' calculations.

Table 2
Pairwise correlation matrix.

Variables	L.capex_ln	div_ln	rev_ln	NI-div	IE _ln	II_ln	IE+Div
L.capex_ln	1.000						
div_ln	0.143	1.000					
rev_ln	0.169	0.105	1.000				
NI-div	0.104	0.210	0.202	1.000			
IE_ ln	0.045	–0.144	0.380	–0.162	1.000		
II_ln	–0.095	0.300	0.157	0.166	0.052	1.000	
IE+Div	0.069	0.605	0.496	0.008	0.435	0.214	1.000

Source: Authors' calculations.

As can be seen from the tables, the correlation between the variables that are simultaneously included in any model does not exceed 0.496; therefore there is no reason to believe that multicollinearity is present.

Below is some information about the sample. As can be seen in Fig. 1, the growth rates of investments in fixed assets of Russian non-financial companies decreased significantly after the 2008 crisis and began to recover only after 2018. This may be because companies were recovering from the consequences of the crisis, or decided to increase their presence in the financial market after the situation became more favorable. The manufacturing and extractive sectors are slightly more sensitive to changes in the economic situation than all sectors as a whole. In recent years, the indicator has varied from 0.08 to 0.1, and only in 2019 increased to 0.13. It is worth noting that in the developed countries of Europe this indicator is historically higher, averaging from 0.2 to 0.3.

Fig. 2 shows how the ratio of financial incomes to total income in Russian non-financial companies has changed over time. It can be seen from the graph that from 1999 to 2011 the share of financial incomes did not exceed 25%, but since 2012 it has grown strongly and in 2016 amounted to more than 60%. In other words, it can be assumed that since 2012 Russian non-financial companies have expanded their financial activities.

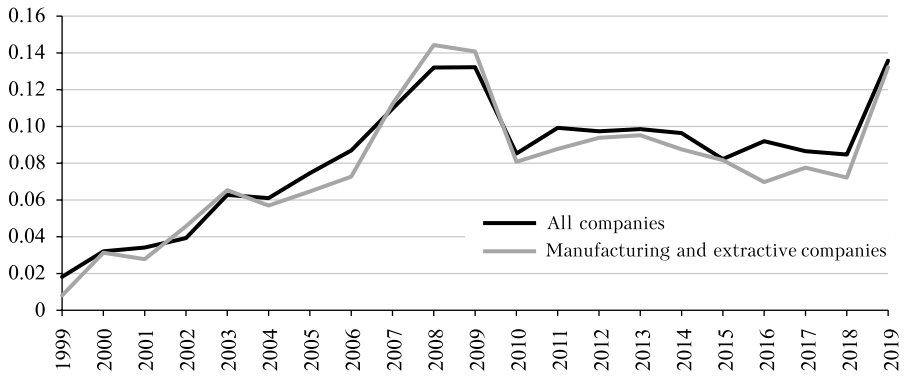

Fig. 1. Investment to capital ratio in Russia, 1999–2019.

Source: Compiled by the authors.

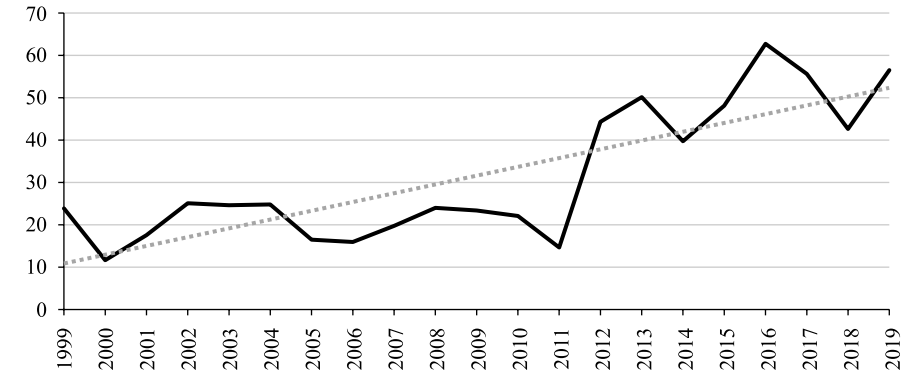

Fig. 2. The ratio of financial incomes to total income in Russia, 1999–2019 (%).

Source: Compiled by the authors.

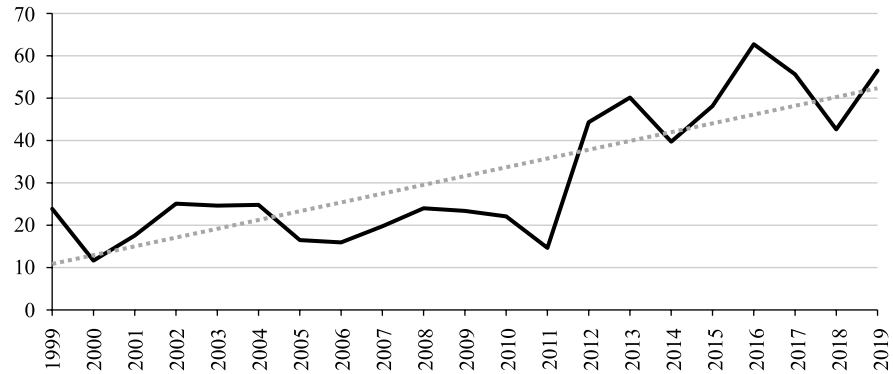

Fig. 3. The ratio of financial expenses to capital in Russia, 1999–2019 (%).

Source: Compiled by the authors.

Fig. 3 shows the ratio of finance expenses, including paid dividends to capital. In this case, a similar situation is observed. Starting in 2012, companies began to increase their financing expenses.

In conclusion, we would like to note that starting from 2010 one can observe a noticeable strengthening of the process of financialization in Russian non-financial companies. However, with the exception of the last period, capital investments during these years were in stagnation.

7. Methodology of econometric estimation

The equations presented above will be estimated in 2 stages. In the first step, they will be assessed using a fixed effects model. Such models are suitable for cases where there is a certain set of companies, and the estimates of interest to the researcher are related to the behavior of these companies. To eliminate the consequences of heteroscedasticity, the models will be built with robust errors. Furthermore, *F*-tests and Hausman tests will be performed on all models to confirm that the estimates obtained with the fixed effects model are better than the OLS or random effects model. As can be seen from the equations, in addition to the set of explanatory variables, the lags of the dependent variable will be included in the model. The main disadvantage of this model is that it does not solve the potential problem of endogeneity of lags in the dependent variable. Moreover, this model may be sensitive to unobservable panel heterogeneity. In this regard, the equations will be estimated by another model, and the results of the two estimates are compared.

The second step will be to evaluate the presented equations using a two-step difference GMM (Generalized method of moments) model (Arellano and Bond, 1991). This model is a powerful tool for analyzing firm-level data for samples in which the number of firms prevails over the number of time intervals. Compared to other estimation models such as OLS, fixed effects and random effects models, the GMM model has several advantages. First, this model is a powerful technique for controlling the potential endogeneity of lags in the dependent variable. Second, this model is not sensitive to bias in estimates due to missing variables. Third, it controls possible data heterogeneity. Furthermore, one of the obvious

advantages is that the model solves the problem of autocorrelation. Moreover, it is capable of eliminating unobservable fixed effects.

In each assessed specification, 2 and 3 lags of the dependent variable will be included as instruments, as well as the first lags of the remaining parameters as predefined indicators. For additional control over heteroscedasticity, robust errors will be used. The Arellano–Bond autocorrelation test will be used to test the endogeneity of the instruments. The validity of the instruments will be checked with the Hansen test.

8. Results of estimation

In this part of the paper, the results of the equation estimates using the fixed effects model and the GMM model will be presented and analyzed. Moreover, we will compare the results of estimates obtained by different models. Table 3 provides a description of all variables.

Let us start the analysis by estimating the equations using the fixed effects model. Column (1) of the Table 4 represents estimates for equation (3). As expected, investment lag and revenues have a positive effect on fixed asset accumulation, while an influence of interest expense is negative. However, the coefficient for retained earnings was insignificant. The second column presents the following model (4). Adding dividends to the model made all coefficients insignificant except for the CAPEX lag. Hence, it can be concluded that the addition of dividends did not improve the model. This specification is not suitable for analysis. Column (3) presents the results of estimating equation (5). Adding financial incomes improved the model; we got three significant coefficients. The signs of the coefficients, as in the first case, expectedly coincided with our assumptions. The fourth column

Table 3
Description of variables.

Variables in estimates	Variables in equations	Description of variables
L.capex_ln	$\ln\left(\frac{I}{K}\right)_{it-1}$	Investment in fixed assets
L.NI-dev_ln	$\ln\left(\frac{\pi - div}{K}\right)_{it-1}$	Retained earnings
L.rev_ln	$\ln\left(\frac{R}{K}\right)_{it-1}$	Revenue
L.IE_ln	$\ln\left(\frac{IE}{K}\right)_{it-1}$	Interest payments
L.CD_ln	$\ln\left(\frac{div}{K}\right)_{it-1}$	Dividend payments
L.II_ln	$\ln\left(\frac{\pi_F}{K}\right)_{it-1}$	Financial incomes
L.IE+Div_ln	$\ln\left(\frac{FE}{K}\right)_{it-1}$	Financial expenses
L.II_K_big	$\ln\left(\frac{\pi_F}{K} D_{big25}\right)_{it-1}$	Financial incomes of 25% biggest companies

Source: Authors.

Table 4
Estimates of equations by the fixed effects model.

	(1)	(2)	(3)	(4)	(5)
L.capex_ln	0.358***	0.388***	0.414***	0.373***	0.363***
	(0.0491)	(0.0483)	(0.0498)	(0.0514)	(0.0512)
L.NI-div_ln	0.0142	0.0187	0.0439*	0.0467*	0.0466*
	(0.0256)	(0.0244)	(0.0239)	(0.0255)	(0.0253)
L.rev_ln	0.161*	0.0144	0.0641	0.232**	0.209**
	(0.0911)	(0.0944)	(0.101)	(0.0969)	(0.0966)
L.IE_ln	–0.0888***	–0.0517	–0.0706**		
	(0.0322)	(0.0337)	(0.0322)		
L.CD_ln		0.0151	–0.0280		
		(0.0179)	(0.0184)		
L.II_ln			–0.0300	–0.0196	0.168**
			(0.0259)	(0.0264)	(0.0830)
L.IE+Div_ln				–0.114***	–0.111***
				(0.0331)	(0.0329)
L.II_K_big					–0.209**
					(0.0876)
F *p*-value	0.000	0.000	0.000	0.000	0.000
Hausman *p*-value	0.000	0.000	0.000	0.000	0.000

Note: Standard errors in parentheses; constants are omitted for brevity; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: Authors' calculations.

presents estimates of the model, in which dividend payments and interest expenses are combined into finance expenses. As we expected, investment lag, retained earnings and revenues have a positive impact on CAPEX. Financial expenses reduce investments, but the coefficient of financial incomes turned out to be negative, although not sufficiently significant. The last column presents the estimates of equation (7). In this specification, all coefficients turned out to be significant; that is, this model has great explanatory power. From these estimates, we find that, as in the previous case, the investment lag, retained earnings and revenue increase the accumulation of fixed assets, and financial expenses decrease it. As for financial incomes, the coefficient for small firms was 0.168. In other words, financial incomes in small firms have a positive effect on physical investment. For large firms, the coefficient was 0.168 + (–0.209) = (–0.041). That is, in large firms, financial incomes reduce investments in the real sector, and physical investments are crowded out by financial ones. We can conclude here that the consequences of financialization process in Russia depend on the size of the company.

In Table 5, we can see that ever since the 2008 financial crisis, there has been a change in the behavior of Russian non-financial companies. In this regard, we split our sample into two parts and estimate models (6) and (7) on a subsample starting from 2010. The first column of the table presents the estimates of the model (6) on the sample with observations starting from 2010. The signs for the coefficients remained the same as in the estimates for the full sample. However, in this case, revenue and financial expenses turned out to be insignificant. The second column presents the estimates of the model (7). A similar situation is observed here as with the estimates of the model 4. It is important to note that for small firms, since 2010, financial incomes have become insignificant. In the case of large companies, the negative impact of financial incomes increased compared to the general population.

Table 5
Estimates of equations by the fixed effects model on data from 2010.

	(1)	(2)
L.capex_ln	0.458***	0.431***
	(0.0575)	(0.0585)
L.NI-dev	0.0769***	0.0762***
	(0.0262)	(0.0260)
L.rev_ln	0.0128	–0.00567
	(0.131)	(0.130)
L.IE+Div	–0.0138	–0.0125
	(0.0424)	(0.0421)
L.II_ln	–0.0575*	0.166
	(0.0339)	(0.114)
L.II_K_big		–0.244**
		(0.119)
F *p*-value	0.000	0.000
Hausman *p*-value	0.000	0.000

Note: Standard errors in parentheses; constants are suppressed for brevity; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: Authors' calculations.

Fixed effects estimates were not comprehensive because too many factors were found to be insignificant.

Next, let us move on to the GMM model. As stated earlier, this model is most often applied to this kind of dynamic panel data. Column (1) of the Table 6 presents estimates of equation (3) by the GMM method. The expected signs at the coefficients were obtained, but the financial incomes were insignificant. The second column contains the estimates of the model (4). Here, all the coefficients turned out to be significant, in contrast to the estimates of the fixed effects, and all the signs were expected. Column (3) presents the estimates of the model (5). All coefficients except financial incomes are significant; the signs are expected. Column (4) contains the results for the model (6). We have received a positive and significant investment impact from last year's investment, retained earnings and revenues. Both proxies of financialization are significant and have a negative impact on the accumulation of fixed assets. Column (5) contains the estimates of the model (7). In this case, we can observe a phenomenon similar to the fixed effects model: financial incomes in small companies increase investments, while in large companies it decreases. All coefficients were found to be significant.

Further, by analogy with the estimates using the fixed effects model, we divide the sample by years and estimate models (6) and (7) starting from 2010, see Table 7. The first column contains the estimates of the model (6). In this case, we got the expected signs for significant variables. Revenue and financial incomes were insignificant. The second column estimates model (7). As in the rest of the cases, dividing the effect of financial incomes into effects for large and small firms increased the significance of the coefficients and the model as a whole. We found that, starting in 2010, financial incomes have a positive effect on investment in small firms with an elasticity of 0.525. The impact of financial incomes in large firms was negative.

Having estimated all our equations using two approaches, we are inclined to believe that the GMM model gives more efficient and meaningful estimates, so

Table 6
Estimates of equations using the GMM model.

	(1)	(2)	(3)	(4)	(5)
L.capex_ln	0.365***	0.362***	0.340***	0.246***	0.262***
	(0.0371)	(0.0462)	(0.0615)	(0.0378)	(0.0477)
L.NI-dev	0.137***	0.0771***	0.0638***	0.0968***	0.0901***
	(0.0181)	(0.0208)	(0.0190)	(0.0152)	(0.0188)
L.rev_ln	0.206***	0.297***	0.602***	0.347***	0.340***
	(0.0622)	(0.0656)	(0.150)	(0.0604)	(0.0417)
L.IE_ ln	–0.0583	–0.199***	–0.273***		
	(0.0373)	(0.0438)	(0.0366)		
L.CD_ln		–0.107***	–0.150***		
		(0.0241)	(0.0228)		
L.II_ln			–0.00480	–0.0188*	0.127*
			(0.0266)	(0.0126)	(0.090)
L.IE+Div				–0.253***	–0.236***
				(0.0268)	(0.0294)
L.II_K_big					–0.148*
					(0.091)
Arellano-Bond test AR(2) *p*-value	0.008	0.023	0.066	0.032	0.016
Hansen test *p*-value	0.400	0.190	0.381	0.408	0.381

Note: Standard errors in parentheses; constants are suppressed for brevity; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: Authors' calculations.

Table 7
Estimates of equations using the GMM model on data from 2010.

	(1)	(2)
L.capex_ln	0.284**	0.274**
	(0.129)	(0.132)
L.NI-dev	0.163**	0.178**
	(0.0687)	(0.0680)
L.rev_ln	0.0654	0.340*
	(0.383)	(0.318)
L.IE+Div	–0.292***	–0.257***
	(0.0923)	(0.0895)
L.II_ln	0.00174	0.525**
	(0.0697)	(0.235)
L.II_K_big		–0.548**
		(0.250)
Arellano-Bond test AR(2) *p*-value	0.093	0.039
Hansen test p-value	0.422	0.340

Note: Standard errors in parentheses; constants are suppressed for brevity; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Source: Authors' calculations.

further analysis will be based on it. While analyzing the models, we expectedly received a positive effect of investment lags, retained earnings and revenues. These results are consistent with those obtained by Orhangazi (2008) for the United States and those obtained by Tori and Onaran (2018) for the United Kingdom. Initially, we assumed that we would find that the financialization in the country contributes to the reduction of physical investment. In the full sample, we found that financial costs are reduced by physical investments. At the same time, finan-

cial incomes increase investments in fixed assets only in small and medium-sized companies; in large ones it also reduces them. Analysis of the data since 2010 confirmed our results. The difference lies only in the strength of the influence of factors. Thus, since 2010, financial incomes have had the strongest impact on the accumulation of fixed assets in small and medium-sized firms. In general, our results are consistent with the results of other researchers, despite our assumptions about Russian specificity.

It is worth noting that revenue, which approximates capacity utilization in the post-Keynesian investment model, has the greatest positive impact on physical investment. In turn, retained earnings do not have a significant impact. Financialization, expressed by financial outflows, has a significant impact on investment decline. The accumulation of fixed assets would have been 23.6% higher if it were not for the growth of financial payments. The growth of financial incomes in small and medium-sized companies increases investment by 12.7%, and in large companies it decreases investment by 2.1%. In the post-crisis period, the effect of financialization for large companies remained at about the same level, while for medium and small companies the effect of financial incomes doubled. Given the elasticity, it is financial payments that have the strongest negative impact on physical investments.

9. Conclusion

This paper presents an empirical study of the impact of financialization on fixed investment by non-financial companies in Russia, based on dynamic panel data. It was found that financial expenses aimed at paying interest on external financing and paying dividends — that is, focusing on shareholder value, and hence decreasing the internal funds of companies — reduce real investments. Financial incomes have shown the crowding-out effect for large companies. Financial incomes as additional "free" funds in large companies are not perceived as an opportunity to accumulate fixed assets. Managers prefer to increase financial investments instead of real ones. In small and medium-sized companies, financial incomes, however, drive growth. This can be explained because small firms, at a particular stage in their lives, find it more profitable to invest in their own growth. Results from the general sample, without dividing by size, indicate that financialization in Russia clearly reduces real investment. It is important to note that our results were obtained on a specific sample of publicly listed non-financial companies in Russia and may differ from other similar studies.

Our results are consistent with those of other authors obtained in other countries. So, for example, our results are comparable (but not completely so) to the results obtained by Tori and Onaran (2018) for the UK, Kuzmina and Rozmainsky (2020) for Spain–2020, Stockhammer (2004) for European countries, and Orhangazi (2008) for the USA. So, for example, we, like most authors, found that financial expenses have the strongest negative impact on investment in all companies and at all time periods. In terms of financial incomes, the results are similar to those obtained by Tori and Onaran (2018), and Stockhammer (2004), but slightly different from the conclusions obtained by Orhangazi (2008). We obtained a negative impact of financial incomes on physical investment in general and for large firms, and a positive effect for small and medium-sized firms. In turn, Orhangazi (2008) came to the conclusion that the influence of financial incomes

in the United States strongly depends on the size of companies and for the general sample received an insignificance of this indicator of financialization.

It is worth noting that our results confirm the criticism of mainstream literature (first of all, Neoclassical economics), which asserts the extremely beneficial effects of financialization on economic growth. The assumptions made in the post-Keynesian literature have been confirmed in our study.

This research is not exhaustive. It is necessary to continue research on this issue, to consider approaches to investment and financialization from a different point of view. In addition, other model specifications need to be checked. Furthermore, we did not consider in this paper the next important issues: what is the role of oil revenues in financialization? How is the Russian economy placed in the global economy? How does it impact the mode of financialization of Russian economy? These issues — as well as a detailed descriptive comparative analysis — are beyond the scope of this paper and can be relevant subjects in future investigations.

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References

Arellano, S., & Bond, M. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *Review of Economic Studies, 58*(2), 277–297. https://doi.org/10.2307/2297968

Arrow, K. J., & Debreu, G. (1954). Existence of an equilibrium for a competitive economy. *Econometrica, 22*(3), 262–290. https://doi.org/10.2307/1907353

Arestis, P., & Demetriades, P. (1997). Financial development and economic growth: Assessing the evidence. *Economic Journal, 107*(442), 783–799. https://doi.org/10.1111/j.1468-0297.1997.tb00043.x

Beck, T., & Levine, R. (2004). Stock markets, banks, and growth: Panel evidence. *Journal of Banking and Finance, 28*(3), 423–442. https://doi.org/10.1016/S0378-4266(02)00408-9

Dubinin, S. K. (2017). Financialization of economic growth and the Russian national financial system. *Finance: Theory and Practice, 21*(4), 6–21 (in Russian). https://doi.org/10.26794/2587-5671-2017-21-4-6-21

Epstein, G. (2001). *Financialization, rentier interests, and central bank policy*. Paper prepared for PERI Conference on "Financialization of the World Economy", December 7–8, University of Massachusetts, Amherst.

Fazzari, S. M., & Mott, T. L. (1986). The investment theories of Kalecki and Keynes: An empirical study of firm data, 1970–1982. *Journal of Post Keynesian Economics, 9*(2), 171–187. https://doi.org/10.1080/01603477.1986.11489611

Gilchrist, S., & Himmelberg, C. P. (1995). Evidence on the role of cash flow for investment. *Journal of Monetary Economics, 36*(3), 541–572. https://doi.org/10.1016/0304-3932(95)01223-0

Karayev, A. K. (2018). The impact of financialization and income inequality on economic growth, investment processes and innovation. *Economics, Taxes and Law, 11*(6), 57–68 (in Russian). https://doi.org/10.26794/1999-849X-2018-11-6-57-68

King, R. G., & Levine, R. (1993). Finance and growth: Schumpeter might be right. *Quarterly Journal of Economics, 108*(3), 717–737. https://doi.org/10.2307/2118406

Kuzmina, A. F., & Rozmainsky, I. V. (2020). The effect of financialization on investment by non-financial private sector in Spain: An empirical analysis. *Journal of Institutional Studies, 12*(3), 60–82 (in Russian). https://doi.org/10.17835/2076-6297.2020.12.3.060-082

Law, S. H., & Singh, N. (2014). Does too much finance harm economic growth?. *Journal of Banking and Finance, 41*(1), 36–44. https://doi.org/10.1016/j.jbankfin.2013.12.020

Levine, R. (2005). Finance and growth: Theory and evidence. In P. Aghion, & S. N. Durlauf (Eds.), *Handbook of economic growth* (vol. 1A, pp. 865–934). Amsterdam: Elsevier.

Orhangazi, Ö. (2008). Financialisation and capital accumulation in the non-financial corporate sector: A theoretical and empirical investigation on the US economy: 1973–2003. *Cambridge Journal of Economics, 32*(6), 863–886. https://doi.org/10.1093/cje/ben009

Palley, T. I. (2013). Financialization: What it is and why it matters. In *Financialization* (pp. 17–40). London: Palgrave Macmillan. https://doi.org/10.1057/9781137265821_2

Rozmainsky, I. V. (2017). Shock therapy as a generator of limits to rationality in the Russian transitional economy in the 1990s. *Terra Economicus, 15*(1), 68–78.

Stockhammer, E. (2004). Financialisation and the slowdown of accumulation. *Cambridge Journal of Economics, 28*(5), 719–741. https://doi.org/10.1093/cje/beh032

Tori, D., & Onaran, Ö. (2018). The effects of financialization on investment: Evidence from firm-level data for the UK. *Cambridge Journal of Economics*, *42*(5), 1393–1416. https://doi.org/10.1093/cje/bex085

Appendix

Table 1A
Descriptive statistics.

Variable		Mean	Std. Dev.	Min	Max	Observations	
compan~e	overall	236	135.9726	1	471	N =	9891
	between		136.1102	1	471	n =	471
	within		0	236	236	T-bar =	21
capex_ln	overall	–2.978716	1.466007	–12.93637	2.600736	N =	5215
	between		1.068768	–10.55236	–0.309454	n =	413
	within		1.159565	–12.53996	2.292087	T-bar =	12.6271
NI_ln	overall	–2.724152	1.549003	–13.12239	1.653318	N =	5208
	between		1.187168	–11.94350	0.099307	n =	423
	within		1.192258	–10.00700	1.681814	T-bar =	12.3121
div_ln	overall	–5.095919	2.886009	–17.47551	2.225593	N =	2460
	between		2.279001	–13.76912	–0.258572	n =	334
	within		2.070485	–14.83358	2.581405	T-bar =	7.36527
rev_ln	overall	0.5093375	1.355633	–11.741300	9.020822	N =	5556
	between		1.475678	–9.234753	4.385908	n =	424
	within		0.626564	–6.310561	6.995876	T-bar =	14.0472
NI_dev	overall	–2.817464	1.268519	–9.674927	–0.343412	N =	2128
	between		0.968546	–7.505400	–1.252509	n =	325
	within		0.957019	–9.517336	0.163441	T-bar =	6.46805
IE_abs~n	overall	–3.867194	1.561506	–13.106740	2.597495	N =	1005
	between		1.663068	–9.987738	0.797694	n =	118
	within		0.866851	–9.705004	0.520244	T-bar =	8.51655
II_ln	overall	–5.289112	1.430846	–13.516010	2.556244	N =	696
	between		1.180628	–8.793372	–2.366650	n =	88
	within		0.962155	–12.652750	–0.252544	T-bar =	7.90505
IEpDiv	overall	–3.010854	1.132211	–11.103380	1.553662	N =	667
	between		1.106447	–5.966106	0.797875	n =	87
	within		0.782303	–10.217220	–0.367189	T-bar =	7.66667