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Currency exchange rate as a business climate factor for foreign investors in the Russian Federation

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Abstract: The economic crisis in Russia between 2014 and 2017 revealed several patterns associated with changes in the exchange rate of the Russian currency and the dynamics of incoming foreign direct investment (FDI). Based on macroeconomic modelling, the authors assess the impact of the exchange rate on FDI flows into different countries as well as into Russia at the regional and sectoral levels. They conclude that strengthening the ruble's real exchange rate increases the potential of the domestic market of region and industries within Russia, and of the country as a whole, and leads to an influx of FDI into the Russian economy. The article was written on the basis of the RANEPA state assignment research program.

Keywords: foreign direct investment; FDI; exchange rate; Russian ruble; horizontal investments; vertical investments; business climate; economic sanctions; Russia.

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1 Introduction

Portfolio investment and foreign direct investment (FDI) are important sources of capital that complement domestic private and public investments. FDI is often associated with the creation of new jobs, the stimulation of technological exchange, and the promotion of overall economic growth in host countries. In particular, the exchange rate and its volatility are important determinants for FDI inflows (Lokesha and Leelavathy, 2012).

The depreciation of a currency associated with a decrease in its value relative to another currency may increase a country's competitiveness due to lower wages and production costs. Therefore, the country becomes more attractive for investing in production facilities by increasing profitability for foreign investors implementing projects in that country. However, several factors can affect this attractiveness. First, a change in the exchange rate should also change the relative production costs in different countries, and therefore should not be offset by wage increases and production costs in the country receiving FDI. Second, investors' expectations regarding the further increase in the exchange rate are reflected in the rising cost of financing an investment project, since interest rate parity equalises the expected return rates in different countries with some risk adjustment.

The economic sanctions imposed on Russia by the Western economies in 2014 resulted in most foreign investors revising their strategies. In general, the ruble's depreciation due to the fall in world oil prices and sanctions pressure contributed to the decline in FDI in the Russian economy in 2014–2016 (Zaytsev, 2017). However, different firms reacted to the crisis in various ways. Table 1 shows that in 2015, as a result of the political effects of Russia's currency depreciation, foreign firms targeting the Russian market (horizontal investments) reduced their FDI volumes, while firms focused on exports (vertical investments) increased their fixed asset investments (Loshchenkova and Zaytsev, 2019).

Table 1 Some actions taken by foreign investors in Russia, 2015

'Horizontal' investment	*'Vertical' investment*
MITSUBISHI MOTORS RUS (Japan) reduced investments by 30%	RUSHONG-HUA CO. LIMITED (China) increased investments by 33% to USD12.5 million in the oil and gas sector, which amounted to 35.52% of its revenue
AIS BETAILUNGS (Germany), which produces electronic equipment for cars, reduced investments by 26%, which resulted in a decease of 22% in revenue	JSC INGA (UK) increased investments by USD8.03 million in the oil and gas sector

Source: Compiled by the authors based on data from the Ruslana Database (https://www.bvdinfo.com/ru-ru/our-products/data/national/ruslana)

As an example, by the end of 2017, the volume of FDI in Russia just from European Union countries exceeded USD14 billion, more than six times the level of 2016 (Zaytsev, 2018). On the one hand, this may have been due to European investors increasingly using localisation strategies. On the other hand, this trend suggests a positive relationship between a strengthened national currency exchange rate and increased FDI inflows. Thus, this article attempts an empirical assessment of the correlation between FDI inflows and

exchange rate fluctuations to check the fairness of the trends in Russia from 2014 to 2017.

To address the topic, this article reviews theoretical and empirical literature to establish the hypotheses. It also checks the proposed hypotheses using econometric models to assess the impact of the exchange rate on FDI inflows to countries around the world, as well as to Russia at national, sectoral and regional levels.

2 Literature review

The literature review reveals three main categories of FDI research: models that study FDI at the micro level, models that study FDI at the macro level, and modern mixed (eclectic) models that combine different approaches. In the first category, the earliest FDI model (the classical model) explains economic cooperation between developed and developing countries (Kemp, 1964). According to the classical model, developed countries are interested in investing in developing countries to improve their well-being. If the interest rate in developing countries is higher than capital productivity in developed countries, then both parties benefit. As found by MacDougall (1960), the direction of FDI flows is determined by the difference between the interest rates of the countries involved.

Another macro-level FDI model is based on the effects of exchange rates. This model was proposed by Robert Aliber and considers the relationship between FDI flows and exchange rate fluctuations (Knickerbocker, 1973). It is based on the sustainability of different currencies and differences in sustainability in the FDI host country and source country. Aliber suggests that weaker currencies (as compared to the stronger currency of the investing country) help attract FDI because they create an opportunity to take advantage of the differences in the market capitalisation rate. However, the model does not explain FDI inflows in countries with a regulated exchange rate. A dynamic model of exchange rate expectations was proposed later by Cushman (1985) and Chen et al. (2006). They show that the expected currency devaluation in the host country may positively or negatively correlate with the inflow of FDI.

Chen et al.'s (2006) research categorises FDI into two groups: market-oriented (horizontal FDI) and export-oriented (vertical FDI). They show that there is a negative relationship between the expected currency devaluation and market-oriented FDI in and a positive relationship between the expected currency depreciation and export-oriented FDI in the host country.

Thus, different types of investments react to changes in exchange rates differently. Exchange rate depreciation may slow down the flow of horizontal FDI into a country. However, it contributes to the inflow of vertical FDI (Aizenman and Marion, 2004). Some researchers reject the empirical significance of interest rate parity, suggesting the imperfection of capital markets and the lack of full information available to investors about projects they support abroad (Froot and Stein, 1991).

In the second category, there are two models associated with the micro level, namely the oligopolistic FDI model and the internalisation model. The oligopolistic FDI model is based on imperfect markets (Lahiri and Ono, 2008). It identifies three important motives that influence the choice of a country as a place to create a new enterprise:

a firms seek to expand access to the host country's market

b firms want to use factors inherent in the host country

c firms follow their competitors' strategies (Head et al., 2002) in order not to lose their strategic advantage.

In particular, Head et al. (2002) claim that in oligopolistic industries market leaders that invest abroad are followed by their home competitors (Knickerbocker, 1973).

The internalisation model focuses on explaining the growth of transnational firms and what motivates them to participate in FDI projects (Buckley and Casson, 1976). It assumes that a firm overcomes the imperfections of world markets by creating a local market when it will have an advantage. Buckley and Casson (1976) admit that foreign firms have oligopolistic power in FDI-receiving countries, which helps multinational corporations create barriers to entry and control capital flows. Thus, the internal market allows the firm to reduce its costs through integration, pricing transfer and economies of scale (Kim, 2010).

In the third category, the eclectic FDI model combines the main theories of an imperfect market (the oligopolistic theory and the theory of internalisation) and adds a location element when the host country should have particular location advantages (location-specific advantages or L-advantages) compared with other countries, including the investor's country of origin (Dunning, 1980).

The eclectic model suggests that the more benefits a firm receives as a result of internalisation and the more benefits it will create, acquire and use by the expense of its location outside its own country, the greater the inflow of FDI to its host country.

The literature review has also revealed researches focused on regional cases that confirm positive correlations between the exchange rate ratio of the national currency and the FDI inflow. Alba et al. (2009) find that in a favourable FDI environment in the USA, the exchange rate has a positive and significant effect on the average rate of FDI inflows. Lokesha and Leelavathy (2012) identify the exchange rate as one of the main factors affecting FDI flows into India.

The research cited above is relevant to this paper and its research hypotheses to explain the relationship between the exchange rate and the inflow of FDI into the national economy.

3 Empirical provisions for research model and hypotheses

Several empirical models justify the link between FDI and the exchange rate. Chakrabarti and Scholnick (2002) analysed the impact of exchange rate expectations on FDI in developed countries. They put forward three hypotheses for testing:

Hypothesis 1 The forthcoming depreciation of foreign currency reduces the volume of FDI into the country.

Hypothesis 2 The volume of FDI increases if the national currency of the investing country depreciates.

Hypothesis 3 The high volatility of the national currency of the investing country hinders incoming FDI.

To test these hypotheses, the authors modified Chakrabarti and Scholnick's (2002) model to define FDI using independent variables including exchange rate levels, fluctuations and shocks. Also, the model was modified using a proxy variable concerning the

asymmetry of the exchange rate and the addition of independent variables such as market capacity, salary, export potential of the country and the current inflation rate. These additional variables reflect important factors that determine the level of FDI in a country. This model is the following [equation (1)]:

$$FDI_{it} = \beta_0 + \beta_1 \Delta REER_{it} + \beta_2 FXD_{it} + \beta_3 TFXD_{it} + \beta_4 X_{it} + \mu_i + \varepsilon_{it} \quad (1)$$

where FDI_{it} is inbound FDI to developing countries, $REER_{it}$ is the real effective exchange rate of the FDI host country, FXD_{it} is the exchange rate of the two countries, adjusted for inflation, $TFXD_{it}$ is the time component of the exchange rate of the countries, X_{it} is the value of other variables involved in the model, and μ_{it} is effects on the country, changing over time.

Moreover, it is necessary to note the role of ε, which reflects errors in the specification of the model, which are associated with the consequences of the implementation of economic policy, the role of state institutions, and differences in the level of liberalisation of the investment regime.

Regarding the exchange rate of currencies adjusted for inflation, the model applies the average level of the exchange rate between the two countries (the value of the national currency against the US dollar). The level of the exchange rate is also adjusted for inflation (FXD).

To solve the problem of limited data in the countries that arose in the study, a proxy variable of the expected change in the exchange rate of the national currency is used as a measure of the change in the REER in the country where the FDI is directed.

Udomkerdmongkol et al. (2008) suggest that the nominal exchange rate tends to equilibrium. In this regard, fluctuations in the nominal value of the exchange rate indicate how its value will change in future.

Thus, the change of the REER indicator (both decreasing and increasing) within the framework of the assessed model indicates that the strengthening or depreciation of the national currency can be expected if it deviates from the equilibrium state. Having analysed empirical data on the real exchange rates in 93 developing economies from 1960 through 1994, Goldfajn and Valdés (1999) showed that an overvalued exchange rate can contribute to current account deficits as a result of the currency's loss of competitiveness. The appropriate policy of the national central bank could lead to wasted national foreign exchange reserves.

Such a situation can be corrected by implementing an appropriate monetary policy associated with the nominal devaluation of the national currency. Thus, overestimations of the level of the real exchange rate in most cases shifted the value of the nominal devaluation.

The value of the effective exchange rate can provide useful information for decision-makers about the competitiveness of the investing country (Waiquamdee et al., 2005). To determine whether the effective exchange rate is overvalued or undervalued at a given time, it is necessary to compare it with the value of the base period index.

For modelling purposes, it is necessary to understand whether the value of the REER is an effective indicator for determining the equilibrium value of the exchange rate of the national currency. To solve the practical problem of determining the REER's value of the national currency, a proxy variable is often used.

The theoretical premise assumes that if the economic situation of the state improves, the REER value rises relative to the base period. This in turn means that both direct and portfolio investments will increase in the country.

From a macroeconomic point of view, this situation is not optimal in the long-term, since the 'expensive' currency contributes to the formation of a negative current account balance. In this case, imports exceed exports due to a decrease in the competitiveness of national exports. In this regard, the central bank in the country of investment can adjust by buying the foreign currency. This can help devalue the currency (Goldfajn and Valdés, 1999). Such a measure, in turn, may contribute to a decline in FDI flows into the country (Broll, 1992). The expected devaluation of the local currency reduces the current flow of FDI into the country.

The opposite situation is also possible when the exchange rate of the national currency decreases. In the theoretical scenario, among the main factors affecting exchange rate depreciation are the trend component, a cyclical component, and other components that cannot be predicted. The level of the exchange rate of the currency in the future and construct its long-term trend can be assumed based on the analysis of these three factors (Udomkerdmongkol et al., 2008).

In international practice, a country's international competitiveness is usually assessed using the average exchange rates of key trading partners by assigning weights that depend on the trading position of each partner. This tends to adjust for differences in inflation rates between countries that trade with each other.

The theoretical and empirical provisions give a basis for the main hypotheses of the study that are related to the effect of the exchange rate on various types of FDI:

Hypothesis 1 A decrease in the exchange rate of the FDI host country will correlate with a decrease in horizontal FDI in this country and with an increase in vertical FDI in it.

Hypothesis 2 The more country is export oriented, the less FDI increases at a stronger exchange rate (the negative impact of strengthening exchange rates on export-oriented industries).

4 Research methodology

To test the formulated hypotheses, we evaluate three econometric equations. The first equation analyses the impact of the exchange rate fluctuations on FDI flows into different countries of the world. The second equation assesses the impact of the exchange rate fluctuations on FDI flows into Russia. The third equation illustrates the impact of the exchange rate fluctuations on FDI inflows in key sectors of the Russian economy.

To assess the impact of the exchange rate on FDI flows into country i in year t, we evaluate a model with the individual fixed effects [equation (2)]. Panel regression analysis was based on 13 developed and 15 developing countries from 1999 to 2016 (18 years). Thus, the number of observations in the sample is 504.

$$\begin{aligned}\ln FDI_{it} = {} & \alpha + \beta_1 REER_{it} + \beta_2 \ln REER * ExpShare_{it} + \beta_3 \ln Interrate_{it} \\ & + \beta_4 \ln GDP_{it} + \beta_5 \ln Portfolio_{it} + \beta_6 \ln Inflation_{it} + \varepsilon_i\end{aligned} \tag{2}$$

where $\ln REER_{it}$ is a log of the REER of country i in year t, $\ln REER_{it} * ExpShare_{it}$ is an interaction term of a log of the REER of country i in year t and export share of the gross domestic product (GDP) of country i in year t, $\ln InterRate_{it}$ is a log of real interest rates for a loan in country i in year t, $\ln GDP_{it}$ is a log of GDP at constant prices of country i in year t, $\ln Portfolio_{it}$ is a log of the ratio of portfolio investment to GDP for country i in year t, $\ln Inflation_{it}$ is a log of inflation rates for country i in year t, and ε_i reflects the individual fixed effects of countries.

This formula does not include indices of the country's investment attractiveness due to a high correlation with other explanatory variables. In particular, it does not include the ratio of portfolio investment inflows to a country's GDP, because portfolio investments are made in countries with a favourable investment climate. The model also does not include the variable of exchange rate volatility due to the lack of data for this indicator.

In our opinion, there is no significant effect of FDI on the real exchange rate in different situations. In a situation of FDI inflow for the production of goods for the domestic market, the impact on the exchange rate will be offset by lower prices, higher wages and higher production costs. As a result, the inflow of FDI will slow down. FDI flow into a country with a high share of imports will lead to an increase in demand for imported components and a negative impact on the exchange rate. But because of increased production costs, FDI inflows will likely slow down and the exchange rate will recover.

In either case, the impact of the exchange rate on FDI will be significantly greater than the impact of FDI on the exchange rate. It is important to note that the strength of these effects depends on the country (or of the industry or region within Russia) and its mode of foreign trade (export production or orientation towards the domestic market, high or low share of imports in production), which is captured in the models by individual effects per country (or industry or region).

In addition, certain factors affect both FDI and REER, such as a country's political regime or the level of investment confidence. For the purposes of this study, we therefore included the variables of portfolio investment value, level of corruption and credit rating. The influence of missing factors is captured by individual effects.

To assess the impact of the exchange rate on FDI inflows on 22 Russian industrial sectors, we evaluated a model with individual fixed effects using data from 2005 to 2016 [equation (3)].[1] Thus, the number of observations (taking into account missing values for some variables) is 197.

$$\begin{aligned}\ln FDI_{it} = {} & \alpha + \beta_1 \ln REER_t + \beta_2 \ln REER_t * ExpShare_{it} + \beta_3 \ln Corrupt_t \\ & + \beta_4 \ln COC_t + \beta_5 \ln Volatility_t + \beta_6 \ln InflationRUS_t + \beta_7 Rating_t \\ & + \beta_8 Pereschet_t + \varepsilon_i\end{aligned} \tag{3}$$

where $\ln REER_t$ is a log of Russia's REER in year t, $\ln REER_t * ExpShare_{it}$ is an interaction term of a log of Russia's REER in year t and the export share of production of sector i in year t, $\ln Corrupt_t$ is a log of the index of corruption perceptions in Russia in year t, $\ln COC_t$ is a log of interest rates on loans in Russia in year t, $\ln Volatility_t$ is a log of the volatility of the ruble's nominal exchange rate in year t, $\ln InflationRUS_t$ is a log of inflation rates in Russia in year t, *Rating* in Russia's credit rating in year t, $Pereschet_t$ is a dummy variable to control changes in FDI accounting after 2009, which is 0 before 2008 and 1 from 2009 on, and ε_i includes the fixed individual effects of sectors.

This formula does not include portfolio investments, as there are no adequate statistical data on the dynamics of portfolio investments by sector in the Russian economy.

To assess the impact of the exchange rate on FDI flows into region i in year t, we evaluated a model of fixed individual effects on a sample from all regions in Russia from 2000 to 2016 [equation (4)]. Thus, the number of observations (taking into account missing values for some variables) is 1,212.

$$\begin{aligned}\ln FDI_{it} = \alpha + \beta_1 \ln REER_t + \beta_2 \ln REER_t * ExpShare_{it} + \beta_3 \ln Corrupt_t \\ + \beta_4 \ln COC_t + \beta_5 \ln VRP_{ti} + \beta_6 \ln Volatility_t + \beta_7 \ln Inflation_{it} + \varepsilon_i\end{aligned} \quad (4)$$

where $\ln REER_t$ is a log of Russia's REER in year t, $\ln REER_t * ExpShare_{it}$ is an interaction term of a log of Russia's REER in year t and export share of gross regional product (GRP) of region i in year t, $\ln Corrupt_t$ is a log of the index of corruption perceptions for Russia in year t, which is calculated as a ratio of Russia's rank in the index to the number of countries ranked, $\ln COC_t$ is a log of long-term interest rates in Russia, $\ln VRP_{it}$ is a log of the GRP of region i in year t, $\ln Volatility_t$ is a log of the volatility of the ruble's nominal exchange rate in year t, $\ln Inflation_t$ is a log of inflation rates in region i in year t, and ε_i includes the individual fixed effects of the region.

This formula does not include variable inflows of portfolio investments in the region due to the lack of adequate statistical data, as well as the lack of indices on data investment attractiveness since it strongly correlates with indices of freedom from corruption, which are included in the model.

5 Statistics

This study used data from the World Bank's database on FDI inflows to countries in the Organisation for Economic Co-operation and Development (OECD) and the BRICS members of Brazil, Russia, India, China, and South Africa on exports of goods and services, inflation rates, GDP, volume of portfolio investments and loan interest rates (World Bank, 2018), REER figures were taken from the database of the International Monetary Fund (IMF, 2018).

The data on FDI inflows for Russian industries were taken from the Bank of Russia (2019) and Rosstat (2018a). The data on the volume of commodity exports and gross value added of industries came from the Rosstat (2018b, 2018c) databases, in particular the sections on 'national accounts' and 'industrial production'. To eliminate missing values in these databases we completed the data as follows: for the variable $\ln REER_t * ExpShare_{it}$, exports of services by industry (type of activities) were represented by the values of foreign trade (export) services indicators, based on the sixth edition of the IMF Balance of Payments and International Investment Position Manual (IMF, 2009) and the Manual on Statistics of International Trade in Services of the United Nations Department of Economic and Social Affairs (2010). The annual volatility of the ruble exchange rate was calculated on data describing the average monthly nominal exchange rate of the US dollar to the ruble, collected from the databases of the Bank of Russia (2019) and Rosstat (2018b). The data on Russian inflation are from Rosstat (2018e).

The data on long-term interest rates in Russia are taken from the OECD (2018). Transparency International's (2018) corruption perceptions index was used. The higher

Russia's rank, the more widespread is corruption in the country. Russia's long-term credit rating was taken from Trading Economics (2018). With regard to specific industries the average inflation rate for Russia was used as a variable in formula (3) by industry (unlike the calculations by country or region) because the inflation rate in a particular industry does not affect FDI flows into this industry. The difference in regional inflation levels matters because it reflects either the rate of regional economic development or a decline in the real purchasing power of that regional population. Thus, it affects FDI inflows.

The data on FDI flows into the regions within Russia are taken from the Bank of Russia (2019) and supplemented by data from Rosstat (2018d). The data on exports, GDP, and regional inflation rates originate from Rosstat's (2018d) yearbook *Regions of Russia. Socio-economic Indicators*.

6 The empirical results

Table 2 presents the results of the evaluation of three the formulae for the OECD and BRICS countries and for Russian industries and regions.

According to the estimates for the OECD and BRICS countries, almost all the hypotheses are not rejected at the 1% significance level. However, the coefficient for the variable of a log of the inflation rate is not significant. This can be explained by the fact that economic activity increases as inflation rises. This may contribute to FDI inflows. The coefficients at the variables of exchange rates, GDP, and portfolio investments have an expected positive result and are highly significant. This means that as a country's GDP grows, the purchasing power of the population and the volume of the domestic market also grow. This makes market-oriented foreign investments in that country profitable.

A slowdown of FDI inflows should be expected for an export-oriented country if its currency is strengthening. This can be explained by FDI aimed at locating production with a high share of imports (for example, components or raw materials) or focused on the domestic market. It can also be caused by a share of capital-intensive exports that is higher than the share of labour-intensive exports. Therefore when the exchange rate is strengthened, domestic producers in export-oriented countries will attract FDI that is necessary for purchasing equipment and other capital assets for production.

The growth of portfolio investments in a country indicates a high degree of investor confidence in that country, which also contributes to the growth of FDI inflows. The coefficient of the interest rate variable has a negative result and is highly significant. As a country's interest rate grows, its FDI inflows will decrease, because the cost of capital will increase, which will make attracting further business development difficult. The demand for products in a country will likely decrease, especially for intermediate products.

With regard to the Russian sectors, only the coefficients of the variables of the real exchange rate and interest rate are significant. With an increase in interest rates, FDI inflows grow because the price of capital grows. With the growth of the real exchange rate, FDI inflows to any industry increase. This also indicates the orientation of localised production towards the domestic market. The coefficients of the interaction term, inflation, credit rating, and volatility variables have the expected results, but are statistically insignificant due to a small number of observations.

Table 2 Results of models with fixed individual effects, by OECD and BRICS countries, by Russian industries and by Russian region

Variables	*OECD and BRICS countries*	*Industries*	*Regions*
Log of the real effective exchange rate of country *i* in year *t*	1.108*** (0.276)	2.989* (1.703)	1.997*** (0.536)
Interaction term log of the real effective exchange rate and export share of GDP in year *t*	0.231*** (0.059)	–0.023 (0.250)	–0.025 (0.033)
Log of real interest rate on loans	–0.159*** (0.055)	3.922*** (1.472)	1.021*** (0.210)
Log of GDP	0.679*** (0.049)	–	–
Log of GRP	–	–	1.103*** (0.088)
Log of the ratio of portfolio investment to GDP	0.174*** (0.024)	–	–
Log of inflation rate in year *t*	–0.054 (0.051)	3.164 (4.124)	–0.702 (1.573)
Log of index of corruption perception in Russia in year *t*	–	1.944 (2.076)	–1.840*** (0.723)
Russian credit rating in year *t*	–	0.675 (0.575)	–
Log of the volatility of ruble nominal exchange rate in year *t*	–	–0.239 (0.149)	0.048 (0.042)
Dummy for changes of FDI accounting	–	–0.870* (0.475)	–
Number of observations	500	197	1212
R^2 within	0.3811	0.1378	0.3165
R^2 between	0.8583	0.1283	0.5307

Note: Abbreviations: BRICS = Brazil, Russia, India, China and South Africa, FDI = foreign direct investment, GDP = gross domestic product, GRP = gross regional product and OECD = Organisation for Economic Co-operation and Development (OECD).

Source: Authors' calculations

Based upon the coefficients of determination, the specification by regions is adequate. The REER variable has the expected positive coefficient, which is significant at the level of 1%. Thus, the growth of the real exchange rate has a positive effect on FDI flows into regions in Russia. The coefficients of the variables of corruption, GRP, and interest rates have the expected results and high statistical significance. With the growth of corruption in Russia, regional FDI inflows decrease as the investment climate worsens and the costs of doing business and risks to potential foreign investors increase. GRP growth indicates an increase in the purchasing power of the population and in the size of the domestic regional market, which are considered incentives for FDI in that region.

Unfortunately, the obtained coefficient of the interaction term of the log of the exchange rate and the share of exports in a region's GRP is not statistically significant. However, the variable has an expected negative result. The coefficients of the variable of

exchange rate volatility and the level of regional inflation are also insignificant. The insignificance of nominal exchange rate volatility can be explained by the fact that exchange rate volatility was calculated for Russia as a whole, so the indicator does not differentiate between regions in the same year. The actual REER may differ significantly among the regions.

The insignificance of the coefficient at the regional level of inflation is explained by the two-way effect of inflation on the FDI inflow. The proposed hypothesis was based on low inflation as an indicator of stability and low currency risks for investors. Thus, its growth hurts FDI inflows. However, rising inflation may indicate economic growth and increased business activity, which contribute to FDI flows into a region.

Thus, the increase in the ruble's real exchange rate strengthens the potential of the domestic market of Russian regions, industries, and the economy as a whole by stimulating the FDI inflow.

7 Conclusions

Despite the pressure caused by sanctions, foreign companies continue to invest in Russian food and manufacturing markets to localise production processes as a result of the ruble's devaluation in 2014. Foreign agricultural companies moved production to Russia to avoid the impact of embargoes on import processes for agricultural products.

The decrease in FDI inflows in 2015 and 2016 is associated with a decline in the interest of foreign (especially Western) investors in Russia. This situation could change if foreign investors' risk perceptions of the Russian market improve. Risks can be substantially reduced by improving the investment climate factors characterised by regulatory, macroeconomic and political issues.

As the examples show, localisation strategies can facilitate FDI flows into the Russian economy. Domestic markets are also greatly benefiting from localised production by foreign manufacturers in Russia, because local producers benefit through new skills and technologies.

Our research confirms the hypotheses about the significance of the exchange rate impact on FDI inflows at the national, regional and sectoral levels. Essentially, the exchange rate is a key factor in an investment climate that characterises the national economy.

References

Aizenman, J. and Marion, N. (2004) 'The merits of horizontal versus vertical FDI in the presence of uncertainty', *Journal of International Economics*, Vol. 62, No. 2, pp.125–148.

Alba, J.D., Park, D. and Wang, P. (2009) *The Impact of Exchange Rate on FDI and the Interdependence of FDI Over Time*, ADB Economics Working Paper Series, No. 164.

Bank of Russia (2019) *Statistika vneshnego sektora (External Sector Statistics)* [online] http://www.cbr.ru/statistics/macro_itm/svs/ (accessed 25 January 2019).

Broll, U. (1992) 'The effect of forwarding markets on multinational firms', *Bulletin of Economic Research*, Vol. 44, No. 3, pp.233–240.

Buckley, P.J. and Casson, M. (1976) *The Future of Multinational Enterprises*, Macmillan, London.

Chakrabarti, R. and Scholnick, B. (2002) 'Exchange rate expectations and foreign direct investment flows', *Weltwirtschaftliches Archiv*, Vol. 138, No. 1, pp.1–21.

Chen, K-M., Rau, H-H. and Lin, C-C. (2006) 'The impact of exchange rate movements on foreign direct investment: market-oriented versus cost-oriented', *The Developing Economies*, Vol. 44, No. 3, pp.269–287.

Cushman, D.O. (1985) 'Real exchange rate risk, expectations, and the level of direct investment', *Review of Economics and Statistics*, Vol. 67, No. 2, pp.297–308.

Dunning, J.H. (1980) 'Towards an eclectic theory of international production', *Journal of International Business Studies*, Vol. 11, No. 1, pp.9–31.

Froot, K.A. and Stein, J.C. (1991) 'Exchange rates and foreign direct investment: an imperfect capital markets approach', *Quarterly Journal of Economics*, Vol. 106, No. 4, pp.1191–1217.

Goldfajn, I. and Valdés, R.O. (1999) 'The aftermath of appreciations', *Quarterly Journal of Economics*, Vol. 114, No. 1, pp.229–262.

Head, K., Ries, J. and Mayer, T. (2002) 'Revisiting oligopolistic reaction: are decisions on foreign direct investment strategic complements?', *Journal of Economic and Management Strategy*, Vol. 11, No. 3, pp.23–39.

International Monetary Fund (IMF) (2009) *Balance of Payments and International Investment Position Manual* [online] https://www.imf.org/external/pubs/ft/bop/2007/pdf/bpm6.pdf (accessed 25 January 2019).

International Monetary Fund (IMF) (2018) *International Financial Statistics* [online] http://data.imf.org/?sk=4C514D48-B6BA-49ED-8AB9-52B0C1A0179B (accessed 25 January 2019).

Kemp, M.C. (1964) 'World monetary arrangements', *Economic Papers*, Vol. E1, No. 17, pp.3–85, The Economic Society of Australia.

Kim, C.Y. (2010) *The Exchange Rate Effects on the Different Types of Foreign Direct Investment*, PhD thesis, University of Oregon.

Knickerbocker, F.T. (1973) *Oligopolistic Reaction and Multinational Enterprise*, Division of Research, Harvard University, Cambridge, MA.

Lahiri, S. and Ono, Y. (2008) *An Oligopolistic Heckscher-Ohlin Model of Foreign Direct Investment*, Discussion Paper No. 55, Southern Illinois University, Carbondale [online] http://opensiuc.lib.siu.edu/econ_dp/55 (accessed 25 January 2019).

Lokesha, B.K. and Leelavathy, D.S. (2012) 'Determinants of foreign direct investment: a macro perspective', *Indian Journal of Industrial Relations*, Vol. 47, No. 3, pp.459–469.

Loshchenkova, A. and Zaytsev, Y. (2019) 'The impact of exchange rate dynamics on foreign direct investments inflow to the Russian Federation', *Journal of the New Economic Association*, in Russian, Vol. 4, No. 44, pp.127–142.

MacDougall, G.D.A. (1960) 'The benefits and costs of private investment from abroad: a theoretical approach', *Economic Record*, Vol. 36, No. 73, pp.13–35.

Organisation for Economic Co-operation and Development (OECD) (2018) *Long-term Interest Rates* [online] https://data.oecd.org/interest/long-term-interest-rates.htm (accessed 25 January 2019).

Rosstat (2018a) *Finansy Rossii (Russia's Finance)* [online] https://rosstat.gov.ru/bgd/regl/b18_51/Main.htm (accessed 25 January 2019).

Rosstat (2018b) *Nacionalnye scheta ((National Accounts)* [online] https://rosstat.gov.ru/bgd/regl/b19_15/Main.htm (accessed 25 January 2019).

Rosstat (2018c) *Promyshlennoye proizvodstvo (Industrial Production)* [online] https://rosstat.gov.ru/enterprise_industrial (accessed 25 January 2019).

Rosstat (2018d) *Regiony Rossii. Socialno-ehkonomicheskoe polozhenie (Russian Regions. Socio-economic Development)* [online] https://rosstat.gov.ru/bgd/regl/b19_14p/Main.htm (accessed 25 January 2019).

Rosstat (2018e) *Tseny (Prices)* [online] https://rosstat.gov.ru/price (accessed 25 January 2019).

Ruslana Database [online] https://www.bvdinfo.com/ru-ru/our-products/data/national/ruslana (accessed 25 January 2019).

Trading Economics (2018) *Russia – Credit Rating* [online] https://tradingeconomics.com/russia/rating (accessed 25 January 2019).

Transparency International (2018) *Corruption Perceptions Index* [online] https://www.transparency.org/research/cpi (accessed 25 January 2019).

Udomkerdmongkol, M., Morrissey, O. and Holger, G. (2008) *Exchange Rates and Outward Foreign Direct Investment: US FDI in Emerging Economies*, WIDER Working Paper Series RP2008-102, World Institute for Development Economic Research (UNU-WIDER) [online] https://ideas.repec.org/p/unu/wpaper/rp2008-102.html (accessed 5 May 2019).

United Nations Department of Economic and Social Affairs (2010) *Manual on Statistics of International Trade in Services* [online] https://unstats.un.org/unsd/publication/seriesm/seriesm_86rev1e.pdf (accessed 25 January 2019).

Waiquamdee, A., Disyatat, P. and Pongsaparn, R. (2005) *Effective Exchange Rates and Monetary Policy: The Thai Experience*, Discussion Paper No. 4, Bank of Thailand.

World Bank (2018) *World Development Indicators* [online] http://databank.worldbank.org/data/reports.aspx?source=world-development-indicators (accessed 25 January 2019).

Zaytsev, Y.K. (2017) 'Makroehkonomicheskie factory formirovaniya investicionnogo klimata' ('Macroeconomic factors of investment climate'), *Ehkonomicheskij analiz: teoriya i praktika (Economic Analysis: Theory and Practice)*, Vol. 16, No. 6, pp.1012–1021.

Zaytsev, Y.K. (2018) 'Pryamye inostrannye investicii v 2017 g' ('Foreign direct investments in 2017'), *Ehkonomicheskoe razvitie Rossii (Economic Development in Russia)*, Vol. 25, No. 7, pp.11–15.

Notes

1 The 22 sectors of the Russian economy are: real estate operations, rental, and provision of services; financial activities; transportation and communication; hotels and restaurants; wholesale and retail trade; repair of motor vehicles, motorcycles, household goods, etc.; building; production and distribution of electricity, gas and water; production of vehicles and equipment; production of electrical, electronic and optical equipment; production of machinery and equipment; production of rubber and plastic products; chemical production; production of coke and petroleum products; pulp and paper production, publishing and printing; wood processing and production of wood products; production of leather, leather goods and footwear; textile and clothing production; food production, including beverages and tobacco; mining; fishing, fish farming; agriculture, hunting and forestry.