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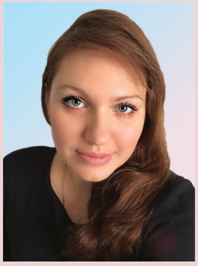
Modeling of Diversification of Market as a Basis for Sustainable Economic Growth*



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Abstract. The article considers the issue of dependence of key macroeconomic indicators on the energy supply price dynamics, especially oil price, relevant to the modern Russian economy. In order to overcome the negative trends related to oil price dynamics, the authors propose to consider the measures on the gradual diversification of the Russian economy as an effective tool of state regulation. To test the hypothesis that diversification contributes to the increase in sustainability of the national economic system, the authors review the simultaneous equations model, the endogenous variables of which include structural values which reflect the structure of national production system. The share of gross value added (hereinafter, GVA) generated in the i-th sector in the total GVA and the base GVA index generated in the i-th sector similar to the industry output index sequentially serve as endogenous variables in this study. The test of the hypothesis was carried out in two stages: at the first stage, according to the results of econometric modeling, the indicator of the real effective ruble exchange rate to foreign currencies was chosen as the main exogenous variable; at the second stage, the basic system of equations was evaluated. Econometric calculations have been made for the following types of economic activity (according to the classification of the Russian National Classifier of Economic Activities): agriculture, hunting and forestry; mineral extraction; manufacturing; wholesale and retail trade; repairs of motor vehicles, motorcycles, household goods and personal appliances. During the econometric modeling, co-integrated equations for the pairs of indicators under study have been obtained; it has also been concluded that there are significant disparities in the selected economic sectors. The analysis of the obtained data has helped develop a set of measures of state regulation aimed at overcoming the existing disparities.

Key words: diversification; export oil price dynamics; econometric modeling; Granger causality test; co-integration; gross value added; real effective ruble exchange rate; state regulation.

Introduction

Due to the peculiarities of the structure of Russian national economy and its dependence on the dynamics of exogenous factors and global market situation is extremely high. This fact has been repeatedly noted by many Russian and foreign researchers: A.G. Granberg [5], R.M. Melnikov [8], A.I. Tatarkin [13], E.A. Fedorova and M.P. Lazarev [14], N.N. Dvorets and A.Yu. Shevelev [6], Z.R. Gazizov [3], K. Ito [17], G. Grossman [18], W. Leontieff [20], R. Miller [21], Raa [23], A. Young [26]. However, a comprehensive program for overcoming export and raw material orientation of the Russian economy has not been developed and implemented yet. The present study attempts to analytically apprehend the structural features of the Russian economy and, using the tools of econometric modeling, reveal consistent patterns of the impact of oil price fluctuations on certain sectors of the Russian economy; this can be further used for the development of the state policy to overcome adverse trends related to the dynamics of energy prices. The methods of econometric modeling

(Granger causality test, checking time-series for stationarity and solving the problem of non-stationarity, construction of co-integrating equations) applied in this research are described in detail in the works of domestic and foreign scientists: S.A. Ayvazyan [1], B.E. Brodsky [2], E.I. Sukhanova and S.Y. Shirnaeva [12], V. Kistanova [7], Krugman [19], M. Porter [22], D. Storey [25].

1. Basic hypotheses and results of econometric modeling

The authors suggest considering measures on gradual diversification of the Russian economy for ensuring less dependency of key macroeconomic indicators on exogenous fluctuations in global stock markets as effective tools of state regulation for the prevention of adverse trends related to the fluctuations of global energy prices. First of all, the authors speak about world oil prices, which is a key factor in the dynamics of the Russian economy. Thus, the main exogenous variable in this study is oil price fluctuations on the world commodity markets.

To test the hypothesis that the diversification will improve the sustainability of national economic systems by reducing the impact of energy prices on key macroeconomic variables, the system of simultaneous equations should be considered, the endogenous variables of which serve as structural values (reflecting the structure of national production) and analyze data obtained during econometric modeling. The use of structural endogenous variables in the system of simultaneous equations helps, first, carry out the analysis by sector of the national economy, and, second, avoid multicollinearity when building a more complex econometric model.

The authors propose to test the hypothesis in two steps: the first step is to determine the main exogenous variable, the second stage – to assess the basic system of equations. All authors' calculations presented in the present paper were performed using the application program packages Microsoft Excel and EViews.

One of the macroeconomic parameters which experiences the fluctuations in energy prices and serves as an indicator of the situation on energy world markets, is the national currency exchange rate. An increase in oil prices entails a rise in real ruble exchange rate because economic agents are confident about the stability of the national economic system and, as a result, the national currency and the Russian Central Bank policy. On the contrary, the decline in oil prices, particularly sharp and/or prolonged, leads to economic agents' negative expectations and forces them to create unfavorable forecasts, which, due to the reduction of foreign currency inflow into the country, leads to its increased demand and the dropping demand for the national currency [24].

Figure 1. Dynamics of crude oil export prices, US dollars per barrel

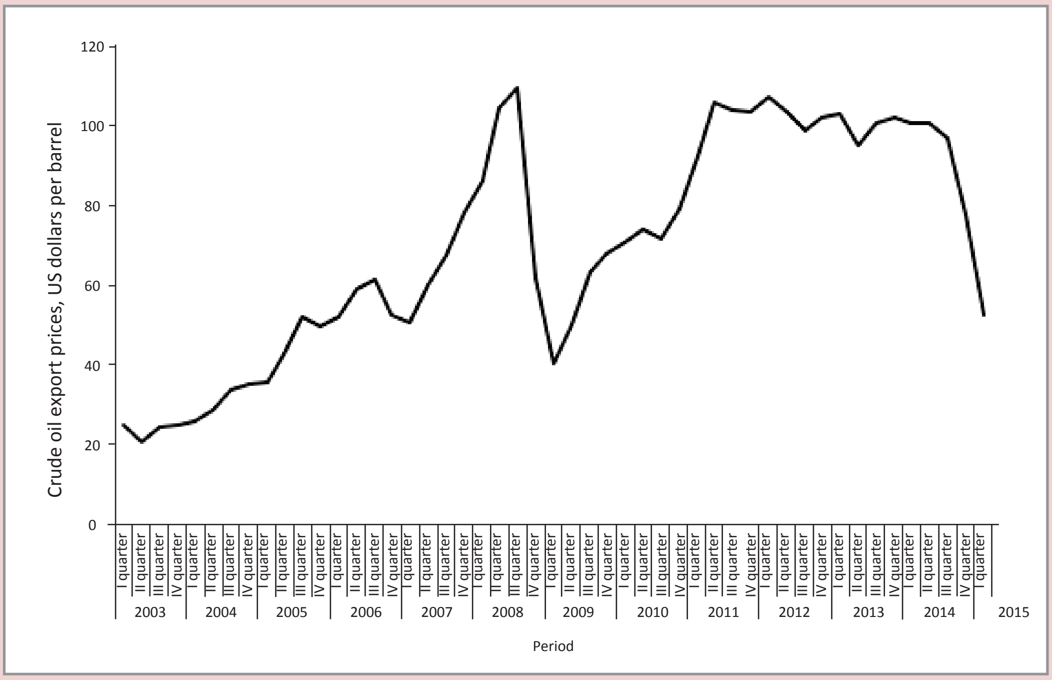
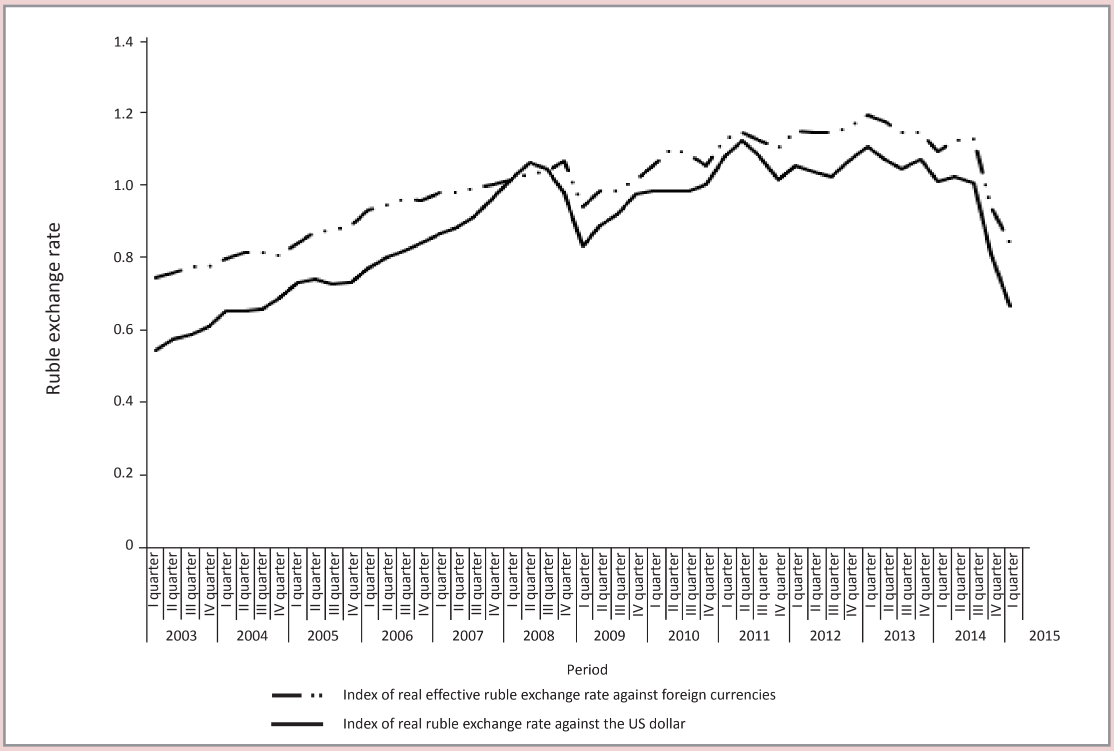


Figure 1 presents the quarterly dynamics of crude oil export prices. It is known that the value of Russian grade of Urals export oil blend directly depends on the price of Brent crude oil; however, due to higher density and sulphur content, it is sold at a certain discount. Considering the above, the authors consider crude oil export price calculated as the average value for each quarter as the main exogenous variable. It is clear from the figure that there are two periods of a sharp fall in world energy prices: during the 3rd quarter of 2008 – the 1st quarter of 2009 and during the 3rd quarter of 2014 – the 1st quarter of 2015.

At the same time, fluctuations in the ruble real exchange rate against the US dollar and real effective ruble exchange rate against foreign currencies have been observed, which is reflected in *Figure 2*. The figure of real exchange rate in the indicated time intervals does not so clearly "give", first, due to the current Central Bank policy supporting the national currency; second, in connection with the peculiarities of indicator calculations, which also take into account global trends (this is obvious when comparing the performance dynamics during the 2008–2009 crisis, especially concerning the index of the real effective exchange rate calculated for a number of countries which are the main trade partners of Russia). This also explains the higher volatility of the real ruble exchange rate against the US dollar compared to the index of the real effective ruble exchange

Figure 2. Dynamics of real ruble exchange rate indices against the US dollar and real effective ruble exchange rate indices against foreign currencies, the 1st quarter of 2008 = 1



rate, as in the second indicator, dollar fluctuations are partially "extinguished" by fluctuations of other currencies included in the calculations. In addition, the real effective ruble exchange rate is somewhat higher than the real ruble exchange rate against the US dollar.

Thus, the first dependency, which the authors propose to analyze in the framework of the study, deals with finding functional correlation between indicators of real ruble exchange rate and crude oil export prices. These indicators for the period from the 1st quarter of 2003 to the 1st quarter of 2015 (49 observations in total) are calculated on the basis of the statistical information publicly available at the official website of the Central Bank of the Russian Federation [9]. In order to ensure the consistency in statistical data, all indicators were hereinafter recalculated up to the 1st quarter of 2008.

Despite the obvious conclusions about the direction of causality, the authors ran the Granger causality test for their justification. The high degree of indicator volatility restricts the use of aggregates similar to monthly or quarterly, since the boundaries of largely random adjacent time intervals may include divergent tendencies, which, when aggregated, become invisible and distort the test results. The statistical base of the study includes data on daily quotations of Brent crude oil and daily ruble exchange rate against the US dollar established by the Central Bank, websites of the Central Bank and the FINAM group [10]. The indicators were tested for the time interval from January 1st, 2003 to March 31st, 2015, i.e. over the entire period under review. The test results determines the unique Granger causality of ruble exchange rate against the US dollar from oil price quotations; the causality becomes apparent (*F*-test = 37, the *p* value is significantly less than 0.01) with the inclusion of few-day lags, as the Central Bank rather carefully responds to the changes in the environment; moreover, at the weekend and on public holidays, ruble exchange rate is, as a rule, stable. The inverse correlation has not been confirmed.

In general, the functional correlation between the variables under study may be presented as follows:

$$e_t = f(oil_t), \quad (1)$$

where e_t – index of real ruble exchange rate;

oil_t – crude oil export price.

The expression (1) sets the function of the real exchange rate against crude oil export prices. The index of the real ruble exchange rate against the US dollar and the index of the real effective ruble exchange rate against foreign currencies alternatively served as a dependent variable.

During the augmented Dickey–Fuller test (ADF) it has been discovered that the initial statistical series are first-order integrated. To solve the problem of non-stationarity of source statistics sets, indicators of their expansion serve as variables. After linearization, the regression equation may be written in the form of expression (2):

$$\ln e_t - \ln e_{t-1} = a_1 + a_2 \times \times (\ln oil_t - \ln oil_{t-1}) + u_t \quad (2)$$

The results of the equation evaluation at a $\alpha = 0.05$ significance level are presented in *Table 1.*

Both equations and their coefficients appeared be statistically significant, with the exception of the constant. It is noteworthy that the determination coefficient is substantially higher for the index of real ruble exchange

Table 1. Results of evaluation of regression equations of real ruble exchange rate indicators

	Logarithm of real ruble exchange rate against the US dollar index	Logarithm of real effective ruble exchange rate against foreign currencies index
const	0	0
$\ln oil_t$	0.26	0.15
R^2	0.49	0.28
DW	1.65	2.01

Figure 3. Dynamics of actual and estimated logarithm of the real ruble exchange rate against the US dollar index, the 1st quarter of 2008 = 1

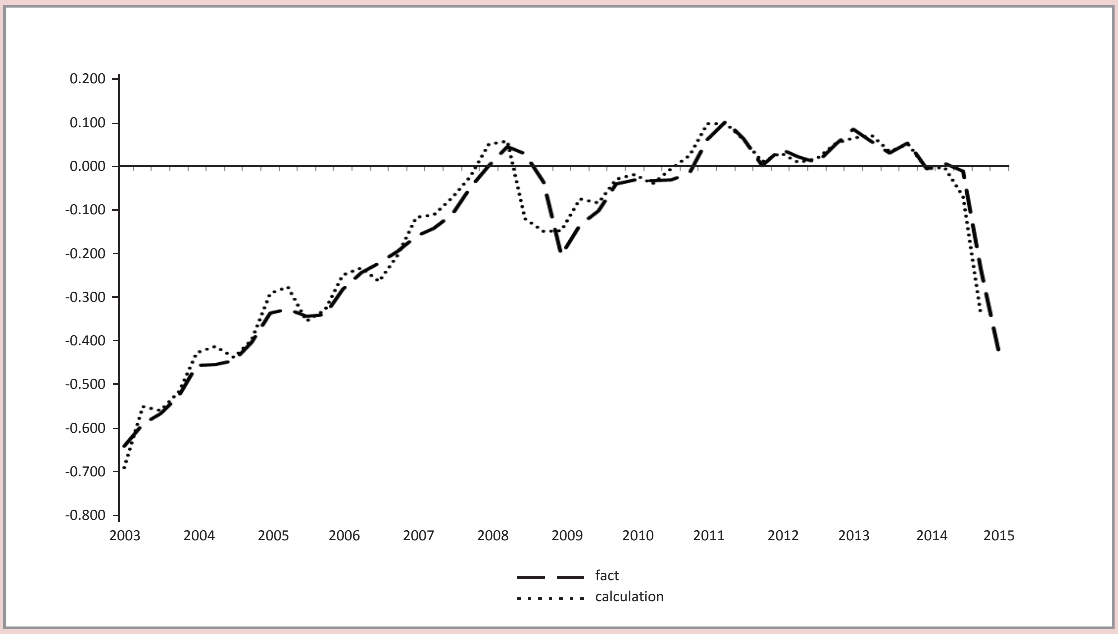
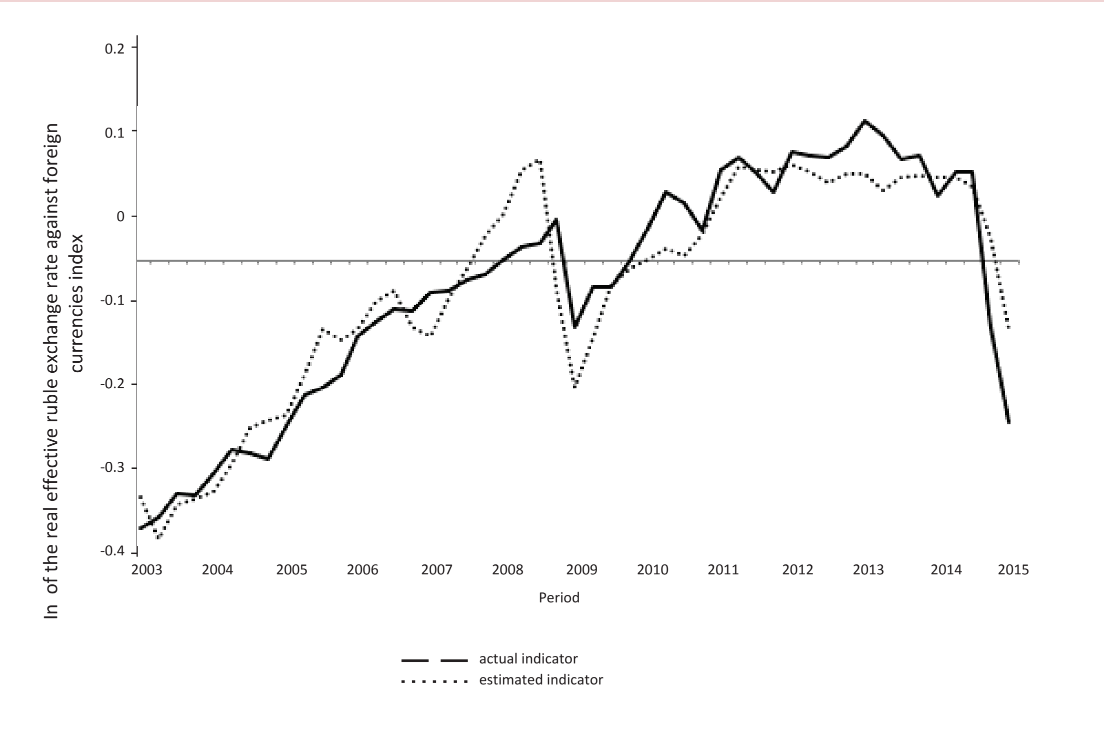


Figure 4. Dynamics of actual and estimated logarithm of real effective ruble exchange rate against foreign currencies index, the 1st quarter of 2008 = 1



rate against the US dollar, which is quite understandable. However, the dependency is not so close (medium), since real exchange rate is affected by not only the crude oil price factor, depending on fluctuations in world markets, but also by many other factors: institutional, political, and other economic factors not considered in the model. The obtained Durbin–Watson statistics (DW) indicate the satisfactory quality of the obtained regression equations.

Figures 3 and *4* present the dynamics of ruble exchange rate actual indicators and indicators estimated according to the obtained models. It is obvious that the model built for the index of real ruble exchange rate against the US dollar is more preferable from the point of view of forecasting. However, for the purpose of further study the second indicator is more preferable to be used as an independent variable – the index of real effective ruble exchange rate against foreign currencies, because in recent years the dynamics of macroeconomic indicators in Russia is more and more often affected by the dynamics of both US dollar exchange rate and also Euro and other currencies exchange rates, especially amid refocus of international relations on BRICS countries.

For the purpose of further research the authors present a general system of simultaneous equations which must be solved:

$$\begin{aligned} GVA_{s1\ t} &= f(e_t) \\ GVA_{s2\ t} &= f(e_t) \\ &\dots \\ GVA_{si\ t} &= f(e_t), \end{aligned} \qquad (3)$$

where $GVA_{si\ t}$ – a corresponding value of gross value added formed in the *i*-th sector;

e_t –index of real effective ruble exchange rate against foreign currencies.

Compared to other studies devoted to similar issues, the present work considers the indicators of gross value added and its derivatives as the main dependent variable. The choice of a dependent variable is explained by the following reasons:

1) gross value added is a key component of gross domestic product (its contribution to GDP is relatively stable and amounts to 85% throughout the whole study period);

2) the indicator of gross value added excludes intermediate consumption.

The indicators of gross value added formed in the *i*-th sector are: a) the share of gross value added formed in the *i*-th sector in the total gross value added; b) the base index of gross value added formed in the *i*-th sector (equivalent to the industry's output index). The presents study reviews the indicators of gross value added formed in the following economic sectors according to the RNCEA (Russian National Classifier of Economic Activities) classification system:

- agriculture, hunting and forestry (section A);
- mineral extraction (section C);
- manufacturing (section D);
- wholesale and retail trade; repairs of motor vehicles, motorcycles, household goods and personal appliances (section G).

The source data on the size and structure of gross value added are taken from an open source – the Federal State Statistics Service database [11].

An independent variable is expressed by the index of real effective ruble exchange rate against foreign currencies. It is obvious that the model could also include an exogenous variable from the first model – crude oil export price; however, in order to eliminate the effects of multicollinearity in econometric modeling, only the first indicator was included in the model specification. In addition, the use of crude oil export price as a regressor in this model could lead to a distortion of the overall calculation results due to closer connection of the indicator with indicators of extractive industries. All the indicators included in the model specification, are taken in logarithms of the corresponding values.

Let us test the obtained time series for stationarity; in case of a non-stationary time series, the order of integration should be determined. Time series were tested for stationarity using the augmented Dickey–Fuller test. The test detected non-stationarity of time series in levels and stationarity at the level of first-order differences.

To avoid building false regressions and conclusions, pairs of time series with the same order of integration and stationary series of model residuals were applied a co-integration approach according to the Engel–Granger method. The essence of the co-integration approach is that a linear combination of non-stationary series may be stationary, then it is possible to use the classical least square method for estimating the results of econometric modeling. The obtained co-integrating equations can be considered as estimates of long-term dynamic equilibrium between the variables.

It follows from the above that the co-integrating equations can be set for all pairs of time series in which the indicators of the share of gross value added formed in the *i*-th sector in total gross value added serve as a dependent variable. Thus, it is possible to discuss the stable dependencies between the reviewed indicators in the long term.

Figure 5. Dynamics of the share of gross value added formed in the i-th sector in the total gross value added:

GVAA – agriculture, hunting and forestry; GVAC – mineral extraction; GVAD – manufacturing; GVAG – wholesale and retail trade; repairs of motor vehicles, motorcycles, household goods and personal appliances

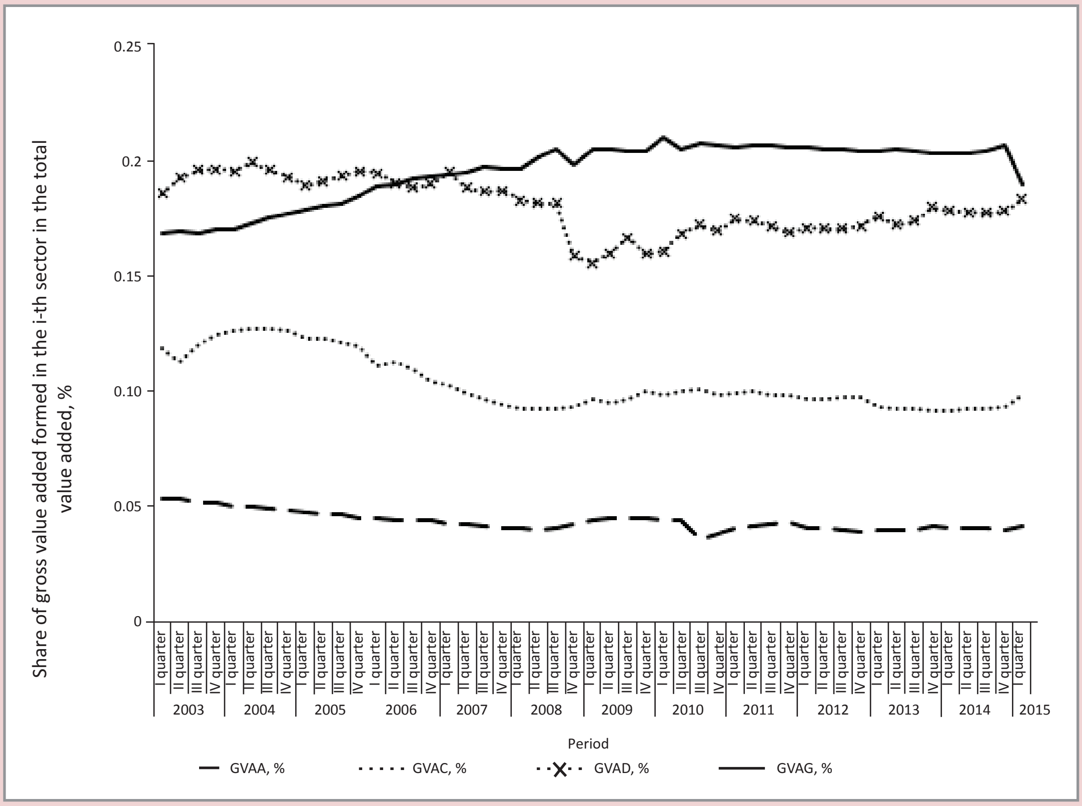


Figure 5 presents a graph of the studied parameters during the period from the 1st quarter of 2003 to the 1st quarter of 2015. It follows from the presented data that three indicators (share of gross value added formed in agriculture, mineral extraction and manufacturing) generally demonstrate a negative trend, which is especially noticeable for mineral extraction and manufacturing indices. This is due to the fact that in the last few years, an increasingly important contribution to the gross added value is made by types of activities not related to production: finance, real estate, leasing and provision of services and, primarily, wholesale and retail trade; repairs of motor vehicles, motorcycles, household goods and personal appliances.

The following co-integrating equation was obtained as a result of assessing the dependency in the first pair of time series (e_t и GVA_A):

$$\ln GVA_{A\,t} = -0.553 \ln e_t - 3,157.$$

The equation coefficients, as well as determination coefficient (0.726), are statistically significant at a $\alpha = 0.05$ significance level. As evidenced by the equation, the correlation between the reviewed variables is significant, its direction is negative. Thus, it is possible to say that the long-term coefficient of elasticity of the share of gross value added formed in agriculture in the total gross value added of the real effective ruble exchange rate against foreign currencies is 55.3%.

The following co-integrating equation was obtained for the second pair of time series (e_t and GVA_C):

$$\ln GVA_{C\,t} = -0.653 \ln e_t - 2.296.$$

The equation coefficients, as well as determination coefficient (0.680), are statistically significant at a $\alpha = 0.05$ significance level. As evidenced by the equation, the correlation between the reviewed variables is significant and inverse. Thus, it is possible to say that the long-term coefficient of elasticity of the share of gross value added formed in mineral extraction in the total gross value added of the real effective ruble exchange rate against foreign currencies is 65.3%.

The following co-integrating equation was obtained for the third pair of time series (e_t and GVA_D):

$$\ln GVA_{D\,t} = -0.311 \ln e_t - 1.729.$$

The equation coefficients, as well as determination coefficient (0.430), are statistically significant at a $\alpha = 0.05$ significance level. As evidenced by the equation, the correlation between the reviewed variables is significant and inverse. Thus, it is possible to say that the long-term coefficient of elasticity of the share of gross value added formed in mineral extraction in the total gross value added of the real effective ruble exchange rate against foreign currencies is 65.3%.

The following co-integrating equation was obtained for the third pair of time series (e_t and GVA_G):

$$\ln GVA_{G\,t} = 0.454 \ln e_t - 1.625.$$

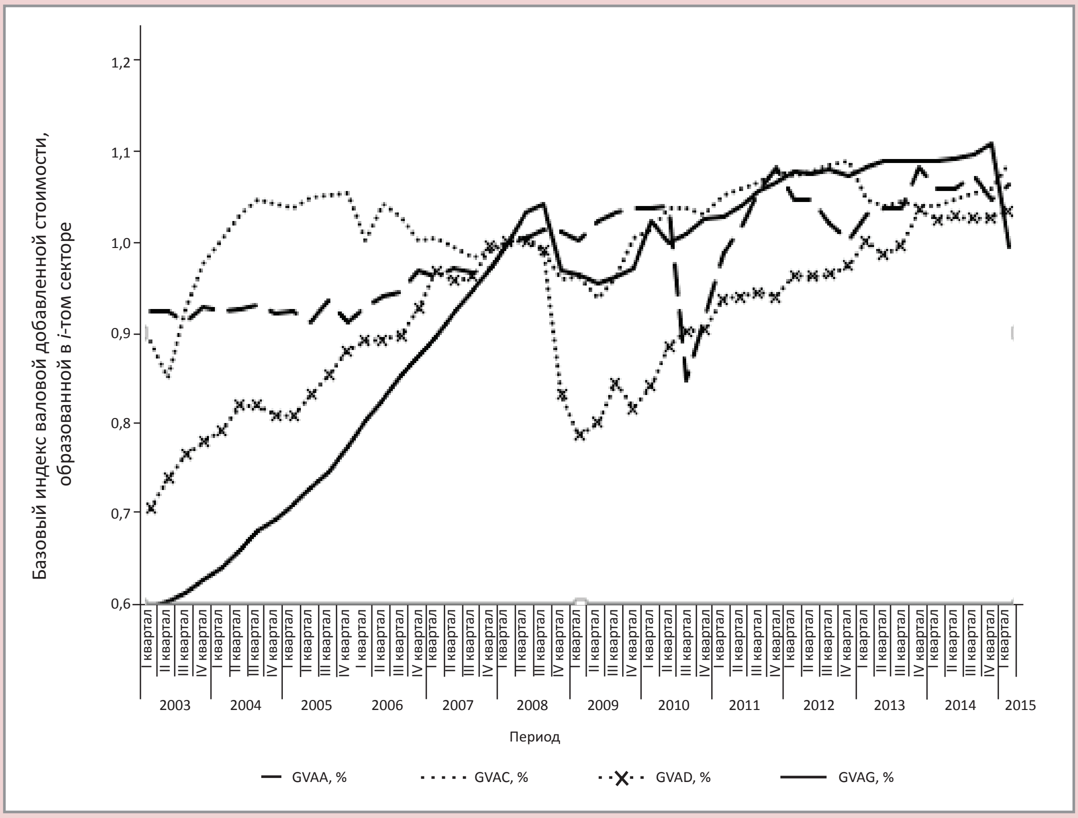
The equation coefficients, as well as determination coefficient (0.838) are statistically significant at a $\alpha = 0.05$ significance level. As evidenced by the equation, the correlation between the reviewed variables is strong and direct. Thus, it is possible to say that the long-term coefficient of elasticity of the share of gross value added formed in wholesale and retail trade in the total gross value added of the real effective ruble exchange rate against foreign currencies is 45.4%.

For additional verification of the obtained results and extension of analytical framework the authors also considered the following four pairs of time series including the corresponding indicators of the base index of gross value added formed in the i-th sector. *Figure 6* presents the graphs of the studied parameters during the period from the 1st quarter of 2003 up to the 1st quarter of 2015. As follows from the presented graph, all four indicators have the upward trend, with the greatest differences being observed in manufacturing. In addition, it is noteworthy that "the valley" in the index for manufacturing industries was quite expected in the first half of 2009, while for agriculture it occurred in the second half of 2010 with unfavorable climatic conditions (despite the fact that data used for calculations exclude the seasonal factor). The highest growth is demonstrated by the index for wholesale and retail trade, while the largest stability is characteristic of the index for mineral extraction.

The following co-integrating equation was obtained as a result of assessing the dependency in the first pair of time series (e_t and $iGVA_A$):

$$\ln iGVA_{A\ t} = 0.291 \ln e_t.$$

Figure 6. Dynamics of the base indices of gross value added (by the 1st quarter of 2008): iGVAA – agriculture, hunting and forestry; iGVAC – mineral extraction; iGVAD – manufacturing; GVAG – wholesale and retail trade; repairs of motor vehicles, motorcycles, household goods and personal appliances.



The equation coefficient, as well as determination coefficient (0.459) are statistically significant at a $\alpha = 0.05$ significance level. As evidenced by the equation, the correlation between the reviewed variables is direct. Thus, it is possible to say that the long-term coefficient of elasticity of the share of gross value added formed in agriculture at the real effective ruble exchange rate against foreign currencies is 29.1%.

The following co-integrating equation was obtained for the second pair of time series (e_t and $iGVA_C$):

$$\ln iGVA_{C\,t} = 0.185 \ln e_t - 0.024.$$

The equation coefficients, as well as the determination coefficient (0.260) are statistically significant at a $\alpha = 0.05$ significance level. As evidenced by the equation, the correlation between the reviewed variables is significant and direct. Thus, it is possible to say that the long-term coefficient of elasticity of the share of gross value added formed in mineral extraction at the real effective ruble exchange rate against foreign currencies is 18.5%.

The following co-integrating equation was obtained for the third pair of time series (e_t and $iGVA_D$):

$$\ln iGVA_{D\,t} = 0.527 \ln e_t - 0.086.$$

The equation coefficients, as well as the determination coefficient (0.527) are statistically significant at a $\alpha = 0.05$ significance level. As evidenced by the equation, the correlation between the reviewed variables is significant and direct. Thus, it is possible to say that the long-term coefficient of elasticity of the share of gross value added formed in mineral extraction at the real effective ruble exchange rate against foreign currencies is 52.7%.

The following co-integrating equation was obtained for the fourth pair of time series (e_t and $iGVA_G$):

$$\ln iGVA_{G\,t} = 1.291 \ln e_t - 0.056.$$

The equation coefficients, as well as the determination coefficient (0.856) are statistically significant at a $\alpha = 0.05$ significance level. As evidenced by the equation, the correlation between the reviewed variables is significant and direct. Thus, it is possible to say that the long-term coefficient of elasticity of the share of gross value added formed in wholesale and retail trade at the real effective ruble exchange rate against foreign currencies is 129.1%.

2. Economic analysis of the results and the main conclusions

First, it should be noted that co-integrating equations of satisfactory quality have been obtained for all pairs of indicators reviewed in the present paper; this means that there are long-term sustainable dependencies. This confirms the thesis about a significant non-random influence of oil price dynamics on the national exchange rate and structural indicators of production in some economic sectors in Russia.

Second, the authors note that the obtained system of equations (4) may be expanded if necessary: it may include both additional structural indicators and structural indicators for other economic sectors, as well as and other indicators of assessing the national currency exchange rate and oil prices in world commodity markets.

$$\begin{aligned} &e_t = f(oil_t) \\ &GVA_{s1\,t} = f(e_t) \\ &GVA_{s2\,t} = f(e_t) \\ &\dots \\ &GVA_{si\,t} = f(e_t). \end{aligned} \quad (4)$$

The choice of specific indicators for analyzing the presented dependences is justified above, but this does not exclude the possibility of introducing a system of alternative indicators of the denoted macroeconomic variables for obtaining more comprehensive and complete assessment of the reviewed interactions according to the changing external conditions of functioning of the Russian economy and its structural changes [15]. The presented model should be regarded as a basic one, which can be supplemented if necessary.

Third, it is necessary to make a comment regarding the fact that the proposed model helps estimate only indirect influence of oil price dynamics on the structural indicators of the national production through the impact on the national exchange rates. The results obtained during the study show that the dependency of national exchange rates on oil price dynamics is not as close as it sometimes seems (medium), since the real exchange rate is affected not only by the crude oil price factor which depends on fluctuations in world markets, but also by many other institutional, political and economic factors not considered in the model.

Finally, before analyzing data obtained during the second phase of the study, the authors make a comment on the results of econometric modeling [16]. The present study was not aimed at identifying all significant factors influencing the dynamics of gross added value, that is why generally low values of the determination coefficient (especially for models containing indices of gross value added formed in the respective sectors) must not be misleading in terms of the quality of the obtained equations. The obtained values of determination coefficients only evidence that the dynamics of the studied parameters is strongly influenced by other economic factors and factors of different nature not considered in these models.

Contrary to a popular belief about the most significant dependence of the output indicators in mineral extraction on the real exchange rate, the strongest correlation between the studied values is observed in wholesale and retail trade. Econometric modeling has revealed that the indices of wholesale and retail trade are very closely related to the indicator of the real effective ruble exchange rate against foreign currencies and, unlike the other three considered groups of indicators, they are the only ones to demonstrate a positive correlation with the real effective national exchange rate in both models, i.e. with ruble appreciation, both the share and the index of gross value added formed in wholesale and retail trade increase significantly. This is explained by the fact that wholesale and retail trade in Russia is very heavily dependent on import of goods, therefore, its indicators are so sensitive to fluctuations in the ruble exchange rate.

In addition, close correlation between the indicators of real effective ruble exchange rate against foreign currencies and the share of gross value added formed in agriculture in the total gross value added is also noteworthy. With ruble appreciation, domestic prices of agricultural products become less competitive, so the efficiency of food and agricultural raw materials exports fall, causing a reduction in the share of gross value added formed in agriculture in the total gross value added (this is especially important when the share of agricultural products in the county's exports has been steadily increasing in recent years). At the same time, the index of gross value added in this industry demonstrated an upward trend with an increase in the real effective exchange rate. This is due to the fact that the industry is dependent on import of raw materials and technology, therefore increasing the purchasing power of the national currency entails a reduction in agricultural producers' costs of imported goods for intermediate consumption. In order to understand which of the two trends is crucial for the agricultural sector, it is enough to compare the dynamics of indicators presented in figures 2, 5 and 6. The data suggest that up to 2010, the focus of agriculture on the import of raw materials and equipment was crucial;

however, nowadays export orientation is getting more significant, so the decline in purchasing power is not accompanied by serious "gaps" in agricultural indicators. In addition, amid a sharp decline in the real effective ruble exchange rate against foreign currencies in 2014–2015 a slight growth in agricultural indicators was also observed, which is undoubtedly related to the policy of import substitution [4]. However, it should be born in mind that there is a strong dependence of the value of agricultural production on natural and climatic factors, which is especially evident in 2010 (however, one should not exclude the fact that a sharp decline was exacerbated by the reaction to the 2008–2009 crisis, when stocks of capital and raw materials from the previous years ran low). Probably, the solution to the problem of major dependence of agricultural indicators on the fluctuations of national exchange rates lies in the reduction of costs of agricultural production by introducing more efficient technologies and in the shift of the intermediate consumption in agriculture to the domestic market.

Indicators of manufacturing and mineral extraction are characterized by a decline in the share of gross value added formed in the corresponding sector in the total gross value added with ruble appreciation against foreign currencies. This is especially noticeable in the model for mineral extraction. It is obvious that, as in the case of agriculture, this is explained by the loss of competitiveness due to higher domestic prices. However, the products of mineral extraction owing to its specificity and high demand in global market always have consumers, so mineral extraction output (in indices) is not so elastic with regard to real effective exchange rate. At the same time, production of low-margin manufacturing industries is more focused on the domestic market, more vulnerable and may be replaced by imported goods. The use of imported components forces the manufacturers to reduce production with national currency devaluation; and, on the contrary, with ruble appreciation, goods of intermediate consumption become cheaper, production costs are reduced and output is increased.

Based on the obtained results, one should not draw improper conclusions. Thus, high degree of dependency of agricultural indicators on the dynamics of national exchange rates does not mean that the measures of stabilization policy should be directed against the support of this sector and focused on the outflow of capital from the industry. Moreover, low elasticity of output indicators (indices) of mineral extraction in terms of real effective ruble exchange rate should not be misleading regarding excessive support of extractive industries. In the authors' view, in order to reduce the dependence of the economic system on the fluctuations of national currency, and, consequently, price quotations on global commodity markets, regulatory measures should be aimed at eliminating structural imbalances.

In the authors' opinion, further studies of this issue may be focused on the following objectives:

– building of an advanced model of interaction of the indicated macroeconomic variables on the basis of the proposed basic model including other structural indicators or the structural indicators for the expanded range of economic sectors, as well as other indicators of exchange rate and oil price on global commodity markets according to the changing external conditions of functioning of the Russian economy;

– assessment of the impact of measures of stabilization policy on the structural indicators of production in particular sectors of the Russian economy;

– building of a macroeconomic model of the impact of stabilization policy measures on the national production taking into account the structural peculiarities of the Russian economy in order to obtain forecast values of key macroeconomic indicators.

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