China-USA Business Review, Mar.-Apr. 2021, Vol. 20, No. 2, 79-98
doi: 10.17265/1537-1514/2021.02.002

The Structural Analysis of Russia's Economic Growth: Measuring, the COVID-19 Crisis and Macroeconomic Policy*

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The current economic crisis has become a force majeure circumstance in the development of the world system and has shown a completely new source-generator of crisis dynamics—self-restraints affecting the characteristics of the demand of macroeconomic dynamics. This raises the problem of not only eliminating the crisis, but also entering a new growth trajectory. The research is devoted to the analysis of the Russian economy structural dynamics with the identification of its characteristics, the main determinants in order to make a conclusion about the influence of economic structure elements on economic growth, which leaves the main goal. And also, the purpose of the study was to assess the "COVID crisis" and the parameters of the pre-crisis dynamics, which reflected the troubles in maintaining economic growth in Russia. The research methodology is based on the use of structural analysis, which identifies the components of GDP by expenditure, income, and sectors, determining their contribution to economic growth. Thus, it is possible to identify the model of the of economic growth structure. The impact of the sectoral structure on economic dynamics is assessed for three sectors—manufacturing, raw materials and transaction and separately for two sectors—transactional and non-transactional. The research results in identifying the picture of the Russian economy structural dynamics. The main conclusion is that the formation of a new model of economic growth in Russia is possible only through structural changes and appropriate structural policies that ensure the movement of resources between sectors, in particular, manufacturing, raw materials and transaction. In addition, based on panel data on the Russian economy, econometric models are constructed that show the relationship between the level of inequality, poverty, and gross domestic product, confirming the need for economic policies aimed not only at applying targeted assistance to the population in reducing poverty, but also reducing inequality as a measure that stimulates economic growth. Thus, the study solves the problem of measuring the structure of growth with the identification of the contribution of this structure to the growth rate, which provides long-term data on the possibility of maintaining economic dynamics at a particular rate.

Keywords: economic sectors, Gini coefficient, gross domestic product, financial and non-financial investments, inequality, poverty, regression models

* The text of the paper is the basis of the author's scientific report, carried out on October 22, 2020 at the Institute of Economics of the Russian Academy of Sciences.

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Introduction

Structural constraints on economic growth are perceived as the main determinants of modern development, but they stem from the current economic structure. The impact of structure on the economy dynamics is studied in separate areas (for example, within the framework of a sectoral approach), but the overall picture, as some studies rightly point out, cannot be obtained, not to mention the fact that structural problems of development are not fully incorporated into the fabric of economic growth theories (Freire, 2019; Alonso-Carrera & Raurich, 2018; Brancaccio, Garbellini, & Giammetti, 2018; Vu, 2017; Romano & Traù, 2017). A detailed structural analysis of growth was either not carried out, or was carried out in a very narrow sense, and it was assigned a secondary role (Gabardo, Pereima, & Einloft, 2017).

It can be assumed that this is due both to the complexity of this type of analysis and to the fact that the vast majority of economic growth models are aggregated models, while structural models are complex, and structural changes were not considered as a separate driver of growth, giving priority to scientific and technological progress or institutional conditions (Vo & Le, 2017; Hanusch, Chakraborty, & Khurana, 2017; Welsch & Kühling, 2016; Aghion, Akcigit, & Howitt, 2015; Solow, 1994; 2007; Aghion & Howitt, 1992). It should be especially noted that empirical research on growth in the spirit of Kuznets unjustifiably took a back seat (Kuznets, 1973; Denison, 1979), giving priority to complex model constructions, thereby clearly underestimating the possibilities of structural analysis and accounting for structural dynamics. However, this type of research allows to expand our views on the impact of inequality and poverty on the opportunities for growth and improvement of the economic structure, because inequality and poverty can be the result of the economy structure and not just the policy (Stiglitz, 2013). Therefore, the problem of income distribution is a structural problem and forms an economic structure that ensures growth (Tinbergen, 1985).

Empirical studies of structural dynamics were limited to calculating various indices that characterize structural shifts. However, the important task is not even to assess the structural shift as such, but to measure the contribution of a system element to its growth and in relation to other elements that also make a certain contribution to the economic growth rate. To present a portrait of the emerging structural dynamics for the formation of strategic guidelines for macroeconomic policy and solving the problem of long-term sustainable growth is a valuable condition. The design of strategic development goals and tools for achieving them cannot be carried out without obtaining a portrait of such dynamics. For example, the radical structural adjustment of China over the past 30 years, among other things, confirms our position (Brondino, 2019). A changing structure provides new growth opportunities, although it may block growth. In which case each result occurs requires additional research, and one of the directions is to get a portrait of structural dynamics and establish its properties in order to develop measures for the formation of a different growth regime and structural dynamics that gives the greatest social results. The structure of the economy becomes a kind of “rule” for a certain period of time, at least until it changes significantly, either strengthening or slowing down the development of the economy. Modern transformations are so extensive that they force to change economic perceptions of, a depression or recession, especially in the context of the COVID-19 crisis, when not only social contacts change, but also the structure of the economy. Functioning occurs in conditions of shrinking opportunities and economic activity, which becomes an attribute of the crisis.

In view of these circumstances, identifying structural dynamics, measuring them, and assessing their impact on growth are a very useful analytical task that will provide additional information about the application

of economic policy measures, in particular, the impact of resource allocation by sector on economic growth. Separate studies support this position, showing that governments are taking steps to move resources to manufacturing sectors in order to modify their structure and increase productivity through technological renewal (Samaniego & Sun, 2016).

The review shows that the problem of resource allocation in the economy in terms of use retains a deterministic influence on growth, and it is poorly studied. We present the methodology of this study, revealing the content of a possible solution to this problem and moving on to the analysis of the growth structure according to the method of structural analysis by GDP components and economic sectors. We will take into account the impact of inequality and poverty on GDP, which is the most important aspect of growth policy and without which it is impossible to consider the impact of structure on growth, since the structure of income distribution is the most important element of economic development. The object of the study is the Russian economy—its growth, structure and the impact of inequality and poverty on changes in GDP. There is a large literature devoted to this problem, but different studies across countries give a different picture of the degree of influence of inequality and poverty on growth or the presence or absence of a Kuznets curve (Breunig & Majeed, 2020; Ridzuan, 2019), depending on whether or not there is a determination of inequality by poverty. In this regard, the aspect of the impact of inequality and poverty in assessing the structure of economic growth is significant. We will continue the research, showing its methodology, and then proceed to discuss the results and main conclusions.

Research Methodology

The structure of economic growth is formed by various parameters—the structure of GDP, economic sectors, regions, etc. How resources are distributed among the elements of the economic structure is of fundamental importance in terms of ensuring their dynamics and contribution to the economic growth rate, as well as their impact on each other.

The way the resource is distributed across the economic structure is largely determined by the ratio of the structure basic parameters that have developed to this point, which plays the role of a kind of distribution rule. However, the decisions make also affect the movement of resources. Labor and capital movement leave the real sector of the Russian economy and are placed in the raw materials and transaction sectors. Moreover, this movement slowed down or occurred in the opposite direction when the risk of functioning in the manufacturing sector changed. Therefore, by institutionally influencing the ratio of risks in sectors, including focusing on this, for example, monetary policy, one of the main tasks of which is to provide advance capital to the real sector, it is possible to influence the movement of resources and the formation of the economic structure.

The problems of Russia’s economic growth have been dragging on since the 2000s and have been especially aggravated since 2012, with a slowdown. The Russian economy in 2020 is experiencing a crisis with a new factor basis. It is not caused by a financial or currency crisis that came from outside, or provoked inside the country, but is caused by self-limitation of its own development due to the COVID-19 “virus attack” on the population and economy, moreover, having an international coverage, where self-limiting development measures were also introduced and are being introduced. This reaction, in fact, immediately limits aggregate demand, both internal and external, worsening the parameters of the dynamics of gross consumption, investment spending, and net exports, which cannot but affect government consumption (government revenues and expenditures). By reducing demand, restrictions that arise in the functioning of raw materials markets,

hydrocarbons, and the financial markets are destabilized. In addition, there are systemic effects, by the way, little studied, both growth retardation and crisis provocation. It should be noted that, in Russia, in 2020, the degree of destabilization of the foreign exchange or financial market was not as great as, say, in the recessionary years 2014-2016. However, the expression of the crisis in terms of recession in many sectors is comparable to the recession in 2015, and in some types of activities, it exceeds it. The whole set of the indicated circumstances brings to the fore not only the problem of elimination of the "COVID crisis", but also the need to ensure recovery growth in the subsequent period.

Based on this, it is not difficult to present a structural formula for estimating the contribution of elements to the growth rate of a country's GDP. So, for the cost of the product, it is represented in the form: $Y = C + I + G + NX$, that is, as the sum of consumer and investment spending, government spending, and net exports. Denote the dynamics (growth rate) of each component of GDP as gC, gI, gG, gNX, and the share of each component in GDP, respectively, c, i, g, and nx. In this case, the structural formula will be presented in the form of:

$$g_Y = g_C c + g_I i + g_G g + g_{NX} nx \quad (1)$$

The contribution to the growth rate of each component is determined by the product of its growth rate and its share in the gross product (according to Formula [1]). Thus, we have four contributions to the GDP growth rate by expenditure-consumption, investment, government spending, and net exports.

Similarly, it can be thought of GDP by income as the sum of compensation paid to employees, net taxes on production and imports and gross profit and mixed income. In this case, the structural formula for calculating the contribution to the growth rate of each component of income will be represented by three elements, each of which is the product of the share and the growth rate of the element. When considering three sectors, namely manufacturing, raw materials, and transaction, the product is presented as the sum of the products of the three sectors (gross value added). Therefore, the total growth rate is equal to the sum of the product of each sector's share by its growth rate. For two sectors (transactional and non-transactional), the expression is simplified to two terms, each of which is the product of the sector's share and its growth rate.

According to the dominance of one or another component of GDP in economic dynamics, we can distinguish models of dynamics, which are summarized in Table 1.

Table 1 shows that depending on how the structure is selected for the main parameter that characterizes the dynamics of the economy, the dynamics models are also determined. Moreover, for each structural selection, its own model can be designated. Different combinations are possible for different countries; however, the comparison of emerging dynamics models and their correspondence is a separate task that is very useful for comparative studies.

If the economy is represented as consisting of two distinct sectors-transactional (Yf) and non-transactional (Yn), which together give the total value of the GDP: $Y = Yf + Yn$, then we can come to a structural formula that evaluates the contribution of each sector to the growth rate, and also formulate the task of evaluating the contribution of investment in each sector to economic dynamics. The product created in each sector depends on the investments made in the sector, that is, $Yf = f(\mathrm{If})$, $Yn = q(\mathrm{In})$, where If and In are investments in each sector, respectively, where $Y = f(\mathrm{If}) + q(\mathrm{In})$.

As noted above, according to the structural formula for the economy of the two selected sectors, the growth rate will be: $g = f * gf + n * gn$, that is, the sum of the products of the growth rate of the sector $gf = (1/Yf)dYf/dt$; $gn = (1/Yn)dYn/dt$ by its share in the product, respectively f and n.

Investments in both these sectors add up to the total amount of investment expenses, i.e., $I = If + In$. Thus, substituting the value of investment expenditures in the calculation of GDP by expenditure, broken down into two types of investment by sector, we get: $Y = C + I + G + Nx = C + If + In + G + Nx$. After differentiation and transformation, we can estimate the contribution of each type of investment to the growth rate: $gY = DC * c + gIf * df + gIn * dn + gG * a + gNX * b$, where df is the share of investment in the transaction sector in the gross product, dn is the share of investment in the non-transaction sector in the gross product, gIf and gIn are the growth rate of investment, where it can be seen the contribution of each type of investment to the growth rate. Using econometric modeling, it is possible to estimate the contribution of investments divided into financial and non-financial components (in financial and non-financial assets). This allows us to identify the impact of financial investments on economic dynamics. At the same time, when analyzing the impact of financial investments on the economy, it is useful to use a parameter that is designated as the institutional bias of the financial market, defined by the value $\gamma 0 = F/(S - N)$, where F is the financial investment (in financial assets), N is investment in non-financial assets, and S is total savings. This parameter shows the excess of financial investment of the difference between savings and non-financial investments. If it is negative, it indicates attracting non-financial investments for development (exceeding savings) (Sukharev & Voronchikhina, 2020).

Table 1

Models of Dynamics by the Contribution of the GDP Structure Element to the Growth Rate

Dominance of elements by contribution to the growth rate	Name of the dynamics model	Characteristics
C—household final consumption expenditure	Consumer	Consumer spending is the main contributor to the growth rate.
I—gross capital formation	Investment	Investment expenditures shape economic dynamics and structural changes.
G—government final consumption expenditure	Budgetary	Government spending contributes significantly to the growth rate.
Nx—net exports	Foreign-economic	Exports contribute to the growth rate of, for example, hydrocarbons or other products (agriculture). This model is inherent in developing countries, usually combined with other models indicating a mixed version of influence.
Manufacturing sector	Industrial	The manufacturing sector dominates. It makes the main contribution to the growth rate dynamics.
Raw materials sector	Raw-material	The main contribution to the growth rate is accounted for by the raw materials sector.
Transaction sector	Service	Services and trade dominate the contribution to the growth rate.
Compensation of employees	Salary-consumer	The dynamics of compensation is decisive for the contribution to the growth rate.
Net taxes in production and imports	Distributive	Net taxes make the largest contribution to the growth rate. This is a dynamic model related to the distribution of generated revenue.
Gross profit of economy and gross mixed income	Market and entrepreneurial activity	Profit dynamics indicate the largest contribution to the growth rate.
Mixed influence of various elements	Mixed growth model	When it is impossible to distinguish the dominance of one component from these groups, it is possible to form a mixed model of dynamics, both in terms of GDP components by expenditure and income and in a sectoral context, respectively.

Based on the indicated methodology, further research will be reduced to conducting a structural analysis of the growth of the Russian economy, assessing:

- the contribution of the GDP component to the rate of economic growth by expenditure, sectors (three sectors—manufacturing, raw materials, and transaction) and income, defining the model of this dynamics (according to Table 1);
- contribution of the sectors—transactional, manufacturing, and raw materials, as well as transactional and non-transactional (two-sector representation of the economy) to the rate of economic growth;
- the impact of financial investments on economic dynamics in comparison with non-financial investments, comparing with the same parameters in Germany and the United States (countries selected randomly for comparison);
- the impact of inequality and poverty on gross domestic product by performing econometric modeling using the Gretl 2020b program based on panel data on the Russian economy in order to obtain recommendations for planning and implementing economic development policies.

Thus, structural analysis, together with an assessment of the impact of such social development basic parameters as inequality and poverty, can create a useful picture of economic growth analysis with relevant recommendations for economic policy. In this study, we first summarize the characteristics of the COVID-19 crisis and highlight the features of the economic growth of the Russian economy in the pre-crisis period in order to outline the possibilities of a new growth model for the near and long term and then analyze the structural characteristics of macroeconomic dynamics to identify the prevailing pre-crisis economic model growth.

The Economic Crisis in Russia due to COVID-19

The “COVID” economic crisis was spreading due to the imposed restrictions related to the prevention of infection, curtailing the parameters of demand for various types of activities and sectors of the economy. It should be noted that other sectors have found an increase in demand due to the increased demand for these products to combat the epidemic. This led to an increase in the price of these products, which fell only as a result of the expansion of production capacities.

The decline in production turned out to have a stronger multiplying leverage (relative to those sectors where it increased) in the Russian economy, since a significant decline was revealed in many sectors already in the second quarter of 2020. Note that the specificity of this crisis was that the financial market was not its main generator. It reacted to a decrease in demand, energy prices (also as a result of a decrease in demand), but did not create the effect of a landslide devaluation with strong imported inflation. The reasons consisted, apparently, in the fact that this crisis quickly acquired the meaning of a world recession, when world demand decreased, covering the trade cooperation of various countries rather synchronously due to the applied restrictive measures. The devaluation was observed in an incremental mode, but the decline in demand also affected imports, which, in general, at the first stage held back prices in some way. Thus, external demand, in addition to the planned devaluation carried out by the monetary authorities, restrained the negative effect of the devaluation and destabilization of the financial market.

Manufacturing industries (see Figure 1, left) declined in April 2020, returned to their previous values in May, but increased production in June, while the decline in electricity supply continued until July. Only in July-August 2020, in general, they returned with an excess of March values. It should be noted that the output

for this type of activity began to decline until March, that is, even before the “COVID attack” and quarantine measures (see Figure 1, left). Extractive activity and water supply followed the dynamics of the electric power industry, but with a smaller decline. Figure 1, on the right, shows the dynamics of the production of high-tech activities. As we can see, it was only in July-August that it was possible to reach zero levels, having experienced a significant decrease in output from March to June to 20%.

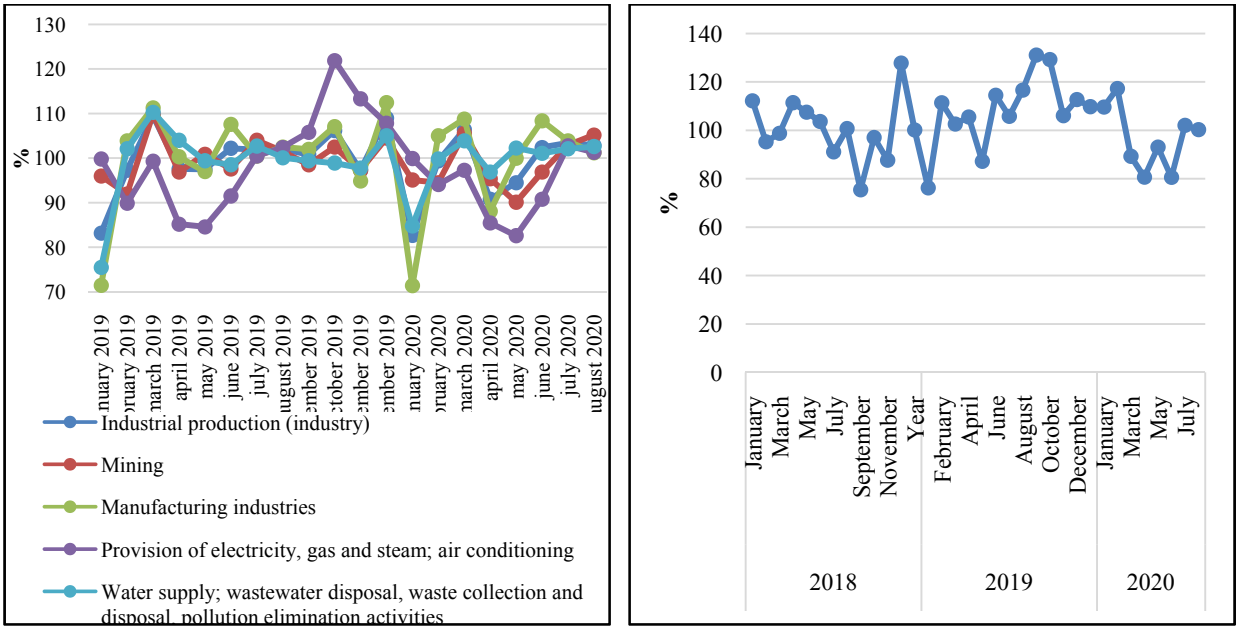


Figure 1. Production indices by type of activity (left), production index by high-tech manufacturing activities (right) (Source: Rosstat, https://www.gks.ru/folder/11189; https://www.gks.ru/enterprise_industrial).

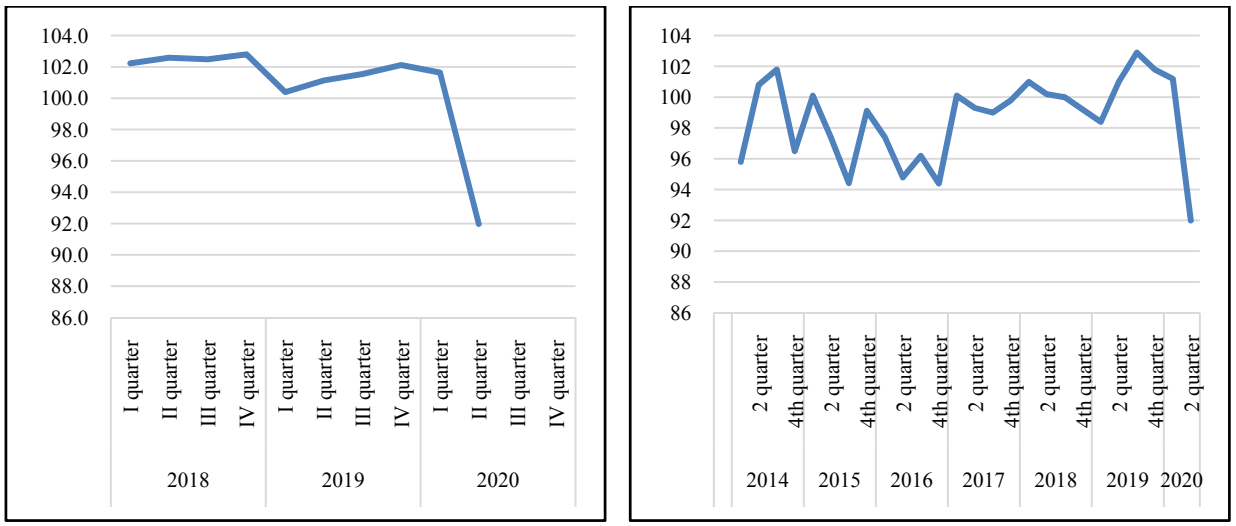


Figure 2. Index of physical volume of GDP (left) and real disposable income of the population (right) (in% of the corresponding quarter of the previous year) (Source: Rosstat, https://rosstat.gov.ru/accounts; https://rosstat.gov.ru/folder/13397).

Figure 2 on the left shows how Russia’s GDP decreased, especially in the second quarter to 8%, but a decrease was also observed in the first quarter relative to the fourth quarter of 2019. The real disposable income of the population also decreased in the first quarter, but in the second quarter of 2020, it was above 9% (see

Figure 3, right). It should be noted the very modest economic growth in 2018-2019, as well as a very slight increase in real disposable income in 2019 with their decrease in the second-fourth quarters of 2018 (with economic growth) and in the fourth quarter of 2019. These data indicate that overcoming the recession in 2015-2016 was carried out very slowly, with clearly accumulated problems of organizing economic growth, which led to the resignation of the Government in January 2020. Investments in fixed assets in the first half of 2020 compared to the same period in 2019 amounted to 96% according to Rosstat. The growth in the unemployment rate is reflected in Table 2, and its steady growth is seen in the interval of eight months of 2020 according to surveys of the population from 15 to 72 years on average for three months.

Table 2

The Unemployment Rate of the Population Aged 15-72 Years by the Constituent Entities of the Russian Federation, on Average for Three Months, % (According to Sample Labor Force Surveys), 2020

	January-March	February-April	March-May	April-June	May-July	June-August
Unemployment	4.6	5.0	5.5	6.0	6.2	6.3

Source: Rosstat, https://rosstat.gov.ru/labour_force.

In the second quarter of 2020, the decline in the extractive industry outpaced the decline in GDP (above 10%), while in the manufacturing industry roughly matched the decline in GDP (about 8%). It should be noted that the dynamics of the manufacturing and extractive industries outpaced the dynamics of GDP in the period 2014-2019, and the dynamics of the mining industry exceeded the dynamics of the manufacturing industry.

Thus, already from the first quarter, there is a downward trend in the main macroeconomic indicators to the previous period, which is sharply intensified by the “COVID” crisis from the second quarter of 2020. Thus, there were obvious problems with the growth characteristics of the Russian economy, associated with its unstable dynamics, low social indicators (there was no growth in real disposable income, it decreased against the background of GDP growth, productivity did not grow, etc.). However, the new crisis, which can be considered to a certain extent a force majeure circumstance, by no means diminished or eliminated the existing development problems, but only increased them. In this regard, it is required, when solving the problem of restoring economic growth, to look for an answer to the fundamental question—whether it is necessary to return to the previous growth model or to look for a new growth model, but then which one and to what extent it will be achievable in the current conditions of the “COVID crisis”.

It should be noted that simultaneously with the introduction of restrictions that have direct economic consequences in the form of curtailing certain types of activities, the Russian government in an operational mode ensured the creation of an economic plan for resisting the crisis with the prospect of economic recovery. Despite the existing and widely discussed shortcomings, nevertheless, it seemed reasonable to support the aggregate dispute and the real disposable income of the population, as well as some of the most vulnerable sectors of the economy and types of activity. For the first time in the past three major crises, starting in 1998, 2009, and 2015-2016, there was no sharp increase in the key interest rate; moreover, it was lowered for the first time to 4.25%, and the modern Russian economy has never had such a value. Another conversation is that such a decrease in the context of the specifics of this crisis could no longer withstand the decline in investment, since with a decrease in the percentage, say, from 14% to 7%, there is only one effect on investment, but with a decrease from 5-6 to 4.5, it is completely different in scope and significance as a policy. This effect, in the

author's opinion, is clearly manifested in the Russian economy in 2020. It is required to accompany decisions on the rate with additional monetization of the economy, and not only through a budget mechanism using reserves, but also a stimulating monetary policy. Such decisions suggest themselves, but the essence of the issue boils down to the scope of application of these instruments, for example, the use of the budget and reserves in the form of the National Welfare Fund to compensate for losses to business and the population.

The structural problems of the Russian economy are, of course, multifaceted, covering various sectors and segments of the economy—funds, personnel, and regions. But one macrostructural proportion determines the macroeconomic dynamics, becoming an immanent characteristic of the economy, reflecting its systemic structure. Having presented the Russian economy as consisting of two sectors (processing and transactional raw materials), we will assess the change in the basic resources of development—funds and personnel employed in the sectors (see Table 3). As follows from Table 3, the inflow of funds into the manufacturing sector for the indicated time is eight times lower than in the transactional raw materials sector (of course, due to the raw materials sector). It should be noted that personnel are also moving into transactional and commodity-based activities—there is an outflow of personnel from processing, and a significant inflow into the transactional and commodity sectors. Moreover, this inflow of personnel exceeds the outflow of personnel from processing, which indicates the training of new personnel who go into transactional activities and replenish the raw materials sector. And here the transaction sectors are already leading.

Table 3

Change in Resources (Fixed Assets and Personnel) in the Manufacturing and Transactional and Raw Materials Sectors of Russia, 2006-2019 (in 2005 Prices)

	Fixed assets		Employed	
	RUB million in 2005 prices	%	Thousand people	%
Manufacturing sector	3,555,837	17.29	-1,461	-2.09
Transactional and raw materials sectors	23,149,007	140.51	4,886	6.90

Source: author's calculations based on data from Rosstat, https://rosstat.gov.ru/labour_force; https://rosstat.gov.ru/free_doc/new_site/business/osnfond/nal_ved2.htm.

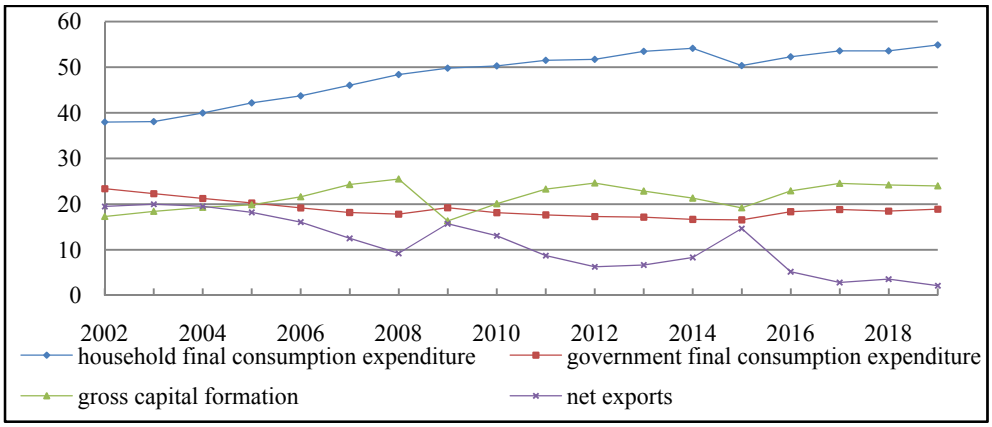
The structural dynamics, which is reflected in Table 3, clearly shows that resources are distributed extremely unevenly—not in favor of the development of the real sector, industry, and high-tech activities. This structure forms the basis of the pre-crisis development of the Russian economy, before the emergence of restrictions associated with COVID-19.

Most of the assessments before the "COVID crisis" about the sluggish growth of the Russian economy boiled down to the fact that insufficient policy measures are being applied, structural and institutional changes, which are urgently needed in terms of the formation of new conditions and growth patterns, are not taken into account. In essence, the Russian economy, in which discussions were constantly going on, sometimes strengthening, then subsiding, about the structural maneuver, modernization, transformation, technological breakthrough, seemingly having significantly changed the structure (for raw materials) and most of the institutions regulating economic transactions, faced an urgent need, both structural modernization and deep institutional adjustments.

In connection with the above, let us consider the structure of Russia's economic dynamics before the "COVID crisis", highlighting its characteristic features.

Structural Analysis of Russia's Growth: Results and the Content of Macroeconomic Policy

We will analyze the structural dynamics of Russia's GDP over the main time period of 2003-2019 (before the "COVID" crisis) by expenditure components, sectors (manufacturing, raw materials, and transaction) and income (compensation, profits, and taxes). We will give a structure for these components (see Figure 3), then calculate their contribution (see Figure 3) to the growth rate.



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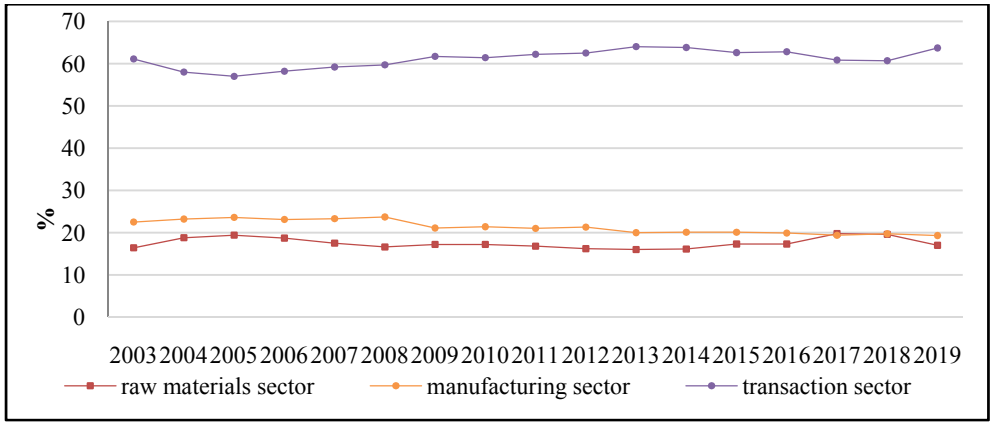

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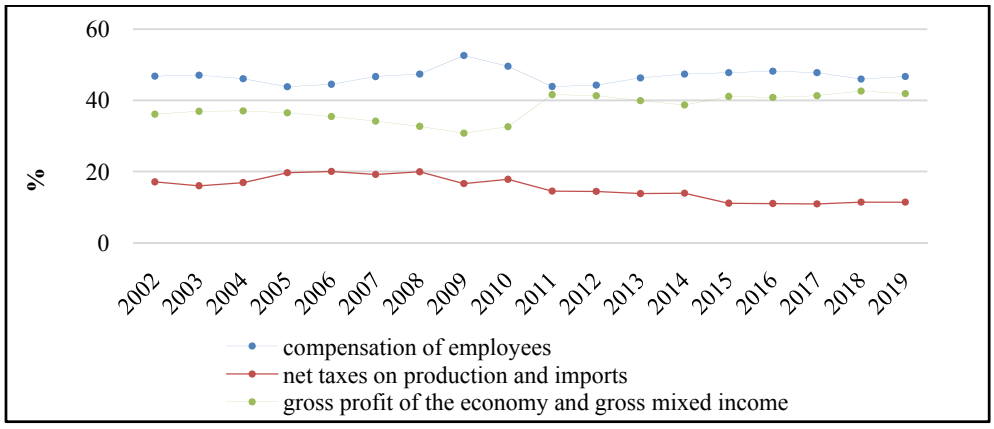


(c)

Figure 3. Structure of Russia's GDP by expenditure, sectors (manufacturing, raw materials, and transaction) and income (from [a] to [c]).

Figure 3 shows that gross consumption dominates as a share of GDP, followed by investment spending, government spending, and net exports. The sectoral dimension of transaction dominates the sector, followed by the manufacturing and the raw materials sector by income-compensation, profits, and taxes. The contribution to the growth rate is also related to the dominant component—gross consumption, the transaction sector, and compensation make a decisive contribution to the Russia economic dynamics (see Figure 4). However, on average, for a time interval, it is not compensation, but gross profit that contributes more to the growth rate of the economy. Compensation and profits compete for their contribution to the dynamics over the entire interval.

As we can see, consumption makes the main contribution to the GDP growth rate over the time interval. The same applies to the transaction sector, but in terms of income, the main contribution to the growth rate is made on average by profit, not compensation, although the average contributions to the pace are quite close. It should be emphasized that the contribution of public spending to the growth rate is extremely small, which indicates that budget policy has been practically removed from powerful tools to influence economic dynamics.

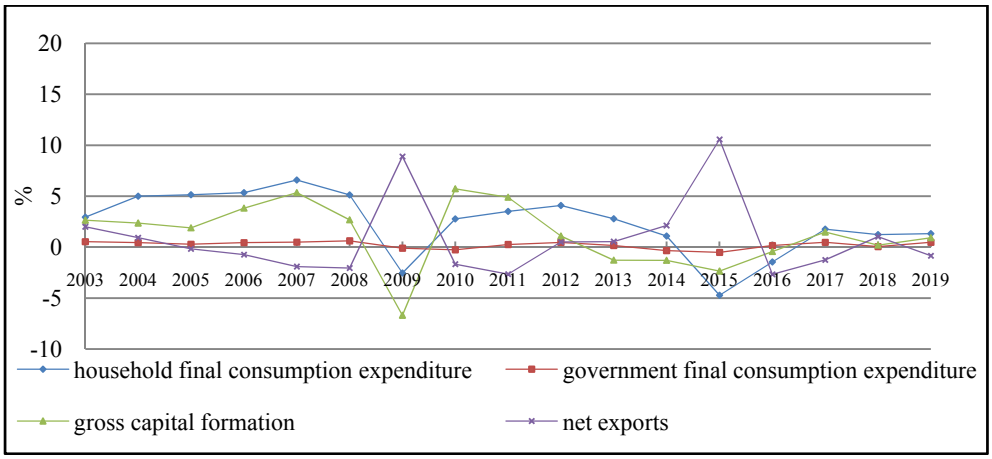
The method of paired correlations, which, as is known, allows to establish a close relationship between the parameters confirms that the contribution of consumer spending to the rate of growth is more closely related to the rate of economic growth than other components. The contribution to the net export rate has a weak but inverse relationship with the growth rate. The contributions of consumer and investment spending show the closest relationship (0.76), followed by the contribution of consumer and government spending (0.7). The close relationship between the contribution to the growth rate of net exports and investment expenditures is reversed (-0.75). It should be noted that the relationship between the contribution of net exports and the contribution of other components of GDP is negative. Thus, summing up the assessment of the contribution of the GDP component to growth and the tightness of communication, consumer spending has the strongest impact on growth. Russia’s net exports are more likely to slow down economic dynamics. The link between the contribution of consumption and investment provides a good basis for lowering interest rates, which, in addition to stimulating investment and its contribution to the rate, will certainly affect the increase in consumption. Although the main contribution to growth is made by the transaction sector, the close relationship between this contribution and the growth rate is less than that of the manufacturing sector, meaning that changes in the contribution of the manufacturing sector, under certain conditions (for example, the availability of necessary resources), may have a slightly stronger effect on the change in the growth rate than changes in the contribution of the transaction sector. The manufacturing and transaction sectors are the most closely connected. Estimating the paired correlations of the income contribution and growth rate gives a closer relationship for the tax contribution and growth rate, although gross profit makes the largest contribution to the growth rate.

The structural analysis of GDP dynamics by expenditure, income and sector allows (according to Table 1) to establish that there is a service, consumer, and distribution model of economic growth in Russia over the considered time interval.

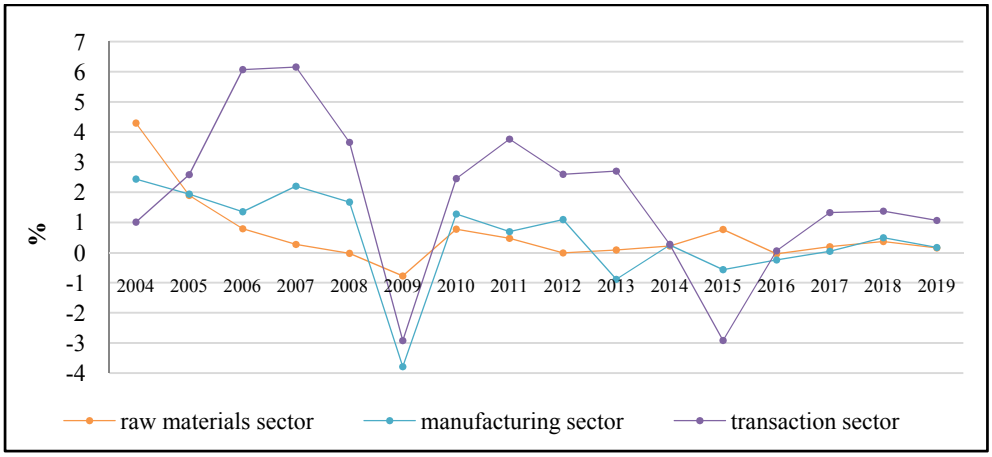
Appendix 1 shows the results of an empirical comparative assessment of changes in the share of each component of GDP (by expenditure and income) and sectors with their growth rate. This allows to identify how the change in the share of a component or sector was related to its rate. This also shows the effect of changing the structure on the element growth rate.

In particular, the increase in the share of consumer spending was accompanied by a decrease in their growth rate. In terms of government spending, the increase in the share was weak, but it was accompanied by

an increase in the rate. Relative to investment, the share growth was also accompanied by an increase in the growth rate. As for net exports, the change in their share of GDP did not show a connection with the growth rate.



(a)



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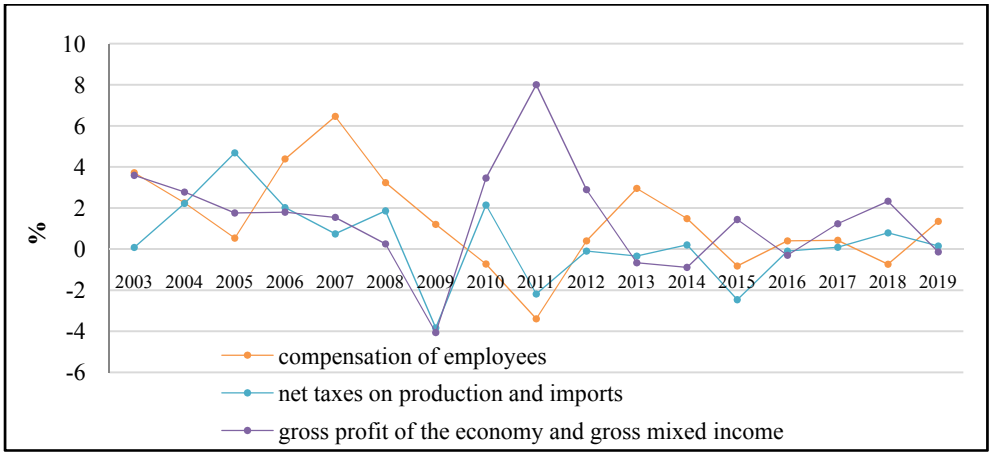


(c)

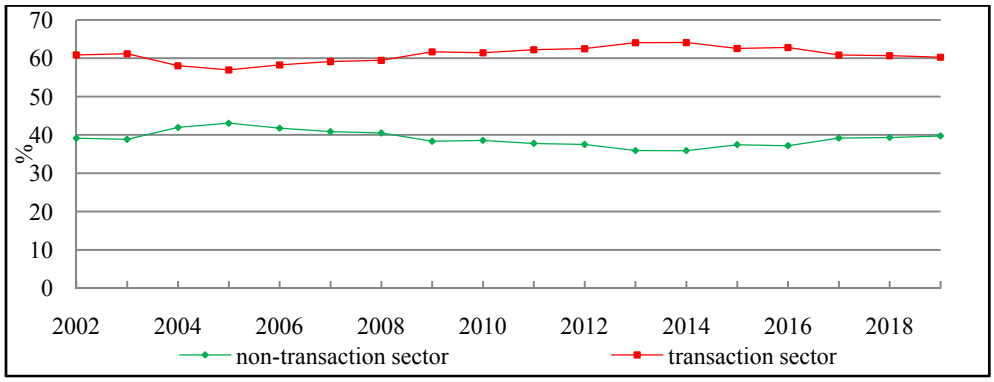
Figure 4. Contribution of the structure of expenditures, sectors and incomes to the Russian GDP growth rate (from [a] to [c]) (Source: author's calculations based on Rosstat data, http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/accounts/#).

With an increase in the share of gross profit, the growth rate increases slightly, and the same happens with an increase in the share of taxes (see Appendix 1). However, with the growth of the share of compensation, its rate decreases over the considered period of time. At the same time, the contribution of compensation and profits does not depend on the share, but the contribution of taxes is higher with a higher share of GDP.

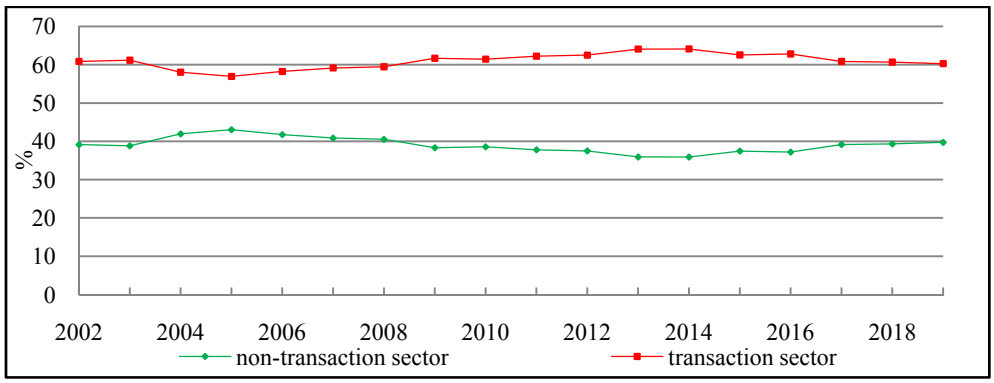
Regarding sectors, the picture is the following: particularly aggressive pace of the manufacturing sector with its growth, also slightly increasing the pace in the raw materials sector by increasing the share. The transaction sector, in contrast to the above two, despite a significant spread of points, nevertheless, with an increase in the share in this interval, shows a slowdown in growth. As the share increases, the contribution to the growth rate of the manufacturing and raw materials sectors increases, and the transaction sector decreases. Such dynamics already represents a certain change in the sectoral structure and, at the same time, demonstrates a prerequisite for the development of manufacturing sectors.

Now let us imagine the Russian economy as two sectors—transactional and non-transactional. Let us assess the contribution of transactional and non-transactional sectors and investments in them to the Russian economy economic growth.

Figure 5 shows the results of calculations performed during the specified time period.



(a)



(b)

Figure 5. Sectoral structure[1] of the Russian economy (a), 2002-2019, contribution of the transactional and non-transactional sectors to the growth rate (b), 2003-2019[2] (Sukharev, 2020a).

[1] Source: compiled by the authors according to Rosstat, https://www.gks.ru/accounts.

[2] Source: compiled by the authors according to Rosstat, https://www.gks.ru/accounts; https://www.gks.ru/accounts; https://www.gks.ru/free_doc/new_site/business/invest/tab_inv-OKVED.htm; https://www.gks.ru/accounts; https://www.gks.ru/accounts; https://www.gks.ru/free_doc/new_site/business/invest/tab_inv-OKVED.htm.

As we can see from Figure 5, the transaction sector dominates and its share in the economy has increased on average. The contribution to the economic growth rate of the transactional sector exceeded the non-transactional sector, with the exception of the following years: 2004-2005, 2015, and 2017-2018. During the crisis years, namely in 2009 and 2015, the contribution of the transaction sector became negative, which is also typical for 2017-2018. A common feature that follows from the fading dynamism of the Russian economy is a decrease in the contribution of these two sectors to the growth rate. In this regard, the expansion of the transaction sector was accompanied by a decrease in its contribution to the growth rate, and a decrease in the share of the non-transaction sector also occurred with a decrease in its contribution. Consequently, one sector expanded, but its contribution to the dynamics did not grow, and the other sector shrank with a decrease in its contribution to the overall dynamics. In 2019, the transactional sector regained its position on the contribution to the growth rate relative to 2017-2018. However, it can be assumed that in 2020, due to the crisis affecting the transactional sectors in the first place, this contribution may also be lower than the non-transactional sector (although the production of durable goods is also experiencing a crisis in 2020, so the result is not obvious and known in advance).

Summarizing, we note that Russia's economic growth, in general, service-oriented, if we rely on the classification of dynamics models shown in Table 1. At the same time, the recession of 2015-2016 is interesting, after which the dynamics are strongly influenced by the non-transaction sector, and the transaction sector even slows down growth in 2017-2018. Of course, the crisis caused by the pandemic in 2020 may also lead to a drag on the role of the transaction sector in generating growth. However, this effect is detected earlier, which can be associated with the peculiarities of the functioning of transaction activities.

The structure of financial and non-financial investments is also indicative when studying the relationship between the structures of economic growth, including the contribution of each type of investment to the rate of economic growth.

Figure 5 shows the comparative aspect of financial and non-financial investments in Russia, the United States, and Germany.

The most important positions that follow from Figure 5 are as follows:

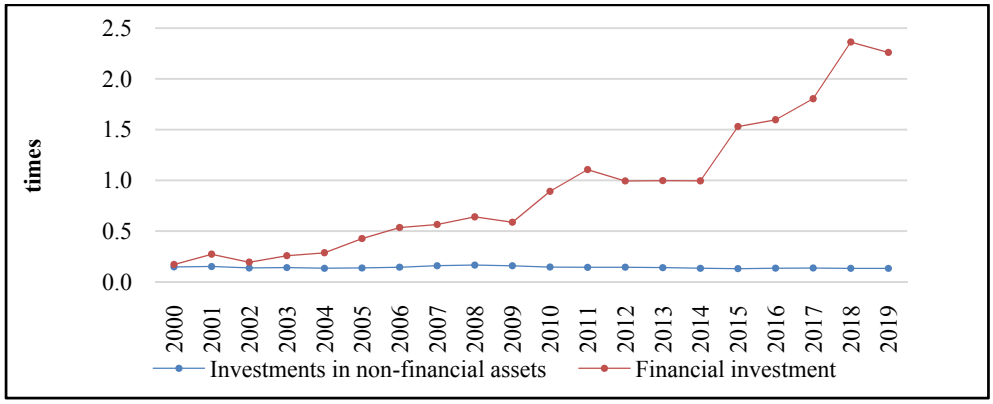
1. For Russia, the difference between the two types of investment as a share of GDP is very significant. Moreover, this difference increases significantly and due to the growth of financial investment, it increases to the point that it exceeds the value of GDP.

2. The same dynamics does not show neither the US nor Germany. For example, in the US, financial investment is inferior to non-financial investment, and the ratio to GDP is less than one. In Germany, investment in financial assets exceeds investment in non-financial assets.

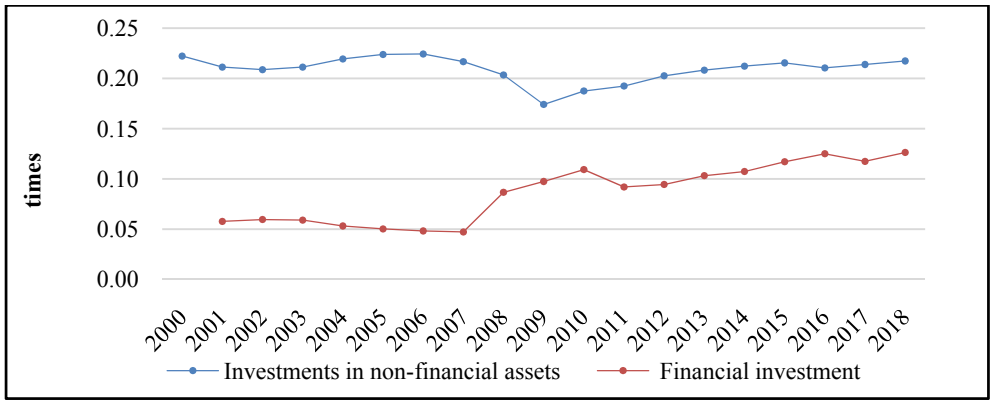
3. The value of the financial market biases y_0 changes as in Figure 6.

This bias increases sharply in Russia and, for example, is relatively stable in Germany (see Figure 6).

If y_0 is positive, it means that non-financial investments are not higher than total savings. This parameter can grow when investments in non-financial assets increase, when savings do not grow much, but financial investments increase. According to Rosstat data, investment in financial assets is increasing in Russia. In Germany, this parameter does not grow much due to the fact that the difference between types of investment remains. In the US, this parameter is negative, since investment in non-financial assets is higher than savings, and external capital was attracted to the country. For this reason, the parameter $\gamma 0$ may grow (not due to financial investments), but, as can be seen from Figure 6, in the negative range of values.



(a)



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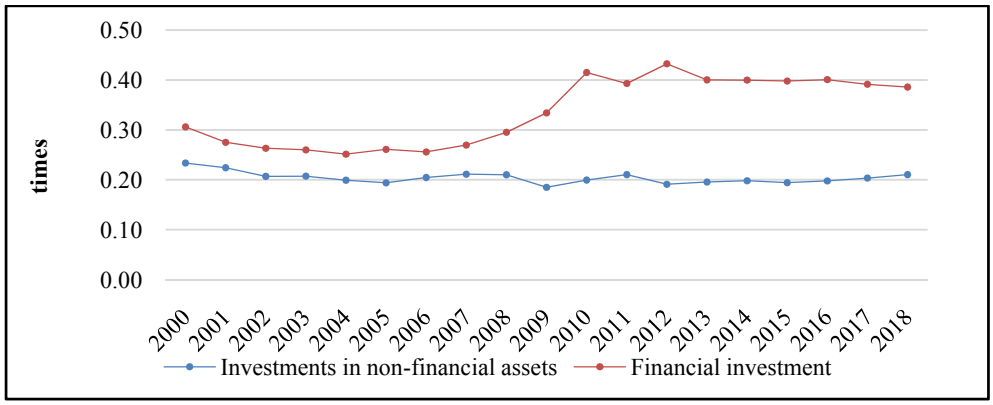

(c)

Figure 5. Investments in financial and non-financial assets in Russia (a), USA (b), and Germany (c)[3] (Sukharev, 2020a; Sukharev & Voronchikhina, 2020).

For Russia, in contrast to the countries compared, financial investments are too high, which emphasize the existing speculative growth model (service-consumer-distribution model of economic growth, according to Table 1 and calculations of structural dynamics).

[3] Source: compiled by the authors according to Rosstat, https://www.gks.ru/investment_nonfinancial; https://www.gks.ru/folder/14476; https://www.gks.ru/storage/mediabank/tab1(2).htm; World Bank, https://data.worldbank.org/indicator/NE.GDI.TOTL.KD, https://data.worldbank.org/indicator/NY.GDP.MKTP.KD, International Monetary Fund, https://data.imf.org/regular.aspx?key=61545853.

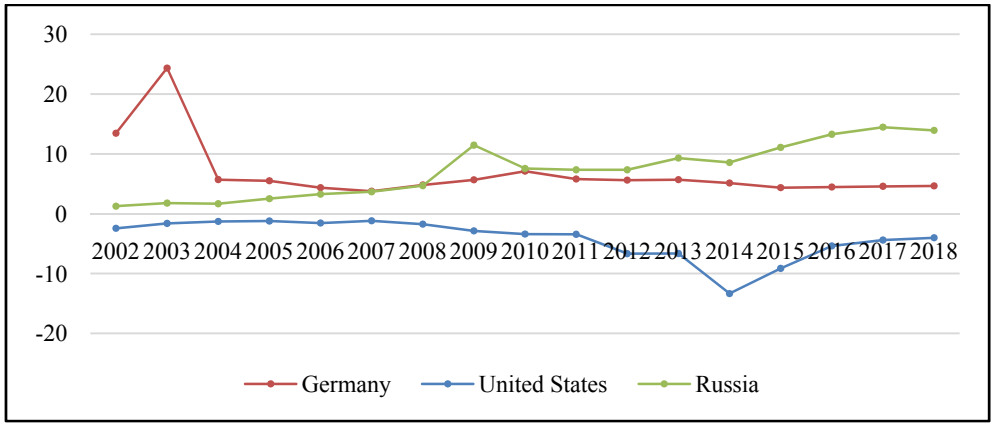

Figure 6. Financial market institutional bias y_0 in Russia, USA, and Germany (Sukharev, 2020a; Sukharev & Voronchikhina, 2020).

The analysis of the growth structure in Russia revealed the inherent features of the current growth model of the Russian economy, so that its characteristics suggest that a change in the model is possible due to the expansion of the manufacturing sectors and technological renewal and change in the growth model. However, this task cannot be solved within the framework of persistent stereotypes of macroeconomic and structural policies. Particularly noteworthy is the impact of social parameters of growth—the level of inequality and poverty in Russia. Based on panel data, we will evaluate the impact of inequality and poverty on the gross domestic product in the period 2000-2019 for the Russian economy. To do this, we use the Gretl 2020b software module that implements the least squares method for obtaining regression equations. The selection of models is carried out by the rejection method, focusing on the best statistics of the model. We get the following results by writing GDP per capita in 2010 prices (Y) as the resulting model:

$$Y = 4307 - 51 * Gini - 56 * P + 7 * gY \quad (2)$$

where $Gini$ is Gini coefficient, P is the level of the national poverty[4], and gY is the growth rate of GDP per capita.

As follows from the presented model, the increase in inequality reduces the possibility of increasing the gross product per capita in Russia, as well as the increase in poverty. A high growth rate naturally has a positive effect on the value of GDP. Thus, in addition to structural changes, stimulating aggregate demand and consumption is a very powerful factor in triggering growth through reducing poverty and inequality, including channels for equitable income distribution.

Macroeconomic policy instruments, the price of oil, and inflation are equally important factors for economic growth. The use of a regression analysis tool, for example, based on the Gretl 2020b software module, allows to obtain the following model that demonstrates the impact on GDP dynamics (Y, product growth rate—y) of the key interest rate (i), the level of monetization (M2/Y), oil prices (brent) and inflation (inflation). The model is constructed using the least squares method for the period 2001-2019. As a result, its appearance is as follows:

$$y = 877 + 1.8 * brent - 12.9 * i + 14 * M3/Y - 0.4 * inflation \quad (3)$$

[4] Source: World Bank, https://data.worldbank.org/indicator/SI.POV.NAHC?view=chart. According to the source, the poverty level is the percentage of the population with monetary incomes below the minimum subsistence level set at the national level for the population as a whole. The models were selected using the Gretl 2020b software module and the best ones were identified by the filtering method according to the calculated best statistics. Tables with statistics are not included here to save space.

The resulting model confirms that the increase in the oil price and the level of monetization positively affected the rate of economic growth in the considered interval. The key interest rate significantly slowed down economic growth, with its increase, inflation had very little effect on the growth rate.

Thus, during the time period under review, it is immediately clear which economic policy tools worked for growth, and which ones strongly slowed it down, while others did not have a significant impact. Separately, it can be noted that the ongoing monetization had little effect on reducing the interest rate, which largely depended on institutional circumstances. The growth policy goal of suppressing inflation was also not adequate, according to the estimates received. It should be noted that this policy slowed down growth and deepened social problems. The perspective of the analysis is to consider the problems of growth and structural changes in the economy together with the necessary social development tasks.

Conclusion

Summing up the article, we will formulate the most important conclusions.

Firstly, the Russian economy shows a consumer-service structural model of economic dynamics, which is determined not so much by investment as by the level of consumption. In this regard, these parameters of poverty and inequality are both growth goals and determinants of growth opportunities. Given that the solution to the problem of poverty is possible by solving the problem of income distribution and eliminating risk in certain areas of activity, this circumstance is an additional condition for the intensification of growth in Russia. Moreover, the coronavirus crisis is not only not canceled, but even more emphasizes the importance of this circumstance.

Secondly, in the strategic dimension, there is reason to believe that the contribution of the transaction sector to the growth rate exceeded the ability of this sector to continue maintaining a high rate. Therefore, the allocation of resources in favor of manufacturing sectors can create a good basis for economic growth in the future and increase the contribution of this group of sectors to it. Such guidelines for macroeconomic growth policy will require a larger amount of investment, which can be made at the expense of the existing reserves of the banking system and appropriate institutional adjustments (taxes, incentives-investment rules, reducing administrative and bureaucratic barriers, etc.), improving the distribution of investments and increasing returns on them within the country. The analysis confirms the recommendations given in terms of building an economic development policy.

Thus, to create a different model of economic growth in Russia, it is necessary not only to change the factorial, but also the structural basis of growth, which is possible due to the impact on the distribution of resources between sectors, including through institutional adjustments. In addition, we need policies that stimulate consumption and reduce inequality and poverty, which will have a positive impact on gross domestic product and which will increase in 2020 due to the “COVID” crisis. Nevertheless, the study outlines the perspective of both analysis and measures of economic policy that counteract the crisis.

Conflict of Interest

Author declares no conflicts of interest in this paper.

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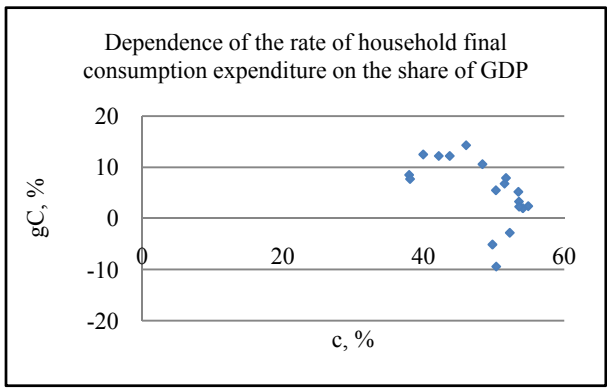
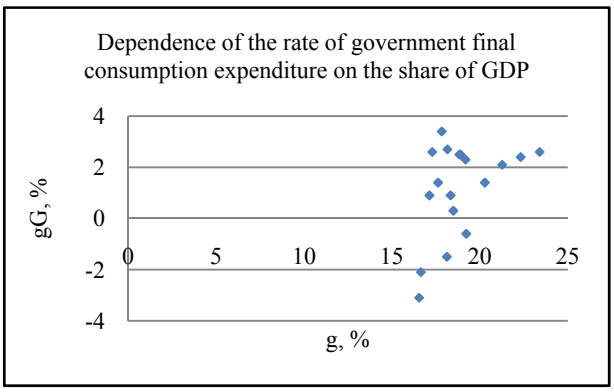
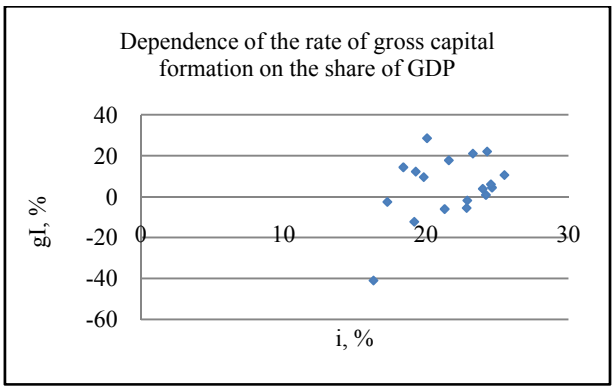
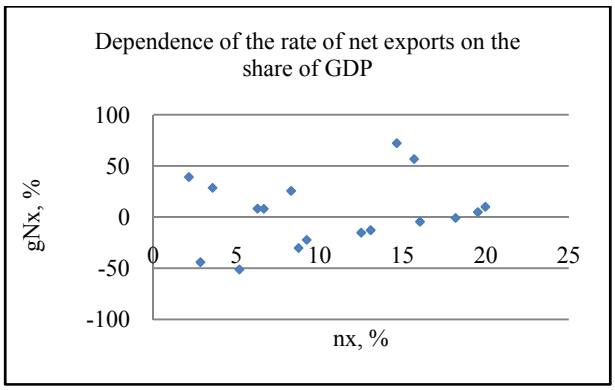
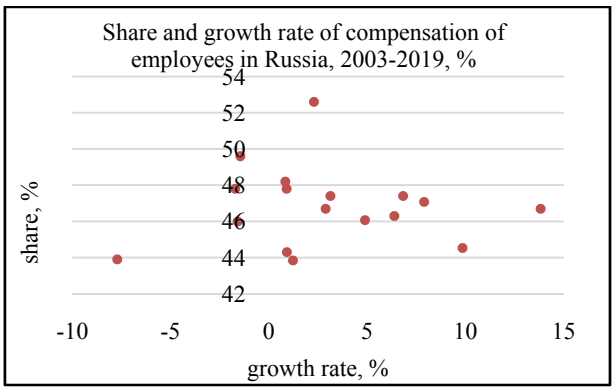
Appendix 1: The rate of the element's dynamics and its share in GDP, 2002-2019.

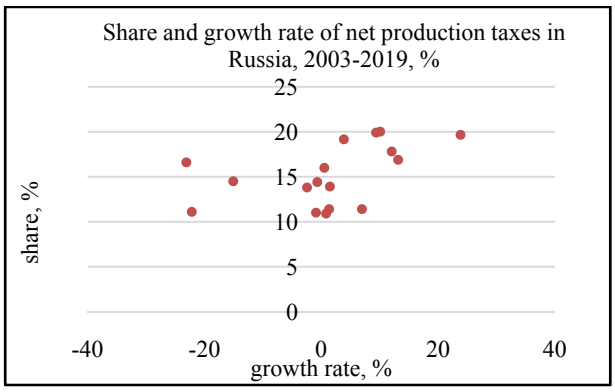


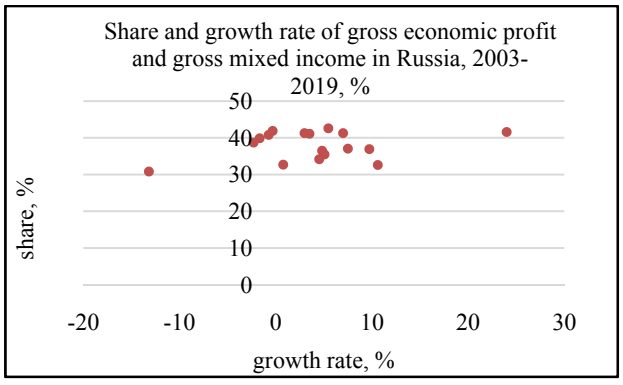


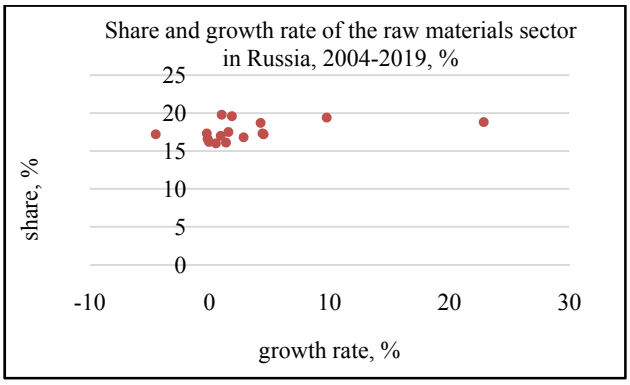


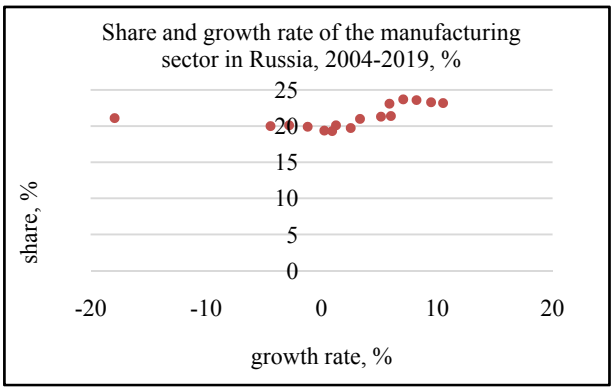


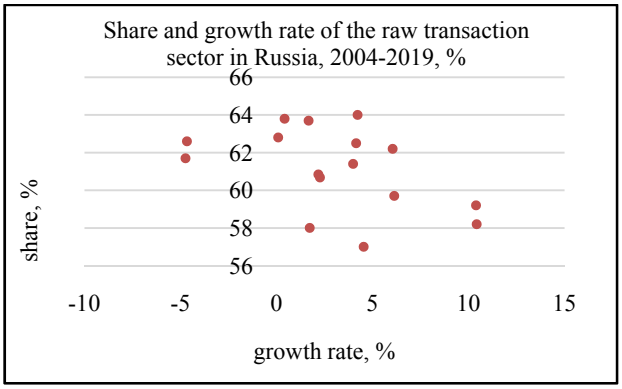









Share and growth rate of the manufacturing sector in Russia, 2004-2019, %
share, %
25
20
15
10
5
0
-20
-10
0
10
20
growth rate, %


Share and growth rate of the raw transaction sector in Russia, 2004-2019, %
share, %
66
64
62
60
58
56
-10
-5
0
5
10
15
growth rate, %