Inflation Targeting: Eliminating Economic Growth and Structural Deformation in Russia

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ABSTRACT

The paper examines the impact of the inflation targeting policy as a basic component of the government's general anti-inflationary measures on economic growth and the structure of the Russian economy. **The purpose of the study** is to identify the impact of targeting policy in Russia on the rate of economic growth and the structure of the economy, represented by aggregated sectors — manufacturing and transactional raw materials. **The research methodology** consists of empirical-statistical structural, index methods of analysis, econometric modeling, reduced to the construction of factor models by type of production functions. Taking into account these methods, an algorithm has been developed to assess the impact of price dynamics and its targeting on macroeconomic dynamics and structure of the economy. Following this algorithm allowed, on the one hand, to give measurable estimates of the impact of consumer and industrial prices on general inflation in the country, and of inflation itself on GDP dynamics, on the other hand, to determine the degree of deformation of the structure of the Russian economy under the influence of inflation targeting policy. **The main result of the study** is that the large role of the transactional raw material sector in generating inflation and the fact that the introduction of targeting as a method of inflation suppression policy fixes the structure of the economy, slowing down development, which also affects growth towards its slowdown, is confirmed. Thus, a moderately restrictive monetary policy slows down growth and deforms the economic structure. **The prospect of applying** the results is that a change in inflation targeting policy, as well as an approach that assesses the impact of price dynamics on economic growth and its structure, which should lead to the justification of flexible ranges of inflation targets and the targeting of nominal GDP as a policy goal, taking into account the necessary change in the sectoral economic structure. In theoretical terms, future research on the adsorption of the money supply by the economic structure and determining the impact of such absorption on price dynamics is important.

Keywords: inflation; economic growth; anti-inflationary policy; targeting; GDP deflator; economic structure; macroeconomic dynamics; index method; factor models

INTRODUCTION

Monetary policy is the main tool to counter inflation and to stimulate economic growth, but despite a very large number of studies of this effect, many questions remain completely unanswered, in particular, the adsorption of the money mass by economic activities, the cumulative impact of various monetary instruments on growth and price dynamics [1]. Moreover, existing papers on the influence of the inflation targeting method on inflation and growth itself [2–8], as well as on other various aspects of economic development, leave unclear the problem of changes in the structure of the economy and its dynamics, as also the effects of the elements of structure and growth on changes in price levels [9–11], not to mention the need to consider such influences in relation to the relationship between economic growth and price dynamics.

For example, in developing countries with different levels of financial development, it has been shown that targeting seems to slow down inflation, but such studies ignore the problem of growth, i.e. it remains unclear whether growth is accelerating or slowing down [5]. The usefulness of these studies is that they show the targeting effect depending on the state of financial institutions and the characteristics of the banking system. The effects and uncertainty of targeting on inflation itself depend on Taylor's rule adopted by the country's monetary authorities [6], as well as on the influence of "global inflation", which is weak for middle- and low-income countries [2, 3].

There are papers demonstrating a flexible monetary policy regime, including targeting aimed at stabilizing production and inflation. Currency interventions and confidence in the Central Bank [7], as well as deviations from the targeting regime in macroeconomic shocks [3, 4], the impact of targeting on the formation of inflation expectations are studied [8].

The set inflation target does not yet mean that it can be achieved through monetary and general macroeconomic policies, including budgetary and tax instruments. For example, the experience of the Central Bank of Japan shows that the 2% inflation target was impossible [8], confirming the importance of setting the target correctly. It is necessary to make this purpose dynamic, or to give a range, how much the macroeconomic dynamics are volatile, and fixing the overall price dynamics at some level can generate aggregate supply and demand imbalances [12] with the consequent negative effects on the economic structure and dynamics. Moreover, different variants of price dynamics by industry and activity can lead to the same overall inflation target, and this cannot fail to affect development in medium and short intervals, not to mention long-term changes. In the basic document on monetary policy of the Central Bank of the Russian Federation, targeting with the target parameter of 4% is based on the experience of different countries (selected 47 states), but does not take into account that they have a different economy, institutions, level of development, and economic structure, and the target itself is different; in some countries it is assigned to one value (as in Russia), in others it is a range.[1] It was noted that the level of justification of a particular value, as well as why it should remain unchanged for a long time, and why it is not set by a range (which, however, also needs to be justified and flexibly modified) are not contained in this document of the monetary authorities.[2]

Inadequately studied in the scientific literature, the reverse impact of the structure of the economy on inflation and targeting as a tool on the structure and dynamics require, at least, the **purpose of the study**. Two **objectives** are needed for this: first,

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[1] Main directions of Single State Monetary Policy for 2023 and the period 2024 and 2025. Moscow: Bank of Russia; 2022. 159 p. URL: https://cbr.ru/about_br/publ/ondkp/on_2023_2025/ (accessed on 15.08.2023).

[2] Main directions of Single State Monetary Policy for 2023 and the period 2024 and 2025. Moscow: Bank of Russia; 2022. 159 p. URL: https://cbr.ru/about_br/publ/ondkp/on_2023_2025/ (accessed on 15.08.2023).

to determine the influence of inflation-determining factors and targeting on the structure of the economy represented by aggregated sectors; and second, to identify the impact of the growth rate of the sectors themselves on the inflation components.

When solving these problems, a number of measuring and modeling problems arise, but their solution is possible through the following **methodology** — the method of regression, econometric factor analysis, and empirical comparisons. After defining the methodology of the study, we began to reveal the objectives formulated for the general purpose of the paper.

METHODOLOGY OF RESEARCH

On the subject of inflation targeting in the scientific literature, two main areas of research can be identified.

Firstly, this is the determination of the impact of the targeting method on individual parameters or sectors of the economy: Inflation [13], private investment [14, 15], financial or macroeconomic stability, emerging markets, the environment [16–18] etc.

Secondly, modeling the relationship of different macroeconomic parameters or sectors, including inflation and countermeasures, including comparisons between countries [18] in order to establish the most appropriate inflation targeting regime associated with dynamics such as exchange rate or trade [19–22].

A separate direction can be considered for questions of inflation targeting and information for the Central Bank, as well as the information effects generated during the application of this method of anti-inflation policy [23, 24].

Note that the review of contemporary literature reveals, in general, the inadequacy of studies on the impact of targeting on growth and changes in economic structure, as well as the determination of the influence of dynamics of structural elements on inflation. Of course,

changes in the structure of economics are rather weakly embedded in economic theory and modeling, which F. Gabardo rightly noted with co-authors [25]. But it is this circumstance that makes it difficult to formulate an algorithm for the study of such influence in the breakdown to the relationship "inflation — targeting — economic growth". More importantly, how the structure of the economy affects inflation and growth, as well as targeting the formation of the economic structure to grow and generate price dynamics. Research, for example, on the influence of financial structure on growth was conducted by L. K. Chu [26], and was empirical, but the fact that what happens with the structure of the economy depending on targeting and how it affects growth did not get the required, in our view, coverage, which will be supplemented by the approach developed in this paper. In connection with the methodological meaning of the proposed algorithm of research within the purpose and objectives set, the following steps are envisaged:

Step 1. Measurement of inflation in Russia by basic indicators based on data from Rosstat (GDP deflator,[3] consumer price index, producer price index).

Step 2. Modeling the relationship between the deflator as an indicator reflecting the average price change in the economy for the period and the consumer price index, the producer price index. Non-linear regression of the relationship between overall inflation and base price indices. This will allow us to find out the influence / contribution of different types of prices to overall inflation and get a structural picture of inflation in Russia.

Step 3. Construction of factor models reflecting the relationship between the

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[3] The GDP deflator index characterizes the average price change in the economy over a period of time. It is calculated by dividing the value index of GDP (in current prices) by the physical volume index of the GDP or by devising the absolute volume of GNP in current prices by its absolute amount (in the same period) in prices of the previous year, according to Rosstat. URL: https://rosstat.gov.ru/storage/mediabank/met774–08112021.pdf (accessed on 15.08.2023).

deflator of GDP (as well as the index of consumer prices) and the dynamics of the two aggregated sectors (processing and transactional raw materials), allocated by the OKVED[4] and in the sum of the constituents of the gross domestic product of Russia, and the structure of the aggregate "demand-supply", which will enable us to find out the impact of the dynamic of the sectoral structure of the economy on the dynamism of prices.

Step 4. After getting the required model links and changing the value of the target as the inflation target, reverse examine the options of the economic structure represented by the two aggregated sectors, comparing the model result with the real structural dynamics. Thus, it is possible to establish the imbalance in the development of the economic structure generated by the method of inflation targeting.

Step 5. A similar approach under step 4 of the algorithm should be applied to the structure of aggregate supply and demand modeled to the value of the consumer price index. For different values of the inflation target, you can get variants of the "demand-supply" structure in the economy, determining the size of the gap relative to current values.

Step 6. Implementation of the aggregate analysis of inflation in relation to economic growth and changes in its structure.

Step 7. Getting key conclusions on the impacts of targeting on Russia's economic development, restricting inflation, and impact on economic growth and structure.

Total inflation is estimated in the country by the size of the deflator index, as well as separately by the consumer price index (CIP).[5] For the implementation of the proposed algorithm of the present study, the application of regression analysis and factor modeling (by type of production functions) is envisaged. The period of time covering the Russian economy from 2003 to 2022 was researched. The resulting regression and factor models are reflected in the graphs, with the relevant statistics in the footnotes to the names of the figures.

Implement the formulated research plan to achieve the purpose and the above-mentioned objectives.

PRICE DYNAMICS AND INFLATION TARGETING IN RUSSIA

In Russia, the method of inflation targeting has been introduced since 2014, with the target of 4% inflation, which has been unchanged for almost a decade, as a benchmark of anti-inflation policy. It is noted that there were no significant changes in the economic structure during the period, and the rate of economic growth has slowed down on average. Thus, not explicitly, the monetary authorities have adopted the assumption that the target should not change, as if the target parameter did not reflect changes in the economy.[6] *Figure 1* shows price dynamics on two indices — consumer and producer prices.

Empirical data on the Russian economy for the period 1998–2022 indicate (*Fig. 1*), that consumer prices averaged a decrease in inflation in the interval. It was interrupted by its increase in individual years. Producer prices show deflation in 2008, 2019, 2022 and very low inflation in 2020. The overall downward trend of inflation is also evident.

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[4] The following sectors (sum of activities) are allocated by gross value added (VAT) according to the OKVED of Rosstat: 1) manufacturing sector: manufacturing; construction; 2) transactional raw materials aggregated sector: agriculture, forestry, hunting; fisheries and fisheries; mining; electricity, gas and steam; air conditioning; water supply; drainage, waste collection and disposal; pollution management activities; wholesale and retail trade; repair of motor vehicles and motorcycles; transportation and storage; hotel and catering activities; information and communications activities; financial and insurance activities; real estate operations; professional, scientific and technical activities; administrative and associated services; public administration and military security; social welfare; education; health and social services; cultural, sports, leisure and entertainment activities; provision of other services.

[5] Depending on the convenience of analysis and the quality of the selected model, the decomposition of the models during their construction.

[6] Main directions of Single State Monetary Policy for 2023 and the period 2024 and 2025. Moscow: Bank of Russia; 2022. 159 p. URL: https://cbr.ru/about_br/publ/ondkp/on_2023_2025/ (accessed on 15.08.2023).
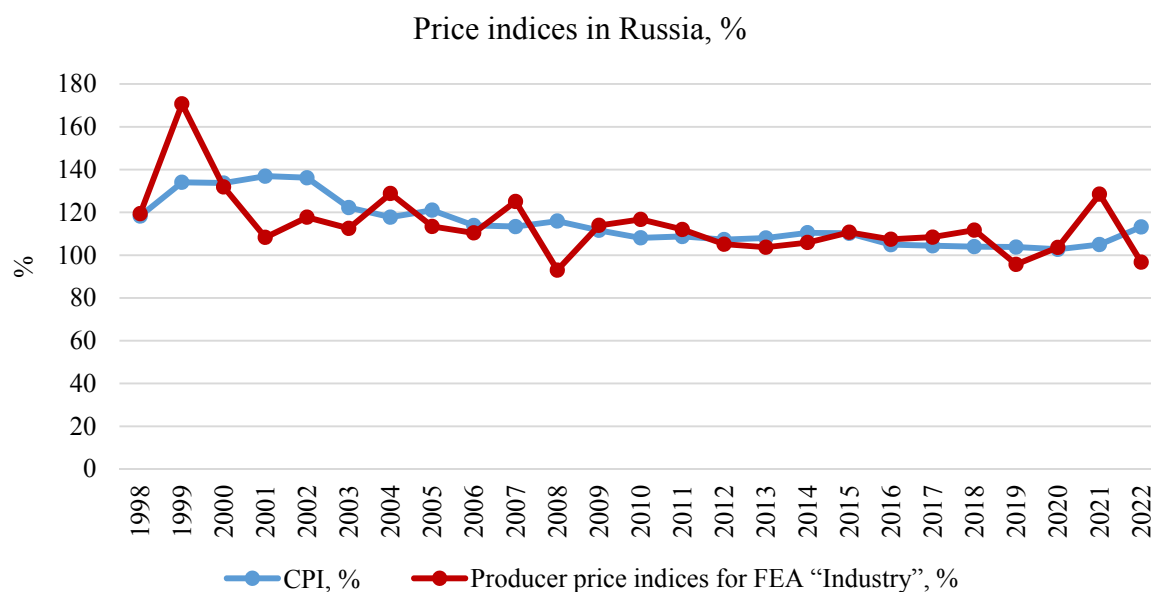
Price indices in Russia, %

Fig. 1. **Inflation in Russia by Two Price Indices, 1998–2022**
Source: Compiled by the authors based on Rosstat data. URL: https://rosstat.gov.ru/statistics/price (accessed on 15.08.2023).

And it was long before the introduction of the targeting method in 2014. By the way, immediately after its introduction, there was a rise in prices in 2014–2015 (*Fig. 1*), and the producer price index grew in 2017–2018.

The significant characteristic shown in *Fig. 1* is the high fluctuations of the producer price index relative to the consumer price index, expressed as a substantial increase, replaced by the same decrease in the given index. It may be assumed that sectoral decisions in the real sector of the economy, related to cost and price formation, determined this dynamic, as well as dependence on expensive imports. That is, the specificity of the market had a significant influence on the change in inflation in this segment of the Russian economy.

Dividing the period of development of the Russian economy by time before and after targeting, we have given empirical graphs of the relationship between the rate of growth and the GDP deflator index for these periods (*Fig. 2, 3*).

Until 2014, when inflation targeting was applied, that is, anti-inflation policy was built with a targeted inflation of 4%, the higher inflation corresponded to a higher rate of growth of the Russian economy. With the decrease of the deflator index, the decline

in the rate of economic growth is accurately detected (*Fig. 2*).

Beyond the inflation target, relatively high economic growth is no longer observed. The decrease in the deflator index still occurs when the growth rate decreases, although the relationship between the rate of growth and the deflator is not indicative. However, the variance of points (*Fig. 3*) demonstrates that there is no definite relationship between how one parameter changes in regard to another.

Thus, elementary empirical analysis (*Fig. 1–3*) demonstrates that after the introduction of inflation targeting as a method of government policy, not only targeting was the cause of slowing the rate of growth of the Russian economy, but a change in the fundamental factors that determined its dynamics. However, the fact that, when targeted for the next nine years, the Russian economy did not reach a sustainable and acceptable growth trajectory (at a rate of 3% and above) by exposing deterred development, the policy of the unchanged target contributed somewhat significantly, as will be shown below. The growth of the *M*2 monetary aggregate was accompanied by an average decline in the growth rate of the Russian economy and a
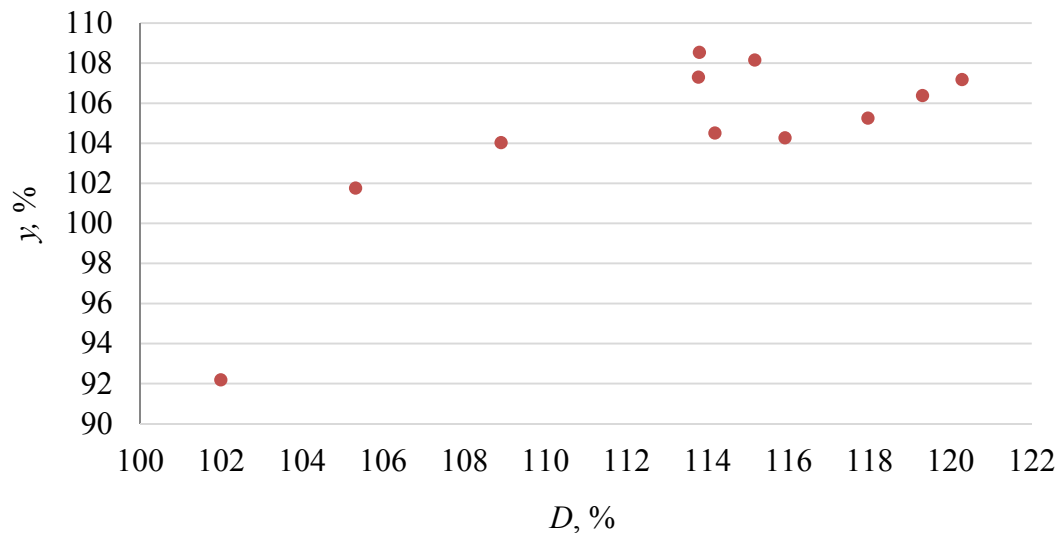
Fig. 2. **Growth Rate (*y*) and GDP Deflator Index (*D*) in Russia, 2003–2013**

Source: compiled by the authors based on Rosstat. URL: https://rosstat.gov.ru/statistics/accounts; https://rosstat.gov.ru/statistics/price (accessed on 15.08.2023).
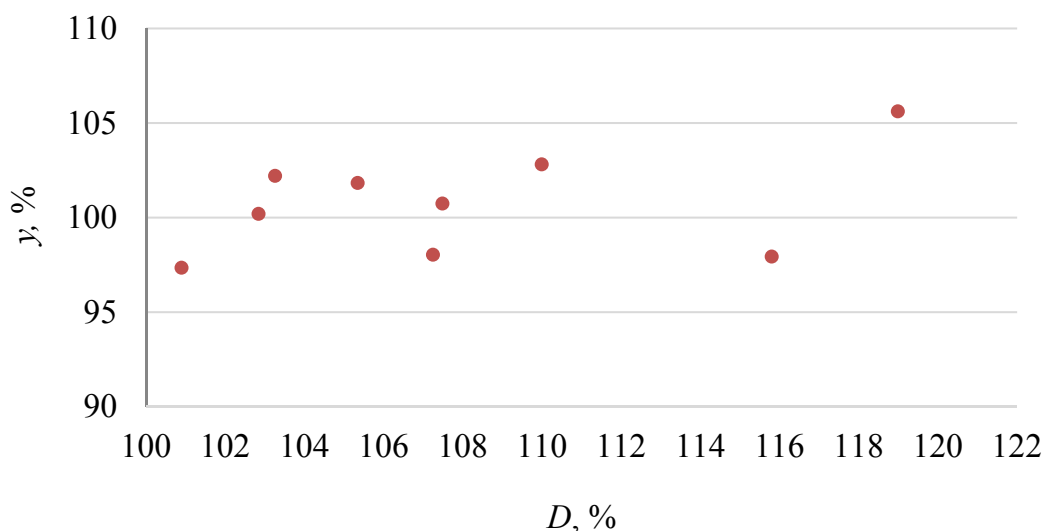

Fig. 3. **Growth Rate (*y*) and GDP Deflator Index (*D*) in Russia, 2014–2022**

Source: Compiled by the authors based on Rosstat. URL: https://rosstat.gov.ru/statistics/accounts; https://rosstat.gov.ru/statistics/price (accessed on 15.08.2023).

decrease in the deflator index. This empirical relationship between the dynamics of these characteristics must be considered while developing Russia's monetary and general macroeconomic development policies.

We detail the leading analysis by connecting regression and factor models taking into account the structural characteristics of the Russian economy.

ECONOMIC STRUCTURE, INFLATION AND TARGETING POLICIES

Total inflation in Russia, estimated by deflator (*D*),[7] is determined by two base indices — consumer prices (CPI) and producer price (PPI) as base indicators of inflation.[8] A factor model

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[7] Increase of dD / dt > 0 deflator means increase of inflation, decrease of dD / dt < 0 — decrease of inflation.

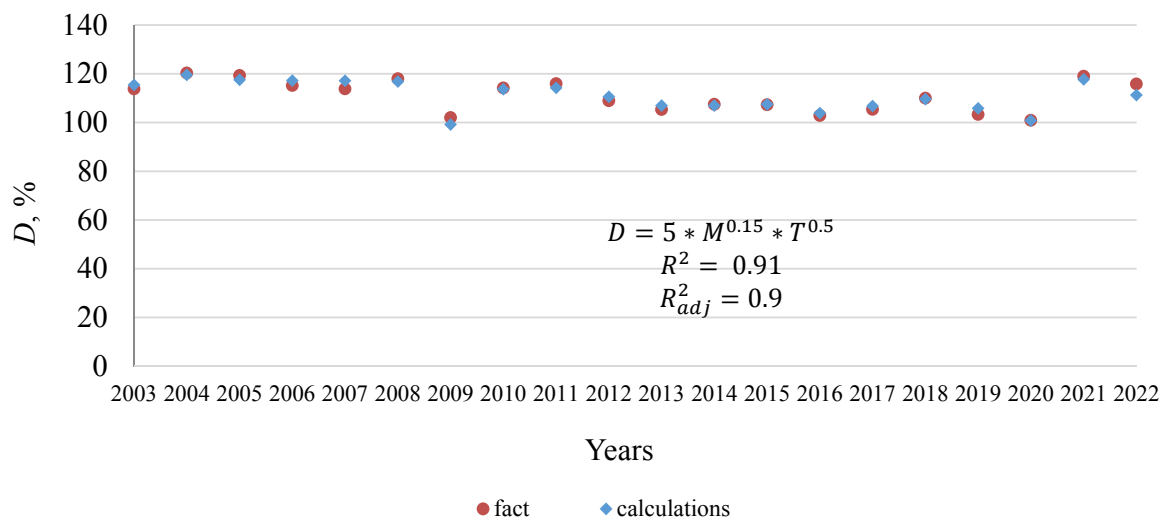[8] Of course, more different price indices are considered Rosstat.

$$D = 5 * M^{0.15} * T^{0.5}$$
$$R^2 = 0.91$$
$$R^2_{adj} = 0.9$$

Fig. 4. **GDP Deflator (*D*) of the Nominal Growth Rate of the Manufacturing (*M*) and Transactional Raw Materials (*T*) Sectors in Russia**

Source: Compiled by the authors based on Rosstat. URL: https://rosstat.gov.ru/statistics/accounts; https://rosstat.gov.ru/statistics/price (accessed on 15.08.2023).

Note: Model statistics: *F*-criterion = 79.6; *D-W* calculation = 1.57 not ∈ [1.54; 2.46]; White test: χ2 calculation = 2.1; χ2 criterion = 5.99.

of the influence of different prices on overall inflation in the country can be presented as follows:

$$D = 2.12 * I^{0.75} * P^{0.09},$$

where D — deflator, I — CPI, P — PPI. Statistics for this model are as follows: $R^2 = 0.71$; $R^2_{adj} = 0.68$; *F*-criterion = 12.3; *D-W* calculations = 2.06 ∈ [1.54; 2.46]; White test: χ2 calculations = 8.43; χ2 criterion = 5.99. Thus, it has some heteroscedasticity, which deteriorates the statistical characteristics. However, from the point of view of assessing the overall impact — it's understandable: the consumer price index (*I*), that is, consumer inflation contributes more to the overall price dynamics in Russia than producer prices. Choosing a model with the exclusion of heterosexuality can result in a more complex type of connection, but it also indicates a higher influence of consumer prices on inflation and, in some cases, restricting influence producer prices:

$$D = -1.1 * I^{0.88} + P^{-1.4} + 0.8 * I^2 + 1.2 * I * P;$$

(model statistics: $R^2 = 0.9$; $R^2_{adj} = 0.89$; *F*-criterion= 31.8; *D-W* calculations = 2.2 ∈ [1.56; 2.44]; White test: χ2 calculations = 1.28; χ2 criterion = 5.99).

Building a model of the impact of the dynamics of economic sectors on the deflator, confirms the greater influence of the transaction sector (*T*), including services, trade, finance on the overall price dynamics (*Fig. 4*). Processing dynamics (*M*) have less impact on overall inflation.

Changes in the deflator over the period under consideration depending on changes in the physical volume index of processing and transactional raw materials of aggregated sectors (model: $\Delta D = 34.7 * \Delta M^{-0.02} * \Delta T^{0.25}$; statistics: $R^2 = 0.68$, $R^2_{adj} = 0.64$, *F*-criterion = 4.1; *D-W* calculations = 2.43 ∈ [1.54; 2.46]; White test: χ2 calculations = 2.1; χ2 criterion = 5.99) shows that the increase in processing growth has slowed, while the transactional raw materials sector has, on the contrary, accelerated overall inflation. So the dynamics of the economic structure influenced the price dynamics. At the same time, the relationship between inflation and economic growth was not as predicted by the monetary
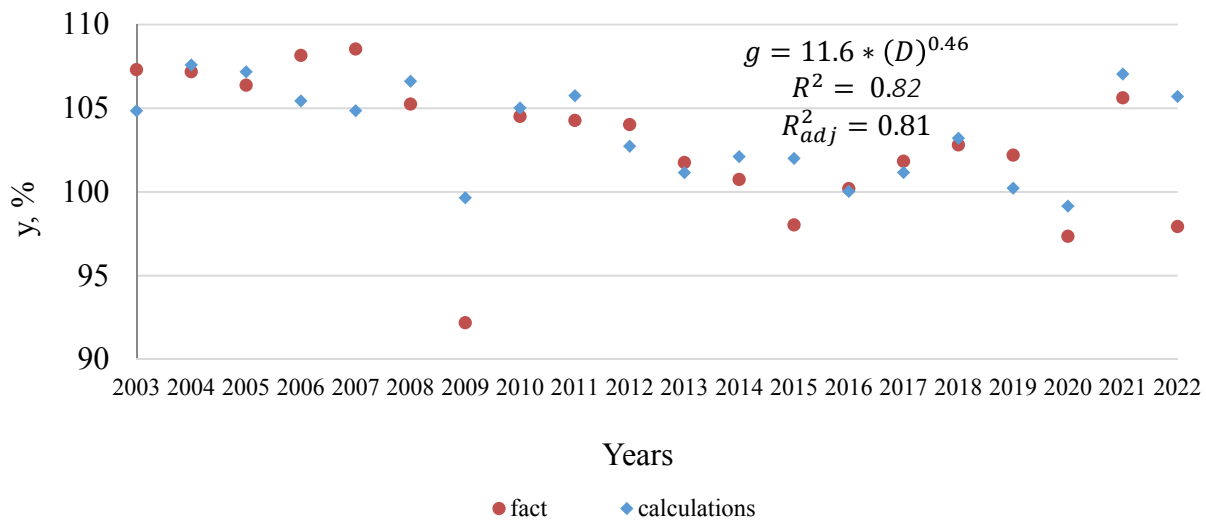
$$g = 11.6 * (D)^{0.46}$$
$$R^2 = 0.82$$
$$R^2_{adj} = 0.81$$

Fig. 5. **GDP Growth Rate (*y*) and GDP Deflator (*D*) in Russia**

Source: compiled by the authors based on Rosstat. URL: https://rosstat.gov.ru/statistics/accounts; https://rosstat.gov.ru/statistics/price (accessed on 15.08.2023).

Note: Model statistics: *F*-criterion = 44.3; *D-W* calculation = 1.41 not $\in$ [1.41; 2.59]; White test: χ2 calculation = 0.23; χ2 criterion = 3.84.
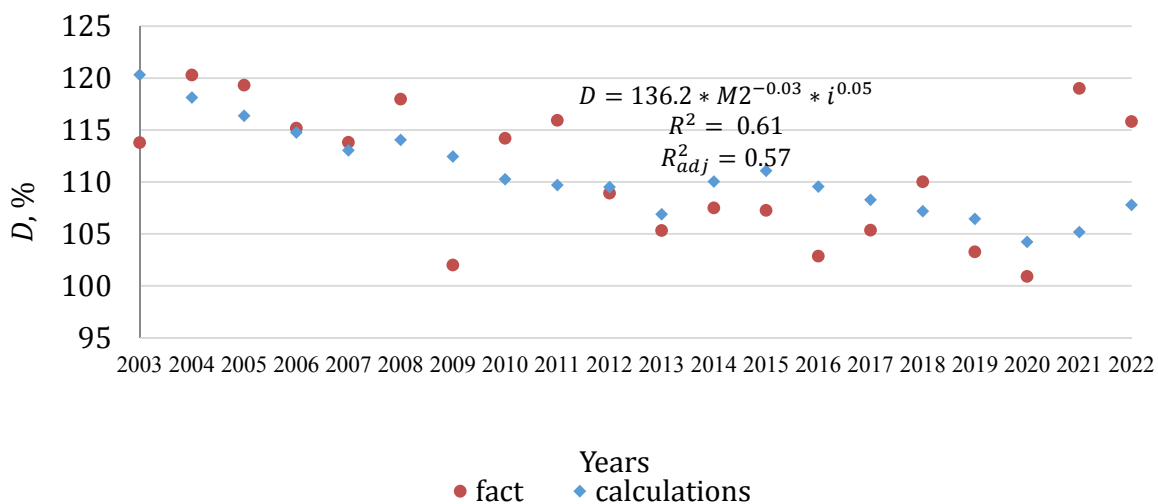

$$D = 136.2 * M2^{-0.03} * i^{0.05}$$
$$R^2 = 0.61$$
$$R^2_{adj} = 0.57$$

Fig. 6. **Deflator from Money Supply and Interest Rate**

Source: Compiled by the authors based on Rosstat. URL: https://rosstat.gov.ru/statistics/accounts; https://rosstat.gov.ru/statistics/price (accessed on 15.08.2023).

authorities that a decrease in inflation was a prerequisite for further growth [13]. The resulting model (*Fig. 5*) shows that higher inflation (*D*) corresponded, on average, to a higher growth rate (*g*) of the Russian economy, and lower inflation corresponded to lower growth.

At the same time, an increase in the monetary mass (*M*2 aggregate) slowed overall inflation, but a higher key interest rate resulted in higher deflator inflation. This corresponds to the model in *Fig. 6*.

Fig. 6 confirms the position that the monetization of the Russian economy was not the cause of inflation rising dynamics of prices, and the key interest rate was significantly increased, acting pro-inflation.

The relationship between overall inflation (by deflator) and economic structure reflects the model in *Fig. 7*. Following this model, the
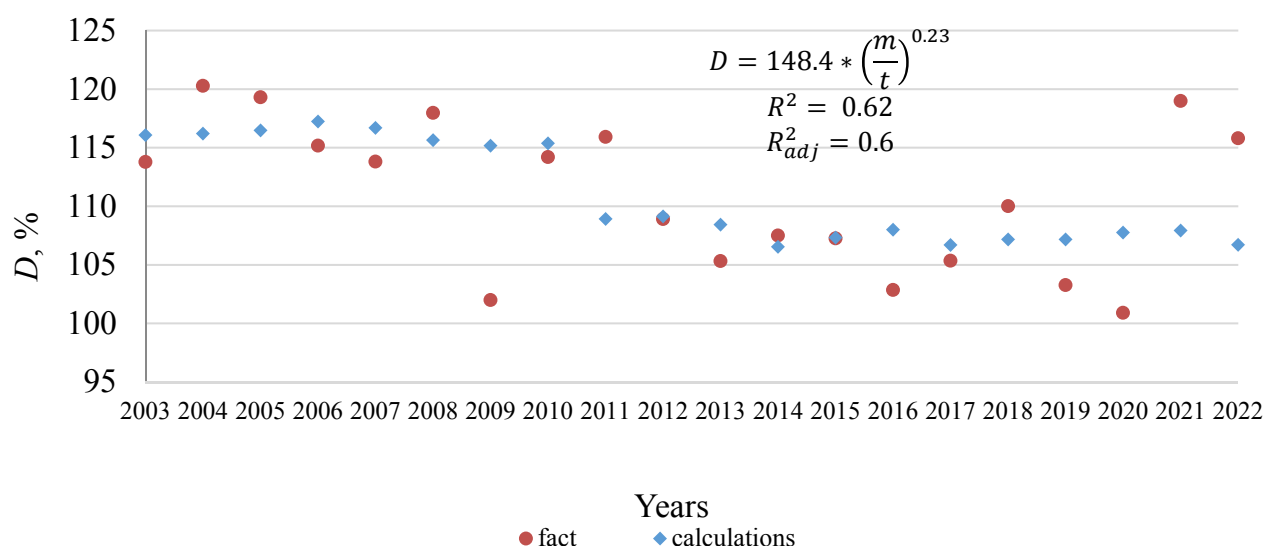
$$D = 148.4 * \left(\frac{m}{t}\right)^{0.23}$$
$$R^2 = 0.62$$
$$R^2_{adj} = 0.6$$

Fig. 7. **GDP Deflator (*D*) from the Ratio of the Shares of the Manufacturing and Transactional Raw Materials (*m/t*) Sectors in Russia**

Source: Compiled by the authors based on Rosstat; EMISS. URL: https://rosstat.gov.ru/statistics/accounts; https://rosstat.gov.ru/statistics/price; https://www.fedstat.ru/indicator/37697?ysclid=llbx2rakes273442283 (accessed on 15.08.2023).

Note: Model statistics: *F*-criterion = 20.4; *D-W* calculation = 1.81 not ∈ [1.41; 2.59]; White test: χ2 calculation = 1.83; χ2 criterion = 3.84.

research can proceed to the final steps, namely, forecasting the size of the target to get model economic structures and then conducting a comparative analysis with the actual sectoral structure that generates price dynamics in the economy. This will enable us to understand how the aspiration to inflation targets can generate structural imbalances and influence economic development prospects and dynamics. A similar model is to be constructed for aggregate supply and demand, assessing the structural disparities arising here from the desire for some generalized price dynamics (target). It has been shown above that different sectoral price dynamics will have an impact on the overall dynamics, so aggregate targeting cuts efforts on these directions (sectoral) of inflation resistance.

Consider the emerging strictness for different inflation targets, considering that the setting of the target occurs by deflator. Assess the structure of sectors corresponding to the target of 4% and for different targets, according to the model *Fig. 7*, and compare it with the current structural dynamics (in fact). The result reflects *Fig. 8*, which shows that the economic structure (processing to

transactional raw materials sector ratio *m/t*) during the specified period was essentially weakly sensitive to deflators (factual points on the chart). However, according to the model obtained, which connects overall inflation in Russia (deflator) and economic structure, following a target should result in a change in the structure of the economy, with the 4% target reducing the share of processing and increasing the proportion of transactional raw materials in the sector (*m/t* decreases).

In fact, this has happened, which reflects *Fig. 9*, according to which there is a decrease in the share of processing in the GDP of Russia in 2014 and then after 2016. Although the decline was observed earlier, in 2011, it can be said that the anti-inflation policy of targeting still contributed to some structural stagnation of the Russian economy, and also, taking into account the link between inflation and the rate of growth, hindered economic growth. In order to increase the share of the manufacturing sector, according to the analysis carried out, a completely different inflation target, exceeding 4%, is needed; otherwise, with the stereotype of macroeconomic policy and the links found
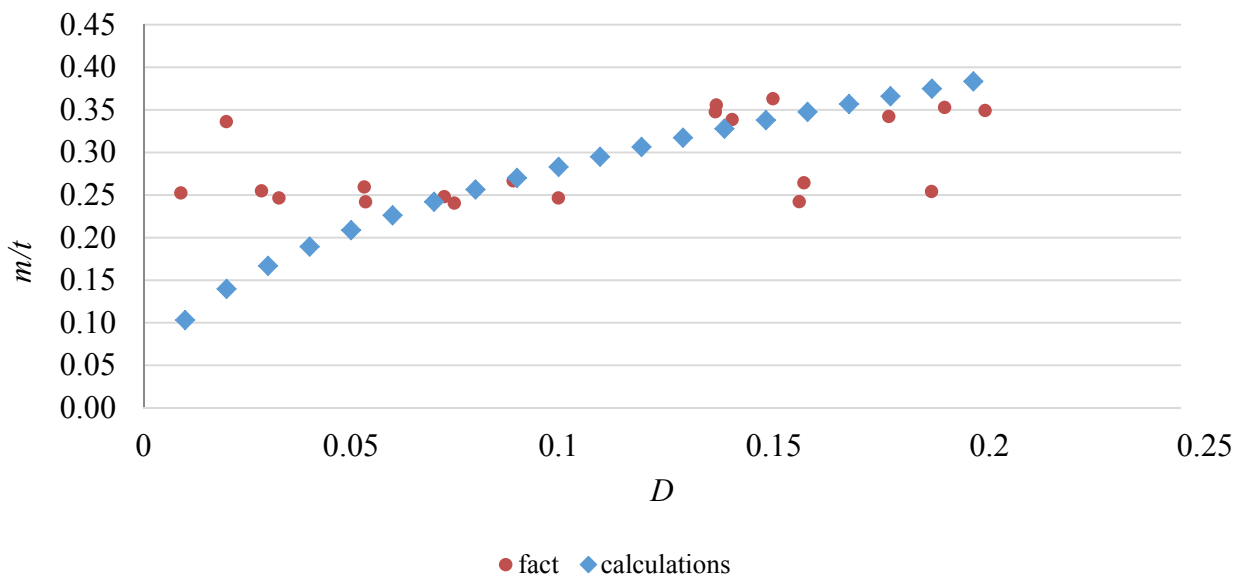
● fact ◆ calculations

Fig. 8. **The Structure of Sectors of the Russian Economy on the Value of the Deflator/Target, 2003–2022**

Source: Compiled by the authors based on Rosstat. URL: https://rosstat.gov.ru/statistics/accounts (accessed on 15.08.2023).

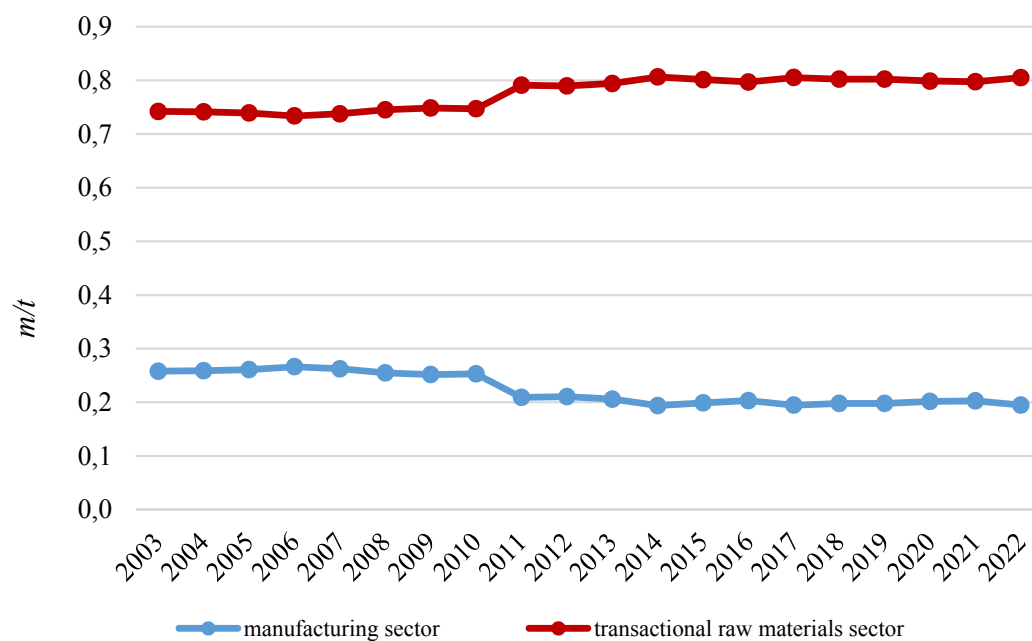manufacturing sector ——— transactional raw materials sector

Fig. 9. **Actual Change in the Structure of the Russian Economy (Share of the Manufacturing Sector – *m*, the Transactional Raw Materials Sector – *t*), 2003–2022**

Source: Compiled by the authors based on Rosstat. URL: https://rosstat.gov.ru/statistics/accounts (accessed on 15.08.2023).

in the study, this problem cannot be solved. With relatively high inflation until 2014, the structure of the Russian economy included a larger manufacturing sector and smaller transactional raw materials. Of course, structural changes are influenced by many factors, including institutional, technological, external, etc. Nevertheless, at least, it can be argued that the introduction of the method of inflation targeting ensured a kind of blocking change in the structure of the Russian economy, including neutralizing the possibilities for its new industrialization and unambiguously containing its growth.
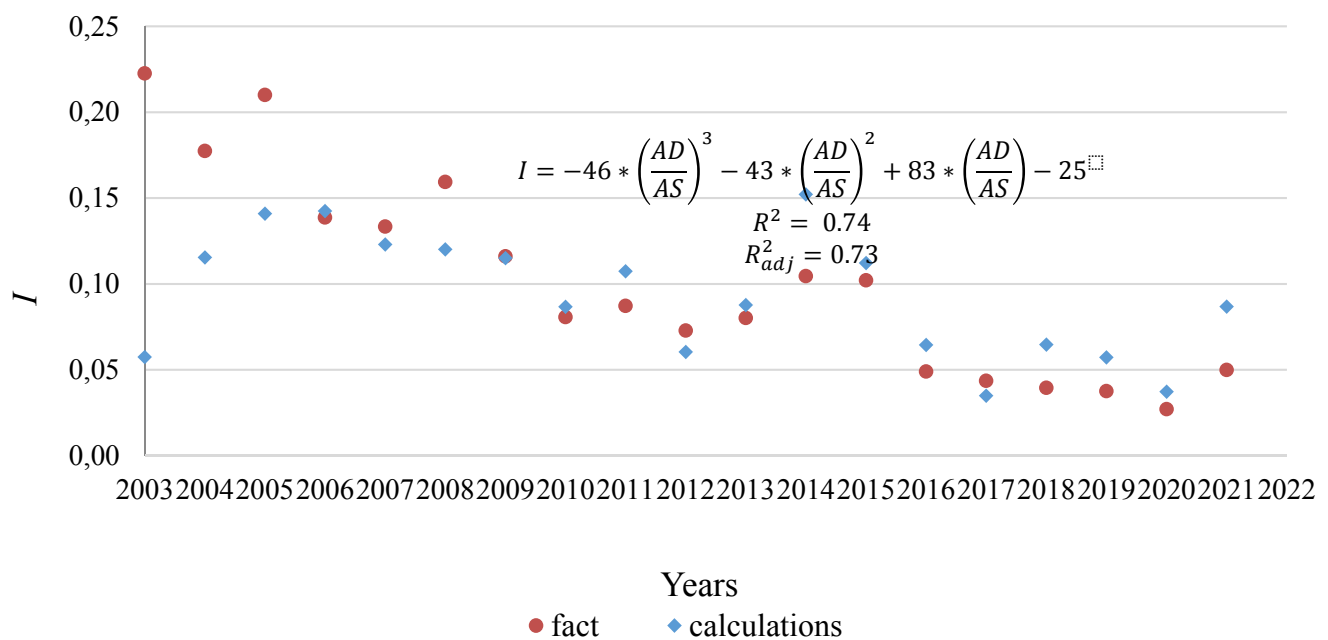
$$I = -46 * \left(\frac{AD}{AS}\right)^3 - 43 * \left(\frac{AD}{AS}\right)^2 + 83 * \left(\frac{AD}{AS}\right) - 25$$

$$R^2 = 0.74$$
$$R^2_{adj} = 0.73$$

Fig. 10. **CPI (*I*) Inflation and *AD/AS* Supply-Demand Structure in Russia**

Source: Compiled by the authors based on Rosstat. URL: https://rosstat.gov.ru/statistics/accounts; https://rosstat.gov.ru/statistics/price (accessed on 15.08.2023).

Note: Model statistics: *F*-criterion = 26; *D-W* calculation = 1.6 not ∈ [1.4; 2.6]; White test: χ2 calculation = 0.8; χ2 criterion = 3.84.
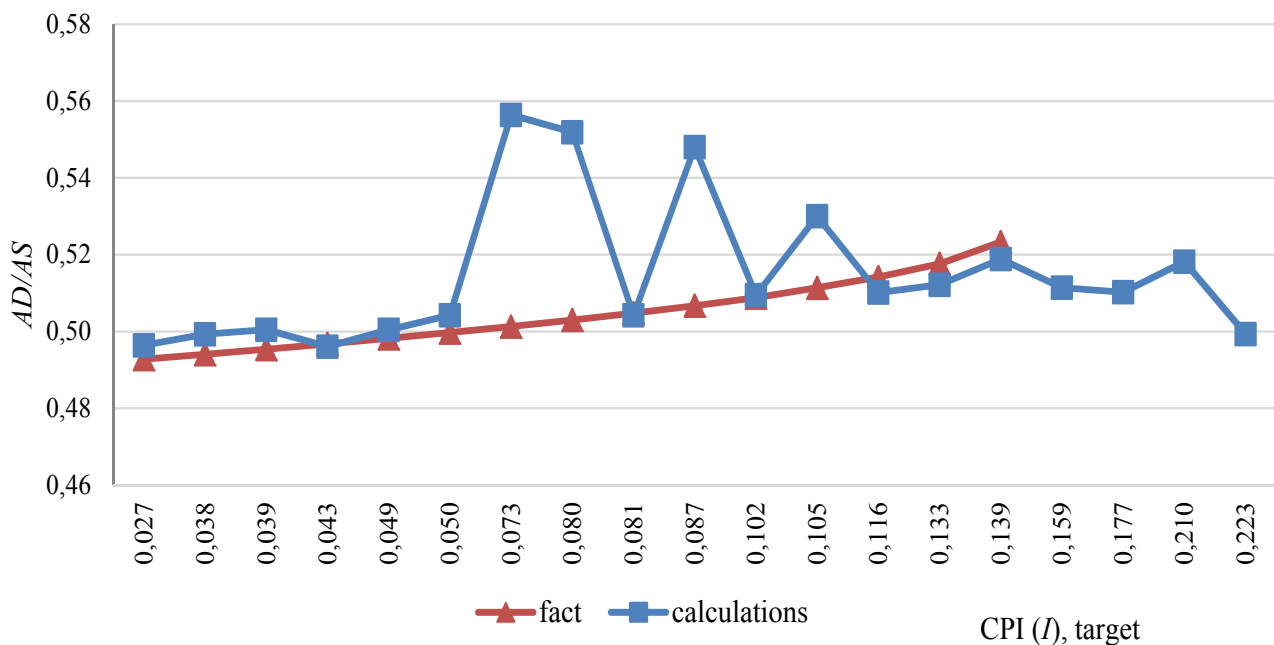

Fig. 11. **Change in the Supply-Demand Structure Depending on Inflation (CPI) and Target in Russia (Fact and Model)**

Source: Compiled by the authors based on Rosstat. URL: https://rosstat.gov.ru/statistics/accounts; https://rosstat.gov.ru/statistics/price (accessed on 15.08.2023).

We have a similar approach to aggregate demand (*AD*) and supply (*AS*), taking the form of the first GDP of Russia by expenditure and the second — full output of goods and services plus imports.[9] We describe inflation in the form of a consumer price index and build a model of its connection with the structure of "demand-supply" according to the indicated parameters. Results reflect in *Fig. 10, 11*.

Resolving the resulting cubic equation (*Fig. 10*), for a specific value of the target, changing this value and getting each time the solution of the equation relative to the structure of supply and demand (*AD/AS*), we get the model changes of the economic structure from the target and give its actual changes from the CPI (*Fig. 11*). From the predetermined calculations it follows that the introduction of the target lowered the supply-demand ratio, that is, affected the structure of the economy, and for the target of 4% the model result coincides with the fact (*Fig. 11*). Based on fact data, before the introduction of the target in 2014, the *AD/AS* ratio averaged increased, although it fluctuated, but after introducing and decreasing inflation to the target and even below it (three points), the structural ratio decreased. The theoretical constructed model (chart "calculation" on *Fig. 11*) also shows that higher inflation would correspond to greater demand in the structure under consideration, and its reduction and reduction to target deforms this structure. The following model, that connects the consumer price index (CPI) to changes in supply and demand, confirms the improvement $I = 0.05 * \Delta AD^{6.3} * \Delta AS^{-6.3}$ (statistics model: $R^2 = 0.93$; $R^2_{adj} = 0.92$; *F*-criterion = 125.6; *D-W* calculations = 1.68 $\in$ [1.54; 2.46]; White test: $\chi 2$ calculations = 4.76; $\chi 2$ criterion = 5.99). Changes in demand can rising inflation while decreasing supply over time.

As a result, it can be concluded that targeting as a policy method in the fight against inflation affected the structure of the Russian economy, restricting its development and causing elimination at the rate of growth, which confirms the analysis presented in the paper.

CONCLUSION

Summarizing the analysis, the most important results were formulated.

Firstly, if before the introduction of inflation targeting in Russia, its decline was accompanied by a decrease in the rate of growth, then with this rule introduced in 2014, growth, in fact, has stabilized at relatively low values of its rate. The connection between lower inflation and lower growth has also been confirmed. The increase in the money supply was accompanied by a slowdown in inflation, and the rise in the key interest rate corresponded to higher inflation. Consumer prices had a greater impact on overall inflation.

Secondly, the transactional raw materials aggregate sector contributed the most to inflation compared to the manufacturing sector, and the introduction of targeting was accompanied by an increase in the share of this sector, as confirmed by model constructions, despite the not good determination of the model itself ($R^2 = 0.62$). However, it can be argued that the method of targeting has constrained the development of the Russian economy not only in rate, but also in structure. Higher targets correspond to increased processing by reducing the transactional raw materials sector share. Consequently, without changing the approaches in the field of macroeconomic (monetary) policy to counter inflation, it is difficult to expect a significant structural change in Russia's economy, in particular, its industry and technological modernization.

Thirdly, aggregate demand determined consumer and general inflation, and its decrease before the introduction of targeting retained its higher value relative to the volume of output plus imports (analogue of supply), but with the tightening of policies

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[9] We are interested in the structure, that is, the ratio of the specified AD/AS regulatory input parameters.

and the introduction of a target — lowered and fixed the structure of "demand-supply", contained demand.

Thus, in order to set macroeconomic goals related to the development of the economy's structure and growth, it is necessary to align them with the goal of inflation, which completely neutralizes a whole set of useful development problems, providing them unsolvable or making the path to a positive solution difficult. Such agreement entails expanding the inflation target and introducing it in the range of 5–7% (*Fig. 8, 11*), which will allow more flexibility to manage aggregate demand and not record the structural sectoral imbalances in the Russian economy. In other words, the structural parameters of the Russian economy are such that higher growth will require slightly higher inflation than the target, and monetization of the economy does not lead to inflation, but stimulates growth. It may be useful to target the consumer price index separately, the deflator separately and, of course, the nominal GDP, but these issues go beyond the purpose and objectives of this paper.

REFERENCES

1. Glazyev Yu., Sukharev S., Afanasyeva N. Monetary policy in Russia: Negative cumulative effect in the framework of the neoclassical model and its overcoming. *Mikroekonomika = Microeconomics*. 2022;(2):5–38. (In Russ.). DOI: 10.33917/mic-2.103.2022.5–38

2. Parker M. How global is "global inflation"? *Journal of Macroeconomics*. 2018;58:174–197. DOI: 10.1016/j.jmacro.2018.09.003

3. Feldkircher M., Siklos P.L. Global inflation dynamics and inflation expectations. *International Review of Economics & Finance.* 2019;64:217–241. DOI: 10.1016/j.iref.2019.06.004

4. Neri S., Ropele T. Disinflationary shocks and inflation target uncertainty. *Economics Letters*. 2019;181:77–80. DOI: 10.1016/j.econlet.2019.05.008

5. Ouyang A.Y., Rajan R.S. The impact of financial development on the effectiveness of inflation targeting in developing economies. *Japan and the World Economy*. 2019;50:25–35. DOI: 10.1016/j.japwor.2019.03.003

6. Arbex M., Caetano S., Correa W. Macroeconomic effects of inflation target uncertainty shocks. *Economics Letters*. 2019;181:111–115. DOI: 10.1016/j.econlet.2019.05.009

7. Adler G., Lama R., Medina J.P. Foreign exchange intervention and inflation targeting: The role of credibility. *Journal of Economic Dynamics and Control.* 2019;106:103716. DOI: 10.1016/j.jedc.2019.07.002

8. Fukuda Sh.-I., Soma N. Inflation target and anchor of inflation forecasts in Japan. *Journal of the Japanese and International Economies*. 2019;52:154–170. DOI: 10.1016/j.jjie.2019.01.002

9. Sukharev O.S. Investment function of economic growth in Russia. *Finance: Theory and Practice*. 2021;25(1):35–50. DOI: 10.26794/2587–5671–2021–25–1–35–50

10. Sukharev O., Voronchikhina E. Financial and non-financial investments: Comparative econometric analysis of the impact on economic dynamics. *Quantitative Finance and Economics*. 2020;4(3):382–411. DOI: 10.3934/QFE.2020018

11. Tongurai J., Vithessonthi Ch. The impact of the banking sector on economic structure and growth. *International Review of Financial Analysis*. 2018;56:193–207. DOI: 10.1016/j.irfa.2018.01.002

12. Sukharev O.S. Inflation control and adequacy of targeting to economic growth policy. *Upravlenets = The Manager.* 2020;11(1):33–44. (In Russ.). DOI: 10.29141/2218–5003–2020–11–1–4

13. Dubey A., Mishra A. Anticipation of central banks' adoption of inflation targeting and its effect on inflation. *Central Bank Review*. 2023;23(2):100118. DOI: 10.1016/j.cbrev.2023.100118

14. Bambe B.-W.-W. Inflation targeting and private domestic investment in developing countries. *Economic Modelling*. 2023;125:106353. DOI: 10.1016/j.econmod.2023.106353

15. Coleman W., Nautz D. Inflation target credibility in times of high inflation. *Economics Letters*. 2023;222:110930. DOI: 10.1016/j.econlet.2022.110930

16. Mishra A., Dubey A. Inflation targeting and its spillover effects on financial stability in emerging market economies. *Journal of Policy Modeling*. 2022;44(6):1198–1218. DOI: 10.1016/j.jpolmod.2022.10.003

17. Mbassi Ch.M., Hyoba S.-E.C., Shahbaz M. Does monetary policy really matter for environmental protection? The case of inflation targeting. *Research in Economics*. 2023;77(3):427–452. DOI: 10.1016/j.rie.2023.06.004

18. Mirza N., Naqvi B., Rizvi S.K.A., Boubaker S. Exchange rate pass-through and inflation targeting regime under energy price shocks. *Energy Economics*. 2023;124:106761. DOI: 10.1016/j.eneco.2023.106761

19. Gong L., Wang Ch., Wu L., Zou H.-f. Currency misalignments, international trade in intermediate inputs, and inflation targeting. *Journal of International Money and Finance.* 2023;134:102843. DOI: 10.1016/j.jimonfin.2023.102843

20. Dridi I., Boughrara A. Flexible inflation targeting and stock market volatility: Evidence from emerging market economies. *Economic Modelling*. 2023;126:106420. DOI: 10.1016/j.econmod.2023.106420

21. Piergallini A. Average inflation targeting and macroeconomic stability. *Economics Letters*. 2022;219:110790. DOI: 10.1016/j.econlet.2022.110790

22. Chen Zh., Li L., Yu Ch., Monetary policy shocks and the signaling channel of monetary policy in China. *China Economic Quarterly International*. 2023;3(1):46–59. DOI: 10.1016/j.ceqi.2023.03.001

23. Hüpper Fl., Kempa B. Inflation targeting and inflation communication of the Federal Reserve: Words and deeds. *Journal of Macroeconomics*. 2023;75:103497. DOI: 10.1016/j.jmacro.2022.103497

24. Tanahara Y., Tango K., Nakazono Y. Information effects of monetary policy. *Journal of the Japanese and International Economies*. 2023;70:101276. DOI: 10.1016/j.jjie.2023.101276

25. Gabardo F.A., Pereima J.B., Einloft P. The incorporation of structural change into growth theory: A historical appraisal. *EconomiA*. 2017;18(3):392–410. DOI: 10.1016/j.econ.2017.05.003

26. Chu L.K. Financial structure and economic growth nexus revisited. *Borsa Istanbul Review*. 2020;20(1):24–36. DOI: 10.1016/j.bir.2019.08.003

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