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# A Multidimensional Assessment of the Efficiency of the Russian Economy

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**Abstract:** Boosting efficiency is a top priority in the development of any economic system. Creating a trouble-free Russia is impossible without innovative socio-economic development, effective implementation of demographic programs, creating quality jobs, effective social control, effective guarantees for the protection of property and fulfilling contracts, the competitiveness of key factors for running a business, the efficiency of state power, combating corruption and a number of other crucial factors. In this regard, it's important to comprehend and assess the cause-effect linkages between the various indicators and aspects of the efficiency of Russia's economy. The article presents the methods and results of a multidimensional assessment of the efficiency of the Russian economy, which is based on the interrelationship between the crucial socio-demographic, market and financial-investment proportions of the economy. The understanding of the effective state of a macroeconomic system is indissolubly associated with the development of the theory of economic systems. Theoretical-methodological support for a multidimensional model for the efficiency of a macroeconomic system is laid down in the works of representatives of mercantilism, the Physiocratic school of thought, the neoclassical school of thought, the Austrian economic school of thought, the comparative and competitive advantage schools, the rational expectations theory. The author construes the efficiency of a macroeconomic system as a state of being close to the "ideal" functioning of the macro-system, attaining strategic objectives and long-run development priorities for the innovative modernization and social capital of the economy, the availability of efficient mechanisms for competition, sustained minimization of corruption and formation of efficient market establishments. The use of the multidimensional model implies sequential comparison of the functions obtained statistically with the "ideal" functions reflecting the dependencies of the resulting variable on the factor variable. The aggregate of the ideal functions implies attaining the maximum long-run socio-economic effect in the development of Russia. The constructed multidimensional model for the efficiency of the Russian economy has revealed the following major disproportions in the functioning of the macroeconomic system. Within the socio-demographic block it is the ineffectiveness of the government's social spending and the institutionalization of corruption. Within the market block it is a low degree of integration between the capital market and the real sector of the economy, which is manifested in the absence of a positive effect of the interest rate on the cost of capital and the employment rate. Within the financial-investment block it is the ineffectiveness of tax governance, which is caused by, first of all, the activity and sustainability of the one-day cash-in firms establishment and other forms of tax evasion, the not quite correct (predominantly state) design of innovation policy, weak use of the financial leverage effect, which harmonizes with the relatively low efficiency of Russia's corporate property governance establishment. The results obtained enabled the author to come up with a set of activities aimed at bringing the level of socio-economic efficiency of the Russian economy in line with that of the developed countries of the world.

**Key words:** Efficiency · Macroeconomic system · Development · Competitiveness · Socio-economic effect · Multidimensional methods

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## INTRODUCTION

The dynamism of the functioning of modern macroeconomic systems paves the way to developing multidimensional methods for assessing their efficiency. The author suggests that the efficiency of a macroeconomic system be considered as a comprehensive and multi-aspect category [1], which is substantiated by the evolution of scientific views of the essence of efficiency, which is related to the development of the theory of economic systems. Mercantilism (P. Boisguilbert, T. Mann, W. Petty, J. Stewart, D. Hume) considers a nation's economy to be efficient when it is able to benefit by accumulating monetary reserves through a positive balance of trade and justifies government regulation and creative state control [2]. The Physiocratic school of thought (F. Quesnay, J. Turgot, V. Mirabeau) [3] lays emphasis on productive work as the source of national wealth and suggests simple methods for analyzing productivity. We find an expanded understanding of the efficiency of an economic system as based on active market behavior in the teachings of the neo-classical economic school of thought, which originated under the influence of works by V. Pareto [4]. The behavioral character of attaining efficiency is traced in the works of the mainstays of the Austrian School (C. Menger, E. von Böhm-Bawerk, L. von Mises, H. Hazlitt, M. Rothbard, F. Hayek). This school focuses on the self-organizing force of the market price mechanism, which makes mathematical modeling in economics a hard task to deal with [5]. The comparative advantage school (A. Smith, D. Ricardo, E. Heckscher, B. Ohlin, R. Torrens, W. Stolper, P. Samuelson) finds the source of efficiency in the richness of natural resources and considers their effective use in production as the basis for the country's competitiveness. This school of thought has its origins in the works of Adam Smith and his notion of an "invisible hand" [6]. The partnership basis for the economy's effective state is suggested by the competitive advantage school (S. Lindner, M. Posner, R. Solow, B. Minhas, J. Tinbergen, J. Hicks, P. Krugman, M. Porter). The dynamicity of a macroeconomic system is an important factor in the rational expectations theory (R. Lucas) [7]. Proponents of this school of thought maintain that the stability of an economic system is attained through the rational economic behavior of agents [8] and the government's use of methods of stabilizing the economy [9]. Present-day views of the efficient state of macroeconomic systems are revealed through not only economic but social aspects. The economic model is a simplified form of exploring the economy on the whole [10].

**Methods:** The author construes the efficiency of a macroeconomic system as a dynamic state of being close to the "ideal" functioning of the macro-system, which is expressed through attaining strategic objectives and long-run development priorities for the innovative modernization and social capital of the economy, the availability of efficient mechanisms for competition, sustained minimization of corruption and formation of efficient market establishments. The efficiency of a macroeconomic system is defined as an integral indicator of the efficiencies of the socio-demographic, market and financial-investment proportions of an economic system and is the bottom-line attribute of the functioning of a national economy.

The multidimensional model for efficiency consists of one-factor dependencies existing as part of the socio-demographic, market and financial-investment blocks (Figure 1). The socio-demographic block of the multidimensional model reflects the impact of social inequality on the socio-demographic proportions of the macro-system's functioning; the effectiveness of the state's social policy and the character of the impact of the macroeconomic system's corruptness on socio-demographic indicators of its development. The center of the model features the market block, which comprises a set of quantitative and qualitative attributes of the development of the markets of goods, labor and capital. The third block, financial-investment, is represented by a system of internal interrelations between the results of Russia's financial activity and investment-innovative development. The use of the multidimensional model implies sequential comparison of the functions derived statistically with the "ideal" functions reflecting the dependencies of the resulting variable on the factor variable. The aggregate of the "ideal" functions implies attaining the maximum long-run socio-economic effect in the development of Russia. Table 1 presents the character of the "ideal" functional dependencies of the multidimensional model for Russia's present-day economy.

As the strategic reference points of the development of the economy and society change, the character of the "ideal" curves of the multidimensional efficiency model

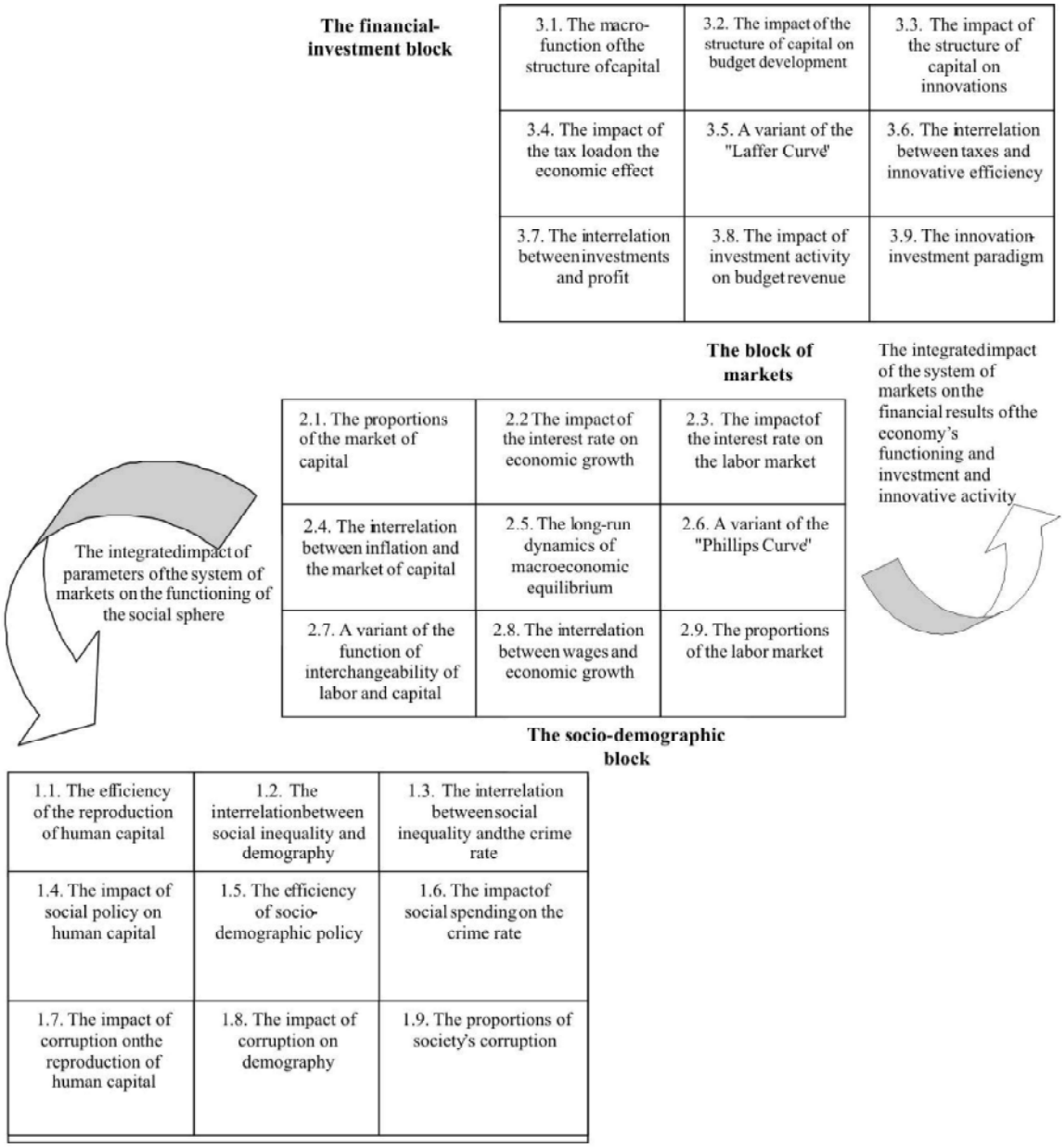


Fig. 1: A multidimensional model for the efficiency of a macroeconomic system

can change too, particularly in terms of the elasticity of the mutual impact of the variables. For the purposes of multidimensional analysis, constructing the "ideal" functions comes down to resolving two consecutive issues: whether the function is rising or falling; whether the "ideal" function is elastic or inelastic - in other words, we need the presence of the multiplier effect of the resulting variable depending on changes in the factor variable. The choice of any specific type of the "ideal" function depends the parameters of functioning of a macroeconomic system being investigated, strategic goals and objectives for its development, long-run trends for the ratio of demand of supply on the resource market, prospects of government regulation and other factors.

**Main Part:** According to the results of Table 2, socio-demographic efficiency is -1,422. This indicates that despite certain success in executing the state's socio-economic policy over the period of 2000-2009, no efficient mechanisms and establishments were created to

Table 1: The character of the "ideal" functional dependencies of the multidimensional model for the present-day economy of Russia[1]

| The number of the quadrant | The name of the quadrant | The monotonicity of the function (rising "+", falling "-") | The elasticity of the function (elasticity[2] more than one "+", elasticity less than one "-") |
|---|---|---|---|
| The socio-demographic block | | | |
| 1.1 | The efficiency of the reproduction of human capital | - | + |
| 1.2 | The interrelation between social inequality and demography | - | + |
| 1.3 | The interrelation between social inequality and the crime rate | + | + |
| 1.4 | The impact of social policy on human capital | + | + |
| 1.5 | The efficiency of socio-demographic policy | + | + |
| 1.6 | The impact of social spending on the crime rate | - | + |
| 1.7 | The impact of corruption of the reproduction of human capital | - | + |
| 1.8 | The impact of corruption on demography | - | + |
| 1.9 | The proportions of society's corruption | + | + |
| The block of markets | | | |
| 2.1 | The proportions of the market of capital | - | - |
| 2.2 | The impact of the interest rate on economic growth | - | - |
| 2.3 | The impact of the interest rate on the labor market | + | - |
| 2.4 | The interrelation between inflation and the market of capital | - | + |
| 2.5 | The long-run dynamics of macroeconomic equilibrium | - | + |
| 2.6 | A variant of the "Phillips Curve" | - | + |
| 2.7 | A variant of the function of interchangeability of labor and capital | - | - |
| 2.8 | The interrelation between wages and economic growth | + | + |
| 2.9 | The proportions of the labor market | + | - |
| The financial-economic block | | | |
| 3.1 | The macro-function of the structure of capital (a relevant dependency variant) | + | - |
| 3.2 | The impact of the structure of capital on budget development | + | - |
| 3.3 | The impact of the structure of capital on innovations | + | - |
| 3.4 | The impact of the tax load on the economic effect | - | + |
| 3.5 | A variant of the "Laffer curve" | - | - |
| 3.6 | The interrelation between taxes and the economy's innovation efficiency | - | + |
| 3.7 | The interrelation between investments and profit | + | + |
| 3.8 | The impact of investment activity on budget revenues | + | + |
| 3.9 | The innovation-investment paradigm | + | + |

[1]The statistical data for constructing the actual dependencies is taken from statistical collections of the Russian Federal State Statistics Service covering the period of 2000-2010. [11], [12]

[2]by the absolute value.

Table 2: The efficiency of the socio-demographic block of the multidimensional model for the economy of Russia

| The number of the quadrant | The name of the quadrant | R2 | The actual function (y) | Efficiency (for the year 2010) |
|---|---|---|---|---|
| 1.1 | The efficiency of the reproduction of human capital | 0,67 | y = 0,001x–7,67 | 7,67 |
| 1.2 | The interrelation between social inequality and demography | 0,891 | y = 8316,6l(x) + 6705,7 | –17,731 |
| 1.3 | The interrelation between social inequality and the crime rate | 0,37 | y = 164201e7,1824x | 0,000 |
| 1.4 | The impact of social policy on human capital | 0,80 | y = –2E–05x + 0,949 | –0,173 |
| 1.5 | The efficiency of socio-demographic policy | 0,76 | y = 0,080x – 1115 | 1,013 |
| 1.6 | The impact of social spending on the crime rate | 0,48 | y = 3E+06e4E-05x | 0,000 |
| 1.7 | The impact of corruption on the reproduction of human capital | 0,99 | y = 0,439x0,253 | –0,253 |
| 1.8 | The impact of corruption on demography | 0,88 | y = 102,5x – 1707 | –3,322 |
| 1.9 | The proportions of society's corruptness | 0,43 | y = 1E+06x0,372 | 0,000 |
| Efficiency for the whole block | | | | – 1,422 |

ensure sustainable improvement of the quality and standard of living in the country. The controlled raising of social parameters in current conditions won't lead to positive changes in the socio-demographic proportions in Russia.

Despite the negative value of the resulting efficiency of the socio-demographic proportion, there are positive efficiency values as well – for Quadrant 1.1 and Quadrant 1.5. The highest efficiency is observed for Quadrant 1.1 (Table 2), for by 2009 the Russian Federation had seen the formation of proportions of impact of social inequality on the reproduction of human capital. By progressively acting upon the reduction of social inequality, the government will be able to ensure augmentation of the efficiency of reproduction of the human capital of citizens. Carrying out activities aimed at the reduction of social inequality will facilitate attainment of the target level of human capital by 7,67% (Quadrant 1.1, Table 2). A similar situation is observed when it comes to the impact of social spending on the rate of natural population increase. Increases in social spending will facilitate attainment of the target level of natural population increase by 1,01%. The comparatively noticeable efficiency of socio-demographic policy is due to the commencement of implementing the "mother's capital" program (which will pay women to have a second child) starting from January 1, 2007. However, we won't boost the rate of natural population increase by just reducing social inequality in Russia. The efficiency of Quadrant 1.2 is -17,73 to indicate that there is a need to radically change the way we approach dealing with the issues of our demographic policy, enhancing our family and marriage establishments, modernizing the social status of the retired and people with disabilities. The state's social spending policy too needs rationalization (the efficiency of Quadrant 1.4 is -0,173), including in the area of effective delimitation of the powers of bodies of federal and regional level state authority and bodies of local self-government (municipalities) within a given region. A huge resource for boosting the efficiency of macroeconomic systems in the areas of improving the reproduction of human capital (the efficiency of Quadrant 1.7 is -0,253) and enhancing the demographic proportions (the efficiency of Quadrant 1.8 is -3,322) is de-institutionalization of corruption, which consists in the consistent altering of society's attitude towards corruption, reverse transformation of corruption from a de facto social norm into a most dangerous anomaly. The efficiency of Quadrant 1.3 (the interrelation between social inequality and the crime rate), Quadrant 1.6 (the impact of social spending on the crime rate) and Quadrant 1.9 (the proportions of society's corruption) has the null value. This situation indicates that the considered socio-demographic indicators have no impact on the crime rate in society – we need new social establishments to be created.

We'll now address the market-related issues in the improvement of Russia's efficiency and possible solutions for them. Table 3 presents the results of an assessment of efficiency for the market block of the multidimensional model.

The resulting efficiency of the market proportion of Russia's economy is 0,98, which means that given a positive change in the market variables, such as the interest rate, the price index and the average nominal monthly wage, by 1%, the actual market dependencies will come closer to their target form by 0,98%. The market of capital is the least developed and is institutionally imperfect, which is evidenced by the presence of negative efficiency in two of the three quadrants for the impact of the interest rate on the qualitative indicators of the markets' functioning (the efficiency of the proportions of the market of capital is -0,605, the efficiency of the impact of the interest rate on the labor market is -0,07). Normalizing the functioning of Russia's market of capital, boosting the extent of its efficient integration with the economy's real sector will make it possible to boost the efficiency of the functioning of the macroeconomic system by at least 0,67%. Of principal importance is dealing with the issues within Quadrant 2.4, in the area of the impact of inflationary processes on the market of capital (a potential increase in efficiency by 1,471%).

We'll now address the financial-investment issues in the improvement of Russia's efficiency and solutions for them. The financial-investment dependencies of indicators of Russia's efficiency are characterized by relatively low values, which indicates that efficient establishments for financial-investment development haven't been created yet. Quadrants 3.1 – 3.3 (Table 4) indicate a weak impact of the structure of capital on the profit of economic entities, their innovation activity and budgetary efficiency.

Methodologically speaking, the absence of a link between the structure of capital and the economic effect indicators is due to the fact that Russia's corporative governance is developed poorly, on the whole and so are the systems of managing the effective attracting of loan capital, in particular. Financial leverage does have a direct, if weak, impact on the profit (Quadrant 3.1) and innovation activity (Quadrant 3.3) of economic entities. The quadrants for the impact of the tax load on the

Table 3: The efficiency of quadrants of the market block of the multidimensional model for the economy of Russia

| The number of the quadrant | The name of the quadrant | R2 | The actual function (y) | Efficiency (for the year 2010) |
|---|---|---|---|---|
| 2.1 | The proportions of the market of capital | 0,905 | y = 2437x1,654 | –0,605 |
| 2.2 | The impact of the interest rate on economic growth | 0,732 | y = 14416x-0,54 | 1,852 |
| 2.3 | The impact of the interest rate on the labor market | 0,921 | y = 5E+68x-13,9 | –0,071942 |
| 2.4 | The interrelation between inflation and the market of capital | 0,817 | y = 5E+06l$^1$(x) –2E+07 | –1,471 |
| 2.5 | The long-run dynamics of macroeconomic equilibrium | 0,389 | y = 4E+06e-0,042x | 0,000 |
| 2.6 | A variant of the “Phillips Curve” | 0,602 | y = 1E+06x-0,63 | 0,630 |
| 2.7 | A variant of the function of interchangeability of labor and capital | 0,833 | y = 2E+13x-1,93 | 0,518 |
| 2.8 | The interrelation between wages and economic growth | 0,949 | y = 15356e6E-05x | 1,119 |
| 2.9 | The proportions of the labor market | 0,852 | y = 956,48l$^1$(x) – 2863,9 | 6,806 |
| Efficiency for the whole block | | | | 0,975 |

Table 4: The efficiency of quadrants of the financial-economic block of the multidimensional model for the economy of Russia

| The number of the quadrant | The name of the quadrant | R2 | The actual function (y) | Efficiency (for the year 2010) |
|---|---|---|---|---|
| 3.1 | The macro-function of the structure of capital | 0,076 | y =76,46x1,074 | 0,000 |
| 3.2 | The impact of the structure of capital on budget development | 0,009 | y =13452e-0,007x | 0,000 |
| 3.3 | The impact of the structure of capital on innovation | 0,013 | y =7,315x + 469,9 | 0,000 |
| 3.4 | The impact of the tax load on the economic effect | 0,609 | y =8E-06x5,633 | –5,633 |
| 3.5 | A variant of the “Laffer Curve” | 0,634 | y =91,999e0,1299x | –0,226 |
| 3.6 | The interrelation between taxes and the economy’s innovation efficiency | 0,577 | y =3E-06x5,378 | –5,378 |
| 3.7 | The interrelation between investments and profit | 0,452 | y =3,800x0,813 | 0,000 |
| 3.8 | The impact of innovation activity on budget revenue | 0,197 | y =220,4x0,439 | 0,000 |
| 3.9 | The innovation-investment paradigm | 0,609 | y =0,109x + 103,4 | 0,888 |
| Efficiency for the whole block | | | | 1,15 |

financial-investment indicators are characterized by a better sustainability but are deformed. Only Quadrant 3.5 matches an “ideal” function, as it exhibits a rising interrelation between the economy’s tax load and consolidated revenues of the state budget of the Russian Federation. The interrelation presented within Quadrant 3.4 indicates that reducing the tax load doesn’t lead to the expected rise in the profitability of Russia’s economic entities. Moreover, the dependence of changes in profit on the tax load is elastic, which indicates the existence of commonly used schemes for hiding profits and evading taxes. We believe that the tax system’s reforms won’t be effective without a radical approach to tackling tax evasion, cracking down on one-day firms and radically enhancing the caliber of tax discipline. The logic behind the rising interrelationship between taxes and innovation activity (Quadrant 3.6) is this: increasing the tax load, which ensures the enlarging of the revenue base of Russia’s consolidated budget, entails the boosting of funding for foundations and corporations engaged in innovation activity. The derived dependency substantiates the fact that in current conditions the Russian government is the sole carrier of innovation activity, which in the strategic run of things appears ineffective, for on the market, major demand for innovation should be put forward to the economy’s private sectors. Quadrants 3.7–3.9 (Table 4), which reflect the impact of investments on the financial-innovation parameters in the development of the socio-economic system, match the “ideal” type, even though they are characterized by a low level of sustainability. Thus, we observe a direct impact of investment activity on the profit indicator of economic entities (Quadrant 3.7) and the state budget’s revenues (Quadrant 3.8). The low level of these dependencies’ sustainability is due to the insufficient transparency of investment processes in the national economy, which especially applies to government investment spending, which harmonizes with the problem of corruption. The derived direct and relatively sustained impact of investments on innovation activity in the economy does indicate the availability of investment-innovation establishments, but their activity should be more active, transparent and efficient.

## CONCLUSION

Constructing the multidimensional model for Russia’ efficiency enabled us to reveal the following major macroeconomic and institutional disproportions in the development of Russia’s macroeconomic system over the period of 2000-2010:

- Social inequality is an extremely significant factor for the impact on Russia's human capital and the crime rate. However, in existing institutional conditions, we won't be able to comprehensively resolve our demographic problems by just reducing social inequality – we need a comprehensive socio-demographic modernization, including enhancing our education, family and marriage establishments, modernizing the social status of the retired and people with disabilities.
- This study has identified the anomalous dependencies of the human potential index and the crime rate on the dynamics of the government's social spending, as well as the extremely low elasticity of the impact of social spending on demographic processes. This indicates that a comprehensive modernization of the system of substantiating, distributing and installing social expenditures is a crucial resource for improving Russia's socio-economic efficiency in the long run.
- We need to tackle the issues of institutionalization of corruption, those of transforming corruption from a social anomaly into a social norm, which are behind the mid-run nominally positive impact of corruption on the reproduction of human capital and demographic proportions of the Russian Federation. This situation is extremely dangerous from the standpoint of trying to boost the efficiency of the socio-economic system on the whole in the years to come – in the adopted paradigm a future increase in the level of corruption will result in the degradation of all the spheres of socio-economic relations, including education, health care and law and order.
- The quadrants reflecting the impact of the interest rate on the parameters of Russia's economic development are substantially deformed. This is due to, first of all, the low level of integration of the system of commercial banks and enterprises in the real sector of the national economy. On the whole, the market of capital in the RF needs comprehensive institutional modernization.
- The quadrants for the market of goods match the "ideal" functions and exhibit a negative impact of inflation on the dynamics of the real GRP and the employment rate. This substantiates a well-known notion, which, actually, is actively practiced by the RF government, that curbing inflation is one of the most crucial objectives in socio-economic development.
- The proportions of the labor market are characterized by the highest degree of institutional formedness, infrastructural support and potential efficiency. The most crucial resource for the long-run growth of efficiency, as the findings on this block of the multidimensional model indicate, is, respectively, sustained increases in wages both in the state and corporate sectors of the national economy.
- The findings of the study reveal a weak impact of the structure of capital on financial-investment processes in the economy. This is due to both the general poorness of corporate governance in Russia and the relative inaccessibility of long-term loan resources to most enterprises in the processing industry.
- The dynamics of the tax load exerts an anomalous impact on profit and innovation activity in the economy. This demonstrably indicates the need of a preventive (preceding tax reform per se), most rigorous, crackdown on tax evasion schemes, one-day cash-in firms, etc.
- The quadrants for the impact of investments on the major financial-innovation indicators, overall, match the "ideal" form. However, we need the activization and boosting of the transparency and efficiency of transforming the investment expenditures of various economic entities into innovative products and services.

The general character of the mutual efficiency impact of the multidimensional model blocks is presented in Figure 2. The situation with the positive efficiency of the block of markets and the negative efficiency of the socio-demographic and financial-economic blocks is not sustainable. In the end, the socio-demographic sphere and the financial-investment sector, which are functioning not quite satisfactorily, will cause the worsening of the parameters of development of the markets of labor, goods and capital. Therefore, activities aimed at the institutional and structural regulation of socio-demographic processes and the sphere of finance, investment and innovation will be of major significance to the development of competitive market mechanisms in Russia.

**Inferences:** Keeping track of the strategic socio-demographic, market and financial-investment reference points in the state's present-day economic policy will facilitate enhancing the caliber of the efficiency of the government's economic policy practiced in the country. The major disproportions in the functioning of the macroeconomic system are:

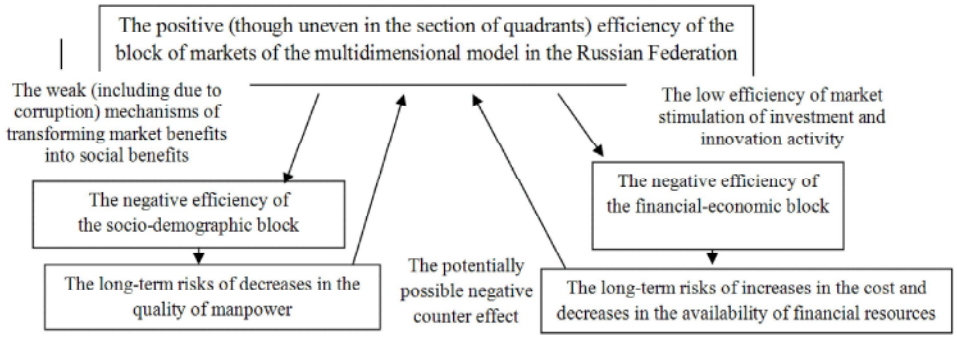


Fig. 2: The general character of the mutual efficiency impact of the multidimensional model blocks

- Within the socio-demographic block – the inefficiency of the government's social spending and the institutionalization of corruption.
- Within the block of markets – low levels of integration between the market of capital and the economy's real sector, which is manifested in there being no positive impact of the interest rate on the cost of capital and the employment rate.
- Within the financial-economic block – the ineffectiveness of tax governance, which is due to, first of all, the activity and sustainability of the one-day cash-in firms establishment and other forms of tax evasion, the not quite correct (predominantly state) design of innovation policy, weak use of the financial leverage effect, which harmonizes with the relatively low efficiency of Russia's corporate property governance establishment. The findings of the multi-aspect analysis of the efficiency of the Russian economy presented in the article substantiate the availability of resources for its development. Our analysis indicates that the existing problems and disproportions in economic development can be resolved through implementing constructive economic policy. At the same time, the findings of our calculations indicate that with the existing rate of enhancing the caliber of economic efficiency we are facing a gradual build-up in growth inhibitions, system and institutional risks. Gaining an insight into the causes and situations hindering the realization of the economy's resources and potential is one of the major aspects in developing and implementing a state economic strategy oriented towards sustainable development and will enable Russia to overcome the gaps in its socio-economic development in matching up against the developed countries of the world.

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