

SECTION I. ECONOMIC THEORY

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STRUCTURAL FEATURES OF INDUSTRIAL GROWTH POLICY

Oleg S. Sukharev

ORCID ID: [0000-0002-3436-7703](https://orcid.org/0000-0002-3436-7703), Researcher ID: [C-3767-2018](https://orcid.org/C-3767-2018)

E-mail: o_sukharev@list.ru

Market Economy Institute of the Russian Academy of Sciences
47, Nakhimovsky prospekt, Moscow, 117418, Russia

The present research is devoted to the main points of industrialization, its possible types and typical structural changes in the production process. To reveal its features we have identified parameters to compare industrialization and de-industrialization processes. According to this fact the industrialization is construed as a managed process of structural transformation of the Russian economy that suggests the movement of resources from mining industry to manufacturing one. This attitude to the process under consideration has revealed two main types of industrialization: the first one is characterised by the growth of industrial production share in GDP, and the second type suggests the increase of production manufacturability when the share of industrial sector in GDP does not change even if it decreases in the total amount of GDP. The revealed types of industrialization demand the specification of their implementation conditions in terms of the current Russian economy to solve all scopes of strategic tasks, such as the development of industrial production on a new technological basis and the increase of import substitution rate. For this purpose using the Minsky frame model we have presented a two sectoral model of economy as an aggregate of consumer and manufacturing sectors. Analytical accurate correlation between salary and labour productivity has been determined on this basis for different industrial growth regimes. The suggested theoretical model demonstrates that salary change rate in the manufacturing sector of production means may increase labour productivity rate in this sector to provide economic growth. Different regimes of economic system dynamics depending on the correlation between salary and labour productivity rates in consumer and production sectors have been determined. They confirm that the compliance of outpacing changes of labour productivity relative to salary is not compulsory to provide economic growth in the country. Moreover, according to the theoretical model it may limit the economic industrial growth. Besides, we have analytically revealed that when salary growth rate in the consumer sector outpaces the labour production growth rates it will lead to a regime when labour productivity growth rate in manufacturing sector must be higher than salary growth rate there. The conclusions we have made may be used as a foundation for the development of strategic priorities to provide security in the field of scientific and technical and technological development of the country. Meanwhile, the development of a complex macroeconomic policy considering the impact of institutional factors will be significant in the current trends of the Russian economy development. This policy will make conditions for further industrialization and the increase of industrial security of the country.

Keywords: structural policy, industrial growth, manufacturing sector, consumer sector, wages, labor productivity, two sectoral H. Minsky model.

СТРУКТУРНЫЕ ОСОБЕННОСТИ ПОЛИТИКИ ИНДУСТРИАЛЬНОГО РОСТА

Олег Сергеевич Сухарев

ORCID ID: [0000-0002-3436-7703](https://orcid.org/0000-0002-3436-7703), Researcher ID: [C-3767-2018](https://orcid.org/C-3767-2018)

Электронный адрес: o_sukharev@list.ru

Институт проблем рынка Российской академии наук

Россия, 117418, г. Москва, Нахимовский проспект, 47

Исследуется сущность индустриализации как процесса, возможные типы индустриализации, а также характерные для нее структурные изменения в производстве. Для выявления ее специфики обозначены параметрические характеристики сопоставления процессов индустриализации и деиндустриализации. Исходя из этого индустриализация трактуется как управляемый процесс структурной трансформации российского хозяйства, предполагающий движение ресурсов из добывающих отраслей в обрабатывающие производства. Такое видение изучаемого процесса позволило выделить два основных типа индустриализации: первый – при котором растёт доля промышленного производства в создаваемом валовом продукте страны и второй тип, который предполагает увеличение технологичности производства при неизменной доле промышленного сектора в ВВП либо даже при ее сокращении в общем объёме создаваемого страной валового продукта. Выделенные типы потребовали конкретизации условий их реализации в условиях современной российской экономики для решения всего спектра стратегических задач, таких как развитие промышленного производства на новой технологической основе и повышение уровня импортозамещения. С этой целью, используя скелетную модель Х. Мински, мы представили двухсекторную модель экономики как совокупность потребительского и производственного секторов. На этой основе определено аналитически точное соотношение между заработной платой и производительностью труда для различных режимов индустриального роста. Представленная теоретическая модель показывает, что темп изменения заработной платы в секторе производства средств производства может опережать темп роста производительности труда в нем для обеспечения экономического роста. Установлены различные режимы динамики экономической системы в зависимости от соотношения темпа изменения заработной платы и производительности в потребительском и производственном секторах. Они подтверждают, что для обеспечения экономического роста в стране соблюдение условия опережающего изменения производительности труда относительно заработной платы работников не является обязательным. Более того, согласно теоретической модели это может стать лимитирующим условием для индустриального роста экономики. Кроме того, аналитически установлено, что если темп роста заработной платы в потребительском секторе опережает темп роста производительности труда, то возможен режим, когда темп роста производительности труда в производственном секторе должен быть выше темпа роста заработной платы в нем. Сделанные выводы могут стать основой разработки стратегических приоритетов обеспечения безопасности в сфере научно-технического и технологического развития страны. При этом наибольшее значение в современных условиях развития российской экономики приобретает разработка комплексной макроэкономической политики с учетом влияния институциональных факторов, формирующей условия для дальнейшей индустриализации и наращивания промышленной безопасности страны.

Ключевые слова: структурная политика, индустриальный рост, производственный сектор, потребительский сектор, заработная плата, производительность труда, двухсекторная модель Х. Мински.

Importance to study the main points of industrialization

The term “industrialization” is usually explained as the replacement of manual work by machine one that leads to personnel dismissal that apply for other positions or create new types of activity. The simplest motivation scale of manual labour substitution for machine one comes down to the rule: labour should be relatively expensive, the development of

machines and units that replace the manual labour should cover all casts for the replacement. Definitely technological changes being an independent part of human activity provide accumulation of new results in the field of machinery, equipment, tools and technologies that guarantee manual labour replacement. In other words there must be a huge amount of achievements in the fields of science and technology that will allow us to make the best solutions when replacing

manual labour by machine one. Certainly this process must be reasonable and efficient from the view point of all costs during the considered time period. In case the risks of technology implementation are higher in comparison to manual labour, e.g. due to lower reliability, then entrepreneurs would not like to replace manual labour by machines. High capital intensity of production at significant costs for new equipment and technologies development and high risks of production procedure change (the replacement of labour by technologies is certainly accompanied by working condition change, especially if the staff working with new equipment needs corresponding training) limit industrialization (according to the above mentioned definition), its rate and scale.

It should be noted that manual labour replacement by machine one increases manufacturability of production, operation accuracy and productivity.

However, personnel release and their application for other sectors of economy may lead to productivity decrease in the corresponding sectors, whereas challenges in training and machine application do not contribute to productivity rise for a short time period. If the equipment that replaces the manual labour is imported, in the present economic system we observe an economic model that depends on import. Nowadays the decrease of industrial production share in the GDP does not mean deindustrialization as manufacturability increase of production and limited demands make the industry compact and sufficient to satisfy the aims of economy development. Currently industrialization means a significant increase of production manufacturability (the share of industrial production may not change, decrease or increase as, for example, in China). Herewith

the time for an item production and its life expectancy significantly decrease in terms of capitalist economy that has successfully passed the industrialization epoch. The dynamics of changes sharply increases. And new technologies that bring new results within the same type of item category due to cost savings lead to these changes. Thus, industrialization may be of two types: the first one is characterised by the growth of industrial production share in the product made by a country (a classical example of industrialization at the very beginning of capitalism development in European countries, America and of socialism development in socialistic countries); the second type of industrialization suggests the increase of production manufacturability when the share of industrial sector in GDP does not change even if its share decreases in the total amount of GDP made by a country. Modern agriculture is also a high-tech branch, so the industrialization issue may concern this sector as well especially if a country is in a climate zone where all conditions historically are in favour of agriculture development and its products processing. For these countries the issue of deindustrialization is rather conventional and its definition may be incorrect.

Thus, when discussing deindustrialization we should not contrast industry against agriculture as two sectors in economic structure. This rule is particular significant for the economy of developing countries where agriculture is the dominant branch in the GDP structure.

Fundamental differences between industrialization and deindustrialization of an economic system are described in the original table.

Comparison of industrialization and deindustrialization using principal parameters

Parameters / Process	Industrialization	Deindustrialization
Industry (% GDP)	Increases	Decreases
Main production funds, billions of roubles	Relatively fast updating, decrease of its deterioration, putting in new technologies and facilities	High deterioration and aging, low updating rate, immanent barriers for new technologies introduction
Staff qualification	Increases	Decreases

The End of Table

Parameters / Process	Industrialization	Deindustrialization
Technological level (level of mechanization, automation, the intensity of raw materials processing)	Increases	Decreases
Share of import components, units, machine parts costs	Decreases	Increases
Life expectancy of an item	Decreases	First gradually increases, then sharply decreases due to a product wear
Complexity of a technological operation	Increases	Decreases
Costs and time for a new product development	Systematically increase for a short period of time and decrease for a long time period	Significantly and sharply increase preventing the introduction of new items and technologies
Existing development institutes	Efficient as provide financing (crediting) of production and new technologies introduction	Efficiency is low, financing of resources for an industry and new technologies development is insufficient

Taking into account the above mentioned comparison and the world experience two types of deindustrialization may be distinguished: 1) the first one is characterized by the decrease of industrial production share while the share of service sector increases (if it decreases while manufacturability increases then we may speak about the industrialization of the second type); 2) the second type is characterized by both the decrease of industrial production and its manufacturability, destruction/termination of industrial infrastructure, production capacity fall. The economic situation in Russia in 1990–2000 was characterized by the second type of deindustrialization. And the industrial system has not completely recovered yet. The deindustrialization phenomenon is measured by a depth parameter as any country is characterized by its particular level.

A deindustrialization depth (an industrialization rate) is measured by time that is necessary for a new product development as well as by a number of complex or high-tech operations per a cost of the developed item and by a correlation of complex operation cost to the final product price. The overall rate of production manufacturability will be determined by its ability to recycle the available resource at a particular time period and to produce value added from them. The resources are distributed among the sectors of

industry that interact with each other, that is why the factors that influence the process should be considered [1]. The factors and conditions that influence the resources redistribution for new opportunities of industry development may be divided into the following relevant categories:

- state of old manufactures (technologies) and the rate of their wear and load at the current operation regime;
- features of new technologies and inter-specific resource (quality and price) necessary for them;
- rules of resources mobility and their inter-changeability – replacement, coupling and supplement of technologies (the existing inter-sectoral structure and institutions that affect the investment assessment may function as this rule);
- the level of market monopolism, forms of business organization, contracts and international cooperation;
- labour market state (deviations), labour mobility and the level of initial competences of the staff;
- structure of obsolescent and new technologies (the core – and periphery), regime of technological development of the economic system;
- opportunities of monetary and budget policy.

To overcome these inhibitory factors it is necessary to impact the Russian economy using self-development outlines that are formed at a special policy implementation. Programs, institutions of development, budget fund distribution, public sector functioning, development of incentives in a private sector, etc. should be subordinated to these outlines. In this case a systematic improvement of the modified system will be possible. A set of structural tasks will have to be solved. These tasks include resources distribution between labour and capital, old and new technologies, sectors with increasing and decreasing return providing capital and labour mobility.

The purpose of industrialization in the USSR was to develop commercial production in general, in particular to develop a so called “heavy” sector of industry (production means). It dealt with two main tasks – to develop the production of the current technological level and to increase the provision level with machines and equipment.

Despite the deindustrialization that means an absolute loss of individual types of production and industry sectors as well as significant decrease of general manufacturability of production systems and economy, modern Russia still has high-tech equipment in space, armament and defence technologies, even in micro-electronics, nano biotechnologies. Moreover, it has fundamental results that will lead to the development of different types of production and even sectors of activity. However, the gap may increase for some of the above mentioned sectors due to low demand for these technologies at the domestic production. Thus, the fundamental task of all measures of the industrial policy that is aimed at the economy industrialization should not only include the increase of production share in the total volume of the product made but it should mainly concern the development of a regime that will increase technological results. The latter will make use values (product connected series of different purposes and markets) with the subsequent positive effects in the field of material capacity and power intensity of productions (the two most important parameters of manufacturability). To solve this task we need

resources and development incentives in private and public sectors of industry. It is also necessary to plan and organize the regime of these sectors interaction. When an inefficient resource movement is observed and as a result excess specialization occurs in economy, according to the postulates of the self-development theory of an economic system some force that will change the resource transition should appear. Thus, Russia started to specialize in the resource sector (other types of production and activity however profitable and useful they could be for the society suffered greatly). This sector began to dominate and subordinated different technological and manufacturing processes. The tools for the resources movement influence should be set considering the criteria that assess the type of movement and the use efficiency for each type of the resource individually. The criteria should also consider the resource coherence and interrelation. In other words if the resource moves somewhere, it does not mean that it is properly used there. The guarantee that the resource would be efficiently used in the sector it has moved to can not exist automatically as alternative ways of its usage are not considered. Moreover, the efficiency of the resource application is affected by its amount and whether the resource is enough for the subsystem (activity type) functioning.

All the above mentioned facts stress the value and importance of a fundamentally new approach to the establishment of the model of a new industrialization in the context of Russian reality.

Approaches to a new industrialization in Russia: individual interpretations

Currently there are different views on the interpretation of industrialization and its types in Russia. We will not review these attitudes (there is enough literature on this aspect), we would stress that in particular “re-industrialization” should be, from our point of view, considered in accordance to the prefix “re-” that means “over”, i.e. to “over-industrialize the system”, to renew it technologically. The term “knowledge

intensive” production that is also widely used is considered to be “a terminological demarche” and does not express the main idea of the concept (as when speaking about reindustrialization we mainly mean production manufacturability and science linkage). However, both reindustrialization (it can not be treated as deindustrialization overcome) and a new industrialization are impossible without knowledge. Moreover, a new industrialization suggests the development of a new industry, i.e. new previously non-existent types and sectors of industrial (technological) activity. This process is considered to be new as in comparison to soviet traditional industrialization it must occur in new conditions (in terms of the development of the sixth, seventh or may be the eighth waves of innovation).

The features we have distinguished allow us to treat reindustrialization as a managed process that promotes technology to a new technological level in terms of formed types of production and recovery of some of them (in accordance to substantiated necessity and demand). Such classification of the concepts seems to be logical and clear and does not make additional terminological confusion¹. The current structure of “old” (used for a long period of time) and new technologies will have a determinant impact on the solution of the task of the general technological level increase.

The increase of industry manufacturability (being the purpose of a state) for Russia’s economy is possible due to power increase in the field of so called “old” technologies. This result although being paradoxical has been empirically obtained from the conducted analysis of the revealed technological priorities of development, of the resources allocated for this purpose including all development institutions that are encouraged to impact this process. According to the theory of self-development by A.I. Tatarin [2] we may distinguish the key outlines of self-development of the Russian

economy: agriculture and food industry, building and materials, processing industry and defence sector, extractive industry (resource sector) and social sectors – science, education and medicine [2].

To provide the industrialization of an independent (from import) type, the market of production means should be developed for these outlines that end by a final products for home (import replacement) and foreign (export strategy) markets. The tasks should be divided for public and private sectors of industry (if there is any interaction) and the “demands–opportunities–results” scale should be applied as a tool for development and co-ordination of different plans of the development.

The problem of import substitution in industry is not new for Russia. At the end of 1980s and in the first half of the 1990s some programs to liquidate the technological gap in Soviet and then in Russian economy were considered. One of the issues of the programs was devoted to import substitution. When privatization started in 1993, the reorganization of the defence industry and its conversion became urgent. The task for import substitution was also solved in the frameworks of the defence industry reorganisation and conversion program. Particular resources were allocated for that purpose. However, an opposite process occurred and the share of import component parts and elements increased in the sector. Thus, the structural independence coefficient of engineering decreased in Russia in the 2000s. The decrease was mainly caused by macro-structural factors rather than the program directions and financial resources allocated for their implementation. Clichés that correspond to the current situation and to the tasks of the national economy development and that keep within an economic policy about the importance to increase labour productivity and about the advanced growth of salary that in its turn adds up to the increase of load on labour and as a result the clichés will not be realized. The problem is that it will be difficult to increase the labour productivity in Russia owing to the “labour” factor because technological factors

¹ The use of the concept “super-industrialization” seems to be redundant.

seriously determine this parameter. Besides, the correlations we have calculated for the industrial growth do not prove the compulsory nature of the increase as an immanent term for economic growth or as a quantitative feature for its sustainability.

Thus, the most parts of programs that aimed at industry modernization and that included the tasks for import substitution and were implemented since the end of the 1980s and in 1990s did not lead to the necessary results.

In the industrial sector of commodity manufacturing despite the branch of manufacturing (engineering, electronic industry, instrument-making industry) an owner (proprietary) makes a decision about import substitution based on the strategy development of the business, the production expanding and diversification. For example, Russian entrepreneurs have to buy transformers of specific types abroad because they are not produced in Russia any more.

Deep fragmentation of Russian industry and increasing technological gaps definitely complicate the import substitution process. Despite the production volume increase in some types of industry, these factors indicate that the deindustrialization process has not been cut down yet. Besides the deindustrialization has led to the situation when due to losses it is more profitable to develop new types of manufacturing even with the participation of foreign investors rather than to recommence old ones. But this type of development will result into technological dependence and from the institutional point of view will give poorly predicted results concerning the improvement of “old–new technologies” structure. The gap intensity in technological and reproducing outlines in industry is so significant that to solve import substitution tasks in the sector of commodity production and markets we need a huge volume of resources and time.

The forming of economic motives of enterprise owners is one of the main institutional challenges of import substitution. Institutional restrictions that exist in Russia on the manufacture development decrease owner opportunities to develop science

intensive, high-tech business. In this case it is important to plan economic motives that contribute to the home market development and to place manufacturing in Russia. Besides it is necessary to control the transition of Russian property to foreign jurisdiction. Otherwise all measures of the industrial policy will concern the objects that will not belong to Russian citizens and that will lead to management restrictions on their further development.

An important element of an industrial policy is an import substitution strategy that can not be considered beyond it. The strategy implementation depends on the reconstruction of production, hardware and technical bases of Russian industry as well as on the development of the home market for industrial products.

It also should be noted that in the works by Russian economists the term “import substitution” comes down to successful sale of Russian products at foreign markets. To our mind, an export strategy and an import substitution strategy are two different types of strategies. Later on the achievements and progress in the import substitution policy will be partly used in export. However, an export oriented strategy is aimed at foreign market development but an import substitution first of all concerns the formation of the home market where foreign competitors are replaced. Efficient import substitution at the home market is impossible without industrial chain reconstruction, overcoming of industrial fragmentation, deindustrialization, personal qualification increase and the industrial policy implementation. At that a strategic purpose of the industrial policy must be devoted to the forming of the home market for production means designed for the development of broad product series that are able to satisfy the needs of local producers of final products and to provide the competitiveness increase of the national production.

Structural transformation of an industrial model of the economic growth must contribute to the solution of this purpose.

A structural model of the industrial growth: correlation between productivity and salary

An economic system and an industry that is considered to be its most important component may be represented in a form of two sectors: a sector of production means manufacturing and a sector of commodity production (“A” and “B” product groups if we consider previously existed branch distribution). The production means are sent for commodity manufacture and for the development of means of production themselves.

Further we will represent the simplest model that demonstrates the connection between these sectors that is considered to be the factor of economic growth of the economic activity. Thus, the provision of economy by up-to-date means of production may be considered as the most important trend in the strategy of its industrialization. This idea updates the task to overcome the dependence of technology development and production means on import.

Let us consider the task of determining the impact of industrialization on the country economic growth from the theoretical point of view [3]. We accept that the created product Y consists of two parts – means of production (Y_s) and commodities (Y_p). In its turn the means of production are used to make other production means (Y_{sh}) as well as they are bought by commodity producers (Y_{sp}). In that way we represent this idea in the following formulae $Y=Y_s+Y_p$, and $Y_s=Y_{sh}+Y_{sp}$ respectively. The amount of labour force (N) includes those employed in production means manufacturing L_s and those employed in commodity production L_p , thus, $N=L_s+L_p$. The personnel employed in the manufacture of production means make them for the manufacturing of new types of engineering and for consumer benefits, thus $L_s=L_{sh}+L_{sp}$ by the analogy with the product distribution of this sector (Y_s). We introduce the designation n that indicates a share of each sector in the created product of the present system: $n_s=Y_s/Y$, $n_p=Y_p/Y$, $z=n_s/n_p$ that is considered to be a determining structural factor of the economy. The growth

rates of each sector and the system are indicated in the following way: $g_Y=(1/Y)dY/dt$, $g_s=(1/Y_s)dY_s/dt$, $g_p=(1/Y_p)dY_p/dt$. The situation when an economic growth is observed is described as $g_Y>0$. Given $g_Y=g_s n_s+g_p n_p>0$, then the structural condition of the economic growth is $g_s>-g_p/z$.

Make an assumption that parts of an output aggregate of the economic system (function Y_p and Y_s) change over time, we present these parts in standard production functions: $Y_p=A Y_{sp}^a L_p^b$, $Y_s=B Y_{sh}^m L_s^n$.

Consequently:

$$Y_p=A [Y_s-Y_{sh}]^a L_p^b, \quad (1)$$

$$\text{where } Y_s=B Y_{sh}^m L_s^n.$$

In other words, the volume of manufactured production means is a function of production means created for manufacturing of new production means and commodities involved in the manufacturing of production means, i.e. $Y_p=f(Y_{sh}, L_p, L_s)$. In this dependence we should consider the structure of the employed in two sectors $l=L_s/L_p$.

The expression for the GDP is

$$Y=A [B Y_{sh}^m L_s^n - Y_{sh}]^a L_p^b + B Y_{sh}^m L_s^n. \quad (2)$$

We transform the expression for Y_p ; expressing Y_s we get:

$$Y_s=(Y_p^{1/a}/L_p^{b/a})(1/A^{1/a})+Y_{sh}. \quad (3)$$

Having differentiated the expression Y_s with respect to time, we discover the production growth rate in the sector of production means manufacturing $g_s=(1/Y_s)dY_s/dt$.

Given $g_{L_p}=(1/L_p)dL_p/dt$ и $Y_p=A Y_{sp}^a \cdot L_p^b$, we get the expression:

$$\frac{dY_s}{dt} = \frac{1}{a} Y_{sp} (g_p - b g_{L_p}) + \frac{dY_{sh}}{dt}. \quad (4)$$

We multiply the left and the right parts of the above mentioned expression by $1/Y_s$. We want to stress that this value is not equal to zero and by the definition is not negative. We differentiate two types of manufacture in the sector of production means manufacturing: the first one is to recommence production means themselves (Y_{sh}); the second one is for the creation of commodities (Y_{sp}). Let us denote the shares of these subsectors: $k_1=Y_{sp}/Y$, $k_2=Y_{sh}/Y$. It is necessary to consider that $g_{sh}=(1/Y_{sh})dY_{sh}/dt$. In this case the expression for g_s that denotes the growth rate of the sector of production means manufacture is

$$g_s = \frac{1}{a}k_1[g_p - bg_{Lp}] + k_2g_{sh}. \quad (5)$$

Further based on the criterion of economic growth of the whole system that includes the two above mentioned sectors (to be more precise three if we take into account the division of the sector of manufacture of production means into two subsectors), $g_Y > 0$, i.e. $g_s > -g_p/z$, we get the expression to characterize the growth rate of the commodity production sector g_p , that corresponds to the specified condition of the economic growth. To comply with the present condition it is important that the value of the growth rate of the commodity production sector exceeds the expression in the right part of the inequality:

$$\begin{aligned} g_p &> \frac{bk_1g_{Lp} - ak_2g_{sh}}{k_1 + a/z}, \\ g_p &> a1g_{Lp} - a2g_{sh}, \\ a1 &= \frac{bk_1}{k_1 + a/z}, \\ a2 &= \frac{ak_2}{k_1 + a/z}. \end{aligned} \quad (6)$$

Thus, to provide the economic growth, the growth rate of commodity production sector should be higher than the weighted difference of the growth rate of the personnel employed at the commodity production sector and the growth rate of the part of the production means manufacture that is aimed at the renewal of machines, equipment and tools (production means) reproduction. This parameter demonstrates the industrialization dynamics, i.e. the higher it is then the lower commodity growth rate should be to support the total growth rate of the economic system.

Further in the frameworks of the designated simple model we refer to the frame economic model suggested by Hyman P. Minsky in the middle of the 1980s [4, pp. 215–218]. This model allows us to obtain a condition for the system economic growth taking into account the correlation between salary change rate and productivity, for example in the sector of the production means

manufacturing. The theoretical result¹ that we have obtained due to simple calculations will significantly correct the economic policy purposes that are currently widely discussed in the frameworks of a new growth in the Russian Federation [1].

For further computations we accept that w_s , w_p are salary in the sector of production means manufacturing and in the sector of commodity production respectively and L_s , L_p are an amount of employees. Accepting the conditional assumption by H. Minsky [4, pp. 214–215] that a labour remuneration fund in the investment and consumer goods sector is spent to buy the whole product made in the commodity production sector Y_p , then we may write that $Y_p = w_sL_s + w_pL_p$.

Taking into account that $Y = Y_s + Y_p$ and introducing a productivity parameter for each sector $A_s = Y_s/L_s$, $A_p = Y_p/L_p$, we get $Y = Y_s [1 + w_s/A_s + (w_p/A_p)(1/z)]$, where $z = Y_s/Y_p$.

Now we express the rate of a product change in each sector and in the economy in general as well as the rate of salary and productivity changes:

$$\begin{aligned} g_Y &= \frac{1}{Y} \frac{dY}{dt} > 0, \\ g_p &= \frac{1}{Y_p} \frac{dY_p}{dt}, \\ g_{ws} &= \frac{1}{w_s} \frac{dw_s}{dt}, \\ g_{wp} &= \frac{1}{w_p} \frac{dw_p}{dt}, \\ g_{As} &= \frac{1}{A_s} \frac{dA_s}{dt}; g_{Ap} = \frac{1}{A_p} \frac{dA_p}{dt}. \end{aligned} \quad (8)$$

Based on the economic growth provision criterion of the whole system $g_Y > 0$, we finally get the condition about the

¹ In the assumption that the sectoral structure of economy does not change significantly, i.e. $z = Y_s/Y_p = const$ and $dz/dt = 0$. For further discussions this condition is of primary use if we take into account that an industrialization is a process expressed by Y_s increase. Consequently $dz/dt > 0$ because z will increase, and the reductive record of the present equation does not have any impact.

salary change rate in the sector of production means manufacture¹:

$$g_{ws} > g_{As} + \frac{A_s}{w_s} \frac{1}{z} \frac{w_p}{A_p} (g_{Ap} - g_{wp}) - \frac{A_s}{w_s} \frac{1}{z} \frac{g_p}{n_p}, \quad (9)$$

$$\Omega = \frac{A_s}{w_s} \frac{1}{z} \frac{w_p}{A_p} (g_{Ap} - g_{wp}) - \frac{A_s}{w_s} \frac{1}{z} \frac{g_p}{n_p}. \quad (10)$$

Thus, to provide an economic growth [5–12] the salary change rate in the sector of production means manufacture may increase the productivity change rate in the present sector of economy.

Now we discuss conditions for different regimes of the economic dynamics [10–12], taking into account correlation between salary and productivity growth rates in the commodity production sector. If a salary growth rate is higher than productivity growth rate in the commodity production sector $g_{wp} > g_{Ap}$ and the sector itself rises $g_p > 0$ then $g_{ws} > g_{As} - \Omega$, i.e. a salary growth rate in the sector of production means manufacture may be both higher and lower by Ω value (Fig. 1) than labour productivity growth rate. It is expressed by the distance between the lines AA and BB .

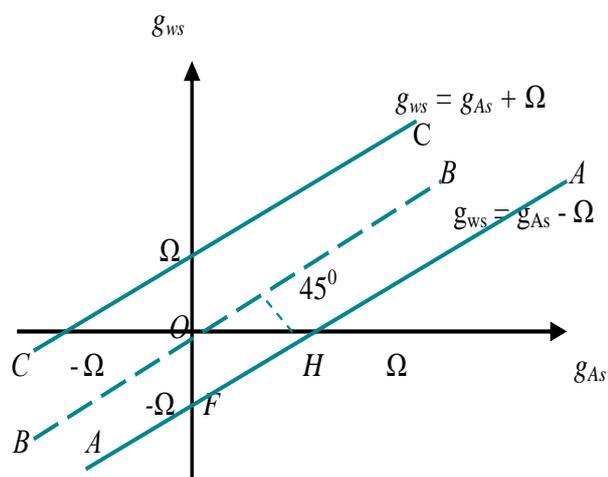


Fig. 1. Correlation between salary and productivity growth rates in the sector of production means manufacture (the industrialization condition)

¹ Correlations A_s/w_s and A_p/w_p may be considered as productivity per each rouble of salary in each sector or “real productivity”.

In other words, if salary in the commodity production sector grows faster than the production in the same sector then during the rise in this sector the salary growth rate may remain behind or increase the production growth rate in the sector of production means manufacture by Ω value (but not more than this value) to provide the economy increase in these two sectors.

In case when a salary growth rate in the commodity production sector is lower than the productivity growth rate in the same sector ($g_{wp} < g_{Ap}$) and the sector increases $g_p > 0$, besides the option when $g_{ws} > g_{As} - \Omega$, there is another condition (dependence on the final sign in the Ω expression) that is specified by the CC line in Fig. 1 $g_{ws} > g_{As} + \Omega$. Thus, the salary growth rate may be always higher than the production growth rate to provide the growth of the economic system.

In case when a salary growth rate increase the production growth rate in the commodity production sector during the observed decline of the sector $g_p < 0$, there are also two options for the lines AA и CC (Fig. 1). Thus, there is a growth regime when salary in the sector of production means manufacture must grow faster than the labour productivity in the same sector to demonstrate the economy rise. This theoretical conclusion demonstrates the meaning of structural restrictions best of all. These restrictions are relevant when choosing a model of economic growth and are even more significant when forming an incentive policy that impacts different factors and provides the system growth.

It should be noted that the regime of economic dynamics is possible when the productivity in the manufacture sector of production means increases (the rate is positive $g_{As} > 0$) at the negative salary growth rate in the present sector $g_{ws} < 0$ (triangle OFH in Fig. 1). At that the salary in the commodity production sector $g_{wp} > g_{Ap}$ grows faster than the productivity at the total increase of production volume in the sector $g_p > 0$. In case when $g_{wp} < g_{Ap}$ if there is an increase in the commodity production sector, the regime of economic dynamics when salary may slightly decrease at the increase of the production growth rate in the same sector is possible.

The analysis we have made is surely connected with the demand and offer condition at the labour and capital market and with those factors that influence the productivity [13]. Institutional factors may rectify the interpretation of the model [7–10; 14; 15]. However, since the above mentioned regime is theoretically possible, there are no reasons to believe that the economic policy should proceed from the assumption that salary increase is impossible without labour productivity growth. Under these circumstances the procedure must be inverse.

Similar consumption is observed in the interpretation of economic policy of the contemporary Russia [14; 16]. This circumstance may further significantly restrict the industrialization policy. Development of new science intensive production sectors, attraction and training of new personnel for these sectors where salary will motivate people to stay and to work at this place may become the basis for a new industrialization process in Russia. This idea should be based on when developing plans, programs and strategies for the country development that will guarantee the formation of a new model of economic growth based on new factors. How to organise the transition of resources in favour of processing sectors including a relative capital reduction is an important trend of a structural policy in Russia. The reduction should occur due to the corresponding monetary policy as well as demonopolization, institutional modification of the capital market that will contribute to capital reduction as a resource. A relative capital and material resources reduction at the home market at a labour value rise will normalize the process of human capital reproduction and its use, will strengthen incentive schemes for the production technological renewal that should be considered as the key aspect of the industrial growth policy in the contemporary Russia.

Conclusion

Finally we would like to mention that the industrial growth policy is more significant for the Russian economy than the policy of economic growth “starting” because resources are distributed in favour of the processing industry within the frameworks of the former policy. When implementing this type of policy one should take into account that at first stages it can not lead to a high growth rate. However it may become the basis for further sustainable long-term growth. At the same time the industrial growth policy allows us to make a structural choice between the stimulation of the manufacturing of the production means and the commodity production. The Minsky model that we have modified demonstrates different regimes of an industrial growth. They, for example, describe situations when the labor value increase neither corresponds to the productivity growth function in an economic sector nor it is associated with productivity growth.

Such theoretical solution based on the results of the two sectoral model construction needs further research of relative dynamics in the investigated sectors of the national economy. Thus, all other things being equal the institutional terms of the industrial growth are connected to the norms of technological and industrial security provision [16] of the Russian economy development. The liquidation of the damage in the field of technologies and industrial development caused by exogenous and endogenous factors of competitiveness impact will make the above mentioned terms. Struggling against the damage caused by competitors within the country will improve the opportunities for the industrialization and will make conditions for an industrial economic growth in the Russian Federation [16–18].

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Information about the Author

Sukharev Oleg Sergeevich – Doctor of Economic Sciences, Professor, Head of the Laboratory, Market Economy Institute of the Russian Academy of Sciences (47, Nakhimovsky prospekt, Moscow, 117418, Russia; e-mail: o_sukharev@list.ru).

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Сведения об авторе

Сухарев Олег Сергеевич – доктор экономических наук, профессор, заведующий лабораторией, Институт проблем рынка Российской академии наук (Россия, 117418, г. Москва, Нахимовский проспект, 47; e-mail: o_sukharev@list.ru).

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