

# Type of Employment as the Most Important Factor of Economic Growth

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**Abstract**—The labor force has a number of essential characteristics that can be classified, on the one hand, into quantitative and qualitative, and on the other, in accordance with the phases of reproduction. Based on the set of characteristics, it is possible to classify the labor force into basic, producing traditional products, and pioneer, producing innovative products. Identifying the influence of employment on the dynamics of GDP and the type of economic growth, it is proposed to distinguish two types of employment: flexible and rigid. The relevance of this article is to identify the influence of the type of employment and the possibility of achieving positive economic growth on a qualitative basis in the long-term perspective. On the basis of theoretical study of types of labor and types of employment a comparative analysis has been carried out for the countries of Great Seven, Russia and China to identify reproduction peculiarities of labor power in these countries and to justify their impact on economic growth. A grouping of the studied countries by type of employment was proposed according to the type of employment based on the ratio of GDP dynamics and the dynamics of the number of consumed workforce. As a result, the type of employment of labor force is closely related to the parameter of labor productivity, which significantly affects the dynamics of national production.

**Keywords:** *basic workforce, pioneer workforce, flexible employment, rigid employment, economic growth*

## I. INTRODUCTION

The modern world economy is heterogeneous, so the roles of individual national economies differ significantly. The G7 countries include economically developed countries, such as: the USA, Canada, Great Britain, Germany, Italy, France, Japan, and in the mid-1990s they were joined by Russia, which later left the formation. Analyzing the theoretical and practical aspects of the problem, we believe that the

experience of economically developed countries, as well as of China, which has achieved unprecedented rates of economic growth, is especially important for Russia to determine the prospects and directions of its economic development strategy.

Factors of production are a significant source of economic growth. Marxism and marginalism suggest different interpretations of the importance of factors of production.

According to the Marxist theory, labor force and the means of production are the main factors of production. Determining the contribution of a particular factor to the produced product is done by determining the cost of the product. And the contribution of the material factor is determined by the value of the constant capital, and of the personal factor – by the value of the variable capital.

The theory of marginalism distinguishes traditionally four groups of factors of production: land, labor, capital, entrepreneurial ability. However, in the process of constructing theoretical models, marginalists, as a rule, use only two factors – labor and capital, considering them only as general technical and economic elements of production. In the middle of the XX century on the basis of marginalist methodology there was a theory of "human capital", when an educated person with an education becomes the owner of two factors: labor and human capital. Wages can be seen as a combination of the market price of labor and the rental income from investments in human capital.

In the process of development of national economies, the emergence of "new industrial countries" and the transition of developed countries to the post-industrial stage, economic thought has got further development.

The complexity of the social and class structure of modern society is one of the characteristic features of postindustrialism. Knowledge and information have become the most important resource of production, and the basis to refer people to the ruling class and that can control this resource and is able to dispose it. Today, a group called in Western social science theory as a knowledge-class or a class of intellectuals acquires special importance.

D. Bell has based his theory of “postindustrial” and “information” society on the following provisions: 1) postindustrial society is a society in which the leading role is given to the service sector; 2) in postindustrial society, priority is given to theoretical knowledge and technology; 3) there is a new class – specialists and intellectuals who turn knowledge into a source of power. Thus, the key positions in the society belong to universities and other institutions of knowledge.

## II. METHODOLOGY

An interesting view on the problem of the importance of labor for the functioning of the economic system is expressed by the American researcher Kerk L. Phillips, who in 2011 published his work “Labor Force, Specialization and Market Development as an Engine of Economic Growth”, devoted to the interaction of labor force and role of specialization in stimulating economic growth. Kerk L. Phillips proposes a model in which total economies of scale result from the gradual specialization of labor. In this model, only one factor of production is studied – labor, so the achievement of economic growth is largely associated with the specialization of labor force, which ultimately helps to reduce the cost of buying and selling goods.

Specialization of labor is the result of social division of labor. By acquiring a particular profession, the employee receives special knowledge to work in a particular field of activity. Emphasis in our opinion on two important types of labor, such as basic labor force and pioneer labor force, is primarily based on the specialization of labor: basic workers produce traditional (basic) product, and pioneer workers produce innovative (pioneer) product.

K. Phillips predecessors also investigated the problem of labor force influence on the economic system. In the literature, analysis of economic growth has focused on the effects of various endogenous mechanisms. For example, Paul M. Romer (1986) paid attention to the increasing returns to scale production. Works presented by Segerstrom (Segerstrom, 1990), Grossman and Helpman (Grossman and Helpman, 1991) continue the ideas of Joseph A. Schumpeter, confirming the importance of R&D in achieving economic growth.

Young and Borland (1991) proposed a model that generates economic growth through labor specialization. Growth is driven by learning from self experience and increasing returns to scale. The economy is growing, the market is expanding, as long as these two key parameters are neither too small nor too large.

Fishman and Simhon (2002) guess that there may be a model in which imperfections of capital market limit

specialization. This situation is typical in their opinion only for poor households.

Thus, it is obvious that there is a fairly strong relationship between economic growth, quantitative and qualitative parameters of the used factors of production, the main of which traditionally include labor, capital and technological progress. Close attention is paid to such a factor as labor, since all the above studies confirm the thesis of the importance of labor in its various characteristics and classifications for the creation of a national product and economic growth.

This is confirmed by studies on the Chinese economy, which has shown unprecedented rates of economic growth in recent decades, largely due to the labor factor, and is the leader in GDP production in the world economy.

In particular, the formation of human capital is analyzed at the household level as a resource for economic mobility, since it can create certain advantages, for example, in the creation of new enterprises that provide access to wages.

The well-known Russian researcher of human capital S.A. Dyatlov (2016) believes that in the system of the new global information and network economy, which has replaced studies in the interaction of old industrial and market economy, the main role is played by highly qualified workers. The human capital of highly educated and skilled workers is the main factor in the growth of competitiveness and innovative economic growth today. Investments in the human capital of employees are the most important tool for high dynamism and sustainable development of the modern economy, so it is important to assess the effectiveness of investments in educational projects.

Another Russian scientist I.V. Il'yinsky (2016) explores the relationship of different characteristics of the labor force, for example, migration processes, investment in people and the achievement of sustainable socio-economic development of the country.

The process of reproduction can be considered not only in relation to the product or the labor force, but also in relation to the type of economic system. More precisely, these processes of reproduction are closely related: the reproduction of labor with certain characteristics will contribute to the reproduction of a certain type of system. In order to change the characteristics of the reproduced labor force it is necessary to change the type of economic system.

Reproduction of labor includes the following phases: production-distribution-exchange-consumption. The consumption of labor-power, that is, its productive use, will be determined by the employment of labor-power. Considering the fact that the labor force is heterogeneous in its qualitative characteristics, we will emphasize the basic and pioneer labor force. We will give the corresponding characteristics of the proposed types of labor.

The basic worker creates a basic product that is produced in the traditional way and meets the vital needs without which a person cannot exist. The specific resource yield of the basic sector, and therefore of the basic worker, is high.

Pioneer worker produces a product that is made in a new way and meets the new needs, which are not vital needs. Pioneer workers are better qualified than basic workers because the pioneer product is new in a particular economic system and in some cases innovative altogether, that's why a special knowledge is required to produce it. Consequently the cost of producing pioneer workers is more significant and long-term than the cost of producing basic workers.

Based on the reproductive approach, we believe that labor should first be produced and then consumed. Basic and pioneer workers, included in the reproduction of the labor force as a whole, will determine not only quantitative, but also primarily important, qualitative characteristics of the total labor force.

For example, if unskilled workers are created at the stage of production of labor force, then in all subsequent phases, and especially at the stage of consumption, these unskilled workers will function. Such a workforce will be able to create only a basic product with low quality characteristics, that is, uncompetitive with the basic products of other systems. The consumption of such a basic product will not contribute to the profitability of the basic sector, the proper financing of the pioneer sector, the creation of a pioneer product and the emergence of pioneer workers in the required number. In general, such a system will reproduce unskilled labor and the characteristics of the economic system will remain unchanged for a period of time in simple reproduction, thereby consolidating the same type of system, conditions, factors and directions of development.

Let us consider the reverse situation, when the economic system produces a sufficiently large proportion of the labor force, which we refer to the category of pioneer. Then potentially such a system will be able to create not only a basic, but also a pioneer product, thereby increasing its competitiveness and contributing to changes in the structural characteristics that determine the type of economy.

Consequently, the reproduction of quantitative and qualitative characteristics of the labor force is able to consolidate or change the characteristics of the economic system, and accordingly, its type and features of development. At the same time, the economic system itself, through other elements of the material subsystem (technologies, means of production) and the institutional subsystem, will influence the characteristics of the labor force and the process of its reproduction.

In modern science, the issue of reproduction of different types of labor force, characterized by different cost-benefit ratio, remains unresolved. Analyzing the dual value of the product we believe that the cost of labor can also be dual: on the one hand, it is the cost of production (cost of inputs), the other hand it is the value of outcome, which can be measured as the value of the stock in the form of the potential quantity of labor which is consumed in portions the production process.

According to our assumptions, the ratio of the costs and the results of the basic and pioneer workers is different. For basic workers, the result exceeds the costs and, thus, they create conditions for the accumulation of all kinds of resources

that are used for the needs of the pioneer sector. For pioneer workers, the costs are higher than the results, meaning thus their production and maintenance is provided to a greater extent by the profitability of the basic sector.

We believe that in any economy there can be two sectors: basic and pioneer. The basic sector of the economy produces traditional, basic products that are the basis of life support of economic entities. Alongside with the basic sector there is a pioneer sector that produces pioneer, including innovative products.

In the production of a pioneer product, due to its novelty and increased complexity, the costs are not covered by the results. Therefore, the development of a pioneer product is possible only through the withdrawal of resources from the basic sector. Thus, one of the biggest structural problems is to determine the optimal ratio between the two sectors of the economy (basic and pioneer) at the existing level of economic development.

The problem of the effective functioning of a particular type of economic system, or the problem of changing the type of system, is that the cost of the result exceeds the size costs for the basic workers, and in general the basic sector is resource-surplus.

For pioneer workers, on the contrary, the size of costs exceeds the cost of the result, and in general, the pioneer sector is resource-sufficient. Thus, for progressive economic development, the system must reproduce both the basic and pioneer labor force, considering the fact that the pioneer sector as a whole is unprofitable and must be provided with all kinds of resources. However, it is in the pioneer sector that pioneer products are created, including innovations, which support the competitiveness of the national economy.

Ratios between sectors in the economic system will be determined according to the ratio of produced and consumed both basic and pioneer workers. The financing mechanism for the pioneer sector will depend on the structure of the material subsystem, and will be implemented either through a trade transaction mechanism, a planning mechanism, or a combination of the two. Changes in the proportion of basic and pioneer workers are able to lead to a change in the ratio of sectors to the change in funding mechanism of pioneer sector to changes in basic parameters of the economic system, and, consequently, the type of system.

It is obvious that the characteristics of the labor force have always had a direct impact on the structure of the economic system, and accordingly, on the economic growth of a country. Let us study this influence more specifically. Analyzing details the relationship between the dynamics of GDP and the number of employed labor force through the definition of the type of employment in the studied G7 countries, Russia and China, we can identify the distinctive characteristics of the structure of their national economies. The related problems how to achieve economic growth and progress in economic development, possible as a result of changes in the ratio of the basic (traditional) and pioneer (innovative) sectors allow us to determine the impact of

TABLE I. DYNAMICS OF CHINA'S GDP (IN CURRENT PRICES, BILLION US DOLLARS) AND NUMBER OF EMPLOYEES (MILLION PEOPLE) FOR THE PERIOD 1990-2017

Indicator	Period										
	1990	1995	2000	2005	2006	2007	2008	2009	2010	2011	2017
GDP billion	404	757	1192	2287	2793	3504	4547	5105	5949	7324	23159
GDP growthrate, %	100	187	295	566	691	867	1125	1263	1472	1812	5731
Number of employees, million people	650	700	730	745	749	753	755	758	761	764	772
The number of people in employment, %	100	107	112	114	115	115	116	116	117	117	118

factors of production on the efficiency of the economic system.

Considering factors of production, it is possible to establish specific dependencies: 1) between the type of employment and labor efficiency in the form of its productivity; 2) between labor productivity and investments in fixed capital per employee; 3) between the type of employment and investments in fixed capital per employee. One of the most important characteristics of the labor force is the type of employment, which can be flexible or rigid type.

Flexible employment implies a unidirectional change in the dynamics of the number of employed in the economy, depending on the dynamics of GDP. Rigid type of employment is caused by either multidirectional or non-synchronous change of the studied indicators. In this case, it is possible to emphasize direct rigid type of employment, when the dynamics of GDP exceeds the change in the number of employed labor force. There is also an inverse rigid type of employment with an inverse ratio of GDP and a number of employees.

### III. RESULTS

Identification of the type of employment for the studied countries will be carried out by the algorithm on the example of China. From the early 1990s to the present, the number of people employed in China's economy has been increased annually, with an average of 1–2% during 1990–2011. The most significant increase was observed in the period 1990–2000, when the number of employees increased by 12% (table I).

However, China's employment did not grow to the extent that GDP did. On average, GDP grew between 1990 and 2002 by 40% annually. After 2002, there was a more intensive GDP growth-annually by 110%. In the period 1990–2017, China showed one of the highest GDP growth rates in the world: the volume of national production reached a record value of 23.1 trillion USD in 2017. In 2017 the economic growth of national production in Chinese economy was 5731% compared with 1990.

The success of Chinese economy is largely achieved through the introduction of a mechanism for financing innovation, the reduction of time of R & D, the creation of modern technologies in a short time for example in space exploration and active state intervention in economic processes. In Russian economy, there are a number of

problems in the organization of venture financing of innovative projects, which hinders the progressive development of the pioneer sector and the entire economy as a whole.

It is important to note that, despite the increase in the number of employed, there are currently many unemployed in China, both in rural and urban areas.

As a result of the increase in life expectancy and the implementation of a strict state policy to limit fertility in China, the number of elderly people (65 years and older) has increased and exceeds 7%. On average, there is one incapable person (younger or older than the working age) to one capable person.

Despite of the existing difficulties in the system of reproduction of the human resource, China has a constant growth of population, both the economically active population and the number of employed. In 2017, compared to 1990, the number of employed increased by 18%, amounting in quantitative terms to 122 million people, that is a record for the world economy. The type of employment in the Chinese economy is defined as direct, since the dynamics of GDP consistently exceeds the growth rate of employment. There is no other comparable country in the world with the same characteristic.

From the point of view of our classification, the type of employment in the Chinese economy in terms of the produced national product is rigid ("direct rigidity").

It justifies theoretical conclusions which can characterize the dynamics of economic system:

- direct rigidity of employment
- positive growth rates of labor productivity
- possibility of expansion of basic sector of economy
- profitability increase, and, consequently, savings in the basic sector increase with the increase of profitability
- favorable opportunities to finance pioneer sector
- expansion of pioneer sector
- increased competitiveness of the economic system through the creation and implementation of innovations
- a progressive mixed economy, which functions quite effectively, but requires active state regulation to

**TABLE II.** DYNAMICS OF GDP AND EMPLOYMENT IN THE G8 COUNTRIES FOR THE PERIOD 1995-2017 (IN %, 1995=100%)

Indicator	Period											
	1995	1996	1998	2000	2005	2007	2009	2010	2011	2012	2014	2017
<i>UK</i>												
1.GDP dynamics	100	105.6	123.7	125.3	195.2	239.8	186.9	194.9	209.8	211.6	242.7	269.0
2. Number of employed	100	100.4	101.1	103.0	106.8	108.7	110.3	110.7	111.3	112.0	113.5	-
<i>Germany</i>												
1.GDP dynamics	100	96.6	86.5	75.2	110.3	132.6	131.8	131.7	144.9	136.4	148.7	194.1
2. Number of employed	100	100.7	101.8	101.3	103.7	105.7	106.2	106.3	106.2	105.9	105.5	-
<i>Italy</i>												
1.GDP dynamics	100	111.8	108.2	97.5	158.2	188.2	186.6	181.6	194.5	178.6	184.1	218.1
2. Number of employed	100	100.4	101.1	102.1	108.1	109.2	110.1	110.2	110.8	111.2	111.8	-
<i>Canada</i>												
1.GDP dynamics	100	104.1	104.9	122.8	193.4	242.2	227.7	268.1	297.1	304.4	296.8	307.2
2. Number of employed	100	100.9	104.2	107.9	118.1	122.1	124.8	126.0	127.3	128.5	130.8	-
<i>Russia</i>												
1.GDP dynamics	100	98.2	67.8	65.0	191.3	325.4	306.1	381.7	476.8	505.0	954.9	1007
2. Number of employed	100	98.8	95.4	103.3	103.7	106.5	107.3	107.1	107.1	107.0	106.3	-
<i>USA</i>												
1.GDP dynamics	100	105.7	118.6	134.3	171.0	189.0	188.3	195.4	202.6	211.0	227.3	265.1
2. Number of employed	100	101.4	104.8	107.8	112.5	114.6	115.7	115.4	116.4	117.3	119.1	-
<i>France</i>												
1.GDP dynamics	100	100.3	93.9	85.0	136.9	165.5	167.3	164.4	177.9	166.9	174.4	176.6
2. Number of employed	100	101.3	102.0	103.7	109.4	110.8	112.9	113.3	113.7	114.0	114.4	114.7
<i>Japan</i>												
1.GDP dynamics	100	88.2	73.4	88.7	85.7	81.7	94.4	103.0	110.7	111.3	91.8	86.0
2. Number of employed	100	100.8	101.6	101.0	99.3	99.8	99.3	99.7	99.4	99.0	98.5	98.1

preserve the proportions between the sectors of the economic system. This provides not only quantitative economic growth, but also its qualitative component, therefore, direct rigidity of employment should be maintained.

In general, the success of the Chinese economy is impressive. According to the IMF, for the period 2014-2017 in terms of GDP, the leading country was China with a corresponding GDP value of 18.2-23.1 trillion USD. The US was in the second place, but with growing national production from 16.2 to 19.3 trillion USD. Third place for the period 2014-2017, went to India: 7.3 and 9.4 trillion USD in 2014 and 2017, the fourth place in the study period went to Japan (4.7 and 5.4 trillion USD), in fifth place – Germany (3.7 and 4.1 trillion USD), the sixth – Russia (3.8 and 4.0 trillion USD), in seventh place – Indonesia (2.6 and 3.2 trillion USD), in eighth place – Brazil (3.2 and 3.2 trillion USD), the ninth and the United Kingdom (2.6 and 2.9 trillion USD), the tenth-France (2.6 and 2.8 trillion USD), Italy ranks twelfth in the world ranking - 2.0 and 2.3 trillion USD accordingly, Canada was in seventeenth place in 2017 with national production of 1.7 trillion USD. Thus, out of the top ten countries in terms of GDP, five countries in 2017 are the G7 countries. Russian economy for the period 1990-2000 was losing ground as a result of the decline in national production, but since 2001 there has been generally positive economic growth with some periods of recession.

Let's consider the type of employment in the studied countries. The group of eight (G8) or group of eight economically developed countries until 2015 was a forum for the governments of the eight largest national economies in the

world, both in nominal GDP and the human development index. Together, the G8 countries produced 50.3% of the world nominal GDP (as of 2012) and 40.9% of the world GDP in PPP terms.

In the case of economically developed countries, the high quality of economic growth should be noted. GDP growth is mainly due to the traditionally high quality of competitive products and is based on a large-scale innovation process. However, in Russia, about 50% of annual GDP growth is due to increased production and exports of oil and gas, which in some periods enjoyed growing payable demand. Thus, in addition to the temporary supply of high prices for exported raw materials, the growth of national production in Russia is still far from being based on accelerated scientific and technological progress. The necessary condition for economic growth is not only the effective use of labor force, but also its production. As a result, domestic products, with the exception of military-industrial complex products, do not differ in novelty and high competitiveness.

The main factors determining the situation in the national labor markets in the 1990s and at the beginning of the XXI century in the world economy were the following: constant positive dynamics of production, stable economic development, institutional reforms, increased investment activity, financial stability.

Consider the interrelation between trends in GDP and the number of employed people in the study countries in order to identify the type of employment. It is necessary to express the volume of GDP and the number of employees as a percentage of the base year to determine the type of employment and to identify their dynamics in interrelation (table II).

After the crisis of 2008 in the G8 countries there was a slight increase in employment, except for Japan, where there was a drop in the number of employed from 67.4 million people in 1997 to 65.3 million people in 2013.

In 2009, employment of the labor force increased in the UK – by 0.3%, Germany – by 0.3%, Canada – by 0.4%, in France – by 1.2%. In the United States, the employment of the labor force during the study period increased significantly – by 32 million people, from 131.1 million people in 1990 to 163.1 million people in 2013 in particular. As can be seen from these indicators, the crisis in the world economy had a insignificant influence on employment, and all countries except Japan have seen employment growth. At the same time, the number of employed labor force for 1990–2014 in the G8 countries as a whole increased from 400.4 million people to 453.9 million people.

For the period 1995–2017 the stable positive dynamics of economic growth is observed in such countries as United Kingdom, Canada, Italy, USA. The alternation of periods of recession and recovery is typical for Japan, Germany, France and Russia. Constant positive dynamics of employment is observed in most countries, with the exception of Japan and Russia. The largest increase in employment is observed in Canada (130.8%), the United States (119.1%), France (114.4%) and the United Kingdom (113.5%).

#### IV. CONCLUSIONS

The above study to identify the type of employment for the G8 countries has shown that they can be divided into two groups.

The first group will include such countries as Germany, Russia, France, Japan according to the type of employment and associated characteristics of the functioning system.

Having specified types of macroeconomic employment in these countries at the beginning of the studied period we notice an inverse rigidity when the rate of GDP growth is lower than the growth of the number of the employed which leads to decrease in labor productivity.

Gradually reverse rigid employment becomes direct rigidity of employment. This transition indicates positive processes, which is confirmed by the positive growth rates of labor productivity, stabilization of the situation in the basic sector of the economy and the creation of conditions for further development of the pioneer sector. The expansion and development of the pioneer sector contributes to the achievement of economic growth through innovation.

The type of economic system according to the type of employment in the countries of the first group tends to be mixed (having unstable dynamics of GDP), since the rigidity of employment is not absolute, changing the nature from the reverse to the direct. In this situation, the number of labor consumed is not rigidly fixed, but changes more than the volume of the created national product. The largest GDP growth in this group of countries is achieved in 2017, in Russia is 1007% of the base year. The mixed type of employment is reflected in the dynamics of economic growth,

which is characterized by instability, accompanied by alternating phases of rise and fall.

The second group will include countries such as the UK, Italy, Canada, USA. The largest GDP growth is achieved in 2017 in Canada (307%) and the UK (269%), the US (265%). In Italy, only in 2000–2001 there is a reverse rigid employment, but in general during the studied period it corresponds to the direct rigid type. In this group of countries, the type of employment is direct, which evidences the efficiency of the sectoral structure of production, as well as an effective structure of a reproducible labor force. The positive growth rates of labour productivity resulting from the direct rigidity of employment indicate a favorable economic situation in both the basic and pioneer sectors of the economy, resulting in stable positive economic growth on an innovative basis. The type of economic system is mixed, with a favorable influence of labor on structural characteristics. The Chinese economy can also be attributed to this group of countries, showing a direct type of rigidity of employment and the highest rates of economic growth.

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