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THE TRANSFORMATION OF LABOUR AND EMPLOYMENT IN POST-INDUSTRIAL SOCIETY

ABSTRACT: The article is devoted to the analysis of the transformation of labour and employment in post-industrial society. Allocation shifts in industrial production have become characteristic features of the world economy. The structure of employment has also transformed in new conditions of world development.

KEY WORDS: transformation, employment, world economy, globalization, post-industrialism

The urgency of the research presented in the following article is defined by the growth of the scale and intensity of the world economic relations, major geopolitical transformations in the second part of the 20th century. The development of the world economy during globalization, the increase of mutual dependence of all members of the world economy, the increase of the range of national economies' openness resulted in radical changes in the structure and functions of international production and exchange. The structure of employment is also transforming in the present-day conditions of development under the influence of current processes.

The aims of this research are as follows:

- To prove that the role and importance of industry in the post-industrial epoch have not changed as much as it seems at the first glance, when we analyze the statistics concerning the growth of the service sector in modern society.
- To prove that at the post-industrial stage industry is still the most important

sector of economy in highly-developed countries and the most powerful industrial potential is concentrated in these countries.

- To explain that it is necessary to take into consideration the structure of employment in the service sector (especially “producer services”) when you analyze the transformation of employment in the so-called industrial sector of economy;
- To reveal the peculiarities of the transformation of labor and employment in the countries of different types and levels of socio-economic development.

THE PECULIARITIES OF THE TRANSFORMATION TO POST-INDUSTRIAL SOCIETY

Globalization and transformation of the developed countries to the post-industrial level of development have mainly stipulated the restructuring of the world economy. According to many scientists and experts, the world economy, as far as the main characteristics are concerned, already possesses special qualities of the united system, although its global structure is torn up morphologically. But the intensification of all forms of international economic and political relations leads to the establishment of still closer ties between all members of the world economy, including the international capital migration, allocation shifts in industrial production, and even the developing process of the global work force formation.

The change of the model of labor and employment can be examined as one of the direct results of the systematic changes in society. But at the same time we cannot but mention the factor of scientific-technical progress that directly influences the process of a specific influence of the latest informational technologies on the process of labour itself and on the level of employment.

A common tendency can be noticed practically in all countries of the world throughout the 20th century: the agricultural sector has lost (or is losing) its leading role in economy, firstly giving way to the industrial sector, and then to the service sector. These two major structural transformations are called industrial and post-industrial stages of economic development. But we should keep in mind, that two different but inter compensating processes were taking place in the world economy in the second half of the 20th century.

Firstly, as a result of the fast development of the service sector, the role and importance of the primary (agriculture) and the secondary (industry) sectors of economy in the developed countries were decreasing (i.e. their shares in the total volume of production and employment), thus, practically bringing their transformation to post-industrialism. A new term – “deindustrialization” of developed countries, which in our opinion is rather vexed, appeared.

Secondly, the industrial sector was outstripping in its development, and so was employment in this sphere, both in post-socialist countries and in many, if not to say in most, developing countries. Only since the beginning of the 1990s, in the former socialistic and communist countries, now called “countries with economy in transition” or “countries in transformation”, the employment in the industrial sector decreased, which can be explained by the structural crisis and a general fall of production in that period, but not by the transformation of this group of countries to post-industrial level of development (Table 1). In other words, the increase of the employment in the service sector took place at the expense of the employment contraction in agricultural sector. And the industrialization process was gaining momentum.

Table 1. Labour force by occupation in the economy of East European countries (%)

Branch/years	1950	1960	1970	1980	1987	2005–2006
	USSR					Russia
Total labour force in the economy:	100	100	100	100	100	100
agriculture and forestry	47.6	38.8	25.4	20.2	19.0	8.5
industry and construction	27.5	32.4	37.9	38.5	38.4	29.7
services	24.9	28.8	36.7	41.3	42.6	61.8
	Poland					
Total labour force in the economy:	100	100	100	100	100	100
agriculture and forestry	54.0	44.1	34.6	29.7	28.4	16.1
industry and construction	26.2	32.4	37.6	38.9	37.1	29.0
services	19.8	23.5	27.8	31.4	34.5	54.9
	Hungary					
Total labour force in the economy:	100	100	100	100	100	100
agriculture and forestry	50.6	38.9	26.4	22.0	20.9	5.5
industry and construction	23.3	34.0	43.2	41.4	38.2	33.3
services	26.1	27.1	30.4	36.6	40.9	61.2
	Czechoslovakia					
Total labour force in the economy:	100	100	100	100	100	100
agriculture and forestry	38.8	26.0	18.5	13.4	12.2	4.1
industry and construction	36.7	46.0	47.3	48.3	48.1	37.6
services	24.5	28.0	34.2	38.3	39.7	58.3
	Bulgaria					
Total labour force in the economy:	100	100	100	100	100	100
agriculture and forestry	79.5	55.5	35.8	24.6	20.0	8.5
industry and construction	11.4	27.1	38.8	43.2	46.3	33.6
services	9.1	17.4	25.4	32.2	33.7	57.9
	Romania					
Total labor force in the economy:	100	100	100	100	100	100
agriculture and forestry	74.3	65.6	49.3	29.8	28.7	31.6
industry and construction	14.2	20.0	30.8	43.8	44.7	30.7
services	11.5	14.4	19.9	26.4	26.6	37.7

Source: Prepared on: Rodionova, I. 2005: *World Economy...*; Korolev, I.S. (editor) 2003: *World economy: global tendencies...*

The development of the USSR in the 20th century was taking place under the motto of the electrification of the whole country and a grand plan of industrialization, often at the expense of other branches of economy. Nevertheless, the USSR had not managed to solve all problems of industrialization and to create a complete structure of economy by the beginning of World War II. After that war, all problems had to be solved simultaneously with the restoration of destroyed economy. Nonetheless, the USSR made an enormous scientific and technological breakthrough in certain branches of economy. Space research was one of the most important directions of development of Soviet industry. For the first time ever in such a big country the unified power system, the longest in the world network of electrified railways was built, etc. Naturally, all these demanded the growth of employment in the industrial sector of economy; moreover, they demanded highly-professional labor force that the success in the sphere of education contributed to.

Simultaneously, since the middle of the 1960s, the employment in the service sector was growing and reached 41% by 1990. This process sped up since the beginning of the 1990s 53% by 2000. According to the State Statistics Committee of Russia (*Федеральная служба государственной статистики*), the service sector turned out to be the only one with the net growth of employment the employment in industry fell by 39%, in agriculture by more than 13% in the 1990s. However, the researchers state that the influx of labour force into the service sector from agricultural and industry sectors in 1994–2000 was insignificant. Either the formerly unemployed or newcomers, e.g. the youth after graduation, or returnees after a break occupied work places in the service sector. Such transformation of labour and employment in Russia is yet to be studied.

It is generally acknowledged that most former socialistic and communist countries commenced the process of full-scaled industrialization only after World War II. They used to be mainly agricultural with the rudiments of some basic branches of industry: Poland – coal mining, metallurgy, textile; Romania – oil; Bulgaria, Hungary – food and catering. Czechoslovakia was the most developed among them. The common weak point for this group of countries was the underdevelopment of machine-building, chemical industry, and power engineering. It is worth remembering that the industrialization of East European countries was being fulfilled with the active tangible, technical and technological aid of the USSR.

The membership of these countries in the Council for Mutual Economic Aid (COMECON) guaranteed the delivery of necessary raw materials (oil, gas, electricity, iron ore, etc), and many products (especially those of machine building and chemical from the USSR). As a result, heavy industry was formed in these countries, and it became possible to reconstruct and strengthen both light,

and food industries, to modernize all sorts of transport. These countries mutually constructed and used unified oil, gas, and electricity mains. All this demanded the transformation of labour and employment and the increase of work force in industry and construction, as well as in the service sector that the information in Table 1 presents.

As for the developing countries, many of which are just entering the industrial stage, the significance of industry in producing GNP and the rate of employment in this sector are still growing. Three quarters of the planet's population live in these countries, e.g. China and India, where employment in the industrial sector shows an unprecedented growth and not just a relative increase of indices.

THE ROLE OF INDUSTRY IN MODERN SOCIETY

But, even if we discuss the decline of the industrial stage of development in highly developed countries, we would not insist on understanding such terms as "post-industrial" or "outer-industrial" literally. General decrease of indicators, characterizing the specific gravity of industry in forming world GNP and the level of employment in this sector of economy, related to the rapid growth of those involved in the sphere of services and the profits received there, does not call for an adequate decrease of the importance of the industrial sector in the economy of highly developed countries.

Thanks to the achievements of scientific and technological progress, the range of production and assortment of industry in the world economy is increasing. The growth of production and simultaneous decrease in the number of employees in highly developed countries is defined as "jobless growth". The level of labour productivity in industry is higher than in agriculture, and even in the service sector. Highly developed countries still produce the most of the world's agricultural product in general, and especially in certain branches. Their supremacy is not limited to high technologies alone.

Although economic activity is moving more and more from the production of goods to services, the society in highly developed countries is unlikely to become the society of elite in the near future. Also, we cannot speak about the expansion of information technologies' studies (managerial, professional, and technical) that will constitute the core of the new professional structure of population, according to the classical theory of post-industrialism. Many researchers notice the shift to employment in information sector (not to be confused with the service sector in general) is much slower than the trend of growth of employment in the service sector.

Different combinations of the number of those involved in branches of economy reflect acute disproportion in the level of development of productive

forces between highly and least developed countries. Not so long ago, in 1995, 48% of working people were involved in agricultural sector, namely in agriculture, hunting, fishing, and forestry. 17% of the world population was employed in industry and construction and about 35% in other sectors (non-productive and service spheres). But at the same time, population of the developed countries of North America and Western Europe, working in industry, was 9 times and 4 times higher respectively than the population employed in agriculture. As for the developing countries, even at the end of the 20th century, about 50% of the working population worked in agriculture.

At the same time, in the poorest countries, about 80% and more was working in this sector. Nowadays, the structure of GNP and working population (WP) in developed and developing countries differ considerably. In 2006 the structure of labour employment in the world in different sectors of economy (primary, secondary, and tertiary), can be expressed as 41:21:38.

The dynamics of changes of labour force employed in industry of differently developed countries is reflected in Table 2. In the world economy, the specific weight of occupation in the service sector as a whole is reaching 40%, in the highly-developed countries it is already higher than 70%. At the same time, we should bear in mind, that at present more than 65% of value added of world GNP is gained in the services agriculture – about 4%, industry and construction – about 30%.

Table 2. Labour force by occupation: industry (incl. construction), 1900–2006 (%)

Types of countries/ countries, regions	1900	1950	2000	2006
World	13.9	16.4	18.9	20.8
Developed countries	20.4	28.7	25.7	
Developing countries (incl. China)	7.3	9.2	15.9	
China	6.8	7.7	17.6	25.0
Eastern Europe countries (post-socialist countries)	34.7	36.5	29.2	
USSR/the CIS		33.0	30.0	
Russia	27.5	36.7	30.0	29.7

Source: Prepared on: Castells, M. 2000: *The Information Age...*, page 530–539; Korolev, I. S. (editor) 2003: *World economy: global tendencies for 100 years...*

In the whole world, the growth of labour force in non-productive sphere is primarily connected with the growth of labour productivity in branches of material production, with general scientific-technological progress and the increase of different forms of services.

Strategies of using the quickly growing contingent of labour force and curbing the further growth of multi-million army of the unemployed have become a serious social problem, especially for the developing countries. Solutions to the presented problems may be listed as: develop new branches of economy, especially in the tertiary sector; re-profile economy; and introduce sophisticated technologies and develop industry and service spheres in the developing countries.

Typical as it is, such indicator as an absolute quantity of the employed in the industrial sector in the majority of countries (including highly developed countries) demonstrates a continuing growth, especially in the developing countries, with China being in the first place (Table 3). The process of industrialization is continuously developing.

Table 3. Employment by industry in different countries, 1995–2006

Country	Years	Labour force – total (millions)	Employment in industry (% of total)	Employment in industry (millions)
USA	1995	132.90	24.30	32.29
	2002	148.30	24.10	35.74
	2006	151.40	22.90	34.67
Japan	1995	66.20	33.20	21.98
	2002	68.00	25.00	17.00
	2006	66.40	27.80	18.46
Germany	1995	39.50	37.40	14.77
	2002	41.10	33.40	13.73
	2006	43.60	33.40	14.58
China	2002	769.30	22.00	169.25
	2006	798.00	24.00	191.52
Russia	1995	73.00	38.60	28.18
	2002	77.80	27.70	21.55
	2006	73.80	29.10	21.50
Poland	1995	19.40	34.60	6.71
	2002	19.90	22.10	4.40
	2006	17.26	29.00	5.01
World	2006	3001.00	21.00	630.21

Source: Prepared and calculated on: <http://www.cia.gov/cia/publications/factbook/>, page 113–115; 7; 8

THE MARGINS OF THE SERVICES

In order to define the process of labour and employment transformation, it is necessary to look at the term ‘service’ itself. Statistics has always used the term ‘services’ as residual, and applied it to everything that was not a part of agriculture, mining and quarrying (including oil production), construction, public utilities, enterprises (electricity, gas, and water), and manufacturing.

Yet, we would like to note that it is becoming more and more difficult year-by-year to say definitely where the exact margin between the main spheres of economic activity is. The margins are not clear. Moreover, different countries interpret the contents of this sector of economy in different ways, and there is no international generally accepted classification of services. For example, in many countries only passenger transportation is considered as services, meanwhile cargo transportation is considered as a part of material production process in it is final value. But in the USA all transportation is considered as services. In the majority of countries, electricity, gas, and water supply are included in industry, meanwhile in the USA they are included in the services sector. And there are many more similar examples.

Speaking about the industry and services drawing together, we should bear in mind that computer software, video production, electronics, biotechnologies and such alike are now considered as part of services sector, but the material part of the product here is interconnected with the informative context, and that makes it impossible to draw a distinct line between products and services.

Moreover, a number of economic activities that today are considered as services are directly interconnected with industrial production, such as technical services, engineering, consulting companies, etc. For example, the number of employees in automobile industry is decreasing constantly, but it is increasing in car-service, etc. Thus, we can speak about “producer services”, which cover auxiliary services to business. Additionally, the process of “industrialization” of services is taking place too. For example, a company selling tea is also weighing it out and packing. Or, a company selling computers is also assembling them. We would like to draw your attention to these facts, in order to be able to characterize the process of labor employment and peculiarities of professional structure of population in the period of transformation from industrial to a post-industrial way of development from this point of view.

THE METHODS AND THE STATISTICAL BASIS OF THE RESEARCH

Firstly, we can study the structure of output from the point of view that there are three major sectors: agriculture, industry, and services. Secondly, we can take

into consideration only industry, or together industry and construction. Thirdly, giving characteristics of the structure of labour employment in different sectors of economy, we can take into account the employment in the industrial sector directly that is, we can take both mining and manufacturing, or only manufacturing. Fourthly, we can take the last indicator and add the data on employment in the sector “producer services”, and, in our opinion, it is preferable, and the best way to characterize processes going on in the world economy.

Thus, we used detailed statistical data from “The Information Age...” by M. Castells to analyze the labor employment in leading capitalist countries (USA, Japan, Germany, France, Italy, Great Britain, and Canada) in the period between 1920 and 1990. We also used data from special periodical and information editions of international organizations, Russia, and foreign countries (Rodionova, 2005; Volskiy, 2004; *World Development Indicators. The World Bank, 2004–2006*; Korolev, 2003). We also studied and analyzed tables with statistical data in scientific publications, including by a group of authors from the Institute of World Economy and International Relations of Russian Academy of Science (IMEMO RAN) (tables by B. Bolotin) (Castells, M. 2000).

We would like to explain that the Industrial Sector includes all branches of mining and manufacturing industries, construction and public utilities. The “producer services” sector that we are interested in includes data on labour employment in such spheres as: banks, insurance, real estate, design, accounting, business, and legal services. Of course, there are certain difficulties in defining different activities according to the sectors of economy in statistics. So sometimes the percentage rate may be slightly increased or decreased.

TRANSFORMATION OF LABOUR EMPLOYMENT IN “G-7” COUNTRIES

The analysis of the evolution of labour employment in seven developed countries was carried out on the basis of two data periods: 1920–1970 and 1970–1990 (Annual statistics report of COMECON member-states, 1988:270–283). During the first period, these countries were industrial, during the second they were undergoing transformation to post-industrialism. We continued the statistics analysis till the year 2005, on the basis of the data of Central Intelligence Agency, USA (The World Factbook, 2007), and the publications of World Development Indicators, 2004–2006 among others.

Thus, the research was special, because we studied transformation of labour employment taking into consideration employment in “producer services” sector. The calculations made and the diagrams drawn allowed us to study the transformation of labor and employment in highly developed countries. We

have a proof that highly developed countries demonstrated different models of development and underwent specific individual transformations to post-industrialism.

In the first period, 1920–1970, the shift of employment in the direction of services *sector* took place at the expense of decrease of employment in agriculture, because the employment in industrial sector: industry and construction and producer services, was increasing (in USA, Germany, Canada, etc.), and sometimes was increasing rather substantially (Japan) (Table 4).

Table 4. Employment in Different Branches in Some Developed Countries (%)

Branch/years	1920	1930	1940	1950	1960	1970	1980	1990
USA								
Agriculture	26.3	22.9	19.2	12.7	7.0	3.7	3.6	2.8
Industry with producer services	38.3	37.3	36.5	40.4	43.6	42.4	41.1	40.2
Other services	35.4	39.8	44.3	46.9	49.4	53.9	55.4	57.0
Total:	100	100	100	100	100	100	100	100
Japan								
	1920	1930	1940	1950	1960	1970	1980	1990
Agriculture	54.9	49.9	44.0	48.6	32.9	19.4	11.0	7.1
Industry with producer services	21.3	20.8	27.3	22.8	29.7	34.4	33.9	34.5
Other services	23.8	29.3	28.7	28.6	37.4	46.2	55.1	58.4
Total:	100	100	100	100	100	100	100	100
Germany								
	1925	1933	1950	1967	1970	1987	1999	2002
Agriculture	30.9	29.1	12.9	6.8	3.8	3.2	2.8	1.0
Industry with producer services	43.6	43.4	53.2	57.7	55.2	48.5	41.9	41.0
Other services	25.5	27.5	33.9	35.5	41.0	48.3	55.3	58.0
Total:	100	100	100	100	100	100	100	100

Source: Calculated on: *Annual statistics report of COMECON member-states*. 1988:270–283

But in the period 1970–1990, the decrease of labour employment in industry in G-7 countries was not as obvious as is usually suggested. These countries, constituting the core of global economy, demonstrated substantial diversities in the process of transformation of labor employment.

The analysis of the dynamics of employment in G-7 countries in this period reveals a tendency to decreasing working places in industry, and close connection between industry and producer services. At the same time, the decrease of employment in industry, especially in manufacturing industry, was often

accompanied by the growth of employment in the producer services sphere.

Let's look at the USA. There we can see a tendency of not creating working places in industry, but concentrating on producer services and social services. Japan and Germany demonstrate the structure of employment with a strong industrial sector.

We should bear in mind, describing the transformation of labor employment in modern society that different countries could have individual features and peculiarities, as we can observe a variable and gradual transformation to informational paradigm of development even in developed countries.

CONCLUSION

The aim of this research was dictated by studying the deepening differentiation between the countries of the world in respect of character and tempo of structural transformation of the secondary (so called industrial) sector of economy, the processes of industrialization and “deindustrialization” in the modern world.

Really, by the end of the 20th century, a certain amount of population moved from industry into the service sphere, the same as by the end of the 19th century they moved from agriculture into industry. Nonetheless, industry still plays a very important role in the development of society in the age of post-industrialism. Total decrease of indicators, which characterize the specific weight of industry in the world economy that was caused by the fast growth of the employees and profits in the services, does not imply an adequate decrease of the significance of the industrial sector. As usual, the level of their industrial development defines the level of social and economic development and the contrasts between the development and developing countries.

Nowadays, the most powerful industrial potential is concentrated in the highly developed countries, which, actually, are on the post-industrial level of development. But the present situation, even if we speak about the economy of the highly developed countries, cannot be characterized without taking into consideration the structure of employment in the services (especially “producer services”).

The significance of industry in forming GNP and the amount of labor force in the industrial sector of the most developing countries (with the biggest share of the world population) some of which only start on the industrial level of development is growing.

In other words, as countries are at different stages of development, in order to enable the highly developed countries to concentrate on the post-industrial model, it is necessary for other countries to fulfill their role in the world economy as industrial workshops. At the same time, there are still certain countries in

the world that are, actually, on the pre-industrial stage of development, with the corresponding employment in agriculture.

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