FACTORS OF CHANGE IN THE VALUE ADDED OF THE INDEUSTRIAL SECTOR IN 2013[1]

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The results of decomposition of growth in the output index point to the fact that in 2013 growth in the gross value added (GVA) of industry was achieved by means of accumulation of extensive factors. According to the preliminary estimates, the growth rates of the aggregate factor productivity (AFP) of industry turned out to be negative. In 2013, in the pattern of costs of the main factors of the industrial sector capital inputs had a dominant role to play; changes in labor costs in manufacturing are characterized by growth in labor volumes (the number of the employed) and reduction of the rate of utilization thereof (hours worked).

An approach to analysis of the factors behind differentiation of different types of economic activities is based on decomposition of economic growth rates. The basis of the above approach consists in evaluation of the differential form of the production function under which the output growth rates are the total of the three components. The first two components determine the effect of the dynamics of costs of the main factors: labor and capital (extensive components of growth). The evaluation methods used suggest the fact that the costs of factors are equal to the product of factor volumes (the number of the employed and volumes of capital assets) by the rate of utilization thereof (hours worked by one employed person and loading of industrial capacities). The third component which is determined as the aggregate factor productivity is the remainder – that cannot be explained by the main factors – which is regarded as characteristics of intense components of growth. Such an assessment of the aggregate factor productivity reflects not only changes in "technological" components, but also exogenous shocks, effects of higher efficiency of production setup, quality of management, as well as changes in demand and pricing situation.

According to the data of Rosstat, in 2013 the gross value added rose by 0.8% and 0.9% in manufacturing and production of primary products, respectively, as compared to the previous year, while in production and distribution of power, gas and water it fell by 1.6%. It is to be noted that all the sectors are characterized by slowdown of growth rates of GVA as compared to the previous year. In manufacturing, production of primary products and production and distribution of power, gas and water growth rates of value added happened to be 1.9 p.p., 0.7 p.p. and 1.7 p.p. lower than the 2012 level, respectively.

In 2013, maximum growth rates of value added in industry were demonstrated by primary sector enterprises. In accordance with the results of decomposition (*Table 1*), in 2013 growth rates of costs of the main factors were ahead of the value added growth rates of primary sector enterprises. The most important factor behind the value added growth rates of primary sector enterprises was capital costs: a contribution to growth rates of the GVA determined by an increase in capital assets exceeded almost ten times over the contribution justified by labor costs. Growth in labor costs of that type of economic activities was determined completely by an increase in the number of the employed, while the number of hours worked by a single worker decreased.

On the basis of the results of 2013, primary sector enterprises are characterized by a reduction of the AFP. Growth in GVA of that type of business activities was determined completely by growth in costs of the main factors, while the contribution of the aggregate factor productivity to output growth rates happed to be negative. As was stated above, the estimate of the AFP represents a remainder which cannot be explained by the main factors. In particular, utilization of value indices of the output and the capital may result in a shift in the estimate of AFP due to irregularities in the dynamics of prices of output and capital assets. As compared to the rest of industry, the AFP dynamics of the primary sector depends to a great extent on the price situation on global markets of primary products. Econometric evaluation[2] of correlation between

1 In that section, the results of decomposition of growth in the output index (the value added of manufacturing) in 2013 – which were received in accordance of the methods outlined in the IEP paper: The Factors of Economic Growth (Scientific Work Series No. 70. The IEP, Moscow, 2003) – were presented. Decomposition is based on a breakdown of economic growth into extensive and intensive components which permit to evaluate the quality of growth and forecast further trends in economic development. The presented results characterize transformation of the pattern of economic growth and permit to identify the most important factors which determine changes in the dynamics of growth rates of the output index.

2 Singling out of a situation component in the AFP composition is carried out by means of evaluation of the effect of regression of the growth rates of AFP on those of global oil prices on the basis of the annual data in the 1993–2013 period.

Table 1

DECOMPOSITION OF GROWTH RATES OF VALUE ADDED OF THE INDUSTRIAL SECTOR IN 2012–2013 PERIOD*

	Production of primary products		Manufacturing		Production and distribution of power, gas and water		Industrial production**			
	2012	2013	2012	2013	2012	2013	2012		2013	
GVA	1.6	0.9	2.7	0.8	0.2	-1.6	2.0		0.6	
I. Costs of factors	7.56	2.88	4.15	2.73	2.35	1.29	8.86	(5.20)	0.93	(1.86)
I.1.Labor***	0.31	0.03	-0.17	-0.08	0.28	-0.21	3.55	(0.06)	-1.55	(-0.05)
The number of the employed	0.23	0.09	-0.41	0.32	-0.07	0.26	1.69	(-0.13)	0.21	(0.23)
Hours worked (per worker)	0.08	-0.05	0.24	-0.40	0.35	-0.47	1.87	(0.19)	-1.76	(-0.28)
I.2. Capital	7.25	2.85	4.33	2.80	2.07	1.50	5.31	(5.14)	2.48	(1.91)
Volume of capital funds****	3.85	2.85	3.04	2.80	2.07	1.50	3.09	(3.23)	2.48	(1.91)
The extent of loading of capacities	3.40	-	1.29	-	0.00	0.00	2.22	(1.91)	-	(-)
II. AFP*****	-5.93	-1.93	-1.44	-1.90	-2.20	-2.86	-6.86	(-3.20)	-0.33	(-1.27)

* In respect of 2013, preliminary estimate is given.

** Estimates as regards industrial production are based on aggregation of the initial estimates by the type of economic activities (the results of decomposition shown in brackets were received by aggregation of estimates by the type of economic activities).

*** Preliminary estimate of the growth rates of the number of the employed in the industrial sector is based on the data on the number of displaced jobs in 2013 on assumption of the invariability of the ratio of the employed by the type of economic activities to the number of displaced jobs.

**** The preliminary estimate of the physical volume of capital assets in 2013 is based on the assumption of the invariability of the retirement rate of capital assets and the share of investments made in modernization of capital assets.

***** The estimate of the AFP in 2013 in the primary sector, manufacturing and in industry in general is biased due to a lack of data required for evaluation of changes in the extent of loading of capacities of enterprises of the above types of economic activities.

the growth rates of AFP and those of global oil prices permit to single out the following two components in AFP: the situation component (which is determined by changes in pricing situation on global markets of primary products) and the "ultimate remainder". It is to be noted that singling out of a component which is determined by changes in oil prices from the AFP index of the primary sector does not result in quality changes in conclusions as regards the dynamics of aggregate productivity: "the ultimate remainder" demonstrates negative growth rates, too.

Unlike the previous periods, in 2013 manufacturing industries yielded as regards the GVA growth rates to primary sector industries. In the past few years, enterprises of that type of economic activities managed to restore the value added volumes which were achieved before recession which began in 2008. In real terms, in 2013 the GVA volume of the manufacturing sector amounted to 100% of the 2007 level.

The pattern of value added growth rates of the manufacturing sector differs little from the pattern demonstrated by the primary sector. As compared to the previous periods, that type of economic activities demonstrates a decrease in growth rates of capital assets. However, in the pattern of costs of the main factors the costs of capital are still a dominant component. Labor costs are characterized by a negative contribution to the GVA growth rates of that type of economic activity. Reduction of labor costs in manufacturing is carried out only by means of reduction of the number of hours worked in a situation where labor volumes are positive. It is to be noted that manufacturing industries are the only industrial sector where in 2013 the number of hours worked by a single worker exceeded the level of 2008, but at the same time it is the only industrial sector where the number of the employed failed to amount to the pre-crisis level.

According to the preliminary data, in 2013 the AFP growth rates of manufacturing are in the area in negative values, though that estimate is most probably a biased one as it does not take into account changes in the extent of loading of industrial capacities.

In industry, the negative value added growth rates were demonstrated by enterprises specializing in production and distribution of power, gas and water. On the basis of the results of decomposition, reduction of GVA volumes of the above type of economic activities was determined completely by a decrease both in labor costs and AFP in conditions of growth in capital costs. It is to be noted that in the pattern of the rate of reduction of GVA in production and distribution of power, gas and water AFP has a dominant role to play:

its contribution in the rate of reduction of GVA exceeds more than ten times over the contribution of labor costs. Reduction of labor costs of enterprises specializing in production and distribution of power, gas and water is realized by means of reduction of hours worked by a single worker, while the growth rates of the number of the employed in that type of economic activities remain positive.

The results of evaluations received for the aggregate data by the type of economic activities point to the fact that in 2013 the value added growth rates in general amounted to 0.6% which is 1.4 p.p. lower than the 2012 level.

In accordance with the preliminary outputs of decomposition (in the absence of the data on the extent of loading of capacities), in 2013 the growth rates of the GVA of industry were determined completely by growth in capital costs. So, capital costs remain the dominant factor behind growth in value added of industrial production despite the slowdown of growth rates of capital funds. In 2013, unlike previous periods the industrial sector demonstrated a decrease in the growth rates of the number of the employed which situation was accompanied by negative growth rates of hours worked. In 2013, the AFP growth rates of industrial production were negative, too. Singling out from AFP of the component which characterizes redistribution of the value added and labor and capital costs by the type of economic activities results in an insignificant change in the contribution of productivity to the AFP growth rates of industrial production. It is to be noted that narrowing of differences in AFP estimates received on the basis of the aggregate data and by the sector points to slowdown of the process of redistribution of resources between the types of economic activities in industry in 2013 as compared to the previous period.

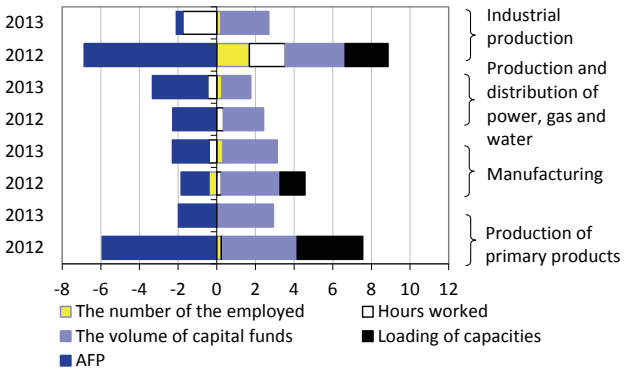

Fig. 1. Growth pattern of the gross value added of industrial production in the 2012–2013 period