

JEL code: O14, O18

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EFFECTS OF INDUSTRIAL RESTRUCTURING AT NATIONAL AND REGIONAL LEVEL IN EAST CENTRAL EUROPE

У статті розглянуті наслідки реструктуризації промисловості на національному та регіональному рівні в Центральній та Східній Європі

В статье рассмотрены последствия реструктуризации промышленности на национальном и региональном уровне в Центральной и Восточной Европе

Market economy can be characterized by a constant structural change, i.e. some sectors shrink while others widen. These are short-term processes that are influenced by the technology and innovation, life cycles of sectors and the number of people employed. Productivity of the processing industry has been increased significantly in the Visegrád countries between 2000 and 2007.

Productivity growth in Slovakia could be reached by those of certain sectors, development in technology and a boost in high-tech industry. Effects of the explaining factors of productivity growth in the Czech Republic were balanced naming reallocation of labour force and technological development. Changes in productivity were not followed by allocation of the labour force, it was not a pulling factor in Poland. Instead, increase in productivity was influenced by the productivity growth of certain sectors (98,24%) that were caused by technological changes. On the other hand, allocation of the labour force played the most crucial role regarding productivity growth in Hungary (7,16%). Labour force moved towards vehicle and machinery equipment production, participation decreased in electrical and chemical industries strongly. Advantageous labour force structural change could not compensate lower productivity growth and lack of technological expansion in comparison with the Visegrád Four. The unfavourable reallocation of the labour force among different sectors is to highlight the fact that need for labour force in the processing industries seems to increase slower in Hungary than in the other Visegrád Four countries. Productivity during industrial structural changes is influenced by a country's ability via the reallocation of labour force. In order to reach the intended growth track revitalisation of the labour force is necessary by strengthening social dimensions.

What regards the regional dimension it can be stated that industry shows outstanding significance in half of the regions (in eighteen) and has a characteristic role in ten more. In the Czech, Slovakian and Silesian regions with significant industrial traditions and capacities, where it was possible to modernise the production structure via the appearance of foreign direct investment in the second half of the transition period, the industry continues to have an outstanding significance. The capital regions having a dominance of the tertiary sector differ substantially from this, and so do the eastern regions in Poland and the southern regions in Hungary with their agricultural characteristics.

Keywords: Est Central Europe, industrial restructuring, spatial economics, regional comparison

Introduction. The definition of structural change can express transitions of the industries of the developed countries or their entire economy since the 1970s (Kiss, 2010). Deindustrialisation refers to the decline, the decrease or the destruction of the industry. However, structural change is often identified with deindustrialisation

that is a narrower term and often decreases in the number of people employed in the industry (Kiss 2010; Cheshire 1991) or decline in industrial production are meant. The definition of structural change is capable of expressing transitions in a wider and more complex sense. Deindustrialisation is a long-term process through which the percent of industry decreases regarding not only gross domestic products but also the rate of the employed and production.

According to one interpretation of the definition the relative decline of the industrial sector is differentiated. In this case, other sectors are to show a higher growth rate than the industrial sector, concerning the number of the full-time employed or the rate of GDP the percent of industry decreases. Absolute decline is to be mentioned when production, the number of the employed investment and profits are decreasing year by year. In parallel with deindustrialisation tertialisation appears, i.e. the strengthening of the service sector (Barta et al., 2008). Barta et al (2008) refer to the appearance of new sectors, activities and products where traditional industrial activities cease or decrease so industrial activities take their places. Regarding regions the authors divide world economy into three main groups:

Deindustrialisation and delocation characteristic of developed countries mean that industries with high added values and productivity take the places of traditional industries producing lower added values. Decrease in the number of people employed in the industry is not equal with decline in the GDP rate of the industry. In these countries, labour force moves to the direction of the tertiary sector. Despite delocalisation there is a steady growth of GDP (Lux, 2007) that can be explained with the persistence of parent companies, decision-making centres and the relocation of lower value added production processes. By relocating capital, these countries have a perceptive role in the process of migration. In the developed Western countries deindustrialisation and industrial delocalization has occurred that began in the United States in the 1960s and in Western Europe in the 1980s. These processes strengthened by the millennium (Barta et al., 2008). In certain segments of the labour market as a result of delocalisation surplus in labour force is to take place.

Changing of the manufacturing productivity. Economic literature raises two questions concerning structural changes:

First of all, the modification of relative emphasis on sectors, i.e. the number of people employed in a certain sector or in the view of a sector's contribution to GDP.

Secondly, the connection between the structural changes of manufacturing and economic growth.

Other important factor is to increase productivity. Thirlwall and Faberger (2000) draw attention to the close relation between the output of processing industries and economic growth. Those countries have the most favourable development rates or show large expansions where processing industries have a crucial role. In other words, these are characterised by rapid growth in productivity or increasing "high-tech" activities of the processing industries. In parallel with the examination of growth in productivity the allocations regarding

human resources are to be surveyed as well. For instance whether increase in industrial production goes hand in hand with growth in the number of the employed. The efficiency of certain national economies to reallocate the labour force towards industries of high productivity. In the view of the Visegrád Four the productivity of processing industry is intended to be examined focusing on the realignment of the employed in concrete industries as a major factor influencing productivity. In the following, changes in productivity are to be examined with the so-called Shift and Share analysis. It is widespread among those specialist studying economic geography, economic history and industrial development. The essence of the analysis is to highlight the causes of forthcoming changes and increase in productivity. Fabricant (1942) and Maddison (1952) also applied the following method during their studies about structural change and economic growth after WWII. Furthermore, Faberger (2000) conducted contrastive researches of world economy.

Deduction of the applied formula is the next step:
 Define P = Labour productivity,
 Q = Value added,
 N = Labour input (number of persons employed).

$$P = \frac{Q}{N} = \frac{\sum_i Q_i}{\sum_i N_i} = \sum_i \left[\frac{Q_i}{N_i} \cdot \frac{N_i}{\sum_i N_i} \right] \quad (1)$$

i=industry (i=1, ..., m).

In this case 19 branches in manufacturing have been observed.

After the assessment of industries changes in the productivity of processing industries are to be indicated in the following diagram. Productivity increased the most in Hungary. Among the four countries Slovakia has improved, too.

In the case of the Visegrád Four there is a significant difference in the number of people employed in the processing industries. In the Czech Republic 25% of those employed full-time belong to the processing industries while in Poland it is 15%, although the number of people employed in the industry increased during the examined period.

$$S_i = \frac{N_i}{\sum_i N_i} \quad (2)$$

$$\Delta P = \sum_i \left[\frac{P_{i0} \Delta S_i}{P_o} + \frac{\Delta P_i \Delta S_i}{P_o} + \frac{S_{i0} \Delta P_i}{P_o} \right] \quad (3)$$

The first part of the formula shows contribution to growth in productivity through changes in the allocation of labour force concerning processing industries. Economic literature calls it “static effect”; changes in productivity are measured through the percent of people employed. It becomes a positive value if the rate of people employed in industries of high productivity increases. In other

words, labour force moves towards sectors of higher productivity. Showing the capability of a national economy how it can reallocate human resources from sectors of low productivity to those of high productivity. According to the figures industries of higher productivity developed in Hungary the most. In Poland negative figures show that labour force moved towards industries of lower productivity.

Table 1- Changes in the labour productivity of the processing industries (2000-2007)

	factor	factor	factor	Productivity change (€)
Czech Republic	547	225	11 179	11 951 €
Hungary	832	30	10 776	11 638 €
Poland	-50	176	7 017	7 143 €
Slovakia	333	141	12 673	13 147

Source: authors' compilation on the basis of EUROSTAT data.

The second component measures the connections between the changes in productivity of certain industries and distribution of labour force in processing industries (also called “dynamic effect”). Indicators are to show positive values if the number of people employed in those sectors improving their productivity the quickest. As well as, sectors with decreasing employment rate have descending productivity. Hungary’s lower indicators show that the number of employed in those sectors of high productivity has not increased according to our calculations. In the Czech Republic together with growth in productivity the number of people employed also increased in sectors with higher productivity. We can conclude that negative indicators show that sectors with decreasing rates concerning labour force have increasing productivity.

The third indicator demonstrates a sector’s contribution to productivity growth. It concentrates on the changes in productivity of the examined sectors besides the employment structure of 2000. Changes in productivity of the processing industries were the lowest in Poland in the view of the indicators. Increase in the productivity of sectors was the most significant in Slovakia.

According to our calculations productivity growth changed in Slovakia the most. Productivity has increased almost the same way in the Czech Republic and Hungary. In these two countries the structures of productivity change are different. In Hungary productivity growth was ensured by the flow of the labour force towards industries of higher productivity. That is how, productivity growth of certain sectors was not in tandem with the reorganisation of employment structures. In Poland productivity of the processing industries improved the slowest, new workplaces emerged in sectors with lower productivity so labour force moved there. In the following table the changes in percentage concerning the Visegrád Four are indicated. According to a year-by-year analysis, productivity of processing industries increased by 16% in Slovakia, 12% in the

Czech Republic, 10% in Hungary and 7% in Poland. On the other hand, if sectoral productivity is examined, besides processing industries services and the productivity of the extractive industry are also dealt with the largest productivity growth was in Poland. As the table shows, the largest productivity growth was in Slovakia. On the other hand, allocation of the labour force played the most crucial role regarding productivity growth in Hungary (7,16%). Furthermore, productivity growth was not followed by the allocation of labour force; it was not a pulling factor. Actually, increase in productivity was influenced by the productivity growth of certain sectors (98,24%) that were caused by technological changes. Examining the static indicator or the reallocation of labour force it can be concluded that in the field of vehicle production the value increased in the four countries, most of the labour force moved there. It changed tremendously in Hungary and also significantly in Slovakia. Labour force participation increased in tyre and plastic production in the Czech Republic in contrast with other countries where these meant insignificant number of growth in labour force. People employed in metal processing industries increased the most in Hungary. While indicators are negative concerning machinery equipment production in Poland and Slovakia, employment related to productivity prospered during the examined period in Hungary and Poland. The rate of people employed decreased in textile, electrical and chemical industries among the four countries. Blue cells show the migration of labour forces in a sector regarding a certain country. The smaller the value is the more people left the sector between 2000 and 2007.

Regional dimension of industrial restructuring

De-industrialisation, then the new gaining ground of the industry did not affect the regions of the Visegrád countries in a uniform way. The market processes of the transition period increased the inequalities in development between the individual regions. The calculations bear out that among the regions outside the capitals, where tertiarisation was the strongest, the economies of the regions were able to start on a lasting growth path where the industrial restructuring had taken place and thus jobs were retained and the region was able to get involved in the European and global division of labour.

The regions (NUTS 2 units, of which there are 35 in the Visegrád countries) were examined in terms of the changes in the number of workers in the processing industry and the volume of added value in the period 2000 – 2007.

The changes in the number of workers in the secondary sector on a national level were described previously, now the regional projection of the changes will be presented. Each of the four Visegrád countries shows a different configuration. Hungary and Slovakia are a couple of contrast, for while in Hungary all the regions – although to different extents – were affected by the labour market de-industrialisation (decreasing employment in the industry), in the northern neighbouring country the powerful industrialisation that can be demonstrated at national economy level made its positive effect felt in all the

regions. In Hungary the largest decrease was shown by Central Hungary, as a result of the powerful tertiarisation of Budapest. A similar extent of decrease can be registered in the Southern Dunántúl. The decrease was of the smallest extent in Central Dunántúl. In Slovakia the number of jobs in the industry increased to the greatest extent in the western areas close to Bratislava, and to the smallest extent in the capital itself.

In the Czech Republic and Poland the processes in the industry have a more mixed spatial print. In the Czech Republic the regions of the capital and the country/rural regions are sharply divided. While in Prague the number of industrial workers decreased both in the absolute and the relative extent, it increased in the other seven regions. The region of Střední Čechy (close to the capital) and the region in the North-West (Severovýchod) benefited most from the labour market expansion of the industry. In Poland the wider surroundings of Warsaw (Mazowieckie) showed the largest increase, in addition, the number of workers in the secondary sector increased in most of the regions of the country (ten). At the same time in six regions the number of workers in the industry decreased (in central Łódzkie, in South-Eastern Małopolskie and Lubelskie, in Opolskie in Silesia, and in the Northern Zachodniopomorskie and Kujawsko-Pomorskie).

In terms of added value, each region showed an increase, although its value shows a significant scatter. It is a general phenomenon that the increase of the industrial value higher than the national average took place in the regions of the capital or around the capital (the exception being Mazowieckie in Poland). This is a particularly outstanding performance when it was taken into consideration above that central regions are characterised by a decreasing or stagnating number of industrial workers. It can be read from the two processes that the capitals are likely to excel in attracting and retaining knowledge- and technology-intensive industries creating a high added value. In addition, the figures disclose that the regions around the capitals also enjoy the benefits of the spatial restructuring of the industry. This lends itself particularly well to measuring in the Czech Republic and Slovakia: in Střední Čechy and Západné Slovensko (Western Slovakia). These trends are less characteristic of Poland.

In the Czech Republic, in addition to the dynamic growth of the capital and the regions around it, Moravskoslezsko achieved a higher level of expansion rate.

In Hungary, in terms of added value Northern Hungary and Central Dunántúl showed a higher growth, although below average; thus in this case the traditional (north-eastern – south-western) industrial axle of the country is reflected.

It is interesting that in Slovakia the dynamics of the expansion of the industrial value is given not by the region of Bratislava, but by the regions in Western and Eastern Slovakia, where the largest increase in added value could be registered in the complete Visegrád population. The most complex picture in this comparison is also provided by Poland. Among the Visegrád countries

Poland has the lowest added value increase while thus the slower rate is better distributed in spatial terms, for the industrial added value increased in 8 regions at a rate above the national average. It is conspicuous that in these regions employment in the industry also increased by a larger rate in the period examined. It follows that in these regions the expansion of production in the labour-intensive industries provided the foundation for this development.

As a result of the transformation the following regional economic configurations had developed in the Visegrád countries by 2006.

The group of the central regions is easy to separate in terms of sectoral distribution. In these regions the role of the tertiary sector is outstanding concerning both the labour market and the added value. In the case of Bratislava and the region of Warsaw (Mazowieckie) it is possible to recognise individual features. In the former the industry can be regarded as significant in value creation, while in the latter the role of the agriculture as employer becomes important due to the peripheral, rural regions. This group also includes the region of Szczecin (Zachodniopomorskie).

The majority of the remaining 31 regions (27) possess secondary sectors more significant than average, considering both the labour market and the added value.

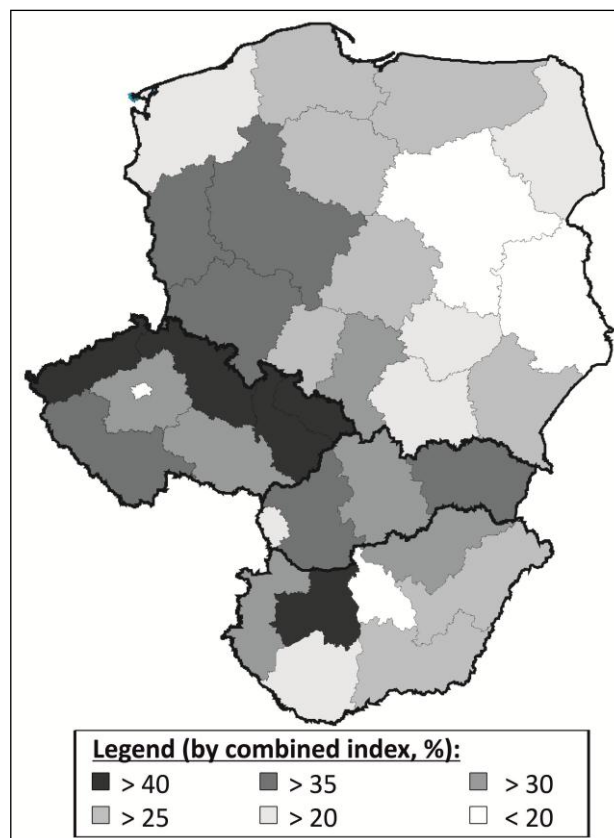


Figure 1- The role of the industry in the regional economies of East Central European countries (2006)

Source: authors' compilation on the basis of EUROSTAT data.

In the Czech Republic and Slovakia the country regions (outside the capital) show a particularly strong, individual industrial character in both aspects. Only in Western Slovakia (Západné Slovensko), in the 'larder of the Highlands', does agriculture appear as a characteristic sector in terms of added value.

Hungary and Poland present more mixed pictures with more and more diverse regions. In Hungary the earlier (south-western – north-eastern) industrial axle is still evident, but the industrial character appears combined with agriculture also outside of these regions. It is only in Southern Dunántúl that the agriculture is an employer with above average weight. In Poland, particularly in the east, the agricultural profile appears markedly and it gradually weakens towards the west. In the easternmost regions the labour market and economic roles of the primary sector are also characteristic. At the same time in Silesia (Slaskie, Dolnoslaskie) and in the south (Malopolskie), as well as in the western and south-western regions (Lubuskie) the industry has maintained its priority role.

Conclusion

In the past two decades the role of industrial activities has shown significant modifications both in inter- as well as in intra-sectoral comparison. The first half of the 1990s was characterised by a strong de-industrialisation in terms of both the economy and of the labour market. The process generated severe social tensions (increase in unemployment and decrease of the income level), however, it exerted a beneficial effect on the environment due to the decreasing emissions. By the 2000s, accession to the European Union, the convergence of the Visegrád countries, the recovery of the global economy and the inflow of capital resulted in a considerable expansion of the production capacities in Central-Eastern Europe, a simultaneous increase in the number of jobs in the industry as well as in the volume of the exports of goods. This period (2000-2007) involved a restructuring within the secondary sector. As a result of the medium- and high-tech industries gaining ground, we can talk about a re-industrialisation of the neo-industrialisation type.

The regional comparison at the same time has shown that the favourable macro-economic processes cover significant spatial differences within the industry. The regions of the capitals (with high-tech activities) and the regions with a favourable geographical location and considerable industrial traditions can be regarded as the winners of the transition. In these areas foreign capital resulted in restructuring, an increase in the efficiency of labour and an expansion of production. At the same time mention must be made of the losers of the transition, of the regions where the restructuring generated by the domestic and international (capital) resources failed to materialise. Thus the share of the industry in the economies of these regions decreased or stagnated at a low level. This exerted a negative effect both on employment and the income producing capacity.

The various spatial elements, or groups of regions established as a result of the analysis can be described in short as follows:

The capital regions ('absolute winners') where the economy demonstrated a dynamic growth, labour is flexible and active, the services sector is wide, and production capacity is well-developed with an infrastructure serving it.

The secondary beneficiary (potential converging) regions, which enjoy favourable geopolitical location (mostly western), are urbanised, possess considerable and modernised industrial traditions and capacities as well as a well-developed services sector (although of a smaller weight) and are thus successfully involved in the European division of labour and value creation.

The regions that are the losers of the transition ('potential laggards') are the regions with less favourable geographical location, lying on the (inner or outer) periphery, where the economic restructuring is still ongoing, which results in an unfavourable sectoral division of the economy and unfavourable labour market conditions.

The performance of the processing industry remains of outstanding significance concerning the future sustainable economic development of Central-Eastern Europe. That is why it is a priority task to retain and take advantage of the industrial competitive advantages, primarily against the highly developed competitors in Western Europe and North America. To achieve that, the most important tasks seem to be attracting working capital, developing an investor-friendly environment, developing the infrastructure, easing the dual company structures (by supporting SMEs) and ensuring the appropriate vocational and professional training meeting the market demand.

“The described work was carried out as part of the TÁMOP-4.2.1.B-10/2/KONV-2010-0001 project in the framework of the New Hungarian Development Plan. The realization of this project is supported by the European Union, cofinanced by the European Social Fund.”

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Поступила в редакцію 4.04.2012р