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## Transformations of the employment structure as an expression of the transformation of Polish industry against the background of the European Union

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## **TRANSFORMATIONS OF THE EMPLOYMENT STRUCTURE AS AN EXPRESSION OF THE TRANSFORMATION OF POLISH INDUSTRY AGAINST THE BACKGROUND OF THE EUROPEAN UNION**

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**ABSTRACT.** Global social and economic changes, connected mainly with globalization processes, have an impact on changes both in present spatial and division structures of the industry and in its functions in the economic development of various spatial systems. The aim of the paper is to analyze changes in the industry's role in the Polish economy during the period of economic transformation and European integration based on its share in the employment structure. These changes are set against transformations in other EU countries, diversification and transformations of the division structure of employment in Polish industry and the similarity of the Polish employment structures to the EU countries as an expression of transformation processes. The analyzed processes are stimulated by the international environment and a change in national conditions for the socio-economic development.

**KEY WORDS:** Poland, EU countries, transformation, industry, employment structure.

### **INTRODUCTION**

Modern global social and economic changes, connected mainly with moving from the industrial through the post-industrial to the information stage of the civilization development as well as with growing globalization processes, have an impact on the reconstruction of the sectoral economic structure where industrial activity, being an economic basis in the industrial stage, gives way to service activity. A consequence of this process is a change both in present spatial and division structures of industry and in its functions as regards the economic development of various spatial systems, from local through regional to national and international systems. As is commonly known, in the majority of

highly developed countries industrial activity decreases its function pertaining to activation of labour resources for the service sector, which is, *inter alia*, a consequence of increasing mechanization, automation and computerization of production processes.

This process is noticed by many authors (Daniels, 1991; Schettkat, Yocarini, 2003, 2006; Maroto-Sánchez, Cuadrado-Roura, 2009). From this perspective, the problem of the new role to be played by industry at the information stage of civilization development (Zioło, 2009b), of multiplier effects of the economic development to be generated by it (cf. Wiedermann, 2007, 2008; Domański, Gwosdz, 2008; Rachwał, Wiedermann, 2008) and of reflection in transformations of various population structures, in particular, structures related to professional activity and employment (cf. Marelli, 2004; Rodionova, Sholudko, 2008) seems to be an essential research issue. Transformation of industry has an influence on demographic transformations taking place (Szymańska, Matczak, 2002; Hołowiecka, Szymańska, 2008; Kurek, 2009).

In the light of the outlined rationale, the aim of the paper is to analyze: (a) changes in industry's role in the Polish economy during a period of economic transformation and European integration based on its share in the employment structure against transformations in other European Union countries; (b) diversification and transformations of the division structure of employment in Polish industry and the similarity of the Polish employment structures to those of EU countries as an expression of transformation processes, due to stimuli coming from the international environment and a change in national conditions for social and economic development.

The paper also attempts to evaluate the suitability of the employment indicators for determining industrial potential and of the role of the industrial sector and its individual divisions in the national economy under conditions of moving to the information stage of civilization development. As it seems, the performed analysis fits in well with the current problem of studies on socio-economic geography where problems of transformations of varied population structures under the influence of economic transformations seem to be essential (Szymańska, 2004; Hołowiecka, Szymańska, 2008; Jelonek, 2008).

The analysis covers Poland and, for comparative purposes, other EU Member States. The employment analysis is conducted by sections and divisions according to the 2004 Polish Classification of Activities (NACE, Statistical Classification of Economic Activities in the European Community, Rev. 1.1), valid until 2007, in terms of the number of people employed. The time frame of the analysis covers the years 1995–2007. The source of statistical data is GUS (Główny Urząd Statystyczny, Central Statistical Office) statistical yearbooks and the Eurostat database. In the case of some countries, however, a barrier to access comparable

data was encountered (lack of data or a necessity to use data for 2006, instead of 2007). Due to the data incompleteness or statistical confidentiality it was also necessary to combine certain divisions (e.g., in section C – Mining industry) for analytical purposes. The problem of serious difficulties in access to detailed data on industry development in specific time sections was thoroughly discussed in the author's previous paper (Rachwał, 2008). This research paper also uses current information on shaping economic processes under the conditions of the ongoing worldwide crisis. However, it should be stressed that too little time has elapsed yet to make a thorough evaluation of the impact of this crisis on structural transformations in industry. As is commonly known, this economic sector is characterized by certain 'inactivity' of the structure resulting from, *inter alia*, capital intensity and time consumption of investment processes. Therefore, the so-called 'media clutter' regarding the enormous impact of the economic crisis on the employment level and structures should be treated with great prudence.

For comparative purposes, previous studies on the EU region's industry (Rachwał, Wiedermann, Kilar, 2008a, 2008b, 2009) as well as studies on transformations of Polish industry against the background of Central and Eastern European countries were used (*inter alia*, Domański, 2003, 2006; Rachwał, 2009). The article is limited to the presentation of the most important results of these studies.

### **CONDITIONS FOR TRANSFORMATION IN THE DIVISION STRUCTURE OF EMPLOYMENT**

The process of transformations in the division structure of employment in industry takes place under the influence of various conditions which may be divided into international and national ones. International conditions, related mainly to increasing globalization processes of economic activity include (Rachwał, 2008): (a) integration processes of countries and regions, including the process of European integration; (b) capital concentration processes and integration processes of enterprises leading to a rise in competitive pressure in the global market; (c) increase in importance of international corporations to the global economy (cf. Tobolska, Matykowski, 2006; Zioło, 2009a), including, in particular, IT corporations (Kilar, 2009a, 2009b); (d) strong development of the IT sector entailing a change in traditional factors of location of business activities and leading to shaping creative areas whose importance to social and economic development is growing systematically (Stryjakiewicz, 2008, 2009); (e) flows of direct foreign investments (directions, size, purpose – motives) and their growing role in social and economic development (cf. Domański,

2001, 2003; Sala, 2006; Tobolska, 2007; Rojeca, Damijan, 2008) leading to delocalization and relocation of enterprises as well as ‘externalization’ of their activity, e.g., in the form of *outsourcing*, *off-shoring*, *spin-off* processes (cf. Fixlera, Siegelb, 1999; Gierańczyk, 2008); (f) fast technological progress (cf. Fagerberg, 2000), particularly in the field of information technology as well as automation and computerization of production processes; (g) growing role of knowledge in management, leading to an increase in importance of advanced research and development works (R&D, Research and Development) and innovations (cf. Ratajczak, 2008; Borowiec, Dorocki, Jenner, 2009; Gierańczyk, 2009); (h) processes of ‘servicization’, ‘softening’ of the industry structure and of an increase in the role of small and medium production entities (cf. Karpiński, 1994; Tkocz, 2007); (i) reduction in the life cycle of products and gradual moving from ‘economies of scale’ to ‘economies of scope’; (j) changes in the consumption model and lifestyle of members of the ‘information society’; (k) in the years 2008–2009: deepening of the global economic crisis and actions taken by governments of various countries for counteracting the social and economic consequences of the crisis.

In the case of Poland and other Central and Eastern European countries, of great importance to transformations of the employment structures are national conditions resulting from the changes in the management system and from the state economic policy, manifesting themselves in, *inter alia*, creating legal instruments, conducted industrial policy, including the process of enterprise privatization as well as creating and implementing a strategy for restructuring specific industry sectors. Therefore, the national conditions include (Rachwał, 2008): (a) implemented legal and administrative regulations related to economic transformation and harmonization of economic law in connection with EU integration; (b) new pro-environmental requirements of production and a necessity to observe stricter environmental standards; (c) speed, scope and paths (legal conditions) of privatization of state-owned enterprises; (d) conditions resulting from implemented strategies for restructuring individual industrial enterprises, whose success, to a large extent, depends on their internal structure and the nature of their relations to their environment on the threshold of economic transformation; (e) opening of the Polish market, including the capital market, to an inflow of foreign entities, goods and capital; (f) scope and instruments of the impact with regard to the economic policy, in particular the industrial policy, also with regard to SEZ (Special Economic Zones) operation (cf. Kitowski, 2007; Smełkowski, 2008); (g) creation and implementation of a strategy for restructuring specific industry divisions; (h) state policy on education, science and implementation of innovations, in particular with respect to the exchange of scientific and research achievements.

## CHANGES IN INDUSTRY'S SHARE IN EMPLOYMENT

An analysis of the changes in industry's share in the employment structure from 1995 to 2007 indicates a slow but regular decrease in the role of this sector in activation of labour resources (Fig. 1).

In the years 1995–2007, the share of the industry and building engineering sectors in employment decreased from 31.2% to 29% and of industry itself (sections: C – Mining and quarrying, D – Manufacturing and E – Electricity, gas and water supply) from 25.5% to 23.1%. Two characteristic stages of transformations should be mentioned here – in the years 1995–2001, the share experienced a large decline to 20.8% and then, in the years 2002–2007 it increased. However, it should be noticed that it was highly influenced by the revaluation of agriculture employment data according to the results of the Polish Census.

The relatively small changes during the examined period of time influenced the fact that Poland still belongs to the group of the European Union countries characterized by the high shares of the industry sector in employment. This phenomenon is characteristic of the majority of the Central and Eastern European countries, transforming their economies, which joined the European Union at a later time. However, it may be stated that a downward trend regarding the industry's share in employment is general and refers to all countries (except Latvia

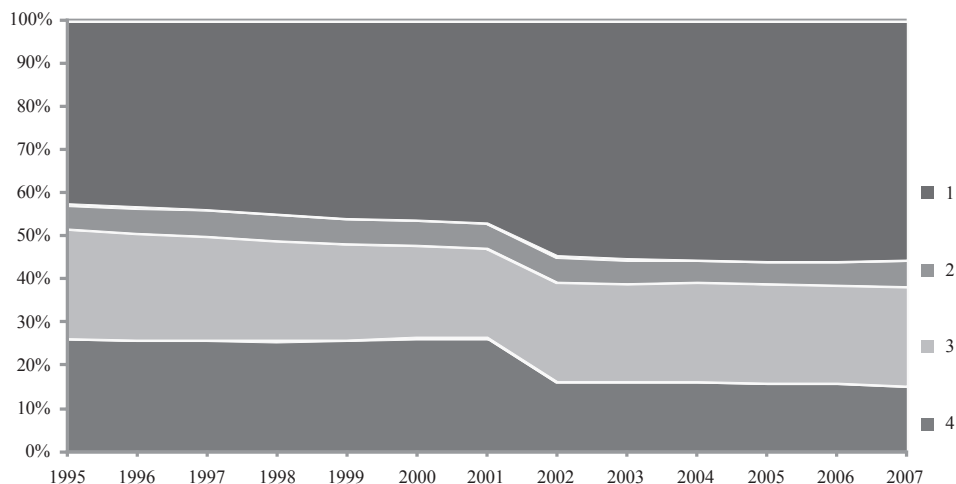


Fig. 1. Polish national economy employment structure in the years 1995–2007  
Explanation: 1 – services; 2 – construction; 3 – industry; 4 – agriculture

Source: Own study based on GUS data

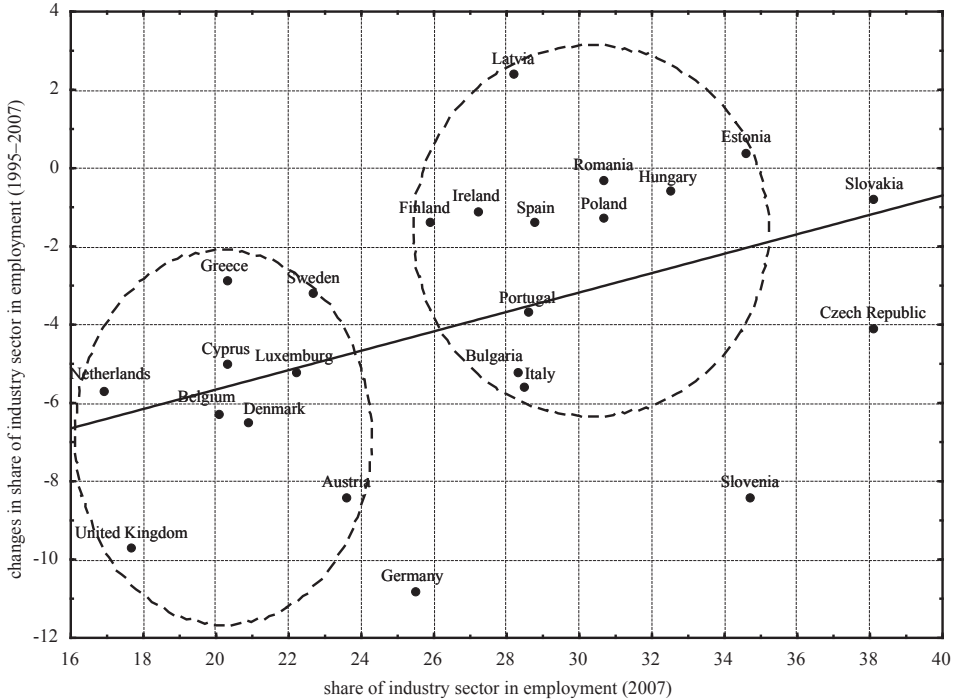


Fig. 2. Relationship between the share of the industry sector in the employment structure and the changes in this share in the EU countries from 1995 to 2007

Source: Own study based on GUS data

and Estonia), which is not surprising as this regularity was observed many years before and formulated in the so-called three sector theory (Fisher, 1935; Clark, 1940; Fourastié, 1949). However, an interesting thing is the diversification as to the scale of the changes. As is indicated by an analysis of relationships between the size of industry's share in employment and the changes in this share during the examined period of time, the largest declines were noted in the countries which already have relatively low shares of industry in employment (Fig. 2). They are mainly the countries of the so-called 'old' EU-15, including the EU core countries such as Germany or the United Kingdom. In the countries which joined the EU at a later time (including also Ireland, Spain, Finland) this decline is smaller.

Although, in general, industry's share in national employment rates is declining in almost all analyzed countries, which is related to production mechanization and elimination of the labour force in industry as well as to relocation of activity. A previous analysis of this phenomenon by regions shows that in many European regions, also those of the so-called 'old' Europe, this share is high and is either

declining insignificantly or still growing (cf. Rachwał, Wiedermann, Kilar, 2008a, 2008b, 2009). It should be noted that the situation is similar in the case of industry's share in the gross value added (GVA). When adopting GVA as an indicator of industry's role in the economy, it is necessary to note its great importance to many regions indicated by the fact that industry's share in GVA is higher than industry's share in employment. However, it should be stressed that contrary to commonly held opinions the increase in industry's share in GVA is not so rare in EU regions as it may be expected and refers to, for example, many regions of Germany or Austria. Most regions with long-term traditions and with a great role of industry as well as regions of dynamically developing countries, such as Ireland and Spain, still strengthen the potential of this sector, which means that a hypothesis put forward in numerous papers and regarding common processes of deindustrialization of Europe cannot be agreed with.

Thus, transformations of the industrial potential measured by means of the number of persons employed and gross value added are rather a confirmation of reindustrialization processes where labour-consuming industry gives way to knowledge-consuming industries characterized by the higher value added, which reduces the decreasing role of industry in direct activation of labour resources. This is the more and more visible feature of the industry of the so-called new economy, which was revealed by many authors, including K. Kuciński (2007), stressing that the changing importance of industry to the economy as well as related economic, social and spatial implications do not mean processes of deindustrialization and elimination of industry from the structure of economic macrosystems. Therefore, it is necessary to agree with the author (Kuciński, 2007: 208) that 'we may speak of deindustrialization when industry's share in creating the value added and national product, export value, investment outlays and employment declines significantly and with respect to employment it is not only relative but also absolute'. In the majority of European countries such changes may not be stated.

It should be noted that applying only the employment indicator for analyzing the changes in industry's role in the economy, although still commonly used, is not the best solution. It is necessary to take other indicators into account and to conduct analyses of the changes in the industrial potential and its role in the economy based on a synthetic indicator, for the calculation of which, apart from the employment size, also, for example, the gross value added is adopted (or any other indicator illustrating economic effects of industrial activity, e.g., value of sold production). An advantage of this approach is that its value is influenced by both the number of persons employed being of significant importance in the case of labour-consuming industries and the gross value added (or the value of sold production), which better illustrates the more technologically advanced



industries, with large outlays on research and development works. In a situation where industry stops performing its leading function with regard to activation of labour resources, relying on only one commonly-used employment indicator seems pointless as this approach would emphasize countries or regions where labour-consuming industry is predominant, while the importance of more modern industries, with great production mechanization and automation, characterized by the high value added and characteristic of the most developed EU countries or regions, would be minimized (Rachwał, Wiedermann, Kilar, 2008b). In addition, it should be noted, quoting K. Kuciński (2007), that reduction in employment in industry and the related process of so-called ‘servicization’ of the economy partially results from a striving of enterprises for higher economic effectiveness through outsourcing the implementation of a part of processes to specialized service business entities. As a consequence, the business activity which has been an integral part of the industrial sector so far becomes a component of the service sector.

## CHANGES IN THE DIVISION STRUCTURE OF EMPLOYMENT IN INDUSTRY

As the analysis of the data of the industry employment structures by sections indicates, during the examined period Polish industry employment size decreased from 3.7 to 3.1 million. However, in the years 2000–2007 a small increase in the number of persons employed in industry was observed, as a consequence of an increase in employment in section D – Manufacturing (Fig. 3). In the case of other sections (C – Mining and quarrying, and E – Electricity, gas and water supply) a significant decrease in the number of persons employed was observed, although the role of these sections in employment in industry is not as important as that of manufacturing. An analysis of the diversification of industry employment structures by sections, by virtue of the nature of the valid classification, does not allow a more precise evaluation of the changes in the employment structures.

To capture the structural changes in employment in industry it is necessary to perform an analysis at the division level. The largest number of persons is employed in the divisions of ‘manufacture of food products and beverages’, ‘manufacture of machinery and equipment’ and, in recent years, also ‘manufacture of metal products’ (Fig. 4). A relatively great role is played by the mining industry (included in the analysis as all four divisions of section C – Mining and quarrying, as the coal mining industry gathers more than 90% of the employment potential, thus, further divisions are of no importance). Modern production divisions, e.g., DL30, 32, 33 are characterized by the relatively low employment potential.

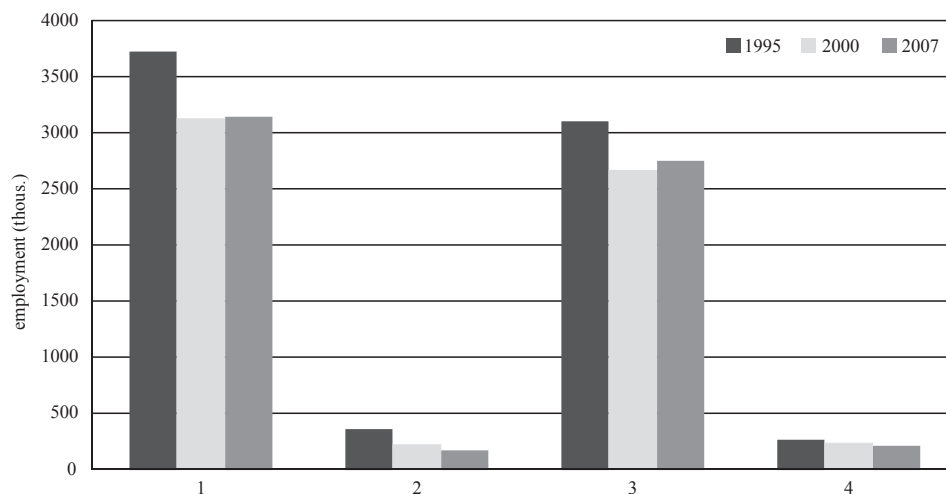


Fig. 3. Employment in industry in Poland by sections in the years 1995, 2000, 2007  
 Explanation: 1 – industry (total); 2 – section C (mining and quarrying); 3 – section D (manufacturing); 4 – section E (electricity, gas and water supply)

Source: Own study based on GUS data

An analysis of the dynamics of the changes in employment in industry by divisions shows an almost double rise of employment in the division of ‘manufacture of office machinery and computers’ and ‘recycling’; however, we must be aware of the minimal importance of these divisions to the employment potential (Fig. 5). These growths could be easy to be achieved as employment in the base year was very low and opening one larger factory with employment of more than one thousand people has a significant impact on the rise of the indicator. The largest employment declines, up to 50%, were observed in the traditional industry divisions, e.g., mining industry, textile industry, production of clothes, leather, and leather products. It is an obvious consequence of the decreasing role of hard coal and lignite in the economy and of the fact that Poland is systematically losing its position of a country with low production costs, which in the case of textile and clothes production is of decisive importance.

The changes in the employment size in the individual divisions have been reflected in the changes in the employment structure where we may still observe the high share of the food industry and of the machinery and device industry but there is a significant decline in the importance of the mining industry, which lost its second place in the ranking to the benefit of the ‘manufacture of metal products’ division (Table 1).

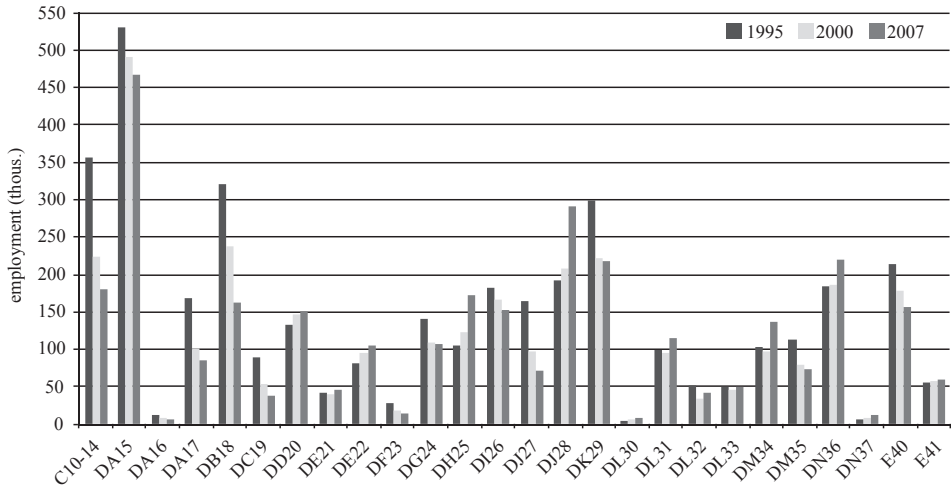


Fig. 4. Employment in industry in Poland by divisions in the years 1995, 2000, 2007  
 Explanation: C10–14 – Mining and quarrying; DA15 – Manufacture of food production and beverages; DA16 – Manufacture of tobacco products; DA17 – Manufacture of textiles; DB18 – Manufacture of wearing apparel and furriery; DC19 – Processing of leather and manufacture of leather products; DD20 – Manufacture of wood and wood products; DE21 – Manufacture of pulp and paper; DE22 – Publishing, printing and reproduction of recorded media; DF23 – Manufacture of coke, refined petroleum products; DG24 – Manufacture of chemicals and chemical products; DH25 – Manufacture of rubber and plastic products; DI26 – Manufacture of other non-metallic mineral products; DJ27 – Manufacture of basic metals; DJ28 – Manufacture of metal products; DK29 – Manufacture of machinery and equipment; DL30 – Manufacture of office machinery and computers; DL31 – Manufacture of electrical machinery and apparatus; DL32 – Manufacture of radio, TV and communication equipment; DL33 – Manufacture of medical, precision and optical instruments, watches and clocks; DM34 – Manufacture of motor vehicles, trailers and semi-trailers; DM35 – Manufacture of other transport equipment; DN36 – Manufacture of furniture; DN37 – Recycling; E40 – Electricity, gas, steam and hot water supply; E41 – Collection, purification and distribution of water; CDE – Industry (total)

Source: Own study based on GUS data

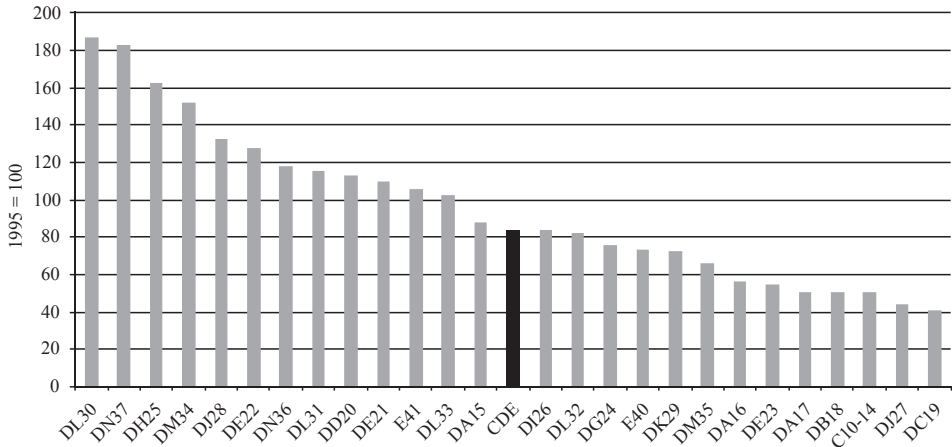


Fig. 5. Dynamics of employment in industry in Poland by divisions in the years 1995–2007

Explanation: C10–14 – Mining and quarrying; DA15 – Manufacture of food production and beverages; DA16 – Manufacture of tobacco products; DA17 – Manufacture of textiles; DB18 – Manufacture of wearing apparel and furriery; DC19 – Processing of leather and manufacture of leather products; DD20 – Manufacture of wood and wood products; DE21 – Manufacture of pulp and paper; DE22 – Publishing, printing and reproduction of recorded media; DF23 – Manufacture of coke, refined petroleum products; DG24 – Manufacture of chemicals and chemical products; DH25 – Manufacture of rubber and plastic products; DI26 – Manufacture of other non-metallic mineral products; DJ27 – Manufacture of basic metals; DJ28 – Manufacture of metal products; DK29 – Manufacture of machinery and equipment; DL30 – Manufacture of office machinery and computers; DL31 – Manufacture of electrical machinery and apparatus; DL32 – Manufacture of radio, TV and communication equipment; DL33 – Manufacture of medical, precision and optical instruments, watches and clocks; DM34 – Manufacture of motor vehicles, trailers and semi-trailers; DM35 – Manufacture of other transport equipment; DN36 – Manufacture of furniture; DN37 – Recycling; E40 – Electricity, gas, steam and hot water supply; E41 – Collection, purification and distribution of water; CDE – Industry (total)

Source: Own study based on GUS data

Table 1. Industry employment structure in Poland in the years 1995, 2000, 2007

Divisions	structure (%)			changes (1995– –2007)
	1995	2000	2007	
C10–14 Mining and quarrying	9.6	7.1	5.7	–3.8
DA15 Manufacture of food production and beverages	14.2	15.7	14.8	0.6
DA16 Manufacture of tobacco products	0.3	0.3	0.2	–0.1
DA17 Manufacture of textiles	4.5	3.2	2.7	–1.8
DB18 Manufacture of wearing apparel and furriery	8.6	7.6	5.2	–3.4
DC19 Processing of leather and manufacture of leather products	2.4	1.7	1.2	–1.2
DD20 Manufacture of wood and wood products	3.6	4.7	4.8	1.2
DE21 Manufacture of pulp and paper	1.1	1.3	1.5	0.3
DE22 Publishing, printing and reproduction of recorded media	2.2	3.1	3.3	1.1
DF23 Manufacture of coke, refined petroleum products	0.7	0.6	0.5	–0.3
DG24 Manufacture of chemicals and chemical products	3.8	3.5	3.4	–0.4
DH25 Manufacture of rubber and plastic products	2.8	3.9	5.5	2.6
DI26 Manufacture of other non–metallic mineral products	4.9	5.3	4.8	0.0
DJ27 Manufacture of basic metals	4.4	3.1	2.3	–2.1
DJ28 Manufacture of metal products	5.2	6.6	9.3	4.1
DK29 Manufacture of machinery and equipment	8.0	7.1	6.9	–1.1
DL30 Manufacture of office machinery and computers	0.1	0.2	0.3	0.2
DL31 Manufacture of electrical machinery and apparatus	2.7	3.0	3.7	1.0
DL32 Manufacture of radio, TV and communication equipment	1.4	1.1	1.3	0.0
DL33 Manufacture of medical, precision and optical instruments, watches and clocks	1.3	1.5	1.6	0.3
DM34 Manufacture of motor vehicles, trailers and semi–trailers	2.8	3.1	4.3	1.6
DM35 Manufacture of other transport equipment	3.0	2.5	2.4	–0.7
DN36 Manufacture of furniture	5.0	6.0	7.0	2.0
DN37 Recycling	0.2	0.3	0.4	0.2
E40 Electricity, gas, steam and hot water supply	5.7	5.7	5.0	–0.8
E41 Collection, purification and distribution of water	1.5	1.9	1.9	0.4
Industry (total)	100.0	100.0	100.0	x
Rodgers index	0.457	0.448	0.446	–0.011

Source: Own study based on GUS data

To determine the level of the division diversification of industry in a synthetic manner, the Rodgers index was calculated and then it was modified and adjusted by Warakomska (Troc, 1991). Small changes in the index of the division diversification of industry in Poland indicate maintenance of the average diversification of industrial activity; a small decline in the index's value may be evidence of simulation of the employment structure to that of highly developed countries.

An analysis of the changes in the share of the individual divisions in the industry employment structure shows that the most traditional, labour-consuming industries such as the mining industry, production of clothes, textile industry, production of leather but also production of machines and devices, power engineering and the chemical industry are losing their importance (Table 1). The divisions such as production of metal products, rubber and plastic products, production of furniture and vehicles have significantly increased their share in the structure. However, it is difficult to rank these divisions among the most technologically advanced ones. As it seems, we may speak here of the appearance of large foreign capital investments in these production divisions, which is also indicated by analyses conducted by other authors (Domański, 2001; Tobolska, 2007). However, it should be noted, quoting A. Świdurska (2009), that there is a positive upward trend in the value of sold production of high-technology industry in Poland with small changes in the employment size. However, it is worth stressing that during the examined period the development of these industries was not proceeding continuously. In addition, bearing in mind a necessity to compensate for a technological gap between Poland and highly developed countries, the rate of positive structural changes towards increasing the share of high-technology industries in Poland is still too low.

Thus, the issue of how the division structure of employment in industry in Poland looks against the background of other European countries seems interesting in this context. In individual EU countries (for which data were available) this structure is highly diversified. In most countries, we may notice the high share of 'food and tobacco manufacturing' (in the analysis, these divisions have been combined due to the lack of data resulting from statistical confidentiality) and of 'production of machinery and equipment' as well as 'production of metal products'. The share of the most technologically advanced industry divisions is relatively small but we have to bear in mind that they are industries of low labour consumption, though characterized by great value added. The calculated Rodgers index of the division diversification shows that Polish industry is far more diversified than that of other European countries (Fig. 6). The industry of Lithuania, Denmark, Latvia or Germany is less diversified, yet, it should be stressed that these indices differ slightly from each other, when adopting the value between 0.42 and 0.59.

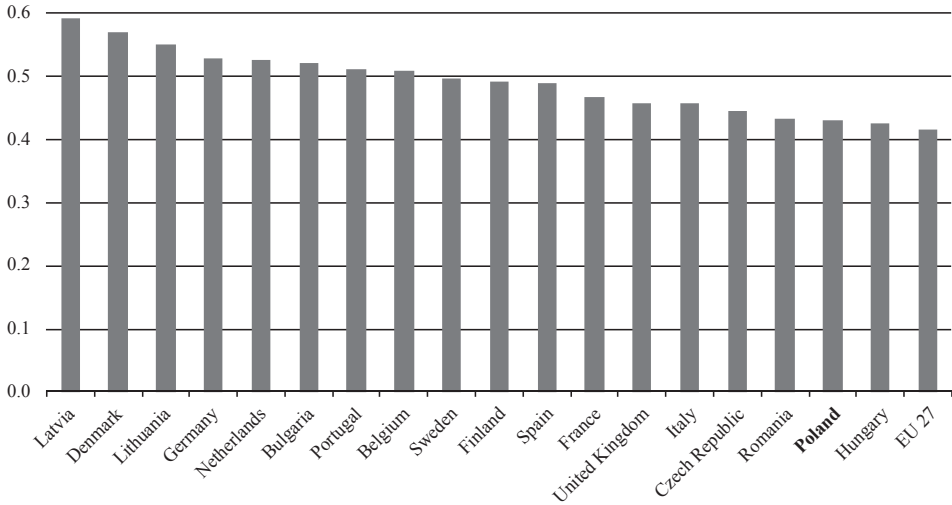


Fig. 6. Adjusted Rodgers index of the division diversification of industry for selected EU countries in 2006

Source: Own study based on Eurostat data

Attempts conducted to analyze the similarity between industry employment structures in individual EU countries using cluster analysis methods (e.g., Ward's method – Fig. 7) allow us to distinguish four groups of countries with similar division structures in 2006.

A characteristic thing is that Poland together with the Czech Republic and Hungary was included in the second group with Spain and Italy and not – as it might have seemed – with other Central and Eastern European countries. An analysis of characteristics of the division structure of employment for individual groups of countries shows that group 1, in which Belgium, France, the United Kingdom, Denmark, and the Netherlands have been included, is characterized by the high share of employment in the production of foodstuffs and tobacco products, metal products, machines and devices, publishing activity, printing industry, and chemical products. The countries from group 2, which covers the Czech Republic, Hungary, Spain, Italy, and Poland, are characterized by the high share of employment in the production of foodstuffs, metal products, machines, and devices and vehicles, while significant differences are visible here as regards the share of the high-technology divisions, as in the Czech Republic and in Hungary it is definitely higher than in Poland. Group 3, covering Germany, Finland and Sweden, is characterized by the relatively low share of employment in the production of foodstuffs, while this share is high in the production of machines, devices and metal products, with significant differences in employment in the automotive industry being noticeable

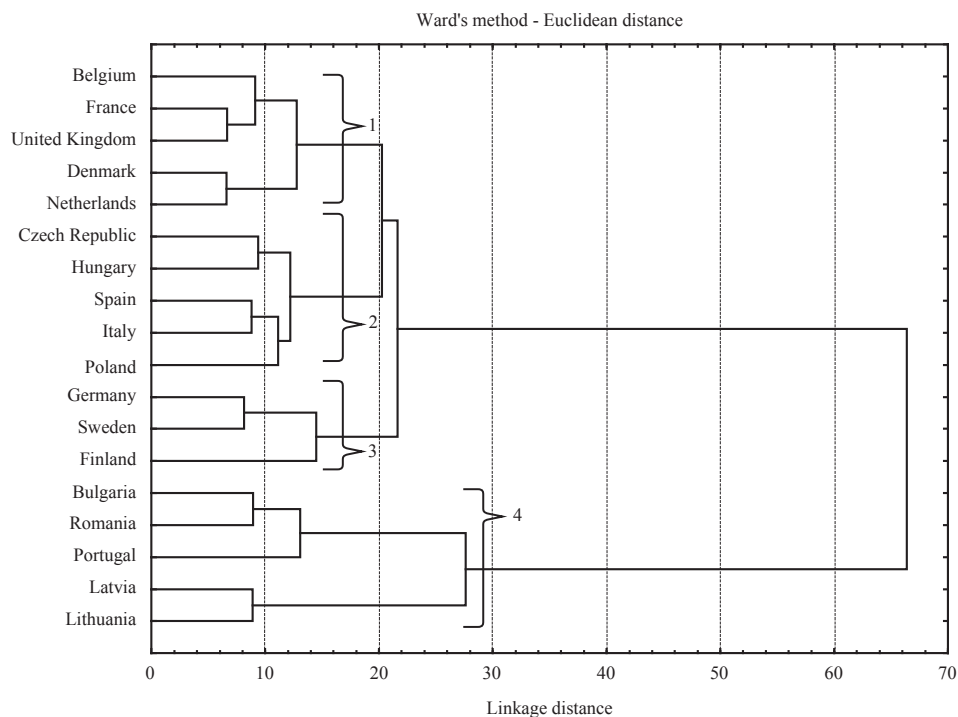


Fig. 7. Similarity between the industry employment structures of selected EU countries in 2006 in the light of cluster analysis

Source: Own study based on Eurostat data

here: in Finland, as opposed to Germany and Sweden, the share of this industry is low, while in Finland there is the highest share in the electronic industry (division DL32). Apart from the high importance of employment to the production of foodstuffs, group 4, covering Bulgaria, Romania, Portugal, Latvia, and Lithuania, is characterized by the relatively high share of the textile industry, production of clothes, wood and wooden products as well as low shares in employment in the high-technology divisions (DL30, 31, 32, 33). An analysis of similarities in terms of the employment structures indicates advantageous changes with regard to restructuring the Polish industry, whose structure is closer and closer to the structure of the so-called 'old' European Union countries.

From the standpoint of an analysis of Polish industry's competitiveness in global markets (including the single European market) under conditions of shaping the information society and creating the knowledge-based economy, a question about the share of the most technologically advanced divisions in the employment structure seems to be important. These industries generate a series



of multiplier effects in social and economic development and are characterized by much more beneficial economic effects of the activity when compared to the traditional industry. However, the analysis shows the low employment potential of these industries in Poland against the background of other countries. This share is far below the European average and is much lower than in the case of, for example, Hungary or the Czech Republic, which is also shown by other authors (Borowiec, Dorocki, Jenner, 2009). As it seems, it is rooted in the low research and development potential of the Polish economy. Against the background of other European Union countries, the R&D employment potential in Poland and its share in total employment is not significant; also, outlays on the expansion of R&D are low, when compared to other countries (Borowiec, Dorocki, Jenner, 2009; Rachwał, Wiedermann, Kilar, 2009). High differences within Central and Eastern European countries are noticeable here. In the Czech Republic and in Hungary, we may observe the dynamic growth of employment in R&D in the years 1995–2006, which may not remain without any influence on the relatively high shares of high-technology industries in the employment structure of these countries. When comparing outlays on the R&D activity in Poland and other Central and Eastern European countries to other EU countries, we may notice an even higher contrast than in the case of differences in employment in R&D works. It testifies to a higher amount of funds allocated for research by companies and institutions located in the area of the most developed part of the EU. Unfortunately, despite the small nominal increase in outlays on R&D works in Poland, the share of outlays on these works in GDP is decreasing, while in other countries of the region (especially in the Czech Republic and in Hungary) the dynamic increase in outlays was observed in the years 1995–2006.

## CONCLUSIONS

The presented analysis of the changes in the Polish industry employment structure against the background of other EU countries allows the following conclusions to be formulated:

- during the examined period, there is a clear tendency of reducing employment in industry in Poland and the majority of the analyzed EU countries, which means decreasing importance of industry to the activation of labour resources, while reduction in employment in this sector does not have to mean progressing deindustrialization processes;
- in the case of the majority of the analyzed countries, the industry's share in the employment structure shows a downward trend (also in Poland) although in certain countries a small rise in this share is observed;

- in the employment structure, importance to the activation of labour resources is being lost mainly by the traditional industry divisions such as the mining industry, textile industry, and production of metals or clothes, which is related to the relocation of this type of activity to countries with lower labour costs;
- calculated indices of the division diversification of industry in Poland show maintenance of the average diversification in industrial activity; a small decrease in the index value may be evidence of simulation of the employment structure to that of highly developed countries, which are usually characterized by the high division diversification of industry, although it should be stressed that in the majority of the EU countries this diversification is lower than in Poland;
- the changes in the employment structure refer to the structure of investments in fixed assets in industry, including the foreign capital inflow structure;
- against the background of other countries, Poland is characterized by relatively low employment in the high-technology industry divisions, which may be related to disadvantageous trends of the changes in Poland with regard to employment and outlays on R&D works when compared to other EU countries, including also Central and Eastern European countries, transforming their economies, that develop their R&D potential and allocate more and more funds to these works, which is particularly visible in the Czech Republic;
- the share of outlays on R&D works in Polish GDP, which is clearly low when compared to other EU countries and regions, as well as relatively low outlays on the development of education and science, may essentially contribute slowing down positive changes in the division structure of employment in industry;
- the conducted analysis shows a need to use, in analyses of the role of industry and its individual divisions in the economy, not only the commonly available employment size but also other indicators reflecting the industrial potential (e.g., gross value added or value of sold production). The employment indicator should be, first of all, used in analyses of industry's role in the activation of labour resources.

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