
The Impact Of The Industrial Sector On Romanian Employment

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Through our study we aim to highlight the place and role of the Romanian industry in the national economy and its impact on employment in the last twenty years. Moreover, we intend to underline the regional gaps determined by the role and place of the industry at regional level. The results of our analysis carried out based on the statistical data between 1990 and 2009, show, on the one hand, the deindustrialization of the economy based on the reduction of the industry's contribution to GDP as well as to civil employment, and on the other hand, the negative impact that the industry's evolution had on employment. For the industry to generate new jobs and sustainable economic growth, we consider that it is necessary to turn our industry into a more efficient one and to increase its adaptability to the market's demands.

The results of this paper consist of original heterodox methods presented, intuitive or developed that can be found conclusively within the key proposals for education and regulation.

Keywords: industry, employment, GDP, regional disparities, deindustrialization

Introduction

The industrial sector represents an important component of the national economy and it consists of those enterprises, which deal with the exploitation of natural resources and with their transformation or other raw materials (agricultural products, etc) into capital and consumer goods. From the point of view of the National Institute of Statistics of Romania [1], the industrial sector consists of the mining and quarrying industry, the manufacturing industry and the industry for production, distribution and supply of electricity, gas, steam and water, etc according to the classification of activities in the national economy (CANE Rev. 2).

Although the economic literature and practices show that an efficient sector of services, with a high level of quality, is a decisive factor for the sustainable economic development and competitiveness of modern economies, the industrial sector remains a major determinant of a country's economic performance. According to this, the industrial sector, especially the manufacturing industry has an important role in the economic development process [2] because:

- There is an empirical correlation between the degree of industrialization and income per capita.
- productivity is higher in the industrial sector than in the agricultural sector;
- The transfer of resources from manufacturing to services provides a structural change burden in the form of Baumol's disease. As the share of the service sector increases, aggregate per capita growth will tend to slow down.
- Compared to agriculture, the manufacturing sector offers special opportunities for capital accumulation in developing countries.
- The manufacturing sector offers special opportunities for economies of scale, which are less available in agriculture or services.
- Linkage and spillover effects are presumed to be stronger within manufacturing than within other sectors. Linkage and spillover effects between manufacturing and other sectors such as services or agriculture are also very powerful.

The role of the Romanian industry in the process of economic growth

Transition economies, including the Romanian economy, have inherited a deformed economic structure, where the forced development of the hard industry affected the increase in the services' sector and convenience goods' sector.

In the post-war period, the Romanian industry, being almost entirely state-owned and subordinated to the excessively centralized government, witnessed a preponderantly extensive development, marked by gaps between branches. The political events in December 1989 and the beginning of the transition process generated ample transformations among which also the change in the direction of evolution of the Romanian industry. Thus, after 1990 we witnessed a deindustrialization of the economy, by the reduction of the industry's contribution to the creation of gross domestic product (GDP), as well to employment.

The commerce and prices liberalization opened the way to resource reallocation and a change in the economic activity's structure on sectors, branches and domains, according to the market's needs. Under these circumstances, the industrial production in Romania recorded substantial reductions. Thus, in the first decade of transition to the market economy (1990-1999), the industrial production of the country recorded negative rhythms for 6 years, rhythms that varied between -4.9% (in 1997) and -23.7% (in 1990), being characterized by an amplitude far larger than the positive rhythms recorded between 1993 and 1996 (fig.1). Therefore, during the '90, the industrial production went far below the level recorded in 1989, reaching the minimum level in 1999, of 44% of the production recorded in 1989, according to data in fig.2.

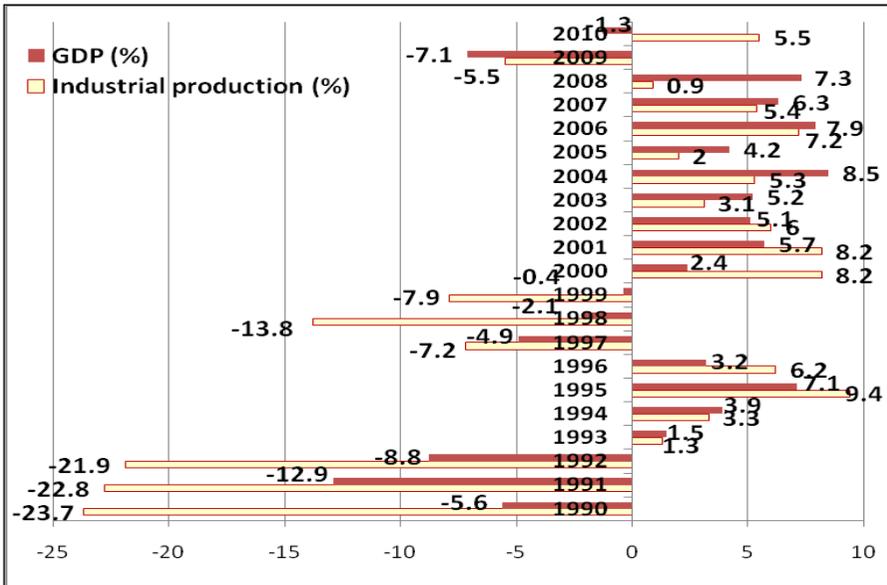


Figure 1: The annual evolution of industrial production and GDP

Source: Based on the statistical data in [1] and [3-4]

Although, in the following period (2000-2010), the industrial production recorded positive rhythms in ten out of eleven years (according to statistical data in fig.1), the industrial production in 2010 accounted for only 69% of the level achieved in 1989 (fig.2).

Countries such as Estonia, Hungary, Poland, Slovakia, managed, in 2010, to get an industrial production above the level achieved in 1989, precisely those countries that currently have a much higher development level compared to the one Romania has.

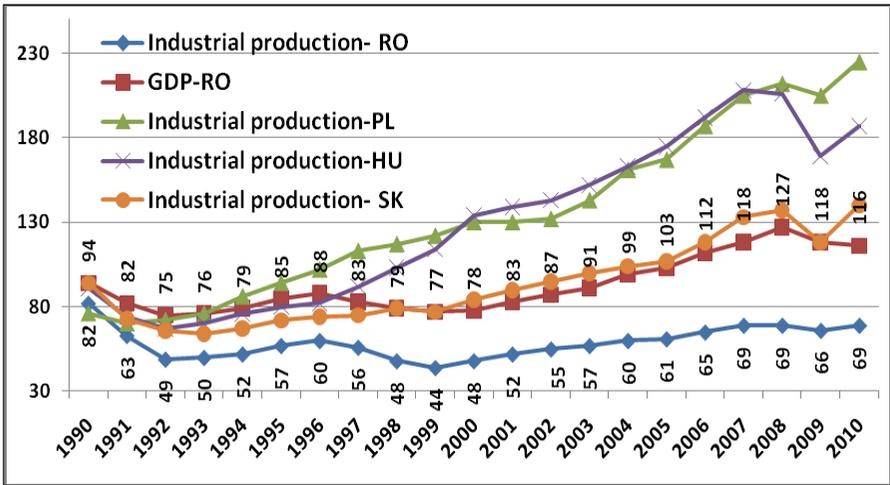


Figure 2: Evolution of industrial production and GDP (1989=100%)

Source: Based on statistical data provided by [4]

It results, from the comparative analysis of the data that reflects the evolution of industrial production and that of GDP in fig. 1 and 2, that the dynamics of industrial production significantly influenced the process of economic growth. The periods during which industrial production recorded negative rhythms coincide with the periods of economic recession (1990-1992, 1997-1999, 2009), and the periods during which the annual industrial production increased coincide with the periods of economic growth (1993-1996 and 2000-2008).

All these evolutions have determined a compression of the place of industry in the national economy.

Deindustrialization and employment in the Romanian economy

The transition from the centralized economy to the market economy has generated significant modifications both in the economic structure and also regarding the sectors composition of the employed population [5].

As a result of the restructuring and privatization policies promoted in the field of industry, especially in the first decade of transition, the place

of industry in the Romanian economy diminished considerably if we take into account the fact that, in 2000, the industry's share in total GDP reached the level of 26.1%, by 14.4 percentage points (p.p.) less than the specific share achieved in 1990, fact which underlines the progress of the deindustrialization process of Romania. In the same period, there was also a reduction in the share of jobs in industry in total jobs, from 36.9% to 23.2% (fig.3).

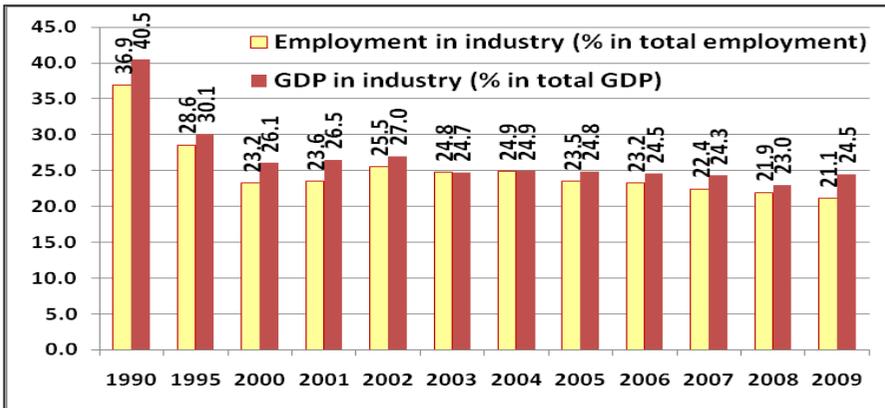


Figure 3: The contribution of industry to GDP and civil employment, In Romania, 1990-2009

Source: Own calculations based on data contained in [1]

In Romania, the strong direct correlation between the employment structure and the contribution of the employed population to the creation of the Gross domestic product, calculated using the Spearman correlation coefficient (of +0.938), allows us to state the following: the decrease in the share of employed population in industry of the total employed population by 15.8 p.p. (from 36.9% to 21.1%) determined, between 1990 and 2009, a decrease in the contribution of this sector by 16 p.p. (from 40.5% to 24.5%). The substantial reduction of the share of industry in GDP and employment may seem like a natural process of eliminating the consequences of a forced previous industrialization and one of taking Romania closer to the other European countries.

We mention that in 2010, according to data provided by Eurostat [6], the contribution of industry to the creation of gross value added (GVA)

was of 29.7%, our country ranking second among the UE-27 countries. The only country whose GVA share achieved in industry in total GVA is superior to the one obtained in Romania is the Czech Republic. As for the employment share in industry in total employment, Romania ranks third after the Czech Republic and Slovakia, according to data in fig. 4.

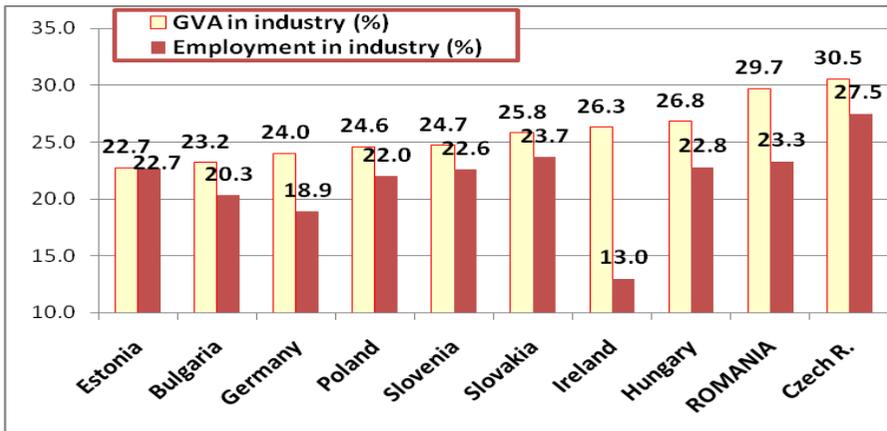


Figure 4: The contribution of industry to GVA and employment, In 10 EU countries, in 2010

Source: Own calculations based on data contained in [6]

It is worrying that after 1989 the employment share in industry decreased compared to the employment share in agriculture, having, after a decade, a difference of 16.8 p.p. between the two sectors, considering that, in 1999, jobs in agriculture accounted for 41.2% in total jobs, and the ones in industry accounted for only 24.4% (fig. 5). Such a tendency, in which employment is predominant in agriculture to the detriment of industry, marked the shift of our country from an industrial-agricultural profile to an agricultural-industrial one. At the same time, there was a growth tendency of the contribution of agriculture to GDP, accompanied by an accentuated decrease in the industry's contribution to GDP. In the next decade (2000-2009) there was an improvement in the between agriculture and industry, by the fact that the employment share in agriculture recorded a more accentuated decrease tendency, from 41.4% to 28.7%, compared to employment in industry, which dropped from 23.6% to 21.1%.

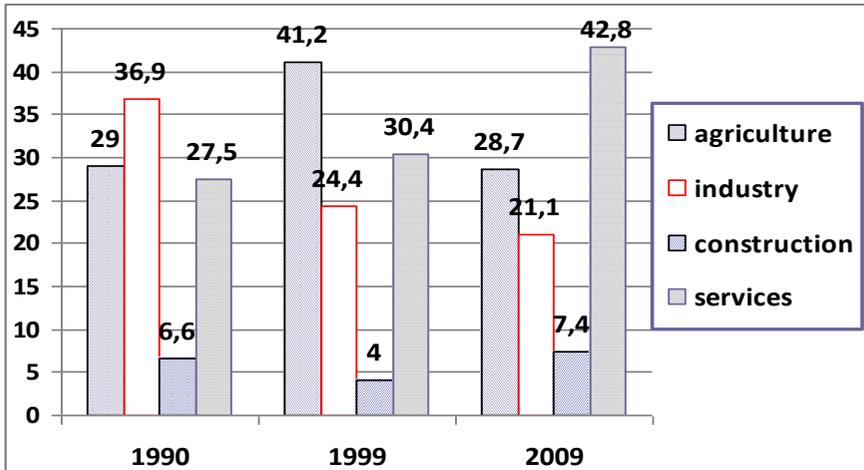


Figure 5: Civil employment structure, by economic activity (%), 1990-2009
Source: Own calculations based on data contained in [1]

The fact that, in 2009, the employment share in industry was lower compared to the employment share in agriculture (21.1% compared to 28.7%) represents, on the one hand, the direct result of deindustrialization, and on the other hand, it indicates the fact that agriculture absorbed people laid off after the privatization of state enterprises in secondary sector, people came back to rural origins, with or without state compensatory payments. The consequence of this fact is found not only in the field of employment but also in the field of labor productivity, agro industrial produce competitiveness on the domestic market and EU's market.

As far as the relationship between employment in industry and employment in services is concerned, this suffered some changes during the last twenty years, meaning that employment in services increased from 27.5% to 42.8% between 1990 and 2009, and employment in industry decreased from 36.9% to 21.1%. The services sector in Romania proves to be the only sector where an increase of the employed population is registered. Between 1990 and 2009, 615 thousand jobs were created in the tertiary sector (the employed population in this sector increased from 2,985 thousands in 1990 to 3, 600 thousands in 2009).

All these changes in the employment sectoral structure determined Romania [6], in 2009, to hold the last place within the EU in terms of

employment in services (only 40.9%, as compared to 53% in Bulgaria, 55.9 in Poland, 58.5% in Slovenia, 70.4% the EU-27 average etc.). On the contrary, Romania held the first place in EU in terms of the share of employment in the primary sector (27.8%, compared to 19.9% in Bulgaria, 13.4% in Poland, 5.6% the EU-27 average etc.) and the fourth in terms of share of employment in the secondary sector-industry and construction (31.3% compared to 32.8% in Slovenia, 33% in Slovakia, 37.1% in Czech Republic, 24.1% the EU-27 average). We notice that our country is far from the European Union's values and even from some countries in Central and Eastern Europe [7].

The Romanian industry proved to be the biggest job loser after 1989. In the 1990-2009 period, the civil population employed in industry dropped from 4005 thousand persons to 1774 thousand persons (fig.6), which means a reduction of 2231 thousand persons of the employed population in this sector, compared to 1990, i.e. of 55.7%.

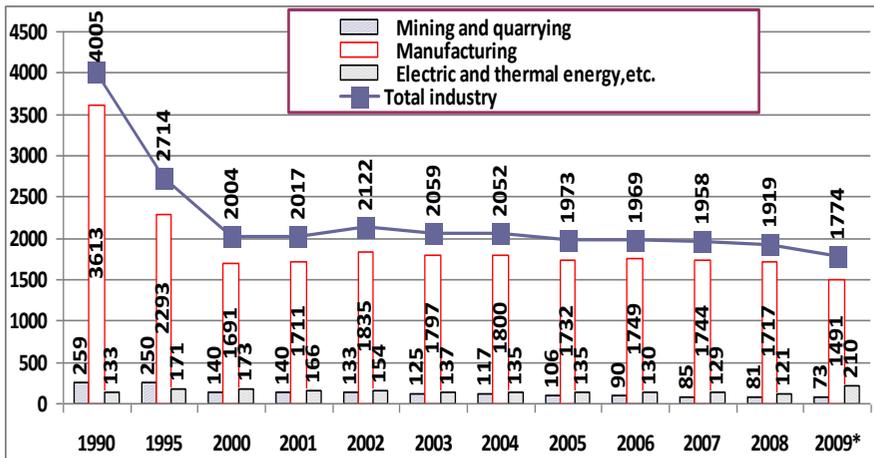


Figure 6: The evolution of the civil employed population in industry

Note: *In 2009 the structure of production and employment in industry according to CANE rev. 2

Source: Based on data contained in [1]

During the same period, at the level of national economy, there was a reduction in the total civil employed population of 2429 thousands

persons, from 10,840 thousand persons to 8,411 thousand persons [1]. These figures suggest the fact that the loss of jobs at the level of national economy was caused up to 91.8% by the loss suffered in industry.

Data presented in fig. 6 shows the fact that the greatest job loss in this sector was recorded in the first decade of transition, when the number of jobs in industry decreased by 2,001 thousands, which accounts for 89.7% of the total jobs lost in the last 20 years.

The structure of the Romanian industrial sector and employment

From the analysis of the structure of the Romanian industrial sector, we notice that manufacturing has far the greatest share in total industrial production and this dominant role seems to have been constant over the last twenty years. In 2009 the manufacturing industry represented for the main component of the Romanian industry, covering approximately 77% of the industrial activity volume.

The structure of the Romanian industrial production in the 1990-2009 period, suffered some changes, through two main tendencies, presented in fig.7: on the one hand, the share of extractive industry dropped (by 6.1 p.p.) as well as the one of manufacturing industry (by 8.9 p.p.), and on the other hand, the share of electric and thermal energy, gas and water increased (by 15 p.p.). The share of 20.3% recorded, in 2009, by 5.2 p.p. higher compared to 2008, was caused also by the fact that in 2009, also the water supply; sewerage, waste management and decontamination activities were included in the activity of electric and thermal energy, gas and water according to the classification of activities in the national economy CANE rev. 2.

The changes we mentioned were generated by the different intensity of involution happening after 1989, in the three activities of industry, as well as by price liberalization, which generally took place to the detriment of the manufacturing industry and in favour of the other two activities [8]

Similar tendencies, but with a lower intensity, were shaped also in terms of employment in industry.

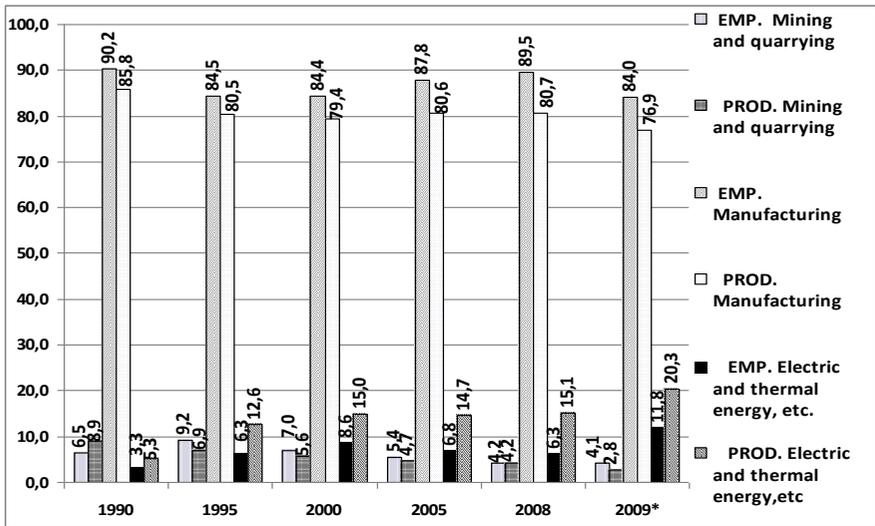


Figure 7: The relationship between the structure of industrial production and the structure of employment in industry

Note: *In 2009, the structure of production and employment in industry is according to CANE rev. 2.

Source: Own calculations based on data contained in [1]

From the analysis of the statistical data presented in fig.7, for the 1990-2009 period, in terms of the structure of industrial production and the structure of employment in industry, we notice that the share of manufacturing industry in total production was inferior and declining compared to the share of the employed population in this sector of activity, fact which indicates a reduced and declining level of labor productivity. In mining and quarrying, except 1990, the relationship between production and employment was below one and decreasing, reflecting the drop in labor productivity in this activity.

On the contrary, in the activity of electric and thermal energy, gas and water, etc, a growth in labor productivity has been recorded, if we take into account the fact that the relationships between the share of production and that of employment in this industrial activity is over one and increasing, according to data in fig.7.

The profound changes within the structure of the Romanian industry that took place in the last years have been influenced by the restrictions of the internal and external market, by the financial difficulties it was faced with and by the necessity of fulfilling the conditions of the functional market economy [9].

The negative impact of industry on employment

The changes that took place in employment in industry were caused by a multitude of factors, which acted differently from one period to another. The main diminishing factor of the numbers of employees was the drastic reduction in industrial production compared to 1989 (fig.1 and fig.2), also the technical profile and nature of production contributed to this, to a certain extent. Thus, in the economic activities based on highly labor force consuming technologies, the reduction in the level of production had as result a higher decrease in the number of employees.

The results of the statistical analysis based on the Spearman correlation coefficient, carried out in order to establish the intensity of the relationship between the annual change in industrial production and employment in industry, highlights that in the 1990-2009 period, there was a direct correlation (Spearman correlation coefficient=+0.628) between the two variables: the drop in industrial production in Romania determined the decrease in employment in industry, according to data in fig. 8.

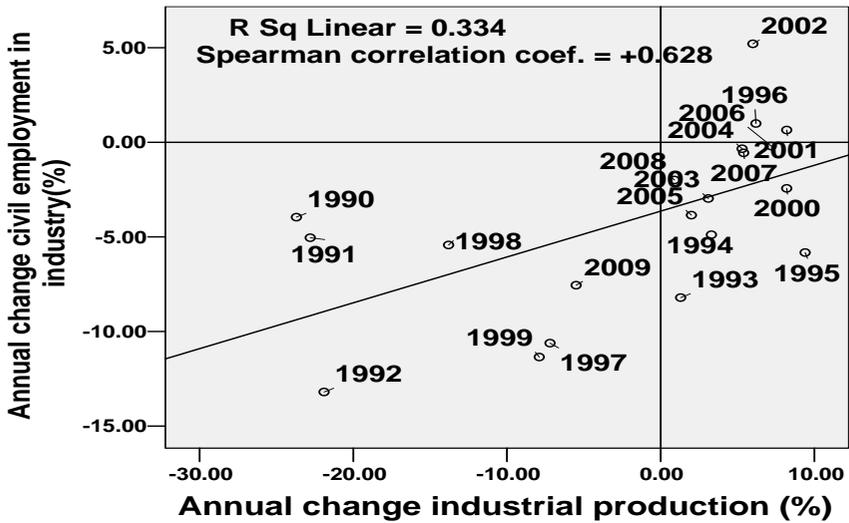


Figure 8: Direct correlation between annual change in industrial production and civil employment in industry

Source: Own calculations based on data contained in [1]

Despite losing an impressive number of jobs in industry in the two decades after the fall of communism, according to data provided by Eurostat [6], in Romania in 2010, the share of those employed in this activity, was at a higher level compared to the average recorded in UE-27 (of 16.3%), as well as compared to some of the east-European countries (Hungary, Bulgaria, Estonia, Lithuania, etc.), which had gone through the transition from the centralized economy to the market one. Only two countries of EU, (the Czech Republic and Slovakia) recorded higher shares of employment in industry than those in Romania (where 23.3% of jobs were created in industry), according to statistical data in fig.4. In these countries, the sector of services has almost doubled its share in total labor force, having positive consequences on labor productivity and economic development.

The decrease in employment in industry, both as number and share in total civil employed population, was caused mainly by the manufacturing industry, which, between 1990 and 2009, reduced the number of jobs by 52.48%, from 3613 thousands, in 1990, to 1491 thousands in 2009 (fig.6). In the first decade of transition to market economy, based on the

transformations that took place in the national economy, the manufacturing industry became the main job loser. Thus, statistical data in fig.6 shows that until 2000 this economic activity lost 1922 jobs, this tendency also continued in the 2001-2009 period, but with a lower intensity.

The shift from the centralized economy to the market one meant also a transformation in the structure of property, thus private property became predominant. Therefore, the general tendency among active enterprises was that of growth in the number of SMEs, according to data in table 1. Thus, in the 1992-2009 period, the number of SMEs in industry increased three times, and in the manufacturing industry 2.8 times. However the share of SMEs in industry in total SMEs decreased from 15.1% to 11.2%.

Table 1: Evolution of SME active in industry, 1992-2009

Indicators	1992	2009
<i>Total SMEs¹</i>	126549	517870
Total SMEs from industry	19067	57970
SMEs share in industry in total SMEs ¹ (%)	15.1	11.2
Total SMEs in manufacturing	18924	53909
SMEs share in manufacturing from total SMEs in industry (%)	99.3	92.9

¹*active small and medium enterprises in industry, construction, trade and other services*

Source: Own calculations based on data contained in [1]

Although SMEs are known for their ability to easily adapt to the market demands, under the circumstances in which the manufacturing industry owns over 90% of total SMEs in industry, we consider that Romania cannot have a competitive manufacturing industry, being known that these enterprises are sometimes in impossibility of assimilating and developing the modern technology, of applying a modern management. The

inefficiency of SMEs in the manufacturing industry can be revealed also by the inverse proportional relationship established between the evolution in the number of SMEs and the evolution of jobs: the number of jobs dropped by 52.48%, even if the number of SMEs grew by 184.9%.

Post-communist Romania inherited a structure of the manufacturing industry which is insufficiently correlated with the country's needs and resources, with integration possibilities in the labor division on a global scale. This is the reason why creating a modern market economy should have included, on a central position, the optimization of the manufacturing industry's structure. The restructuring and privatization policies promoted in the field of industry after 1989, didn't lead to improvement in the Romanian manufacturing industry's structure, but rather to its accentuated deterioration, and at the same time the country's deindustrialization took place.

The negative trend of jobs in the manufacturing industry only followed the trend of industrial production. The explanation for the reduction in the number of jobs in the manufacturing industry, in the first years of transition, is also based on the smaller subsidies that were provided by the state for the manufacturing industry.

The evolution of employment in industry was also influenced by the changes that took place in the extractive industry, where the restructuring of activity in mining had as result the reduction by 72% of the employed population (from 259 thousand persons to 73 thousand persons).

Regional disparities in the Romanian industry

The deindustrialization of the Romanian economy is experienced also at regional level, by the deepening of the economic gaps at the level of development regions.

Romania, according to the Law on regional development (no.151/1998) is divided in eight development regions: Centre (C), West (W), South-East (SE), North-West (NW), North-East (NE), South-West Oltenia (SW), South-Muntenia (S) and Bucharest-Ilfov (B-I), which constitute the creation, implementation and evaluation framework of the regional development policy.

As compared to 1995, when the difference between the highest contribution of industry to regional GDP and the lower one was of 9.7 p.p., in 2009, this difference increased up to 13.9 p.p. (according to statistical data in table 2 and fig. 9), fact which reflects the increase in regional disparities, having a negative impact on the level of economic development. If in 1995, four out of eight regions (South-Muntenia, Center, South-East and West respectively) recorded a level of GDP/capita (indicator that reflects the level of economic development) above the national average, in 2009, only two regions, Bucharest-Ilfov and West respectively, managed to obtain a higher GDP/capita compared to the national average, according to data presented in table 2.

Table 2: Evolution of the employment (EMP.) in industry (%), GDP in industry (%) and GDP per capita (%), at regional level

	1995			2009		
	GDP	EMP.	GDP/capita	GDP ¹	EMP.	GDP/capita
Romania	30.1	28.6	100.0	23.0	21.1	100
North-West	29.2	28.1	93.7	23.8	23.1	89.8
Center	35.4	36.8	104.2	28.8	26.6	94.2
North-East	27.1	24.9	81.4	18.8	17.1	60.3
South-East	25.7	23.7	101.6	23.0	19.8	81.2
South-Muntenia	27.2	29.9	147.0	31.3	22.2	86.5
Bucharest-Ilfov	34.7	32.3	97.8	14.9	15.8	242.7
South-West Oltenia	31.5	24.4	85.2	27.9	19.5	76.3
West	29.5	30.3	101.0	26.3	27.2	109.1

Source: 12008; Own calculations based on data contained in [1] and [10]

The deepening tendency of regional gaps was also recorded in terms of share of employment in industry in total employment, even if this indicator, in 1995, recorded values between 24.4% and 36.8%, and in 2009, values between a more reduced interval (17.1% and 27.2%).

From the statistical analysis on the civil employment in industry and GDP in industry, it results that in the regions where employment in industry is high, the share of GDP in industry in total GDP is high, and vice versa (fig. 9). The value of the Spearman correlation coefficient of $+0.667$ for 1995 and $+0.661$ for 2009 shows that between the two indicators there is a statistically significant direct relationship. Moreover, data in fig. 9 reflects once again the deindustrialization of the Romanian economy, in the 1995-2009 period.

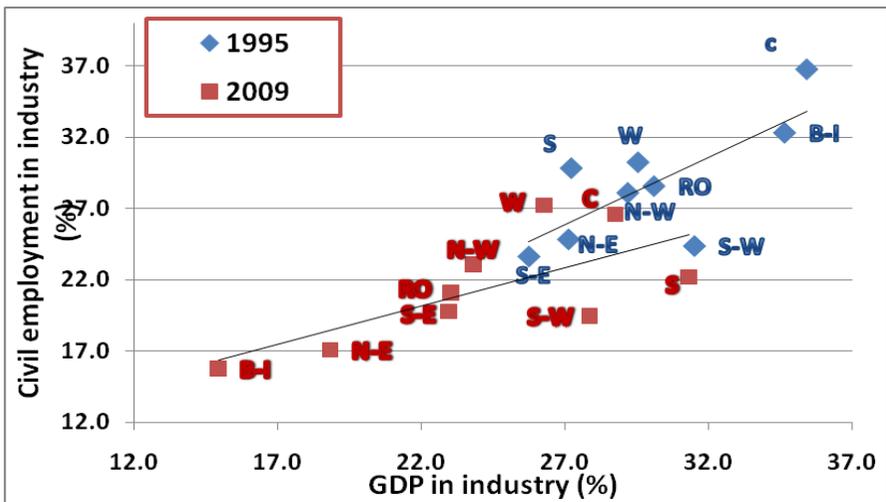


Figure 9: Direct correlation between civil employment in industry and GDP in industry, at regional level

Source: Own calculations based on data contained in the table 2

The drop in the contribution of industry to GDP and job creation, at regional level, in the 1995-2009 period, did nothing else but to follow the tendency recorded at the level of national economy. The only region, where the share of regional GDP created in industry in total regional GDP increased in 2008 compared to 1995, was the South-Muntenia region, the one which in 2008 held the first place, compared to the last but one place, in 1995, regarding this aspect.

The most significant changes are recorded in the Bucharest-Ilfov and Northeast regions. Thus, in the Bucharest-Ilfov region, there was a

compression of the role of industry, caused by the reduction by over 50% of the industry's contribution to GDP and employment creation. At the same time, we notice a spectacular growth in GDP per capita from 97.8%, in 1995, to 242.7%, in 2009 (compared to the national average of 100%), but also in the role of the services sector. The services sector represents the main provider of jobs in the Bucharest-Ilfov region, where the share of employment in services is of 73.3%, a lot above the national average of 40.9% [1]. The distance between the Bucharest-Ilfov region and the other regions, from the point of view of the share of civil employed population in services, is due to the rapid growth of the sector of businesses in services, the relatively high rate of attendance in higher education, a factor which supports the growth of services [11].

In contrast to the Bucharest-Ilfov region, where there was a compression of the role of industry in favor of services, in the Northeast region, the diminishing of the role of industry was followed by the increase in importance of the primary sector. We mention that in this region the highest share of employment in agriculture is recorded of (48.2%), but also the most reduced employment in services (31.1%). Due to the fact that the North-East region is marked by its dependence on agriculture and a high level of ruralisation as well as by the proximity to the border with Moldova and Ukraine, in 2009, it was characterized by the lowest level of development, with a GDP/capita of only 60.3% of the average at the level of national economy.

In the 1995-2009 periods, there were significant changes in terms of the hierarchy of regions according to the specific share of industry in regional employment. If, in 1995, the first three places were hold by the Centre, Bucharest-Ilfov si South-West Oltenia regions, in 2009, the first place was hold by the West region, followed by the Centre and North-West regions. Benefiting from their closer position to the western markets and their more reduced dependence on the primary sector, West, North-West and Centre regions have attracted more foreign investors, fact which has significantly contributed to their development.

If we analyze the contribution of industry to regional GDP compared to the contribution of industry to civil employed population, we notice that in some regions the contribution to GDP is higher compared to the contribution to civil employment and vice versa. The regions in the first

category (South-Muntenia, South-West Oltenia), where the relationship between the contribution to GDP and the contribution to employment is higher than one and as high as possible, are characterized by a higher labour productivity compared to the other regions where the relationship is below one, according to fig. 10 and table 2.

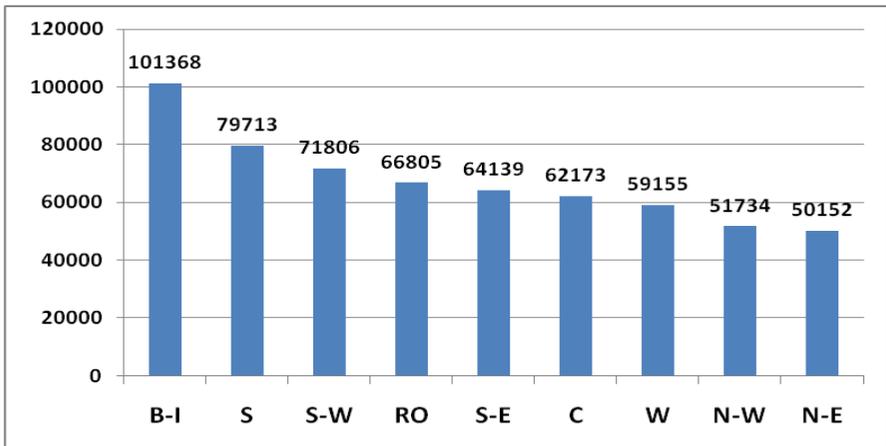


Figure 10: Labour productivity in industry (lei/employed person), at regional level, 2009

Source: Own calculations based on data from [1] and [10]

An important indicator for the gaps existing between regions is labor productivity in industry, calculated as the relationship between gross value added and civil employed population. According to data presented in figure 10, a worker in the industry of the B-I region (where there is the highest productivity) obtains a gross value added two times higher than a worker in the North-East region, the one with the lowest level of economic development and the lowest labor productivity in industry, there being a relative gap between the regions with extreme values of 2/1.

In order to diminish and even eliminate the economic discrepancies between different regions, it is necessary to promote some measures that should aim to adequately develop the industry at territorial level.

Conclusions

The results of our analysis carried out based on the statistical data in the 1990-2009 period in terms of the place and role of the Romanian industry in national economy and its impact on the employment highlight the following most important aspects:

- The deindustrialization of the economy through the decrease in the industry's contribution to GDP as well as to civil employment;
- The existence of a direct relationship between the evolution of industrial production and the evolution of employment, thus the reduction in industrial production determined the reduction in employment;
- The reduction of employment in industry, especially in manufacturing industry, had a negative impact on the relation between employment in industry and employment in agriculture, with negative consequences on economic development;
- The incapacity of the services sector to generate jobs, so that the losses suffered in the industrial sector, in terms of employment to be significantly diminished or even eliminated. The problem is not only the reduction in industry, as share to GDP and also as share to employment, but rather the fact that agriculture was the one to absorb the people made redundant after the privatization of state-owned enterprises in industry and not the tertiary sector.
- The existence and deepening of regional gaps in terms of the place and role of industry in the economic development process.

So as for the industry to generate jobs and sustainable economic growth we consider that it is necessary to develop an open and flexible industrial system, compatible with the European structures, with a real competitiveness and adaptability capacity to the demands of the national and international market.

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