

STRUCTURAL CHANGES IN THE INDUSTRY OF THE EUROPEAN UNION AND BULGARIA. EVOLUTION AND FUTURE CHALLENGES AFTER THE CRISIS

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Abstract

The present paper provides new insights into the transformation process of the EU industry which remains the most important sector of EU economies, in spite of its decreasing share in EU GDP and the loss of jobs in many industrial sectors. During the last 15 years, the structural changes were induced by various factors, including the so-called “servitisation of manufacturing”, outsourcing and delocalization of production, especially in labour intensive industries, implementation of new technologies and more recently the effects of the world financial and economic crisis. The crisis has changed expectations regarding the EU industry development both at national and EU level and new questions arise about the necessity of structural changes in manufacturing, based on higher competition.

Consequently, taking into consideration all these challenges, the main goal of our paper is to reveal the stance, the development, and the priorities of the EU industry. After a short introduction, in the first section we analyze the main factors which marked the changes in EU industries, as well as the causes and the development of the conception of deindustrialization. In the second section, we deal with peculiarities of the Bulgarian industrial sector, as well as its recent performance despite the overall downturn of the Bulgarian economy after the crisis. Finally, we emphasize the main conclusions.

Keywords: European industry, European integration, deindustrialization, new technologies

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1. Introduction

During the last 15 years, the European industry changed radically, not only in the euro zone, but also in the New Member States and among them in Bulgaria. Important changes have been taking place in the value added generation of the industry, as well as in the employment of workers in this sector. The relative shrinking of some industrial sectors gave rise to the formulation of the concept of *deindustrialization*. The changes in the structure of the industry pave the way for the development of new strategies in manufacturing as well as the development of new industrial sectors based on new technologies. The main goal of the EU industry is the achievement of high labour productivity and competitiveness in industrial sectors.

The economic crisis changes expectations of the EU industry development and new questions arise about the necessity of structural changes in manufacturing based on higher competition. This is an investment for the preservation of the EU industrial production market share at global level. As a part of the EU industry, Bulgarian manufacturing sectors face similar problems as those of the other EU Members States, although the Bulgarian industrial structure differs substantially from that of the developed EU countries and most of its industrial sectors were sensitive to the impact of the crisis. Bulgaria has the same objectives as other EU Member States and Europe 2020 Strategy, aiming at significantly improving the efficiency of the production in order to enlarge the export oriented potential of the Bulgarian industry.

The goal of this paper is to reveal the stance, the development, and the priorities of the EU industry, which remains the most important sector of the EU economies. In the first part we try to describe the main factors, which marked the changes in the EU industries, as well as the causes and the development of the conception of deindustrialization. We analyse how the European economy is performing after the deep fall of the industrial production during and after the economic crisis. The main challenge for the European industry is the improvement of the labour productivity and the competitiveness in order to face the increasing competition from Asia and the USA. In the second part, we deal with peculiarities of the Bulgarian industrial sector, as well as its recent performance despite the overall downturn of the Bulgarian economy after the crisis.

2. Changes and challenges facing the EU industry

2.1. Factors with an impact on EU industry

Manufacturing represents approximately 21% of the EU's GDP and 20% of its employment, providing more than 30 million jobs in 230 000 enterprises, mostly SMEs (Eurostat, 2015). Nowadays, the definition of the European industry is much larger, because their structure includes industrial sectors from mining and quarrying, machine-

building to the production of energy and business services. Moreover, each job in industry is considered to be linked to two more in related services.

In 2013, more than 50 million persons across EU worked in the industrial sector, which in 2011 generated 19% of the gross value added (GVA). They represented 22.4% of the labour force against 5% employed in agriculture and 72.5% in the services sectors. In 2008, the corresponding number was almost 57 million workers or 25% of the total employment, with 5.4% working in agriculture and 69.8% in services. The Czech Republic was the member state with the highest share of employees in the industry (36.2% in 2013 against 38% in 2008), and Greece the lowest at 14.7% (2013) against 19.9% (2008). In 2008 Netherlands was the member state with the lowest share of industrial employment at 16.8% (Eurostat data).

Manufacturing employment and manufacturing's share in GDP has continuously declined over a number of years in the EU and currently represent about 15% of the value added and 14% of the total employment. Despite its "squeeze" and currently small share of value added and employment, manufacturing still plays an important role in the EU economy, contributing to exports, research and development and also productivity growth.

The EU countries have different industrial structures. In countries such as Germany, Czech Republic, Hungary, Ireland and Romania, manufacturing reveals to have higher shares in GDP than in Luxembourg, Cyprus, Latvia or Great Britain. However, it is worth to underline that the contribution of services to GDP is increasing in all EU countries regardless of whether the share of manufacturing is higher or lower.

This evolution of the European industry was due to the impact of a number of long-term factors. Among them there are: the macroeconomic development of the EU countries in the 1970s, 1980s and 1990s, the functioning of the EU single market, the effects of the globalization of world markets, and the implementation of new technologies. These fundamental long-term factors affected the changes in the manufacturing industry of developed EU countries and have been imposed by the turmoil in economic, political and social relations during the last decades of the last century.

In the 70s, the multinational corporations (MNC), most of them with American capital, took advantage of the overvalued dollar, and bought-in European companies at a reasonable price. Through mergers and acquisitions, the MNC gained a significant market share and crowded out of the market many EU based companies (Moussis, 2011). The EU policy also stimulated this kind of market transformation of ownership by the application of policies stimulating the MNCs' market penetration.

In the 80s, the European industry structure changed under the impact of new entities on the market. First, small and medium sized enterprises (SMEs)² appeared like dynamic companies, specialized in high-tech industries and positioned in specific production and market niches. They provided specific products with higher value added. SMEs were cost-effective, compared to larger companies, which were pursuing in principal, global strategic market objectives. SMEs have a more effective management of the production processes and staff, better social contacts, and other benefits. Second, European companies gradually began to restrict their investments in the EU economy and invested in new locations, where unit labour costs were lower. The delocalization strategies of European companies were related to long lasting factors as the process of internationalisation of the capital and the expansion of the role of foreign direct investment (FDI), the rapid development and use of communication services and Internet, the fast industrialization of the new emerging markets. The increase of the effectiveness of the production from the viewpoint of costs and, consequently, the increase of benefits improved the European firms' competitiveness on the world markets.

The delocalization of certain manufactures led to the loss of about 88 000 of jobs in European countries. Between January 2002 and October 2007, almost 9% of the total jobs in the European industrial enterprises disappeared. In Ireland, the percentage reached 27.9% of jobs, due to the delocalization of industrial companies abroad. In Portugal 26.3% of jobs, while in Denmark 23.2% of jobs ceased to exist. The EU New Member States of Central Europe became one of the destinations for the delocalization of Western European manufacturing production (European Restructuring Monitor, 2014). A large part of the disappearing jobs in Western European countries industries were classified as internal restructurings, mergers and/or acquisition of equity capital, or as bankruptcies.

The decreasing share of the industry in the EU GDP, the delocalization of European industries, the loss of jobs in main industries induced a number of researchers to depict this new situation in European industry as "deindustrialization". In the economic literature, this concept was formulated at the end of the 70s and the early 80s, when branches as the steel industry, the machine-building, the port equipment, the textile industry and other associated with these industrial sectors were restructured. In 2000s, the concept of deindustrialization arose again, when the European enterprises started to participate actively in mergers and acquisitions of equity capital of foreign companies on new emerging markets. The consequences of delocalisation of the production of European enterprises were diverse, but they contributed for the gradual decline in the share of value added to GDP and employment in manufacturing. Part of

² Starting with mid-90s, the European Commission provided definitions for small and medium-sized enterprises (SMEs) in the general EC policies. See the Treaty on the functioning of the EU, Article 173, Recommendation 2003/361.

the loss of manufacturing value added was often attributed to a shift towards new emerging markets, and most notably China. However, these trends and characteristics of manufacturing enterprises expansion were not specific only for Europe, but for other developed economies, like the USA economy for example.

2.2. The impact of the global economic crisis on the EU industry

Manufacturing remains the most negatively affected sector by the economic crisis. The EU's industrial production index peaked in 2007 and 2008, nevertheless it fell sharply afterwards. In the euro zone as well, the production index grew in 2007 and 2008 and fell abruptly in 2009. The world financial and economic crisis resulted in a negative downturn in industrial output in the EU in 2008. In almost all EU countries the contraction in economic activity was considerable. The production index deteriorated with 16.54% for the 19 Euro Area countries. For EU28, the fall was of 15.18% from the period 2008-2009. The drop of the industrial production in 2011-2013 as compared to 2010 was significant in old EU member states such as Spain and Italy. Amongst the new EU member States, after the abrupt drop recorded in 2009, the industrial production invigorated anew, including in Bulgaria (Table 1).

Table 1: Changes in the production of industry of EU-28 countries (2010 = 100)

| Countries | 2006 | 2008 | 2009 | 2011 | 2012 | 2013 |
|----------------|--------|--------|--------|--------|--------|--------|
| EU 28 | 106.9 | 108.78 | 93.60 | 103.13 | 100.85 | 100.39 |
| Euro area 19 | 107.58 | 109.72 | 93.18 | 103.44 | 100.89 | 100.22 |
| Belgium | 90.47 | 100.26 | 89.91 | 104.43 | 101.03 | 101.87 |
| Bulgaria | 108.82 | 119.81 | 97.90 | 105.79 | 105.59 | 105.60 |
| Czech Republic | 98.32 | 106.19 | 92.27 | 105.67 | 104.81 | 104.97 |
| Denmark | 119.80 | 114.89 | 98.24 | 102.00 | 101.87 | 102.73 |
| Germany | 101.10 | 107.16 | 89.70 | 106.66 | 106.28 | 106.48 |
| Estonia | 105.36 | 106.69 | 81.21 | 119.47 | 121.19 | 124.88 |
| Ireland | 94.61 | 97.33 | 92.97 | 99.58 | 98.14 | 95.93 |
| Greece | 120.38 | 117.90 | 107.05 | 94.14 | 92.20 | 89.24 |
| Spain | 125.13 | 117.75 | 99.20 | 98.26 | 91.49 | 89.92 |
| France | 112.88 | 110.66 | 94.98 | 102.09 | 99.33 | 98.73 |
| Croatia | 105.48 | 111.54 | 101.59 | 98.85 | 93.54 | 91.75 |
| Italy | 117.26 | 115.18 | 93.62 | 101.14 | 94.64 | 91.69 |
| Cyprus | 102.27 | 112.28 | 101.74 | 98.85 | 93.54 | 91.75 |
| Latvia | 107.79 | 105.85 | 86.84 | 108.18 | 114.83 | 114.47 |
| Lithuania | 102.42 | 105.85 | 86.84 | 106.61 | 110.60 | 114.26 |
| Luxembourg | 115.82 | 109.51 | 92.01 | 102.02 | 97.64 | 94.38 |
| Hungary | 102.60 | 109.86 | 90.68 | 105.63 | 104.13 | 105.69 |
| Malta | 104.88 | 107.20 | 92.15 | 99.65 | 105.00 | 99.46 |
| Netherlands | 95.78 | 100.40 | 92.81 | 99.25 | 98.70 | 99.32 |
| Austria | 98.51 | 105.61 | 93.73 | 106.82 | 106.54 | 107.42 |

| Countries | 2006 | 2008 | 2009 | 2011 | 2012 | 2013 |
|----------------|--------|--------|-------|--------|--------|--------|
| Poland | 83.47 | 93.42 | 89.56 | 106.81 | 108.26 | 110.88 |
| Portugal | 112.14 | 107.61 | 98.41 | 98.95 | 92.89 | 93.34 |
| Romania | 98.97 | 105.73 | 97.09 | 108.63 | 111.29 | 120.01 |
| Slovenia | 103.47 | 112.74 | 92.72 | 101.2 | 100.68 | 99.29 |
| Slovakia | 81.86 | 109.35 | 93.57 | 105.34 | 113.40 | 119.44 |
| Finland | 109.63 | 115.79 | 94.94 | 101.99 | 100.34 | 96.82 |
| Sweden | 110.39 | 111.36 | 91.46 | 101.98 | 100.75 | 96.10 |
| United Kingdom | 109.10 | 105.95 | 97.03 | 99.32 | 96.35 | 96.13 |

Source: Eurostat data.

The job losses in the sector between September 2008 and November 2009 added up to slightly more than half of the total job losses. Jobs in manufacturing were 9.4% lower in the third quarter compared to the first quarter of 2008. Eurostat data announced 13.8% decrease in the corresponding period (EC, 2010a and 2010b). In the majority of industrial sectors, it was resorted to the reducing working hours per worker, in particular in the manufacturing of basic metals, motor vehicles, coke and refined products, where average hours per worker have declined by more than 9% from the first quarter of 2008 to the second quarter of 2009.

The crisis hit the most vulnerable industries, as the external demand fell quickly. For example, many industries, sensitive to the business cycles, such as motor-vehicle, construction, transport equipment, chemical industry, were among the most seriously affected by the crisis. Some less sensitive cyclical industries, which rely more on a stable demand, such as food and beverages, many of the services or markets with prospects for a rapid growth in the medium term like pharmaceuticals, were less affected by the economic crisis. A significant decline in the EU industry has been registered in traditional industries too.

The economic crisis had a strong impact on the growth potential of the EU manufacturing sectors. Despite the sharp decreases of the industrial production, and the rise of unemployment in manufacturing sectors, observed for all EU countries in 2009, it did not mean that manufacturing industries became less important for the economic growth in the EU countries (e.g. for countries like Germany and the New Member States of Central Europe such as Czech Republic, Slovakia, Poland, Romania and even for Bulgaria). From a long-term perspective, manufacturing sectors have remained among the most productive in the EU economy.

Despite signs of emerging from recession in 2010, the index of production of EU-28 remained low. In 2010, there were few public infrastructure projects due to financial constraints (Jaegers, Amil, 2011). In 2011, the industrial production increased in Poland by 9.9%, in Latvia by 8.5%, in the Czech Republic by 5.4%, in Romania by 3.3%, in Bulgaria by 0.6% (Eurostat, 2012).

In November 2011 compared to October 2011, the euro area's industrial new orders index fell by 1.3%, after a rise of 1.5% in October. In the EU, industrial new

orders decreased by 1.4% in November 2011, after an increase of 0.2% in October. Excluding ships, railway and aerospace equipment, for which changes tend to be more volatile, industrial new orders dropped by 0.5% in the euro area and by 1.2% in the EU (Eurostat, 2012).

In the period 2011-2013 all EU countries with some exception succeeded to recover the pre-crisis level of industrial production. Some of the EU countries with the leadership of Baltic countries (Estonia) and the Central European countries realised highly manufacturing growth than the EU average (Table 1).

2.3. Indicators for structural change

An important indicator for EU structural changes is the relative slowdown of the value added. In 1995-2007, the share of the value added of the industry was different in the EU developed countries. The value added of industry in Germany increased to 23.9% (2007) against 22.6% (1995). By contrast, in France, the value added of the industry decreased from 22.2% in 1995 to 18.4% in 2007. In Italy, the value added fell from 22.2% in 1995 to 18.4% in 2007. In Great Britain, the decline in value added of industry was most acute: from 21.2% in 1995 down to 12.6% in 2007. In 2008, a total of EUR 6.2 billion gross value added was generated in the economy of the EU. Industry, without construction, generated almost 20% of the total gross value added in the EU.

In 1995-2007, the value added of the industry in EU was increasing at a slower pace, as compared to that generated by the whole economy (by 2.9% on average per year against 4.7% on average per year). After 2000, the differences between the growth rate of value added in industry and the economic growth by EU countries were relatively small. The difference was more important for the United Kingdom, where the stagnation in the industrial sector was accompanied by a sustainable economic growth. Germany's industries experienced a dynamic growth, which was reflected by the increase of value-added by manufacturing. Growth of value added before the economic crisis was registered in sectors "Basic metals and fabricated metal products" and in "Machinery and equipment". The value added in other sectors as food industry, chemical industry, machine-building and equipment, electrical networks and stations, automobile industry remained at similar levels.

At the level of each of the 24 different sub-sectors of manufacturing, the largest EU sub-sectors in 2010 in terms of value added and employment were food manufacturing, the manufacturing of fabricated metal products and the manufacture of machinery and equipment (Manufacturing statistics 2010). Around 9.8% of all enterprises in the EU non financial business economy were classified to manufacturing in 2010, with a total of 2.1 million enterprises. In 2010 the manufacturing sector generated EUR 1.590 billion of value added.

Table 2: Sectoral analysis of manufacturing (NACE) Section C, EU-27, 2010
(as % of the total)

| Sub-sectors of manufacturing | Value added | Employment |
|--|-------------|------------|
| Manufacturing | 100 | 100 |
| Machinery and equipment | 10.9 | 9.5 |
| Food products | 10.5 | 13.6 |
| Fabricated metal products* | 9.5 | 11.9 |
| Motor vehicles, trailers | 8.9 | 7.2 |
| Chemicals, chemical products | 7.0 | 3.9 |
| Pharmaceutical products | 5.4 | 1.8 |
| Electrical equipment | 5.3 | 4.9 |
| Computer, electronic, optical products | 4.9 | 3.8 |
| Rubber, Plastic products | 4.9 | 5.4 |
| Mineral products | 4.0 | 4.5 |
| Basic metals | 3.8 | 3.3 |
| Installation machinery/equipment | 3.4 | 4.0 |
| Transport equipment | 2.9 | 2.4 |
| Paper | 2.6 | 2.2 |
| Other manufacturing | 2.5 | 2.9 |
| Beverages | 2.3 | 1.4 |
| Printing | 2.1 | 2.8 |
| Wood products | 2.0 | 3.5 |
| Furniture | 1.9 | 3.5 |
| Coke and refined petroleum products | 1.5 | 0.4 |
| Textiles | 1.4 | 2.2 |
| Wearing apparel | 1.2 | 3.5 |
| Leather | 0.7 | 1.4 |
| Tobacco | 0.4 | 0.2 |

* Except machinery and equipment

1. Value added represents the difference between the value of what is produced and intermediate consumption entering the production, less subsidies on production and costs, taxes and levies.

2. The number of persons employed is defined as the total number of persons working in the various industries: employees, non-employees (e.g. family workers, delivery personnel) with the exception of agency workers.

Source: Eurostat Manufacturing data.

Manufacturing contribution to value added can be decomposed into its contribution to employment and to the labour productivity. One indicator for structural changes in the EU industries is the number of employees in manufacturing. Table 2 shows that the number of employees in the food industry, metal product industries, machine building, electrical and optical equipment production remained stable in 2010.

The number of employees, working in old traditional European industries, like textile, wearing apparel, leather and tobacco are insignificant in comparison with those working in the machine building, fabricated metal products and food industries.

In general, the loss of jobs in manufacturing after the crisis permits two basic assumptions. *First*, the reduction of jobs in some industries was due to a large extent to the restructuring by the implementation of new technologies and innovative processes.

Second, the decrease of jobs in sectors like “textile” reflects the stagnation of this industrial sector and the shrinking of its relative share in manufacturing. The delocalisation of European textile enterprises on new emerging markets in Asia also leads to a reduction of employment in this sector.

The problem is not that jobs disappeared in the EU industrial sector, but the fact that no new jobs are created. New jobs appear on new emerging markets, generated by European companies located there. However, the reduction of jobs in the EU industries tends to deteriorate the EU labour productivity because no significant new reinvestments took place in capital and human resources by European companies on the internal market.

Manufacturing sub-sectors are diverse and they combining activities with relatively low apparent labour productivity such as manufacture of textiles, wearing apparel, leather products, and furniture with other activities with higher values reflecting in the labour productivity, such as tobacco manufacturing, the processing of coke and petroleum, the manufacture of pharmaceutical products.

Between 2000 and 2010, labour productivity in the EU slightly improved. The labour productivity in the EU rose between 2000 and 2007. In 2007, it began to fall in Denmark, France and Sweden, but it continued to grow in Bulgaria, Estonia, Ireland, Spain, Cyprus, Slovakia, Portugal and Poland.³ The economic crisis reversed this trend. After several years of growth, labour productivity in the EU fell in 2008 and 2009. In 2010 some signs appeared that the 2007 level could be reached.

The fall in labour productivity during the economic crisis was the result of companies’ strategies not to lay off workers as much as expected, but to apply measures as work-sharing, reducing working hours per worker. As a result, labour market flexibility was reduced also because of the restrictions of layoffs in the labour legislation of several Member States. The labour productivity declined also because of the slower capital accumulation.

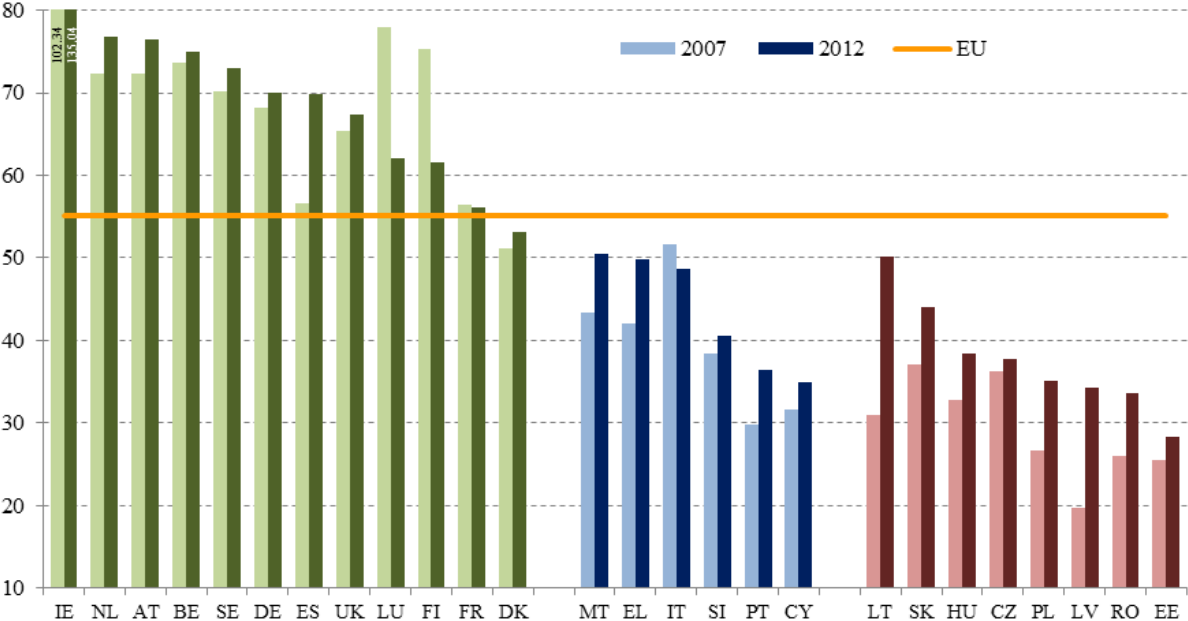
However, the period of sustained economic growth (2003 to 2007) did not lead to above average increases in labour productivity growth. This can be explained by factors such as declining investment per employee, slowdown in the rate of technological progress, sluggish reorientation of the economy toward sectors with high productivity, the relatively small size of the EU’s information and communication technology industry as compared with other developed countries, and a stagnating share of R&D expenditure in GDP (Timmer, van Ark, 2005).

The crisis deepened the differences in labour productivity between the EU Member States. Between 2000 and 2010, the labour productivity grew sharply in EU New Member States, with positive GDP growth rate, e.g. Romania (74.7 %), Latvia (65.2 %), Slovakia (55.8 %), Estonia (60.1 %), Lithuania (56.6 %), Poland (35.0 %) and Hungary (32.6 %). Bulgarian labour productivity grew as well but at a lesser extent.

³ http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/.

The differences between labour productivity, measured by the value added and the employment, appear even more significantly between the developed EU Member States and the New Member States. Bulgarian labour productivity is with over 60% below the EU average level (Figure 1).

Figure 1: Labour productivity in manufacturing by countries in 2007 and 2012 as % of EU average expressed as gross value added (GVA), in 1000 PPS/employee



Notes: IE-Ireland, NL-Netherlands, AT-Austria, BE-Belgium, SE-Sweden, DE-Germany, ES-Spain, UK-United Kingdom, LU-Luxembourg, FI-Finland, FR-France, DK-Denmark, MT-Malta, EL-Greece, It-Italy, SI-Slovenia, PT-Portugal, CY-Cyprus, LV-Latvia, LT-Lithuania, SK-Slovakia, HU-Hungary, CZ-Czech Republic, PL-Poland, RO-Romania, EE-Estonia.

For RO data are for 2007 and 2011, no data for Croatia (HR) and for Bulgaria (BG).

Source: Eurostat.

Labour productivity growth per person employed in industrial sectors, from 1995 to 2010, was higher than in the most productive services activities, such as wholesale, retail and financial intermediation. One of the long lasting factors driving higher labour productivity in manufacturing was research and development activities of well performing companies in the industrial sector. As a result, the increase of trade with patents and the incentives for innovations had become a characteristic feature of growth of a number of manufacturing sectors as radio, TV communications, machine building, pharmaceuticals, transport equipment, office machinery and others.

Taking into account the level of labour productivity in manufacturing, the EU countries can be classified into three main groups (Figure 1). In the first group were included 11 countries, starting with: Ireland (IE), Netherlands (NL), Austria (AT), Belgium (BE), Sweden (SE), Germany (DE), Spain (ES) and United Kingdom (UK). In 2012, Spain succeeded to increase the labour productivity due partly to the structural

changes in Spanish manufacturing in the post crisis period. Denmark and France did not make any significant changes to ameliorate the manufacturing despite the closing of industries during the crisis. Italy's (IT) labour productivity was lower than the EU average, signalling that the country had retreated from its previous positions and was not able to boost ahead the sluggish economic development. At the level of countries included in the third group, the main goals remained to overcome the negative economic crisis impacts and to continue with the catch up process.

In most of the EU countries the increase of labour productivity in manufacturing was closely related with the need for investments. Despite that the labour productivity in manufacturing increased after 2007, this slight improvement reflected the fact that the total number of workers decreased much faster than the decrease of manufacturing output. The main causes were lower investments in capital equipment and innovations, which could jeopardise the progress in many EU member states.

The economic crisis has hit manufacturing industries in Europe in an unprecedented manner and it has also demonstrated the importance and the necessity of development of production activities for a sustainable economic balance. It remains questionable whether the European industry will achieve the desired goals of effective structural changes based on improved labour productivity and competitiveness.

2.4. Deindustrialization or restructuring of the European industry

The relative decline of Europe's manufacturing sector was often viewed as a new start to Europe's growth after the crisis. In 2012 the European Commission launched a roadmap for reindustrialising Europe. "Europe needs industry" became a slogan for a stronger European industry for growth and economic recovery. The aim was to raise the share of industry in GDP from the current level of 15% to as much as 20% according the Europe 2020 initiative.

Despite the comparative reduction of the relative share of the European industry in the EU GDP, manufacturing, as it was underlined, has not lost its fundamental contribution in EU Member States' economies. The EU industry remains of primary importance for the EU economy.

The industry represents 81% of the private sector and R&D in the EU. It contributes substantially to the equilibrium of Europe's trade balance. Industrial goods represent three quarters of Europe's exports, and provide employment-multipliers and drive demand for industry-related services: every industrial job creates two extra jobs in the service sectors.⁴ European manufacturing is also a dominant element in

⁴ Main conclusions of the seminar: *What future for European manufacturing workers? New industrial policies, workers' participation and structural change*, <http://industrialpolicy.ttp.eu/EMF/What-future-for-European-manufacturing-workers/Seminar-Agenda-EN>, Brussels, September 16, 2010.

international trade, leading the world in areas such as automotive, machinery and agricultural engineering.

During the last years, a sensible restructuring of the main sectors of manufacturing took place, namely in the developed EU economies. Some of the “old” sectors of manufacturing lost their relative importance in GDP, but other branches had arisen and developed in industries like aeronautics, automotives, pharmaceuticals, electrical equipment, telecommunications and information equipment. A higher level of development and diversification of industries created a basis for a sustainable economic growth. Manufacturing sectors also have the highest multiplier effects; interlinkages can generate positive, but also negative changes in terms of production or employment in other sectors. The German automotive sector illustrates this phenomenon. It mirrors how the demand for motor vehicles had an impact on other industries and whether this impact is constant (DG Enterprise and Industry, 2011a, p. 9).

The driver for the EU wealth creation is the productivity in manufacturing. Productivity based on production and not on value added brings further evidence concerning the dynamics of the EU labour productivity growth. Overall productivity growth, measured as production per hours worked, for total manufacturing amounted to 2.3% in 2000-2010. In the period 2000-2005 this indicator was 2.6% and in 2006-2010 it fell to 1.9%. In 2010, the productivity grew in five sectors: beverages, clothing, leather, computer, electronic and optical products and other transport equipment (DG Enterprise and Industry, 2011a, p. 65).

The labour productivity increased through the implementation of innovations in the real sector, as well as by “outsourcing” operations in manufacturing business activities like logistics, information and communication activities, market services. The growth of labour productivity in manufacturing had a significant impact on the improvement of energy efficiency in energy intensive industrial sectors.

The interlinkages and the interdependence (spill over effects) between different sub sectors of the manufacturing industries had a strong impact on the development of the whole business sector of the economies and on the structural changes in the industrial sector. In some of the cases the innovative industries can generate highly positive changes and to underpin the emergence of new sub sectors in the industries.

However, in some of the cases, the structural changes may have strong negative aspects. When firms from the industrial sectors decided to delocalize their production abroad, because of considerations for increasing their competitiveness by lowering costs, increasing their productivity and innovation. In the post crisis period, the manufacturing sectors of EU developed countries succeeded to reduce labour costs and increase productivity.

The restructuring of manufacturing is of vital importance for the further improvement of international competitiveness of EU industries. Without detailing the reasons, the improvement and the reconstruction of European industries depend on the international competitiveness of EU manufacturing. Export market shares provide

insight into the EU external trade position relative to international competitiveness. Gains or losses of market share indicate whether or not the EU industry is gaining competitiveness on the international market (by means of trade).

The EU constitutes a significant part of world trade in manufactured goods. The share of the European Union in world trade is around 1/3 for both exports and imports (WTO, 2014). At the same time, the European single market is important because 70% of total cross-border supply of goods in Europe take place within the EU countries. EU export potential of industrial production increases with the deepening of the globalization and the industrialization of new emerging market. This is confirmed by the increase of EU manufactured goods export on world market. Asia and USA are the two other main trade players, and together with the EU, they accounted for about 84% of the total world export flows (DG Enterprise and Industry, 2011a, p. 95).

The increase in FDI, undertaken by EU MNCs, also contributes to the improvement of production process and to the stability of the industrial sector. The inward and outward FDI are concentrated mainly in financial services and real estate properties. The intra-EU FDI illustrates the close inter-trade ties between the Member States, showing also the vitality of the European single market. About 62% of the stock of EU FDI inflows originates from other EU Member States. More than 2/3 of EU FDI inflows are oriented towards tourism, retail trade, motor vehicles, telecommunications, and some chemical products (DG Enterprise and Industry, 2011a, p. 131).

The increase of the overall stock of EU FDI improves the macroeconomic situation and contributes to the enhancement of international competitiveness of domestic production. Industrial sectors undoubtedly benefit from the improvement and the modernization of the economy of services. Although, the EU FDI outflows are concentrated in vertical investment deals, mainly "resource-driven" sectors as "refined petroleum products", "mining and quarrying", "extraction of petroleum and gas and metal products". The EU MNCs try to gain access to new markets or create "localized market oriented knowledge" which helps EU firms to export their existing technologies and products to foreign markets. We underline that the European industries structure changed significantly because of the European single market and the ongoing process of high international competition. Nevertheless, the European industry keeps its share in world trade with industrial products and so far has managed to resist the high international competition by carrying out foreign investment strategies.

Restoring growth and achieving sustainability require a strategic shift in Europe from cost-based competition to an approach based on the creation of high added value. There is also an increasing demand for greener, more customised and higher quality products. Manufacturing needs to address the challenge of producing more, while consuming less material, using less energy and creating less waste. These are in fact the basic pillars of the research and innovation in production technologies.

3. Bulgarian industries – development and challenges in European context

Bulgarian manufacturing industries experienced significant structural changes when most of the biggest state industries were privatized. Bulgarian industry lowered significantly its size. Many of the enterprises from the heavy industries have lost their economic weight, and the employment in those sectors lowered significantly. The number of workers in the production of basic metals and rolled steel, one of the important sectors of the manufacturing, more than halved (from 23000 to 11000 persons). Some of the sectors of the heavy industries disappeared, although this industry had continued to have a high share of the gross value added (GVA) and a high percentage of the GDP.

The relative share of manufacturing of Bulgaria was 18.6% of GDP in 2009. In the period 1997-2009, it has increased by 0.2%. The relative share of the market services amounted to 44.9% of GDP in 2009, and they increased by 8% in the period 1997-2009 (DG Enterprise and Industry, 2011a, p. 37).

In 2000-2012, Bulgaria was one of the EU countries, where the manufacturing increased its shares of GDP in 2012 as compared to 2000. Bulgaria (+2.8%), Germany (+0.1%), Lithuania (+2%), Latvia (+0.1%) and Romania (+2.8%) were the only EU countries with positive changes in manufacturing shares of GDP in 2012 as compared to 2000 (DG Enterprise and Industry, 2013, p. 19). In 2014 (Q1) the share of the industry to the GDP amounted to 32.7%, registering a decrease of 0.2% in comparison of 2013 (Q1) (National statistical institute data).

Manufacturing continues to provide big shares in the GVA in comparison with other EU countries. This was mainly due to specialization in textile, clothing, processing of raw oil, and production of raw materials. Transport, communications, electricity, gas and delivery of water resources had also higher shares in Bulgarian economy, compared with the EU average.

The industry evolution in Bulgaria after 2000 has been driven by two factors, as follows. *First*, the increase of the effectiveness of capital and labour resources, as a result of the financial and economic stabilization achieved after 2002 and the undertaken institutional reforms. *Second*, the gradual recovery of the physical capital lost during the transition period through a pick-up in domestic and foreign investment.

Bulgarian industrial production increased significantly after 2002, however the positive evolution was halted by the economic crisis, similarly the other EU countries. In 2008-2009 the index of industrial production (IIP) dropped by 18.3%, one of the biggest declines of this index amongst the EU countries. The Gross value added (GVA) per employee and GVA per man-hour decreased mainly because of the rise of the unemployment. Foreign direct investments in manufacturing decreased sharply in 2009, afterwards FDI entries was higher and represented almost one third of the total FDI in Bulgaria (Table 3).

Table 3: Changes in macroeconomic indicators of the real sector of Bulgaria

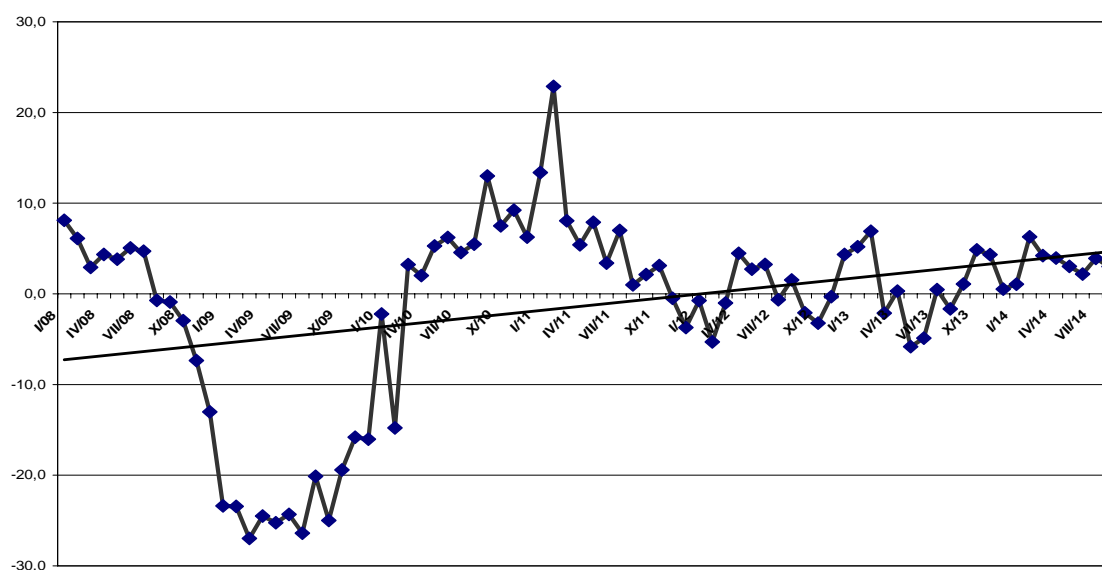
| Indicators | 2009 | 2010 | 2011 | 2012 | 2013 |
|---------------------------|-------|-------|-------|-------|-------|
| 1. GVA ¹ | -2.8 | 0.8 | 2.3 | -0.4 | 1.2 |
| 2. IPP ² | -6.6 | 8.7 | 9.4 | 4.2 | -1.6 |
| 3. IPX ³ | -14.4 | 10.9 | 5.0 | 12.0 | -3.9 |
| 4. IPM ⁴ | -8.7 | 4.6 | 8.5 | 2.2 | -4.0 |
| 5. FDI ⁵ | -9.02 | 47.06 | 21.31 | 46.40 | 33.57 |
| 6. Unemployment % | 9.1 | 9.2 | 10.4 | 11.4 | 11.8 |
| 7. AMW (EUR) ⁶ | 304.5 | 324 | 343 | 365.5 | 404 |
| 8. GDP per capita (EUR) | 3500 | 3500 | 3700 | 3700 | 3800 |

Notes: GVA-Gross value added (annual real rate of change, %), IPP-Index of producer prices (annual % change), IPX-Index of prices of exported goods (changes of average prices on the basis of the previous year %), IPM-Index of prices of imported goods (change in base annual average prices of previous year, %), FDI-Foreign direct investment in manufacturing as a percentage of total FDI in Bulgaria, AMW-Average monthly wage rate.

Sources: BNB, NSI.

The economic crisis had a negative impact on the dynamic processes and structural changes in the Bulgarian industrial production. The negative trend was exacerbated by the parallel shocks and limitations arising from the country's membership in the EU and the adaptive reactions of production, consumption of the national economy during the crisis. The impact of the crisis was felt in 2009 when GVA declined, the overall index of producer prices were low, and prices on imports and exports deteriorated (Table 3). An unfavourable factor was the increase in unemployment, which indicates that the economic activity continued to be low. Bulgaria is at the bottom of the list with a value 53% lower than the average GDP per capita of the EU-28.

Figure 2: Percentage change in the index of industrial production (corresponding month of the previous year), January 2008-August 2014



Source: NSI.

The industrial production in the post crisis period developed unequally, but despite the temporary downturns, manufacturing marked a slight but positive development. The manufacturing development however is continuing to be unsatisfactory against the background of the unstable macroeconomic stance in Bulgaria. The recovery of the industrial production is directly related to the economic and financial recovery of the main trading partners of Bulgaria in the EU, and the revival and incentives for the positive evolution of manufacturing.

3.1. The structure of Bulgarian manufacturing

Heavy industries (basic metals, metal products, machines and equipment, cars, vehicles) employed 21.9% of the work force. The value added provided by heavy industries amounted to 14.6%. The share of those sectors in the industry as a whole amounted to 16.7%. People working in the production of electrical equipment are 3.5% of the work force and the value added is 3.4%. Food and beverages preserve 18.9% of the labour force and give 14.7% of the value added. Chemicals and the production of rubber and plastics give 6.0% of the value added and 6.9% of the workers are working there. The value added generated by the textile manufacturing and the wearing apparel amounts to 9.5%, and the employees there are 22.3% of the work force. The value added of sub-sector "computers, electronics, optical products" is 1.4% of the total and the employees are 1.8% of the work force. The part of the mentioned sectors remained very low (1.2%).

The index of the industrial production (IIP) increased in sub-sectors such as machinery equipment, fabricated metal products, motor vehicles, chemicals, electrical equipment, food and beverages in 2010. After the crisis, there is recorded a fall in textiles and wearing apparel. The employment in the textile production had a dominant share in the overall employment of the country, as well as food and beverages. Despite that the economic crisis hit those sectors of manufacturing, they shrank, but didn't diminish their importance for Bulgarian economy.

A dominant share of the export of industrial production hold the products of the sub-sectors "machinery and equipment", "basic metals", "wearing apparel", "chemicals". The structure of the export by sub-sectors reveals that Bulgarian economy was continuing to be dominated by industrial branches with a technical intensity in manufacturing lower than the EU average. Branches, characterized by negative growth in the developed EU countries, had largest shares and increased role in Bulgarian economy. The exports of products with higher labour work intensity, as production of raw materials, formed the unfavourable export structure of Bulgarian industry (Table 4).

Table 4: Sub-sectors analysis of manufacturing in 2012*

| Sub-sectors of manufacturing | % of manufacturing | % of value added | % of employment | IIP 2010 | Turn-over % 2010 ** | % of Export | % of Import |
|--|--------------------|------------------|-----------------|--------------|---------------------|-------------|-------------|
| Manufacturing | | | | | | | |
| <i>Machinery and equipment</i> | Less 3 | 3.5 | 5.9 | +6.9 | +5.9 | 6.9 | 10.7 |
| <i>Food products</i> | 15.6 | 10.7 | 15.9 | +4.9 p. | +50.5 | 8.5 | 9.1 |
| <i>Fabricated metal products*</i> | 6.4 | 7.0 | 9.0 | +12.0 | +13.3 | 3.6 | 3.9 |
| <i>Motor vehicles, trailers, semi trailers</i> | 1.6 | 1.1 | 3.6 | +48.8 | +36.4 | 3.0 | 4.4 |
| <i>Chemicals, chemical products</i> | 3.5 | 2.0 | 2.8 | +17 | +18.8 | 5.6 | 9.9 |
| <i>Pharmaceutical products</i> | | | | | | | |
| <i>Electrical equipment</i> | 3.7 | 3.4 | 3.5 | +14.2 | +28.8 | 5.9 | 6.7 |
| <i>Computer, electronic, optical equipment</i> | 1.2 | 1.4 | 1.8 | +7 | +19 | 4.3 | 9.0 |
| <i>Rubber, Plastic products</i> | 4 | 4 | 4.1 | +4.2 | +5.4 | 2.6 | 2.8 |
| <i>Basic metals</i> | 4.5 | 2.0 | 2.4 | +1.5 | +36.9 | 18.7 | 7.8 |
| <i>Other Transport equipment</i> | 1.2 | 1.0 | 1.0 | -22.2 | -3.8 | 1.4 | 1.2 |
| <i>Paper</i> | 1.4 | 1.4 | 1.9 | +47.8 | +45.9 | 1 | 2.6 |
| <i>Beverages</i> | 3 | 4 | 3 | +5 (2013) | +4 (2013) | 2.6 | |
| <i>Printing</i> | 1.6 | 1.9 | 1.5 | -4 | -7.3 | 0.003 | 0.04 |
| <i>Wood products</i> | 1.5 | 1.5 | 3.5 | +12.6 | 7.1 | 1.3 | 1 |
| <i>Furniture</i> | 2.0 | 2.0 | 4.6 | +6.4 | +3.6 | 1.5 | 1 |
| <i>Textiles</i> | 2.0 | 1.5 | 2.6 | -3.5 | +2.7 | 2.5 | 5.6 |
| <i>Wearing apparel</i> | 5 | 8 | 19.7 | -5.4 | -1.9 | 10.3 | 2.8 |
| <i>Leather</i> | 0.7 | 1.0 | 2.9 | -0.6 | +13.8 | 1.8 | 1.4 |
| <i>Tobacco</i> | 2 | 1 | 1 | -2 | +6 | | |

* Unless otherwise stated

** Except machinery and equipment

IIP – Index of industrial production

1. Value added represents the difference between the value of what is produced and intermediate consumption entering the production, less subsidies on production and costs, taxes and levies.

2. The number of persons employed is defined as a percentage of the total number of persons working in the various industries: employees, non-employees (e.g. family workers, delivery personnel) with the exception of agency workers.

Source: Bulgarian Ministry of Economy data.

Metallurgy, which is one of the main export oriented industrial sectors, managed to increase the export and the import of metals and metal products and generated a positive external trade balance in 2010 of EUR 1.5 billion, as well as up to 2013. The labour productivity per employee in this sector is four times higher than the average productivity of employees in the total manufacturing of the country. The gross value

added created is 3 times higher than the average in manufacturing.⁵ New contracts in manufacturing were increasing by 42.9% on an annual base. The mining industry, which is of crucial importance for the Bulgarian economy, as it is providing 5% of GDP and is a milestone for almost all the other sectors, restructured some production facilities. About 20% of the largest companies in the sector invested in new technologies and human resources qualification.

The average annual growth of industrial contracts for the EU is 14.3%, while in the euro area is 15.5%. Among the New Member States only Estonia registered a larger increase (of 62.1%) of the industrial production. The positive trends in the development of the Bulgarian industry are a precondition for this sector to become an engine for the restoration of economic growth, if there are favourable economic signals that the EU economy is recovering indeed.

The deployment of the software industry and the outsourcing facilities tended to have a positive impact on Bulgarian industry. The software sector realised 8% growth and the sales on average by 10%.⁶ Around 2/3 of the exports of software was for EU countries. Bulgaria will continue to be an attractive outsourcing destination for special business projects. In 2011 foreign investors are continuing to expand their part of businesses in Bulgaria. The number of employees in the industry reached 12 000 people and has increased by 20%.⁷

The economic crisis impact on EU industry and on Bulgaria showed the need for substantial changes in both the technological level of the industrial base and the generation of significant investments into innovative corporate governance and the production of industries. The main priorities for the Bulgarian industry continue to be the ongoing process of the restructuring of the economy, investments in energy and transport infrastructure, changes in business environment, the improvement of the qualification of the workers, the improvement in education, and the boosting of the innovation and investments in new industrial projects.

Bulgaria has the most energy-intensive industry in the EU. The costs of production are high but quality is below international standards. Labour-intensive industry prevails, nevertheless Bulgaria is situated on an average European level for this indicator.

The main goal is the implementation of innovations in the real sector in Bulgaria. In this regard, there are large and significant differences between the EU countries, those who implement more innovations and those where innovation is not yet a priority. These differences reinforce the weaknesses of and challenges for European industry and this could lead to a new economic crisis.

⁵ According to the Bulgarian Metallurgic Association data, 4.11.2011, p. 2.

⁶ Barometer of Bulgarian IT industry, Bulgarian Association of Software Companies, 2010.

⁷ McKinsey data on Bulgaria.

Bulgaria did not succeed in achieving a higher level of competitiveness. Bulgaria's real effective exchange rate depreciated slightly from its 1999 level to 2005 but appreciated strongly from 2006 to 2009, indicating significantly decreased competitiveness. Concomitantly, nominal unit labour costs in Bulgarian manufacturing decreased between 2000 and 2005 and then sharply increased resulting in an overall increase of 26%, which was significantly above the EU average of 19% (European Commission, 2010, p. 42).

Bulgarian economy had also been subjected to substantial economic pressure in 2014 due to external events such as the crisis in Ukraine, the problems with the prices of a number of raw materials, the closure of certain markets, as well as internal occurrences such as the EU funds freeze and the subsequent re-start of these payments, as well as the additional financial stress caused by the closing of the Corporate Commercial Bank (KTB or Corpbank).

If we add to that the natural disasters, which had a negative impact on the business environment and the development of businesses as a whole, the future development of the economy and the industry seems unpredictable and difficult.

However, in 2015, stressing that the collapse in crude oil prices, which was expected to cause prices of other raw materials, would be beneficial to Bulgaria as the country remains a major importer of energy resources. Bulgaria needed to recover the increase of real economic growth of around 5-9% in order to catch up with other EU New Member States. Unfortunately sources to fuel this growth are too limited. On the one hand, the level of FDI is low, and on the other, the level of absorption of EU structural funds is unsatisfactory. The structure of investments show that the overall domestic and foreign investment amount to around EUR 17-18 billion, of which only EUR 3 billion are EU funds. The internal investment should step up, which can guarantee economic and industrial development, including improving the living standards of the Bulgarian population.

Conclusion

During the last 15 years, the delocalization of many EU companies and the consecutive deindustrialization in some areas of the real sector changed the structure of European industries. The value added as well as the employee number decreased in certain sectors, namely in EU heavy industries. Nevertheless, the EU industry has changed radically with the enhancement of labour productivity and the innovative production facilities in new industrial sectors such as aerospace, informatics, optics, chemical and pharmaceutical or new technologies. The employees in the mentioned sectors acquired better qualification and knowledge. The rise of knowledge-based economy developed new industrial sectors and skills.

Our analysis underscored the relative decline of manufacturing in Europe's GDP and employment, which was the result of many factors. Among them, there are the slower growth in demand for products compared to services, the acceleration in the

pace of productivity growth in manufacturing and the increasing competition coming from the Asian countries. Across most of the manufacturing sectors the decline was evident and this process claimed for reindustrialisation.

However, despite the trends of deindustrialisation, the manufacturing sectors continued to be of primary importance for many EU countries. The structural changes in European industry reflected the shifts towards higher value added activities and the increasing share of services in the manufacturing sector (“servitisation of manufacturing”, according to Veugelers, Sapir, 2013, p. 164). Some scholars consider that the transformation of Europe’s manufacturing towards higher value-added, more innovative and higher skilled activities holds across all sectors, even in traditional ones such as food and textiles (Sapir, Veugelers, 2013).

Alongside with the EU priorities for the enhancement of the role and the meaning of industry in EU countries, Bulgaria has to strengthen its policies for overcoming the disproportion in the structure of manufacturing. The most important factor is the increase of the competitiveness of the Bulgarian production, investing in new technologies and modernizing the old production structure. We consider that there is a need for a clear concept regarding the importance of ecological and energy saving production. It will encourage the development of sectors requiring modern technologies and knowledge. The Bulgarian economic policy must stimulate and attract FDI in export-oriented sectors with relatively high value-added, which would have positive impact on employment in the long-term.

Despite the economic crisis and the sluggish trends of economic recovery, the EU and Bulgaria should seek to accomplish the requirements and the priorities of the Strategy Europe 2020. The main drivers of strong economic growth are competitive firms of all sizes. For this, they require an environment that favours new ideas and new businesses. Consequently significant progresses towards the implementation of the goals included in the Strategy Europe 2020 are required and among them there are: structural changes in the economy, the innovation of industries, the sustainability and resource efficiency, the enhancement of the effectiveness of the single market and a better access of the small and medium-sized enterprises to the markets.

However, disparities in labour productivity and real effective exchange rate hide great divergence between EU Member States and are a prerequisite for further misbalances. Strong European industrial policies and investments are required in order to catch up and to overcome to some extent the differences in the economic and in the industrial sector at the EU level. There are clear downside risks and the fragility of the post crisis period is reflected in the sentiment of uncertainty and the lack of clear economic perspective of growth in Europe.

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