

Structural changes in the industry of the EU member states

Iskra Christova-Balkanska

Abstract. In recent decades, significant changes have taken place in the industrial structure of EU member states as a result of globalization, the activities of multinational companies (MNCs), and EU policies. In search of higher profits, European companies are exporting industries outside the EU, and some sorts of production are gradually disappearing from the developed Western European economies. The global financial and economic crisis, as well as the sovereign debt crisis in Europe, have contributed to the deepening of deindustrialization processes in Western Europe (with the exception of Germany), which has affected the competitiveness of European exports compared with the main competitors on the international market of goods and services.

The restructuring of the European industrial sector is an essential part of the general process of economic reform because the development of high-tech industries in Europe is a secure basis for improving the competitiveness of production and diversifying the export structure of European countries.

The object of analysis of this article is the causes of structural changes in European industry, with an emphasis on the new EU industrial policy that is directing member states to create conditions for the development of the digital economy through the introduction of innovative enabling technologies. The aim of the present study is to identify the European industrial policy for innovative industries in the context of new information and communication technologies, and the challenges facing Bulgaria in this field.

Keywords: F15, L59, L50

Introduction

The European Union's (EU) economic policy is based on three main pillars: structural reforms of the economies of the EU member states; internal and external investments; and fiscal discipline. The structural reforms aim to stimulate economic growth through liberalization of the markets of goods, labour and services. Their basic objective is to enhance labour productivity, to create new jobs, and to stimulate investments in the economies of EU 27 member states.

The restructuring of the industrial sector of the European economy is a significant part of the general course of reforms because the development of high-tech production in Europe is a secure basis for improving the competitive capacity of production and for diversifying the export structure of each member state.

In recent decades, considerable changes have taken place in the industrial structure of the EU member states as a result of globalization and the activity of multinational companies (MNCs), as well as of EU policies. The analysis in this article is focused on the underlying causes of structural changes in European industry. The goal of the study is to identify the European industrial policy for innovative productions in the context of the new information and communication technologies, as well as the challenges facing Bulgaria in this field.

In the first part, the article investigates the underlying causes of the structural changes in European industry. The second part is devoted to the direction of development of European industry as related to achieving the objectives of Industry 4.0 under conditions of digitalization of the economy.

Why has the structure of European industry changed in recent decades?

The structural changes in the economy of the European countries have come about as a result of the changes in international economic relations in the postwar period. They are a manifestation of the deep political, social, informational and demographic changes taking place in Europe and in the world during the last few decades. The European Community (EC) changed the economy and politics of Europe, especially after the establishment of the European Single Market (ESM) and the subsequent harmonization of economic and social policies of the EC member states.

The structural changes in the economy and industry of the West European economies were influenced until the mid-1970s and early 1980s by the theory of effective demand, according to which the state should play a considerable role in the economy. Subsequently, after the link between the dollar and gold was broken (1971) and with the adoption of the neoliberal dogmas of the Washington Consensus, supply theories became predominant.

According to the theories of demand, structural changes in the economy are accounted for in terms of income elasticity of demand for goods and services in different sectors of the economy. The different values of income elasticity in trade of goods and services express the different degrees of development of economic branches. The demand economy is based on effective demand, which underlies economic dynamics. Effective demand is stimulated by state policy and by the distribution of public expenditures.¹

According to the theories of supply, the emerging differences between the productivity of labour in different sectors of the economy (between the indus-

¹ Effective demand is a combination of consumption in society, investments in industries (including capital commodities), centralized government expenditure in priority economic branches and the stimulation of net export.

trial branches) are what basically determine structural changes in the economy. Scientific-technical progress is the “carrier” of the economic and industrial development of a given country or region. According to the principles of the supply economy, the most effective way to achieve high economic growth is to conduct policies that encourage the large companies to produce more goods and services for export. The enlarged trade influence of companies greatly depends on the government, which should pursue a sustained tax and export crediting policy encouraging export. Paul Krugman, David Harper, and John Kenneth Galbraith have stressed that the economy’s opening up to the free market has a rather unfavourable impact on a country’s internal production structure and does not stimulate the real sector. Consequently, the rapid opening of the national economy to the free market is dangerous for the smaller European economies.

In the short-term aspect, structural changes in the economy also come about as a result of temporary cyclic misbalances, speculative trends on the international capital markets, and discrepancies in international payments. In the long-term aspect, they are determined by macro-economic misbalances that have accumulated over time, by discrepancies in the business cycles of the major trade partners, by the poor adaptability of the internal production to the requirements of the new information technologies, as well as by changes in prices of raw materials. Structural changes in the economy have an impact, through monetary and financial channels, on the macro-economic condition of the EU member states, and on economic growth.

The production branches in which new technologies are invested have greater innovativeness. That is where foreign direct investments (FDI) are made, the effectiveness of production is improved, and qualified workers are recruited. A country’s industrial policy contributes to the development of competitive export-oriented production. The spread of good practices in industry favourably affects export-oriented branches and the country’s economic growth.

Changes in the international economic environment that promoted changes in European industry during the period prior to the global financial and economic crisis

The industrially developed European countries have a developed industrial basis and manufacture a large share of the world industrial produce oriented to export.² Significant changes in the European industrial structure came about with the establishment of the European Community. The heavy industry branches were restructured, whereby production capacities were shut down in metallurgy, heavy machine building, and harbour technology. Branches of light industry, such as textile industry, became less important for the development of West European economies.

Starting from the late 1960s, American companies invested in West European economies, taking advantage of the overvalued dollar with respect to the European currencies, and acquired share capital in European companies. The

² The greater part of the industry was concentrated in the Southern England, Benelux, West Germany, Eastern France, Northern Italy, and Switzerland; these countries and regions (known as the “Blue Banana”) were the centres of European processing industry.

penetration of American capital into the European financial markets made possible the transformation of capital ownership in Europe. This gave American companies an opportunity gradually to push some of the larger and medium-sized European companies out of certain markets (Moussis 2015).

In the 1980s, the policies of the European Commission (EC) became oriented to stimulating the development of European companies, including by means of subsidies at national and regional level. The main objective was to enhance their role of priority units of European economy and production, especially as international trade in industrial goods and the effectiveness of foreign trade transactions was growing.

An important factor contributing to international trade is the diversification of industrial production in the developed capitalist economies. The reduction of time and distance involved in foreign trade transactions is a continuing trend that allows international companies to expand their access to markets in different points of the world. The decrease of foreign trade and the transportation costs of processed commodities have a direct impact on the structure of the capitalist production process.

Highly developed and diversified production was increasingly dependent on import of various components produced in other developed countries; this intensified international trade connections and transactions within branches.³ The volume of international trade in intermediate processed goods containing raw materials and semi-finished products was also growing.

Structural changes of production stimulated transnational corporations (TNCs) to invest in foreign countries, localizing part of the production processes and/or services in foreign markets and thereby making FDI.

During those years, liberalism, as a feature of international economic relations, and the growing volume of FDI, changed the policies of developing country, which had previously strongly restricted the activity of foreign companies on their local territories. These countries decided to attract FDI in some basic branches of production in order to develop and diversify their economies (Andreff 1999). The developing countries in Asia, Latin America, Central and Eastern Europe (in the early 1990s) opened their internal markets and introduced liberal economic and trade regimes. Liberalization of economic and trade relations made it possible for European companies to increase their expansion to markets outside the EU.

Under conditions of globalization and stronger commercial and investment relations between countries, TNCs played an important role in this respect. The eclectic paradigm of John H. Dunning (1979) explains why under conditions of globalization TNCs make FDI. Dunning's paradigm is based on three factors - ownership, localization, and internalization - based on which the usefulness of a TNC is evaluated when it chooses to make trans-border investments.⁴

³ The foreign trade list of France and Germany (countries with similar production factors) shows that the inner-branch trade between the two countries has a higher share than inter-branch foreign trade.

⁴ Ownership refers to the available information about the host country receiving FDI and the company's ownership rights, which give it a competitive advantage. When deciding

The main incentives for TNCs to make trans-border investments are: easy access to raw materials, expansion of production to foreign markets when internal production possibilities are exhausted, avoidance of custom duties and quotas, increasing competitive capacity through the fluctuations of the real effective currency exchange rate, reduction of competition, avoidance of bureaucratic regulations, protection of industrial innovations and patents.

During the 1980s, the strategies of European companies changed significantly as a result of changes in world trade and investments and growing competition on the international markets. One of the reasons for this was the comparative decrease of the profits of European companies due to changes made in the management of their production in order to overcome losses and enhance competitive capacity. Quite often, the restructuring of companies involved layoffs, and hence growth of unemployment in European industry.

One form of restructuring is to move a company's activity outside the EU, to countries where production costs are considerably lower than in the EU. This has led to reduced production of some kinds of goods in a number of European industrial branches, such as textile. The reduced importance chiefly of European labour-intensive industries due to their delocalization to foreign countries leads to a reduction of the relative weight of European production in the economy. The localization of European companies on trans-border markets outside the EU has a negative impact on their investment plans for capital investment in European industry.

The merging and acquisition of companies outside of Europe is a measure that provides certain benefits with regard to the stabilization of the economic and financial strength of European companies. TNCs expand by acquiring trans-border industrial branches, which enables them to diversify their commodity production structure, to decrease their production costs, to increase the competitive capacity of their export. As a result, the labour-intensive European productions, which are traditional branches of European industry, continue to diminish in importance.

The decreasing importance of these branches, as well as of other major European industrial branches, in the developed European economies, under the decisive influence of liberalism in international economic relations and of the trans-border delocalization of industrial production carried out by European companies, was already defined in the late 1980s as a tendency towards *deindustrialization* of the European economy. Growing globalization enhanced competition between TNCs, whose investment and trade activity was supported actively at regional and national level by the EU institutions (Michalet 1999, 387).

After 2000, trans-border merging and acquisition of companies across the world by European companies increased. The export of production, or out-

to make a FDI, the international companies assess the comparative advantages ensuing from location. Internalization indicates whether it is more profitable for the multi-national company to produce a certain commodity within the national economy or, instead, to invest in the same production in a foreign country.

sourcing⁵, made it possible to transfer many unprofitable European productions and services to trans-border agents who perform the same activity at lower costs. The companies save on economic resources by channeling the free financial resources of TNCs to new information and communication technologies (ICT), while also delocalizing production activities and services to other countries. This allows them to enhance production effectiveness.

Thanks to the development of ICT, outsourcing now includes provision of various services and industrial activities, such as management of innovative production, designing of projects, consultancy services, etc.

Small and medium enterprises (SMEs) are also active in effecting trans-border investments: they transfer certain productions or provide business services to external firms in foreign countries. In most cases, the large companies transfer the performance of certain production-related services to SMEs. The latter, for their part, in striving to make effective deals, turn to trans-border subcontractors.

The results of outsourcing are not entirely positive for companies, because they transfer the risks to the host state through export of various services provided for industrial and trade activities. Delocalization of European productions has a negative impact on the structure of employment in industry, where jobs are gradually abolished without new ones being opened. A similar employment reduction effect in developed European economies is brought about by outsourcing of services for industries. The continuous transfer of production activities and services to foreign countries has decreased the number of workplaces in Europe by 88,000 in 2000-2007.⁶

The elimination of jobs in industry has been attributed to growing deindustrialization in Europe. When a European company opens a subsidiary abroad, it exports not only production but also services requiring highly qualified specialists and company departments devoted to research, marketing and sales. Deindustrialization in Europe practically means that workplaces for highly qualified specialists are moved to a foreign country along with production.

In liberal economic literature, the economic attractiveness of a given geographical region is determined by the strategic goals of the large foreign investors, the TNCs. The delocalization of production by European companies actively promotes the growing economic power of newly industrialized Asian countries, above all, the fast growing economic power of China (Chavagneux 2008).

It is well known that the introduction of ICT leads to a higher degree of robotization of production, which determines job cuts in industry. In the European structure-defining branches, such as motor vehicle production, electrical

⁵ Outsourcing consists in transferring some of the internal functions of a company to an external company. The organization that assumes the performance of the transferred functions is called the destination of the production export.

⁶ In the period January 2002 - October 2007, 8.9% of the workplaces in West European industrial enterprises were eliminated. In Ireland, 27.9% of job reduction was due to delocalization of production or services to foreign countries; in Portugal, 26.3% of the workplaces were eliminated; in Denmark, 23.2% (Eurostat [sts_inpr_q]).

industry, audio-visual technology production, the number of jobs is decreasing due to the implementation of automatized processes in the management of industry. In this respect, job cuts are defined as a necessity ensuing from inner restructuring of the management and organization of production.

Merging of companies and/or acquisition of share capital contribute to concentration of capital in Western Europe, which transforms the structure of the processing industry in France and Great Britain. In Italy and Spain, labour productivity in industry is gradually decreasing. The growth of FDI contributes to the internationalization of production relations, to the enhancement of the commercial and industrial power of TNCs and their penetration into strategic industries located in various destinations in the world.

The changed conditions of international trade and investment relations in the context of the predominant liberal conceptions and globalization of the economy and finances are intensifying competition on the international industrial goods market; the newly emerging economies of Asia are successfully competing in export of European industrial goods. On the other hand, structural transformations of European industry lead to reduction of the relative weight of some productions that are traditional for Europe.

Structure of European industry in the post-crisis period

In the period leading up to the global financial and subsequent economic crisis, the structure of European industry changed under the pressure of industrial production restructuring, the entry of new ICT means of production, and the elimination of productions due to their delocalization to foreign markets. This has changed the growth of the profit margin in industry at lower levels of employment.

The impact of the global financial and economic crisis (GFEC) (2007-2009) on industry in the EU has been extremely negative. From the first quarter (Q1) of 2008 to Q1 of 2009, industrial production in EU 27 fell by 16.7%, and services were reduced by 8.3%. In 2008-2009, 4.9% of jobs in industry and services were abolished (Visocka 2009).

Industrial production decreased in other regions of the world as well, for instance, in the US, but the crisis did not affect so strongly the industrial production in the newly industrialized countries of Asia, and especially in China, where a deep reorganization of the basic capital was conducted based on the implementation of innovative production practices.

The Industrial Production Index in EU 27 in 2009 (2015 = 100) was lower in all EU 27 member states. Only in Greece, Spain, and Finland was industrial production equal to the 2015 level. Industrial production decreased in EU 27 by 13.5% and in euro area by 12.5%. Industrial output fell in EU 27 as follows: by 16% in Bulgaria, by 40.8% in Estonia, by 44.2% in Ireland, by 24.3% in Czech Republic, by 28.6% in Poland, by 28.9% in Rumania. Industrial production sharply decreased in the EU member states of Central and Eastern Europe (CEE), where the level of industrialization is relatively high and industrial production yields a higher share of value-added in the GDP compared with the developed economies of Western Europe. The level of industrial production of West European countries has decreased by an average of about 20%.

In 2005-2008, the prices of high-tech commodities decreased, and after the crises they became stable. The prices of goods produced in medium-tech and low-tech branches of production grew after 2005 (except in 2009). The prices of goods in the branches related to medium-low technologies, as well as those related to the basic metals, which are determined by the prices of energy carriers, grew considerably between 2005 and the end of 2008. After this period, the price index decreased by more than 20% at the beginning of 2009, after which it began to grow (Eurostat [sts_inpp_q]).

In the post-crisis period, West European industry began to improve, albeit slowly, and after 2015 had positive rates of about 2 to 5% (for Germany). The recovery of industrial production in the South European countries (Greece, Spain, Portugal, Cyprus) was too slow, because together with the economic consequences of GFEC, these countries also felt the repercussions of the European debt crisis (2010), displayed in the sharp deficit of liquidity in European banks and the decreased value of the government bonds of the indebted states. These serious financial disturbances had a negative impact on the economy and the processing industry, which was in need of fresh bank loans.

The annual rates of industrial growth in the CEE countries were considerably higher after 2015. Poland and Czech Republic reached higher rates of industrial production growth than Hungary and Slovakia. The industrial production of Rumania grew at higher rates than that of Bulgaria, while the Baltic republics Estonia, Lithuania and Latvia also increased their production considerably compared with the year 2015 (Table 1).

By 2016, investments in industry had grown by 20%, while FDI made possible the creation of new jobs. FDI increased in motor vehicle production, machine building and equipment production, and logistics. The food industry in Europe grew by 43%.

After 2015, Bulgaria, Czech Republic, Poland, Hungary, and Rumania came close to their pre-crisis level of industrial production, and in the last few years, the extraction and processing of mineral resources, the production of electric energy and gas, and the manufacturing industry have grown. The growth of industrial production is particularly strong in Poland, Czech Republic, and Rumania, due to the recovery of the developed European economies. Bulgaria increased its industrial production after 2015, although at lower rates than Rumania. Slovakia had high rates of industrial production, being a country to which many productions in the motor vehicle industry were delocalized (Fig. 1). Concrete measures for restoring European industry have been taken in recent years, aimed at rapid restructuring of the EU processing industry.

Despite the post-crisis recovery of industrial production in EU during the second quarter of 2019, the processing industry in the developed European economies decreased by 0.8%. The disaggregated data for industrial production in the euro area countries show that the processing industry in Germany decreased by 5.0% in this period due to the reduced production of motor vehicles. To the contrary, industrial production in France and Spain grew by 1.0 and 1.4% respectively compared with the second quarter of 2018.

Table 1. Industrial Production Index values for the processing industry by countries; annual data, 2009-2018, 2015 =100

State	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
EU 27	86.5	93.3	97.7	95.5	94.9	97.0	100	102.0	105.7	107.4
EU 28	87.3	93.8	98.0	95.8	95.2	97.4	100	101.9	105.5	107.1
EU 19	87.5	94.2	98.6	96.1	95.3	97.2	100	101.8	105.0	106.3
Belgium	84.4	93.0	98.6	98.1	97.7	101.1	100.0	102.8	105.8	108.6
Bulgaria	84.0	87.2	91.9	91.8	92.3	95.9	99.9	104.1	110.2	112.7
Czech Republic	75.7	82.9	88.8	88.1	88.9	94.8	100.2	103.8	111.4	115.2
Denmark	85.5	88.0	91.8	94.2	96.3	99.0	100.1	104.9	108.2	113.0
Germany	80.5	90.0	97.7	97.2	97.4	99.3	99.7	101.1	104.7	105.9
Estonia	59.2	72.5	88.7	90.4	94.1	99.2	100.0	102.8	106.3	110.5
Ireland	55.8									
Greece	117.2	111.3	101.2	97.6	96.6	98.3	100.0	103.2	106.2	109.1
Spain	104.2	104.7	103.5	95.4	94.2	96.1	100.0	102.6	106.1	107.1
France	95.2	99.2	103.0	100.0	99.1	98.8	100.0	100.5	103.4	103.6
Croatia	105.3	103.1	102.9	97.7	93.8	96.8	100.2	105.6	108.1	107.1
Italy	100.6	107.7	109.4	101.9	99.0	98.9	100.0	102.2	106.0	107.1
Cyprus	139.4	134.3	123.6	110.7	95.5	94.7	100.0	109.3	118.9	129.5
Latvia	67.6	78.4	87.4	95.8	96.2	96.1	100.0	105.0	113.6	117.4
Lithuania	72.4	77.8	85.9	90.3	94.3	95.2	100.0	102.9	110.3	116.4
Luxemburg	91.4	99.1	101.9	96.5	94.2	98.5	100.0	100.2	103.7	103.8
Hungary	72.0	80.5	85.4	84.4	85.9	92.9	100.0	101.2	106.6	110.8
Malta	92.0	101.0	100.6	106.0	100.0	93.8	100.1	95.5	99.0	98.1
Netherlands	90.6	96.9	100.1	99.4	98.3	99.4	100.0	102.9	106.5	109.2
Austria	83.9	89.7	95.7	95.8	96.6	97.7	100.0	102.7	108.2	112.3
Poland	71.4	80.3	86.9	88.1	90.7	94.6	100.0	104.1	112.1	118.3
Portugal	99.0	99.6	98.3	95.4	95.8	97.6	100.0	100.0	103.5	103.2
Rumania	71.1	74.8	81.0	83.5	91.0	97.8	101.2	105.8	115.6	121.6
Slovenia	85.9	92.3	94.0	92.2	90.8	94.2	99.4	108.2	117.9	124.3
Slovakia	67.1	77.7	83.0	88.2	90.0	93.6	100.0	105.1	108.7	112.0
Finland	100.2	105.2	108.5	106.4	102.4	100.9	100.0	104.5	108.7	112.0
Sweden	96.7	104.7	107.7	103.7	99.3	97.0	100.0	102.0	106.8	110.4
UK	93.2	97.4	99.8	98.1	97.2	100.0	100.0	101.3	103.9	105.0

Source: Eurostat [sts_inpr_a].

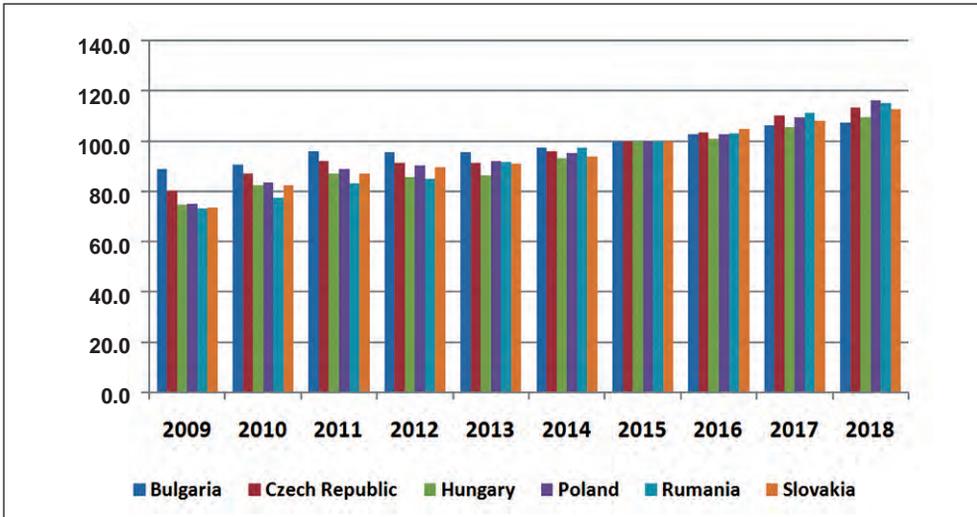


Fig. 1. Industrial production, including extraction and processing of mineral resources, manufacturing industry, electricity, gas, steam and conditioners, in Bulgaria, Czech Republic, Poland, Hungary, Rumania, by years in the period 2009-2018

Source: Eurostat [sts_inpr_a].

Industrial production, considered by countries, is different compared with the same period in 2018. Processing industry production grew by 5.6% in Lithuania, by 5.4% in Estonia, by 4.6% in Belgium, by 3.2% in Finland and Slovenia. By contrast, industrial production decreased in Austria, Malta, the Netherlands and Portugal.

The emerging misbalances and decrease tendencies in European industrial production by the end of 2019 are determined by the forthcoming tension - expected to arise from Brexit - in trade of industrial goods between the United Kingdom and the EU, as well as by the foreign trade disagreements between the US and China related to the introduction of custom duties on the basic import-export goods of the processing industry (World Manufacturing Production 2019).

High-tech productions in Europe are developing at various rates. During the years of this economic crisis, the decrease of production with high value-added was due to the reduced production of computers, electronic and optic equipment, which amounted to 48% of the high-tech produce of the EU 27 countries.

The production of aviation and space technology amounted to 12% of high-tech production; these branches were not reduced by the crisis. Pharmaceutical production, amounting to 40% of European high-tech industries, also did not decrease during the crisis, while in the post-crisis period, sales in this branch decreased only in the year 2011. High-tech production decreased by less than 10%, and in the post-crisis period, these branches recovered considerably faster than other industries. From the end of 2010 to the end of 2012, the production of aerial vehicles and space technology grew by 17% (Eurostat [sts_inpr_q]).

Table 2. Share of value-added of the processing industry in the GDP by regions according to current prices (%)

Region	1995-1999	2000-2004	2005-2009	2010-2013
World	18.0	16.5	15.7	15.8
Countries with developed economies	17.5	15.5	14.0	13.3
Asia	21.0	19.3	18.8	18.0
America	16.1	14.0	12.5	12.0
Europe	16.6	15.5	15.5	15.8
Western Europe	13.0	11.6	10.0	9.9
Eastern Europe	19.3	18.2	18.6	18.3

Source: Industrial Development Report 2016, 33.

The data show that, on a global scale, the processing industry's share of value-added in the GDP decreased. The most significant reduction of its share in Western Europe was from 15.5% in the period 2000-2009 down to 9.9% in 2010-2013 (Table 2).

Although production capacity decreased in the CEE countries due to the shutdown or restructuring of the large state-owned enterprises left over from the time of the planned economy, the value-added of industry contributed a larger percentage to the GDP in these countries compared with the Western European developed industrial countries. Thanks to delocalization of industries from Western Europe, the Central European countries were able to preserve a comparatively high share of value-added in the GDP for the processing industry.

The countries of Central Europe (Poland, Czech Republic, Slovakia, and Hungary) were able to compensate for their economic lag and to improve their living standard thanks to their developed export-oriented industry. Their economic development comes close to that of the EU member states in Southern Europe. These countries, as well as Rumania, were successfully able to invest monetary resources in the development of the industrial base through EU investment funds, and attracted a considerable amount of FDI. By contrast, Bulgaria is lagging behind them and needs much larger EU funding and FDI to restructure and modernize its industry and economy for the purpose of compensating for the lag.

Germany's industrial base ensures the country's macro-economic stability and provides for the development of EU member states; it is also the motor of the European economy. Germany attracts and controls the localization of global value chains (GVCs) in the competitive branches of the German economy. The country has a long-term advantage in high technologies, a well-qualified workforce, and a developed infrastructure. The export of goods with medium value-added and of high-tech products amounts to 73% of the country's export, which indicates the competitive capacity of the German economy in this field compared with its main rivals in Asia and North America. The share of Germany's processing industry in its GDP has been growing in the long term, and the country's specialization and production capacity has been improving.

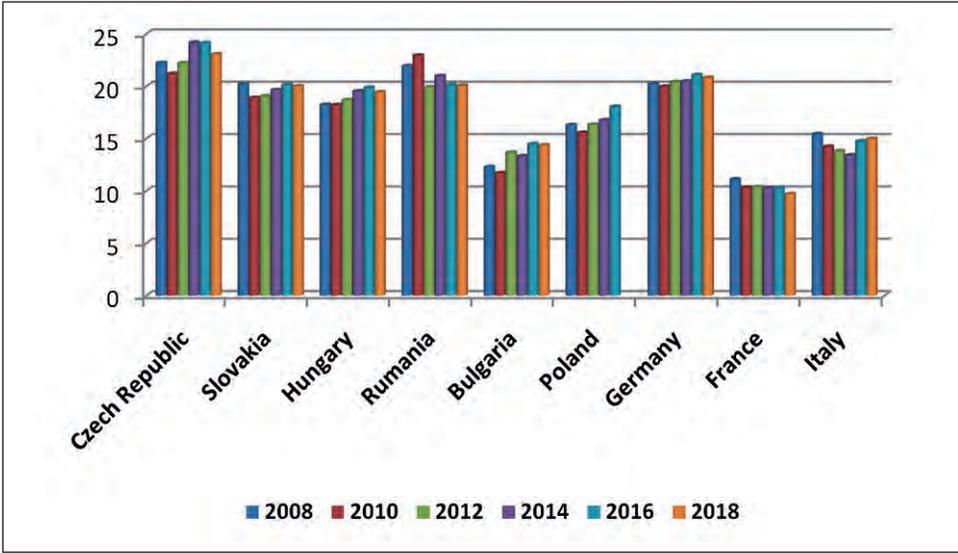


Fig. 2. Share of value-added in the processing industry of EU member states from Western and Central and Eastern Europe (% of GDP of the respective country)

Source: Manufacturing, value-added (% of GDP)

The data show that the share of value-added of German industry is considerably higher than that of France, one of the major EU economies: France's share is only 10% of its respective GDP, while that of Italy is approximately 15% (Fig. 2).

In the post-crisis period, the global value chains located in the EU have continued to delocalize part of the motor vehicle manufacturing industry to Czech Republic, Slovakia, Hungary, Rumania, where, according to data from the International Organization of Motor Vehicle Manufacturers (OICA), approximately 19% of the European motor vehicle manufacturing takes place, compared with only 9% in 2004. Some examples of delocalization are the opening of a factory of the French company Peugeot, providing 900 workplaces, in Trnava, Slovakia, and a Volkswagen factory, with 7,500 workplaces, in Bratislava (2010-2011). The trend is continuing with the forthcoming investment to be made by Volkswagen: this is a classic example of competition between countries for attracting foreign long-term capital that creates jobs.

Another important indicator of the relative decrease of industry's share of value-added in a country's economy is the Competitive Industrial Performance (CIP) Index⁷, calculated by UNIDO. Countries are classified into five basic groups based on the values of their CIP indexes: *high, high middle, middle, low*

⁷ The CIP index is the basic indicator of long-term sustainable economic growth; it enables ranking countries by their competitive capacity. Changes in value-added, produced by the processing industry, and in the export of industrial goods determine a country's competitive capacity.

middle, and *low*. The countries classified in the upper part of the scale produce about 83% of the world value-added of processing industry, and realize more than 85% of world trade in processing industry products (Industrial Development Report 2016).

The CIP index was calculated for 150 countries for 2018. The value-added produced by production branches in these countries amounted to 12.3 trillion dollars, which corresponds to 15.6% of the global GDP. At present, the index includes more variables and takes into account the specificities of the geographic regions, thereby distinguishing more precisely the differences in productivity of labour across countries and providing a generalized picture of the world manufacturing sector. The developed European economies hold some of the top positions by the CIP index.

The industrialized states of Central Europe figure in the upper range of the CIP scale. Poland significantly improved the competitive capacity of its industry, reaching 21st place already in 2013. Slovakia and Hungary improved the export positions of their industrial goods. The CIP index of Czech Republic is equal to that of Ireland. Thanks to the production of goods with higher value-added, Lithuania has improved its competitive capacity, although the share of industrial goods has decreased in the total volume of its export.

In the ranking of countries for 2015-2016, Czech Republic, Poland, Hungary, and Rumania are in the upper range of the scale, while Bulgaria moved to 54th place in 2016, up from 57th place in 2015. Despite the positive trend, Bulgaria is lagging considerably behind the other member states from Central Europe, as well as from Rumania (we should consider that Bulgaria and Rumania were in a similar economic condition in 2007, the year they became members of the EU (Table 3).

A characteristic feature of the post-crisis industrial development of EU member states is that, except for Germany, which continues to maintain its role of foremost industrial power in Europe, industrial production in the other developed West European economies has grown slowly; this is due to the shutdown of a number of traditional European productions, to the delocalization of production to states outside the EU, and to insufficient investments for implementation of modern technologies and management practices. These factors have a negative impact on the development of European industrial production, which is gradually losing its competitive capacity compared with the fast-developing economies of Asia. The reduction of industrial production in the long term is affecting employment, the attraction of FDI, and the implementation of innovative technologies and management practices.

In the context of the degree of development of capitalism, which can be characterized at this stage by *financialization*⁸ of the economy, there is a growing supply in Europe of various financial and industrial services that have a quick

⁸ The term *financialization* was coined in connection with the rapid development of capital markets and banks, and indicates the prevailing influence of financial markets on the economy.

Table 3. Ranking of EU countries by Competitive Industrial Performance (CIP) Index, 2015-2016

Ranking 2016	State	Value of CIPI 2016	Ranking 2015
1	Germany	0.5234	1
7	Ireland	0.3172	8
8	Belgium	0.2807	8
9	Italy	0.2733	9
10	Netherlands	0.2707	10
11	France	0.2679	11
14	Austria	0.2389	14
15	Sweden	0.2254	16
16	UK	0.2191	15
17	Czech Republic	0.2148	18
19	Spain	0.2044	19
21	Denmark	0.1715	21
23	Poland	0.1651	23
24	Slovakia	0.1604	24
26	Hungary	0.1493	26
27	Finland	0.1457	27
31	Slovenia	0.1109	34
34	Portugal	0.1026	37
37	Rumania	0.1015	36
40	Lithuania	0.0818	39
42	Luxemburg	0.0728	42
48	Estonia	0.0647	48
52	Greece	0.0591	52
53	Croatia	0.0552	54
54	Bulgaria	0.0524	57
65	Malta	0.0398	70

Source: Competitive Industrial Performance Report 2018, 27.

turnover and high profit margin. A number of companies refrain from investing in large production capacities without ensured funding from a large group of investor companies with the support of the state and of the European funds. This process is slow and requires long-term projects for the future industrial enterprise.

The economic crisis and the subsequent European crisis of government bonds indicate that the reduced share of European industry in the GDP of Europe has enhanced deindustrialization of the European economy and leads to even greater reduction of employment in industrial production, especially in the developed economies of Europe.

Trends in the development of European industry

In 2014-2015, the European Commission again prioritized the problem of deindustrialization of the Western European economies and outlined concrete measures for *reindustrialization* of Europe.

Under conditions of globalization and increasing competition between states with fast-developing economies, the economic prosperity of Europe in the long run depends, among others, on the strengthening of its industrial base and encouraging low-carbon economy - and not only on the development of the financial sector and services.

The future of European industry is based on scientific research and innovations, which are key factors of new technologies.

Although, as mentioned, the EU member states hold the top places in the CIP ranking, the European companies and SMEs are not adapting quickly to the dynamically changing economic and technological environment of the world. SMEs in the EU represent 99% of all enterprises in the EU and provide two thirds of the employment in the private sector.

European companies are having continuing difficulties with regard to access to funding due to imbalances accumulated during the economic crisis and the European debt crisis, which has undermined liquidity and the general financial condition of European banks. This predetermines the continuing selective and difficult crediting of European companies by banks.

The restructuring of European industry on an entirely new basis requires considerable investments, which far exceed the present financial capacities of many European companies, especially SMEs, which compose the basic network of European industrial production in the developed economies. In view of achieving the goals of Industry 4.0, it is of essential importance for the EU to orient itself to a digital economy and introduce enabling technologies. It is expected that the application of digital economy will increase by 75% the economic influence of the traditional European branches by improving productivity and competitive capacity.

At present, only 1.7% of European companies gain new business opportunities from the advantages of the digital economy, and 41% of European business does not utilize any of the opportunities provided by the digital economy. Around half of the European companies working in the processing industry have not implemented advanced technologies and do not plan to use them in the near future (Reindustrialisation of Europe 2015).

The digital economy and the new business models are changing the traditional GVCs. The new business models facilitate access to international markets, selling specialized and “smart” production and services, and enhancing the opportunities for funding of innovative SMEs and newly emerging companies in the IT sector. The digital economy aids the link between the streams of trade and of services accompanying the sale of goods on the international markets. The provision of “smart services” is part of integrated industrial production. An example of this is the production and sale of automobiles, which includes servicing the motor vehicles.

Europe has developed industrial production in the field of space industry, of advanced processing industry technologies, of the Internet; but it is lagging behind with regard to investments in enabling technologies (including expanded and advanced production, nanotechnologies, biotechnologies, micro and macro electronics, photonics and the production of improved and modern materials). The comparison between the period 2010-2012 and the year 2020 shows that improvements are envisaged in all branches of enabling technologies (Table 4).

The restructuring of European industrial production based on enabling technologies leads to concrete changes in the EU industrial policy (announced in 2012) aimed at increasing the role of industrial production.⁹ The main goal defined by the EU is to create a favourable environment for the developments of industries in seeking a balance between regulations and freedom of implementing innovations in production.

EU industrial policy is based on four pillars of restructuring. *The first pillar* is the creation of a clear and transparent framework for stimulating and increasing investments in industrial branches producing high-value-added goods. The *second pillar* refers to increasing the export of goods from the EU, reforming the ESM, and facilitating European export to the international markets of

Table 4. Implementation of enabling technologies in Europe in 2010-2012 and in 2020 (%)

Branches	2010-2012	2020
Enabling Technologies		
Space technology	28	38
Advanced technologies in the processing industry	18	22
Internet	between 4 and 5	10
Modern materials	-5	-11
Robotics. Micro and nanoelectronic technologies	-7	-4
Nanotechnologies	-8	2
New generation of electronic components and systems	-9	-4.5
The Internet of the future	-12	-2
The computers of the future	-14	1
Cyber security	-17	-17
Biotechnologies	-18	-5
Preparing the population for the digital age	-19	-1
Technologies, content and management of information	-24	-9

Data from: Study on EU Positioning 2016, 12.

⁹ Some relevant publications: European Commission 2012; European Commission 2014a; European Commission 2014b.

third countries. The *third pillar* is funding of enterprises through public and private funds. The *fourth pillar* is related to structural changes in industry based on improving the education and skills of the labour force. Investments in industry are channeled to new, fast-developing modern industrial activities and branches, such as technologically advanced production, key enabling technologies, bio-based products, clean transport, including clean sea transport, sustainable buildings and resource efficiency, smart networks.

The European Union has introduced a package of measures for improving the competitive capacity of the industrial enterprises both within the framework of the ESM and on the international markets. These policies work in a wide range and encompass horizontal programs for the development of European industry and initiatives addressing specific branches. Without setting new requirements or restrictive measures, the programs are based on three factors - flexibility, sustainability, and innovation.¹⁰

In order to achieve these objectives, the EU has mobilized more than 740 billion euros for investments in key programmes. Under the Plan for Transparency and Technical Assistance, 315 billion euros of investments are allotted in the course of three years. The funding under the EU Framework Programme for Research and Innovation (Horizon 2020) amounts to 80 billion euros (2014-2020). The Programme for the Competitiveness of Enterprises and SMEs (COSME) has a budget of 2 billion euros. The European structural and investment funds have at their disposal a total of 350 billion euros meant to support the economic development of the EU member states (see Table 5).

The data indicate the EU has envisaged measures for achieving these priorities for industrial development in a middle-term aspect. Many of the initiatives are being implemented successfully based on the planned investments in the main industrial branches. The distinctive feature of industrial policy is that it is combined with the building of a single energy and capital market and with qualification of the workforce.

The structural changes in European industry reflect changes taking place in the sphere of production and the stimulation of production of high-value-added products, as well as the expansion of the share of services as part of the processing industry (*servitization of manufacturing*). Sapir and Veugelers have stressed that the changes in the European processing industry towards highly productive activities requiring a skilled workforce are having an impact even on traditional European industrial branches, such as the production of beverages and textiles (Sapir, Veugelers 2013).

EU policy for the development of industry and companies is based on implementation of innovations for the creation of new sources of economic growth, on support for SMEs in the field of industrial production, on ensuring the expansion of trade in industrial goods, as well as on channeling considerable EU investments to innovative and space technologies.

¹⁰ The main initiatives in this respect are the Investment Plan for Europe; the European Single Market Strategy; the Digital Single Market Strategy; the Circular Economy Package; the Energy Union; the Capital Markets Union; the New Skills Agenda for Europe.

Table 5. Basic priorities of industry in Europe in the period 2020-2030

Challenges	Measures	Investment intentions for development of European industry
Access to funding	European investment plan; Capital Markets Union	30 billion euros from the Investment Fund to be distributed for projects generating 168 billion euros of additional investments; 16 billion are invested in 9,000 projects for research and innovation. Under Horizon 2020, 200 approved initiatives aim to facilitate regulation and improvement of the investment climate. Up to 2019, 33 events for an integrated capital market were held.
Resource conservation	Energy Union, Circular Economy Package	The pure energy goals are defined up to the year 2030. They are the following: 40% reduction of greenhouse gas emissions; 27% share of renewable energy sources (RES); 27% improvement of energy efficiency. Legislation for waste reduction and reuse leads to 8% annual savings on the annual business turnover in industry.
Access to digitalization	Single Digital Market	European Platform for linking the national digitalization initiatives. Investments to the amount of 500 million euros for establishing hubs for innovations in digitalization and free statistical data.
Access to Global Value Chains	Single Market, Trade Policy Strategy	Providing service packages from the European online e-card. Suppliers of services expand their business to other member states. Designing easy-to-use instructions for applying the rules of cooperation between the economies.
Skills development	New Skills Agenda	Inter-branch partnership for workers' skills development, involving funding to the amount of 30 million euros in six major European industrial branches: motor vehicle construction, naval technology, space, defense, textile industry, and tourism.
Regulation	Better Regulation Plan	Regulatory initiatives for restructuring business units in order to accelerate their development.

Data from: European Commission 2017.

Conclusion

The reindustrialization of European processing industry based on integrated digital technologies is a necessary condition for maintaining Europe's industrial power and strengthening the competitive capacity of its industries. Sustainable development of the European industry requires implementation of an industrial policy tied to reforms in the other sectors of the economy as well, an objective that the EU has set itself and is pursuing.

European industry is adapting to the requirements of the new industrial revolution. One of the features of the latter is the lifting of restrictions on the activity of GVCs, which are the main suppliers and users of industrial products and services on the global scale. Although the large European companies are in the top rank with regard to production and trade in goods and services with above-medium value-added, their competitive position on the world market depends on the implementation of new and future technologies. The shift to sustainable (circular) and low-carbon economy requires considerable capital investments in the new industries.

The main goals of Bulgarian industry in the context of the adaptation of processing industry to the new European industrial policy is to invest in the restructuring of Bulgarian industry, in the infrastructure and in the education and qualification of workers. One of the ways to achieve this is to develop productions that are part of the general production process of the GVCs - since Bulgaria does not have the capacity to build new industrial structures possessing complex optical and technological equipment.

This would make possible the implementation of clean and energy-saving production in Bulgaria. The concrete steps taken in this direction will contribute to raising the sub-branches of the processing industry to higher levels of technological renewal, which in turn will attract FDIs. Such a trend would help improve the competitive capacity, enhance investments in enabling technologies and promote the development of SMEs. The main carrier of economic growth is the development of a network of various-sized competitive processing industry companies.

References

Andreff 1999: W. Andreff. Peut-on empêcher la surenchère des politiques d'attractivité à l'égard des firmes multinationales? - In: A. Bouët, J. Le Cacheux (dir.). Globalisation et politiques économiques: les marges de manoeuvre. Paris: Economica, 1999, 401-423.

Chavagneux 2008: Ch. Chavagneux. Le double visage des fonds souverains. - Alternatives Economiques, 2008, 266, 11-12.

Competitive Industrial Performance Report 2018: Competitive Industrial Performance Report 2018. Biennial CIP report, edition 2018. United Nations Industrial Development Organization, March 2019.

European Commission 2012: European Commission. A Stronger European Industry for Growth and Economic Recovery. COM (2012) 582 final. Brussels, 2012.

European Commission 2014a: European Commission. An Integrated Industrial Policy for the Globalisation Era. Putting Competitiveness and Sustainability at Centre Stage. COM (2014) 614. Brussels, 2014.

European Commission 2014b: European Commission. For a European Industrial Renaissance. COM (2014)14/2. Brussels, 2014.

European Commission 2017: European Commission. Industry in Europe. Facts & Figures on Competitiveness & Innovation. Luxembourg: Publications Office of the European Union, 2017.

Eurostat [sts_inpr_a]: Production in industry - annual data. - In: Eurostat. Available from: https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=sts_inpr_a&lang=en [Accessed: 5 November 2019].

Industrial Development Report 2016: Industrial Development Report 2016. The Role of Technology and Innovation in Inclusive and Sustainable Industrial Development. Vienna: United Nations Industrial Development Organization.

Industrial production statistics: Industrial production statistics. - In: Eurostat. Statistics Explained. Available from: <https://ec.europa.eu/eurostat/statisticsexplained> [Accessed: 5 November 2019].

Manufacturing, value added (% of GDP): Manufacturing, value added (% of GDP). - In: World Bank. Data. Available from: <https://data.worldbank.org/indicator/NV.IND.MANF.ZS> [Accessed: 5 November 2019].

Michalet 1999: C. A. Michalet. Un nouvel impératif de la politique industrielle dans la globalisation: l'attractivité. - In: A. Bouët, J. Le Cacheux (dir.). Globalisation et politiques économiques: les marges de manoeuvre. Paris: Economica.

Moussis 2015: N. Moussis. Access the European Union Law, Economics, Policies. 21st updated edition. Cambridge, 2015.

Reindustrialisation of Europe 2015: Reindustrialisation of Europe: Industry 4.0 - Innovation, jobs and growth, 2015.

Sapir, Veugelers 2013: A. Sapir, R. Veugelers. Manufacturing Europe's growth. Europe's policies should focus on the high-end industries driving Europe's productivity growth. - In: R. Veugelers (ed.). Manufacturing Europe's Future. Bruegel Blueprint Series, 21. Brussels: Bruegel Publication Launch, 2013.

Study on EU Positioning 2016: European Commission, Fraunhofer ISI. Study on EU Positioning: An Analysis of the International Positioning of the EU Using Revealed Comparative Advantages and the Control of Key Technologies. Final Report (July 2016). Luxembourg: Publications Office of the European Union, 2016.

Visocka 2009: S. Visocka. Economic downturn in the EU: The impact of employment in the business economy. - Eurostat. Statistics in focus, 60, 2009, 1-8.

World Manufacturing Production 2019: World Manufacturing Production. Statistics for Quarter II, 2019. United Nations, Industrial Development Organization.

Prof. Dr Iskra Christova-Balkanska
Head of Department "International Economics"
Economic Research Institute
Bulgarian Academy of Sciences
3 Aksakov Str.
1040 Sofia, Bulgaria
Email: iskrachristova@abv.bg