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RE-INDUSTRIALIZATION TO FOSTER GROWTH AND EMPLOYMENT IN THE EUROPEAN UNION

Abstract

In 2010, as a consequence of the financial crisis, the European Commission (EC) developed the Europe 2020 strategy. Within this strategy the EC emphasized re-industrialization and set the goal to enlarge the European manufacturing share of the gross domestic product (GDP) from 14% to 20% by 2020. The intention was to achieve a stronger international competitiveness and to increase the job creation potentials of the European labor markets. Several initiatives were founded on EU and on country level.

This analysis based on literature and empirical data shows that it is more than doubtful if the EU can reach the proclaimed re-industrialization aim. Poland is the only EU member country with a clear re-industrialization trend since 2000. Furthermore, the influence of industrialization on growth seems to depend on the size of the manufacturing share. A direct statistical connection between re-industrialization and employment could not be calculated. De-industrializing countries like Sweden or the United Kingdom also recovered from the financial crisis within two years and had growth rates above average since that time. Hence the manufacturing share alone might not generally be the decisive variable for growth and employment. It seems therefore questionable if the re-industrialization aim of the EC is equally appropriate for all EU countries.

Keywords: Re-industrialization, de-industrialization, manufacturing, growth, employment

1. Introduction

During the financial crisis the production in the European Union (EU) decreased by 10% and three million industrial jobs were lost (European Commission, 2012: 4)[1]. Shortly after the crisis, the European Commission (EC) emphasized the significance of manufacturing for the development of the European economy, because every fourth job was directly in this sector and one more indirectly depended on it. Therefore the EC stressed the "…importance of a strong, competitive and diversified industrial manufacturing value chain for the EU's competitiveness and job-creation potential." (European Commission, 2010)[2] and proclaimed a re-industrialization aim to increase the share of manufacturing of the GDP from 14% in 2010 to 20% in 2020.

Since the 1970s the globalization of the value chain through offshoring, either via foreign direct invest-

ment or via global sourcing, has been a widespread internationalization strategy, especially in manufacturing. Since the early 1990s concerns started to be raised about employment impacts (Hurley, Storrie, 2017: 3)[3]. In recent years, reshoring as a revision of former offshoring decisions gained attention in the media, academic research and especially in the political debate (Backer et al., 2016: 2; Naudé et al., 2019: 4).

The aim of this paper is to evaluate to which extent the stated re-industrialization target of the EC is reached until now by looking at the development of the manufacturing share in the EU as a whole and in different member states. Furthermore, an analysis of the influence of the manufacturing share on growth and employment is carried out to evaluate the effects of re-industrialization on these two variables. This paper proceeds as follows: Section 2 gives a brief overview of the used definitions, as well as the political and theoretical background. Section 3 explains the data basis and the methodology. Section 4 comprises the empirical findings. It starts with a descriptive look at the development of the manufacturing share, growth and employment on country level. After that, the available data for reshoring from the literature are analyzed. Furthermore, the European countries are clustered and compared taking into account variables characterizing the macroeconomic and institutional framework. The paper ends with a conclusion in Section 5.

2. Theoretical background

Industrialization, re-industrialization and de-industrialization are defined by the changes of the manufacturing share in the gross domestic product (GDP) and/or domestic employment (Tregenna, 2011: 5; Peneder, Streicher, 2018: 88; Naudé et al., 2019: 3). This paper follows the EC approach and focuses on the GDP share. Offshoring means generally producing abroad via foreign direct investments (FDI) or global sourcing (WTO, 2005: 266–267)[4]. The European Commission[5] defines reshoring as relocation of parts of the production process previously offshored to another country. It differentiates between nearshoring as the relocation to a site near the home country and backshoring as relocation to the home country itself.

Re- and de-industrialization are integral components of economies' structural change. In the literature, one can find several approaches to explain the drivers of these changes, like different income elasticities of the demand side or technological developments through innovation (Gabardo et al., 2017: 400).

Based on a Keynesian perspective Kaldor (1966) analyzed the influence of manufacturing on economic growth. According to Kaldor's first law, the growth rate of the real GDP depends on manufacturing growth. In his model, manufacturing is the sector with the highest static and dynamic returns to scale, the highest productivity gains and capital accumulation (Keho, 2018: 1). Hence the costs for manufacturing products fall and due to high income elasticity for manufacturing goods the demand increases. With a demand growth higher than productivity gains the sector requires more labor. The additional workforce is absorbed from the other sectors having lower returns to scale or a weak relation between employment growth and output growth (Thirlwall, 2018: 26). Wages in manufacturing are above average, so the increasing income leads again to a higher demand. The expanding demand for manufacturing goods induces further innovation, technological progress (Romero, 2019: 37) and human capital creation through learning-by-doing (Tregenna, 2011: 5). Spillover effects of output growth in manufacturing lead to productivity growth in other sectors (Di Meglio et al., 2018: 1496). When the productivity gains of the economy through manufacturing growth diminish and the domestic market for commodities grows more and more saturated, the GDP growth slows down. Kaldor's first law could be confirmed in several empirical analyses using different data and methods for different country groups and time series (Keho, 2018: 1).

The development stage of an economy plays a major role in this regard. Due to the productivity effect, industrialization takes place during an early stage of development whereas in highly developed countries there is a trend towards de-industrialization (Stijepic, Wagner, 2017: 103). It is well known that Fourastié already in 1949 described the development stages of economies with an increasing income per capita. Economies are transformed from mainly agricultural societies to industrialized countries and later to service economies. Drivers on the demand side are changes of income elasticities and saturation effects, whereas on the supply side it is different sectoral productivity developments that drive the transformation. In highly developed economies, only a higher de-

mand from foreign markets can again lead to higher production and employment in manufacturing, increases in productivity and a higher competitiveness (Thirlwall, 2018: 27).

Romer (1990) developed an endogenous growth model in which increasing returns to scale are explained by increased division of labor and innovation spillover effects (Gabardo et al., 2017: 397). Growth results from the research sector, in which new designs are produced by human capital. Innovations are in the long run non-rival goods. In the short run, innovating companies have a temporary monopoly from which they temporarily gain monopoly rents. These rents are the incentives for further innovations. The determinants of sectoral development therefore are innovations and the accumulation of human capital.

Since the early 1990s trade liberalization, upcoming emerging markets like China and India, as well as market opening of countries, which were at that time still in transition, changed the production process in manufacturing. Today the manufacturing sector is characterized by fragmentation and internationalization of the value chain with consequences for international trade. Companies interact with international suppliers trading goods, services, technology and information (Timmer et al., 2019: 1). International trade is shifting towards an increased trade with intermediates (Stijepic, Wagner, 2017: 104). Offshoring of tasks within the supply chain of multinational companies (MNCs) change the comparative advantages of economies (van Neuss, 2019: 318). All these trends influence both re- and de-industrialization. The eclectic theory of Dunning is the most frequently used theoretical framework for analyzing internationalization strategies of companies like offshoring (Di Mauro et al., 2018: 109).

Dunning (1977) introduced the eclectic paradigm (EP) to research the international allocation of resources through FDI. The kernels of his so-called OLI paradigm are three main interdependent determinants: ownership advantage (O-advantage), location advantage (L-advantage) and internalization advantage (I-advantage). Beginning with the static related activities, the O-advantages result from different company-specific assets like patents, brands or trademarks, but can also result from economies of scale or international transfer pricing. Consisting of particularities related to a specific country, L-advantages can be the different prices associated with important input factors as well as economic or political frame conditions. I-advantages describe the ability of a company to exploit and co-ordinate both the O- and L-advantages (Dunning (1980: 10). In the dynamic perspective, O-advantages result from technological, managerial, organizational or institutional competence and are relatively mobile. The L-advantages arise from assets of a country or region, which are location bounded and important for an MNC to be able to exploit the ownership advantages they have. The I-advantages emerge from the competences of the firm to realize O- and L-advantages better via hierarchy than through market transactions (Dunning, 2003: 4).

For the first time in the internationalization theory, Dunning combined internal O- and I-advantages of companies with the external L-advantage (Calvelli, Cannavale, 2019: 10). The location advantages of foreign markets are generally available for all MNE producing and sourcing there, but the creation of competitive advantages out of these conditions requires firm-specific capabilities (Theyel et al., 2018: 301).

3. Methodology and data

Based on the proclaimed aims of the EC and the theoretical background the following research questions can be derived:

1. Are there in the EU countries trends towards re-industrialization to observe and can the manufacturing share in the EU reach the proclaimed 20% aim by 2020?
2. Did countries with a higher manufacturing share generally overcome the consequences of the financial crisis for growth and employment more quickly than others?
3. Does the manufacturing share generally have a significant influence on growth and employment?
4. Which European economies are similar to each other looking at selected macroeconomic and institutional determinants, reflecting L-advantages?

For answering the first two questions, a descriptive analysis of the development of the manufacturing share in the EU countries as well as growth and employment is carried out on the basis of Eurostat data[6]. The EU countries are therefore grouped by their manufacturing share. These results give

also some hints about the hypothesis that countries with a higher manufacturing share are more robust against external shocks like the financial crisis. The description is complemented by curve fit regression analyses of the development of the manufacturing share over time with manufacturing share as the dependent variable and time as the independent variable to calculate the trend of re- or de-industrialization in the EU in total and in each of the member countries. All statistics were calculated with IBM SPSS Statistics 24. The review period is generally 2000 to 2018 despite the fact that the EC proclaimed the re-industrialization aim in 2010. At that time, several countries had already overcome the financial crisis while others needed more time. Hence the influence of the business cycle could overlay the trend in this time period. For the third question, a correlation analysis is carried out for all EU countries and for the country groups with a manufacturing share above and below average.

Finally, a cluster analysis it carried out with regard to selected macroeconomic variables reflecting aspects of the L-advantage, which are influenced by the respective economic policies of the countries. Therefore, data from the Global Competitiveness Report for institutions, labor costs and infrastructure (for a detailed description see Schwab, 2018)[7] and the country ratings published by Standard and Poor's for 2019 (CountryEconomy, 2019)[8] are taken into account. A comparison between the groups formed according to their manufacturing share and the cluster analysis show the influence of the L-advantage of the country-specific macroeconomic and institutional framework.

4. Empirical analysis

4.1 Manufacturing share

A look at the actual statistics shows clearly that it is more than questionable if the EU can reach the aim of a 20% manufacturing share by 2020. With regard to the period 2000–2018, the average manufacturing share in all EU 28 countries decreased from 16.7% to 13.3 % in 2009 during the financial crisis and recovered again to 14.6% in 2018. The data show that the development of the manufacturing share in the EU28 and in the member countries is influenced by the business cycle, especially by the financial crisis. The EU in total shows a slight trend towards de-industrialization, given a decline of the manufacturing share since 2000. The average in 2018 is used to group the EU countries into those with a share above and below average (see Figure 1).

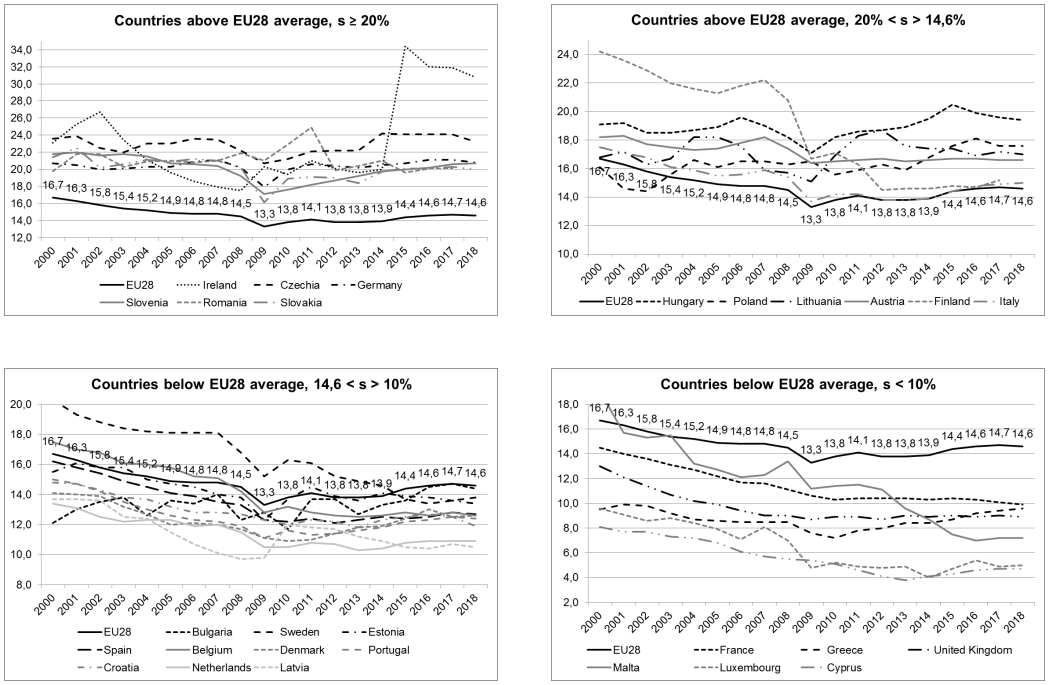
With a 30.8% manufacturing share Ireland ranks the highest in 2018, followed by Czechia, Germany, Slovenia, Romania and Slovakia, all with a share of 20% or above.

In 2000, this group was slightly different, Finland had the highest manufacturing share with 24.2%, followed by Czechia (23.6%), Ireland (23.1%), Slovenia (21.8%), Slovakia (21.4%), Germany (20.7%) and Sweden (20.3%). The country with the largest reduction was Finland, which decreased its share by nine percentage points, followed by Sweden and Belgium. In these three countries a trend to de-industrialization can be observed.

Ireland has also had a high dynamic GDP growth, which has tripled since 1995, whereas the export share of the GDP has grown sixfold. During this process, the manufacturing share increased by nearly eight percentage points. The main reasons for this re-industrialization are seen in the high degree of openness of the country, the low corporate tax of 12.5% and high FDI inflows during the last twenty years. The Irish gross value added (GVA) is dominated by MNCs (Casey, 2019: 11). In Czechia, the manufacturing share is nearly constant with slight fluctuations. That is also true for Germany, where the automotive industry, the machinery industry and the chemical industry are the largest branches, all with an export share of more than 50%. Czechia, Slovakia and Romania are traditional nearshore destinations for manufacturing.

Above average but below 20% is the manufacturing share of Hungary, Poland, Lithuania, Austria, Finland and Italy. Hungary and Poland also belong to the traditional nearshore countries. The Italian industry is characterized by small and medium sized, often family-owned companies. The strength of the manufacturing sector lies in machinery goods, textile and clothing as well as the agricultural and food industries. Italy is particularly well known for luxury products like famous fashion brands and cars (Kangur, 2018: 11). Main industries in the Austrian manufacturing sector are machinery, automotive, agricultural and food production.

Figure 1 Development of the share of manufacturing (s) 2000 to 2018*

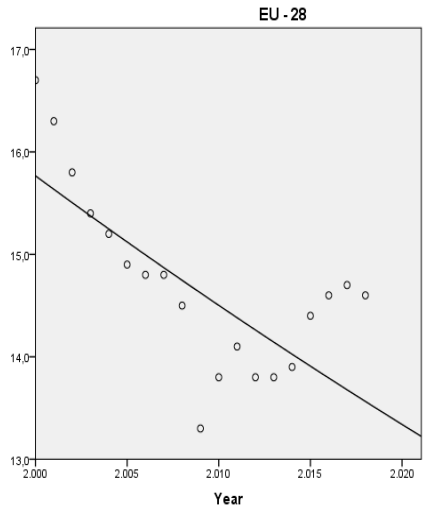


* The development of s is shown in comparison with the EU28 average in 2018
Source: Own representation based on Eurostat, 2019[6]

The regression analyses show a statistically significant trend to de-industrialization in the EU 28 since 2000 (see Figure 2 and Figure 7). For Bulgaria, Czechia, Germany, Greece, Hungary, Lithuania, Romania and Slovakia the regression results are not significant. A clear trend towards re- or de-industrialization could not be identified. For Germany, the plot line is nearly a horizontal straight line, but the fluctuations are too high for a statistically significant result. All the other countries with the exception of Poland have also de-industrialized. Poland is the only EU member country with a clear trend of re-industrialization (see Figure 7, Table 5 in the Appendix).

Hence a trend towards re-industrialization can't be observed all EU countries. It is doubtful if the manufacturing share in the EU will reach the proclaimed 20% aim by 2020.

Figure 2 Curve fit regression for the EU



○ Observation, — Fit line
Source: Own representation based on Eurostat, 2019[6]

4.2 GDP growth

The growth between 2000 and 2018 is influenced by the financial crisis of 2008/2009 and the Euro crisis starting from 2010. The causes and effects of both crises have been extensively analyzed in the literature. Therefore, the following description focuses on the potential influence of the manufacturing share on GDP growth. Generally, countries with a manufacturing share higher than 20% overcame the crises comparably quickly and reached the GDP level of 2006/2007 again in 2011 or 2012 with the exemption of Slovenia, where it took until 2015 (see Table 1 for the EU28 average, Figure 3 for countries).

For all other country groups the results are mixed. The GDP growth of the countries with a manufacturing share between 20% and 14.6% is above average in Lithuania, Hungary and Poland, around average in Austria and below average in Finland and Italy. In both of the latter countries there are dropping manufacturing shares in the same period.

Among the countries with a manufacturing share between 14.6% and 10%, Estonia and Latvia had the highest growth and reached over 130 points in 2018 (2010=100). Bulgaria had an impressive growth too coming from 64 to 120 points in 2018. The Swedish growth rate was also above average. All four countries were affected by the crises, but reached the pre-crisis level of 2006/2007 by 2012 and 2013 respectively; their rates are on par with the countries with an above average manufacturing share of more than 20%. The growth rates in Denmark and Belgium are comparable to the EU 28 average, but it took Denmark until 2014 to reach the pre-crisis level, whereas Belgium reached that level already in 2010. Portugal, Spain and Croatia grew below average and it took Spain until 2017 and Portugal until 2018 to reach the level of 2007. Croatia has not yet reached the level of 2007.

Among the countries with a manufacturing share of less than 10%, Malta had the highest growth and overcame the financial crisis within one year. The United Kingdom and Luxembourg also had an above average growth and recovered by 2012 and 2011 respectively. The economic development in France is in line with the EU 28 average. As commonly known, Greece suffered the most during the financial crisis and was a main contributor to the Euro crisis, due to the country's dramatic indebtedness of both the government and the private sector.

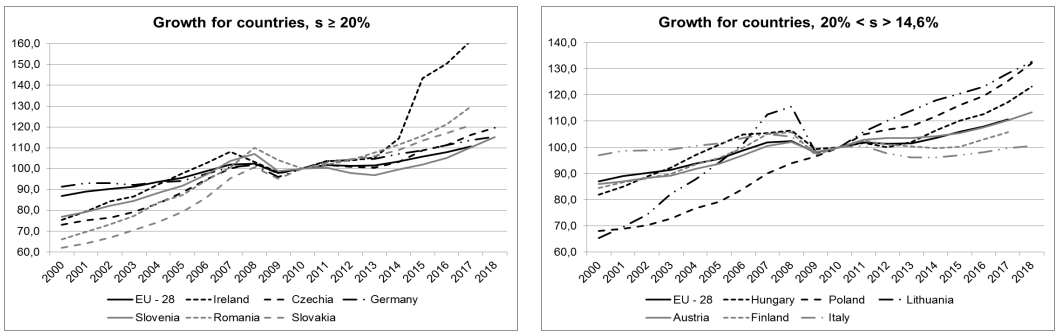
Table 1 GDP growth rate in the EU 28 (2000 to 2018, 2010 = 100)

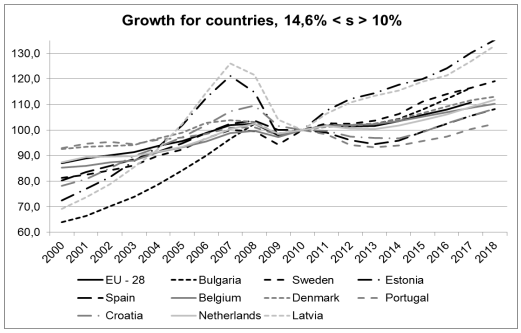
Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
EU - 28	87.0	89.0	90.2	91.4	93.7	95.7	98.8	101.9	102.4	98.0

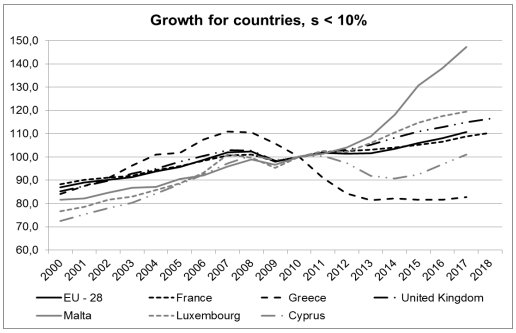
Year	2010	2011	2012	2013	2014	2015	2016	2017	2018
EU - 28	100.0	101.8	101.4	101.6	103.5	105.9	108.0	110.7	113.0

Source: Own representation based on Eurostat, 2019[6]

Figure 3 GDP growth rate 2000 to 2018 (2010 = 100)







Source: Own representation based on Eurostat, 2019[6]

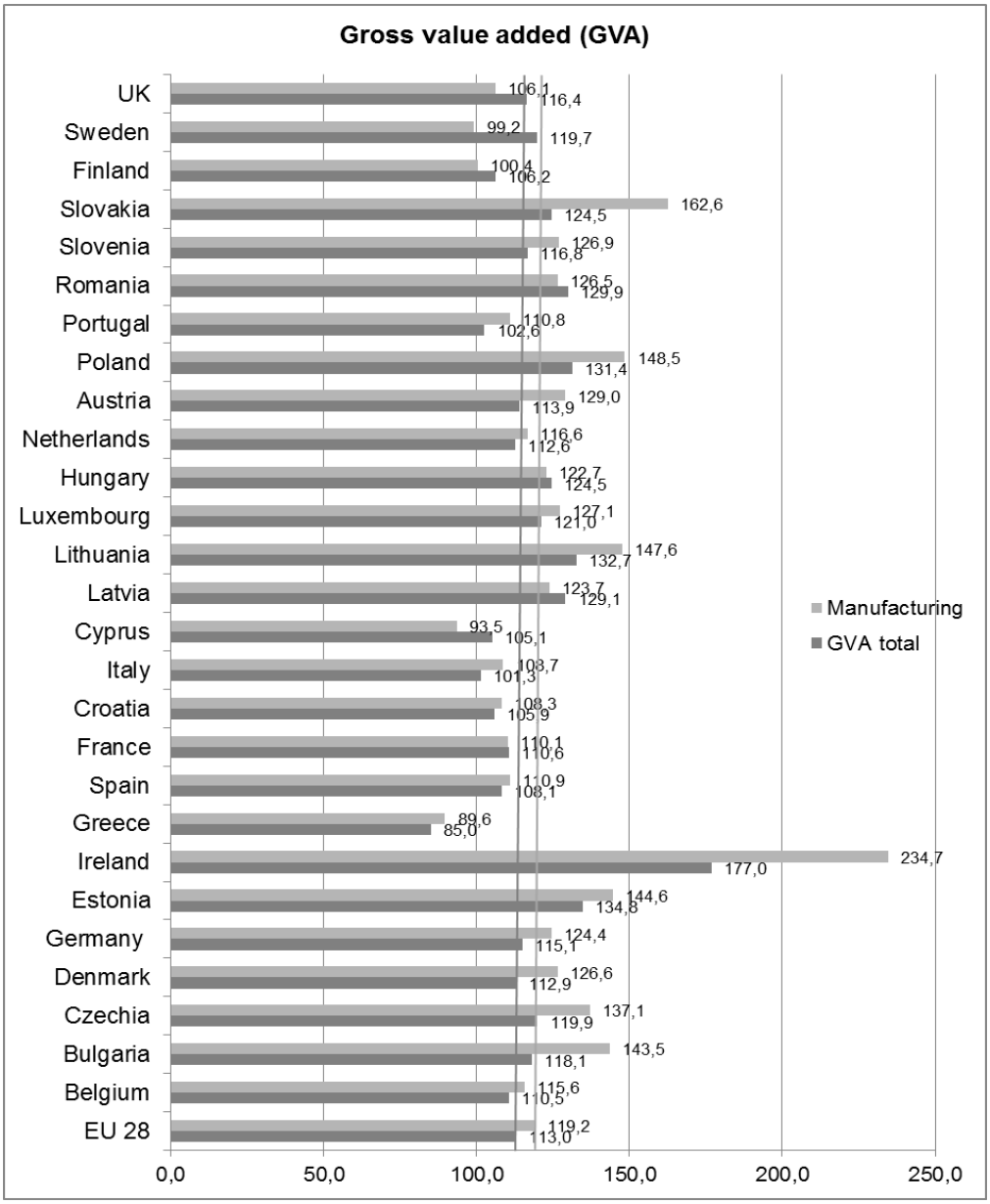
Figure 4 shows the growth rates of the gross value added (GVA) in comparison with manufacturing. One can see clearly that in twenty EU countries the growth rates of manufacturing were higher than the ones of the total GVA. The exemptions are Cyprus, Finland and France with a growth below average in both total and manufacturing specific terms, and a manufacturing growth that is smaller than that of the GVA. In Latvia, Hungary, Romania, Sweden and the United Kingdom the manufacturing growth lies under the total, but the GVA itself grew above average.

4.3 Employment

In all countries with a manufacturing share above 20% the unemployment rate in 2018 was below the EU 28 average of 7% (see Figure 5). Worth mentioning is the decline of unemployment in Slovakia, where the rate decreased from 18.9% in 2000 to 6.6% in 2018. Ireland showed a high crisis sensitivity, the unemployment rate rose from 5.0% in 2007 to 15.5% in 2012, and then sunk gradually to 5.8% in 2018. Germany started in 2000 with an unemployment rate of 7.9%, which increased over time to 11.2% in 2005. Due to the labor market reforms of the Agenda 2010 (Schneider and Zimmermann, 2010) and the positive economic development, this rate was brought down to 3.4% in 2018. It is remarkable that the unemployment rate was nearly stable during the financial crisis. The German Council of Economic Experts (Sachverständigenrat zur Begutachtung der Gesamtwirtschaftlichen Entwicklung, 2012: 20–21)[9] attributes this development to two main aspects: the labor market reforms mentioned above and the institutional reaction of the German government with more flexible working hours and more opportunities for short-time working. In the 1990's and early 2000's several German companies offshored parts of the value chain to foreign countries. During the crisis, companies kept their skilled German personnel and adjusted their labor force in foreign subsidiaries because it was more cost-efficient. The unemployment in Czechia, Romania, and Slovenia developed on a lower level nearly parallel to the EU 28 average.

The situation differs when looking at the other groups, similarly to the one of the growth rate. In the group of countries with a manufacturing share between 20% and 14.6% the unemployment rate was the lowest in Hungary and Poland with 3.7% and 3.9% respectively. In this group, Poland was the most successful because in 2000 the unemployment rate was 16.1% and among the highest in the EU. In Greece unemployment today is still the highest at 19.3% followed by Spain with 15.3%, France with 9.1% and Croatia with 8.5%.

Figure 4 Gross value added growth, 2018* (2010=100)

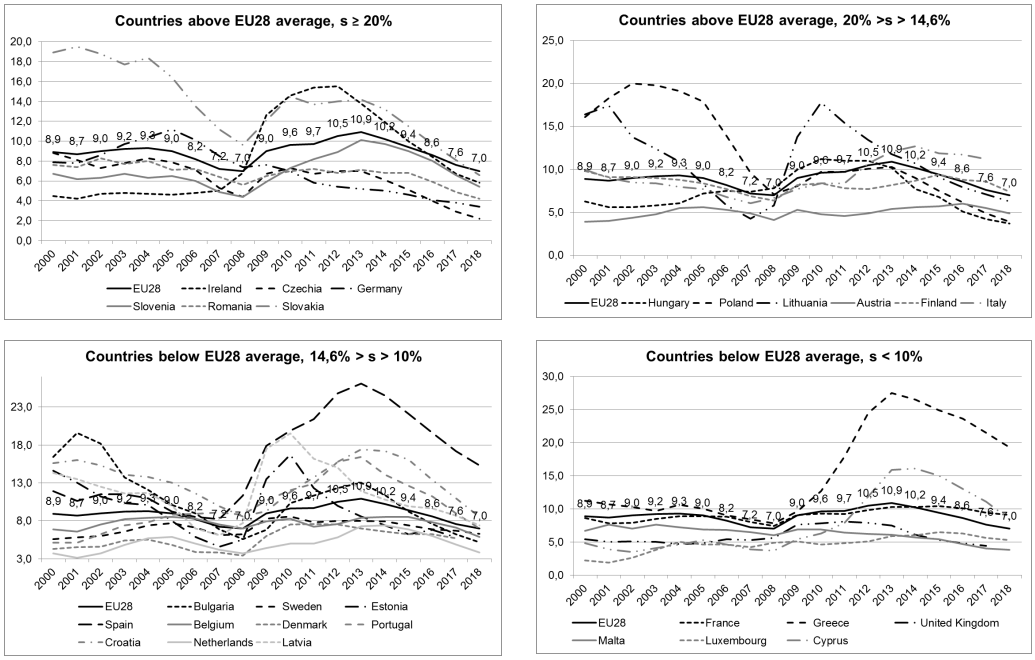


* The lines mark the EU 28 average

Source: Own calculation based on Eurostat, 2019[6].

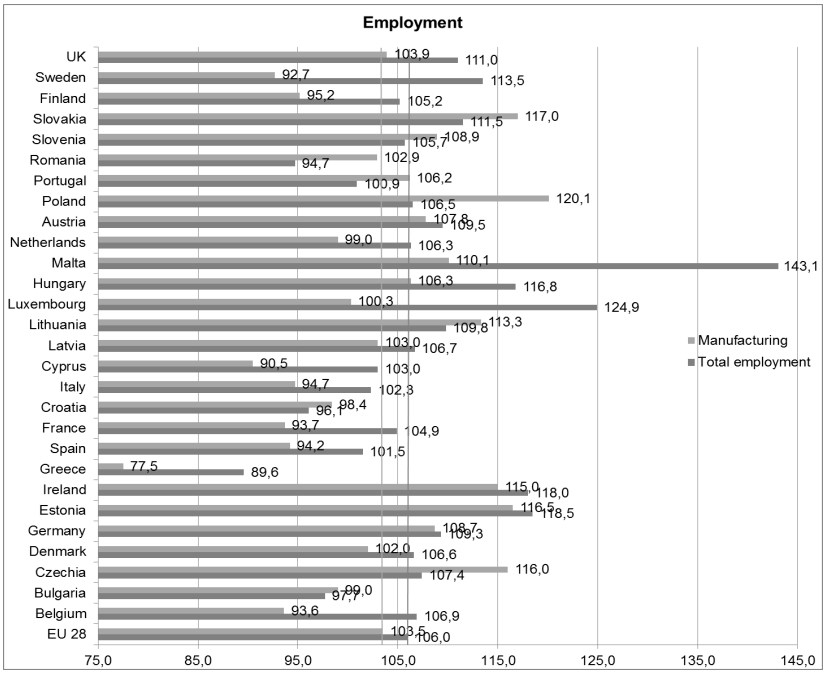
The employment growth of the EU 28 (see Figure 6) lies below the growth rate of the GDP, reflecting an increase in labor productivity (107, 2010=100). In the countries that joined the EU in 2004 or later (Bulgaria, Czechia, Croatia, Lithuania, Poland, Romania, Slovakia and Slovenia), but also in Portugal, the growth rate of the employment in manufacturing was higher than in the economy in total. Hence in all the other countries the employment increase was higher in non-manufacturing sectors.

Figure 5 Unemployment rate 2000 to 2018 (2010 = 100)



Source: Own representation based on Eurostat, 2019[6].

Figure 6 Development of Employment 2000 to 2018 (2010 = 100)



Source: Own calculation based on Eurostat, 2019[6].

In conclusion of the descriptive analysis, there are some aspects which indicate that the manufacturing share influences the economic development of the EU countries. A Pearson's correlation analysis over all EU member countries shows a significant correlation of the manufacturing share with the GDP growth and manufacturing employment both for persons and hours worked (see Table 2). For the total employment and the unemployment rates the correlation is not significant. For countries with a share of manufacturing below average there are no significant correlations assessed. In contrast, for countries with a share of manufacturing above average the correlation is significant for growth, total hours worked and hours worked in manufacturing. The influence of manufacturing on macroeconomic variables depends, as expected, on the size of the share. One can conclude that it is not a necessity to increase the manufacturing share to achieve rising growth and employment and to overcome a crisis in a relatively short time.

Table 2 Correlations between manufacturing share, employment and growth

EU and all member countries

	Share of manufacturing	Growth rate	Unemployment rate	Employment			
				Persons		Hours worked	
				Total	Manufacturing	Total	Manufacturing
Correlation coefficient	1	0.462*	-0.316	-0.064	0.567**	0.015	0.623**
Sig. (2-sided)		0.012	0.095	0.740	0.001	0.940	0.000
N	29	29	29	29	29	29	29

Countries with a manufacturing share below average

	Share of manufacturing	Growth rate	Unemployment rate	Employment			
				Persons		Hours worked	
				Total	Manufacturing	Total	Manufacturing
Correlation coefficient	1	0.166	0.010	-0.397	0.144	-0.398	0.187
Sig. (2-sided)		0.539	0.971	0.128	0.595	0.127	0.488
N	16	16	16	16	16	16	16

Countries with a manufacturing share above average

	Share of manufacturing	Growth rate	Unemployment rate	Employment			
				Persons		Hours worked	
				Total	Manufacturing	Total	Manufacturing
Correlation coefficient	1	0.762**	-0.434	0.498	0.502	0.668*	0.665*
Sig. (2-sided)		0.004	0.158	0.099	0.096	0.018	0.018
N	12	12	12	12	12	12	12

** Correlation is significant on the 0.01 level
* Correlation is significant on the 0.05 level
Source: Own calculation based on Eurostat, 2019[6]

4.4 Country clusters

The cluster analysis classifies the European countries into similar groups. Therefore the previously used variable was enhanced by manufacturing labor costs, the GCI for institutions, skills and infrastructure, and the Standard and Poor's country rating. A hierarchical cluster analysis showed the number of clusters to be six. In the next step, a K-means cluster analysis was performed (see Table 3).

In the cluster analysis, the country groups are formed according to the distance of the variables between them. SPSS gives for each ANOVA table (see Table 4) in a cluster analysis the hint that the F-test can only be used for descriptive purposes. Nonetheless, the differences between the F-ratios show the

influence of the different variables in building the clusters. Obviously, the growth rate has the highest influence followed by labor costs in manufacturing and the Standard & Poor's rating. The share of manufacturing had only a low influence. That is also true for the development of the total employment. The CGI infrastructure was more or less ignored.

Obviously, the country clusters differ from the groups built by the manufacturing share. Ireland (1) and Greece (6) are each in a separate cluster on their own. Ireland has high growth in both in GDP and employment, a moderate unemployment rate and lies in the upper field of the GCI variables and the country rating. For Greece the situation is the opposite. The second cluster contains most of the Western European countries. They are all stable in a majority of the macroeconomic variables, have comparably high labor costs and a country ranking of at least AA, but the importance of manufacturing in these economies differs a lot. Cluster 3 is composed of countries that joined the EU in 2004 with a manufacturing share above average, comparably low labor costs combined with sufficient skills and mostly rated between AA– and A-, the exception being Hungary with BBB. Besides Malta, Estonia and Lithuania, these countries are all traditional nearshoring destinations comparable to Romania in cluster 4. However, the countries of cluster 4 are rated worse in the GCI variables and the country rating. The manufacturing share in Latvia lies below average. Cluster 5, containing Croatia, Cyprus, Italy, Portugal and Spain, is characterized by countries with economic difficulties, high unemployment rates and mostly a low country rating between BBB and BB+. Furthermore, they have a low rank in the GCI indicators.

Table 3 Country clusters

No.	Countries
1	Ireland
2	Austria, Belgium, Denmark, Finland, France, Germany, Luxembourg, Netherlands, Sweden, United Kingdom
3	Czechia, Estonia, Hungary, Lithuania, Malta, Poland, Slovakia, Slovenia
4	Bulgaria, Latvia, Romania
5	Croatia, Cyprus, Italy, Portugal, Spain
6	Greece

Source: Own calculation based on of Eurostat, 2019[6], Schwab, 2018[7] and CountryEconomy, 2019[8]

Table 4 ANOVA of the cluster analysis

Variable	Cluster		Error		F	Sig.
	Sum of squares	df	Mean Square	df		
Share of Manufacturing	107.175	5	26.663	22	4.020	0.010
Growth Rate	1076.631	5	29.745	22	36.195	0.000
Unemployment Rate	52.703	5	4.155	22	12.684	0.000
Total employment (persons)	264.359	5	67.639	22	3.908	0.011
Manufact. employment (persons)	397.519	5	28.213	22	14.090	0.000
Labour costs in manufacturing	837.846	5	29.910	22	28.012	0.000
GCI Institutions	346.816	5	18.781	22	18.466	0.000
GCI Skills	165.236	5	19.419	22	8.509	0.000
CGI Infrastructure	29.864	5	45.413	22	0.658	0.659
Standard & Poor's Rating	64.817	5	2.379	22	27.244	0.000

The F tests should be used only for descriptive purposes because the clusters have been chosen to maximize the differences among cases in different clusters. The observed significance levels are not corrected for this and thus cannot be interpreted as tests of the hypothesis that the cluster means are equal.
Source: Own calculation based on of Eurostat, 2019[6], Schwab, 2018[7] and CountryEconomy, 2019[8].

5. Discussion and conclusion

The stated aim of the European Commission was to enlarge the manufacturing share to 20% by 2020. It is not foreseeable yet that this aim could be reached. The manufacturing share increased since the financial crisis from 13.3% in 2009 to 14.6% in 2018, but is still on a lower level than in 2000 when it stood at 16.7%. In the observation period from 2000 to 2018 a clear trend of de-industrialization was found. Re-industrialization took place only in Poland.

During the last decade countries with a manufacturing share of more than 20% were quite successful in terms of both economic growth and decreasing unemployment.

In addition, they overcame the financial crisis quite quickly. Nonetheless, other countries with a comparably low manufacturing share were also successful, for example, Sweden, Luxembourg or the United Kingdom with competitive advantages in the service sector. Countries with a development level below the EU 28 average have manufacturing shares both above and below average. Between the manufacturing share and economic growth a low but statistically significant correlation was found for the EU in total and for countries with a manufacturing share above average, but not for those below average. Such a correlation could not be calculated with employment variables. As is generally well known, unemployment is influenced by a wide range of determinants, which were not included in this study.

Hence it could be questioned if the EC's general re-industrialization advice is adequate for all member countries. The result of the cluster analysis shows that similarities between EU countries are influenced by several institutional and macroeconomic determinants. The manufacturing share plays a minor role.

In this paper the emphasis was laid on the re-industrialization aim and the EC's associated expectations. One limitation of this paper is the fact that other influencing determinants on growth and employment were not taken into account. Another limitation is the fact that the manufacturing sector was considered as a whole. A detailed analysis of particular branches might give deeper insights. Furthermore, the influence of EU and country-specific political programs was not taken into account.

Further research can look more closely at the development of the increasing intra-industrial trade in manufacturing between the EU countries referring to branches. This could show economic interconnections between manufacturing operators within the EU countries. In addition, it would be interesting to analyze the indirect effects of manufacturing on growth and employment in other sectors. Moreover, strong offshoring connections between some branches in different EU countries due to FDI flows and global sourcing might influence the L-advantage of different production agents within and between the European countries.

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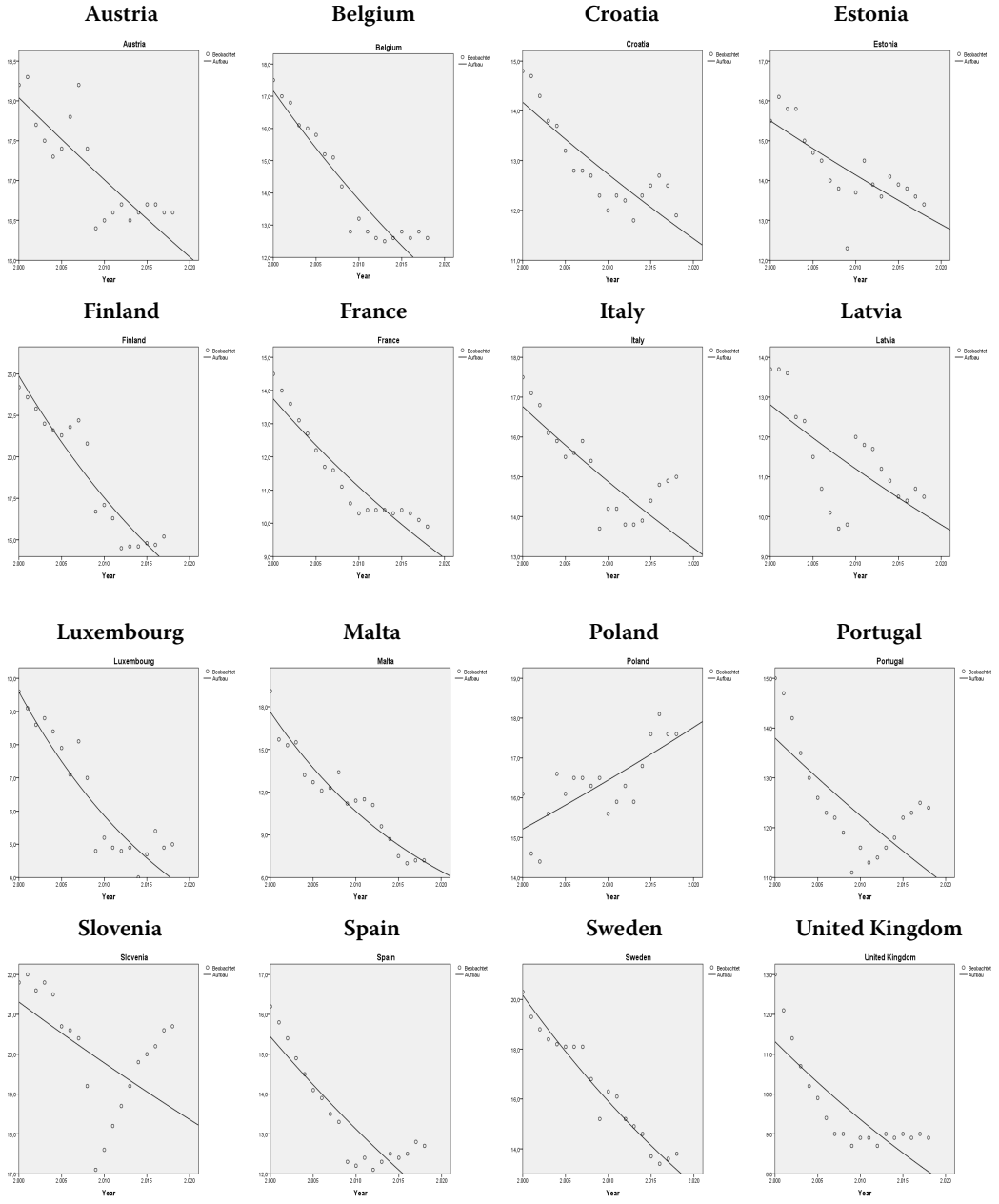
Appendix

Figure 7 Curve fit regression: Observations and fit lines for re- and de-industrializations*



*plots are displayed only for significant regressions
○ Observation, — Fit line
Source: Own calculation based on Eurostat, 2019[6]

Table 5 Curve fit regressions

Model Summary					Coefficients						ANOVA					
						Unstandardized Coefficients		Standardized Coefficients								
	R	R Square	Adjusted R Square	Std. Error of the Estimate		B	Std. Error	Beta	t	Sig.		Sum of Squares	df	Mean Square	F	Sig.
EU - 28	0,732	0,535	0,506	0,043	Year	-0,008	0,002	-0,732	-4,295	0,001	Regression	0,034	1	0,034	18,443	0,001
					Constant	19,474	3,909		4,982	0,000	Residual	0,029	16	0,002		
											Total	0,063	17			
Austria	0,820	0,672	0,652	0,023	Year	-0,006	0,001	-0,820	-5,729	0,000	Regression	0,017	1	0,017	32,820	0,000
					Constant	14,635	2,058		7,110	0,000	Residual	0,008	16	0,001		
											Total	0,025	17			
Belgium	0,942	0,888	0,881	0,043	Year	-0,022	0,002	-0,942	-11,266	0,000	Regression	0,232	1	0,232	126,918	0,000
					Constant	46,627	3,903		11,946	0,000	Residual	0,029	16	0,002		
											Total	0,261	17			
Bulgaria	0,396	0,157	0,104	0,058	Year	0,005	0,003	0,396	1,726	0,104	Regression	0,010	1	0,010	2,979	0,104
					Constant	-6,477	5,250		-1,234	0,235	Residual	0,053	16	0,003		
											Total	0,063	17			
Croatia	0,831	0,691	0,671	0,040	Year	-0,011	0,002	-0,831	-5,978	0,000	Regression	0,056	1	0,056	35,738	0,000
					Constant	24,116	3,606		6,688	0,000	Residual	0,025	16	0,002		
											Total	0,081	17			
Cyprus	0,930	0,866	0,857	0,094	Year	-0,043	0,004	-0,930	-10,157	0,000	Regression	0,908	1	0,908	103,171	0,000
					Constant	88,679	8,562		10,357	0,000	Residual	0,141	16	0,009		
											Total	1,049	17			
Czechia	0,135	0,018	-0,043	0,048	Year	0,001	0,002	0,135	0,545	0,593	Regression	0,001	1	0,001	0,297	0,593
					Constant	0,748	4,373		0,171	0,866	Residual	0,037	16	0,002		
											Total	0,037	17			
Denmark	0,522	0,273	0,227	0,071	Year	-0,008	0,003	-0,522	-2,450	0,026	Regression	0,030	1	0,030	6,001	0,026
					Constant	18,307	6,449		2,839	0,012	Residual	0,080	16	0,005		
											Total	0,110	17			
Estonia	0,724	0,524	0,494	0,048	Year	-0,009	0,002	-0,724	-4,196	0,001	Regression	0,041	1	0,041	17,605	0,001
					Constant	21,124	4,400		4,801	0,000	Residual	0,037	16	0,002		
											Total	0,078	17			

The independent variable is year *The depending variable is ln(country)* *The independent variable is year*

Own calculation based on Eurostat, 2019[6]

Table 5 (continued) Curve fit regressions

	R	R Square	Adjusted R Square	Std. Error of the Estimate		Unstandardized Coefficients		Standar-dized Coefficients	t	Sig.		Sum of Squares	df	Mean Square	F	Sig.
						B	Std. Error	Beta								
Finland	0,940	0,883	0,876	0,070	Year	-0,035	0,003	-0,940	-10,991	0,000	Regression	0,592	1	0,592	120,808	0,000
					Constant	73,111	6,386		11,448	0,000	Residual	0,078	16	0,005		
											Total	0,670	17			
France	0,940	0,883	0,876	0,043	Year	-0,021	0,002	-0,940	-10,990	0,000	Regression	0,223	1	0,223	120,773	0,000
					Constant	45,533	3,921		11,612	0,000	Residual	0,030	16	0,002		
											Total	0,253	17			
Germany	0,159	0,025	-0,036	0,037	Year	0,001	0,002	0,159	0,645	0,528	Regression	0,001	1	0,001	0,416	0,528
					Constant	0,820	3,402		0,241	0,813	Residual	0,022	16	0,001		
											Total	0,023	17			
Greece	0,363	0,132	0,077	0,083	Year	-0,006	0,004	-0,363	-1,557	0,139	Regression	0,017	1	0,017	2,424	0,139
					Constant	13,949	7,575		1,842	0,084	Residual	0,110	16	0,007		
											Total	0,127	17			
Hungary	0,337	0,113	0,058	0,039	Year	0,003	0,002	0,337	1,430	0,172	Regression	0,003	1	0,003	2,044	0,172
					Constant	-2,155	3,564		-0,605	0,554	Residual	0,024	16	0,002		
											Total	0,028	17			
Italy	0,817	0,667	0,646	0,046	Year	-0,012	0,002	-0,817	-5,665	0,000	Regression	0,069	1	0,069	32,088	0,000
					Constant	26,629	4,221		6,309	0,000	Residual	0,034	16	0,002		
											Total	0,103	17			
Latvia	0,647	0,418	0,382	0,087	Year	-0,013	0,004	-0,647	-3,393	0,004	Regression	0,087	1	0,087	11,514	0,004
					Constant	29,348	7,931		3,700	0,002	Residual	0,121	16	0,008		
											Total	0,208	17			
Lithuania	0,162	0,026	-0,035	0,057	Year	0,002	0,003	0,162	0,658	0,520	Regression	0,001	1	0,001	0,433	0,520
					Constant	-0,610	5,241		-0,116	0,909	Residual	0,053	16	0,003		
											Total	0,054	17			
Luxembourg	0,905	0,818	0,807	0,128	Year	-0,049	0,006	-0,905	-8,493	0,000	Regression	1,173	1	1,173	72,126	0,000
					Constant	100,689	11,639		8,651	0,000	Residual	0,260	16	0,016		
											Total	1,434	17			

The independent variable is year *The depending variable is ln(country)* *The independent variable is year*

Own calculation based on Eurostat, 2019[6]

Table 5 (continued 2) Curve fit regressions

	R	R Square	Adjusted R Square	Std. Error of the Estimate		Unstandardized Coefficients		Standar-dized Coefficients	t	Sig.		Sum of Squares	df	Mean Square	F	Sig.
						B	Std. Error	Beta								
Malta	0,956	0,913	0,908	0,085	Year	-0,050	0,004	-0,956	-12,976	0,000	Regression	1,228	1	1,228	168,376	0,000
					Constant	103,577	7,794		13,289	0,000	Residual	0,117	16	0,007		
											Total	1,345	17			
Netherlands	0,883	0,779	0,765	0,041	Year	-0,014	0,002	-0,883	-7,509	0,000	Regression	0,094	1	0,094	56,390	0,000
					Constant	30,366	3,719		8,165	0,000	Residual	0,027	16	0,002		
											Total	0,120	17			
Poland	0,714	0,510	0,480	0,042	Year	0,008	0,002	0,714	4,083	0,001	Regression	0,029	1	0,029	16,672	0,001
					Constant	-12,797	3,817		-3,353	0,004	Residual	0,028	16	0,002		
											Total	0,057	17			
Portugal	0,718	0,516	0,486	0,064	Year	-0,012	0,003	-0,718	-4,129	0,001	Regression	0,069	1	0,069	17,051	0,001
					Constant	26,563	5,822		4,563	0,000	Residual	0,065	16	0,004		
											Total	0,135	17			
Romania	0,137	0,019	-0,043	0,060	Year	-0,001	0,003	-0,137	-0,552	0,589	Regression	0,001	1	0,001	0,304	0,589
					Constant	6,050	5,447		1,111	0,283	Residual	0,057	16	0,004		
											Total	0,058	17			
Slovakia	0,456	0,208	0,159	0,068	Year	-0,006	0,003	-0,456	-2,050	0,057	Regression	0,019	1	0,019	4,203	0,057
					Constant	15,658	6,176		2,535	0,022	Residual	0,073	16	0,005		
											Total	0,093	17			
Slovenia	0,528	0,279	0,234	0,066	Year	-0,007	0,003	-0,528	-2,486	0,024	Regression	0,027	1	0,027	6,182	0,024
					Constant	17,940	6,010		2,985	0,009	Residual	0,069	16	0,004		
											Total	0,096	17			
Spain	0,891	0,795	0,782	0,046	Year	-0,016	0,002	-0,891	-7,869	0,000	Regression	0,128	1	0,128	61,921	0,000
					Constant	35,290	4,155		8,494	0,000	Residual	0,033	16	0,002		
											Total	0,162	17			
Sweden	0,974	0,948	0,945	0,030	Year	-0,024	0,001	-0,974	-17,146	0,000	Regression	0,272	1	0,272	293,985	0,000
					Constant	50,400	2,776		18,155	0,000	Residual	0,015	16	0,001		
											Total	0,287	17			

The independent variable is year *The depending variable is ln(country)* *The independent variable is year*

Own calculation based on Eurostat, 2019[6]

Table 5 (continued 3) Curve fit regressions

	R	R Square	Adjusted R Square	Std. Error of the Estimate
United Kingdom	0,825	0,680	0,660	0,071

The independent variable is year

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Year	-0,019	0,003	-0,825	-5,837	0,000
Constant	40,258	6,509		6,185	0,000

The depending variable is ln(country)

	Sum of Squares	df	Mean Square	F	Sig.
Regression	0,173	1	0,173	34,071	0,000
Residual	0,081	16	0,005		
Total	0,255	17			

The independent variable is year

Own calculation based on Eurostat, 2019[6]

Regina Moczadlo

Reindustrijalizacija za poticanje rasta i zapošljavanja u Europskoj uniji

Sažetak

Zbog posljedica financijske krize Europska komisija je 2010. donijela strategiju Europa 2020. U toj je strategiji Komisija naglasila potrebu za reindustrijalizacijom te kao cilj postavila povećanje udjela europske proizvođačke industrije u bruto domaćem proizvodu (BDP) s 14% na 20% do 2020. Namjera je bila ostvariti veću međunarodnu konkurentnost i ojačati potencijal otvaranja novih radnih mjesta na europskim tržištima rada. Pokrenuto je više inicijativa na razini EU-a te na nacionalnoj razini pojedinih država članica.

Analiza u ovome radu, koja se temelji na literaturi i empirijskim podatcima, pokazuje da je vrlo upitno može li EU ostvariti zacrtani cilj reindustrijalizacije. Poljska je jedina država članica EU-a sa zamjetnim trendom reindustrijalizacije nakon 2000. Nadalje, čini se da utjecaj industrijalizacije na rast ovisi o veličini udjela proizvođačke industrije. Nije se mogla utvrditi izravna povezanost reindustrijalizacije i zapošljavanja. Zemlje poput Švedske i Ujedinjene Kraljevine, koje su prolazile kroz deindustrijalizaciju, također su se oporavile od financijske krize za dvije godine i otada imaju iznadprosječne stope rasta. Prema tome, udio proizvođačke industrije sam po sebi vjerojatno nije uvijek odlučujuća varijabla za rast i zapošljavanje. Stoga je upitno je li cilj reindustrijalizacije, kako ga je postavila Europska komisija, jednako prikladan za sve države članice EU-a.

Ključne riječi: reindustrijalizacija, deindustrijalizacija, proizvodnja, rast, zapošljavanje