



## ANALYSIS OF THE CHANGES NUMBER MANUFACTURING ENTERPRISES OF THE EUROPEAN UNION COUNTRIES TO 2014

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### Abstract:

*The goal of this research is to analyse the lessons learned during the economic crisis in the European Union (EU) countries and to develop proposals for improving the situation on this basis. The major sectors of the economy with the greatest gross domestic product (GDP) and the largest number of employees will be observed is industry. The goal of this paper is to analyse of changes number manufacturing enterprises before and after the economic crisis. How did manufacturing companies of the EU countries survive the economic crisis? What are the lessons learnt?*

*Based on this detailed analysis, it will be possible to develop relevant propositions, which will enable to improve the stable development of the countries.*

*Based on this and previous publications authors we will offer a number of generalized recommendations. These will help to increase the competitiveness of European enterprises.*

**Keywords:** Manufacturing, Enterprises, Economic Crisis, European Union & Competitiveness.

### 1. Introduction:

The aim is to increase the *competitiveness* of Europe, more specifically, the competitiveness of the non-financial companies in the member states as well as the EU as a whole, primarily, however, compared to third countries, the rapidly developing East Asian countries, such as China, India, etc.

One of the priorities of the "Europe 2020" strategy is to increase the competitiveness of Europe. The impacts of the economic crisis have been far reaching on the ability of the EU economy. The EU has proposed a new growth strategy "Europe 2020" which aims at tackling common European challenges and boosting economic growth and quality employment through smart, sustainable and inclusive growth. [1]

When in 2013 was leader U.S., second EU and then China, then in 2014 there has been principle change - the world's economic (GDP by PPP) leader has increased China. The basis of GDP by official exchange rate was in 2014: EU, U.S. and China. The real long-term economic analysis of the results during the Chinese economy more world leaders at GDP of the United States in the exchange rates of 2030th year. [2]

The problem is also that part of today's still a relatively poor developing countries resolve of Western Europe, Japan, Canada and other wealthy countries in the world in terms of their economic level. This will directly affect the financial situation of the labour market and living standards. In turn, depends on the economic potential of the country as well as the political and military influence.

In order to make recommendations to policy makers and business leaders to analyze the social situation carefully and to know the theoretical basis of its performance, they should analyze all of the social determinants of changes in laws and their interconnections. Labour market situation depends in particular on the economy of the economic level, political decisions and other factors.

This article is designed specifically for the management, economists and engineers of enterprises, and policy makers, researchers and students, who have an

interest and a need to explore the world, the European Union and non-financial enterprises problem. This paper is for those, who wish access to the causes with economic crisis and development of European enterprises, is intended for all broad-minded people, those interested in around us world, and Europe, but especially economic.

## **2. Theoretical Based:**

This paper based on the theoretical foundations recognized of the United States and Europe countries and other the academic work of economists, and author of the recently published position. The theoretical bases have been brought in more detail in the authors' earlier works [3 - 13].

## **3. Methodology:**

Methodology - the methodology of Eurostat, IMF, OECD, ILO and the World Bank, and the mathematical models for ubiquitous computing. The methodology has been brought in more detail in the authors' earlier works [3 - 13].

All figures are the authors' illustration.

## **4. The Changes Number Enterprises of Manufacturing:**

*Manufacture*, any industry which makes products from raw materials using manual labour or machinery, which is usually carried out in a systematic division of labour. In a narrower sense, manufacturing denotes the fabrication or assembly of components into finished products on a fairly rather scale. The most important manufacturing industries are those that produce automobiles, heavy machinery, petroleum products, computers, consumer electronics, electrical equipment, airplanes, ships, chemicals, clothing, furniture, steel and tools. [14]

Nearly 10% of all enterprises in the EU non-financial business economy were classified to manufacturing. [15]

The main emphasis of this analysis is on how the manufacturing enterprises or production companies of these countries survived the economic crisis, considering that the economy of some of these states is once again declining. What are the lessons learned from the economic crisis?

Follows analyzed the manufacturing by number of enterprises employment size class; turnover; production; value added of enterprises, by industry sectors and comparison in the world; gross operating surplus; number of person employed and employees; labour productivity; investment per person employed and other key indicators of manufacturing.

Italy, France, Germany, Spain, Poland, Czech Republic and United Kingdom had the largest number of such companies. In 2010, the three first countries constituted 39.8% and all seven together 70.7% of all manufacturing six enterprises in the EU.

The figure shows that in 2008 was a small (2.4%) decrease in the number manufacturing enterprises, which continued in 2009. Two-year decline was 136 thousand, or 6.25%. Followed by growth, in 2010 was 6896 company or 0.32%, more than two years ago. In the coming years, although the number of enterprises increased, but remained below the 2005 level. That is also confirmed in 2011 and 2012 GDP stagnation. In 2013 was however, the record number of manufacturing enterprises. The share of the new EU Member State Croatia was 20,673 or 0.9%. Thus grew significantly in 2013 both GDP and the number of enterprises of manufacturing. Thus to that indicator (the number of enterprises) EU came out of the economic crisis relatively successful already in 2010, but only finalized 2013<sup>th</sup>. [16]

However, must be considered that these include the "letterbox companies" that exist formally, though on paper, but there has been no activity. Enterprises simple

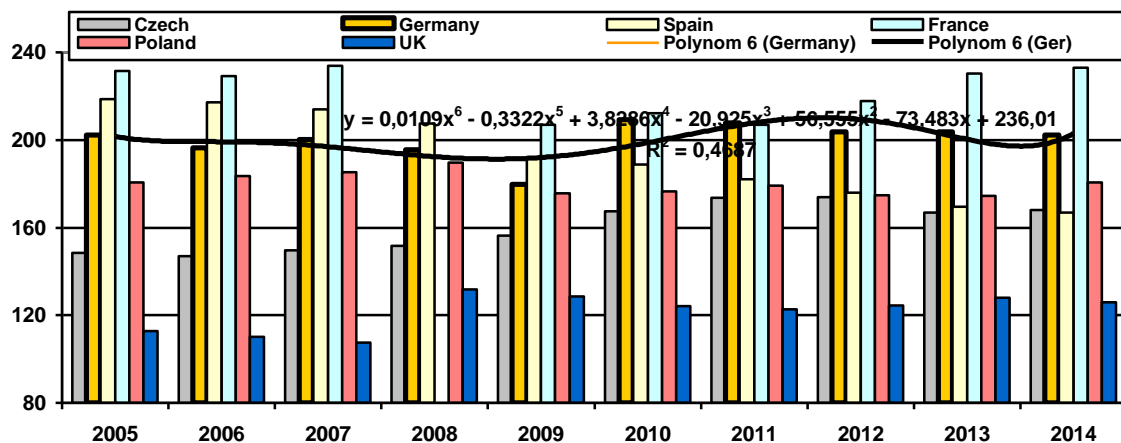
registration allows it. Mention may also be one-man firms (self-employment), which operates one craftsman. Their changes affect of very little throughout the industry.

The new activities of the enterprise start at modestly. It is necessary to procure infrastructure resources: manufacturing buildings, machinery and equipment, and the like. The labour force, especially in the recruitment of highly qualified personnel, their training and work-related skills also takes much time. Finding a market, and more importantly, there is a stable sales organization new enterprise the most time-consuming activity. Why should consumers start buying new goods or services of new enterprise? How to change consumer habits? These problems are more as a promotional, and much more. When an ailing company number of employees decreased divided or large companies were divided, into several a separate enterprises, then a part of the above-mentioned problems either fully exploited or soften falls.

Let's look at these changes by region and country, and also with other factors.

**Table 1:** Largest number of enterprises of EU countries [16]

	2005	2007	2008	2009	2010	2012	2013	2014
Germany	202,236	200,350	195,439	179,834	209,370	203,664	202,824	202,381
Spain	218,596	213,938	207,499	191,972	188,742	175,919	168,935	166,595
France	231,572	233,848	:	207,040	212,193	217,865	226,372	232,516
Italy	481,813	472,762	459,728	439,112	426,778	417,306	407,344	
Poland	180,706	185,377	189,636	175,758	176,384	174,700	174,414	180,465
Czech	148,458	149,578	151,753	156,209	167,344	173,889	167,688	168,413
UK	:	135,901	131,817	128,468	124,038	124,599	127,943	125,884

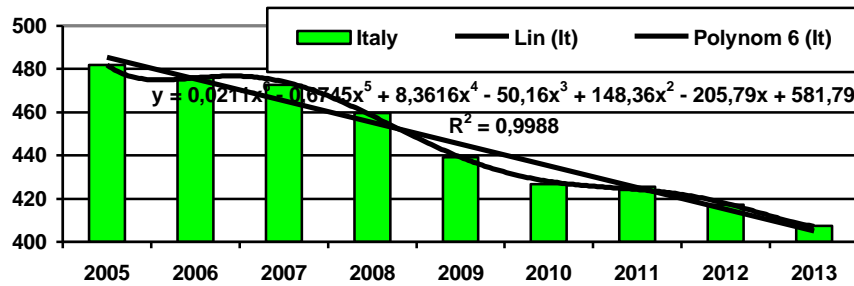


**Figure 1:** Largest number of enterprises of EU countries, thousand [16]  
 Germany  $y = 0,0565x^6 - 1,6682x^5 + 19,065x^4 - 106,23x^3 + 299,15x^2 - 397,35x + 389,18;$   
 $R^2 = 0,7062$

The general trend: small fluctuations, characterized by sinusoid.

Germany is largest European economy, of EU economic motor, which depends on development of most economic indicators throughout of EU.

Italy had the largest number of enterprises, but its number of firms has declined steadily during the period under review. This also applies for the United Kingdom and Spain. The number of companies of Germany declined while in 2009, compared to a record level in 2005 of 11.1%, but the firm has already exceeded the 2005 level in 2010. But progress has been a slight decrease. The number of firms of France has after 2009 again heavily increased, but remains just above the level of 2005 and 2007 missing. [16]



**Figure 2:** Number of enterprises of manufacturing, Italy, thousand [16]

Italy has largest number of enterprises of EU country. Trend is a continuous decreased number of enterprises, from 2005 to 2012 64 507 or 13.4%.

This strong pattern, where  $R^2$ , characterized by well linear trend line.

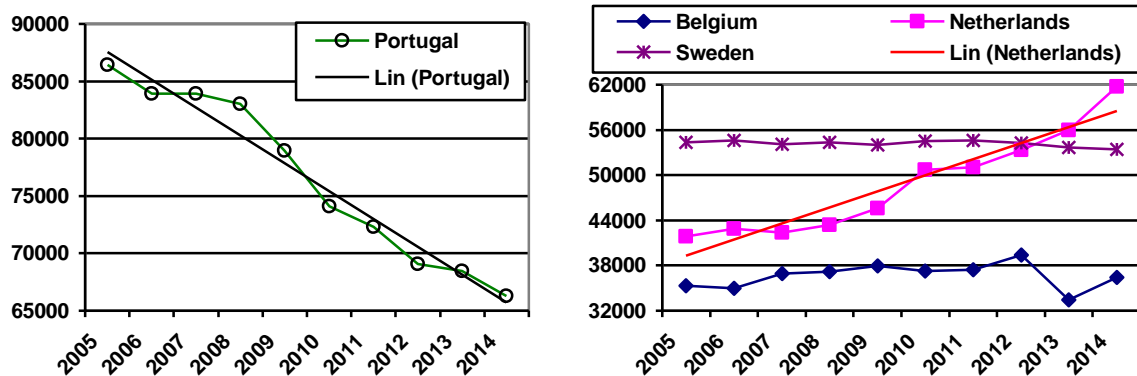
$$y = -10,049x + 495,45; R^2 = 0,9668$$

Very accurately characterized changes number of Italian enterprises six degree polynomial, which is almost functional dependency ( $R \sim 1$ ).

$$\text{Italy } y = -0,0063x^6 + 0,0527x^5 + 0,8149x^4 - 11,454x^3 + 46,556x^2 - 78,376x + 524,24; R^2 = 0,9999$$

**Table 2.** Medium number of enterprises of EU countries [16]

	2005	2007	2008	2009	2010	2011	2012	2013	2014
Belgium	35,321	36,952	37,209	37,981	37,310	37,473	33,972	33,468	36,404
Greece	:	:	85,004	83,565	79,338	74,066	64,582	57,736	56,533
Netherlands	41,876	42,393	43,421	45,570	50,730	51,065	53,319	60,506	61,776
Austria	26,974	27,069	26,081	25,319	25,340	25,139	25,003	25,129	25,259
Portugal	86,408	83,899	83,047	78,940	74,081	72,286	69,053	66,423	66,301
Sweden	54,352	54,087	54,347	53,976	54,509	54,891	54,615	53,681	53,399



**Figure 3:** Medium number of enterprises of EU countries [16]

$$\text{Portugal } y = -2477,4x + 90171; R^2 = 0,9544$$

$$\text{Netherlands } y = 1868,4x + 38122; R^2 = 0,9215$$

Portugal - continued steady reduction the number of enterprises.

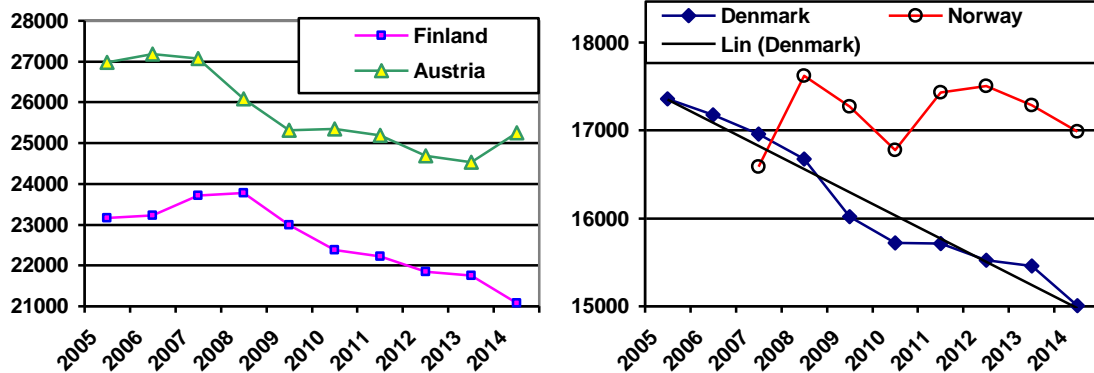
Netherlands - continued steady increased the number of enterprises.

In medium number of enterprises countries group the Netherlands exceeded the crisis in the pre-2008 levels. Other countries were also missing in 2013 on 2008 levels. Luxembourg was relatively deep recession, particularly in 2011.

Greece number of industrial enterprise in 2009 was relatively high, at 83 565, but in 2012 only 64 582.

**Table 3:** Number of enterprises of manufacturing of Nordic countries [16]

	2005	2007	2008	2009	2010	2011	2012	2013	2014
Denmark	17357	16958	16676	16020	15718	15715	15524	15062	15010
Finland	23166	23718	23781	22994	22382	22231	21848	21582	21075
Sweden	54352	54087	54347	53976	54509	54891	54615	53681	53399
Norway	:	16588	17623	17272	16775	17432	17504	17273	16991



**Figure 4:** Number of enterprises of Nordic countries and Austria [16]

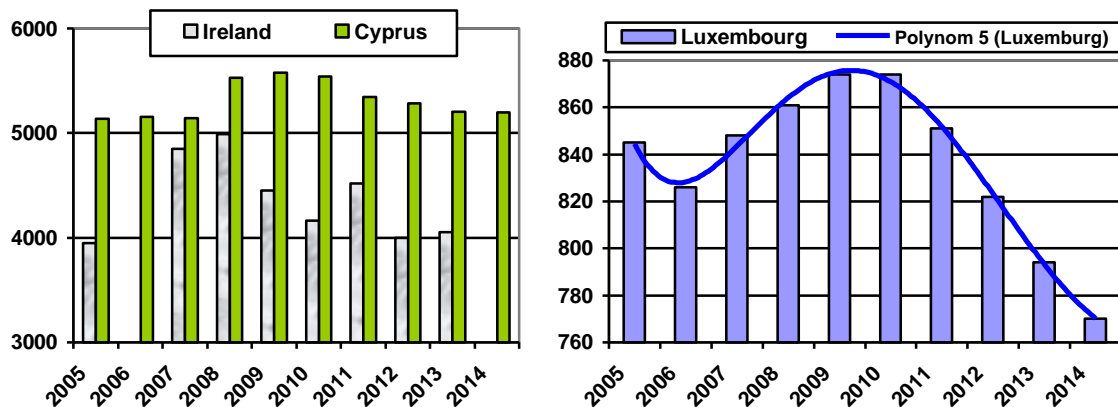
*Denmark*  $y = -266,67x + 17623; R^2 = 0,9414$

Denmark - continued steady reduction the number of enterprises.

The figure given the Nordic countries the industrial company fell during the crisis and in 2013 could not restore the pre-crisis levels. On the one hand, their successful industrial countries have not yet fully overcome the crisis, but on the other hand, we should also review the final conclusion of these financial indicators.

**Table 4:** Small number of enterprises of EU countries [16]

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Ireland	3952	:	4847	4989	4449	4161	4516	3998	4056	
Cyprus	5138	5157	5141	5,530	5575	5540	5342	5283	5242	5198
Luxembourg	845	826	848	861	874	874	851	822	839	770



**Figure 5:** Enterprises number of Ireland, Cyprus, and Luxembourg [16]

The small Luxembourg characterized fact that it GDP per capita is the highest of Europe. Trend is that in times of crisis the number of enterprises increased, decreased after smaller, than it was during the economic boom. Since 2011, however, was big drop. These changes characterized a very well 5-degree polynomial, where  $R^2$  is very high:

$y = -0,0099x^5 + 0,5386x^4 - 8,7927x^3 + 55,354x^2 - 128,05x + 925,42; R^2 = 0,9913$

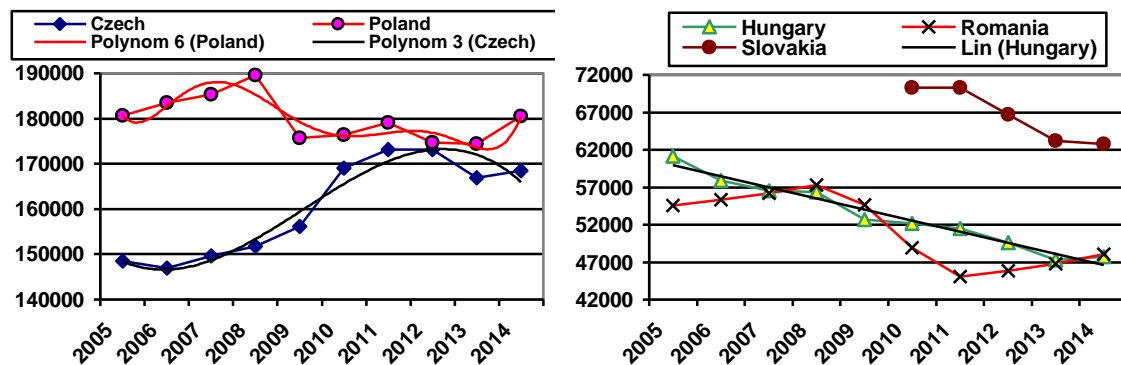


Luxembourg - steady decline since 2010 the number of enterprises.

*Central and Eastern Europe (CEE)*, as is a generic term for countries in Central, Southeast and Eastern Europe, usually meaning former communist states in Europe. It is in use after the collapse of the Soviet Union and it dependent on the country in 1989 - 90. In scholarly literature the abbreviation CEE are often used for this concept. The term CEE includes all the Eastern bloc countries west of the post-World War II border with the former Soviet Union, the independent states in former Yugoslavia (which were not considered part of the Eastern bloc), and the three Baltic states - Estonia, Latvia, Lithuania - that chose not to join the Commonwealth of Independent States (CIS) with the other 12 former republics of the USSR. The transition countries in Europe are thus classified today into two political-economic entities: CEE and CIS. The CEE countries are further subdivided by their accession status to the (EU): the eight first-wave accession countries that joined the EU in 1 May 2004 (Estonia, Latvia, Lithuania, Poland, Czech Republic, Slovakia, Hungary, and Slovenia), the two second-wave accession countries that joined in 1 January 2007 (Romania and Bulgaria) and the third-wave accession country that joined in 1 July 2013 (Croatia).

**Table 5:** Number of enterprises of manufacturing of CEE-8 countries [16]

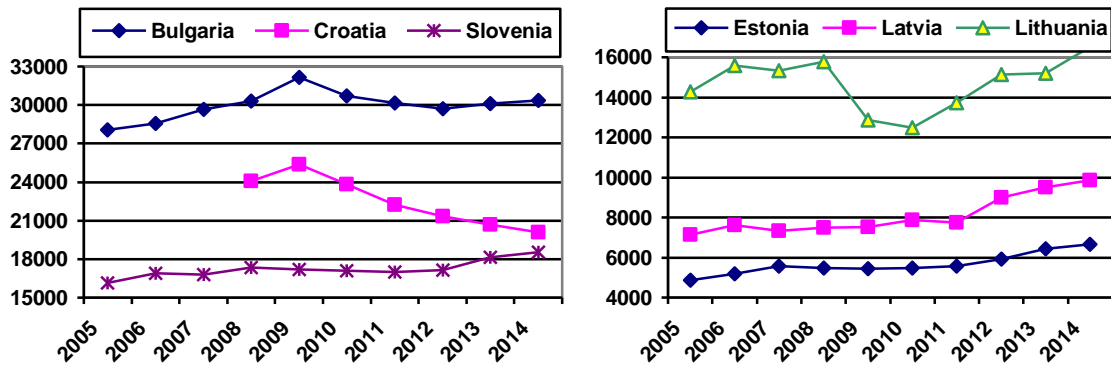
	2005	2007	2008	2009	2010	2011	2012	2013	2014
Czech	148,458	149,578	151,753	156,209	169,077	173,519	173,098	167,688	168,413
Poland	180,706	185,377	189,636	175,758	176,384	179,138	174,701	174,414	180,465
Bulgaria	28,082	29,683	30,288	32,177	30,728	30,135	29,699	30,091	30,380
Croatia	:	:	24,071	25,351	23,809	22,216	21,330	20,673	20,087
Hungary	61,152	56,555	56,346	52,710	52,163	51,521	49,569	47,475	47,684
Romania	54,555	56,200	57,305	54,652	48,933	45,052	45,845	46,761	48,090
Slovenia	16,143	16,771	17,344	17,172	17,113	17,012	17,160	18,148	18,557
Slovakia	6,030	7,611	8,081	8,044	70,271	70,294	66,730	63,208	62,732



**Figure 6:** Number of enterprises of CCE-8 countries [16]

$$\begin{aligned}
 \text{Poland } y &= 18,609x^6 - 581,41x^5 + 7078, \\
 &9x^4 - 42123x^3 + 125156x^2 - 168651x + 260015; \\
 R^2 &= 0,8061 \\
 \text{Czech } y &= -325,77x^3 + 4791x^2 - 16013x + 161116; \\
 R^2 &= 0,9697 \\
 \text{Hungary } y &= -1580,7x + 61815; \\
 R^2 &= 0,9696
 \end{aligned}$$

Hungary - continued steady reduction the number of enterprises.



**Figure 7:** Number of enterprises of CEE and Baltic countries [16]

While the number of enterprises in the CEE-8 countries in 2008 was 534 783, the following year the number was smaller by 12 710, i.e. 2.4%. On the other hand, in 2011, this indicator surpassed the 2008th level 54,534 (+10.2%).

The following trend of CEE-8 States of manufacturing companies can be noted: an increase until 2008, decrease in 2009 and a new increase in the following year that remained below 2008 levels.

The number of industrial enterprise of Czech Republic has grown steadily since 2006, but decline since 2012.

The abrupt growing number of the company after the crisis was in Slovakia. This can be explained by the change in the methodology of calculating the number of the company. The changes in the number of manufacturing companies in Slovakia can be considered formal. For example, when considering all of the individual craftsmen are self-employed, then of course, there was a significant increase in the number of companies. A similar situation was in Slovakia the growing number of transport companies.

Poland was, however, a sharp decline in 2009. Followed by a slow growing number of the company, but it was also in 2013 still far behind 2008 levels. Analogous situation was also in Bulgaria, Croatia, Hungary and Romania.

**Table 6:** Number of enterprises of manufacturing of Baltic countries [16]

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Estonia	4 850	5 197	5 575	5 478	5 441	5 468	5 563	5 922	6 381	6 656
Latvia	7144	7615	7339	7 488	7 521	7 872	7 737	8 348	9 537	9 844
Lithuania	14273	15579	15332	15768	12849	12485	13729	13903	16120	16505

The Baltic States are three countries east of the Baltic Sea - Estonia, Latvia and Lithuania.

Lithuania has been important decreased number of enterprises compared to 2008. But already 2013 almost restored a record level of 2008, only 3.7% were missing. The number of manufacturing companies of Latvia continued to grow since 2007, also during the crisis. It was an exception. Estonian the number of enterprises dropped during the crisis, as follows, and was able restore it and in 2012 to overcome.

Next, we should analyzed the manufacturing by number of enterprises employment size class; turnover; production; value added of enterprises, by industry sectors and comparison in the world; gross operating surplus; number of person employed and employees; labour productivity; investment per person employed and other key indicators of manufacturing.

#### 4. Discussion & Conclusions:

- ❖ The manufacturing has great share in the world economy.

- ❖ Manufacturing proportion within the non-financial business economy of EU-28 in 2012 was by number of enterprises only 9%, but by value added 26% and by basis of persons employed 22%.
- ❖ Germany is largest European economy, of EU economic motor, which depends on development of most economic indicators throughout of EU.
- ❖ The engine of the economy Germany though the number of enterprises in 2009 decreased compared to the previous year, but already in 2010 there were over 2008. It decreased significantly from larger countries in Spain and the United Kingdom and of the smaller countries in Lithuania, Romania, Poland, Finland and Denmark.
- ❖ Italy, France and Germany constituted 39.8% of all manufacturing enterprises in the EU.
- ❖ In 2008 was a small (2.4%) decrease in the number manufacturing enterprises, which continued in 2009. Two-year decline was 6.25%.
- ❖ The enterprises of EU came out of the economic crisis relatively successful already in 2010, but only finalized 2013<sup>th</sup>, then was the record number of manufacturing enterprises.
- ❖ Changes in the number of manufacturing companies during the economic crisis were very different in the various countries. The general trend was: the number of enterprises grew until 2008, decreased in 2009 and experienced another increase during the following years.
- ❖ The general trend: small fluctuations, characterized by sinusoid. It was for Germany, France, Sweden and Belgium.
- ❖ Netherlands, Czech Republic, Slovenia, Latvia, Estonia - continued steady increased the number of enterprises.
- ❖ Italy, Portugal, Austria, Finland, Denmark, Hungary - continued steady reduction the number of enterprises.
- ❖ As a rule, the number of enterprises in CEE-8 countries grew in 2008, declined in 2009 and increased again the following year, though remained below the 2008 levels. The number of single person firms increased during the crisis, since the number of employed person in micro and average sized companies decreased.
- ❖ On principle the manufacture companies of the CEE-8 countries as a whole exited the economic crisis successfully. On the other hand, the crisis meant the death of thousands of companies and a rise in unemployment.
- ❖ Large countries increase was only in Germany, but other major countries also in 2012 were of 2007 level missing. From medium-sizes countries exceeded this level barely Netherlands, Denmark and Ireland, and from CEE countries Poland, Hungary and Slovakia. From three Baltic countries Latvia was only barely missing economic boom era level.
- ❖ When Germany in 2011 exceeded level of the economic boom, then majority of the countries it has remained smaller than in 2008.
- ❖ Considering the significantly different economic levels of these countries, especially during the crisis; and considering the sizes of enterprises, generalisations cannot be made taking into account only the changes in the number of enterprises. For deepened analysis should analyze the size classes of the business. A number of companies at the same time, however, a quantitative indicator. Thus, these indicators alone are not enough to draw conclusions on how manufacturing companies got through the economic crisis. Other key indicators must also be analysed.



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