ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 2345-0282 (online) http://jssidoi.org/jesi/aims-and-scope-of-research/
2013 Volume 1(1): 55–66
http://dx.doi.org/10.9770/jesi.2013.1.1(6)

LITHUANIAN MANUFACTURING TRENDS IN THE CONTEXT OF DEVELOPED AND DEVELOPING COUNTRIES*

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Received 20 March 2013; accepted 15 June 2013

Abstract. The purpose of this paper is to assess the main aspects of the Lithuanian manufacturing industries in the global context. Two approaches are prevailing in the scientific studies analyzing structural changes of economy. The first seeks to identify statistically certain change in economic structure using three-sector hypothesis. The second approach focuses on in-depth structural analysis of the particular sector over time. This study supports the second approach and examines the structural changes in the manufacturing industry of developed and developing countries and draw the Lithuanian picture on the basis of 2000-2009. To this end, two economics tools, namely, the structural changes indicators and Finger-Kreinin dissimilarity index are applied for this purpose. The main findings related to the manufacturing sector's structural tendencies of the Lithuanian economy in the context of developed and developing countries. First of all, the manufacturing industry is looked from the point of view of three economies, such as developed, developing countries and Lithuania's. The author highlights the main trends of manufacturing industry in global context. After further in-depth analysis of the Lithuanian manufacturing structural changes in the context of developed and developing countries has been carried out and new evidence on manufacturing distribution profiles has been provided, concluding remarks have been made. The insights from this study could be useful guide to the Lithuanian manufacturing industry for the need to promote sustainable development in the global context.

Keywords: Structural changes, manufacturing, absolute structural change rate, intensity coefficient, dissimilarity index.

Reference to this paper should be made as follows: Dudzevičiūtė, G. 2013. Lithuanian manufacturing trends in the context of developed and developing countries, *Entrepreneurship and Sustainability Issues* 1(1): 55–66.
http://dx.doi.org/10.9770/jesi.2013.1.1(6)

JEL classifications: L16, L6, O14.

1. Introduction

Theory of structural change have three stages of production, such as primary, secondary and tertiary (Fisher and Clark 1957; Kamaruddin and Masron 2010). Primary production is concerned with the extraction of raw materials through agriculture, fishery and forestry sectors. Low-income countries are dominated by primary sector. Secondary production is concerned through manufacturing and construction. Middle-income countries are often dominated by the secondary sector. Tertiary production is concerned with the provision of

* Research prepared within framework of Long-term Economic Research Program, topic "Energetically secure and sustainable re-structuring of Lithuanian industry sectors in the context of world economy development tendencies´ confirmed by Research Council of Lithuania, IEP-01/2012.

services. High-income countries are dominated by the tertiary sector (Kamaruddin and Masron 2010). Gawlikowska-Hueckel and Uminski (2008) in their investigation argued, that the sectoral approach is useful because it allows us:

- to observe the most general patters of structural changes that are taking place in country and its regions;
- to trace employment trends and workforce transfers between sectors;
- to identify the phase of development in which country find itself and to make intemational comparisons and predictions;
- to formulate industrial policy recommendations and to criticise govemment action in this area;
- to prepare a set of reforms, needed to carry out necessary EU-oriented adjustments in the light of EU industrial policy directives.

Global manufacturing production is shifting gradually from developed countries to developing economies, as companies move to benefit from cheaper labour, lower social costs and large markets in countries like China and India (United Nations Industrial Development Organization 2011). According to the data of United Nations Industrial organization (UNIDO), the share of manufacturing value added in gross domestic product (GDP) declined from 18 % in 1990 to 17 % in 2010 in developed countries and rose from 18 % to 22 % in developing ones. Over a period of 1990-2010, manufacturing value added of global economy grew almost 3 % annually; developed economies reported 1.7 % annual growth rate in manufacturing and it was less than the growth of GDP, which made 2 %. In the same period of time, developing countries recorded the growth of almost 6 % in manufacturing and it was slightly higher rate than the 5 %GDP growth. In 1990, developing countries were producing about 20 % of world GDP and this share had risen to 30 % by 2010 (United Nations Industrial Development Organization 2011). Manufacturing in developing economies is highly concentrated. Five leading economies (China, India, Brazil, Taiwan Province of China and Mexico) recorded 62 % share in developing economy manufacturing value added, up from 53 % in 2000 and 36 % in 1990. China had faster average growth of manufacturing value added than other developing economies over a period of 1990-2010, its share has tripled since 1990 from 13 % to 43 % in manufacturing value added of developing countries (United Nations Industrial Development Organization 2011). During 2000-2008, global manufacturing grew by 3 % annually (in developing countries 7 %). The financial crisis affected developed economies more than developing. Manufacturing value added in developed countries declined by 8 % from 2008 to 2009, while developing countries slowed growth to 3 % in 2009. According to the data of UNIDO, the global crisis affected developing economies in different way depending on their region specific mix of channels such as foreign direct investments, trade, financial flows and others. Europe was the most affected region with manufacturing falling of 7 % (United Nations Industrial Development Organization 2011). This paper aims to draw a picture of the Lithuanian manufacturing sector in the context of developed and developing countries. The author has used UNIDO data related to the manufacturing sector tendencies in the developed and developing countries and the data of the Lithuanian Statistical department and has applied structural changes assessment methods, such as absolute rate, intensity coefficient and Finger-Kreinin dissimilarity index for this purpose. The author has referred to the approach, prevailing in the scientific studies (Matsuyama 2009; Kamaruddin and Masron 2010; Woodall *et al.* 2012; Noland *et al.* 2012; Fafaliou and Polemis 2013) and focusing on in-depth structural analysis of the manufacturing sector over time.

The paper is organized into three sections. Section 1 provides an introduction. A brief review of the empirical studies and methodology particularly on the manufacturing sector trends is made in Section 2. Section 3 looks briefly into some economic indicators assessing manufacturing sector's structural changes of the developed and developing countries, and Lithuania. Section 4 concludes summarizing the main trends observed.

2. Empirical studies' and methodology review

The overview of the recent scientific works shows that two approaches are prevailing in the researches analyzing economic structure. The first seeks to identify statistically certain change in economic structure using three sector (agricultural, industry and services) hypothesis (Teigeiro and Solis 2007; Albu 2010; Gil' Mundinov 2011; Jiang 2011; Mao and Yao 2012; Dudzevičiūtė 2012, 2013). The second approach focuses on in-depth structural analysis of the particular sector over time (Tanuwidjaja and Thangavelu 2007; Matsuyama 2009; Thomas *et al.* 2009; Kamaruddin and Masron 2010; Rosenzweig and Easton 2010; Rezitis and Kalantzi 2011; Woodall *et al.* 2012; Mermod and Dudzevičiūtė 2011; Steinbuks 2012; Noland *et al.* 2012; Smaliukienė *et al.* 2012; Fafaliou and Polemis 2013). Manufacturing sector has been analyzed from different angles and different results were gotten through regions and countries. Salim (2008) empirically estimated the firm-specific productive capacity realization factors using the stochastic frontier production

function and analyses explaining realization rates across firms and over time. Using the Firm level panel data from Bangladesh food manufacturing, the study showed that capacity realization rates widely vary across firms and over time. The author determined the average rate of realization with 65% implying that most of the firms are producing away from their full production capacity. The results also showed that firm size and outward orientation had positive impact on realization, while market structure, capital intensity and effective rate of assistance had negative effect. The author suggested further reform of the domestic and trade policies to ensure competition and competitiveness of the manufacturing sector and of the country. Kim and Shafi'i (2009), investigating Malaysian manufacturing industries over a period of 2000-2004, decomposed productivity growth into technical progress, technical efficiency change, allocative efficiency and scale efficiency change. Research results show that total productivity was driven mainly by technical progress; however, it was hurt by deteriorating technical efficiency. Authors revealed that scale efficiency and allocative efficiency were also significant factors impacting on total productivity. The skill and quality of workers were identified as the most important determinants of technical efficiency, whereas employee quality, foreign ownership and imports sustained technical progress.

Kim *et al.* (2009) analyzed the contributions of patents to total factor productivity in Korean manufacturing industries over a period 1981-1999. The investigation showed that both domestic and foreign-resident patent applications had positive effects on productivity and that foreign-resident patent applications had a larger effect than domestic patents in improving total factor productivity in the Korean manufacturing sector. Kamaruddin and Masron (2010) examined the structural changes and the sources of growth in the manufacturing sector in Malaysia. As the results showed, most of the industries were non-resource based such as textiles, electrical and electronic products. The research revealed that export is increasingly an important factor of change in the industrial growth patterns for the Malaysian economy. The authors have concluded that the structural changes in Malaysian economy mainly caused by the reorientation of industrialization strategies as well as by variations in the composition of domestic demand.

Byun *et al.* (2012) also compared and analyzed the total factor productivity of the manufacturing industries in the metropolitan areas of South Korea, China, and Japan. The manufacturing industries were classified into 10 sectors, and two different time periods (before and after 1997, when the foreign currency crisis began in Korea) were examined. Although the output and total factor productivity in Korea had been increasing since the 1997, the rates of increase in the output and total factor productivity remained behind China. The lower total factor productivity of the companies in Korea compared with those in Japan indicated differences in techniques between these two countries. The researches concluded that the results of the development and competitiveness of the manufacturing industries in Korea, China, and Japan could be useful in establishing promotional strategies and contributing to the economic cooperation among these countries by evaluating their relative competitiveness. Fafaliou and Polemis (2013) in their research assessed the main aspects involved in the competitiveness of manufacturing industries in the Euro zone area (EZ-12), covering the period from 1970 to 2007. The authors concluded that in the long run, a change in labor and capital compensation was not fully passed on to manufacturing growth, while an increase in the market power of the manufacturing sector negatively affected its competitiveness. Steinbuks (2012) investigated interfuel substitution, separately accounting for different types of energy use in the U.K. manufacturing sector. The results indicated that the estimated ownprice elasticities for all fuels and the cross-price elasticities for fossil fuels are significantly higher for thermal heating processes. An increase in real fuel prices in 2001 resulted in higher substitution elasticities based on aggregate data, and lower substitution elasticities for the thermal heating process. The research revealed that technological change was the major determinant of the differences in elasticities before and after the energy price increase.

The overview of the the recent scientific works (Gawlikowska-Hueckel and Uminski 2008; Salim 2008; McCann 2008; Matsuyama 2009; Kumar and Nottestadb 2009; Kim and Shafi'i 2009; Park *et al.* 2010; Fedderke and Naumann 2011; Boussemart *et al.* 2011; Sethi *et al.* 2011; Rezitis and Kalantzi 2011; Saunders 2012; Hasanbeigi *et al.* 2012; Fafaliou and Polemis 2013) showed that manufacturing sector's trends and development can be analysed on the basis of a wide range of indicators, such as income-elasticity, productivity growth, employment concentration, share of output in GDP, contribution to total value added,

total spending and different methods can be applied, as follows: an empirical analysis; a case study; comparison analysis; decomposition analysis; panel data analysis; multi-level analysis; stochastic frontier analysis; a life cycle analysis; correlation analysis; regression analysis. To sum up, it can be say, that several statistical methods can be used for this purpose, ranging from simple descriptive indicators to geometric models and econometric techniques.

In this paper, to better assess the structural changes in manufacturing sector and to study its impact on manufacturing growth, it is useful to measure its structural changes and intensity. The absolute structural changes rate (Memedovic and Iapadre 2010; Dudzevičiūtė 2013), intensity coefficient (Domingo and Tonella 2000; Cortuk and Singh 2010) and Finger-Kreinin dissimilarity index (D index) (Finger and Kreinin 1979; Memedovic and Iapadre 2010) has been used for this purpose.

The *absolute structural changes rate* shows manufacturing sector's structural change and its impact on manufacturing development. Positive rate value means that structural change accelerates growth; and negative rate reducible development. The absolute structural changes rate is calculated as follows:

$$M = D_i - D_0;$$
$$M_{sum} = \sum_{i=1}^{n} M_i \quad (1)$$

where: *M*- the absolute structural change rate; D_i – economic activity share, %; D_0 – economic activity share, % in the basic year; M_{sum}- sum of the absolute structural change rate.

The intensity coefficient of structural changes shows the intensity of manufacturing in time t_i, compare with basic period. As the coefficient value greater, as more intensive structural changes going, and conversely. Its formula is as follows:

$$K = \frac{\sqrt{\sum_{t=2}^{n} (S_{ti} - S_{t0})^2}}{m} \quad (2)$$

where: *K*- the intensity rate of structural ckanges; S_{ti} – economic activity share; *ti, to*- current and basic time; *n*- economic activity quantity; *m*- year.

Finger-Kreinin dissimilarity index (D index) measures how much a given distribution differs from a chosen benchmark. It is calculated as follows:

$$D = \frac{1}{2} \sum_{i=1}^{n} |a_i - b_i| \quad (3)$$

where: a_i and b_i show the share of sector i in each of the two distributions.

When a given distribution at a given time is compared to the same distribution in a previous period, the D index can be used as a measure of structural change (Memedovic and Iapadre 2010).

D index ranges between zero, denoting equality and one, showing maximum dissimilarity.

The main advantages of these indicators could be named as follows: they are easy to calculate, they are informative for interpretation of their impact on economic development. However, they give only general information and do not reveal the reasons for structural changes.

3. The overview of manufacturing sector development

3.1 Decomposition analysis of manufacturing sector

This section aims to overview the manufacturing sector structure of the developed and developing countries and to draw the Lithuanian picture on the basis of comparative analysis covering the date of 2000-2009.

Over a period of 1990-2010, manufacturing value added increased by 40 % in developed countries and has nearly tripled in developing countries since 1990. At the same period of time, the developed countries lost their manufacturing value added share in global economy from 79 % in 1990 to 64 % in 2010, whereas the share of developing countries rose from 21 % to 36 % (Fig.1). Average annual growth rate of manufacturing value added in developing countries was considerably higher than in developed economies. Despite the crisis, manufacturing value added grew an average 6 % a year over 2001–2005, and 7 % in 2006-2010, whereas in developed countries the average growth slowed from 1.4 % to 0.2 % respectively. According to the classification of developing countries by income, four groups of economies were distinguished: high income, upper-middle income, lower- middle income and low income (Fig.2, Appendix).

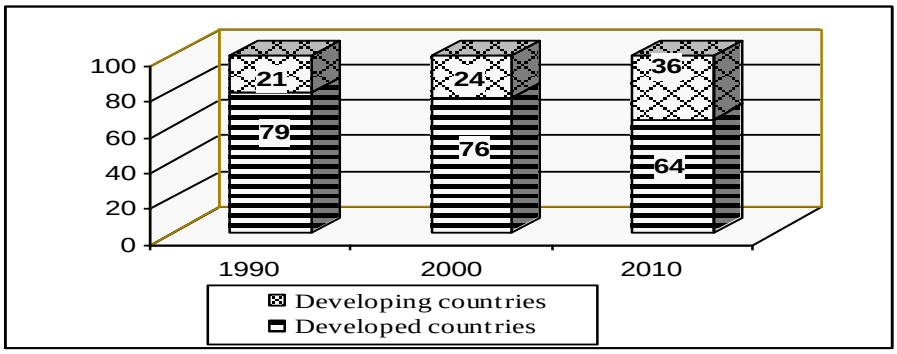

Fig.1. Share of manufacturing value added in global economy, percent
Source: UNIDO (2011) data

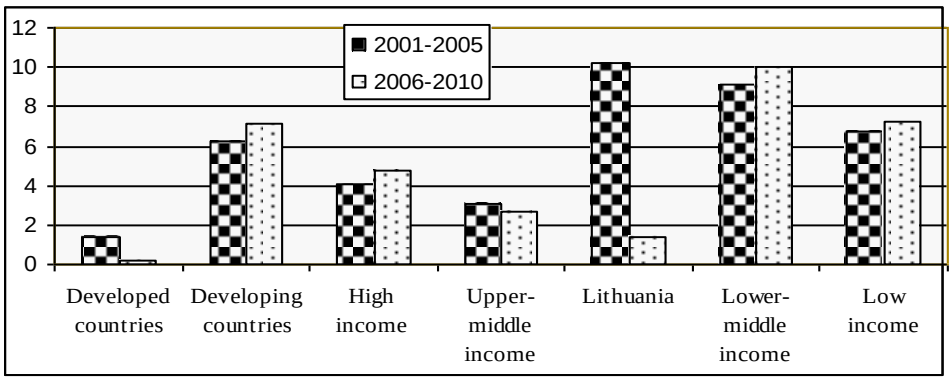

Fig. 2. Average annual growth, percent
Source: UNIDO (2011) data, author's calculations based on the Lithuanian Statistics department (2013) data

Lithuania as the other two Baltic countries- Latvia and Estonia- belongs to upper- middle income economies. There are variations in manufacturing performance among developing economies. Lower- middle income group demonstrated significant average growth with nearly 10 % annually during a period of 2001-2010. China and India had considerable impact on this growth. Over a period of 2001-2005, the Lithuanian manufacturing had the highest growth with 10 % a year among all observed countries' groups.

Due to the global economical and financial crises, the Lithuanian manufacturing value added dropped 15 % in 2008-2009; and this impact on average annual growth rate with 1.4 % over 2006-2010. In developed countries, the leading manufacturing industries in 2000-2009 were machinery and equipment with share of 34% in 2000 and 45.6 % in 2009, transport equipment (9.9% and 9.1%), chemical and chemical products (9.3% and 8.8%); food, beverages and tobacco (9.5% and 8.5%) (Table1).

These sub-sectors made nearly 63% of manufacturing value added in 2000 and 72% in 2009. In the same period of time, the dominant manufacturing sub-sectors in developing economies were machinery and equipment (18.9% in 2000 and 24.5 % in 2009), chemical and chemical products (10.9% and 11.0%); food, beverages and tobacco (17.2% and 14.6%); basic metals (7.1% and 10.1%); (textiles and leather (9.9% and 8.4%). They had 64% contribution to total manufacturing value added in 2000 and 67% in 2009. Machinery and equipment growth in developed and developing economies was a result of increase in demand for electronic goods, such as computers, mobile phones and other electronic devices. Developing countries are distinguished from developed of substantial share of textiles and leather products.

In 2000-2009, the dominant manufacturing sub- sectors in Lithuania were coke and refined petroleum with share of 30.2% in 2000 and 33.9% in 2009, food, beverages and tobacco (25.8% and 22.9%), chemical and chemical products (9% and 11.1%). The share of these sub-sectors made 65% of total manufacturing value added in 2000 and 68% in 2009.

Table 1. Manufacturing sub-sectors contribution to total value added, percent

Manufacturing sub-sectors	Developed countries		Developing countries		Lithuania	
	2000	2009	2000	2009	2000	2009
Food, beverages and tobacco	9,5	8,5	17,2	14,6	25,8	22,9
Textiles and leather	3,8	1,8	9,9	8,4	11,3	4,4
Wood and wood products	2,1	1,4	1,6	1,1	4,1	4,4
Paper and print	8,3	6,3	4,6	3,5	2,2	2,1
Chemical and chemical products	9,3	8,8	10,9	11,0	9,0	11,1
Coke, refined petroleum	2,6	2,2	7,0	5,0	30,2	33,9
Rubber and plastics	3,0	2,4	3,6	3,5	1,8	3,2
Non-metallic minerals	3,3	2,5	5,4	4,9	2,5	2,0
Basic metals	4,5	3,6	7,1	10,1	0,7	0,5
Fabricated metal products	6,2	5,0	4,3	3,5	1,5	2,2
Machinery and equipment (instruments)	34,0	45,6	18,9	24,5	6,3	6,2
Transport equipment	9,9	9,1	7,2	7,5	2,1	1,4
Furniture and other	3,5	2,8	2,3	2,4	2,5	5,7
Total manufacturing	**100**	**100**	**100**	**100**	**100**	**100**

Source: UNIDO (2011), author's calculations based on the Lithuanian Statistics department (2013) data

Textile and leather products were one of the leading sub-sectors in 2000 with contribution of 11.3% to total manufacturing value added, however, in 2009 its share decreased by 4.4%. Figure 3 and Figure 4 show leading manufacturing sub-sectors comparison by countries in 2000 and 2009.

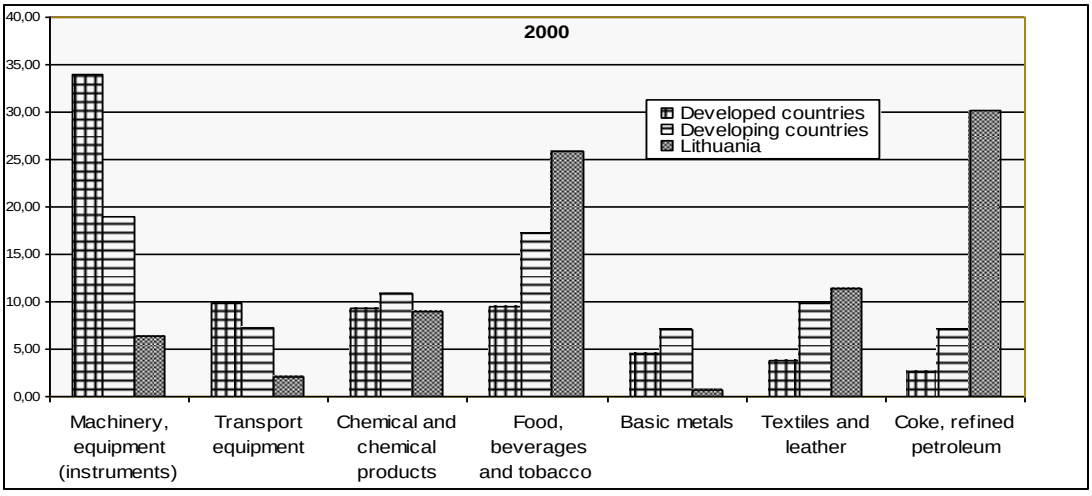

Fig.3. Leading manufacturing sub-sectors in 2000, percent
Source: UNIDO (2011), Lithuanian Statistics department (2013)

In 2000, the Lithuanian manufacturing distinguished from developed and developing countries by substantial dominance of coke and refined petroleum, food and beverages industries. Machinery and equipment industry prevailed in developed economies. Food and beverages, machinery and equipment were leading sub-sectors in developing countries. Over a period of 2000-2009, the leading sectors remained the same in the countries observed, despite the changes of their contribution to total manufacturing value added (Figure 4). The coke and refined petroleum remained the leading sector in Lithuania; and it increased the contribution to total manufacturing value added by 3.7 percentage points. In the same period of time, the Lithuanian food and beverages industry's share decreased by 2.9 percentage points. In 2000-2009, machinery and equipment shares rose in developed countries as well as developing by 11.6 percentage points and 5.6 percentage points respectively.

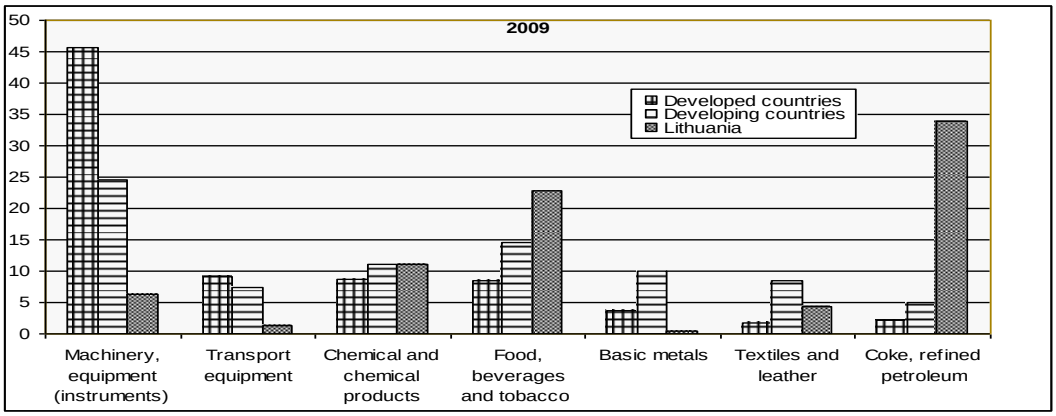

Fig.4. Leading manufacturing sub-sectors in 2009, percent
Source: UNIDO (2011), author's calculations based on Lithuanian Statistics department (2013) data

The contribution of food and beverages industry's to manufacturing value added decreased by 2.6 percentage points. Structural changes in manufacturing have been summarized in Table 2 by using absolute structural changes rate.

Table 2. Absolute structural changes rate in manufacturing industry over 2000-2009, percentage points

Sub-sectors	Developed countries	Developing countries	Lithuania
Machinery, equipment	11,6	5,6	-0,1
Transport equipment	-0,8	0,3	-0,7
Chemical and chemical products	-0,5	0,1	2,1
Food, beverages and tobacco	-1,0	-2,6	-2,9
Basic metals	-0,9	3,0	-0,2
Textiles and leather	-2,0	-1,5	-6,9
Coke, refined petroleum	-0,4	-2,0	3,7
Other	-6,0	-2,9	5,0
Total	**0,0**	**0,0**	**0,0**

Source: author's calculations based on UNIDO (2011) and Lithuanian Statistics department (2013) data

Based on the estimated results of structural changes in manufacturing sector over 2000-2009, it can be concluded, that the manufacturing sector development was negatively impacted by textiles and leather, food, beverages and tobacco in all countries. Absolute structural change rate shows, that machinery and equipment growth positively impacted on manufacturing sector development in developed countries as well as developing ones. Refined petroleum and chemical sub-sectors stimulated and sustained manufacturing development in Lithuania.
Next section has evaluated the structural change process in manufacturing sector and its intensity by countries.

3.2. The assessment of the manufacturing sector's structural changes

To better assess the structural changes and to study its impact on economic growth, it is useful to measure its intensity. The intensity coefficient and Finger-Kreinin dissimilarity index has been used for this purpose. The results obtained by applying the intensity coefficient and D index to the distribution of manufacturing value-added have been summarized in Table 3, Figure 5 and Figure 6. Having evaluated structural manufacturing changes in 2000-2009, using intensity coefficient, it can be stated, that the Lithuanian structural changes intensity was very close to the developed countries intensity.

Table 3. The intensity coefficient of the structural changes in 2000-2009

Sub-sectors	Developed countries	Developing countries	Lithuania
Machinery, equipment	1,2	0,6	0,0
Transport equipment	0,1	0,0	0,1
Chemical and chemical products	0,1	0,0	0,2
Food, beverages and tobacco	0,1	0,3	0,3
Basic metals	0,1	0,3	0,0
Textiles and leather	0,2	0,2	0,7
Coke, refined petroleum	0,0	0,2	0,4
Other	0,6	0,3	0,5
Total	**2,3**	**1,8**	**2,2**

Source: author's calculations based on UNIDO (2011) and Lithuanian Statistics department (2013) data

Over 2000-2009, the Lithuanian manufacturing intensity coefficient made 2.2 and it was mostly impacted by the structural changes of textile and leather and coke, refined petroleum sub-sectors. Machinery and equipment affected the intensity of manufacturing structural changes in developed as well as developing countries. The intensity coefficient of these countries made 2.3 and 1.8 respectively. Hereafter, Finger-Kreinin dissimilarity index (D index) has been applied in order to compare manufacturing distribution in 2000 and 2009 of the same country (Fig. 5) and different countries (Figure 6). When a given distribution at a certain time is compared to the same distribution in a previous time, the D index can be used as a measure of structural change.

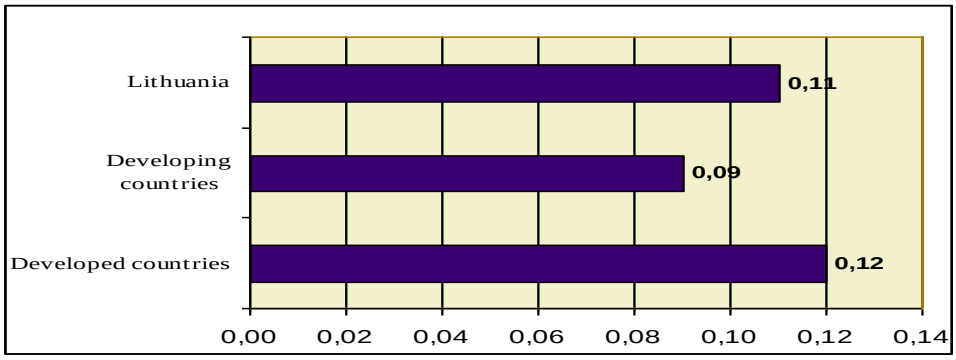

Fig.5. Finger-Kreinin dissimilarity index by countries in 2000-2009
Source: author's calculations based on UNIDO (2011) and Lithuanian Statistics department (2013) data

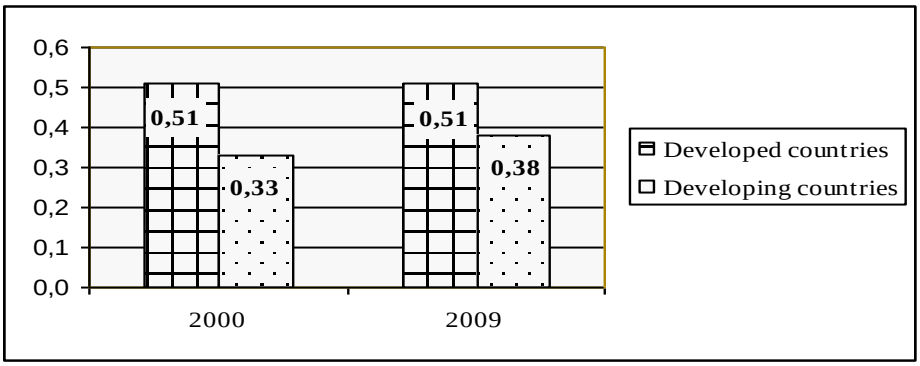

Fig.6. Finger-Kreinin dissimilarity index of Lithuania with developed and developing countries
Source: author's calculations based on UNIDO (2011) and Lithuanian Statistics department (2013) data

Figure 5 shows the results obtained by applying the D index to the distribution of manufacturing value-added in selected countries for 2000-2009 period. As dissimilarity index shows, manufacturing

sector distribution was completely similar in developed and developing countries and Lithuania as well in 2000 compared to 2009. It could be characterized by a higher rate of stability. The economies do not tend to show higher indices of structural change, often denoting the volatility of their specialization patterns. The specialization patterns of economies have been already formed. Figure 6 summarizes the dissimilarity index of Lithuania with developed and developing countries. Several observations have been noted from the results. First, developed countries have higher dissimilarity in their manufacturing distribution profiles with Lithuania's; and the degree of dissimilarity has been relatively stable throughout the studied period. Second, manufacturing distribution of developing countries have had lower dissimilarity index with Lithuania than developed ones and the degree of dissimilarity has risen from 0.33 in 2000 to 0.38 in 2009.

Conclusions

The overview of statistical data has revealed that global manufacturing production is shifting gradually from developed economies to developing countries. Over a period of 1990-2010, manufacturing value added increased by 40 % in developed countries and has tripled in developing economies since 1990.

There are variations in manufacturing performance among developing economies. Lower- middle income group demonstrated significant average growth with nearly 10 % annually during a period of 2001-2010. Over a period of 2001-2005, the Lithuanian manufacturing had the highest growth with 10 % a year among all observed countries' groups. Due to the global economical and financial crises, the Lithuanian manufacturing value added dropped 15 % in 2008-2009; and this impact on average annual growth rate with 1.4 % over 2006-2010.

Over 2000-2009, in developed countries, the leading manufacturing industries were machinery and equipment, transport equipment, chemical and chemical products, food, beverages and tobacco. These industries made nearly 63% of manufacturing value added in 2000 and 72% in 2009. In the same period of time, the dominant manufacturing industries in developing economies were machinery and equipment, chemical and chemical products, food, beverages and tobacco; basic metals, textiles and leather. They had 64% contribution to total manufacturing value added in 2000 and 67% in 2009. The dominant manufacturing industries in Lithuania were refined petroleum, food, beverages and tobacco, and chemical products. The share of these sub-sectors made 65% of total manufacturing value added in 2000 and 68% in 2009.

Based on the estimated results over 2000-2009 using absolute change rate, it can be concluded, that the manufacturing sector development was negatively impacted by textiles and leather, food, beverages and tobacco sub-sectors in all observed countries. Absolute structural change rate showed that machinery and equipment growth positively impacted on manufacturing sector development in developed countries as well as developing ones. Refined petroleum and chemical sub-sectors sustained manufacturing development in Lithuania.

Intensity coefficient of manufacturing structural changes revealed that the Lithuanian manufacturing structural changes intensity was very similar to the developed countries intensity with 2.2 rate. In developing countries the intensity of structural changes was slower than in advanced economies and in Lithuania. It has shown that the Lithuanian manufacturing distribution was more volatile comparing with developing economies.

Lithuania has had higher dissimilarity in manufacturing distribution profile with developed countries than developing ones. The degree of dissimilarity with developed countries has remained relatively stable throughout the studied period. It has shown that the Lithuanian manufacturing distribution profile has been more similar to developing economies. Dissimilarity degree between the Lithuanian manufacturing distribution and developing economies has increased from 0.33 to 0.38 over a period of 2000-2009.

Evidences provided in this paper lead to general conclusion, that the manufacturing structural shifts are typical to all economies to a certain degree and the implementation of the appropriate economic policy could promote sustainable development of the Lithuanian manufacturing in the global context.

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Appendix

Classification of the countries by income group

Developed economies	Developing economies			
	High income	Upper middle income	Lower middle income	Low income
Australia	Bahrain	Algeria	Albania	Bangladesh
Austria	Brunei Darussalam	Argentina	Angola	Benin
Belgium	Croatia	Belarus	Armenia	Cambodia
Canada	Cyprus	Bosnia and Herzegovina	Azerbaijan	Congo, Dem. Rep.
Czech Republic	Estonia	Botswana	Bolivia, Plurinational State	Ethiopia
Denmark	Hong Kong SAR China	Brazil	Cameroon	Eritrea
Finland	Israel	Bulgaria	China	Ghana
France	Kuwait	Chile	Congo	Haiti
Germany	Malta	Colombia	Côte d'Ivoire	Kenya
Greece	Oman	Costa Rica	Ecuador	Korea, Dem. People's Rep.
Hungary	Qatar	Cuba	Egypt	Kyrgyzstan
Iceland	Saudi Arabia	Dominican Rep.	El Salvador	Mozambique
Ireland	Singapore	Gabon	Georgia	Myanmar
Italy	Slovenia	Jamaica	Guatemala	Nepal
Japan	Taiwan Province of China	Kazakhstan	Honduras	Senegal
Korea, Rep.	Trinidad and Tobago	Lebanon	India	Tajikistan
Luxembourg	United Arab Emirates	Latvia	Indonesia	Tanzania, United Rep.
Netherlands		Libyan Arab Jamahiriya	Iran, Islamic Rep.	Togo
New Zealand		Lithuania	Jordan	Uzbekistan
Norway		Macedonia, Former	Moldova	Viet Nam
Portugal		Yugoslav Rep.	Mongolia	Yemen
Slovakia		Malaysia	Morocco	Zambia
Spain		Mexico	Nicaragua	Zimbabwe
Sweden		Namibia	Nigeria	
Switzerland		Panama	Pakistan	
United Kingdom		Peru	Paraguay	
United States		Poland	Philippines	
		Romania	Sri Lanka	
		Russian Federation	Sudan	
		Serbia	Syrian Arab Rep.	
		South Africa	Thailand	
		Turkey	Tunisia	
		Uruguay	Turkmenistan	
		Venezuela	Ukraine	

Source: UNIDO (Industrial development report 2011)