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Dalia Bernatonyte*
Kaunas University of Technology, Lithuania

Estimation of Export Specialization: Lithuanian Case

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Keywords: *trade; export; export specialization; revealed comparative advantage index; trade dissimilarity index*

Abstract: *This paper investigates the nature and pattern of export specialization in Lithuania. The aim of this paper is to estimate the nature and pattern of Lithuanian export specialization under the existing conditions. Seeking to define the nature and pattern of export specialization, the basic methods of export specialization measurement and the nature and pattern of export specialization in trade between Lithuania and the EU are determined. For measurement of the pattern of export specialization in Lithuania two approaches are adopted. The index of export specialization is used to determine the pattern of comparative advantage. Secondly, trade dissimilarity index is used to predict structural changes in Lithuanian exports. Using these methods of measurement and standard international trade classification (SITC), the nature and pattern of Lithuanian export specialization was determined. It was found that the biggest flows from Lithuania to the EU are in the following groups: food, drink and tobacco; raw materials; mineral fuels, lubricants and related materials. These calculation results show the main directions of nature and pattern of export specialization. This research could be useful for preparing and forecasting the possibilities of Lithuanian export development.*

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* Contact: dalia.bernatonyte@ktu.lt, Kaunas University of Technology, School of Economics and Business, Department of Eco-nomics, K. Donelaicio st. 20, 501, LT-44239, Kaunas, Lithuania

Introduction

International trade practice shows that economic instability of countries and lack of trust for foreign trade partners are the main factors impeding the development of export. For various countries, exports are a major source of foreign exchange, a way to maximize economies of scale and specialization and a channel to new technologies and knowledge spillovers (Lall, 2000, pp. 337-369). Specialization patterns and an increasing higher value added of county's exports have important implications for productivity and economic growth. A country's specialization pattern should reflect the structural phenomena such as its factor endowments, economies of scale, relative gap of factor productivity, or specific advantages of firms and industries (Santos-Paulino, 2010, pp.1095-1116). Existing research shows that the variety of goods that a country produces and exports is affected by specialization, which in turn affects economic growth (Amable, 2000, pp. 413-431, Hausman *et al*, 2007, pp.3-42). Countries specialize by exploiting their comparative advantage arising from differences in technology, innovativeness and differences in factor endowments (Bernatonyte & Normantiene, 2009, pp.7-17). Classical approaches to international trade and specialization, such as D. Ricardo theory of comparative advantage and Hecksher-Ohlin theory of factor endowments state that countries with different resources or factor endowments will trade with each other (Husted & Melvin, 2013, pp.104-105). This traditional approach emphasizes the role of specialization in international trade which increases operating efficiency and thus totals productivity.

Many studies suggest that traditional sources of competitive advantage (e.g. natural resources, access to financial resources, economies of scale, etc.) no longer suffice, growing relevance has recently been attributed by researches to human resources and their management (Kazlauskaite & Buciuniene, 2008, pp.78-84). Recent empirical studies confirm the argument that the products in which economies specialize and what they export matters for their economic performance (Lewer *et al*., 2003, pp. 39-46). Today, specialization is a dynamic process and its effect on productivity depends on the circumstances in which industries operate.

EU enlargement creates a wider single market, which stimulates structural adjustment and economic specialization. This implies an increasing interest in analyzing export specialization patterns within the EU market. Several studies have assessed the evolution of the export patterns in the transition economies (Bernatonyte & Normantiene, 2009, pp.7-17).

Lithuania's integration to the European Union has opened huge possibilities for export development. It was determined that in recent years the export of

Lithuanian goods into the EU countries and import from the EU comprised the biggest share of all export and import. Research show that the economic crisis and Russian embargo have a significant influence on the changes of nature and the pattern of Lithuanian export specialization. At the same time, research investigating such changes are missing. For this reason, the actual problem is to estimate the nature and pattern of the Lithuanian export specialization under the changed conditions. In order to estimate the nature and pattern of export specialization, it is necessary to analyze the problem of its measurement.

Methodology of the Research

The research examines the nature and pattern of export specialization in Lithuania. In order to estimate the nature and pattern of the Lithuanian export specialization, the methods of assessment of export specialization were examined and the best methods were selected on these grounds.

Researchers have employed a number of measures of export specialization. They are used for studying the structure and determinants of country's export and to identify the basis on which to build competitive advantages (Bernatonyte & Normantiene, 2009, pp.7-17). The concept of comparative advantage is widely used in modern economic literature to evaluate the patterns of trade and specialization of countries in commodities which have a competitive advantage (Saboniene, 2009, pp.49-57). The indicator of the revealed comparative advantage provides a more concise picture of export specialization. The concept of revealed comparative advantage was introduced by Liesner (1958), but refined and popularized by Bela Balassa and known as the 'Balassa index' (Balassa, 1966, pp. 114-121). It is widely used empirically to identify a country's weak and strong export sectors. Michael Porter uses it to identify strong sectoral clusters (Porter, 1990, pp. 45-50). Balassa (1965) explored the possibility of relying on various theoretical explanations of international trade to determine the patterns of comparative advantage (Balassa, 1965, pp. 35-55). The revealed comparative advantage (RCA) index is defined by Balassa (B) (1965) as follows:

$$B_{ij} = (X_{ij} / X_i) / (X_{wj} / X_w), \quad (1)$$

where: X_{ij} is country's i export of sector j; X_i – total export of country i; X_{wj} – world export of sector j; X_w – total world export.

If the share of sector j in total exports of country j is higher than the equivalent share of sector j in world exports, then $B_{ij} > 1$ and country j is classified as having a revealed comparative advantage in sector j A value of less than unity implies that the country has a revealed comparative disadvantage in the sector j. The Balassa index has been subject to several critiques, leading some authors to propose several modified versions. Laursen (1998) suggests a transformation that produces a symmetric outcome, ranging from -1 to 1 with a threshold of 0; Proudman and Redding (2000) suggest a transformation that results in a constant mean across the different sectors for a given country. As in the Proudman and Redding (2000) contribution, the product specialization index suggested here has a clear and well-defined link to the original Balassa index (Laursen, 1998, pp. 30-42); Prodman & Redding, 2000, pp. 373-396).

The export specialization index (ES) is a slightly modified RCA index, in which the dominator is usually measured by specific markets or partners. It provides product information on revealed specialization in the export sector of a country and is calculated as the ratio of the share of a product in a country's total exports to the share of this product in imports to specific markets or partners rather than its share in world exports:

$$ES = (X_{ij} / X_{it}) / (m_{kj} / M_{kt}), \quad (2)$$

where: X_{ij} is the value of country's i export of product j; X_{it} – total export of country i; m_{kj} – the value of import of product j in market k; M_{kt} – total import in market k.

The ES is similar to the RCA in terms of the fact that the value of the index lower than a unity indicates a comparative disadvantage and a value above unity represents specialization in this market (Trade indicators, 2010).

A common measure for export specialization in the literature is the herfindahl index on exports. The evolution of the herfindahl index of export specialization might reveal to what extent a given country is becoming more specialized or diversified, regardless of how the economic structures of other countries are evolving. A higher index indicates that the country exports in a smaller range of sectors and hence is more specialized (Trade indicators, 2010). Santos-Paulino (2010) used the trade dissimilarity index to illustrate how specialization might affect a country's export productivity (Santos-Paulino, 2010, pp.1095-1116). Trade dissimilarity index reflects the adequacy of a country's trade pattern or specialization, that is, it considers the uncertainty in the real growth of exports. The indicator tries to predict structural changes in a country's exports. Also, it evaluates if a

change in the behaviour of exports is oriented towards more dynamic products demanded by the rest of the world, or by the main trade partners of a country. It is calculated as follows:

$$A_j = \frac{1}{2} \sum_k \left| X_{jk} / X_j - X_k / X \right|, \quad (3)$$

where: k is the product and j is the country. X represents total exports.

Trade dissimilarity index ranges from zero to one, with higher values indicating higher dissimilarity. This indicator is higher when a country exports commodities in an industry with relatively low international demand. A lower dissimilarity index means higher diversification and diversification into new export products protects economies against unstable price and terms of trade shocks. As indicated by empirical exercise in Amable (2000), a decrease in trade dissimilarity index has a potential positive impact on the trade pattern of growth (Amable, 2000, pp. 413-431).

Regarding the fact that export specialization index helps assess a country's export potential, it will be used to analyse the nature and pattern of export specialization between Lithuania and the EU. The structural changes in Lithuanian export are examined using trade dissimilarity index.

Comparative Analysis of Export Specialization in Lithuania

Development of the Lithuanian economy depends to a great extent on foreign trade. Development of foreign trade encourages structural changes of economy, helps to make close economic contracts to businessmen of other countries and to adjust to market conditions better. Lithuanian integration into the EU opened huge possibilities for Lithuanian foreign trade. Regional integration oriented transformations in the Baltic region Formation of the unified social, economic and technological space in the Baltic region could be comprehend as a successful case of the regional integration oriented transformations in the European Union (Melnikas, 2008, pp. 54-64). It was determined that in recent years export of Lithuanian goods into EU countries and import from the EU comprised the biggest share of all export and import. In 2014 export of Lithuanian goods to the EU comprised 54.9% and import from the EU –63.8 % (Statistical Yearbook of Lithuania, 2014). While the demand in Eastern markets is shrinking, export conditions to EU countries are getting more attractive (Snieska, 2008, pp. 29-41). Increase of

the share of export of industrial products in comparison to the general export to EU market shows possibilities for industrial production to compete in these markets.

The analysis of Lithuanian export specialization is based on export specialization index and trade dissimilarity index. Using export specialization index (ES) and standard international trade classification (SITC) are calculated the nature and pattern of export specialization in trade between Lithuania and the EU (Table 1).

The export specialization index presented in Table 1 indicates that in 2007-2013 Lithuania has achieved comparative advantage in trade with the EU in: food, drink and tobacco, raw materials, mineral fuels, lubricants and related materials and other manufactured goods.

Table 1. Export specialization indices of Lithuanian trade with the EU in 2007–2013

SITC	Year						
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Food, drink and tobacco (SITC 0+1)	3.19	3.31	3.23	3.43	3.41	3.42	3.44
Raw materials (SITC 2+4)	1.94	2.02	1.99	2.01	2.02	2.14	2.16
Mineral fuels, lubricants and related materials (SITC 3)	2.62	2.64	2.60	2.62	2.67	2.69	2.70
Chemicals and related products (SITC 5)	0.84	0.83	0.85	0.86	0.88	0.89	0.89
Machinery and transport equipment (SITC 7)	0.53	0.55	0.54	0.55	0.65	0.67	0.69
Other manufactured goods (6+8)	1.13	1.16	1.16	1.18	1.19	1.23	1.26

Source: own calculations based on Eurostat (2014).

Data of Table 1 show that Lithuanian trading with the EU in food products, drinks and tobaccos during 2013 not only increased if compared to 2007 but also were the largest. Such situation was determined by many reasons, mainly, abolition of customs taxes for food products and alcoholic drinks from the EU states. This reduced the prices of these products in 2005, increased consumption and import thereof. On the other hand, during the examined period from 2007 to 2013 export of the said goods increased.

Using the trade dissimilarity index standard international trade classification (SITC) are calculated the pattern of export specialization between the Lithuania and the EU (Table 2).

Table 2. Trade dissimilarity indices of Lithuania in 2007–2013

Year	Trade dissimilarity index
2007	0.34
2008	0.30
2009	0.31
2010	0.32
2011	0.33
2012	0.35
2013	0.36

Source: own calculations based on Eurostat (2015).

Empirical results indicate a large variation in the trade dissimilarity index (Table 2). The results presented in Table 2 reveal that the trade dissimilarity index is lower in 2008. This situation is connected with trade structure of Lithuania (i.e. trade structure of Lithuania is rather similar to the EU trade). The EU trade policy and implementation of its principles had an influence on new EU members' export and import marketable structure. It should be noted that since the moment Lithuania became the member of the EU, common custom tariff of the EU has been valid in Lithuania. This means that the same customs are applied for goods which are imported to the territory of Lithuania from the third countries as to importing goods to any other EU country. In order to make sure, implementation of solid foreign trade policy Lithuania and other members of EU apply the custom tariffs, quantitative limitations, tariff quotas and other means of foreign trade regulation to the third countries which EU applies. Lithuania has applied other means of EU foreign trade regulation: antidumping, protective, compensatory, reciprocal means, quantitative limitations, non-tariff limitations (veterinary and other standards), and means, introduced as sanctions according to the decisions of the United Nations.

Thus, the analysis of export specialization reveals that after Lithuania becoming the member of the EU, having national economics under development, structural changes of its economy takes place. Having Lithuania trade with the EU in a free trade regime influences the increase in the volumes of import and export. A country can simultaneously decrease the amount of produced goods and to increase the range of goods useful to the consumers. Thus, the nature of international trade is changing as well as its structure of goods due to increasing specialization within a branch and the variety of produced goods increases.

Conclusions

The conducted analysis enabled to draw the following conclusions.

Firstly, research shows that Lithuanian integration into the EU has influence on the changes of export specialization. It was determined that in recent years export of Lithuanian goods into EU countries and import from the EU comprised the biggest share of all export and import.

Secondly, in order to understand the nature and pattern of export specialization of Lithuania the methods of assessment of export specialization were examined, and on these grounds the best method was selected. The analysis of these methods shows that researchers have employed a number of measures of export specialization for studying the structure and determinants of country's export and to identify the basis on which to build competitive advantages. It was determined that that export specialization index is the best of measuring export specialization in trade between Lithuania and the EU. This index helps to estimate a sector in which the country is relatively more competitive in terms of trade.

Thirdly, on the basis of study many methods of export specialization it was determined that the most appropriate method for measuring how specialization might affect a country's export productivity is trade dissimilarity index. Trade dissimilarity index reflects the adequacy of a country's trade pattern or specialization, that is, it considers the uncertainty in the real growth of exports. The indicator tries to predict structural changes in a country's exports.

Fourthly, on the basis of standard international trade classification (SITC) and export specialization index the nature and pattern of export specialization in Lithuania were determined. It was found that the biggest flows from Lithuania to the EU are in the following groups: food, drink and tobacco; raw materials; mineral fuels, lubricants and related materials. Such situation was determined by many reasons, mainly, abolition of customs taxes for food products and alcoholic drinks from the EU states. This reduced the prices of these products in 2005, while increasing the consumption and import thereof. On the other hand, during the examined period from 2007 to 2013 export of the said goods from Lithuania increased.

Fifthly, on the basis of standard international trade classification (SITC) and the trade dissimilarity index the pattern of export specialization between Lithuania and the EU were calculated. Low level of trade dissimilarity index was determined, because the trade structure of Lithuania is rather similar to the EU trade.

Thus, the analysis of export specialization reveals that after Lithuania became a member of the EU, having national economics under develop-

ment, structural changes of its economy have taken place. Having Lithuania trade with the EU in a free trade regime influences the increase in the volumes of import and export. Lithuania can simultaneously decrease the amount of produced goods and to increase the range of goods useful to the consumers. Thus, the nature of international trade is changing as well as its structure of goods, due to increasing specialization within a branch and the variety of produced goods.

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