LITHUANIAN INTRA-INDUSTRY TRADE WITH THE MAIN PARTNER COUNTRIES

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Abstract. The paper deals with the analysis of Lithuanian intra-industry trade. The largest foreign trade partner countries selected for the analysis are as follows: Russia, Germany, Latvia, and Poland. An increase in the extent of intra-industry trade stimulates interest in this phenomenon. Traditional trade theories cannot explain why some countries trade in differentiated products. Some economists think that intra-industry trade is based on monopolistic competition and economies of scale, which point that any countries located close to each other will trade with each other in similar products the more intensively, the more they are similar to each other with regard to both economic development and geographical resources. Various indices are used to assess the intensiveness of intra-industry trade. Calculations provided in the paper are carried out applying the Grubel - Lloyd index, which is the most frequently used for this purpose. The paper analyses changes in trade during the period of 2005 - 2011 based on the data of Statistics Lithuania according to the Combined Nomenclature of goods. The object of research is trade between Lithuania and the above-mentioned countries. The methods of research are as follows: analysis of scientific literature and description, analysis of Lithuanian foreign trade statistics.

Keywords: export, import, intra - industry trade, Grubel - Lloyd index.

1. Introduction

In this period of developing globalization and integration, the meaning of international trade grows fast. International trade is the essential factor of economic growth and benefit of each country. It is an integral part of daily life because countries trade with each other trying to gain the biggest possible economic profit. The bigger is the profit gained, the better is the social life in a country. International trade is a very complex process, which is influenced by various factors: economic situation in the country, political and legal aspects, level of economic integration, monetary policy and others. International trade is especially important for small countries, which cannot produce all the necessary goods because of small available market and little production abilities.

Today all the countries carry on international trade; therefore, it is important for Lithuania to develop its participation in international trade, specialization in production, and cooperation, all the more that the membership in the European Union gives an opportunity to base on the EU market and to ensure the economic development of the country.

Countries carry out their trading activity in two ways: trade among industrial branches – when a country sells to another country any production of any single industrial branch and purchases from it any production of any other industrial branch, and intra-industry trade. Interest in intra-industry trade increased about 1960 - 1970, when this international trade phenomenon was noticed, which could not be explained by any traditional trade theories. Up to then, international trade and science in international trade were clear and simple. Trade between branches, as distinct from intra-industry trade, is an exchange carried out among any countries with different products of industrial branches. Such trade is called inter-industry trade. Countries trade with each other in products, which can be produced by them in large quantities than by other countries due to larger resources, competitive advantage, etc. Specialization increases the extent of production, and any surplus is exported – thus, inter-industry trade is growing; therefore, the role of international trade increases. This trade is characterized by trade in homogenous goods and perfect competition. Inter-industry trade means exchange with products with different need for production factors. Countries having large skilled labour force reserves tend to export more complex products, while countries having large reserves of natural resources export goods manufactured from these reserves. A big part of such inter-industry trade is carried out among the countries having different resources and extent thereof and can be explained by the comparative advantage theory or any other theories.

Intra-industry trade makes up about a quarter of total international trade. Economists B.Balassa (1966) [2], R.J. Ruffin (1999) [16], R.L.A.Batiz, M.A. Olivia (2003) [3], H.Grubel and P.Lloyd (1975) [11], D.Bernatonytė (2007, 2008, 2009) [4,5,6], R.J. Carbaugh (2008) [7], P.R.Krugman, M.Obstfeld (2009) [12] and others defined this type of trade as trade in products of any single branch among any countries, when the countries import and export production of

the same group of goods in the same branch of industry. Intra-industry trade is carried out in differentiated products, that is, products which are an excellent mutual replacement of products. This trade model prevails in the countries where the average income of citizens and the demand preferences are similar.

Reasons and consequences of industrial branch production and its meaning and usefulness for trade were the object of many researches. Most of the researches carried out show that the more developed are countries, the more specialized is the structure of international trade, and intra-industry trade prevails in total international trade in the developed countries (Bernatonyte D., Normantiene A., 2007[6]). Despite the increasing importance of trade in the world economics, no theoretical basis has been formed yet, which would be reasoned and developed enough and could explain why two identical countries trade in similar products satisfying the same needs of consumers. Classical theories of international trade accentuating that trade has originated due to comparative advantage, uniqueness and singularity of countries or due to any difference in production factors, cannot explain the origin of intra-industry trade. Otherwise, any similar countries, e.g. Germany and France, are the biggest mutual international trade partners, which carry out import and export of similar products to and from each other. Some modern theories are therefore developed, which are based on monopolistic competition and economies of scale and emphasize that any countries located close to each other trade in similar products the more intensively, the more similar they are to each other with regard to both the economic development level and consumption culture of citizens and available economic and geographical resources (Ruffin J.R., 1999[16]).

Reasons for intra-industry trade and its meaning to structural regulation and trade were the topic of many studies. Traditional theories, such as comparative advantage or usefulness factors, determine that countries with different resources and production factors will trade with each other. However, empirical research shows that nowadays countries of a similar development level actually trade more. Monopolistic competition based on new theories, and increasing turnover cause intra-industry trade among countries, and the comparative advantage is still applied to those less developed countries.

2. Main Lithuanian foreign trade partner countries

Lithuania is a comparatively small country; therefore, it cannot produce all the necessary products. The country takes part in the international sharing process, which helps to use the available resources in a more effective way, to produce high quality and competitive products and to participate in the international exchange of goods and international trade.

The calculations carried out by the author show that during the period of 2000–2005 both the country's export / GDP ratio and foreign trade turnover / GDP ratio were constantly increasing, and the latter index exceeded the limit of one in 2005. Data provided in Table 1 shows that after 2005 the trends in both indices were changing. Particularly significant changes were caused by economic and financial crisis. In 2009, both analyzed indices decreased; however, the next two years were the period of a significant growth in these indices. In 2010, foreign trade indices exceeded the level observed in 2007. In 2011, the foreign trade turnover exceeded the level reached in 2010 by 29.0 per cent.¹ Such a growth was based on a comprehension that only exports could help the country's economy to get out of the economic crisis.

Indices	2004	2005	2006	2007	2008	2009	2010	2011
Export / GDP ratio	0.410	0.453	0.467	0.435	0.495	0.443	0.568	0.656
Foreign trade turnover/ GDP ratio	0.956	1.049	1.107	1.055	1.147	0.936	1.209	1.400

Table 1. Lithuanian foreign trade / GDP ratio

Source: Compiled by the author based on the data of Statistics Lithuania.

According to the radical concept of open economy any competition on the market is the best regulator of the national economic development. All the obstacles restricting any international economic activity should be removed. At the same time, Lithuania should specialize in the production of such goods where it has a comparative advantage. Free flows of goods, services, capital and labour force guarantee the best distribution and efficiency of production.

¹ Here and in other cases, when there is no reference to any statistical data, the data received from Statistics Lithuania are used as a source.

The following two development models are distinguished in the territory of international trade: import-replacing development and export-oriented development. The model of export-oriented development was formed a far back as the last century. Most of the countries applying this model were able to solve the problems connected with the country's economic development and demonstrated its advantages, which come out first of all as a fast tempo of economic growth. The economic policy followed conducted by Lithuania is based on the more effective export-oriented development model. It is proved by the Lithuanian economic policy trying to overcome the economic crisis, as it is shown by data presented in Table 1.

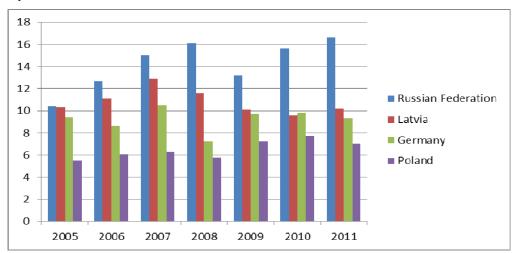


Figure 1. Main Lithuania's export partner countries (per cent)

Lithuania trades with many countries all over the world. Last year (2011) Lithuanian goods were exported to 175 countries, and goods were imported into Lithuania from 150 countries.

For many years, the main Lithuanian trade partner countries remain the same: Russia, Latvia, Germany, and Poland. In 2011, export to Russia accounted 16.6 per cent of Lithuania's total exports, to Latvia – 10.2 per cent, to Germany – 9.3 per cent, and to Poland – 6.9 per cent. Beyond the limit of these four countries were: Estonia – 6.6 per cent of total exports, the Netherlands – 6.1 per cent, Byelorussia – 5.2 per cent. In 2011, compared to 2010, exports increased by 28.8 per cent. The increase in exports was influenced by the increased exports of petroleum products (39.8 per cent), means of land transport (42.8 per cent) and fertilizers (61.1 per cent). Exports of goods, except mineral products, increased by 25.4 per cent. Exports of goods of Lithuanian origin increased by 25.1 per cent, excluding mineral products – by 20.5 per cent.

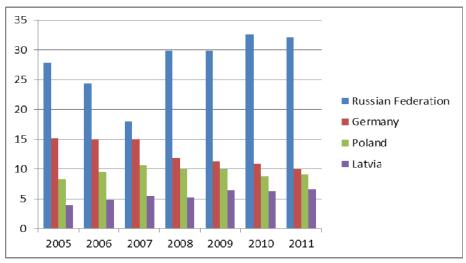


Figure 2. Main Lithuania's import partner countries (per cent)

The main Lithuania's import partner countries are Russia, Germany, Poland, and Latvia. In 2011, imports from Russia accounted for 32.1 per cent of Lithuania's total imports, from Germany – 10.0 per cent, from Poland – 9.1 per cent, from Latvia – 6.6 per cent. Beyond the limit of these four countries were the Netherlands – 5.0 per cent of total imports, Italy – 3.5 per cent, and Sweden – 3.3 per cent. In 2011, in compared to 2010, imports increased by 29.3 per cent. The increase in imports was caused by the increased imports of crude oil (27.6 per cent.), means of land transport (54.3 per cent) and boilers, machines and mechanical equipment (34.4 per cent).

3. Index of assessment of intra-industry trade

Various methods are applied in a effort to assess the importance of intra-industry trade. The first works on this topic were presented by Béla Balassa in 1966. However, the indicator that is most often used to measure the extent of intra-industry trade is that put forward by H.Grubel and P.Lloyd (1975) [11]). It calculates the part of balanced trade (overlap between exports and imports) in total trade in a given industry *i*:

$$IIT_{i,AB} = \left[\frac{(X_i + M_i) - |X_i - M_i|}{(X_i + M_i)}\right] = \left[1 - \frac{\sum_{i} |X_i - M_i|}{\sum_{i} (X_i + M_i)}\right]$$
(1)

where *i* is a certain explored group of products traded among countries A and B.

IITi – index of intra-industry trade for industry *i*;

Xi – value of export in industry *i*;

Mi – value of import in industry *i*;

Xi + Mi – total value of trade;

Xi - Mi - trade balance in industry *i*.

The closer the value IITi is to 1, the more important is intra-industry trade, and vice versa, the closer the value IITi is to 0, the more important is inter-industry trade. If Xi or Mi are equal to 0, there is no inter-industry trade at all, and the IITi index is equal to 0, which means that a country only exports or imports the production of the branch being explored, and there is no intra-industry trade among countries A and B at all. Then they specialize in self production and are net importers of a certain group of products or net exporters. When IITi is equal to 1, countries trade with each other: a country exports the same amount as it imports. To sum up, the closer the value IITi is to 1, the bigger is the importance of intra-industry trade. Such an index does not show the direction of those goods, but merely acknowledges the overlap level of trade in those goods between two countries. The IITi index can be expressed as a percentage.

4. Calculation results of intra-industry trade

Based on the formula (1), the index of intra-industry trade by Combined Nomenclature sections between Lithuania and Russia, Latvia, Germany and Poland was calculated. The results are provided in Table 2 (green-coloured index values are equal to or exceed 0.5; red-coloured index values are equal to or less than 0.1). The values of the *IIT* indices during the period of 2005-2011 are as follows: in case of trade with Russia – 0.34, with Latvia – 0.70, with Germany – 0.47, with Poland – 0.46. Thus, the biggest part of intra-industry trade in total trade with separate countries is in trade with Latvia, then with Germany, Poland and Russia.

Lithuania and Latvia are neighbour countries, and the size, development, cultural milieu, social aspects and size of their markets are similar. This causes the intensiveness of intra-industry trade. There is no group of goods where intra-industry trade is insignificant. Calculation results show that the most intensive intra-industry trade is in the following sections of goods: IX. Wood and articles of wood, VI. Products of chemical or allied industries, I. Live animals; animal products, XVII. Vehicles, aircraft and associated transport equipment, XVIII. Optical, photographic, medical instruments, etc., XI. Textile and textile articles, XV. Base metals and articles of base metal, and other products. During the period 2008-2011, compared to the period 2005-2007 the average index in thirteen sections of goods out of total 21 CN sections of goods in intra-industry trade increased. This shows the growing importance of intra-industry trade between Latvia and Lithuania.

When Lithuania and Latvia joined the EU, some positive changes in trade among countries were observed. Data of the *IIT* analysis show that the character of trade has changed in certain sectors: it transformed from the inter-industry

trade into intra-industry trade. The most significant changes have been observed in following sections of goods: XVII. Vehicles, aircraft and associated transport equipment, XVI. Machinery and sectors of various appliances.

One of possible reasons for the increased intra-industry trade index in these spheres is re-export. Upon Lithuania's and Latvia's accession to the EU, the extent of re-export increased: the part of re-export in the general export structure increased from 29.5 per cent in 2004 to 45.3 per cent in 2011. A particularly strong growth in the trade of both countries was observed in the last years. In 2011, compared to 2010, exports from Lithuania to Latvia increased by 40.7 per cent, imports from Latvia to Lithuania by 35.7 per cent.

	Russia	Germany	Latvia	Poland
I. Live animals; animal products	0.05	0.84	0.90	0.82
II. Vegetable products	0.07	0.82	0.55	0.51
III. Animal or vegetable fats and oils	0.44	0.37	0.78	0.46
IV. Prepared foodstuffs, beverages, spirits, vinegar and tobacco	0.17	0.84	0.75	0.48
V. Mineral products	0.01	0.28	0.26	0.34
VI. Products of the chemical or allied industries	0.74	0.80	0.94	0.53
VII. Plastics and articles thereof; rubber and articles thereof	0.38	0.86	0.79	0.91
VIII. Raw hides, skins, leather, furskins and articles thereof	0.10	0.51	0.84	0.91
IX. Wood and articles of wood	0.92	0.40	0.76	0.81
X. Pulp of wood, other fibrous celluloses material; paper	0.31	0.38	0.95	0.37
XI. Textile and textile articles	0.04	0.96	0.87	0.37
XII. Footwear, headgear, umbrellas, walking sticks, whips	0.24	0.18	0.72	0.43
XIII. Articles of stone, plaster, cement; glass, glassware, etc.	0.41	0.19	0.82	0.34
XIV. Natural or cultured pearls, coin, etc.	0.32	0.49	0.65	0.18
XV. Base metals and articles of base metal	0.76	0.76	0.85	0.54
XVI. Machinery, mechanical appliances; electrical equipment	0.11	0.33	0.82	0.42
XVII. Vehicles, aircraft and associated transport equipment	0.22	0.49	0.89	0.68
XVIII. Optical, photographic, medical instruments, etc.	0.15	0.61	0.88	0.80
XIX. Arms, ammunition; parts and accessories thereof	0.29	0	0.18	0.09
XX. Miscellaneous manufactured articles	0.11	0.41	0.81	0.89
XXI. Works of art, collector's pieces and antiques	0.16	0.30	0.42	0.07

Table 2. Intra-industry trade by CN sections between Lithuania and Russia, Germany, Latvia, Poland in 2008-2011

Source: Compiled by the author based on the data of Statistics Lithuania.

In case of trade with Germany, intra-industry trade index exceeded 0.5 in eight CN sections of goods during the period of 2008 - 2011. The only section of goods, where the index was less than 0.1 was XIX. Arms and ammunition. Lithuania has not got much to offer to Germany in this section of and generally imports goods from another country. The most intensive trade among countries was in the following sections of goods: XI. Textile and textile articles, VII. Plastics and articles thereof, I. Live animals; animal products, IV. Prepared foodstuffs, II. Vegetable products, VI. Products of the chemical industry. Besides of the group of goods XIX. Arms and ammunition, a more one-sided trade is in the following sections of goods: XII. Footwear and headgear (in 2008 - 2011 - the *IIT* index equal to 0.18), XIII. Articles of stone, plaster, cement - 0.19, V. Mineral products - 0.28, XXI. Works of art, collector's pieces and antiques - 0.3, XVI. Machinery, mechanical appliances - 0.33, III. Animal or vegetable fats and oils - 0.37. In case of trade in goods from sections XIII. Articles of stone, plaster, cement and V. Mineral products, exports significantly exceeds imports, and Lithuanian goods prevailed in this case of trade among countries. In the sections of goods XII. Footwear and headgear, III. Animal and vegetable fats and oils, XVI. Machinery and mechanical appliances, and German goods prevailed in this case of trade among countries.

In case of trade with Poland, the intra-industry trade index exceeded 0.5 in thirteen CN sections of goods during the period of 2008 - 2011. The most intensive trade among countries was in the following sections of goods: VIII. Raw hides, skins, leather, furskins and articles thereof; saddlery and harness; travel goods, handbags and similar containers;

articles of animal gut (other than silkworm gut), VII. Plastics and articles thereof, XX. Miscellaneous manufactured articles, I. Live animals, IX. Wood and articles of wood. A more one-sided trade is in the following sections of goods: XXI. Works of art (in 2008 - 2011, --- the *IIT* index equal to 0.07), XIX. Arms and ammunition - 0.09, XIV. Pearls, jewels and precious metals - 0.18, XIII. Articles of stone, plaster, cement - 0.34, V. Mineral products - 0.34, X. Pulp of wood or of other fibrous cellulosic material; recovered (waste and scrap) paper or paperboard; paper and paperboard and articles thereof - 0.37, XI. Textile and textile articles - 0.37. In case of trade in goods from the groups of goods XIX. Arms and ammunition, V. Mineral products, export significantly exceeded import, and Lithuanian goods prevailed in this case of trade. Polish goods prevailed in the following sections of goods: XXI. Works of art, XIV. Pearls, jewels and precious metals, XIII. Articles of stone, plaster, cement, XI. Textile and textile articles.

Trade between Lithuania and Russia is clearly distinguished from that of other countries explored. Inter-industry trade significantly prevails here. During the period of 2008–2011, the IIT index exceeded 0.5 only in three sections of goods: IX. Wood and articles of wood, XV. Base metals, and VI. Products of the chemical or allied industries. One-sided trade was observed in the following groups of goods: V. Mineral products (in 2008 – 2011, the *IIT* index is equal to 0.01), XI. Textile and textile articles– 0.04, I. Live animals – 0.05, II. Vegetable products – 0.07, XX. Miscellaneous manufactured articles – 0.11, XVI. Machinery and mechanical appliances – 0.11, XVIII. Optical, photographic, medical instruments, etc. – 0.15, XXI. Works of art – 0.16, IV. Prepared foodstuffs – 0.17. In case of trade in goods from the sections of goods I. Live animals, II. Vegetable products, XX. Miscellaneous manufactured articles, XVI. Machinery and mechanical instruments, etc., XXI. Works of art, IV. Prepared foodstuffs – 0.17. In case of trade in goods from the sections of goods I. Live animals, II. Vegetable products, XX. Miscellaneous manufactured articles, XVI. Machinery and mechanical appliances. The section of goods V. Mineral products Russian goods prevailed in this case of trade among countries. In the section of goods V. Mineral products Russian goods prevailed. Trade between Lithuania and Russia in most of CN sections has been moving in the positive direction.

5. Conclusions

Lithuania is a comparatively small country; therefore, it cannot produce all the necessary products. The country takes part in the international sharing process, which helps to use the available resources in a more effective way, to produce high quality and competitive production and to participate in the international exchange of goods and international trade. The main Lithuanian trade partners are Russia, Latvia, Germany, and Poland.

Countries carry out their trading activity in two ways: trade among industrial branches – when a country sells to another country any production of any single industrial branch and purchases from it any production of any other industrial branch, and intra-industry trade. The Grubel - Lloyd index is most commonly used for the assessment of intra-industry trade. The analysis of Lithuanian intra-industry trade has shown that this type of trade covers more than half of the country's foreign trade.

A statistical analysis of Lithuanian intra-industry trade with the main trade partner countries has shown that the types of trade in case of trade with the abovementioned countries are different. Latvia and Russia stand on the contrary poles. In case of trade with Latvia, intra-industry trade prevails. Lithuania and Latvia are neighbor countries, thus the size, development, cultural milieu, social aspects and size of the markets are similar. This causes the intensiveness of intra-industry trade. There is no group of goods where intra-industry trade would be insignificant.

Trade with Russia can be described as a type of inter-industry trade. In three groups of goods (sections) intraindustry trade exceeds half. In all the sections of goods, except for those where inter-industry trade is carried on, Lithuanian goods prevail. Russia prevails in the group of sections V. Mineral products.

The analysis performed showed that the intensification of intra - industry trade may be expected in Latvia, Germany and Poland.

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LIETUVOS PREKYBA ŠAKOS VIDUJE SU PAGRINDINĖMIS ŠALIMIS PARTNERĖMIS

Vladas Rimkus

Santrauka. Globalizacija ir ekonominė integracija – tai procesai, atveriantys vis didesnes galimybes vystytis tarptautinei prekybai, tuo pačiu ir prekybai šakos viduje. Auganti prekybos šakos viduje reikšmė pasaulinėje prekyboje turi didelės įtakos įvairių šalių ekonomikos, eksporto ir importo struktūros pokyčiams. Abipusiai prekių mainai labiausiai pasireiškia tarp panašiai išsivysčiusių tiek technologiniu, tiek kapitalo ir darbo aspektu pramoninių šalių, kurios ir sudaro didžiąją dalį pasaulio prekyboje. Tarptautinei prekybai skirtos tradicinės teorijos jau nebegali paaiškinti prekybos šakos viduje fenomeno, kadangi šis prekybos tipas pasireiškia masto ekonomijos efektu, prekių diferenciacija bei prekybos specializacija.

Šalys vykdo dviejų rūšių prekybą: prekybą tarp pramonės šakų, kai viena šalis parduoda kitai šaliai vienos pramonės šakos produkciją ir perka iš jos kitos pramonės šakos produkciją, ir prekybą šakos viduje. Susidomėjimas prekyba šakos viduje išaugo apie 1960–1970 metus, kuomet buvo pastebėtas šis tarptautinės prekybos fenomenas, kuris negalėjo būti paaiškintas tradicinėmis prekybos teorijomis. Daugelis tyrimų rodo, kad kuo labiau išsivysčiusios šalys, tuo labiau specializuota jų užsienio prekybos struktūra, todėl tokiose šalyse prekyba šakos viduje vyrauja bendroje tarptautinės prekybos apimtyje.

Straipsnyje taip pat apžvelgiama Lietuvos prekyba šakos viduje su didžiausiomis užsienio prekybos partnerėmis Rusija, Vokietija, Latvija ir Lenkija. Skaičiavimai atlikti naudojant Grubel-Lloyd indeksą. Tyrimo rezultatai parodė, kad prekyba su minėtomis šalimis labai skiriasi. Prekyboje su Latvija dominuoja prekyba šakos viduje, su Rusija – tarpšakinė prekyba.

Reikšminiai žodžiai: eksportas, importas, prekyba šakos viduje, Grubelio-Loido indeksas.