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Chapter I

1. Introduction

Following the demise of central planning, Central and Eastern European (CEEC) countries experienced severe economic shocks. The Council of Mutual Economic Assistance (CMEA), which had governed the international trade relations of member countries, collapsed in 1989. Under central planning, the republics of the former Soviet Union (FSU) were effectively isolated from the West while the amount of trade by countries in Central and Eastern Europe with non CMEA partners was severely constrained.1

The EU responded to the collapse of communism in Central Europe by providing aid and offering preferential arrangements initially solely in terms of market access. The EU first upgraded status of CEECs to that of the least developed countries by granting them generalized system of preferences (GSP) and soon thereafter signed the European Association Agreement (EA). The EA went beyond narrowly conceived issues of market access by opening the path of deep, policy-induced integration.

The process of real integration between the CEE and EU could finally be intensified mainly because of the unprecedented move to markets by CEE and the move to more free trade on both sides. Central European countries have undergone a very fast restructuring process of their trade patterns and economic geography. Asides traditional explanatory factors such as economic distance, relative incomes, dismantlement of trade barriers and institutional spillovers, most contributions in the literature on emerging trade between the

EU and CEE point at foreign direct investment (FDI) as one of the main explanatory factors of the hastily increasing trade between Eastern Europe and EU.²

1.1. Problem statement and research question

Right after the collapse of the soviet system and the sign of Lithuanian independence a lot of changes have occurred in the country. The process from plan- to market economy so called transition came into a force.

In terms of trade trends the volume started to increase dramatically-export value from LTL 8.7 million in 1993 to LTL 18.3 million in 2001, import value from LTL 9.8 million in 1993 to LTL 25.4 million in 2001. Important to mention is that geographically the trade flows have changed. The increase in the export reorientation towards EU market was gradual.

In terms of foreign direct investments Lithuania didn’t receive a big amount of inflows compared to other CEECs until the year 1998. For instance US$ 30 million were invested in 1993, US$ 355 million in 1997, US$ 926 million in 1998 and around US$ 450 million in 2001. Manufacture sector attracted the biggest share of foreign direct investments and most of these investments were from EU countries.

After observing available data questions like: which were the main factors of the change in export reorientation and why did trade flows increase with EU market, occurred. Further, did foreign direct investments play any role in the pattern of these changes?

Here I present interesting findings done by Hoekman and Djankov (1997) that show that imports of intermediate inputs and machinery to CEECs are an important determinant of the changes in export structure. Sourcing of inputs from abroad is a major factor underlying the expansion of exports to the European Union.

Analysts have done a significant amount of work investigating developments in the trade of countries in Central andEastern Europe during 90’s. 3 This literature presents several stylized facts. First, exports from countries in Central and Eastern Europe (CEEC) to Western Europe have grown rapidly. Second, an increasing share of the trade between many Central and Eastern European countries and the European Union is intra-industry (IIT), that is, it involves exchanges of similar products. Third, inflows of foreign direct investment are heavily concentrated in specific sectors and countries. The importance in these countries of intra-industry trade and foreign direct investments in the changes of pattern of trade was broadly discussed during this period. 4

Guerrieri (1998) shows that analysis of trade and FDI for CEE obviously should include aspects of structural transformation and its consequences on foreign integration. He argues that the FDI played a significant role in shaping trade of Poland, Hungary and the Czech Republic, which attracted about a third of the total amount of foreign capital that has been directed to former planned economies of CEE.

Thus based on the findings above I would like to put investigation question as follows:

“Which role did foreign direct investments play in the changes of trade reorientation towards EU market during the transition process in Lithuania?”

As it was noted earlier there is evidence that increasing share of trade between CEECs and EU is in the form of intra-industry trade. 5 It means that the countries start to trade within the same product category. Based on this idea I would like to present the following hypotheses:


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5 Firstly such trade was studied by Herbert Grubel and Peter Lloyd (1971).
Chapter 1. Introduction

According to Djankov and Hoekman (1996) if FDI is oriented on establishment of vertical production links, it would raise the level of intra-industry trade. Vertical investments refer to those that geographically fragment the production process by stages of production. For example, the parent company may ship, design the intermediate inputs to foreign plant and then export finished product back to the parent country market or other markets.

Thus, second hypothesis is defined as:

2. **Hypothesis.** FDI in Lithuania have a positive impact on the level of intra-industry trade particularly with EU.

1.2. Motivation for Topic

**Reason for choosing a subject**

The idea behind the chosen subject has a few reasons. Firstly, the increasing pattern of foreign direct investments and intra-industry trade is relatively new and actual topic in the field of international economics. Second, there were only few analyses of IIT and FDI about Lithuania. Other CEECs especially like Hungary, Poland, and Czech Republic attracted more attention from international scholars. My assumption is that these countries attracted relatively big part of foreign direct investments and the share of trade was much higher than for other CEECs.

The main motivation of choosing Lithuania is because it is author’s home country and the chosen topic corresponds to the study program in ASB (Aarhus School of Business). With the collapse of central planning, that is once external commerce has finally become subordinated to economic considerations and state monopoly over foreign trade was

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6 Such analysis has been done by Kaminski (2000) who investigated how accession to the EU has affected trade and FDI in CEECs including Lithuania, and Aturupane, Djankov and Hoekman (1997) who investigated determinants of IIT between CEECs (including Lithuania) and EU.
abolished, the EU has quickly emerged as their largest trading partner. The EU is chosen due to the increasing importance for Lithuanian market in terms of trade and investments.

1.3. Delimitations

First, due to the object of the thesis, analysis takes part in manufacture sector excluding other sectors. Second, comprehensive research of FDI and trade would be possible only having information about the companies in Lithuania with foreign capital participation. However, due to the limit access to data of individual companies the analysis is done in the following way. The data on foreign direct investments is gathered according to NACE classification. Information on trade is gathered according to combined nomenclature (CN) data using COMEXT source and then converted to NACE classification using OECD conversion key. Third, organization of information on FDI started parallel with the first FDI inflows into the national economy. During the period 1991-1994, FDI statistics were collected and published by the Ministry of Economics. In 1995, the responsibility for the FDI statistics was transferred to the Department of Statistics. In 1996, Lithuania designed a new questionnaire, which was tested during that year. Since 1997, the present more comprehensive survey method has been used and FDI data was compiled in compliance with the OECD, IMF and World Bank requirements. The detailed analysis of foreign direct investments in this paper starts during the period 1996-2001. The IIT will be calculated from the year 1992 to 2001. This will be done because longer period might show us better picture of the changes in IIT and due to the information availability. Fourth, the overall information on Lithuania’s trade structure and FDI will be shown from the year 1993, the year since which comparable data is available.
1.4. Methodology

1.4.1. Research strategy

Examples of different research strategies include field studies, case studies, laboratory experiments, surveys and action research. Each research strategy is decisive for what type of data and results it is possible to obtain in the study.

The research strategy chosen in this project is case study. Yin (1994) defines a case study as "an empirical inquiry that investigates a contemporary phenomenon within its real-life context, when the boundaries between phenomenon and context are not clearly evident, and in which multiple sources of evidence are used". Further, he states that "the case study allows an investigation to retain the holistic and meaningful characteristics of real-life events". This is in accordance with the aim of this research project, which is to generate in-depth knowledge about the process of foreign trade in Lithuania in transition in combination with foreign direct investments.

Yin (1989) also emphasizes the importance of defining the unit of analysis for the case study, i.e. what exactly constitutes the ‘case’ that will be studied. The unit of analysis will be defined by the research question(s). Accordingly, the unit of analysis for the case studies in this research project is estimation the role of foreign direct investments in the changes of trade reorientation towards EU market.

1.4.2. Research method

Having chosen case study as a research strategy, the question of the methodological is still left open. Case studies may involve use of both quantitative and qualitative methods (Yin, 1994). Quantitative and qualitative research, however, contributes to our pursuit of knowledge in different but complimentary ways. Miles and Huberman (1994) agree that these two research methods need each other more often than not. However, because typically qualitative data involves words and quantitative data involves numbers, there are some researchers who feel that one is better (or more scientific) than the other. In
qualitative research, a hypothesis is not needed to begin research. However, all quantitative research requires a hypothesis before research can begin.

The quantitative method requires the use of standardized measures so that the varying perspectives can be fit into a limited number of predetermined response categories. In order to explain the level of intra-industry trade and to see the dependence between FDI and IIT the calculations and statistical modeling in this research will be used. The qualitative analysis has the purpose of understanding and interpretation of a certain phenomenon in a broad sense. The phenomenon in this paper is changes of the pattern in foreign trade and FDI inflows in the new environment created, leaving the plan and introducing the market economy. The quantitative and qualitative method in this research is inevitable.

1.4.3. Research validity and reliability

The quality of the case study can be strived for by complying with the criteria of validity, and reliability (Yin, 1994). The validity within the case study is guaranteed by means of data triangulation, the use of multiple data sources.

The data for this analysis is collected from various sources including domestic and international organizations, ongoing academic working papers, unpublished and published articles. This is done in order to avoid biased data. The information is taken from reliable Lithuanian organizations such as the Lithuanian Department of Statistics; Lithuanian Development Agency; Lithuanian Bank; Lithuanian Free Market Institute. Author used papers from international organizations such as Organization of Economic Cooperation and Development (OECD); European Bank of Reconstruction and Development (EBRD); World Bank (WB); EUROSTAT.

Not all of the data directly corresponds to this research topic, but gathered data from various organizations and institutions can be helpful in showing overall picture of situation which can be useful in solving research question.
1.5. Structure of the Thesis

The reminder of the paper is organized as follows. Chapter two discusses the theories of international trade with paying the main attention to the theory of intra-industry trade and foreign direct investments. The interdependence between FDI and IIT is explained from theoretical point of view.

Chapter three reviews the transition process in Lithuania. There will be highlighted the three phases of transition and the short discussion of the economic achievements in the country. The process of privatization will take the comprehensive explanation due to the importance of understanding the beginning of inflows of foreign direct investments in the country.

Chapter four reviews the realignment in Lithuania’s foreign trade during transition with the emphasis on its trade with the EU and the role of FDI in integration with the EU.

Chapter five analyzes the main industries in Lithuania. This will be done due to the increasing significance of volume of trading manufacture goods between Lithuania and the EU and increasing inflows of FDI in these industries.

Chapter six takes the main analysis of the intra-industry trade divided according to factor intensities and technology intensities. Then the changes in quality of traded products during the period of ten years will be explained using unit values and the influence of FDI on IIT will be defined. The regression analysis will be used.

Chapter seven concludes.
Chapter II

2. Relevant Theories and Literature Review

Firstly, in this chapter I will start with the explanation of international trade theories which are relative for my further analysis. It’s important to understand and distinguish between the theories of neoclassical trade and new trade (inter-industry trade and intra-industry trade). The latter theory, as it is the core theory of this paper will take the comprehensive explanation. Secondly, the theory of foreign direct investment will be reviewed. The importance of FDI from theoretical point of view will be explained. Thirdly, the significance of inter-relation between the theory of trade and FDI will be explored.

2.1. International trade theories

International trade distinguishes two basic theories: *neoclassical trade theory* and *new trade theory*.

2.1.1. Neoclassical Trade Theory

*Neoclassical trade theory* bases its explanation of trade patterns on the differences between countries and on the assumption of perfect competition. David Ricardo introduced the fundamental concept of neoclassical trade theory: comparative advantage in the production of certain goods. He demonstrated that although a country does not have an absolute advantage in the production of any goods vis-à-vis another country, gains can still be made from international trade. What matters is that a country will specialize in the production of goods in the field in which it holds a comparative
advantage, i.e. where the country’s opportunity costs of producing the goods are lower than the opportunity costs of its trading partners.

2.1.1.1. The H-O Model

The most influential neoclassical trade theory model expanding on Ricardo’s point is Heckscher-Ohlin theory, also known as the factor proportions model of international trade.\(^1\) The standard H-O model\(^2\) begins by expanding the number of factors of production from one to two. The model assumes that labor and capital are used in the production of two final goods.

The H-O model is defined as the ratio of the quantity of capital to the quantity of labor used in a production process as the capital-labor ratio. Assume that different industries, producing different goods, have different capital-labor ratios. It is this ratio (or proportion) of one factor to another that gives the model its generic name: the factor-proportions model.\(^3\)

According to this theory the differences between countries and hence the source of international trade lie in their different endowments of inputs. The comparative advantage of a country is determined by the endowment of resources and the technology of production. In other words country has a comparative advantage in producing the type of goods which relies most intensively on the locally abundant factors of production. Consequently, countries with relative abundance of labor should produce and export more traditional, labor-intensive goods, whereas countries with a relative abundance of capital should produce and export more advanced capital intensive goods. This will result in inter-industry trade, i.e. one-flow trade consisting of either export or import within one product category only.

\(^2\) The “standard” H-O model refers to the case of two countries, two goods and two factors of production.
\(^3\) Sturanovic, S., 1998, “The Heckcher-Ohlin (Factor Proportions) Model”.
2.1.2. New Trade Theory – IIT

According to *new trade theory*, on the other hand, trade can take place even if the endowments of inputs of countries are completely identical. This branch of theory does not build on the concept of comparative advantage. Instead new trade theory takes imperfect competition into account and assumes that the driving forces behind international trade are *product differentiation and increasing returns to scale*. Trade will now consist of importing those product varieties that are not produced domestically, and exporting those that are. This gives rise to intra-industry trade, i.e. two-way trade within the same product category.

According to Greenaway and Milner (1983) intra-industry trade is important for at least two reasons. First, accurate measurement of pure intra-industry trade can give some indication of the importance of determinants of international exchange other than relative factor proportions. Second, there is a possibility that adjustment to trade expansion may be easier when the expansion take the form of an increase in intra-as opposed to inter-industry exchange.

The differences between the inter-industry trade and intra-industry trade you can see from the table below.
Table 2.1. Key differences between inter- and intra-industry trade

<table>
<thead>
<tr>
<th></th>
<th>Inter-industry trade</th>
<th>Intra-industry trade</th>
</tr>
</thead>
<tbody>
<tr>
<td>International trade with products from…</td>
<td>different industries</td>
<td>the same industries</td>
</tr>
<tr>
<td>The underlying theory is…</td>
<td>neoclassical trade theory</td>
<td>new trade theory</td>
</tr>
<tr>
<td>The production function features…</td>
<td>constant returns to scale</td>
<td>increasing returns to scale</td>
</tr>
<tr>
<td>Consumer preferences are…</td>
<td>homogeneous</td>
<td>heterogeneous</td>
</tr>
<tr>
<td>The trade gains stem from…</td>
<td>the exploitation of comparative advantages in production</td>
<td>a wide range of product varieties and increasing returns to scale</td>
</tr>
</tbody>
</table>

Source: Jorgensen, Luthje, and Schroder

There have been attempts to explain IIT without modifying traditional trade models. This tradition dates back to Finger (1975) and others. This has recently been taken a step further by Davis (1995) and Bhagwati and Davis (1994) who show that IIT can occur in traditional trade models with technical differences between countries. The basic intuition is quite simple. Consider a model with two countries, two goods and only one factor, so that factor intensities by definition are equal and the two goods are in the same industry. In this way the model is compatible with the convention of thinking of IIT as occurring in goods with identical factor intensities. Clearly, then, even small technical differences will generate complete specialization in production. As long as there is demand for both goods in both countries, there will be trade, and this trade will be of an IIT type.

The models of Davis and Bhagwati are clearly interesting. They show that IIT can be explained in a very simple framework. It is probably also quite realistic to say that technical differences within industries and between countries are an important cause of IIT. There are relatively large technical differences at the industry level even between highly industrialized countries (Torstensson, 1996c).
2.1.2.1. **Horizontal and Vertical Intra-Industry Trade**

The main breakthrough to a theoretical explanation of IIT occurred in the late 1970s. However, more recent research has produced interesting developments in empirical approaches to IIT. These include attempts to distinguish between IIT caused by vertical differentiation and horizontal differentiation; studies of determinants of quality in vertical IIT; new methods of analyzing the country pattern of IIT, and case studies of different industries.

As just mentioned there are two types of intra-industry trade: *horizontal* and *vertical*. The first type suggests that the more similar countries are in terms of their endowments (incomes), the greater the share of horizontal IIT, which is driven by product differentiation and scale economies; the smaller the minimum efficient scale of production, the greater the number of firms in an industry, the greater the number of varieties supported by the market and the greater the magnitude of IIT. The theoretical basis for such trade was developed by Lancaster (1980), Krugman (1981), Helpman (1981, 1987) and Bergstrand (1990). This type of IIT arises when different varieties of a product are of a similar quality.\(^4\)

The second comprises exchange of similar goods of different quality and is pushed by differences in endowments. The theoretical basis for this type of IIT was first developed by Falvey (1981), further developed by Falvey and Kierzkowsky (1987) who showed that vertical IIT may arise in situations where large numbers of firms produce varieties of different qualities but there are no increasing returns in production. The pattern of vertical IIT follows traditional endowment-based models, with the relatively capital abundant country exporting higher quality products and the relatively labor abundant country exporting lower quality goods. In one sense, Falvey and Kierzkowsky (1987) explain IIT in a neo-Heckscher-Ohlin model, but the stated aim of the Falvey approach is to explain one type of IIT (rather than to argue that all IIT can be explained within this model), and

\(^4\) There are two distinct approaches to modeling horizontal differentiation: Lancastrian and Chamberlinian. The former assumes that consumers seek out a particular combination of attributes in their preferred variety; the latter that consumers aim to consume as many varieties of a given product as possible (D. Greenaway, R. Hine and C. Milner, 1995).
to take an empirical phenomenon such as vertical differentiation into consideration by modifying the traditional H-O model.\textsuperscript{5}

Shaked and Sutton (1984) showed that vertical IIT may also arise in market structures with small numbers of firms and increasing returns. No clear predictions therefore arise regarding the impact of scale or concentration as a determinant of vertical IIT. However, as in the case of horizontal IIT, the greater the number of varieties supported by the market, the more vertical IIT is observed in equilibrium.

The importance of distinction between vertical and horizontal IIT derives from the fact that different industry (and country) characteristics will be associated with trade in the two types of product. Vertical IIT can be related more to traditional theories of comparative advantage whilst horizontal IIT falls much more within the remit of ‘modern’ theories of trade.\textsuperscript{6}

Interesting attempts to distinguish between horizontal and vertical IIT have been made by Greenaway, Hine and Milner (1994, 1995). They use the approach taken by Torstensson (1991, 1996d) where quality of vertically differentiated products is assumed to be measured by price. First, it seems surprising that a large part of IIT is caused by vertical rather than horizontal product differentiation. Second, the determinants of vertical and horizontal IIT seem to differ, which may explain why econometric exercises have led to different conclusions. They argue that in CEEC context the distinction is particularly relevant because the level and growth in horizontal IIT is a good indicator of the extent to which the CEECs are “similar” to the EU. The studies of Greenaway, Hine and Milner have been useful in presenting unresolved puzzles rather than in presenting solutions to these issues. In particular their results suggest that determinants of vertical and horizontal IIT differ sometimes in counterintuitive ways.

\textsuperscript{5} Brulhart, M., and Robert, C., Hine, 1999, “Intra Industry Trade and Adjustment”.
Torstensson (1991) used price indices to examine whether vertical IIT can be explained by differences in factor proportions. A relationship was found between the quality of trade in vertically differentiated products and the factor endowment of the exporting country. In Torstensson (1996d) it was found that it is primarily human capital and not physical capital that determines the quality of production.

Aturupane, Djankov and Hoekman (1999) show that 80 to 90 per cent of total intra-industry trade and 25-40 per cent of total trade between the CEECs and the EU are of the vertical type. According to scholars a statistically significant positive association is found between vertical IIT and product differentiation, economies of scale, labor intensity of production and inward FDI. The horizontal IIT seems to be positively related to FDI and product differentiation and negatively with scale and the labor intensity of production.

2.1.3. Intra versus inter-industry trade in emerging economy

A characteristic of central planning was extensive vertical integration of production and standardization of products, both inputs and final goods. The transition to a market economy involves vertical disintegration, with firms specializing in a limited number of activities. The collapse of the CMEA meant that shifting exports to hard currency markets was crucial to many firms. A lack of knowledge of how to produce for export to OECD markets existed, however. Information on quality standards, packaging requirements, tastes and distribution channels was needed. Upgrading of production techniques frequently required new machinery and/or access to high quality intermediate goods from abroad. European firms were an obvious source of know-how and finance for CEEC enterprises seeking to export to Western Europe.

Hoekman and Djankov (1996) underline in their paper that the pattern of production and trade that emerges after opening the economy is driven in part by relative factor prices (endowments), and in part by economies of scale and scope. Much depends on history-the initial conditions determined by investment decisions under central planning. The first determinant will give rise to inter-industry trade: for example, the exchange of unskilled
labor-intensive goods for human capital-intensive products. The more dissimilar countries’ endowments are, the greater the volume of trade will be. The second factor will generate intra-industry trade: the exchange of similar manufacture products, with firms specializing in different varieties of similar goods, and relying increasingly on foreign suppliers to provide intermediate inputs and components used in their production process. The more similar countries are, the more important the latter type of exchange becomes (Helpman and Krugman, 1985).

The relative importance of intra- versus inter-industry trade for the CEECs is difficult to predict *ex ante*, because some of the countries involved are well endowed with natural resources-minerals, oil, gas, agricultural land (Hoekman, Djankov, 1996). Many are also relatively well endowed with human and physical capital. Real wage costs are significantly lower than in Western Europe. Such factors will result in trade patterns predicted by the standard Heckhscher-Ohlin theory, with countries exporting goods and services that use (embody) relatively abundant production factors. Given that many CEECs, especially in Central Europe, are industrialized nations with a relatively diversified manufacturing base and well-educated labor force, intra-industry trade should also be important.

The scope for rapid growth in IIT after the collapse of central planning can be expected to have been substantial, driven by the opening of the economies and associated changes in managerial incentives, market structure and flows of technology. The new management techniques and flows of technology can be possibly related with the investing foreign enterprises in the economy.

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2.2. Theory on FDI

2.2.1. Definition of Multinational Company and FDI

A multinational enterprise (MNE) is defined as a company that owns and controls value-adding activities in more than one country. The way in which the multinational company establishes ownership of value-adding activities in other countries is through Foreign Direct Investment (FDI).8 Foreign direct investment can be defined as the international capital flows in which a firm in one country creates or expands a subsidiary in another.9

Foreign investment is an investment made by a firm in another firm in another country and can be divided into: direct foreign investment and portfolio investment. Investment is direct if the investor has a permanent interest in the foreign company and achieves full or partial control of the company through the investment. This can be in the form of acquisition of, or merger with, and existing firm, purchase of shares in an existing firm, or the establishment of completely new firms and manufacturing plants, so called greenfield investment. The multinational company takes over an existing firm and utilizes e.g. its knowledge of the market while at the same time replacing the entire capital stock by introducing new technology.

The distinction between portfolio and direct investment is that if an investor owns more than 10 percent of the voting shares, it constitutes FDI (OECD definition of 1996). Note that the terms ‘firm’ and ‘company’ should be interpreted broadly as they cover both private and public firms, organizations, cooperatives, etc., and that the 10 per cent limit to some extent is arbitrary but generally accepted as a dividing line. If, on other hand, the foreign investment amounts to a share purchase of less than 10 per cent of the shares in a firm, by definition, this constitutes portfolio investment. Portfolio investment also includes deposits in banks and financial investment in government or private securities. The emphasis in this paper will only be on foreign direct investments.

8 Jorgen D. Hansen, 2001, “European Integration”- An Economic perspective, page 142
2.2.2. Conceptual framework of FDI

Like trade, FDI across borders comes to exploit a profit potential that cannot be captured in one's own country. The theory of FDI follows in many aspects the theory of international trade, except that it also has to explain why FDI rather than trade is used in order to capture the potential profit. In both cases the motivation is that of a (potentially) multinational firm that is looking for profit opportunities abroad. Like in trade, there are two distinct patterns of FDI: vertical or inter-industry pattern, exploiting industry-wide comparative advantages (as in Helpman, 1984), often found in FDI from developed to developing countries; and the horizontal or intra-industry pattern, where specific comparative advantages within given industries in developed countries are the source of trade. According to the standard theory of FDI, multinational enterprises tend to conduct FDI of the “vertical type” when there is a huge gap in factor prices between their home and the host country, and when the market of the host county is relatively small and trade costs are not large.10

According to Markusen (2002) Horizontal direct investments refer to the foreign production of products and services roughly similar to those the firm produces for its home market e.g., firms produce the same final products in multiple countries. Vertical investments refer to those that geographically fragment the production process by stages of production. Vertical firms generally produce outputs not produced by the parent-country operations. For example a parent firm may ship, design and/or intermediate inputs to a foreign assembly plant and export the final output back to the parent-country market. He argues that vertical activity is closely related to the notion of “outsourcing”, but much of this is transacted through contracts with independent local producers, as in the clothing and footwear industries, rather than through subsidiaries.

Hummels and Rapoport (1998) vertical activity call vertical specialization and relate to several production concepts including outsourcing, vertical integration, and vertical FDI, all of which have garnered much attention in academic research and the popular press.

10 For more see Markusen (1995), Markusen and Maskus (2001)
Outsourcing is the relocation of one or more stages of a good that was formerly produced entirely in the home country. Vertical integration and vertical FDI is activities in which multinational firms locate different stages of production of a good or goods in different countries. These concepts are similar to vertical specialization because they are all concerned with the location of production. The main distinction, however, is that vertical specialization concerns the activities of countries, while outsourcing, vertical integration, and vertical FDI involve the behavior of multinational firms.  

Keren (2002) argues in his paper that production across borders is advantageous when it combines inputs from two countries, some of which are cheaper, better or unavailable in one of them, if such inputs are non-tradable for some reason or if there are artificial barriers for trade in them. Artificial barriers created as part of the import substitution strategy, were an important motivation for FDI in many countries during the second half of the 20th century. Despite the fact that import substitution has lost much of its luster, it is still quite common. Trade barriers are particularly common in the sphere of business and financial services, although the trend for more openness and globalization made important inroads in these spheres too. Situations where non-tradability of production inputs prevails are, however, not less important and theoretically more interesting. It is important to point out that the absence of adequate business services in the host country constitutes a major barrier for FDI in all lines of production, of goods and services alike. This makes FDI in such services of special importance, in addition to its direct contribution to the domestic economy.

One of the most important inputs provided by FDI is knowledge capital, managerial services, engineering services, financial services, marketing services, information services, and similar intermediate business services. In multinationals these services are centered in headquarters in the developed countries of origin. These services require high level of human capital and enjoy returns to scale, and this is the source of their

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12 Keren, M., 2002, “The role of FDI in trade and financial services in transition: What distinguishes transition economies from developing economies?”, Comparative Economic Studies, Flushing; Spring; Vol. 44, Iss. 1; pages 15, 31
comparative advantage in developing countries. They have a very important positive impact on production and growth, through the agglomeration effect of their externalities.\textsuperscript{13}

According to Markusen (2000), business services included under knowledge capital, are not easily tradable, and therefore require FDI. They are non-tradable because their dissemination requires the physical presence of the people with the appropriate skills in the host country, in order to work closely with local people and to be able to keep intensive and meaningful interaction with the headquarters abroad. Much of the knowledge capital is tacit, disseminated through learning-by-doing and not through formal instruction or by instructions from abroad. Markusen (2000) emphasize that the knowledge capital imported through FDI complements rather than substitutes or replaces local human capital in countries where the adequate domestic human capital is available. This is the case in transition economies.

Markusen (1995) points out two reasons why knowledge-based assets are more likely to give rise to direct foreign investment than physical capital assets. First, knowledge-based assets can be transferred easily back and forth across space at low cost. An engineer or manager can visit many separate production facilities at relatively low cost. Second, knowledge often has a joint character, like a public good, in that it can be supplied to additional production facilities at very low cost. Blueprints, chemical formulae and pharmaceuticals, trademarks, and other marketing devices all have this characteristic-but asset based on physical capital such as machinery usually do not. That is, physical capital usually cannot yield a flow of services in one location without reducing its productivity in others. Markusen (2002) suggests third reason according to which knowledge-based assets are skilled-labor-intensive relative to production. This creates a motive for the geographical fragmentation of production and vertical multinationals. Skilled-labor-intensive ‘headquarters’ activities such as R&D and management should be located

\textsuperscript{13} Keren, M., 2002, “The role of FDI in trade and financial services in transition: What distinguishes transition economies from developing economies?”; Comparative Economic Studies, Flushing; Spring; Vol. 44, Iss. 1; pages 15, 31
where skilled labor is abundant and relatively cheap while production may be located in less-skilled-labor-abundant countries and/or in large markets.

### 2.2.3. Motives for FDI

The literature on FDI contains several frameworks for analysis of its determinants. For example, Caves (1982) had stressed the role of intangible assets, while Dunning (1980) developed the ‘eclectic’ approach, which categorizes motives for FDI into the ownership, location and internationalization advantages of trans-national production, so called OLI paradigm. Later, Dunning and Rojec (1993) have proposed a four-fold typology of foreign investment with particular reference to transitional economies: *resource seeking, market seeking, and efficiency seeking and strategic asset seeking*. The first two are expected primarily to motivate new FDI while the latter ones underlie subsequent investments.

Foreign investments are often motivated by access to the host market country. However, there are increasing motivations based on the exploitation of competitive factor inputs, especially the cheap highly qualified labor force (Meyer, 1995). Often the two motives are combined. The low labor cost hypothesis argues that international expansion may increase a firm’s value because it enhances its access to low cost labor inputs (Hood and Young, 1979). Many case studies have been made (for an overview of the main surveys since 1991, see Lankes and Venables, 1996) that listed low labor costs, especially inexpensive for a level of skills comparable to what is found in industrialized countries, as a usual motivation for FDI in transition economies. Economic theory of location suggests the substantial FDI would enter Eastern Europe in search for lower labor costs.

UNCTAD investment report (1999) suggests that Efficiency-seeking FDI occurs when MNEs locate part of their value-added chain abroad in order to improve the profitability of their overall operations. The oldest type of investments is labor-seeking investment. As

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15 See Borsos (1995).
wages rose in home countries, MNEs sought to obtain access to low-cost labor in developing countries by locating labor-intensive segments of their production processes.

Labor-seeking investments are generally trade-creating, since they give rise to exports from host countries. In many cases, they also lead to a diversification in the composition of host-country exports towards manufactures. On the consumption side, such investments also tend to be trade creating, since a large share of the raw materials used in production is imported.

Keren (2002) points that FDI is driven by two alternative motives: 1) to increase the export capacity (export-oriented FDI) of the host country and 2) to penetrate its domestic market (market-oriented FDI). While the use of knowledge capital is important in both cases, it is more pronounced when export is the main goal. The penetration of the domestic market is the same as market-seeking FDI and is more important in large countries with large potential domestic markets. FDI among developed countries is mostly aimed at market penetration. The export-oriented FDI aims to take advantage of low costs of production usually labor-related in foreign countries and then to export the output produced back to their home countries or third countries. Furthermore, there is a clear connection between opening of foreign trade and the increase in foreign investments.16

In the case of export-oriented investment, and as trade and investment barriers fall, such investments become increasingly important compared to those that are made just to service the domestic markets of the host country, increasing the likelihood of positive effects of FDI on trade. More generally, with the rise of integrated international production, trade and investment are now linked in complex ways and are increasingly jointly determined by the location decisions of firms.17

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17 ‘Foreign Direct Investment and Development’, UNCTAD series on issues in International Investment Agreements, United Nations, 1999
Chapter 2. Relevant Theories and Literature Review

It is argued that in transition economies both motives are relevant. Even if we abstract from the rich endowment of natural and energy resources of Russia and a number of other CIS countries, transition economies possess large potential domestic markets and at the same time constitute important sources of potential exports. Thus, together with their particular characteristics of human capital, high level of formal learning but low market skills, especially in the provision of business services, transition economies make a potentially preferred target for FDI in commercial and financial services.

2.2.4. Technology Transfer through FDI

In this part author will briefly discuss the impact of FDI on technological changes and, therefore, to quality of production. Let’s get shortly through the theoretical aspects of it.

Probably the most important contribution that host developing countries desire from MNEs is in the area of technology.\textsuperscript{18} Almost by definition, developing countries lag behind developed countries considering the generation and application of the new technology. The same goods are produced in developing countries with technologies that are outdated in developed countries; and some goods are not produced at all, because the technological know-how is not available in developing countries. Even where similar technologies are used, developing country enterprises tend to use them less efficiently because they lack the requisite skills and capabilities. Since technology is a non-rival good (in the sense that its use or consumption does not diminish its value for another agent) and is sometimes presumed to be transferable without cost across the countries, the technological gap between developed and developing countries needs to be explained. Contrary to what neoclassical growth models postulate (Mankiw, 1995); technology is not a free good that is clearly specified and readily available for use by any firm anywhere. Moreover, some technologies are not accessible if its owners decide not to license it. In important aspects, technological assets contain a tacit element that is not easily transmittable or replicable in another environment, and their effective use entails considerable investments in learning and skill upgrading.

\textsuperscript{18} This subject has been dealt with in several studies. See for example Cantwell (1993) and Chen (1993).
Transforming and upgrading the technologies used in production and strengthening national technological capabilities, including the capacity to innovate, are major objectives of countries with respect to their development process. The transfer of technology, its efficient application and diffusion are, therefore, some of the most important benefits captured by developing countries from FDI. Internalized technology transfer and diffusion has the following characteristics:\(^{19}\):

- Generally, the more modern and productive technologies are transferred through FDI, than those, available in host countries, especially in developing and transition economies. Advanced host countries receive complex technologies or functions, while less developed ones receive simple technologies and processes.
- FDI enhances not only the transfer of technologies, but provides, as well, the skills and knowledge needed for efficient implementation of technologies.
- Competing with local firms, foreign affiliates could provide a horizontal spillover effects, stimulating local competitors to improve technological capabilities and raise productivity.
- Cooperation between affiliates and local suppliers and customers could stimulate technology spillovers to vertically linked firms and service providers.

There are not many empirical studies available, which analyze the transfer of technology to Lithuania or its spillover effects on local industry in particular. Among the few that have been carried out is a survey, performed by the Economic Research Center in 1998, which investigated various spillover effects of FDI in some Lithuanian industries.\(^{20}\)

Among the surveyed companies, the main motivation for starting business in Lithuania was relatively cheap and skilled labor and access to other countries in a region. The size of the market and liberalized trade regime were of less importance.


Chapter 2. Relevant Theories and Literature Review

The main requirements that the foreign-owned companies were facing from their predominantly foreign customers, concerned quality and terms of delivery, sometimes also design and packaging of their production. Such requirements were then put to the local subcontractors, who as a result of increased competition were facing similar demands also from other sources in the market. The resulting spillover effect, pressure for quality seems to be stronger in the subcontractor relationship, than in more loose business arrangement. Companies, which acted as subcontractors to foreign investors, have benefited very much from the business relationships. They all claimed, firstly, that they had been forced to become more efficient.

Furthermore, it has not been unusual for MNEs in the past to continue to derive rents from outdated technologies in developing country operations. At the same time, domestic policy can influence the extent to which FDI makes a technological contribution. Pure import-substitution policies may encourage MNEs to undertake market-seeking investments that fail to incorporate state-of-the-art technologies. Export-oriented policies, on the other hand, are likely to encourage the introduction of technology that would make products more competitive in international markets.

2.3. Inter-relation between FDI and trade

The question of interdependence between trade and FDI was already widely discussed far before the prospects of EU enlargement towards Central and Eastern European countries. Some studies have been made just after the collapse of the Berlin Wall with the aim of finding the prospects for development of the transition economies and their integration into the world trading system (See Hamilton and Winters, 1992).

The importance of the inter-relation between FDI and trade is reconsidered again today especially in the context of the integration of the CEE bloc into the world economy. The foreign investors embrace their local partners into their global network. The network is then a very good starting point for developing the trade relations (Kaminski, 1999).
Kaminski (1998) makes a comparison of different behavior of foreign sector in Hungary and Slovenia. He demonstrates the close links between FDI and export performance in these countries. He shows that among medium and large firms in Hungary there are no purely Hungarian owned private companies. The share of foreign owned firms in Hungarian export increased from 37% in 1992 to almost 80% in 1997. Over the same period, the volumes of export almost doubled. Therefore, growth has come mainly from firms with foreign capital. Kaminski also makes conclusion about the crucial contribution of FDI to the level of intra-industry trade to the Hungarian and Slovakian economies.

Kaminski (2000) found evidence from several CEECs which strongly suggests that foreign firms are more foreign-trade oriented than domestic firms, thus making a relatively larger contribution to reintegration of CEECs into the world economy and especially into the EU.

The advantage to a recipient country is that FDI usually contribute to the development of a two-way inter-industry trade and often integrate established production facilities into global networks of production and marketing which in turn gives rise to intra-product trade (Kaminski 2000).

The traditional trade theory based on the Heckscher-Ohlin model predicts the substitutability between trade and FDI. The new trade theory, however, increase in the level of trade when a country hosts large amounts of foreign investment. Murrell (1991), including the activities of the multinational enterprises in the gravity model, shows that the central planned economies low trade levels can be explained by low (or not existing) foreign direct investments, in particular, instead of systemic differences.

The UNCTAD Investment Report (1994) suggests a multiplicative effect of FDI on trade. MNEs from EU especially have helped to establish new trade linkages between CEE and EU and the EFTA. Many of the MNE follow an export-oriented strategy focusing on the EU market.
The UNCTAD Investment Report (1999) underlines that the shifting of labor-intensive processes to developing countries has probably been the most important factor behind the growth of their manufactured exports in the past three decades, and MNEs have been among the most important agents of their comparative advantage.

Although the general presumption in the literature is that multinational activity and IIT are positively correlated, the relationship between FDI and IIT is ambiguous. Vertical IIT is likely to be associated with the presence of inward FDI, as foreign firms can be expected to combine their technological knowledge with local endowments to produce goods of varying qualities that are then shipped to export markets. In the case of horizontally differentiated products, FDI may substitute for exports of the goods that were previously produced in the investor’s home country (Markusen and Venables, 1996). Whether this would reduce IIT depends on the export structure of the industry in the foreign country prior to entry by the multinational. If the industry did not produce similar goods or if the foreign entrants have positive net exports, horizontal IIT may increase. Helpman and Krugman (1985) conclude that multinational activity will be positively correlated with horizontal IIT once country-specific effects are controlled for.

The inclusion of foreign direct investment into the industry approach opens some new perspective on the relation between trade structures and productivity growth. The usual approach to foreign direct investment is to assume it as a vehicle to transfer technology to transition economies. An important result of a recent study by Damijan (2001) for a subset of EU candidate countries was that productivity grew significantly faster for those firms that were the object of a FDI in five out of eight countries, however, without intra-sector spillover effects on domestic firms. Other empirical investigations seem to confirm the impact of foreign direct investment on the aggregate IIT level. At a 2-digit industry/trade level, recent research found some confirmation of the positive relationship between direct investment and IIT only for some industries and countries: electrical machinery, and other machinery and transport equipment in the cases of Hungary, Poland, and the Czech Republic (Hoekman and Djankov 1996). In Aturupane (from 1997), FDI data on the firm level 9 were ‘con-corded’ to the 3 digit NACE level. The
estimates brought the expected positive signs and a high significance of the foreign direct investment variable on both components HIIT and VIIT whereby the explanatory power of the role FDI might play for VIIT seemed to be higher. To bring the puzzle stone in order, we might expect that the role of foreign direct investment for catching-up of productivity seems to be restricted. Since FDI have a stronger impact on vertical than on horizontal trade, and even if more horizontal, the direct positive effect is associated with the absence of intra-sector spillover.
Chapter III

3. Transition from Plan to Market Economy in Lithuania

Since the analysis in this paper takes part during the period of transition, the theoretical frame of the transition process must be explained. The analysis of this chapter includes the following sections. Firstly, the introduction to transition and the meaning will be identified. This includes various definitions taken from different authors and three main phases of transition process will be introduced. Secondly, the general characteristic of the planned economy will be highlighted. Thirdly, a brief introduction to the economic reforms in Lithuania with the emphasis on privatization process will be discussed. The aim of this part is for better understanding the beginning of investment flows into Lithuania.

3.1. The Concept of Transition

The concept of transition economy in emerging capital markets of Central and Eastern Europe seems to be used in literature to mean – ‘a non-planned, non-market economy’. The economic reforms envisioned under perestroika have a major objective the establishment of a market-based demand economy to replace a socialist command economy.¹

Kornai (1992) calls transition period ‘a dual system’, in which many elements of socialist and capitalist societies exist side by side. Nuti (1996) labeled transition period as a necessary stage of forced market socialism, during which the state sector cannot just

disappear but must be commercialized, reorganized, undergo financial restructuring, and be treated equally with the private sector in its fiscal burden and access to credit.

According to Haavisto (1997) the institutional system is a set of formal rules governing the political processes and the coordination of the economy. On the political level this includes a new democratic constitution with rules of the distribution of political power between president, parliament, central and local governments and the rules for election to these bodies. On the economic level the transition from plan to market includes liberalization, that is: decentralization of decision, information and motivation to independent market units. This includes the liberalization of prices, international trade, banking etc. It includes the legislative framework for the operation of private enterprises. Parallel to liberalization it is necessary to achieve stabilization to secure macroeconomic conditions without inflationary pressure. Finally, it is necessary to change the incentive structure in the state-owned enterprises. This includes privatization, which has turned out to be the most difficult task in the transition of former command economies.²

Figure 3.1 The Phases of Transition

Source: European Integration, Jorgen D. Hansen, 2001

² Haavisto, T., 1997, “The Transition to a Market Economy”, page 18
Chapter 3. Transition From Plan to Market Economy in Lithuania

The figure 3.1 illustrates development over time. Starting at the point a, which indicates the initial crisis of the centrally planned system (accompanied by low growth rates), reforms are introduced in early 1990, starting with price liberalization and the gradual abolishment of control mechanisms, removal of subsidies, and the general implementation of the new legal framework, including possibilities for private ownership and economic activity. As a consequence, prices are rising and output is falling further. This macroeconomic shock is counteracted in the stabilization phase—predominantly by fighting inflation. Tight control of government budget deficits and fixed or semi-fixed exchange rate regimes are the most common stabilizing devices. The final phase consists of structural adjustment and includes privatization, which, in principle, is part of liberalization but typically stretched over a long period of time, and restructuring. Privatization concerns the reallocation of property rights—usually to the means of production—from the state to private hands. Restructuring denotes the reorientation of firms into more efficient units, gaining competitiveness and fuelling growth.3

3.2. Initial Conditions

The general feature of planned economies was a high level of centralization and state regulation of all economic activities. The state as a major economic player determined priorities of economic development and directed the allocation of resources. Priorities were given to the expansion of production possibilities frontier where industrial production was enormously concentrated at mega-sized industrial enterprises. This strategy was formed on the assumption of the endless economies of scale. Thus, each region, republic or country within the borders of the CMEA had its own specialization.

Another important factor concerning the planning economy is the dominance of vertical subordination in decision-making process whereas horizontal links between producers were insignificant. Enterprises were told what to produce, from whom to purchase, and to whom to sell.4 Prices were set under administrative control, and had no meaning for

economic agents but played exclusively technical role for accounting, and did not influence distribution of resources between enterprises or between industries. That resulted in the absence of voluntary trade links between enterprises (which were formed centrally).

The structure of productive sector in socialist economies was biased toward defense industries and a minor attention was paid to production of consumer goods and services. In addition, production was characterized by little product differentiation that may be explained by endeavor to ease the planning process of central level.

External sector of planned economies might be characterized by some distinctive features as well. In particular, international activity was completely monopolized by the government. Volumes of export and import were defined by the central plan, and any international activity required special sanctions from central government.

International links were primarily oriented toward the countries of CMEA. So called “socialist industrialization” was aimed to gain an economic universality within the region and independence from the “capitalist” world.

International trade with developed industrial countries played virtually a function of balancing the plan: they imported only those goods which were in shortage or unavailable, specifically goods with high-technological content and consumer goods, and exported natural resources or resource-intensive products. Import was to some extent a substitute for new technologies in the domestic economy.5

3.3. Economic reforms

After the re-establishment of independence in 1990, Lithuanian authorities have introduced comprehensive political and economic reforms aimed at establishing the democratic governance and conditions for the market economy. These measures included

Chapter 3. Transition From Plan to Market Economy in Lithuania

stabilization policies, liberalization of domestic and external transactions, privatization and establishing the institutions of the market economy.\(^6\)

It is not in the scope of this paper to provide the evaluation of the progress in introducing economic reforms in Lithuania. The purpose of the figure 3.1 given above is to provide the context for the more detailed discussion of measures taken in the area of trade liberalization and privatization process. However, before presenting the main characteristics of the foreign trade policy (in part IV) it should be emphasized that the economic reforms in different areas are interlinked. The table below presents the evaluation of the progress in transition in Lithuania as compared to other CEECs given by the EBRD (progress of privatization is excluded in this table and will be extensively presented in the part about privatization).

**Table 3.1 Progress in transition in the CEECs**

<table>
<thead>
<tr>
<th>Countries</th>
<th>Governance &amp; enterprise restructuring</th>
<th>Price liberalization</th>
<th>Trade &amp; foreign exchange system</th>
<th>Competition policy</th>
<th>Banking reform &amp; interest rate liberalization</th>
<th>Securities markets &amp; non-bank financial institutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulgaria</td>
<td>2+</td>
<td>3</td>
<td>4+</td>
<td>2+</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Czech Rep.</td>
<td>3+</td>
<td>3</td>
<td>4+</td>
<td>3</td>
<td>3+</td>
<td>3</td>
</tr>
<tr>
<td>Estonia</td>
<td>3</td>
<td>3</td>
<td>4+</td>
<td>3-</td>
<td>4-</td>
<td>3</td>
</tr>
<tr>
<td>Hungary</td>
<td>3+</td>
<td>3</td>
<td>4+</td>
<td>3</td>
<td>4</td>
<td>4-</td>
</tr>
<tr>
<td>Latvia</td>
<td>3-</td>
<td>3</td>
<td>4+</td>
<td>2+</td>
<td>3</td>
<td>2+</td>
</tr>
<tr>
<td>Lithuania</td>
<td>3-</td>
<td>3</td>
<td>4</td>
<td>3-</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Poland</td>
<td>3</td>
<td>3</td>
<td>4+</td>
<td>3</td>
<td>3+</td>
<td>4-</td>
</tr>
<tr>
<td>Romania</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>2+</td>
<td>3-</td>
<td>2</td>
</tr>
<tr>
<td>Slovakia</td>
<td>3</td>
<td>3</td>
<td>4+</td>
<td>3</td>
<td>3</td>
<td>2+</td>
</tr>
<tr>
<td>Slovenia</td>
<td>3-</td>
<td>3</td>
<td>4+</td>
<td>3-</td>
<td>3+</td>
<td>3-</td>
</tr>
</tbody>
</table>

Source: European Bank of Reconstruction and Development (2000), index from 1 (no liberalization) to 4+ (full liberalization)

Sachs and Warner (1995) have shown that countries that have done the most to integrate into the world economy have been most successful in attaining above average rates of

economic growth. The literature tends to focus on measures of openness\(^7\) (trade to GDP ratios) to define integration. The index of openness of Lithuania is shown in the table below. The indicators show high ratio of export and import of goods and services as a percentage of GDP. The big increase is seen in the beginning of the period but from low level. This increase can be attributed to the trade and collaboration agreement between Lithuania and EU which was signed in 1992 and came into a force in 1993. The decrease of ratio in 1998-1999 is closely connected to the economic crisis in Russia.

**Chart 3.1 Lithuania’s trade in goods and services (as % of GDP)**

![Chart showing Lithuania’s trade in goods and services](image)


Consecutive Lithuanian governments have worked to establish the legal, institutional and regulatory framework of an independent, democratic state and have shown a solid commitment to a market economy. As a result, Lithuania has developed stable foundations as a business-friendly and opportunity-filled economy. The Fraser Institute (Canada)\(^8\) rated Lithuania’s economy as one of the most liberal in central Europe. According to the Wall Street Journal Europe’s evaluation of twenty seven post-

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\(^7\) The openness index is the ratio between the sum of exports and imports, and GDP (X+M)/GDP

\(^8\) The Fraser Institute of Vancouver Canada rates world economies yearly according to criteria based on Milton Friedman’s free market principles.
communist countries in January 2000, based on ten criteria\textsuperscript{9}, Lithuania ranked among the first seven countries together with Poland, Hungary and the Czech Republic.

### 3.3.1. Privatization Process in Lithuania

Privatization of enterprises is necessary for developing decentralized control and decentralized incentives such as financial ownership rights. The owners and managers need incentives to use the resources efficiently. This is closely connected to the development of efficient corporate governance systems between owners, managers and other stakeholders connected to the activities of the enterprises.\textsuperscript{10}

However, it is difficult to implement privatization in transitional economies because many market institutions are not fully developed - a developed banking system, a well functioning stock market, reliable information about the economic situation of enterprises etc. It is very difficult to give a fair valuation of the assets because the markets are only in a rather low developed stage with very high uncertainty about the future development. The population lacks information and lacks the capital to buy the assets. The solution to the last problem in Lithuania (in Czech Republic and Russia was in a similar way) was privatization through vouchers - privatization coupons freely distributed to the population (see table 3.2.). These vouchers can be used for auctions of the enterprises to be privatized. Investment funds often play an important role in this process. The problem with lack of capital is solved, and it is possible to have a high degree of equality in the distribution of the assets.

\textsuperscript{9} The criteria were: economic strength, balance of payments, business ethics, integration into world economy, liquidity/ease of buying stocks, rule of law, price stability, productivity, currency stability/investment climate and political stability. See OECD reviews of FDI in Lithuania, 2001.

### Table 3.2 Status for Privatization 2000 (EBRD), method of large privatization

<table>
<thead>
<tr>
<th>Country</th>
<th>Private sector % of GDP</th>
<th>Large-scale privatization</th>
<th>Small-scale privatization</th>
<th>Primary privatization method</th>
<th>Secondary privatization method</th>
<th>Peak privatization years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulgaria</td>
<td>70</td>
<td>4-</td>
<td>4-</td>
<td>direct sale</td>
<td>voucher</td>
<td>1997</td>
</tr>
<tr>
<td>Estonia</td>
<td>75</td>
<td>4</td>
<td>4+</td>
<td>direct sale</td>
<td>voucher</td>
<td>1992-94</td>
</tr>
<tr>
<td>Latvia</td>
<td>65</td>
<td>3</td>
<td>4+</td>
<td>direct sale</td>
<td>voucher</td>
<td>1996-97</td>
</tr>
<tr>
<td>Lithuania</td>
<td>70</td>
<td>3</td>
<td>4+</td>
<td>insider/voucher</td>
<td>direct sale</td>
<td>1992-94</td>
</tr>
<tr>
<td>Czech Rep</td>
<td>80</td>
<td>4</td>
<td>4+</td>
<td>voucher</td>
<td>direct sale</td>
<td>1992-94</td>
</tr>
<tr>
<td>Hungary</td>
<td>80</td>
<td>4</td>
<td>4+</td>
<td>direct sale</td>
<td>insider</td>
<td>1992-96</td>
</tr>
<tr>
<td>Poland</td>
<td>65</td>
<td>3+</td>
<td>4+</td>
<td>insider/voucher</td>
<td>direct sale</td>
<td>1997</td>
</tr>
<tr>
<td>Slovenia</td>
<td>55</td>
<td>3</td>
<td>4+</td>
<td>insider</td>
<td>voucher</td>
<td>1995-96</td>
</tr>
<tr>
<td>Slovakia</td>
<td>75</td>
<td>4</td>
<td>4+</td>
<td>direct sale</td>
<td>voucher</td>
<td>1992-96</td>
</tr>
<tr>
<td>Romania</td>
<td>60</td>
<td>3</td>
<td>4-</td>
<td>insider</td>
<td>direct sale</td>
<td>1995</td>
</tr>
<tr>
<td>Russia</td>
<td>70</td>
<td>3+</td>
<td>4</td>
<td>insider/voucher</td>
<td>direct sale</td>
<td>1993-94</td>
</tr>
</tbody>
</table>

Source: based on EBRD-1999/2000, privatization index: 1=no privatization, 4+=full privatization

In other countries such as Estonia and Hungary the most important method of privatization has been direct sale to the investor who could offer the best combination of price, and guarantees of future investment and employment. Direct sale favors capital owners, and especially foreign investors have played an important role in countries using this method of privatization. In Lithuania (Russia and Slovenia similar) insiders, managers and the group of other employees had strong advantages for taking over their enterprises including large and medium sized enterprises.

According to Haavisto (1997), privatization in Lithuania has been one of the most rapid in all the Eastern countries. Already by the end of 1992, 56 % of all assets have been privatized. Voucher and employee ownership have played a more important role, while direct sales and foreign investment have had a smaller role. Considerations regarding the fair distribution of ownership were strong, and the policy has placed much more
emphasize on the interests of workers. The main explanation behind the development lies in fact that non-titular Lithuanian groups have played a limited role.

According to Free Market Institute of Lithuania privatization process had two rounds.\(^\text{11}\)

**The First Round**

The first round of privatization was launched in September of 1991. State property was sold for investment vouchers that were distributed free of charge to all Lithuanian citizens. Both Lithuanian and foreign companies and citizens had the right to purchase property with convertible currency. In practice, this stage of privatization resulted in insider-dominated ownership and limited foreign participation. State property was sold through open and closed subscription of shares, open and closed auctions, restitution, "best business-plan" tenders, and by other methods.

The first round of privatization was designed to create conditions for every Lithuanian citizen to take part in privatization and to become an owner and, by doing so, to ensure social justice. For this purpose, a large portion of state property was sold only for vouchers and only to Lithuanian citizens\(^\text{12}\).

Haavisto (1997) points out that the cornerstone in the fast privatization in Lithuania has been the voucher scheme.\(^\text{13}\) During this stage, privatization was regulated by the Law on the Initial Privatization of State-owned Property adopted in February 1991. The privatization plan was one of the elements in the fight for independence in Lithuania. The scheme signaled a privatization of enterprises formerly owned and controlled by the

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\(^{11}\) See OECD, 2001.


\(^{13}\) The first privatization was in the form of transfers of shares of leased enterprises to employees. The amount transferred was the sum of the leasing fees paid, plus delayed wage payments invested in production plus part of the social funds. Almost 60 enterprises were included in this program. Another early transfer to employees was included in a law from December 1990. Enterprises with capital exceeding a certain amount could sell up to 10 per cent of their capital to employees. Part of this could be paid by vouchers. 50-60 per cent of the state enterprises used this method in the initial stages of privatization up to July 1991, when another program started (Frydman et al., 1993). Source is Haavisto, T., 1997, “The Transition to a Market Economy”, page.49.
central authorities in Moscow. This formed an effective barrier against the flow of rubles from the rest of the (former) Soviet Union into the privatization process.

The large-scale voucher privatization permitted the formation of a wide layer of private owners. On the other hand, a large number of inexperienced small shareholders and restrictions placed on foreign investments prevented a fast and efficient restructuring of enterprises.

The Second Round

The second round of privatization began in July 1995 with the passing of the new Law on Privatization of State and Municipal property. This Law legalized commercial privatization, set more diverse and flexible methods of privatization and equal conditions for both foreign and Lithuanian investors in the privatization of state property. The main feature of the second round is that privatization is based on cash sales. The amended Law on Privatization of State and Municipal Property in the Republic of Lithuania of 4 November 1997 came into force on 1 December that year. It legalized the State Property Fund as the main privatization institution (in place of the Privatization Agency) and the Municipal Property Funds. The Law specifies the more precisely the functions of the privatization institutions, the procedures for privatization operations, and the methods used. Real estate entities are privatized by public auction or lease with the right to purchase. Public shares in enterprises are sold by public tender, through direct negotiations, by public auction, public sale of shares on the stock exchange or by transfer of control of state-owned enterprises. This second round characterized by major infrastructure privatizations and thus a greater inflow of the foreign capital in the economy.

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Chapter IV

4. Trade Liberalization and FDI Flows in Lithuania

4.1. Introduction

Since the beginning of the transition a decade ago, political and economic reforms in Lithuania have radically changed policy making and the functioning of the economy. Internationalization, the opening of the economy as well as the integration into the European Union (EU), has constituted a significant element for these reforms. The unilateral reduction of former barriers to international economic exchange was followed by a number of free trade agreements with neighboring countries.

These reforms, aimed to create conditions for a market economy (e.g., competition and freedom of exchange), also reflected the political priorities of the successive governments of Lithuania. Gradual integration into the EU has become a priority of Lithuanian foreign policy.

Similar changes took place at the level of informal economic relations between Lithuania and the outside world. Several tendencies are worth mentioning. Firstly, the significance of foreign trade has increased, indicating the openness of the Lithuanian economy. In recent years, the share of export in goods and services has been around 50% of GDP and the share of import exceeding 55% of GDP.1 Secondly, there has been a significant shift in trade from Eastern to Western markets and the EU in particular. The share of the EU in Lithuania's total trade turnover has increased from few percent at the beginning of reforms to almost 50% in 2001. At the same time, the share of the CIS countries has decreased from over 60% in 1993 to around 24% in 2001 (see Table 4.1.).

1 According to World Bank indicators www.worldbank.org
Table 4.1 Share of Lithuania’s Exports and Imports by group of countries, 1993-01

<table>
<thead>
<tr>
<th>Years</th>
<th>EU</th>
<th>CIS</th>
<th>CEFTA</th>
<th>EU</th>
<th>CIS</th>
<th>CEFTA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1993</td>
<td>16.9</td>
<td>57.1</td>
<td>8.5</td>
<td>18.7</td>
<td>67.5</td>
<td>3.5</td>
</tr>
<tr>
<td>1994</td>
<td>25.8</td>
<td>46.7</td>
<td>6.6</td>
<td>26.4</td>
<td>50.3</td>
<td>6.9</td>
</tr>
<tr>
<td>1995</td>
<td>36.4</td>
<td>42.3</td>
<td>4.8</td>
<td>37.1</td>
<td>42</td>
<td>7.6</td>
</tr>
<tr>
<td>1996</td>
<td>32.9</td>
<td>45.4</td>
<td>4.1</td>
<td>42.4</td>
<td>32.9</td>
<td>9</td>
</tr>
<tr>
<td>1997</td>
<td>32.5</td>
<td>46.4</td>
<td>3.2</td>
<td>46.5</td>
<td>29.3</td>
<td>9.6</td>
</tr>
<tr>
<td>1998</td>
<td>38</td>
<td>35.7</td>
<td>3.9</td>
<td>50.2</td>
<td>24.7</td>
<td>9.9</td>
</tr>
<tr>
<td>1999</td>
<td>50.1</td>
<td>18.2</td>
<td>6</td>
<td>49.7</td>
<td>23.6</td>
<td>10.8</td>
</tr>
<tr>
<td>2000</td>
<td>47.9</td>
<td>16.3</td>
<td>7</td>
<td>46.5</td>
<td>30.7</td>
<td>9.4</td>
</tr>
<tr>
<td>2001</td>
<td>47.8</td>
<td>19.7</td>
<td>7.3</td>
<td>48</td>
<td>28.3</td>
<td>9.2</td>
</tr>
</tbody>
</table>

Source: Lithuanian Department of Statistics

Internalization and opening of the economy led not only to the growth and geographical change in foreign trade character, but also opened the doors for foreign investors to Lithuanian market. This was done when the laws of privatization have been introduced.

There is a common perception of FDI as an important factor in the transition process contributing to the restructuring of enterprises and the transfer of capital and know-how. The inflow of foreign capital may help increase the aggregate investment rate and thus the overall level of activity in the economy. It may also exhibit a signaling effect as to the soundness of the economy. Piatkin (1993) especially emphasizes the potential of FDI to relieve social tensions in addition to the benefits of having foreign production of food and consumer goods, produced locally, replace import.

The rest of this chapter is divided into two scenarios- foreign trade and foreign investments in Lithuania during transition process. Firstly, the development of

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2 Imported goods by country union are broken up according to the country of consignment.
4 For more on host country effects from FDI see for example Blomström and Kokko (1997).
Chapter 4. Trade Liberalization and FDI Flows in Lithuania

Lithuania’s foreign trade regime after independence will be emphasized. Secondly, foreign direct investment inflows to the country after independence will be presented.

4.2. Development of Lithuania’s foreign trade policy

In Lithuania as well as in other CEECs, foreign trade liberalization represented important external dimension of transition process. It was connected with price liberalization, as imports were expected to help to align domestic prices with world market prices, to increased domestic competition and to provide consumers and producers with a choice of goods. Besides, it was to become one of the main sources of providing the country with hard currency. It was supposed to encourage export-led economic growth and provide for imported capital goods to revitalize the economy. Last but not the least, reorientation of foreign trade from former Soviet markets to Western countries and its reintegration into the world economy, besides being a central part of country's transition to a market economy, had important political and security implications for Lithuania.5

More than decade of foreign trade regime reforms resulted in a change of foreign trade structure and volume of trade. Instead of describing the chronology of the trade policy measures, the following section presents the main features that characterize the Lithuanian foreign trade policy since it has been conducted independently.

4.2.1. Liberalization of foreign trade regime and geographical reorientation of trade

Before the transition, foreign trade in Lithuania was conducted by state agencies, and it was strictly regulated by quotas and licenses. As a result, entire foreign trade system had to be built, and after several years significant foreign trade liberalization and reorientation have been achieved. Since central planning as itself was the major non-tariff trade barrier, the abolition of that was a big step towards open economy.6

Lithuania has undertaken a number of unilateral and contractual measures to liberalize its foreign trade regime. In 1993, a new trade law was adopted under which remaining quantitative restrictions on exports were eliminated. On the import side, a nearly uniform tariff structure with relatively low rates was introduced. The liberalization culminated in the acceptance of the obligations of Article VIII of the IMF’s Articles of Agreement establishing formally current account convertibility. The removal of the most non-tariff barriers to trade and relatively low level of import tariffs contributed to the rapidly growing volume of foreign trade. The Charts 4.1 and 4.2 show the dynamics of Lithuanian foreign trade since 1993, the year since which comparable data is available.

Chart 4.1 Lithuania's export by group of countries 1993 - 2001, million LTL

Source: Lithuanian Department of Statistics

Aside from the rapid growth of both exports and imports, the other tendencies include the increasing share of the EU, CEFTA and the Baltic States, and decreasing share of the CIS in Lithuania's foreign trade turnover as well as the continuous negative trade balance with imports year after year exceeding the exports.

Trade with EU countries is becoming more and more important in the Lithuanian trade. In the period of 1993-2001 the share of Lithuania’s export to EU increased from 16.9% to 47.8% (table 4.1). Lithuania’s export to EU in 2001 valued at LTL 8.755 billion (US$ 2.188 billion). To EU Lithuania exports textile articles, machinery and equipment,
products of chemical industry, wood and articles of wood, miscellaneous manufactured articles, transport means, mineral products.\(^7\)

CIS countries still remain important markets for the Lithuania’s exports. In the period of 1993-2001 the share of Lithuania’s export to CIS decreased from 57.1% to 19.7% (table 4.1). Lithuania’s export to CIS countries in 2001 valued at LTL 3.614 billion (US$ 903.575 million).

**Chart 4.2 Lithuania's import\(^8\) by group of countries 1993-2001, million LTL**

Major Lithuania’s import markets are EU countries. The share of imports from EU countries in the period of 1993-2001 grew from 18.7% to 48% (table 4.1). In 2001 imports from the EU valued at LTL 12.186 billion (US$ 3.046 billion). Lithuania's major imports from EU are machinery and equipment, textile articles, different means of transport, products of chemical industry, plastics and rubber, mineral products, base metals and articles of base metals.

The share of import from CIS countries in the period 1993-2001 decreased from 67.5% to 28.3% (table 4.1). In 2001 imports from CIS valued at LTL 7.187 billion (US$ 1.796 billion).\(^7\) Lithuanian Development Agency, 2002

\(^7\) Lithuanian Development Agency, 2002

\(^8\) Imported goods by country union are broken up according to the country of consignment.
billion). CIS countries are important suppliers of raw materials. Lithuania's major imports from CIS are energy resources: oil, gas, timber, ferrous and non-ferrous metals. These trends will prevail for a considerable length of time, because any changes would be very expensive.

The charts also illustrate the decline of both exports and imports since 1998. The major influence on the decrease on Lithuania’s export was the effect of Russian crisis and fall in demand because Lithuania’s export to Russia from the year of 1998 decreased almost 70%. The crisis affected critically on Lithuania’s producers who immediately asked the government for the protection from foreign competition.

In 2001 the main trade partner was Germany (see Chart 4.3). Lithuania’s export to Germany was 12% of all exports, and import-19% of all Lithuanian imports. Other main Lithuanian trade partners were UK (14% exports and 3% imports), Denmark (4% exports and 4% imports), Holland (3% exports and 4% imports), Sweden (4% exports and 3% imports), France (3% exports and 3% imports) and Italy (2% exports and 8% imports).

**Chart 4.3 EU countries – the main Lithuanian trade partners in 2001, million LTL**

![Chart 4.3 EU countries – the main Lithuanian trade partners in 2001, million LTL](chart.png)
Chapter 4. Trade Liberalization and FDI Flows in Lithuania

The changes in foreign trade structure that followed the initial liberalization related not only to the destination of trade flows, or partner country, but also to product structure. As the study of the Baltic economies produced by the OECD has shown, in 1998 the revealed comparative advantage of Lithuania was found in products related to its natural and human resource endowments, namely, articles of apparel and clothing accessories, fertilizers, petroleum products, electric current, wood and furniture. Although this leads to conclude that "the pre-war patterns of trade specialization have re-emerged", the Soviet time legacy has been also important in affecting the structure of trade in so far as the single factories in the oil processing industry or fertilizers industry play relatively important role for the exports and economic growth of the country in general.

To sum up, the rapid liberalization of foreign trade regime has played a major role in creating conditions for the market economy and economic development of the country. As external analysts have concluded, "Lithuania's generally liberal trade regime has been the key in restoring economic growth…"

4.2.2. Emphasis on regionalism

It was a long process since Lithuania submitted the application to become the member of the GATT, and later the World Trade Organization in 1994, and when six years later after long negotiations Lithuania became the member of WTO in December 2000. At the same time Lithuania has signed a number of free trade agreements and is a part of relatively deeply integrated intra-Baltic free trade area. Although a slow progress of WTO entry is mainly a victim to the activities of domestic interest groups, the participation in numerous regional trading groups has been the defining tendency of Lithuania's foreign trade regime, which is likely to culminate in joining the biggest regional entity in the world - the EU. Political factors seem to have been outweighing the economic considerations in

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Chapter 4. Trade Liberalization and FDI Flows in Lithuania

choosing the form and the countries with which agreements on trade liberalization have been signed.

Thus, currently Lithuania has free trade agreements signed with 30 countries. Politically the most important has been the Free Trade Agreement signed with the EU in 1994 and in force since the beginning of 1995, which was later incorporated into the Association Agreement in force since February 1998 (see table 1 appendix 1). The prospect of becoming EU member has been a crucial factor in facilitating trilateral agreements on free trade with the other two Baltic States as well as signing bilateral agreements with most of the CEFTA members.11 Lithuania’s bilateral agreements signed with other countries see in table 2 appendix 1.

The increasingly preferential nature of foreign trade regime has been reflected in the structure of Lithuania's foreign trade. Currently, about 75 percent of Lithuania's foreign trade is conducted with the countries that have preferential status.

Chart 4.4 Share of exports to the main trade partners in 2001

![Chart 4.4 Share of exports to the main trade partners in 2001](image)

Source: Lithuanian Department of Statistics

As the Charts 4.4 and 4.5 illustrate, the EU has become the largest trading partner accounting for about half of Lithuania's exports and imports. If one sums up shares of current and prospective EU members, the share of trade with these countries reaches more than 60% of Lithuania's total trade turnover. The majority of foreign direct investment (more than 60%) originates also from the EU (will be discussed further).

**Chart 4.5 Share of imports\(^{12}\) from the main trade partners in 2001**

![Chart 4.5 Share of imports from the main trade partners in 2001](image)

Source: Lithuanian Department of Statistics

However, as the data show, more than a quarter of imports come from the CIS. According to the data shown in Lithuanian Department of Statistics 25.3% of all imports comes from Russia which means that only 4.1% comes from other CIS countries.\(^{13}\)

### 4.3. FDI in Lithuania

Relatively small country, but the largest of the three Baltic States with the population of 3.5 million, located in one of the most dynamic regions in Europe; Lithuania has made impressive progress towards establishing itself, since regaining independence in 1990 as

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\(^{12}\) Imported goods by country are broken up according to the country of the origin of goods.

\(^{13}\) Numbers taken from Lithuanian Department of Statistics, 2002-2003
Chapter 4. Trade Liberalization and FDI Flows in Lithuania

an attractive location for foreign direct investment (FDI). The main reasons are high-skill, efficient and low cost alternative to production in the West, along with a stable and strong production springboard to the huge markets to the East.

According to Lithuanian Development Agency there are many reasons to invest in the country such as:

- **Strategic location.**
  The country is strategically located in the gateway between the EU and the CIS. Being on a sea and land route, Lithuania is serving as an arterial road between the East and the West, the North and the South.

  At present, the port of Klaipeda handles cargoes that go to and come from Russia, Kazakhstan at one end and Germany, the Netherlands, the U.S., and then South America and Asia at the other end.

- **High skilled and cheap labor force.**
  The yearly number of university graduates per 1000 inhabitants is one of the highest in the region. The cost of labor is among the lowest. The average monthly wage in the manufacturing sector in Lithuania is EU€ 320, one tenth that of industrialized countries, including those in the EU. It is also 20% - 50% lower than that in CEE.

- **Well developed transportation network.**
  The EU's Transport Commission designated Lithuania as the region's transport hub, with 2 out of the 10 priority corridors in Europe intersecting in Lithuania.

  A network of European-standard 4-lane highways links major industrial centers. Lithuania has a well-developed transportation system. Road construction is underway for connecting with the Trans-European transportation network. It will be part of the transportation system around the Baltic Sea and a transportation axis linking Russia and

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the Baltic Sea. The country offers 4 international airports and an ice-free port on the Eastern Baltic.

- **Attractive operating and living costs.**
  Utilities, rent, building, overhead, service and living costs are among the lowest in Central and Eastern Europe. Thus, Lithuania has significant cost advantages while offering geographical proximity to the EU and Eastern markets.

- **Free economic zones and Industrial parks.**
  Lithuania's Free Economic Zones and Industrial Parks boast excellent infrastructure and transshipment facilities, highly qualified labor forces and offer investors extremely attractive incentives.

- **Social and Political stability.**
  With a strong, pro-business government, excellent external relations and harmonious minority relations internally, Lithuania is an oasis of political and ethnic stability in the region. It has a stable currency, strong banking sector, and offers unrestricted movement of capital and dividends.

**4.3.1. FDI inflows to Lithuania as compared to other CEECs**

Similarly to other former Soviet Republics, Lithuania had been virtually closed to foreign investment before 1990. After regaining its independence in 1990, Lithuania began the process of transition to a market economy and opened its borders to FDI. Yet unlike transition economies of Central and Eastern Europe it did not receive large FDI inflows until the late 1990s. As was discussed in chapter 3, first stage of the privatization process, starting in 1991, offered limited opportunities for foreign investors. It was not until 1997 that FDI inflows into Lithuania increased significantly as a result of the second stage of the privatization process (see the chart 4.6). The 1998 figure was boosted by income related to the privatization of the national telecommunications company. The drop of FDI inflows in 1999 is mainly because of the financial crisis in Russia. Investors didn’t see save to invest in Lithuania. FDI revenues in 2000 were estimated at US$ 375 million,
considerably less than the US$ 486 million recorded in 1999. This was due to a decrease in investments related to privatization of industrial enterprises.¹⁵

**Chart 4.6 Net FDI inflows into Lithuania, 1993-2001**

As an example Hungary opted for privatization to an outside investor, and opened the so-called strategic sectors (telecommunications, utilities, and financial services) to foreign investors around 4-5 years before any other CEEC was ready for this move. Privatization-related FDI flows to Hungary accounted for around 40% of total inflows. The Czech for instance similarly as Lithuania’s mass voucher privatization program erected barrier to FDI, while Slovenian legal framework-rooted in Yugoslav worker’s self-management-turned out to keep foreign investors at bay.¹⁶

As is evident from table 4.2., the overall magnitude of FDI inflows has not been very large. In terms of cumulative FDI inflows per capita during the period 1993-2000, Lithuania ranks eighth among CEEC above Bulgaria and Romania. In terms of the value

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of cumulative FDI inflows, Lithuania ranks ninths exceeding only FDI receipts of Slovenia.

Table 4.2 FDI inflows into 10-CEEC 1993-2000

<table>
<thead>
<tr>
<th>Country</th>
<th>Net FDI inflow (millions of US$)</th>
<th>FDI inflows 2000 as % of GDP</th>
<th>Per capita</th>
<th>FDI inflows 1993-2000 Value</th>
<th>Per capita</th>
</tr>
</thead>
<tbody>
<tr>
<td>Czech Republic</td>
<td>654  878  2,568  1,435  1,286  3,700  6,313  4,583</td>
<td>9.3</td>
<td>446</td>
<td>21,417</td>
<td>2,085</td>
</tr>
<tr>
<td>Hungary</td>
<td>2,350 1,144  4,519  2,274  2,167  2,037  1,977  1,692</td>
<td>3.7</td>
<td>169</td>
<td>18,159</td>
<td>1,812</td>
</tr>
<tr>
<td>Estonia</td>
<td>162  214   201  150  266  581  305  387</td>
<td>7.8</td>
<td>270</td>
<td>2,268</td>
<td>1,580</td>
</tr>
<tr>
<td>Poland</td>
<td>1,715 1,875  3,659  4,498  4,908  6,365  7,270  9,342</td>
<td>5.9</td>
<td>242</td>
<td>39,632</td>
<td>1,025</td>
</tr>
<tr>
<td>Latvia</td>
<td>45  214   180  382  521  357  348  407</td>
<td>5.7</td>
<td>169</td>
<td>2,454</td>
<td>1,015</td>
</tr>
<tr>
<td>Slovenia</td>
<td>113  128   177  194  375  248  181  181</td>
<td>1.0</td>
<td>91</td>
<td>1,597</td>
<td>803</td>
</tr>
<tr>
<td>Slovak Republic</td>
<td>199  270   236  351  174  562  354  2,052</td>
<td>10.7</td>
<td>380</td>
<td>4,198</td>
<td>777</td>
</tr>
<tr>
<td>Lithuania</td>
<td>30  31   73   152  355  926  486  379</td>
<td>3.4</td>
<td>102</td>
<td>2,432</td>
<td>658</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>40  105   90  109  505  537  806  1,002</td>
<td>8.3</td>
<td>123</td>
<td>3,194</td>
<td>391</td>
</tr>
<tr>
<td>Romania</td>
<td>94  341   419  263  1,215  2,031 1,041 1,025</td>
<td>2.8</td>
<td>46</td>
<td>6,429</td>
<td>287</td>
</tr>
</tbody>
</table>

Source: IMF International Financial Statistics (FDI figures) and World Bank World Development Indicators (GDP and population)

4.3.1.1. Foreign Direct Investment by Countries

According to Lithuanian Department of Statistics data total FDI to Lithuania in 2001 was LTL 9,337 billion (EU€ 3.1 billion). Share of investments from EU was 64% of total FDI in the country (see chart 1 in appendix 2). Similarly as to total investments manufacture sector attracted most of the foreign investments from EU countries (Chart 2 appendix 2). Total share from these countries was 62% in 2001.

According to the 2001 estimates the Nordic countries account for almost 45% of total FDI into Lithuanian companies. Along with Denmark, Sweden and Estonia are the leading investing countries, partly because Nordic companies have made major investments in telecommunications, and also due to the sizeable participation of Nordic institutions in the Lithuanian financial sector (for the largest investors in Lithuania in
various sectors you can see the table 1 in appendix 3). Other major investors are Germany and USA. (See the chart 4.7).

**Chart 4.7 Cumulative FDI by Country in 2001 (% of total)**

Investments from these partner countries can be related to the importance of a geographical determinant, i.e. the proximity of potential investor from transition economies. Lithuania is located relatively close to the Scandinavian partners - just on other side of the Baltic Sea. Some researches believe that there is a correlation between geographic proximity and the relative importance of uncertainties in transition economies for the foreign investors. As one analyst has concluded; “The closer the investor is to any given country experiencing transformation process; the more likely there is to be a considered response rather than a ‘knee jerk’ reaction”.18

Kaminski (2000) as well points that geography for starters has clearly mattered. With the unification of Germany in 1991 and EFTA enlargement of the EU in 1995, the number of CEECs directly bordering with the EU has significantly increased. With the exception of Bulgaria and to some extent Romania, geography works strongly in favor of other

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CEECs. Only Romania and Baltic states (though they have easy access to convenient sea links) do not border the EU.

Over the past few years, Lithuania has become a leading location for foreign investors and a competitive centre for product sourcing in the region. The main reasons are a high-skilled, low cost alternative to production in the West, along with a stable and strong production springboard to the huge markets to the East. In addition, impressive economic growth, a stable currency and a great business environment all combine to make Lithuania the premier investment location in the region.

### 4.3.1.2. Distribution by Economic Activity

The manufacturing sector attracted the largest proportion of FDI in Lithuania throughout the 1990s, followed by the wholesale and retail sectors. Within manufacturing, food products, beverages and tobacco attracted the largest share of investment (12% of total FDI stock), followed by textiles and leather products (4%), refined petroleum and chemicals (4%). Electrical machinery and optical instruments as well as wood products also received significant foreign investments. There was a surge of foreign investment in the post and telecommunications sector in 1998, mostly as a result of the Telekomas privatization deal. Table 4.3 shows the distribution of the cumulative FDI by economic activities in 2001 where manufacturing sector has attracted the largest FDI, followed by wholesale and retail trade, financial intermediation and communication sectors.

#### Table 4.3 Cumulative FDI by Sector in 2001

<table>
<thead>
<tr>
<th>Sector</th>
<th>Sum (US$ million)</th>
<th>% of total sum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing</td>
<td>682</td>
<td>25.6%</td>
</tr>
<tr>
<td>Wholesale and retail sale</td>
<td>544</td>
<td>20.4%</td>
</tr>
<tr>
<td>Financial Intermediation</td>
<td>530</td>
<td>19.9%</td>
</tr>
<tr>
<td>Communication services</td>
<td>393</td>
<td>14.7%</td>
</tr>
<tr>
<td>Other</td>
<td>516</td>
<td>19.4%</td>
</tr>
</tbody>
</table>

Source: Own calculations\(^{19}\)

\(^{19}\) Numbers gathered from Lithuanian Department of Statistics.
Chapter V

5. Industry Analysis in Lithuania.

Lithuania has the largest and most diversified economy of the Baltic States. During the last 50 years, intensive industrialization gave birth to enterprises specializing in electronics, chemicals, machine tools, metal processing, wood products, construction materials and food processing. The light industry sector includes the production of textiles, ready-to wear clothing, furniture and household appliances. After 1990, all these sectors, along with the banking system, have attracted substantial investment. Large-scale privatization of many of the larger formerly state-owned enterprises and the infrastructures create continued investment and modernization. The distribution of foreign direct investments in manufacturing is shown in the chart below.

Chart 5.1 Foreign Direct Investments in Manufacturing 1996-2001

Source: Lithuanian Department of Statistics
Chapter 5. Industry Analysis in Lithuania

The performance of some industries will be discussed in this chapter.

5.1. Textiles Industry

The textile and apparel industry is first according to the number of employees and second (after the food industry) according to total industry output and number of enterprises in the manufacturing industry. Compared to the number of employees per 10 000 inhabitants in EU, Lithuania is one of the leaders in this regard.\(^1\) This ratio shows that the textile and apparel industry is one of the most important and specialized industries in the EU and that Lithuania have great potential for development.

With a local population of 3.5 million, exports are the life-blood of Lithuania’s garment and textile companies. Light industry (textiles, clothes and leather) accounts for about 16 per cent of Lithuania’s industrial production, and makes up almost one fifth of the country’s exports, representing on of the biggest export items. The sector has 60 large factories (with more than 200 employees) and more than 370 small and medium enterprises (SMEs) which together employ around 60 000 people.

Based on 2001 data\(^2\), the value of the exported production amounted to about 19.5% of all of Lithuania’s exports. Its textile industry exported 86% of its output in 2001, while its apparel industry exported 93%\(^3\) (See for example table 1 in appendix 3 the performance of the biggest textile and apparel companies in Lithuania). About 83% of all the companies exporting textiles and apparel from Lithuania exported it to the EU. In 2001, the largest percentage of the total exports went to Germany (20%), Denmark (13%) and the UK (13%). In some Lithuanian textile and clothing companies’ export-orientation is almost 100%. For example, Drobe, one of Lithuania’s largest wool textile producers, ships around 95% of its output abroad.\(^4\)

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\(^1\) See Lithuanian Development Agency
\(^3\) EBRD Investment Profile in Lithuania, 2001
Exports were given a boost in January 1998 when the EU removed all tariffs and quotas on imports of textiles and clothing from Lithuania.\(^5\) Between 1995 and 2000 foreign sales of textiles and clothing rose by an average of 14.5% a year. Exports to the EU, which is by far the biggest market for Lithuanian textile and clothing companies, grew by almost 23% a year during 1995-2000. Clothing exports grew over the period by an average of 26.7% a year - faster than exports from any other sector. The share of textile exports (in the country's total exports), has grown from 9.7% in 1993 to 19.5% in 2001. Sewn and knitted articles occupy the leading shares of total textile exports, 32 % and 18 % respectively.\(^6\)

The textile industry has benefited from the government’s policy of privatization and encouraging foreign firms to buy shares. As a result, many plants have been equipped with modern technology.\(^7\) Major FDI in the textile sector has been made by German, Italian and Austrian companies. A number of western companies have acquired shares and established joint-ventures with the local companies, with the aim of exporting their products. More than 90% of the production arising from these joint ventures is exported, either in the form of finished or unfinished goods. Major foreign investors in the textile industry include: Wilhelm Becker and Tuchfabriken (both Germany), Marzotto (Italy), Richard Hammerle Farberei und Appertur (Austria) and Tolaram Group (Singapore).\(^8\)

The main attraction for inward investors is Lithuania’s low labor costs. Textile and clothing group Marzotto (Italy) for example, is moving two thirds of its textile operations to Lithuania to take advantage of lower labor costs.\(^9\) According to figures compiled by the Kaunas Free Enterprise Zone in 2000, the gross cost of employing a skilled worker – including social and other indirect costs - can be as low as US$ 260 a month. This equates to an hourly rate of US$ 1.68. An unskilled worker can cost an employer as little as US$ 195 a month, or US$ 1.25 an hour.

\(^6\) Ministry of Economy; Lithuanian Department of Statistics.
\(^8\) Lithuanian Development Agency.
Lithuania is more than just a low cost offshore manufacturing site. Foreign investors have been attracted by its well-developed transport infrastructure, its proximity to the EU, and the prospect of easy access to wider markets in the region. As well as the other Baltic States, these markets include neighboring Poland and former Soviet republics.

A crucial factor behind the industry’s transformation and market reorientation has been the speed with which the Lithuanian government acted in the early 1990s to rejuvenate the economy, implement a program of privatization, and create a favorable investment climate. Privatization has opened it up to foreign investment and provided much needed capital for modernization (see the appendix 3 box 1 for the example). For instance, Alytau Textile is 63.2% owned by Tolaram Group (Singapore), which is committed to invest US$ 60 million in a modernization program over a period of five years (1998-2003). Alytau Textile is reorienting its production to household textiles and work clothing.

The competitiveness of the Lithuanian textile industry has been preserved, due to the fact that real wages in the sector have increased in line with productivity and more than 75% of the industry's production facilities have been modernized over the past decade. However, the cost advantage is slowly disappearing and competition from Asia is likely to grow further.10

5.2. Motor Vehicles and Automotive Industry

The automotive component industry in Lithuania is focused on manufacturing the following products: automobile wire and cable bundles, fuel pumps, automotive electronics, automotive electronic wiring, automotive air compressors, diesel engines, oil and air filters, brake systems, cargo containers, car hitches, car windows, ornamental parts, etc. Lithuanian companies also have experience in equipping and assembling special purpose motor vehicles as well as in completely assembling stock motor vehicles.

Approximately 93% of the automotive components manufactured in Lithuania were exported in 2001. Around 80% of these exports went to EU, 6% to the CIS and 7% to the EFTA countries. Automobile wire and cable assemblies accounted for the biggest part (83%) of all these exports.11

Table 5.1 The Manufacture, sale, and export of automotive components during 1997-2001

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<tbody>
<tr>
<td>Manufacture in total, thou. EUR</td>
<td>68.336</td>
<td>90.201</td>
<td>87.206</td>
<td>80.391</td>
<td>77.142</td>
</tr>
<tr>
<td>Sales in domestic market, thou. EUR</td>
<td>2.130</td>
<td>4.273</td>
<td>3.038</td>
<td>3.566</td>
<td>5.582</td>
</tr>
<tr>
<td>Exports, %</td>
<td>97%</td>
<td>95%</td>
<td>97%</td>
<td>96%</td>
<td>93%</td>
</tr>
</tbody>
</table>

Such well-known companies as Volvo, Saab, Renault, Nedcar, Valeo, Autolive, Jonsons Control, Gaz, etc., buy automotive components manufactured in Lithuania. Some automotive component manufacturing companies have attracted investments from well-known companies as Siemens-Yazaki, Accel, and Schmitz Cargo bull and are now successfully increasing their production volume. These firms sell the biggest part of their production in foreign markets by filling direct orders from their investors.

In order to successfully penetrate into EU and world markets, it is extremely important to obtain an international evaluation of the products to be exported. Thus, the achievements of the market leaders as SY Wiring Technologies (see the appendix 3 box 2) the Aurida Company Group, Melga, Panevezio Stiklas, etc., in working according to ISO standards are very important when evaluating their activities.12

Rich experience has been acquired in both manufacturing and in scientific research and its application. The design and manufacture of automotive components have deep roots in Lithuania. Electronic devices, metal parts, glass panes, automotive air compressors,

11 Lithuanian Department of Statistics.
12 Lithuanian Development Agency.
agricultural machinery, and other metalworking have been developed in this country for decades.

Lithuanian companies producing automotive parts, metalwork, and electronics have acquired sufficient technological and human potential for foreign companies to be able to shift their orders for the manufacture of automotive components or even entire automobile manufacturing processes to Lithuania.

For example, Swedlit AB Baltija UAB producing plastic parts for door locks luggage compartments and sunroofs for Volvo automobiles. During the period of 1997-2001 the sales increased fourfold, reaching EU€ 4.5 million. The most interesting fact is that all the production is exported to EU.

5.3. Wood Industry

All the major branches of the wood and furniture industry have been developed in Lithuania:

- Wood and wood products;
- Furniture;
- Paper and paper products;

Lithuania’s wood and furniture industry has a long tradition. The furniture branch used to supply Russia and other regions. Until the 1998 Russian crisis, Lithuania’s wood and furniture industry was export oriented towards Eastern European markets. Since this period, the wood and furniture industry has successfully restructured, redirecting its exports towards Western European markets. Lithuania’s manufacturing industry is supported by its traditional industries, one of which is the wood and furniture industry. Today it is one of the quickest developing manufacturing industries.

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13 Lithuanian Development Agency.
Chapter 5. Industry Analysis in Lithuania

The wood and furniture industry employs over 32 thousand people in over 1000 companies. The significance of the industry for Lithuania’s economy is unquestionable. The industry creates over 2% of the gross value added and accounts for 10% of all of Lithuania’s exports. It is also one of the industries, demonstrating the possibilities of adapting to Western European markets and achieving success in export development.

Two main factors have had a major impact on the growth of the wood and furniture industry:\textsuperscript{14}

1. \textit{Capital investments} in the wood and furniture industry have determined the growth of the industry’s competitiveness. Major investments amounting to EU€ 13-19 million were made annually in the wood and wood products branch during the period beginning in 1999. Annual capital investments in the furniture branch were EU€ 8-11 million and in the paper and paper products branch EU€ 3-6 million. The flow of capital investments has sped up the development of new products, increased labor productivity, and improved the industry’s competitiveness in international markets.

2. The wood and furniture industry is \textit{export-oriented}. The wood and wood products exports from Lithuania are around 65% which one third of them are in the form of furniture. The paper industry exports up to 40% of its production. Russia was traditionally the main market for Lithuanian furniture, but the industry has rapidly increased its EU markets, especially in France, Germany, Denmark, Belgium, the UK, Austria and Spain. Now more than 48% of exports are going to the west and only 6% to the CIS countries. The growth of the whole industry is connected with the growth of exports to Western European markets.

Timber is Lithuania's most important natural resource. Around 30% of the country is forested. The predominant trees are pine, spruce and birch. The timber industry has developed rapidly in recent years, spurred by rising world wood and paper prices and

\textsuperscript{14} Lithuanian Development Agency.
since 1991 output has more than doubled. The industry accounts for more than 15% of the industrial share in GDP and the sector is highly export-oriented. Lithuania's sawmill output is more than 1 million cubic meters annually, but the woodworking industry has the capacity to produce more than 3 million cubic meters of raw material.

The sector comprises 40 large specialized companies and more than 3,000 small furniture factories and sawmills. Privatization in the sector was completed at the end of 1994, when all enterprises became joint stock companies. Some of them retain some public capital, which is currently being sold to the private sector. Most companies have been amalgamated into two corporations: 1) Lietuvos Mediena (comprising sawmills, building materials producers and wood-panel factories) and 2) Furniture Producers Association Mede (combining furniture and woodworking companies). For many companies in the wood processing industry profits decreased in 2000 due to a drop in product prices and the low euro rate. An exception was Stora Enso Packaging, the Kaunas affiliate of the biggest European pulp and paper concern Stora Enso (Finland), which increased sales volume substantially in 2000 and now has 15% of Lithuania's corrugated cardboard market.

4. Electronics Industry

All the major branches of the electronics industry are being developed in Lithuania. The production of the electronics industry is distributed among these branches:

- Electrical Equipment and appliances;
- Radio, television and communications equipment and sets;
- Medical, precision and optical equipments.

The fastest growing branch of the electronics industry in Lithuania is medical, precision and optical instruments. The total sales in this branch have more than doubled within the

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15 Lithuanian Development Agency.
last five years and amounted to EU€ 96 million in 2002. The fastest growth in this branch was in 2001, when its total sales increased by 61%.  

Intensive growth during 1997-2002 was also observed in radio, television and communications equipment and sets. In 2000, total sales in this branch increased by 34% and in 2001 by 10% over the previous year. The estimated growth of this branch in 2002 was 20%. This branch is the most significant in the electronics industry and accounts for 55% of the industry’s total sales.

Enterprises in the electronics sector are highly export-oriented, exporting 70-80% of their production, with EU countries representing the main market. Exports to the EU amounted to 44% of all the exports in 2001. The country’s electronics manufacturers managed to gain the confidence of Western customers during 1997-2001, the percentage of exports to the EU growing at this time from 35% to 44%. Two factors caused the growth in the exports of the country’s electronics industry products: 1) competitive prices and 2) promptly filled orders. This was achieved through modernization of the production, improved management skills, and the implementation of quality management standards. The growing exports to the EU demonstrate the industry’s competitiveness; and continued export growth is one of the tendencies of the industry’s development. Acquiring strong positions in the western, domestic and CIS markets was done mainly with a help of foreign capital participation. Major foreign investors include Siemens (Germany), Samsung (South Korea), Farimex (Switzerland), Philips (Netherlands), and a number of electronics companies from the Nordic countries.

It is assumed that significant number of new enterprises in 2001, the domination of small and medium-sized companies, the availability of a highly qualified work force and specialists, the competitive operating costs, and the available know-how have created a favorable environment for investments.

16 Lithuanian Department of Statistics.
18 Lithuanian Development Agency.
Out of the 162 companies operating in the industry, 24 attracted foreign capital (14.8 %) in 2001. The FDI growth rate in Lithuania’s entire processing industry increased in 2000 (12.7 %). The FDI in the electronics industry in the end of 2001 are distributed as follows:

- In the radio, television, and communications equipment and set industry (EU€ 40.9 million or 65% of the total DFI in the electronics industry);
- In the computer and electrical equipment and appliance industry (EU€ 14.9 million or 23 %);
- In the medical, precision, and optical equipment and instrument industry (EU€ 7.4 million or 12%).

5.5. Conclusion

The conclusion can be drawn from the analysis of these industries that exports occupy an important share of the overall production which mostly of them is EU oriented. Another interesting factor is that the industries managed to attract several of investments from western countries which mainly are export oriented. The main arguments behind the great exports and attractiveness of FDI in these industries are:

1. Cheap labor;
2. Good geographical location;
3. Comparably high skilled workforce particularly in the high-tech industries.

Lithuania’s highly qualified specialists (electricians, mechanics, engineers, etc.) are able to create new, high-tech automotive component products at relatively low manufacturing costs.

The country is situated in a very convenient geographical position, as its territory is at the crossroads of East and West. It has also a well-developed transport network and an ice-free port on the Baltic Sea, all of facilitate importing and exporting goods.
Chapter VI

6. Empirical Estimations

6.1. Model

The phenomena of intra-industry trade\(^1\) where countries trade with the similar products was firstly studied by Herbert Grubel and Peter Lloyd (1975) who suggested a simple index, which measures country’s trade with similar product. The unadjusted Grubel-Lloyd (G-L) index is defined as:

\[
\text{Grubel-Lloyd index} = 1 - \frac{\sum |X-M|}{\sum (X+M)}
\]

Where;

X - The value of exports
M - The value of imports

If the goods are only just exported or imported, the G-L index will be equal to 0 (inter-industry trade), if more goods are simultaneously imported and exported the amount of intra-industry trade will be increasing and the index will approach 1.

The index however has some shortcomings, which were pointed by Grubel and Lloyd themselves and which are discussed in the paper by Fontagne and Fdruedenberg (1997). Shortly, I have to note, that presented above G-L index is positively related to the country size and is biased to the aggregation level. As for the country’s size, the bigger is the

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\(^1\) See Helpman (1987) for a theoretical analysis of such trade and Faini and Portes (1995) and Drabek and Smith (1995) for a discussion of intra-industry trade developments between the Central and Eastern European countries and the European Union.
country in terms of GDP (and population), the higher diversity of products it may produce and in the same time it has more diversified demand for imports. The aggregation of products in trade statistics leads to some lost of information that might affect G-L index both in positive or negative directions. In my model I ignore the shortcomings of this simple version of measuring the intra-industry trade which instead gives me some simplicity in calculations.

Based on the explanation provided in the theoretical part I divide the IIT into vertical and horizontal. In order to identify vertical and horizontal IIT author adopts a methodology used by major preceding studies such as Abd-el-Rahman (1991), Fontagne and Freundenberg (1997), Greenaway, Hine, and Milner (1995, 1999) and Aturupane, Djankov, and Hoekman (1999).

In the evaluation of trade flows, quality analysis has been undertaken principally with the use of unit value (UV). The unit value is defined by the value of individual trade flow (export or import) divided by the quantity (tone, per square meter, per item). The methodology is based on the assumption that the gap between the unit value of imports and the unit value of exports for each commodity reveals the qualitative differences of the products exported and imported between the two economies. The rationale for using UVs as an indicator of quality is that, assuming perfect information, a variety sold at a higher price must be of higher quality than a variety sold more cheaply. In one way or another, all studies of quality in international trade start from the position that, at least at a much disaggregated level, relative prices reflect relative qualities.²

Unit values themselves may be computed in several ways- per tone, per square metre or per item. For example Oulton (1990) has used unit values per tone for an extensive survey of quality in UK trade and Abd-el-Rahman (1991) has also employed this measure in a study of French trade. In my case the unit values are computed on trade flows between Lithuania and EU per tone.

According to Abd-el-Rahman (1991), Fontagne and Freundenberg (1997), Greenaway and Hine (1995, 1999) horizontal IIT is defined as the simultaneous export and import of a 2 digits NACE product where the unit value of exports relative to the unit value of imports is within a range of (+-) 15 percent. Where relative unit values are outside that range, any IIT is considered to be vertical.

6.2. Estimation of Intra Industry Trade and Quality of products

6.2.1. Estimation of Intra-Industry Trade

The upper part in table 6.1 shows the evolution of Grubel-Lloyd indices for trade of Lithuania with EU partner over ten sample years, calculated at the two digit NACE level and divided into factor intensive and technology intensive product groups according to OECD. As well you can see the changes of IIT in appendix 5 graph 1 and graph 2.

The lower part in table 6.1 shows the ratio of unit value of exports to unit value of imports according to the factor and technology intensities. The unit value for exports-imports is calculated ECU/tones.
Looking at the table 6.1 we can describe the findings as follows:

- The data shows that IIT of Lithuania with EU increase during the period of 1992-2001.
- Only medium high intensity found to be changing during the period and in the end of given years even decreasing to 0.58 compared to 0.71 in the beginning.
- The significant growth in IIT of labor-intensive manufactures is seen during the period of 1992-93 from 0.56 to 0.96 respectively and later stayed very high during the whole years.
In science based and high tech industries the level of IIT is much lower compared to other given industries.

Scale intensive and specialized supplier industries slightly increased during the time. However, some big jumps and falls are noticed during period especially for former industry.

We can see from data that IIT of low technology intensity rose and stayed high during all given years.

The empirical evidence shows that the biggest increase of IIT is in medium low technology intensive products from 0.14 in 1992 to 0.90 in 2001.

Another interesting observation from these findings is that factor intensity and technology intensity are closely interdependent. For example the industries included in factors like resource intensive and labor intensive are almost all the same as the industries are in low and medium low technology intensities. From the table we see that IIT of these industries is similarly high. On other hand the IIT for factor like science based is found to be very similar as high technologically intensive industry.

The results of intra-industry trade of Lithuania with the EU give us an answer to the hypothesis pointed in the introduction part. Once again I highlight hypothesis 1:

- **Intra-industry trade ratio increased in manufacturing products between Lithuania and EU during 1992-2001.**

I can confirm that this hypothesis is positively associated with my estimations where the groups of products were divided into factor intensities and technology intensities. The ratio was increasing in all groups except medium high tech intensity. Of course looking more detailed we would see more changes in the different industries as data from the table 1 (see appendix 5)\(^3\) show but on the aggregate level IIT index increased significantly.

\(^3\) See in appendix 4 table 1 and 2 for the description of factor intensity and technology intensity according to NACE codes.
6.2.1.1. Discussion of results for IIT estimations

According to Hoekman and Djankov (1996) there are various dimensions that may underlie intra-industry exchange. The first is textbook explanation, where it is the result of firms specializing in differentiated products, driven by the need to realize economies of scale or scope. A second factor is that in the early stages of the transition to a market economy CEEC firms are likely to have incentives to establish linkages with West European counterparts, thereby obtaining access to know-how, working capital, and distribution channels. Intra-industry trade is a mechanism through which transfers of technology occur.⁴

To analyze the changes in IIT by factor and technology intensities we can understand better by looking to the industries separately. The table 1 (appendix 5) gives more detailed explanation about the industries where the IIT was growing or declining according to NACE classification:

1) Resource intensity. High and increasing ratio of IIT was found in the food products and beverages. The growth from very low level is seen in the wood products and non-metallic mineral sectors. Extremely low level stayed in the tobacco and refined petroleum products.

Lithuania is rich in the resources like agriculture products and wood products. Agricultural industry has a long lasting tradition. The country was a main exporter in food products for all the Soviet market. After the opening borders companies began to export abroad, especially to EU and all the time searching for new markets. On import side many products, mostly from EU entered Lithuanian market. Variety of these products has increased significantly.

Chapter 6. Empirical Estimations

From analysis in the previous chapter it is clear that wood industry is an important factor for Lithuanian export. Several products are exported to the EU market and the industry is developing rapidly.

The low level of IIT in tobacco and petroleum products can be explained in such a way that these resources are not found in Lithuania. Tobacco products are mainly imported or produced domestically. For instance there is tobacco producing company Philip Morris which is selling the products domestically and there are importing distributors who import tobacco such as Prince, Barclays etc. Interesting fact is that refined petroleum products are mainly exported to the EU than imported. There is an oil-refinery company in Mazeikiai which imports a big part of oil raw materials from Russia, later process that, sells in local market and exports abroad.

2) Labor intensity. From this table we see that high level of IIT in labor intensive industries is mainly because of the increasing IIT in the industries such as textile and leather (IIT was relatively high during the period). The high IIT was as well in the furniture but shrunk from 0.69 to 0.53. The decrease was found in apparel and fabricated metal products. The high levels of IIT in the separate sectors explain why there was a high ratio in labor intensive product group.

The increase in IIT in the textile industry can be explained in that way that as shown in last part many textile companies have been privatized and some of them almost 100 percent export oriented, particularly to EU. Foreign firms invest in the industry because they find such advantages as location, high skilled labor and low production costs. As an example can be Marzotto company which moved two thirds of their production to Lithuania. The company which is internationally experienced brings the access to Western markets, to know-how, capital and transfers the technology. This coincides with the theoretical explanation that the growth of IIT can be much related to the foreign direct investments. At this point based on theoretical arguments provided by Markusen (1995, 2002) I assume that these investments are of vertical type. Thus we remember that vertical activity is closely related to the outsourcing where in this case the parts of the
textile material can be imported from EU countries like Germany, Italy, Austria, then produced in Lithuania and exported back to these and other EU countries.

The case of furniture can be related to the explanation that the exports jumped few times over the imports. The motives for shift of exports towards EU and growth of exports as already mentioned in the last chapter were the Russian crisis in 1998 and the flow of capital investments which sped up the development of new products, increased labor productivity and improved industry’s competitiveness in international markets. These factors led to increase export capability towards EU market. From table 1 in appendix 5 we can see exactly that IIT was growing until 1998, and after this year diminished significantly.

3) Scale intensity. Looking at the table we would see interesting facts that IIT of this industry was increasing only due to chemical and chemical products and basic metal products. Other such as paper products, printing and reproduction of recorded media, rubber and plastic products, motor vehicles and other transport equipments show the decrease or stagnant low IIT ratio.

The increase in IIT in chemical products I can explain as follows. On one hand Lithuania's chemical product market is dominated by imported production most of which comes from EU. On the other hand a lot of production especially basic chemicals (86 %) and biotechnological (75 %) are exported. The biggest part of exports (65 %) goes to EU markets. The IIT increases because one kind of products are imported and other kind are exported but in the same group of products. Whether it is horizontal or vertical IIT we can find measuring per unit value. From table 3 in appendix 5 we can see that ratio of export-import unit value didn’t change during the period showing clearly better quality of imported products. It is clear that vertical IIT in this case exist showing big quality differences between exported and imported products.

5 See COMEXT trade data.
Chapter 6. Empirical Estimations

4) **Science based.** The IIT level rose because of the increasing ratio in the office machinery and computers and especially increase in medical, precision and optical instruments.

I already mentioned in chapter of industry analysis that electronics industry became highly export-oriented especially to the EU countries. Few factors caused the growth of export such as competitive prices and promptly filled orders. This was achieved through modernization of production, improved management skills and the implementation of quality management standards. Acquiring strong positions in the west was done with the help of foreign capital participation.

5) **Medium high tech.** The decrease of IIT ratio in the medium high tech intensity is worth mentioning in few aspects. Looking at the table we would see that IIT level for chemicals and chemical products was increasing dramatically and machinery grew slightly during the period, but IIT for other industries such as electrical machinery, other transport equipment and motor vehicles and semi trailers diminished or index stayed relatively low. This is mainly why the IIT for medium high tech industries is declining during the period.

**6.2.2. Estimation of products quality**

The results in the table 6.1 where the ratio of exports and imports per unit value is presented dividing product groups into factor and technology intensities show the growth in almost all industries. The stagnant stayed in scale intensive and medium high tech commodities. The decrease of ratio was found in low tech intensive products.

Table 2 (appendix 5) shows the trend in changes of quality of traded product groups by factor and technology intensities between Lithuania and EU. Doing so will give us distinct understanding of the quality differences between exported and imported products. As was pointed earlier this is calculated dividing the price and weight for imports and exports.
The following observations were found from the calculations of differences in products quality:

- In terms of quality we can see that the biggest change occurred in industries of labor and science based intensities. The quality of exports measured in unit values for mentioned factor intensities increased three times in labor intensive and almost three times in science based industries. The quality of imports decreased almost two times for the labor intensive and science based industries.
- The quality of exports and imports of resource intensive industry increased slightly during the given period.
- Quality of exports for scale intensive industry grew and imports declined insignificantly.
- Unit value of exports of specialized supplier grew and the unit value of imports declined.
- The conclusion from the factor intensive industry can be drawn that unit value of imported goods in the year 2001 is still higher than the unit value of exported goods, but the gap is much smaller than in the year 1992. The gap between the quality of imported and exported products diminished obviously in labor-, science based- and specialized supplier industries and it gave the increase in the ratio of export-import UV.
- The quality of exported low tech commodities increased not very rapidly but the quality of imported goods grew significantly. This suggests the decrease of ratio in UV of exports and imports (see table 6.1).
- The quality of medium low tech and medium high tech intensive commodities didn’t change significantly during the analyzed years. We can see the slight growth in exports of unit value in these industries but the imports of medium-low and medium-high declined slightly in the year 2001 compared to year 1992.
- The data shows that the quality upgrading was in export of high technology intensive industry which in the year 2001 was more than three times higher.
than in the year 1992. On other hand the level of quality of imported products in this industry shrank during given period almost twice.

- The conclusion is that there is a tendency of increasing unit value of exporting products in the groups of factor intensity and technology intensity, but the unit value of imported goods on other hand decreased except in resource intensive and low tech intensive industries.

If we compare the IIT and unit values (see Table 6.1) for the factor and technology intensive industries we can come to the conclusion as Falvey (1981) pointed that capital-abundant countries produce and export highly-quality varieties which in my case is EU, whereas labor-abundant countries like Lithuania produce and export low-quality varieties, because the quality level of a product variety is assumed to increase with capital intensity. The intra-industry trade comes into existence because countries with different factor endowments exchange qualitatively different varieties inside the same product group.

Thus based on the findings above which show sufficiently large price difference between exported and imported products and literature attempts made by Falvey (1981), Falvey and Kierzkowsky (1987), Torstensson (1991), Greenaway, Hine and Milner (1994, 1995), Fontagne and Freundenberg (1997) and Aturupane, Djankov and Hoekman (1999) I can present that most of the intra-industry trade between Lithuania and EU is of vertical type which comprises exchange of similar goods of different quality and is pushed by differences in endowments.

This empirical evidence gives me a support that the quality of Lithuania’s export to the EU market especially of labor-, science based and high technology intensive products has improved. The growth of unit value in labor intensive products is mostly related to the textile and furniture products and increase of unit value in science based and specialized supplier is related to medical equipments and radio and television respectively (see table 3 in appendix 5).
Let us picture a possibility of improvement of exported products quality during a given time. In theoretical part I discussed that the quality of products can be improved via foreign direct investments by bringing new and more advanced technologies than exist in the host country. Thus foreign firms can apply new technologies—modernize already existed production lines or introduce the products which were not produced before. We can assume that the increase in quality measured by unit value of labor intensive products in our case has much to do with the share of investments attracted in this industry (see chart 5.1).

In terms of quality for textile industry from the table 3 in appendix 5 we can clearly see that the ratio of export-import unit value from low level in 1992 where the imported products were of better quality increased clearly until 1998 and later stayed high. We can say that the improvement of quality measured per unit value is closely related to foreign direct investments in this industry.

There is no particular research on the FDI effects to the level of technologies and quality of production in the Lithuanian industries. However, the causal relationship is positive and strong; such conclusion is economically logical and proved in numerous researches, as in the theoretical chapter above, considering the technology spillover effects for the whole economy. The following effects could be seen:

- First of all, the higher level of technologies in the industry, reached because of the FDI increased the requirement for the higher quality raw materials.

- Secondly, it could be logically concluded, that the finances of FDI accelerated the introduction of the quality management system, based on ISO (International Organization of Standardization) standards, in domestic companies. Adoption of the system allows the companies to have better possibilities for the export, as the system and ISO standard is recognized worldwide.
Thirdly, the inflow of FDI into domestic industry accelerated the modernization of the assortment of production, as the new technological lines were possible to introduce. For instance in 1999, the company *Rokiskio suris* got 40 million LTL investments from the European Reconstruction and Development Bank and from Bank Bermuda. These investments were directed to the improvement of the milk supply chain (for raw milk producers), for technical reconstruction, for new technological lines, for the perfection of the distribution system, and for the environmental projects. The company owns the technological *know-how* of fat cheese production, having no analogs in the world.\(^6\)

These findings can be related to the factors explained earlier. Foreign companies invest a big part of their production in Lithuania in order to export finished or unfinished output abroad. There occurs so called export-oriented investments.

### 6.3. Results of FDI relation to IIT

As I already mentioned in theoretical part is that FDI inflows are found to be highly correlated with intra-industry trade levels. Hoekman and Djankov (1996) showed that transition countries that managed to attract the largest investment inflows more heavily rely on intra-industry trade and vertical specialization. Evidence from Kaminski (2000) shows that countries which received relatively small amounts of FDI over 1990-1997 did not experience expansion in intra-industry trade.

Previous analysis show that IIT in Lithuania increased in various industries. The growth is mainly related to the local and foreign capital participation in the given areas. The relation can be explained as follows. For instance, the increase of IIT in textile industry is related due to the increase in exports. As it is shown from the last chapter, that due to the implementation of privatization program major FDI in the textile sector has been made by EU companies and more than 75% of the production facilities have been modernized over the past decade. Many western companies have acquired shares and established joint-ventures with the local companies with the aim of exporting their products mostly to

EU market. This attributed to the statement mentioned in theoretical part that labor seeking investments are generally trade-creating, since they give rise to exports from host countries. In many cases, they also lead to a diversification in the composition of host-country exports towards manufactures. On the consumption side, such investments also tend to be trade creating, since a large share of the raw materials used in production is imported. It is clear that foreign investors find advantages to produce in Lithuania in order to export finished or unfinished production to the EU market. These advantages are high skilled and comparably low cost labor force and well-developed transport infrastructure with its proximity to the EU.

To test empirically the relation between FDI and IIT regression analysis will be used.

6.3.1. Regression Results

A statistical procedure called regression analysis is used to develop an equation showing how the variables are related. In regression terminology, the variable being predicted is called the dependent variable. The variable or variables being used to predict the value of the dependent variable are called the independent variables. The dependent variable in my case is IIT and independent variable is FDI. In this case the regression is so called simple linear regression, because analysis is involving one independent variable and one dependent variable.

In the case of a linear relationship between two variables, both the coefficient of determination and the sample correlation coefficient provide measures of the strength of the relationship. The coefficient of determination provides a measure between zero and one whereas the sample correlation coefficient provides a measure between -1 and +1. Although the sample correlation coefficient is restricted to a linear relationship between two variables, the coefficient of determination can be used for nonlinear relationships and for relationships that have two or more independent variables. In that sense, the coefficient of determination has a wider range of applicability. Applying this aspect

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author uses sample correlation coefficient because there is one independent variable in this case.

The regression takes a part cross the industries during 6 years. There are 12 observations in the first two years of analysis and 16 observations during the last four years. The number of observations differs due to the information access.

The author estimates a regression model of the following form:

\[ y = \alpha + \beta x \text{ or } IIT = \alpha + \beta FDI \]

Table 5.2 Regression model of FDI and IIT cross the industries

<table>
<thead>
<tr>
<th>Year</th>
<th>Intercept (constant)</th>
<th>Slope, ( \beta )</th>
<th>( R )</th>
<th>Number of observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996</td>
<td>0,43</td>
<td>0,36 (1,25)</td>
<td>0,36</td>
<td>12</td>
</tr>
<tr>
<td>1997</td>
<td>0,48</td>
<td>0,19 (0,61)</td>
<td>0,19</td>
<td>12</td>
</tr>
<tr>
<td>1998</td>
<td>0,53</td>
<td>0,038 (0,14)</td>
<td>0,038</td>
<td>16</td>
</tr>
<tr>
<td>1999</td>
<td>0,49</td>
<td>0,25 (0,95)</td>
<td>0,25</td>
<td>16</td>
</tr>
<tr>
<td>2000</td>
<td>0,47</td>
<td>0,38 (1,53)</td>
<td>0,38</td>
<td>16</td>
</tr>
<tr>
<td>2001</td>
<td>0,41</td>
<td>0,44* (1,85)</td>
<td>0,44</td>
<td>16</td>
</tr>
</tbody>
</table>

Source: Author’s own calculations.

Note: The values in parentheses are t statistics. In the tables, * shows that coefficients are significant at 10% level, ** at 5% level, and *** at 1% level.

From the table above we can see that the sample correlation coefficient in the year 1996 is positive but not very high. Almost no correlation is found in the next two years, but from the year 1999 there is a sign of increase in positive linear relationship between FDI
and IIT. Only in the last year the regression shows significant positive statistical relation between two variables.

Unfortunately, such detailed data on FDI in order to estimate foreign capital participation according to factor and technology intensities is not available. But combining the theory, industry analysis and author’s estimations in IIT the result is that there is positive influence of foreign direct investments in the sectors where high skilled and cheap labor-intensive processes are needed. These investments were mainly attracted in the sectors such as textile, wood and wood products, chemicals and electronics. These findings can be explained by using Markusens’ argument (2002) where he points the situation where skilled-labor-intensive relative to production exists, creates a motive for the geographical fragmentation of production and vertical multinationals.

The author refers to second hypothesis mentioned in the beginning of the paper:

- **FDI in Lithuania have a positive impact on the level of intra-industry trade particularly with EU.**

The answer to this statement according to statistical estimations is that there is a positive, but very low impact of FDI on the level of intra-industry trade. But combining overall analysis shows that for many industries the FDI has a great impact on the growth of export and the level of IIT in particular industries.

This regression doesn’t show strong positive linear relation as expected, but according to statistical books and the author’s belief: “Statistics is nice and a great tool, but it cannot replace thinking...”

According to Anderson, Sweeney and Williams (2003) “Regression analysis cannot be interpreted as a procedure for establishing a cause-and-effect relationship between

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variables. It can only indicate how or to what extent variables are associated with each other. Any conclusions about cause and effect must be based on the judgement of the individual or individuals most knowledgeable about the application".
Chapter VII

6. Conclusion

This paper analyzed foreign trade pattern of Lithuania and foreign direct investment flows to country after re-creation of independence in 1990 when the main political and economical reforms took place. The purpose for country was to create democratic procedure and conditions for market economy. One of the base economic reform means was the liberalization of foreign trade and the organization of institutions for development foreign trade policy. Many unilateral and conventional decisions have been accepted. On that ground Lithuania’s present foreign trade regime and the structure of the trade policy is created. Negotiations for participation in WTO (previous GATT) and related obligations for foreign trade and other areas made an important role creating Lithuanian economic policy and foreign policy regime. Bilateral and regional free trade agreements, especially with EU were another important factor creating Lithuanian foreign trade policy.

The country has successfully managed its transition towards a market economy. With a consistent program of structural reforms and comprehensive privatization, major results have been achieved. Although the country has been successful in reorienting its exports to new markets, notably the EU countries. Geography and the approach taken to dismantling central planning have ultimately driven FDI flows into Lithuania. Thus it can be said that Lithuania which is relatively small country adopted a radical approach to economic reforms, sustained macroeconomic stability, opened almost all sectors of the economy to foreign participation and actively sought foreign partners in their privatization programs. Following can be stated, that Lithuania was successful in attracting FDI inflows.
The Lithuanian-EU trade liberalization agreements have helped the country to attract foreign investors. Investors from outside the EU would find location in Lithuania as useful to overcome trade barriers in the EU, whereas EU-based firms might then consider moving the production from the EU without fear of deterioration in the conditions of access to their home markets.

Such questions as which were the main factors of the change in export reorientation and why did trade flows increase with EU market were discussed in this paper. The question of the role of foreign direct investments in the pattern of these changes was discussed profoundly.

Overall the main research question was to find which role foreign direct investments played in the changes of trade reorientation towards EU market during the transition process in Lithuania.

To answer these questions author referred to theoretical approaches made by Hoekman and Djankov (1997) that the reorientation of trade can be encouraged by the growth of intra-industry trade and the flows of foreign direct investments in particular industries. Thus the hypothesis 1 was taken into consideration:

**Hypothesis 1. Intra-industry trade ratio increased in manufacturing products between Lithuania and EU during 1992-2001.**

The answer to this hypothesis is clearly yes showing the increase in intra-industry trade in most of the industries between Lithuania and EU. The analysis of industries which were grouped according to factor- and technology intensities showed very precisely where IIT increased, stayed high or shrank during the period between 1992 and 2001. The increase in IIT is found in all groups of industries according to factor intensities. The most significant is detected in labor-intensive industry. According to technology intensities the growth in IIT is found in all groups except medium high-tech. The most significant increase is detected in the medium low-tech industry.
Another finding in this analysis is that the intra-industry trade between Lithuania and EU is of vertical type. Author used approach taken by Torstensson (1991, 1996d) and Greenaway, Hine and Milner (1994, 1995) where the horizontal and vertical IIT is distinguished by quality of products. This analysis clearly shows that the quality of imported products is higher than the quality of exported products. The industries were grouped according to factor- and technology intensities. Thus the quality upgrading is found in all the group of exported products according to factor-, and technology intensities during the 10 year period.


Thus, this can be explained as Falvey (1981) pointed that capital-abundant countries produce and export highly-quality varieties which in this case is EU, whereas Lithuania which is labor-abundant country produce and export low-quality varieties, because the quality level of a product variety is assumed to increase with capital intensity. The intra-industry trade comes into existence because countries with different factor endowments exchange qualitatively different varieties inside the same product group. According to theory and author’s analysis in Lithuania’s case vertical IIT is likely to be associated with the presence of inward FDI especially in labor-intensive industries, as foreign firms are expected to combine their technological knowledge with local endowments to produce goods of varying qualities which then are shipped to export markets.

The second hypothesis looked as follows:

**Hypothesis 2.** FDI in Lithuania have a positive impact on the level of intra-industry trade particularly with EU.
Chapter 7. Conclusion

The answer to this hypothesis is very hard to describe. Firstly, due to the lack of the information on foreign companies in Lithuania is impossible unilaterally to confirm or refute the hypothesis. Secondly, the data gathered from Lithuanian Department of Statistics is not very coincidence with the data gathered on the trade. Thus the regression is found to be significantly low between FDI and IIT. Thirdly, going deeper into the analysis of IIT according to factor- and technology intensities and analysis of the industries in Lithuania, author concludes that FDI is inevitable factor for the shaping the trade flows towards EU and to the level of intra-industry trade. This is found especially in the industries where the cheap and highly skilled labor is needed.

Labor-intensive industry is a good example, as shown in the theoretical part, that multinational enterprises tend to conduct FDI of the “vertical type”. This type is applicable, when there is a big gap in factor prices between the home and the host country, and when the market of the host county is relatively small and trade costs are not large (Markusen and Maskus, 2001). This can be explained that Lithuanian market is relatively small and many MNEs invest production which is export oriented. The analysis showed that there are small barriers on trade with EU and trade costs are relatively small because of the good country’s geographical position.

Thus, becoming a member of the EU, Lithuania is expected to attract more foreign direct investments and the increase in trade is supposed due to the abolishment of trade barriers.
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## APPENDIX 1

Table 1. Most important bilateral trade agreements between Lithuania and EU

<table>
<thead>
<tr>
<th>Agreement</th>
<th>Date of signature</th>
<th>Came to force</th>
<th>Main regulations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trade and collaboration agreement</td>
<td>1992 05 11</td>
<td>1993 02 01</td>
<td>Most favorite status in trade, nondiscrimination; ES common preferential system application to Lithuania; economical cooperation in some areas.</td>
</tr>
<tr>
<td>Free trade agreement</td>
<td>1994 07 18</td>
<td>1995 01 01</td>
<td>Liberalization of trade under the GATT principles; free trade in industrial goods; Lithuania has 6 years of transitional period for extensible import liberalization from EU; standard protection statutes;</td>
</tr>
<tr>
<td>Association (European) agreement</td>
<td>1995 06 12</td>
<td>1998 02 01</td>
<td>Recognized Lithuanian aim to be a member of EU; inclusion of free trade agreement statutes; political dialog; economic cooperation in such areas as competition policy (adaptation of EU policies), services, capital and movement of labor, freedom to establish undertakings, intellectual property protection, consumer protection, co-ordination of laws, cooperation in other areas such as industrial policy, education and technology, energy, environment protection etc; Association council and Association committee.</td>
</tr>
</tbody>
</table>

Source: Corresponding agreements
Lithuania has concluded agreements on Most Favorable Nation (MFN) status and Free Trade Agreements with a number of countries.

**Table 2 List of States that the Agreements on MFN status have been concluded with**

<table>
<thead>
<tr>
<th>Country</th>
<th>Code</th>
<th>The Date of International Agreement Enactment</th>
</tr>
</thead>
<tbody>
<tr>
<td>WTO Members</td>
<td></td>
<td>2001 05 31</td>
</tr>
<tr>
<td>Belarus</td>
<td>BY</td>
<td>1995 02 23</td>
</tr>
<tr>
<td>Kazakhstan</td>
<td>KZ</td>
<td>1998 09 01</td>
</tr>
<tr>
<td>China</td>
<td>CN</td>
<td>1994 06 29</td>
</tr>
<tr>
<td>Russian Federation</td>
<td>RU</td>
<td>1995 01 18</td>
</tr>
<tr>
<td>Uzbekistan</td>
<td>UZ</td>
<td>1995 08 28</td>
</tr>
<tr>
<td>Vietnam</td>
<td>VN</td>
<td>1996 07 24</td>
</tr>
</tbody>
</table>

Source: Lithuanian Development Agency

For the goods produced in the countries or groups of countries that have been granted the MFN status Lithuania applies the **conventional import duty**. The rate of conventional duty varies from 0 to 45%.
## Table 3 Free Trade Agreements of the Republic of Lithuania

<table>
<thead>
<tr>
<th>Country</th>
<th>The Date of International Agreement Enactment</th>
<th>Country</th>
<th>The Date of International Agreement Enactment</th>
<th>Country</th>
<th>The Date of International Agreement Enactment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EFTA countries:</strong></td>
<td>1997 01 01</td>
<td><strong>EU countries</strong>:</td>
<td>1995 01 01</td>
<td><strong>Other countries:</strong></td>
<td></td>
</tr>
<tr>
<td>Island</td>
<td>1997 01 01</td>
<td>Austria</td>
<td>1995 01 01</td>
<td>Romania</td>
<td>2002 07 01</td>
</tr>
<tr>
<td>Liechtenstein</td>
<td>1997 01 01</td>
<td>Belgium</td>
<td>1997 01 01</td>
<td>Czech Republic</td>
<td>1997 07 01</td>
</tr>
<tr>
<td>Norway</td>
<td>1997 01 01</td>
<td>Denmark</td>
<td>1997 01 01</td>
<td>Estonia</td>
<td>1994 04 01</td>
</tr>
<tr>
<td>Switzerland</td>
<td>1997 01 01</td>
<td>Finland</td>
<td>1994 04 01</td>
<td>Latvia</td>
<td>1994 04 01</td>
</tr>
<tr>
<td></td>
<td></td>
<td>France</td>
<td>2000 03 01</td>
<td>Hungary</td>
<td>2000 03 01</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Germany</td>
<td>1997 01 01</td>
<td>Poland</td>
<td>1997 01 01</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Greece</td>
<td>1997 07 01</td>
<td>Slovakia</td>
<td>1997 07 01</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ireland</td>
<td>1997 03 01</td>
<td>Slovenia</td>
<td>1997 03 01</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Italy</td>
<td>1998 03 01</td>
<td>Turkey</td>
<td>1998 03 01</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Luxembourg</td>
<td>1995 11 21</td>
<td>Ukraine</td>
<td>1995 11 21</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Netherlands</td>
<td>2002 03 01</td>
<td>Bulgaria</td>
<td>2002 03 01</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Portugal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Spain</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sweden</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>UK</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Lithuanian Development Agency
*Replaced by the European Agreement since 01 02 1998

For the goods produced in the countries or groups of countries with which Lithuania has concluded the Free Trade Agreements the preferential import duty is applied. For most of goods the preferential import duty is 0.
APPENDIX 2

Chart 1. Total FDI by group of countries in 2001

Source: Lithuanian Department of Statistics

Chart 2. Total FDI in Manufacture by group of countries in 2001

Source: Lithuanian Department of Statistics
There is a list of largest investments in Lithuania according to a survey carried out by the Lithuanian Development Agency in 2002. Nordic and American companies are well represented. Other groups of note are large international oil-related businesses from various countries of origin, as well as producers of food, beverages and tobacco.

Table 1. Top Foreign Investors in Lithuania

<table>
<thead>
<tr>
<th>INVESTOR</th>
<th>ORIGIN</th>
<th>JV/INVESTMENT</th>
<th>INDUSTRY SECTOR</th>
<th>€ mill.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Amber Teleholdings Consortium</td>
<td>Sweden / Finland</td>
<td>Lietuvos Telekomas</td>
<td>Telecommunications</td>
<td>590</td>
</tr>
<tr>
<td>(Telia/Sonera)</td>
<td></td>
<td></td>
<td>(comm. 245)</td>
<td></td>
</tr>
<tr>
<td>2. SEB-Skandinaviska Enskilda Banken AB</td>
<td>Sweden</td>
<td>Vilniaus Bankas</td>
<td>Banking</td>
<td>250</td>
</tr>
<tr>
<td>3. TDC(Tele Danmark A/S)</td>
<td>Denmark</td>
<td>Bitė GSM</td>
<td>Telecommunications</td>
<td>151</td>
</tr>
<tr>
<td>4. Yukos</td>
<td>Russia</td>
<td>Mazeikiu Nafta</td>
<td>Oil Refinery, Pipelines, Sea Terminal</td>
<td>150</td>
</tr>
<tr>
<td>5. Philip Morris International</td>
<td>USA</td>
<td>Philip Morris Lietuva</td>
<td>Tobacco Products</td>
<td>84</td>
</tr>
<tr>
<td>6. Statoil ASA</td>
<td>Norway</td>
<td>Lietuva Statoil</td>
<td>Petroleum Products</td>
<td>81</td>
</tr>
<tr>
<td>7. Carlsberg Breweries A/S; Baltic</td>
<td>Sweden/Finland/</td>
<td>Švyturys and Utena</td>
<td>Brewery</td>
<td>78</td>
</tr>
<tr>
<td>Beverages Holding</td>
<td>Denmark</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Hansapank A/S</td>
<td>Estonia</td>
<td>Hansabankas</td>
<td>Banking</td>
<td>59</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(comm. 43)</td>
<td></td>
</tr>
<tr>
<td>10. DFDS Tor Line A/S</td>
<td>Denmark</td>
<td>Lithuanian Shipping Company</td>
<td>Sea Transport</td>
<td>55</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(comm. 70)</td>
<td></td>
</tr>
<tr>
<td>11. Mars Inc.</td>
<td>USA</td>
<td>Masterfoods Lietuva</td>
<td>Pet Food</td>
<td>44</td>
</tr>
<tr>
<td>12. Hansapank A/S</td>
<td>Estonia</td>
<td>LTB</td>
<td>Banking</td>
<td>43</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(comm. 43)</td>
<td></td>
</tr>
<tr>
<td>13. Ruhrgas &amp; E.ON Energie consortium</td>
<td>Germany</td>
<td>Lietuvos Dujos</td>
<td>Natural Gas</td>
<td>43</td>
</tr>
<tr>
<td>14. Bryggerigruppen</td>
<td>Denmark</td>
<td>Kalnapilis</td>
<td>Brewery</td>
<td>39</td>
</tr>
<tr>
<td>(The Danish Brewery Group)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Company Name</td>
<td>Country</td>
<td>Subsidiary Name</td>
<td>Industry/Industry Segment</td>
</tr>
<tr>
<td>-----</td>
<td>--------------------------------------</td>
<td>------------------</td>
<td>-------------------------------------</td>
<td>-----------------------------------------------------------------</td>
</tr>
<tr>
<td>15</td>
<td>Dansico Sugar A/S</td>
<td>Denmark</td>
<td>Sugar Factories</td>
<td>Sugar Production</td>
</tr>
<tr>
<td>16</td>
<td>Amber Mobile Teleholding AB; Motorola Private Persons</td>
<td>Sweden/Finland/USA</td>
<td>Omnitel</td>
<td>Telecommunications</td>
</tr>
<tr>
<td>17</td>
<td>Kraft Foods International</td>
<td>USA</td>
<td>Kraft Foods Lietuva</td>
<td>Confectionary &amp; Snacks</td>
</tr>
<tr>
<td>18</td>
<td>The Coca-Cola Company</td>
<td>USA</td>
<td>The Coca-Cola Bottlers Lietuva</td>
<td>Soft Drinks</td>
</tr>
<tr>
<td>19</td>
<td>Tele 2 AB</td>
<td>Sweden</td>
<td>Tele 2</td>
<td>Telecommunications</td>
</tr>
<tr>
<td>20</td>
<td>Codan Insurance Ltd., A/S</td>
<td>Denmark</td>
<td>Lietuvos Draudimas</td>
<td>Insurance</td>
</tr>
<tr>
<td>21</td>
<td>AS Hansa Liising</td>
<td>Estonia</td>
<td>Hanza Lizingas</td>
<td>Financial Services</td>
</tr>
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<td>22</td>
<td>Euro Oil Invest S.A.</td>
<td>Luxembourg</td>
<td>Lukoil Baltija</td>
<td>Petroleum Products</td>
</tr>
<tr>
<td>23</td>
<td>Neste OY</td>
<td>Finland</td>
<td>Neste Lietuva</td>
<td>Petroleum Products</td>
</tr>
<tr>
<td>24</td>
<td>Farimex S.A., Profilo Holdings</td>
<td>Switzerland/Turkey</td>
<td>Ekranas</td>
<td>Electronics</td>
</tr>
<tr>
<td>25</td>
<td>Siemens Yazaki Wiring Technologies GmbH</td>
<td>Germany/Japan</td>
<td>Baltijos Automobiliu Technika</td>
<td>Electronics</td>
</tr>
<tr>
<td>26</td>
<td>Partek Insulation; Finnfund; NEFCO</td>
<td>Sweden/Finland</td>
<td>Partek Paroc</td>
<td>Construction Materials</td>
</tr>
<tr>
<td>27</td>
<td>Odense Steel Shipyard Ltd</td>
<td>Denmark</td>
<td>Baltijos Laivø Statykla</td>
<td>Ship Building</td>
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<tr>
<td>28</td>
<td>Baltic Fund One LT</td>
<td>USA</td>
<td>Baltic Fund Securities</td>
<td>Financial intermediation</td>
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<tr>
<td>29</td>
<td>NORD / LB (Norddeutsche Landesbank Girozentrale)</td>
<td>Germany</td>
<td>LŽŪB</td>
<td>Banking</td>
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<tr>
<td>30</td>
<td>Osman Trading AB; Woodison Trading AB; Ferrous Investment Ltd.; Duboil Ltd.</td>
<td>Sweden/Ireland/Great Britain</td>
<td>Klaipėdos Nafta</td>
<td>Oil Terminal</td>
</tr>
<tr>
<td>31</td>
<td>Shell Overseas Holdings Limited</td>
<td>Great Britain/Netherlands</td>
<td>Shell Lietuva</td>
<td>Petroleum Products</td>
</tr>
<tr>
<td>32</td>
<td>Tuch Fabrik Wilhelm Becker</td>
<td>Germany</td>
<td>Eurotextil</td>
<td>Textiles</td>
</tr>
<tr>
<td>33</td>
<td>Svenska Petroleum Exploration AB</td>
<td>Sweden</td>
<td>Genčiu Nafta</td>
<td>Oil Extraction</td>
</tr>
<tr>
<td>34</td>
<td>AGA AB</td>
<td>Sweden</td>
<td>AGA</td>
<td>Trade in Gas</td>
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Appendix 3

Table 1. The Largest Textile and Apparel companies in Lithuania

<table>
<thead>
<tr>
<th>Company</th>
<th>Sales EUR thou.</th>
<th>Exports, %</th>
<th>Activity/Products</th>
<th>Number of employees</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2001</td>
<td>2000</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Textile companies</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alytaus Tekstile UAB</td>
<td>40 974</td>
<td>48 700</td>
<td>85</td>
<td>3000</td>
</tr>
<tr>
<td>Drobe UAB</td>
<td>22 954</td>
<td>19 395</td>
<td>n/a</td>
<td>1300</td>
</tr>
<tr>
<td>Linas UAB</td>
<td>19 742</td>
<td>21 649</td>
<td>89</td>
<td>1682</td>
</tr>
<tr>
<td>Vernitas UAB</td>
<td>14 401</td>
<td>11 632</td>
<td>72</td>
<td>800</td>
</tr>
<tr>
<td>Liteksas UAB</td>
<td>12 260</td>
<td>7 713</td>
<td>n/a</td>
<td>408</td>
</tr>
<tr>
<td>Audejas UAB</td>
<td>9 166</td>
<td>8 207</td>
<td>80</td>
<td>260</td>
</tr>
<tr>
<td>Linu Audiniai UAB</td>
<td>7 576</td>
<td>8 855</td>
<td>89</td>
<td>910</td>
</tr>
<tr>
<td>Siulas UAB</td>
<td>6 905</td>
<td>8 083</td>
<td>93</td>
<td>550</td>
</tr>
<tr>
<td>Vilnika Ltd</td>
<td>5 222</td>
<td>2 767</td>
<td>n/a</td>
<td>455</td>
</tr>
<tr>
<td>Trinyciai UAB</td>
<td>5 019</td>
<td>4 831</td>
<td>63</td>
<td>340</td>
</tr>
<tr>
<td>Pakaita UAB</td>
<td>3 180</td>
<td>3 277</td>
<td>n/a</td>
<td>114</td>
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<tr>
<td><strong>Apparel companies</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Utenos Trikotazas UAB</td>
<td>36 979</td>
<td>35 463</td>
<td>88</td>
<td>1 450</td>
</tr>
<tr>
<td>Edmundas &amp; C0</td>
<td>26 707</td>
<td>18 737</td>
<td>97</td>
<td>206</td>
</tr>
<tr>
<td>Lelija UAB</td>
<td>19 466</td>
<td>19 429</td>
<td>90</td>
<td>3000</td>
</tr>
<tr>
<td>Audimas UAB</td>
<td>16 992</td>
<td>13 243</td>
<td>80</td>
<td>560</td>
</tr>
<tr>
<td>Satrija UAB</td>
<td>7 678</td>
<td>8 368</td>
<td>69</td>
<td>960</td>
</tr>
<tr>
<td>Dainava UAB</td>
<td>6 874</td>
<td>6 758</td>
<td>97</td>
<td>1440</td>
</tr>
<tr>
<td>Fedora Ltd</td>
<td>6 399</td>
<td>2 461</td>
<td>n/a</td>
<td>39</td>
</tr>
<tr>
<td>Visatex, Ltd</td>
<td>5 458</td>
<td>3 588</td>
<td>n/a</td>
<td>970</td>
</tr>
<tr>
<td>Trys Sezonai UAB</td>
<td>4 344</td>
<td>4 493</td>
<td>95</td>
<td>448</td>
</tr>
<tr>
<td>Kauno Baltija UAB</td>
<td>4 080</td>
<td>2 989</td>
<td>n/a</td>
<td>802</td>
</tr>
<tr>
<td>Sparta UAB</td>
<td>3 955</td>
<td>4 342</td>
<td>58</td>
<td>360</td>
</tr>
<tr>
<td>Walters Baltic Ltd</td>
<td>3 206</td>
<td>2 802</td>
<td>n/a</td>
<td>544</td>
</tr>
<tr>
<td>Vilma UAB</td>
<td>3 179</td>
<td>3 475</td>
<td>97</td>
<td>430</td>
</tr>
<tr>
<td>Doblias UAB</td>
<td>3 041</td>
<td>3 652</td>
<td>95</td>
<td>600</td>
</tr>
<tr>
<td>Zemkalnija UAB</td>
<td>2 925</td>
<td>2 789</td>
<td>n/a</td>
<td>700</td>
</tr>
<tr>
<td>Verpstas AB</td>
<td>2 850</td>
<td>2 393</td>
<td>n/a</td>
<td>530</td>
</tr>
</tbody>
</table>

Source: Lithuanian Development Agency, 2002
Box 1 Case of Drobe

Drobe, one of Lithuania’s largest textile and wool companies, exports 95 per cent of its production, mainly to Western Europe. An investment project to revitalize Drobe involved privatization, restructuring and modernization of manufacturing facilities, and consolidation of its operations from four production sites to two. The total investment amounted to US$ 21.3 million, US$ 4.8 million of which paid for the state’s 68.39 per cent stake in the company (initially bought by Finnish investment fund manager CapMan), while the rest is being used to revamp and modernize the plant. At least US$ 10 million is being invested in technology to make Drobe the first textile company in the Baltics to have a fully computerized production line.

The project was financed by EBRD, CapMan (through the Finn Venture V and IV Funds which it manages), the IFC and Vilniaus Bankas. In June 2000 Drobe launched its reorganization, which meant the liquidation of the Vieciunai spinning plant and the Silute weaving plant. In October 2000, CapMan sold part of the shares to the two IFSs, who in this way made a further equity contribution to the firm. CapMan now holds 41 per cent of shares in Drobe, the EBRD 19.99 per cent, the IFC 7 per cent, and the employees 32 per cent. CapMan has committed to invest no less than US$ 11.36 million in Drobe within four years. Investments in 2000 reached US$ 7 million.
Box 2 Case of SY Wiring Technologies Lietuva

*For example SY Wiring Technologies Lietuva* established in Klaipeda with private capital from the Siemens concern (German) and Yazaki (Japan), produces the latest generation of electric wire assemblies (ignition system wires) for Renault automobiles. Since beginning its activities, the company has already invested 24 million euro in the Lithuanian market. The company presently employs 2700 people. More than a thousand new jobs were created by 2002 since the company started producing electric wire assemblies for the Renault Megane. All its production is exported to France and Spain.

This company is the industry leader with an annual turnover in 1999 of 74 million euro, in 2000 of 74 million euro, in 2001 of 63 million euro and in 2002 of 71 million euro. Sales are expected to amount to 99 million euro in 2003 and over 90 million euro in 2004. They have concluded a contract with the Renault company for the supply of electric wire assemblies until 2008.
Appendix 4

Table 1. Description of group of industries according to Factor Intensities

<table>
<thead>
<tr>
<th>Description</th>
<th>NACE codes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Science-based</strong></td>
<td></td>
</tr>
<tr>
<td>Manufacture of office machinery and computers</td>
<td>30</td>
</tr>
<tr>
<td>Manufacture of medical, precision and optical instruments, watches and clocks</td>
<td>33</td>
</tr>
<tr>
<td><strong>Specialized supplier</strong></td>
<td></td>
</tr>
<tr>
<td>Manufacture of machinery and equipment n.e.c.</td>
<td>29</td>
</tr>
<tr>
<td>Manufacture of electrical machinery and apparatus n.e.c.</td>
<td>31</td>
</tr>
<tr>
<td>Manufacture of radio, television and communication equipment and apparatus</td>
<td>32</td>
</tr>
<tr>
<td><strong>Scale-intensive</strong></td>
<td></td>
</tr>
<tr>
<td>Manufacture of pulp, paper and paper products</td>
<td>21</td>
</tr>
<tr>
<td>Publishing, printing and reproduction of recorded media</td>
<td>22</td>
</tr>
<tr>
<td>Manufacture of chemicals and chemical products</td>
<td>24</td>
</tr>
<tr>
<td>Manufacture of rubber and plastic products</td>
<td>25</td>
</tr>
<tr>
<td>Manufacture of basic metals</td>
<td>27</td>
</tr>
<tr>
<td>Manufacture of motor vehicles, trailers and semi-trailers</td>
<td>34</td>
</tr>
<tr>
<td>Manufacture of other transport equipment</td>
<td>35</td>
</tr>
<tr>
<td><strong>Labor-intensive</strong></td>
<td></td>
</tr>
<tr>
<td>Manufacture of textiles</td>
<td>17</td>
</tr>
<tr>
<td>Manufacture of wearing apparel; dressing and dyeing of fur</td>
<td>18</td>
</tr>
<tr>
<td>Manufacture of leather and leather products</td>
<td>19</td>
</tr>
<tr>
<td>Manufacture of fabricated metal products, except machinery and equipment</td>
<td>28</td>
</tr>
<tr>
<td>Manufacture n.e.c. (other manufacturing)</td>
<td>36</td>
</tr>
<tr>
<td><strong>Resource-intensive</strong></td>
<td></td>
</tr>
<tr>
<td>Manufacture of food products and beverages</td>
<td>15</td>
</tr>
<tr>
<td>Manufacture of tobacco products</td>
<td>16</td>
</tr>
<tr>
<td>Manufacture of wood and of products of wood and cork</td>
<td>20</td>
</tr>
<tr>
<td>Manufacture of coke, refined petroleum products and nuclear fuel</td>
<td>23</td>
</tr>
<tr>
<td>Manufacture of other non-metallic mineral products</td>
<td>26</td>
</tr>
</tbody>
</table>

Table 2. Description of group of industries according Technology Intensities

<table>
<thead>
<tr>
<th>Description</th>
<th>NACE codes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High-technology</strong></td>
<td></td>
</tr>
<tr>
<td>Manufacture of office machinery and computers</td>
<td>30</td>
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<tr>
<td>Industry</td>
<td>Technology Level</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Manufacture of radio, television and communication equipment and apparatus</td>
<td>32</td>
</tr>
<tr>
<td>Manufacture of medical, precision and optical instruments, watches and clocks</td>
<td>33</td>
</tr>
<tr>
<td><strong>Medium-high-technology</strong></td>
<td></td>
</tr>
<tr>
<td>Manufacture of chemicals and chemical products</td>
<td>24</td>
</tr>
<tr>
<td>Manufacture of machinery and equipment n.e.c.</td>
<td>29</td>
</tr>
<tr>
<td>Manufacture of electrical machinery and apparatus n.e.c.</td>
<td>31</td>
</tr>
<tr>
<td>Manufacture of motor vehicles, trailers and semi-trailers</td>
<td>34</td>
</tr>
<tr>
<td>Manufacture of other transport equipment</td>
<td>35</td>
</tr>
<tr>
<td><strong>Medium-low-technology</strong></td>
<td></td>
</tr>
<tr>
<td>Manufacture of coke, refined petroleum products and nuclear fuel</td>
<td>23</td>
</tr>
<tr>
<td>Manufacture of rubber and plastic products</td>
<td>25</td>
</tr>
<tr>
<td>Manufacture of other non-metallic mineral products</td>
<td>26</td>
</tr>
<tr>
<td>Manufacture of basic metals</td>
<td>27</td>
</tr>
<tr>
<td>Manufacture of fabricated metal products, except machinery and equipment</td>
<td>28</td>
</tr>
<tr>
<td><strong>Low-technology</strong></td>
<td></td>
</tr>
<tr>
<td>Manufacture of food products and beverages</td>
<td>15</td>
</tr>
<tr>
<td>Manufacture of tobacco products</td>
<td>16</td>
</tr>
<tr>
<td>Manufacture of textiles</td>
<td>17</td>
</tr>
<tr>
<td>Manufacture of wearing apparel; dressing and dyeing of fur</td>
<td>18</td>
</tr>
<tr>
<td>Manufacture of leather and leather products</td>
<td>19</td>
</tr>
<tr>
<td>Manufacture of wood and of products of wood and cork, except furniture</td>
<td>20</td>
</tr>
<tr>
<td>Manufacture of pulp, paper and paper products</td>
<td>21</td>
</tr>
<tr>
<td>Publishing, printing and reproduction of recorded media</td>
<td>22</td>
</tr>
<tr>
<td>Manufacture n.e.c. (other manufacturing)</td>
<td>36</td>
</tr>
<tr>
<td>Recycling</td>
<td>37</td>
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</table>

Source: Classification of high technology products and industries, DSTI/EAS/IND/STP (91)(1), OECD, Paris, 2001
Graph 1. The changes in IIT according to Factor Intensity during 1992-2001

Source: Author’s own calculations.

Graph 2. The changes in IIT according to Technology intensity during 1992-2001

Source: Author’s own calculations.
Table 1. Lithuania’s IIT with EU in manufactures, 1992-2001 (two digit NACE sectors)

<table>
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<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacture of food products and beverages</td>
<td>15</td>
<td>0.48</td>
<td>0.65</td>
<td>0.67</td>
<td>0.73</td>
<td>0.67</td>
<td>0.60</td>
<td>0.59</td>
<td>0.67</td>
<td>0.80</td>
<td>0.91</td>
</tr>
<tr>
<td>* tobacco products</td>
<td>16</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.05</td>
<td>0.00</td>
<td>0.01</td>
<td>0.02</td>
<td>0.04</td>
<td>0.01</td>
</tr>
<tr>
<td>* textiles</td>
<td>17</td>
<td>0.78</td>
<td>0.69</td>
<td>0.89</td>
<td>0.96</td>
<td>0.87</td>
<td>0.86</td>
<td>0.85</td>
<td>0.87</td>
<td>0.90</td>
<td>0.85</td>
</tr>
<tr>
<td>* wearing apparel; dressing and dyeing of fur</td>
<td>18</td>
<td>0.54</td>
<td>0.47</td>
<td>0.40</td>
<td>0.58</td>
<td>0.53</td>
<td>0.54</td>
<td>0.38</td>
<td>0.37</td>
<td>0.36</td>
<td>0.35</td>
</tr>
<tr>
<td>Tanning and dressing of leather; manufacture of luggage, handbags, saddlery</td>
<td>19</td>
<td>0.64</td>
<td>0.72</td>
<td>0.56</td>
<td>0.52</td>
<td>0.61</td>
<td>0.73</td>
<td>0.95</td>
<td>0.70</td>
<td>0.60</td>
<td>0.82</td>
</tr>
<tr>
<td>* wood and products of wood and cork, except furniture</td>
<td>20</td>
<td>0.07</td>
<td>0.21</td>
<td>0.16</td>
<td>0.15</td>
<td>0.14</td>
<td>0.16</td>
<td>0.20</td>
<td>0.17</td>
<td>0.18</td>
<td>0.21</td>
</tr>
<tr>
<td>* pulp, paper and paper products</td>
<td>21</td>
<td>0.87</td>
<td>0.76</td>
<td>0.38</td>
<td>0.17</td>
<td>0.07</td>
<td>0.03</td>
<td>0.04</td>
<td>0.08</td>
<td>0.08</td>
<td>0.06</td>
</tr>
<tr>
<td>Publishing, printing and reproduction of recorded media</td>
<td>22</td>
<td>0.31</td>
<td>0.31</td>
<td>0.25</td>
<td>0.10</td>
<td>0.03</td>
<td>0.03</td>
<td>0.04</td>
<td>0.09</td>
<td>0.09</td>
<td>0.07</td>
</tr>
<tr>
<td>* coke, refined petroleum products and nuclear fuel</td>
<td>23</td>
<td>0.03</td>
<td>0.03</td>
<td>0.03</td>
<td>0.16</td>
<td>0.16</td>
<td>0.25</td>
<td>0.26</td>
<td>0.21</td>
<td>0.40</td>
<td>0.05</td>
</tr>
<tr>
<td>* chemicals and chemical products</td>
<td>24</td>
<td>0.21</td>
<td>0.30</td>
<td>0.52</td>
<td>0.71</td>
<td>0.87</td>
<td>0.95</td>
<td>0.90</td>
<td>0.95</td>
<td>0.97</td>
<td>0.99</td>
</tr>
<tr>
<td>* rubber and plastic products</td>
<td>25</td>
<td>0.28</td>
<td>0.32</td>
<td>0.17</td>
<td>0.24</td>
<td>0.12</td>
<td>0.14</td>
<td>0.17</td>
<td>0.26</td>
<td>0.24</td>
<td>0.19</td>
</tr>
<tr>
<td>* other non-metallic mineral products</td>
<td>26</td>
<td>0.07</td>
<td>0.08</td>
<td>0.15</td>
<td>0.41</td>
<td>0.50</td>
<td>0.71</td>
<td>0.89</td>
<td>0.68</td>
<td>0.72</td>
<td>0.37</td>
</tr>
<tr>
<td>* basic metals</td>
<td>27</td>
<td>0.03</td>
<td>0.14</td>
<td>0.27</td>
<td>0.38</td>
<td>0.64</td>
<td>0.83</td>
<td>0.90</td>
<td>0.72</td>
<td>0.65</td>
<td>0.80</td>
</tr>
<tr>
<td>* fabricated metal products, except machinery and equipment</td>
<td>28</td>
<td>0.46</td>
<td>0.95</td>
<td>0.55</td>
<td>0.51</td>
<td>0.32</td>
<td>0.26</td>
<td>0.25</td>
<td>0.32</td>
<td>0.34</td>
<td>0.29</td>
</tr>
<tr>
<td>* machinery and equipment n.e.c.</td>
<td>29</td>
<td>0.25</td>
<td>0.22</td>
<td>0.22</td>
<td>0.35</td>
<td>0.34</td>
<td>0.29</td>
<td>0.31</td>
<td>0.42</td>
<td>0.43</td>
<td>0.33</td>
</tr>
<tr>
<td>* office machinery and computers</td>
<td>30</td>
<td>0.13</td>
<td>0.10</td>
<td>0.12</td>
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<td>0.16</td>
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<tr>
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<td>0.94</td>
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<tr>
<td>* radio, television and communication equipment and apparatus</td>
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<td>0.65</td>
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</tr>
<tr>
<td>* medical, precision and optical instruments, watches and clocks</td>
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<td>0.59</td>
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<tr>
<td>* motor vehicles, trailers and semi-trailers</td>
<td>34</td>
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<td>0.16</td>
<td>0.13</td>
<td>0.15</td>
<td>0.15</td>
<td>0.12</td>
<td>0.13</td>
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<td>0.25</td>
<td>0.17</td>
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<tr>
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<td>0.13</td>
<td>0.14</td>
<td>0.22</td>
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<td>0.19</td>
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<td>0.41</td>
<td>0.22</td>
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<tr>
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<td>0.80</td>
<td>0.82</td>
<td>0.80</td>
<td>0.93</td>
<td>0.84</td>
<td>0.54</td>
<td>0.44</td>
<td>0.53</td>
</tr>
</tbody>
</table>

Source: Author’s own calculations using G-L index. The numbers were collected from COMEXT database. Two digit CN group products were converted to two digit NACE using OECD CN-NACE conversion key.
Table 2. Unit Values of Factor and Technology Intensities for Lithuania’s Exports and Imports with EU

<table>
<thead>
<tr>
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<tr>
<td>Factor intensity</td>
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<td></td>
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<tr>
<td>Resource intensity</td>
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<td>0.3</td>
<td>0.2</td>
<td>0.9</td>
<td>0.1</td>
<td>0.5</td>
<td>0.1</td>
<td>0.6</td>
</tr>
<tr>
<td>Labor intensity</td>
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<td>11.7</td>
<td>1.9</td>
<td>9.7</td>
<td>2.6</td>
<td>7.3</td>
<td>3.0</td>
<td>6.5</td>
<td>3.9</td>
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<tr>
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<td>0.2</td>
<td>2.2</td>
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<td>Specialized supplier</td>
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<td>9.1</td>
<td>0.9</td>
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<td>1.4</td>
<td>5.6</td>
<td>2.7</td>
<td>5.8</td>
<td>3.3</td>
<td>4.8</td>
</tr>
<tr>
<td>Science based</td>
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<td>18.2</td>
<td>1.4</td>
<td>14.3</td>
<td>2.7</td>
<td>11.6</td>
<td>4.1</td>
<td>11.8</td>
<td>4.8</td>
<td>9.8</td>
</tr>
<tr>
<td>Technology intensity</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low tech</td>
<td>0.5</td>
<td>0.2</td>
<td>0.9</td>
<td>0.5</td>
<td>0.8</td>
<td>1.5</td>
<td>0.5</td>
<td>1.5</td>
<td>0.6</td>
<td>1.5</td>
</tr>
<tr>
<td>Med low tech</td>
<td>0.1</td>
<td>1.4</td>
<td>0.5</td>
<td>2.1</td>
<td>0.2</td>
<td>2.5</td>
<td>0.1</td>
<td>1.1</td>
<td>0.1</td>
<td>1.6</td>
</tr>
<tr>
<td>Med high tech</td>
<td>0.1</td>
<td>3.7</td>
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<td>3.2</td>
</tr>
<tr>
<td>High tech</td>
<td>2.0</td>
<td>18.9</td>
<td>1.4</td>
<td>14.3</td>
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<td>10.8</td>
<td>4.5</td>
<td>11.4</td>
<td>5.2</td>
<td>9.3</td>
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</table>

Source: Author’s own calculations. The data was collected from COMEXT at two digits CN. Two digit CN group products were converted to two digits NACE using OECD CN-NACE conversion key. The unit value for exports-imports was calculated ECU/tones.
### Table 3. Average ratio of export to import unit values, 1992-2001 (two digit NACE sectors)

<table>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacture of food products and beverages</td>
<td>15</td>
<td>1.8</td>
<td>3.7</td>
<td>1.1</td>
<td>1.3</td>
<td>1.5</td>
<td>1.3</td>
<td>1.0</td>
<td>0.8</td>
<td>1.2</td>
<td>1.0</td>
</tr>
<tr>
<td>* tobacco products</td>
<td>16</td>
<td>-</td>
<td>-</td>
<td>0.5</td>
<td>1.5</td>
<td>4.2</td>
<td>3.1</td>
<td>1.8</td>
<td>0.3</td>
<td>3.4</td>
<td></td>
</tr>
<tr>
<td>* textiles</td>
<td>17</td>
<td>0.2</td>
<td>0.3</td>
<td>0.5</td>
<td>0.5</td>
<td>0.7</td>
<td>0.8</td>
<td>1.0</td>
<td>0.8</td>
<td>0.8</td>
<td>0.9</td>
</tr>
<tr>
<td>* wearing apparel; dressing and dyeing of fur</td>
<td>18</td>
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<td>0.8</td>
<td>0.9</td>
<td>0.6</td>
<td>0.7</td>
<td>0.7</td>
<td>1.1</td>
<td>1.3</td>
<td>1.3</td>
<td>1.2</td>
</tr>
<tr>
<td>Tanning and dressing of leather; manufacture of luggage, handbags, saddlery</td>
<td>19</td>
<td>0.1</td>
<td>0.1</td>
<td>0.2</td>
<td>0.2</td>
<td>0.2</td>
<td>0.2</td>
<td>0.2</td>
<td>0.3</td>
<td>0.3</td>
<td>0.3</td>
</tr>
<tr>
<td>* wood and products of wood and cork, except furniture</td>
<td>20</td>
<td>0.2</td>
<td>0.1</td>
<td>0.2</td>
<td>0.1</td>
<td>0.2</td>
<td>0.2</td>
<td>0.2</td>
<td>0.2</td>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td>* pulp, paper and paper products</td>
<td>21</td>
<td>0.3</td>
<td>0.1</td>
<td>0.2</td>
<td>0.3</td>
<td>0.3</td>
<td>0.2</td>
<td>0.5</td>
<td>0.5</td>
<td>0.7</td>
<td>0.3</td>
</tr>
<tr>
<td>Publishing, printing and reproduction of recorded media</td>
<td>22</td>
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<td>0.1</td>
<td>0.2</td>
<td>0.4</td>
<td>0.9</td>
<td>0.6</td>
<td>0.5</td>
<td>0.5</td>
<td>0.7</td>
<td>0.4</td>
</tr>
<tr>
<td>* coke, refined petroleum products and nuclear fuel</td>
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<tr>
<td>* chemicals and chemical products</td>
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<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
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<td>0.1</td>
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<td>0.2</td>
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<tr>
<td>* rubber and plastic products</td>
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<tr>
<td>* other non-metallic mineral products</td>
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<td>0.2</td>
<td>0.2</td>
<td>0.6</td>
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<tr>
<td>* basic metals</td>
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<td>0.3</td>
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<tr>
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<td>* machinery and equipment n.e.c</td>
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<tr>
<td>* electrical machinery and apparatus n.e.c.</td>
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<td>0.4</td>
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</tr>
<tr>
<td>* radio, television and communication equipment and apparatus</td>
<td>32</td>
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<td>0.1</td>
<td>0.4</td>
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</tr>
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<td>* medical, precision and optical instruments, watches and clocks</td>
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<tr>
<td>* motor vehicles, trailers and semi-trailers</td>
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<td>0.5</td>
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</tr>
<tr>
<td>* other transport equipment</td>
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<td>0.3</td>
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<td>0.4</td>
<td>0.9</td>
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<td>1.4</td>
<td>1.4</td>
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<tr>
<td>* furniture; manufacturing n.e.c</td>
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<td>0.4</td>
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Source: Author’s own calculations.