International Journal of Economics and Financial Issues
Vol. 3, No. 4, 2013, pp.799-812
ISSN: 2146-4138
www.econjournals.com

Globalizing Production Structure and Intra-Industry Trade: The Case of Turkey

Emine Kılavuz
Erciyes University, Faculty of Economics and Administrative Sciences,
Kayseri, Turkey. Email: ekilavuz@erciyes.edu.tr

Hatice Erkekoğlu
Erciyes University, Social Sciences Vocational College,
Kayseri, Turkey. Email: haticeer@erciyes.edu.tr

Betül Altay Topcu
Erciyes University, Kayseri Vocational School,
Kayseri, Turkey. Email: batopcu@erciyes.edu.tr

ABSTRACT: Globalization and increased competition have forced countries to pursue more competitive policies. Today's commodities are not homogeneous and also they cannot be produced in a single country or region. It is essential for countries to focus on products which have high added value or to optimize their natural resources in the most effective areas. In this study, intra-industry trade rates were calculated for sectors which constitute 60% of Turkey's overall export volume for the 1990-2011 period. Furthermore, vertical and horizontal intra-industry trade rates were measured and compared with Turkey's trading partners. It was concluded that the best-exporting sectors did not appear to have high intra-industry trade values and they tended to provide lower quality products into the global production process. In other words, Turkey is the part of the global production process within the framework of comparative advantage based on factor endowments.

Keywords: Turkey; Global Production Process; Horizontal and Vertical Intra-Industry Trade; High and Low Quality Intra-Industry Trade
JEL Classifications: F13; F14

1. Introduction

Lower costs and advances in transport in the 19th century encouraged countries to specialize in products in which they were particularly superior. Ricardo's two commodities and two countries model states that countries will benefit from this specialization. Moreover, it is also emphasized that trade liberalization will benefit both countries as well as the outside world. While Ricardo's model explains trade between countries with respect to differences in productivity (technologies), the Heckscher-Ohlin (H-O) model, which is another traditional theory, explains the difference in factor endowments.

According to these theories, trade takes place between different countries and different products, and this type of trading is referred to as inter-industry trade. However, trade in similar products between countries cannot be explained within the framework of comparative advantages. If trade is based on differences in technology or factor endowments, it is not possible to trade the two similar commodities between two countries. Since the 1970s, distinct from traditional foreign trade theories, the "New Trade Theory" has been proposed. Models created within the framework of this theory, as determinants of international specialization and trade as well as economies of scale and product differentiation, have attracted attention rather than the different endowments of countries. The most important features of new trade theories rely on the assumption that increasing returns to scale distinguish imperfectly competitive markets (Brülhart, 1995). Dixit and Stiglitz (1977), Krugman (1979, 1980 and 1981), Lancaster (1980) and Dixit and Norman (1980) attempted to explain the trade of similar products between countries (Jenseni and Barfield, 2012). This kind of specialization and trade will increase their purchasing power and the types of products which they consume.

There are theoretical and empirical studies explaining the reason for the emergence of intra-industry trade. Krugman (1979 and 1980) and Lancaster (1980), emphasize product differentiation, imperfect competition and increasing returns to scale in their theoretical description of the emergence of intra-industry trade (Sharma, 1999). In some theoretical studies (Stone and Lee (1995), Balance, Forstnerve and Sawyer (1992), Globerman and Dean (1990), and Helpman (1987)) the authors draw attention to the link between intra-industry trade and a country's characteristics (Clark and Stanley, 1999). Theoretical models state that intra-industry trade based both on factors particular to a country such as income level, size of the economy, factor endowment, and distance and also on those which are specific to industry such as market structure, product differences and economies of scale (Pittiglio, 2012). Intra-industry trade models are summarized in Helpman and Krugman (1985). Helpman (1981) developed models of horizontally differentiated intra-industry trade with monopolistic competition. Vertically differentiated intra-industry trade with perfect competition is analyzed by Caves (1981) and oligopolistic models of vertically differentiated intra-industry trade, such as those of Shaked and Sutton (1984), exist (Andresen, 2003). Empirical studies on intra-industry trade started with Balassa (1966) and later with Grubel and Lloyd (1975).

The assumption of perfect competition and constant returns to scale in Ricardo's comparative advantage has been replaced by imperfect competition and increasing returns to scale in some new international trade theories (Helpman, Krugman, 1985). Even if countries have the same factor endowments, external economies of scale and differentiated products in an industry provide an important incentive to trade (Jenseni, Barfield, 2012). As the Heckscher-Ohlin model explains inter-industrial trade in homogeneous commodities, it mentions the abundance of relative factors as a resource of comparative advantage. If trade partners have similar factor endowments, inter-industrial trade, which is based on comparative advantage, will not occur. Monopolistic competition explains intra-industry trade based on product differentiation.

New trade theory refers to the effect of external economies of scale on unit costs. These external scale economies are determined by the volume of industry rather than the firm. New trade theory also stresses its importance as the determiner of trade with regard to comparative advantage. Therefore, the theoretical explanation of external economies of scale has led to debates on whether there would be industrial policies to develop and protect external economies of scale so as to provide a competitive advantage (Jenseni and Barfield, 2012).

Apart from the comparative advantages, internal economies of scale provide an additional incentive to trade and cause horizontal intra-industry trade. On the other hand, by positively affecting the advantages which arise from factor endowment and technological differences, external economies of scale reveal comparative advantages. It will stand out as vertical intra-industry trade or inter-industry trade (Jenseni and Barfield, 2012)

The Neo-Heckscher-Ohlin model explains vertical intra-industry trade: in other words, the trade of various quality products. New trade theory explains horizontal intra-industry trade, that is to say, trade in similar products in similar quality. Differences in quality, different choices and specialization in differentiation products of similar quality are among the factors which give rise to vertical intra-industry trade (Gullstrand, 2013). Horizontal intra-industry trade is prevalent for products which have the same sector and production phase. Horizontal intra-industry trade can be described by Neo-Chamberlinian and Neo-Hotelling models which are based on monopolistic competitive markets and Eaton and Kierzkowski models which are based on oligopolistic markets. On the other hand, vertical intra-industry trade can be divided into two groups such as the Neo-Heckscher-Ohlin model based on pure competition and the Shaked and Sutton model based on oligopoly markets (Şenoglu, 2003). Horizontal intra-industry trade is generally performed in high-income countries which have similar income levels, whereas vertical intra-industry trade is carried out in countries which have different per capita income levels.

For instance, Nokia and Samsung mobile phones, which are produced with the same technology and functions, have become the subject of horizontal intra-industry trade in the final phase of production. The outlook and functionality of the two products slightly differ. Vertical intra-industry trade relies on the exportation of products which are in the same industry but in different phases of production. Production is performed in different places in order to make use of local advantages. For instance, China imports technology-intensive computer parts and assembles these parts in labor-intensive parts of the production process by means of a concentrated workforce and exports them back

(World Economy). Looking at global economic developments the following results are seen (Aydın, et al., 2010): reduced restrictions on foreign trade, increased exports of industrial products, increased dependence of production and exports on imports at the global level, decreased transportation costs, developments in information and communication technologies and an increase in intra-industry trade. Improvements in horizontal and vertical intra-industry trade are parallel to those of Global Value Chains (GVC). Each stage in the production of a commodity is carried out in various countries. There is also an inclination towards offshore production activity and the collaboration of foreign companies. GVC is the most important factor in increasing vertical intra-industry trade. As countries specialize vertically, their imports and exports also consist of intermediate goods and services (U.S. International Trade Commission, 2009).

In a production chain, products, which do not require skilled labor and have low tech requirements have a relatively low value-added. On the other hand, products which have high capital endowment have a relatively high rate of capital endowment. Vertical intra-industrial trade arises from the varieties of factor endowments. Therefore, such trade is expected to emerge between developed and developing countries (North-South) (Fukao et al., 2003). Technological development, increased international competition, the reduction of trade barriers and transport costs have led to the relocation of the production process to different countries. Vertical specialization increases the import necessity for production and leads to a division of the production process between developing and developed countries. Direct investments both directly or indirectly support the current process and contribute to the economic growth of developing countries (Aydın et al., 2010).

Globalization and increasing international competition have made the exportation more sensitive to relative prices and costs (Keyder et al., 2004). Labor productivity and nominal wages are two factors that affect unit labor costs. Therefore, taking into account consumer demand, manufacturers present differentiated products, on the other hand, by manufacturing the products in different areas and they thus try to reduce the costs. In this sense, as intra-industry trade gains importance, horizontal and vertical intra-industry trades are mentioned. In the globalization process, during the process of globalization, the transportability of various production chains to different countries provides specialization in the production phase rather than in the whole product. However, every product phase has a different value-added and the amount countries get from the value-added varies according to that phenomenon (TUSIAD, 2011).

2. Literature Review

Studies related to intra-industry trade in Turkey's foreign trade have been increased in recent years. Some of these studies are based on the country or region; others are based on the sector. The results of some of the sector-based studies are given below.

In his study, Vergil (2005) calculated intra-industry trade values of 5-8 in the production line of Turkey according to SITC Rev.3 classification. The study covers the period following Turkey's membership to the Customs Union and its intra-industry trade values with Europe and the rest of the world between 1999 and 2000. It is concluded that intra-industry trade values, which were calculated as intermediate goods, capital assets, consumer goods and other factors, have displayed an increase following Customs Union membership.

Regarding this issue, Şimşek (2005) used the bilateral trade index using data for SITC Rev.3 to calculate Turkey's versatile and bilateral trade with the OECD and the rest of the world. Then, based upon the difference in unit value, the division of horizontal and vertical intra-industry foreign trade was made. The findings of the study indicate that Turkey's share of intra-industry trade with the OECD and the rest of the world has increased over the years. However, it was concluded that intra-industry trade is of low quality.

In Dağlı and Kılıç's study (2013), the intra-industry trade rates were using data for SITC Rev.2, 3 and 4 digit level industry groups for the years 1985, 1990, 2000, 2009 calculated. In 1985, the intra-industry values of 49 products in industries coded 6 and 7 had higher rates. According to the results of the study, it can be stated that the competitive sectors (SITC 652, SITC 634 and so on) have lost their position as net exporters. On the contrary, some product groups have been identified which previously did not have competitive capacity, but later reached the condition of exporter. As an example, some of the product groups are listed as follows: SITC 781 passenger motor vehicles, SITC 744 forklifts and other load bearing vehicles and SITC 785 bikes, bicycles, wheelchairs, etc.

Çakmak's (2006) study aims to address the importance and structure of intra-industry trade in the foreign trade of manufacturing industries between Turkey and four EU countries (Germany, France, Italy and the UK). Turkey conducts a significant part of its foreign trade with these countries. On the basis of calculations, according to SITC Rev.3, in the 3-digit level product groups for the period 1991-2004, the highest intra-industry trade rates of the product group were for SITC 6 (the main manufactured goods classified by material). According to the findings, these three members of the EU (Germany, France, Italy), but not the U.K., saw a significant increase in intra-industry trade in the manufacturing industry in the years 1991-2004. By sub-sectors, the highest intra-industry trade rates of the sectors were, respectively, SITC 655 (fabrics from polyester fibers), SITC 621 (rubber rods, profiles, sheet, pipe) SITC 651 (textile yarns), SITC 666 (ceramic and porcelain tableware, kitchen utensils), SITC 684 (aluminium alloys, first products), and SITC 653 (handmade textile products). Also according to the findings of the study, after 2001 there was a significant rise in the intra-industry trade values of sectors SITC 7 (machinery and transport equipment) and particularly SITC 78 (motor vehicles).

In a study which was carried out by Erkekoğlu (2007), according to the classification of SITC Rev.3 for the period covering 1996-2005 the intra-industry values were measured using the Grubell-Lloyd index for Turkey's manufacturing trade with the EU. The countries with which Turkey had most intra-industry trade were France, Italy, Belgium, the Czech Republic and Spain respectively; the countries with which Turkey had the least intra-industry trade were Greece, Denmark, Luxembourg, and the Slovak Republic. According to the study, Turkey's intra-industry trade sectors, which have a significant share with EU countries, can be listed; iron and steel, textile, electrical machinery and equipment, office equipment, communication equipment, shoes, furniture, travel goods, metal products, glass and glassware, and rubber products. Also, the determinants of intra-industry trade between Turkey and EU countries have been analyzed by using panel data. Accordingly, it was found that intra-industry trade increased with country size and IIT decreased when the transport cost increased. In addition, differences in sizes and differences in the development levels of the countries were appropriated with expected sign, but the coefficients were found to be statistically insignificant.

Başkol (2010) calculated the intra-industry trade index between Turkey and the Central Asian Turkish Republics for the 1992-2009 period. Even though the index value has increased over the years, its value was stated to be at a relatively low level. Hence, the structure of foreign trade between the Central Asian Turkish Republics and Turkey was defined as inter-industry rather than intra-industry. Başkol stated that the share of sectors which included the manufactured goods classified by material (6) machinery and transport equipment (7) was important but the share of sectors which included chemicals and a variety of industrial goods was less in Turkey's intra-industry trade following 1980.

Eşiyok's (2010) study, which focuses on Turkey's economy between 2006 -2009, takes into account the usage of intensity factors and indicates that Turkey was a net importer in the differentiated and science based sectors of the manufacturing industry and a net exporter in labor-intensive sectors. Chemicals and chemical products, machinery and equipment, petroleum products, basic metal industry, medical equipment, data processing equipment, communication equipment, electrical machinery, paper and paper products are Turkey's net importing sectors. Turkey is a net exporter in its traditional products (clothing, textile and food); however, it has become a net exporter in motor vehicles, metal products, nonmetallic mineral products, plastic and rubber products and the furniture sectors in recent years. At a sectoral level, in industries which display oligopolistic features such as motor vehicles and other transport equipment, intra-industry trade takes place at higher levels. There were low rates of intra-industry trade in labor-intensive sectors, which namely the clothing garment sector. There were also low rates of intra-industry trade in differentiated manufacturing industry and science based sectors, specifically office, accounting and computing machinery and medical equipment sectors. On the scale of intensive sector category, intra-industry trade is low in three sectors namely a) printing and publishing, records, cassettes etc., b) chemicals and chemical products, and c) paper and paper products. On the other hand, in plastics and rubber which are placed in scale intensive sector category, as well as in the basic metal industry and motor vehicles sectors Turkey appears to be a net exporter. Intra-industry trade was high in all sectors of the raw material-intensive sectors category.

3. Measurement of Intra-industry Trade and Vertical and Horizontal Intra-industry Trade

The most commonly used index which is used in practice to measure intra-industry trade is shown below; the equation was developed by Grubel and Lloyd (GL)(1975).

$$B_i = 1 - \frac{|X_i - M_i|}{X_i - M_i} \quad (1)$$

Number 1 equation, Xi and Mi represent the "i" product's import and export in equation 1. The index value has a number between zero and one. If Xi=Mi, the index is equal to one and the trade is completely intra-industry trade. If Xi=0 or Mi=0, the index is equal to zero and all trade is in the form of inter-industry trade. Calculations using foreign trade data based on Standard Industrial Trade Classification (SITC) Rev. 3 base and 3 and 4 digits showed that when the level of aggregation is decreased, which means as the number of digits is increased, in accordance with the literature, the values of the index of industries are calculated as low.

In the literature the rate which is obtained by dividing the export unit value (UVx) by the import unit value (UVm) is used as an indicator of horizontal and vertical product differentiation (Mezo, 2007). Because the prices are unknown, unit value (UV) is used as an indicator of the average price of a particular commodity. Abd-el-Rahman (1991) was the first to use horizontal and vertical intra-industry trade and unit values. The rate (by selecting a specific alpha value, generally 15%) which is calculated in terms of 5 digit classification by the dividing the export unit value by the import unit value is defined as horizontal differentiation or vertical differentiation. If it is in the range of 1% ± 15%, it is called horizontal differentiation, and if it is outside the range of 1% ± 15% it is called vertical differentiation.

$$1 - \alpha \leq \left(\frac{UV_i^X}{UV_i^M}\right) \leq 1 + \alpha \quad (2)$$

If the differences between export and import values are small, the quality of the imported and exported goods is assumed to be similar and this trade style is described as horizontal intra-industry trade. If the difference between export and import values is high, the quality of the exported good is significantly more different than the quality of the imported goods so that the trade is called as high-quality vertical intra-industry trade. It is assumed that there is a positive relationship between quality and price (Mezo, 2007). The reason why 15% was chosen as the alpha value is that transportation and insurance expenses constitute approximately 15% of the product price.

Vertical intra-industry trade can be classified as shown in Equations 3 and 4,

$\frac{UV_i^X}{UV_i^M} < 1 - \alpha = 0.85$ Vertical intra-industry trade for low-quality exported goods (VII^{LQ}) (3)

$\frac{UV_i^X}{UV_i^M} > 1 + \alpha = 1.15$ Vertical intra-industry trade for high-quality exported goods ($VIIT^{HQ}$) (4)

If the rate of the export unit value to import unit value for a given sector or product is smaller than 0.85, the quality of the export is lower than the quality of the import. Nevertheless, on the condition that export has a higher quality than import, there is high-quality VIIT which has a rate over 1.15.

4. Intra-Industry Trade Measurement of Sectors Which Have a Significant Share in Turkey's Export

This study has two aims. First, in order to determine Turkey's position world-wide as to whether it is a rival or complementary country, the intra-industry figures using the GL index and SITC Rev.3 and 3 digit data are calculated. Horizontal product differentiation is used for similar quality products while vertical differentiation is used for different quality products. For sectors with a high share of IIT measurement, to determine whether they pose a horizontal or vertical product differentiation by using threshold values of 1± 0.15, the average unit value of exports to imports is calculated. In the measurement of intra-industry trade for high share sectors, to determine whether there is a horizontal or vertical differentiation of products, use of threshold values ±0.15 helps to calculate the average unit value of exports to the average unit value of imports. According to this method it is possible to determine if Turkey is complementary as an economy, and if Turkey's trade takes place on the basis of comparative advantages. Furthermore, in this case there is the subject of

investigation whether there is a change in time. The second objective is to compare the intra-industry trade measurements of sectors in other countries that have the highest share of Turkey's exports.

Turkey is one of the emerging economies in the manufacturing industry and it is a country which has experienced serious structural changes in the process of integration into world markets. Traditional and raw material based products are still very important, but the share of the real value-added of these products has decreased significantly in the 1970-2007 period. The share of the value-added of sectors such as textile, tobacco, leather and food has decreased, while the share of machinery and transport vehicles has increased (UNIDO, 2009).

As of 2011, the IIT and horizontal and vertical IIT measurements for the sectors accounted for 60% of Turkey's exports (Appendix 1) and are given in Table 1. As shown in Table 1, intra-industry trade is observed widely in most of these sectors while IIT measurements are less than 50% in some sectors. Some of these sectors are SITC 057 (fruit, nuts excluding oil nuts), SITC 658 (textile articles n.e.s.), SITC 659 (floor coverings, etc.), SITC 661 (lime, cement and construction materials), SITC 676 (iron, steel bars, shapes etc.) SITC 691 (metallic structures n.e.s.), SITC 844 (women, girls clothing knit). The IIT values of sectors which mainly include agricultural products, raw materials and labor-intensive sectors are low, and the main reason for foreign trade in these sectors is the differences in factor intensity. The most important feature of these sectors is to produce low value-added products.

The IIT figures which are calculated are based on the figures for 2011 and more than 50% show that Turkey's foreign trade is concentrated in low-quality vertical IIT. In other words, it can be said that Turkey's intra-industry trade is carried out in low-quality goods in the same sectors. For example, according to Turkey's Grubel Lloyd index, the first four sectors which have the highest IIT figures are SITC 672 horizontal IIT (ingots etc. iron or steel), SITC 699-vertical IIT, LQ (manufactures base metal, n.e.s.), SITC 781-horizontal IIT (passenger motor vehicles excluding bus), SITC 893-vertical IIT, and LQ (articles, n.e.s., of plastics). The most important features of these sectors are that they are labor-intensive and large-scale industries. To have IIT in low-quality products is an indication that Turkey has a competitive position with the products which have lower relative prices. This result also means that it specializes in low- and medium-tech products. From this point, in order to change and strengthen Turkey's position in the international division of labor, Turkey needs to shift its position to high-tech products, i.e., differentiated and science-based industries.

The measured GL index values for the sectors SITC 699, 893, 841, 784, 781, 713, 713, 761, 699, 673, and 672 have tended to increase over time. An increase in the coefficients of intra-industry trade is not always evaluated as a positive development for the sector. It is appropriate at this point to comment on the foreign trade deficit or surplus of the sector. If there is a foreign trade deficit in a sector (surplus) it is interpreted that the rise of the intra-industry trade coefficient is positive (negative), and the decrease of intra-industry trade is negative (positive). SITC 699 (manufactures base metal, n.e.s.), SITC 893 (articles, n.e.s., of plastics) and SITC 841 (men, boys clothing, x-knit), are foreign trade surplus sectors which have increased the value of IIT over time, but that can be interpreted as a negative development. On the other hand, while sectors such as SITC 784 (parts, tractors, motor vehicles), SITC 781 (passenger motor vehicles excluding bus) and SITC 713 (internal combustion piston engines) contribute to the trade deficit, the IIT value of these sectors is rising, so it can be indicated as a positive development for the sectors.

In Tables 2 and 3, the GL index values on the scale are given for the sectors that have a 60% share in Turkey's exports with the trading partner countries which are selected from among the top 20 countries. The selected countries which are thought to be similar to Turkey are countries such as Spain, India, Mexico, China and Romania and the advanced trading partners are countries like Germany, France, Italy, Belgium and the United Kingdom.

As of the year 2011, the calculated intra-industry trade values have not been very high for the sectors covered in the Chinese economy. When relative prices are considered, intra-industry trade values in these sectors indicate the presence of very low quality vertical intra-industry trade. Therefore it can be said that China's economy, with relatively inexpensive factor endowment, is involved in the international production chain. Sharma (2007), by using the data of certain Chinese manufactured export industries between 1980-2003 in China, draws attention to the fact that there has been important structural change with the liberalization process and trade reforming manufacturing industry, but emphasizes that specialization is in the low-tech manufacturing industry.

Table 1. Grubel-Lloyd Index and Relative Price Rates for Turkey Manufacturing Sectors

	Grubel-Lloyd Index						UVx/UVm						the share of total export (2011, %)	the share of total import (2011, %)	Foreign trade deficit or surplus (2011, million $)
Code	1990	1995	2000	2005	2011	Code	1990	1995	2000	2005	2011				
057	0.034	0.072	0.125	0.117	0.184	057	6.560	3.665	2.141	2.620	1.607	$VIIT^{HQ}$	2.857	0.162	3 464
334	0.907	0.947	0.301	0.710	0.566	334	0.483	0.618	0.759	0.799	0.870	HIIT	4.311	6.116	-8 912
625	0.694	0.471	0.873	0.709	0.778	625	0.723	0.666	0.851	0.829	0.901	HIIT	1.025	0.366	501
651	0.792	0.806	0.982	0.795	0.705	651	1.013	0.935	0.820	1.063	1.298	$VIIT^{HQ}$	1.245	1.280	-1 403
653	0.673	0.873	0.880	0.716	0.798	653	1.533	2.398	1.479	1.439	1.379	$VIIT^{HQ}$	1.143	0.425	517
655	0.242	0.864	0.589	0.460	0.548	655	0.601	0.834	0.692	0.725	1.129	HIIT	1.099	0.232	924
658	0.037	0.063	0.050	0.063	0.166	658	2.061	2.549	1.756	1.346	0.949	HIIT	1.575	0.080	1 932
659	0.065	0.063	0.355	0.356	0.216	659	2.078	1.627	0.994	0.592	0.423	$VIIT^{LQ}$	1.188	0.081	1 408
661	0.601	0.194	0.277	0.189	0.235	661	0.920	0.796	0.318	0.699	0.192	$VIIT^{LQ}$	1.364	0.102	1 595
672	0.584	0.716	0.756	0.986	0.952	672	1.029	1.036	0.943	0.898	0.968	HIIT	1.204	0.613	147
673	0.366	0.188	0.412	0.265	0.583	673	0.858	0.971	1.260	1.103	0.972	HIIT	1.034	1.408	-1 996
676	0.364	0.248	0.266	0.341	0.302	676	0.701	0.510	0.491	0.538	0.650	$VIIT^{LQ}$	5.274	0.526	5 849
679	0.919	0.732	0.925	0.596	0.621	679	0.332	0.348	0.441	0.504	0.528	$VIIT^{LQ}$	1.307	0.329	970
684	0.663	0.513	0.614	0.701	0.681	684	1.238	1.202	1.169	1.258	1.294	$VIIT^{HQ}$	1.161	1.261	-1 469
691	0.580	0.882	0.978	0.351	0.308	691	0.499	0.807	0.506	0.662	0.608	$VIIT^{LQ}$	0.969	0.099	1 069
699	0.390	0.576	0.729	0.975	0.876	699	0.498	0.283	0.319	0.384	0.477	$VIIT^{LQ}$	1.352	0.591	401
713	0.287	0.470	0.510	0.509	0.609	713	0.697	1.185	1.013	0.975	1.072	HIIT	1.266	1.619	-2 190
761	0.222	0.150	0.353	0.141	0.686	761	1.007	0.444	0.484	0.456	0.712	$VIIT^{LQ}$	1.384	0.405	891
773	0.998	0.570	0.576	0.645	0.508	773	0.595	0.511	0.538	0.403	0.546	$VIIT^{LQ}$	1.747	0.333	1 555
775	0.729	0.717	0.993	0.472	0.514	775	0.429	0.490	0.578	0.453	0.543	$VIIT^{LQ}$	2.510	0.487	2 215
781	0.133	0.868	0.390	0.991	0.867	781	0.875	1.066	0.831	0.930	0.828	HIIT	4.807	3.520	-1 991
782	0.264	0.384	0.183	0.807	0.509	782	1.024	0.896	0.816	0.819	0.930	HIIT	3.017	0.577	2 681
784	0.291	0.383	0.459	0.614	0.789	784	0.253	0.329	0.416	0.441	0.504	$VIIT^{LQ}$	2.538	2.183	-1 832
821	0.959	0.960	0.979	0.681	0.716	821	0.344	0.528	0.432	0.536	0.590	$VIIT^{LQ}$	1.209	0.377	722
841	0.005	0.022	0.084	0.164	0.497	841	0.958	0.533	0.645	0.972	0.902	HIIT	1.525	0.283	1 377
842	0.005	0.017	0.063	0.128	0.413	842	0.743	0.681	0.475	0.915	0.826	$VIIT^{LQ}$	2.097	0.306	2 092
844	0.004	0.003	0.046	0.052	0.145	844	0.525	1.476	0.519	0.709	0.679	$VIIT^{LQ}$	1.517	0.066	1 887
845	0.011	0.012	0.075	0.098	0.349	845	0.512	1.261	0.530	0.835	0.848	HIIT	3.619	0.429	3 848
893	0.482	0.780	0.794	0.931	0.815	893	0.218	0.435	0.683	0.489	0.465	$VIIT^{LQ}$	1.141	0.439	481
897	0.946	0.155	0.311	0.339	0.441	897	na	na	16.430	28.296	12.179	$VIIT^{HQ}$	1.459	0.231	1 412
931	n.a.	0.819	0.267	0.270	0.113	931	na	na	na	na	na	n.a.	1.568	14.708	-33 308
971	0.168	0.102	na	0.068	0.382	971	0.123	4.813	n.a.	0.877	0.725	$VIIT^{LQ}$	1.093	2.597	-4 778

Source: The figures above have been calculated from *COMTRADE* data.
Note: The sectors regarding 2011 which do not have UVx/UVm rates have been evaluated in terms of the nearest available date.

IIT values (over 0.50) were calculated for Mexico and, in terms of sectors whose relative price can be computed, VIIT indicates mostly lower quality trade. Sector SITC 897 (gold, silverware, jewellery n.e.s.) has both high quality trade and high IIT value. The sectors which have HIIT values are SITC 651 (textile yarn) and SITC 893 (articles, n.e.s., of plastics). Although it is said that there is trade related to quality variation in these sectors, it is stated that it represents middle and low quality technology.

Romania's IIT values for the previously mentioned sectors are over 0.50. It is observed that VIIT generally represents high quality products. Relative prices are quite high especially for SITC numbered sectors 841, 842, 844 and 845 which are the classifications for textile products. There is high quality of production in Romania's textile sector and an important part of value-added remains in the country.

Table 2. Intra-Industrial Trade and Foreign Trade Unit Values Designed by Grubel-Lloyd Computed for Turkey's 2011 Significant Trade Partners

	China			Mexico			India			Romania			Spain		
Sectors	**G-L**	**UVx/UVm**	**IIT**	**G-L**	**UVx/UVm**	**IIT**	**G-L**	**UVx/UVm**	**IIT**	**G-L**	**UVx/UVm**	**IIT**	**G-L**	**UVx/UVm**	**IIT**
57	0.984	1.075	HIIT	0.466	0.756	$VIIT^{LQ}$	0.810	1.313	$VIIT^{HQ}$	0.423	1.421	$VIIT^{HQ}$	0.427	0.787	$VIIT^{LQ}$
334	0.776	1.001	HIIT	0.352	1.104	HIIT	0.237	0.917	HIIT	0.746	0.859	HIIT	0.891	1.032	HIIT
625	0.098	0.577	$VIIT^{LQ}$	0.484	0.944	HIIT	0.468	n.a.	HIIT	0.508	1.148	HIIT	0.682	0.993	HIIT
651	0.691	0.991	HIIT	0.786	0.868	HIIT	0.331	1.047	HIIT	0.966	1.386	$VIIT^{HQ}$	0.890	1.397	$VIIT^{HQ}$
653	0.310	0.667	$VIIT^{LQ}$	0.128	n.a.	$VIIT^{HQ}$	0.175	n.a.	HIIT	0.236	0.719	$VIIT^{LQ}$	0.897	3.020	$VIIT^{HQ}$
655	0.372	0.804	$VIIT^{LQ}$	0.080	1.386	$VIIT^{HQ}$	0.856	1.280	$VIIT^{HQ}$	0.141	0.287	$VIIT^{LQ}$	0.767	1.277	$VIIT^{HQ}$
658	0.024	0.541	$VIIT^{LQ}$	0.741	n.a.	HIIT	0.121	n.a.	$VIIT^{HQ}$	0.708	1.659	$VIIT^{HQ}$	0.607	1.410	$VIIT^{HQ}$
659	0.114	0.925	HIIT	0.331	n.a.	$VIIT^{LQ}$	0.123	n.a.	n.a.	0.574	1.619	$VIIT^{HQ}$	0.659	1.589	$VIIT^{HQ}$
661	0.059	3.585	$VIIT^{HQ}$	0.721	0.334	$VIIT^{LQ}$	0.405	1.007	HIIT	0.445	0.489	$VIIT^{LQ}$	0.295	1.248	$VIIT^{HQ}$
672	0.014	0.942	HIIT	0.350	0.581	$VIIT^{LQ}$	0.925	1.007	HIIT	0.552	1.098	HIIT	0.500	1.819	$VIIT^{HQ}$
673	0.802	0.881	HIIT	0.534	0.889	HIIT	0.617	0.937	HIIT	0.889	0.814	$VIIT^{LQ}$	0.669	0.995	HIIT
676	0.450	0.563	$VIIT^{LQ}$	0.743	0.659	$VIIT^{LQ}$	0.883	1.239	$VIIT^{HQ}$	0.881	0.797	$VIIT^{LQ}$	0.361	0.831	$VIIT^{LQ}$
679	0.314	0.288	$VIIT^{LQ}$	0.937	0.669	$VIIT^{LQ}$	0.846	0.489	$VIIT^{LQ}$	0.737	0.822	$VIIT^{LQ}$	0.722	1.170	$VIIT^{HQ}$
684	0.534	0.665	$VIIT^{LQ}$	0.175	1.183	$VIIT^{HQ}$	0.788	0.838	$VIIT^{LQ}$	0.660	0.727	$VIIT^{LQ}$	0.936	1.223	$VIIT^{HQ}$
691	0.106	0.412	$VIIT^{LQ}$	0.669	0.815	$VIIT^{LQ}$	0.882	0.326	$VIIT^{LQ}$	0.686	0.897	HIIT	0.497	0.920	HIIT
699	0.448	0.232	$VIIT^{LQ}$	0.757	1.353	$VIIT^{HQ}$	0.717	0.310	$VIIT^{LQ}$	0.744	n.a.	HIIT	0.918	1.014	HIIT
713	0.703	0.520	$VIIT^{LQ}$	0.944	0.752	$VIIT^{LQ}$	0.759	0.595	$VIIT^{LQ}$	0.615	1.161	$VIIT^{HQ}$	0.804	0.894	HIIT
761	0.024	n.a.	$VIIT^{HQ}$	0.195	n.a.	$VIIT^{HQ}$	0.469	n.a.	n.a.	0.566	1.559	$VIIT^{HQ}$	0.509	0.976	HIIT
773	0.550	0.413	$VIIT^{LQ}$	0.754	n.a.	$VIIT^{HQ}$	0.762	0.737	$VIIT^{LQ}$	0.669	1.337	$VIIT^{HQ}$	0.999	0.873	HIIT
775	0.080	0.491	$VIIT^{LQ}$	0.313	n.a.	$VIIT^{LQ}$	0.510	n.a.	n.a.	0.815	1.185	$VIIT^{HQ}$	0.824	1.496	$VIIT^{HQ}$
781	0.167	0.764	$VIIT^{LQ}$	0.426	0.869	HIIT	0.358	0.587	$VIIT^{LQ}$	0.636	0.746	$VIIT^{LQ}$	0.620	0.875	HIIT
782	0.559	0.877	HIIT	0.299	0.929	HIIT	0.212	0.749	$VIIT^{LQ}$	0.786	1.027	HIIT	0.347	0.941	HIIT
784	0.983	n.a.	$VIIT^{LQ}$	0.974	n.a.	HIIT	0.929	n.a.	$VIIT^{LQ}$	0.803	1.273	$VIIT^{HQ}$	0.793	0.872	HIIT
821	0.092	0.488	$VIIT^{LQ}$	0.583	n.a.	$VIIT^{HQ}$	0.992	n.a.	$VIIT^{LQ}$	0.404	1.215	$VIIT^{HQ}$	0.744	1.319	$VIIT^{HQ}$
841	0.101	0.362	$VIIT^{LQ}$	0.379	n.a.	$VIIT^{HQ}$	0.093	n.a.	$VIIT^{HQ}$	0.315	2.898	$VIIT^{HQ}$	0.618	1.467	$VIIT^{HQ}$
842	0.062	0.377	$VIIT^{LQ}$	0.959	n.a.	HIIT	0.018	n.a.	$VIIT^{HQ}$	0.244	3.009	$VIIT^{HQ}$	0.832	1.732	$VIIT^{HQ}$
844	0.019	0.247	$VIIT^{LQ}$	0.930	n.a.	$VIIT^{HQ}$	0.029	n.a.	$VIIT^{LQ}$	0.529	3.356	$VIIT^{HQ}$	0.710	3.246	$VIIT^{HQ}$
845	0.037	0.491	$VIIT^{LQ}$	0.771	n.a.	$VIIT^{HQ}$	0.036	n.a.	HIIT	0.620	2.690	$VIIT^{HQ}$	0.732	1.377	$VIIT^{HQ}$
893	0.317	0.308	$VIIT^{LQ}$	0.603	1.133	HIIT	0.938	0.537	$VIIT^{LQ}$	0.528	1.017	HIIT	0.870	1.044	HIIT
897	0.085	2.586	$VIIT^{HQ}$	0.979	9.317	$VIIT^{HQ}$	0.093	0.687	$VIIT^{LQ}$	n.a.	n.a.	$VIIT^{HQ}$	0.863	4.320	$VIIT^{HQ}$
931	0.090	n.a.	n.a.	0.483	n.a.	n.a.	0.915	n.a.	n.a.	0.750	n.a.	n.a.	0.295	n.a.	n.a.
971	n.a.	n.a.	n.a.	0.053	1.253	$VIIT^{HQ}$	0.016	0.065	$VIIT^{LQ}$	n.a.	n.a.	$VIIT^{LQ}$	0.465	0.150	$VIIT^{LQ}$

Source: The figures above have been calculated from COMTRADE data.
Note: The sectors regarding 2011 which do not have UVx/UVm rates have been evaluated in terms of the nearest available date.

India, after the structural reforms in recent years, as an important economic power, is an economy whose importance is growing across the world and it has made remarkable progress in the field of science and technology. However, poor infrastructure along with high-energy cost and the existence of small scale enterprises weaken the competitiveness of the manufacturing industry (UNIDO, 2013). The Indian economy has high IIT values in the sectors which are coded SITC 057, 655, 672, 676, 679, 691, 784, 821, 893, and 931. When we look at these sectors, it is obvious that there is an intensive trade in iron-steel, aluminum products, furniture, and in some knitted and crocheted goods. While the sectors coded SITC 057, 655 and 676 demonstrate the existence of high quality VIIT, in the sectors coded SITC 679, 691, 784, 821, and 893 low-quality VIIT is observed.

As an EU member, Spain's highest figures for IIT sectors are SITC 334, 651, 653, 684, 699, 713, 773, 775, 842, 893, and 897. Three sectors which are SITC 773 (electricity distributing equipment n.e.s.), SITC 684 (aluminium) and SITC 699 (manufactures base metal, n.e.s.) have the highest IIT values. The sectors coded SITC 334, 699, 713, 773, and 893 are examples of HIIT. However, the other sectors mentioned above have high-quality VIIT.

The intra-industry trade figures of Italy are given in Table 3 in relation to the sectors with a 60 % share in Turkey's exports. According to Table 3, the sectors with the highest IIT values in Italy, which are computed according to G-L index, can be listed in order as SITC 651, 659, 673, 684, 713, 841, 844, 845, 931, and 971. SITC 651, 841, and 845 are the sectors which have the highest IIT values. Accordingly, Italy is seen to have the highest IIT value in the field of textile products and also has VIIT values in these sectors. This means that Italy trades in high quality textile products (unit value rate >1.15).

The sectors which have the highest IIT values in France consist of (SITC 625, 672, 897, 653, 676, 679, 713, 699, 893, 655, 784, 782, and 684) industrial products such as motor vehicles and transport equipment, basic metal products, iron and steel products, rubber and so on. There is high quality merchandise trade in all the sectors which carry out VIIT.

Germany also has quite high IIT values in all sectors. Most of them have high quality VIIT. The sectors which have IIT over 0.80 are coded in order as SITC 676, 841, 672, 673, 661, 931, 971, 775, 773, 781, 625, 684, 653, 651, 713, and 699. While sector SITC 676 (iron, steel bars, shapes etc.) on the first rank has HIIT value, sector SITC 841 (men, boys clothing, x-knit) on the second rank has high quality VIIT value, and the third sector SITC 672 (ingots etc. iron or steel) has HIIT value.

When we evaluate the sectors computed for the U.K. which have an IIT value over 0.50 in terms of relative prices, we observe that either HIIT or horizontal and high quality products are traded. Consequently, it can be said that U.K., which is included in the international production process with high value-added and high quality products, has a manufacturing structure based on product difference. As mentioned earlier, it can be stated that HIIT takes places between countries which have a high income and resemble each other.

When we look into the IIT rates for Belgium, all the other sectors which are dealt with have quite high IIT rates except for two sectors. When we evaluate the sectors in terms of relative prices, a great number of sectors have VIIT values and these rates indicate the presence of high quality trade except for a few sectors.

Therefore, it is observed that these five EU member countries, which have an important place in Turkey's foreign trade, manufacture high value-added and high quality goods in the process of global production. The IIT types of the highest first ten sectors in terms of IIT values which are calculated for Turkey's manufacturing industry are compared with Turkey's trade partners in Table 4.

Table 3. Foreign Trade Unit Values and Grubel- Lloyd Intra-Industry Trade Computed for Turkey's 2011 Significant Trade Partners

G-L	France			United Kingdom			Germany			Italy			Belgium		
Sectors	G-L	UVx/UVm	IIT	G-L	UVx/UVm	IIT	G-L	UVx/UVm	IIT	G-L	UVx/UVm	IIT	G-L	UVx/UVm	IIT
57	0.650	0.992	HIIT	0.103	1.142	HIIT	0.329	1.229	$VIIT^{HQ}$	0.855	0.837	$VIIT^{LQ}$	0.917	0.893	HIIT
334	0.674	0.994	HIIT	0.928	0.950	HIIT	0.626	1.072	HIIT	0.705	1.043	HIIT	0.875	0.981	HIIT
625	0.982	n.a.	HIIT	0.598	1.058	HIIT	0.890	1.091	HIIT	0.768	0.860	HIIT	0.832	2.443	$VIIT^{HQ}$
651	0.795	0.657	$VIIT^{LQ}$	0.602	1.016	HIIT	0.832	1.946	$VIIT^{HQ}$	0.944	1.315	$VIIT^{HQ}$	0.947	0.877	HIIT
653	0.951	n.a.	$VIIT^{HQ}$	0.863	1.069	HIIT	0.854	1.292	$VIIT^{HQ}$	0.665	n.a.	$VIIT^{HQ}$	0.668	n.a.	$VIIT^{HQ}$
655	0.858	1.832	$VIIT^{HQ}$	0.901	1.756	HIIT	0.637	1.706	$VIIT^{HQ}$	0.701	2.194	$VIIT^{HQ}$	0.919	1.354	$VIIT^{HQ}$
658	0.456	n.a.	$VIIT^{HQ}$	0.353	1.626	$VIIT^{HQ}$	0.685	1.529	$VIIT^{HQ}$	0.680	2.348	$VIIT^{HQ}$	0.904	n.a.	$VIIT^{HQ}$
659	0.629	n.a.	HIIT	0.509	1.412	$VIIT^{HQ}$	0.694	1.518	$VIIT^{HQ}$	0.881	1.228	$VIIT^{HQ}$	0.277	n.a.	$VIIT^{HQ}$
661	0.582	1.124	HIIT	0.452	0.777	$VIIT^{LQ}$	0.924	0.481	$VIIT^{LQ}$	0.317	3.369	$VIIT^{HQ}$	0.877	0.998	HIIT
672	0.971	0.924	HIIT	0.779	2.057	$VIIT^{HQ}$	0.936	0.978	HIIT	0.582	1.653	$VIIT^{HQ}$	0.402	1.550	$VIIT^{HQ}$
673	0.680	0.971	HIIT	0.996	0.955	HIIT	0.932	1.072	HIIT	0.920	1.121	HIIT	0.708	1.145	HIIT
676	0.946	1.138	HIIT	0.893	0.985	HIIT	0.990	0.980	HIIT	0.782	0.948	HIIT	0.950	1.081	HIIT
679	0.885	1.445	$VIIT^{HQ}$	0.923	1.323	$VIIT^{HQ}$	0.731	0.985	HIIT	0.396	1.080	HIIT	0.837	1.118	HIIT
684	0.806	1.023	HIIT	0.783	1.030	HIIT	0.882	1.395	$VIIT^{HQ}$	0.846	1.335	$VIIT^{HQ}$	0.905	1.274	$VIIT^{HQ}$
691	0.603	1.503	$VIIT^{HQ}$	0.737	0.996	HIIT	0.721	1.287	$VIIT^{HQ}$	0.475	0.992	HIIT	0.725	0.773	$VIIT^{LQ}$
699	0.870	n.a.	$VIIT^{HQ}$	0.781	1.516	$VIIT^{HQ}$	0.805	1.367	$VIIT^{HQ}$	0.577	1.232	$VIIT^{HQ}$	0.725	0.892	HIIT
713	0.883	1.175	$VIIT^{HQ}$	0.930	1.321	$VIIT^{HQ}$	0.824	0.923	HIIT	0.834	1.523	$VIIT^{HQ}$	0.583	1.619	$VIIT^{HQ}$
761	0.306	n.a.	$VIIT^{HQ}$	0.294	1.808	$VIIT^{HQ}$	0.516	1.112	HIIT	0.166	1.234	$VIIT^{HQ}$	0.911	n.a.	$VIIT^{HQ}$
773	0.775	1.084	HIIT	0.538	1.367	$VIIT^{HQ}$	0.909	1.173	$VIIT^{HQ}$	0.652	0.766	$VIIT^{LQ}$	0.885	1.041	HIIT
775	0.512	1.547	$VIIT^{HQ}$	0.321	1.367	$VIIT^{HQ}$	0.897	1.530	$VIIT^{HQ}$	0.723	1.279	$VIIT^{HQ}$	0.697	4.212	$VIIT^{HQ}$
781	0.787	0.884	HIIT	0.968	1.126	HIIT	0.443	1.386	$VIIT^{HQ}$	0.469	1.263	$VIIT^{HQ}$	0.966	1.205	$VIIT^{HQ}$
782	0.839	0.903	HIIT	0.707	0.875	HIIT	0.642	0.852	HIIT	0.664	0.954	HIIT	0.856	0.583	$VIIT^{LQ}$
784	0.841	n.a.	HIIT	0.589	0.958	HIIT	0.781	1.239	$VIIT^{HQ}$	0.630	0.911	HIIT	0.833	1.051	HIIT
821	0.497	1.508	$VIIT^{HQ}$	0.441	2.445	$VIIT^{HQ}$	0.952	1.463	$VIIT^{HQ}$	0.385	1.631	$VIIT^{HQ}$	0.754	1.189	$VIIT^{HQ}$
841	0.438	n.a.	$VIIT^{HQ}$	0.406	1.354	$VIIT^{HQ}$	0.703	1.628	$VIIT^{HQ}$	0.934	4.027	$VIIT^{HQ}$	0.951	n.a.	$VIIT^{HQ}$
842	0.594	n.a.	$VIIT^{HQ}$	0.432	0.940	HIIT	0.699	1.544	$VIIT^{HQ}$	0.759	4.041	$VIIT^{HQ}$	0.872	n.a.	$VIIT^{HQ}$
844	0.578	n.a.	HIIT	0.378	1.095	HIIT	0.667	1.526	$VIIT^{HQ}$	0.901	2.292	$VIIT^{HQ}$	0.928	17.343	$VIIT^{HQ}$
845	0.692	1.724	$VIIT^{HQ}$	0.390	0.994	HIIT	0.646	1.430	$VIIT^{HQ}$	0.985	3.281	$VIIT^{HQ}$	0.977	4.115	$VIIT^{HQ}$
893	0.860	1.284	$VIIT^{HQ}$	0.736	1.613	$VIIT^{HQ}$	0.784	1.358	$VIIT^{HQ}$	0.721	0.906	HIIT	0.978	1.323	$VIIT^{HQ}$
897	0.963	n.a.	$VIIT^{HQ}$	0.910	5.035	$VIIT^{HQ}$	0.987	3.321	$VIIT^{HQ}$	0.474	5.642	$VIIT^{HQ}$	0.905	1.256	$VIIT^{HQ}$
931	0.053	n.a.	n.a.	0.898	n.a.	n.a.	0.915	n.a.	n.a.	0.806	n.a.	n.a.	0.752	n.a.	n.a.
971	0.443	0.235	$VIIT^{LQ}$	n.a.	n.a.	n.a.	0.913	4.556	$VIIT^{HQ}$	0.886	1.666	$VIIT^{HQ}$	0.773	25.135	$VIIT^{HQ}$

Note: The sectors regarding 2011 which do not have UVx/UVm rates have been evaluated in terms of the nearest available date.
Source: The figures above have been calculated from COMTRADE data.

The sector coded SITC 672 (ingots etc. iron or steel), which has Turkey's highest IIT value, is observed to have HIIT. Also trade in the same sector takes place as HIIT or high quality VIIT in Turkey's trade partners except for Mexico. It is seen that Turkey has high quality VIIT rates in the sectors coded SITC 653 (fabrics, man-made fibres) and SITC 651 (textile yarn). Other trade partners also have high quality VIIT and HIIT except for France in sector number 651, and China and India in sector number 653. Except for the three sectors which are mentioned above, Turkey has low quality VIIT; in other words, it can be said that Turkey joins the global production process with factor endowment difference. It can be said that six member states of the European Union take place in the world production process with high quality and HIIT in the sectors which have a 60% share of Turkey's foreign trade and have the highest IIT. When compared to the IIT values, economies identified as emerging economies such as Turkey China and India, have a low quality VIIT type in terms of sectors that are important for Turkey. Therefore, rather than being a rival to one another India and China as well as Turkey act as complementary partners to each other in sectors with Turkey's highest trade potential. In other words, these countries take places into the global production on the basis of comparative advantages based on factor endowment.

Table 4. Overlapping Sectors in of Turkey and Trading Partners (in Descending Order)

Countries	Sectors									
	672	**699**	**781**	**893**	**653**	**784**	**625**	**821**	**651**	**761**
Turkey	HIIT	$VIIT^{LQ}$	HIIT	$VIIT^{LQ}$	$VIIT^{HQ}$	$VIIT^{LQ}$	HIIT	$VIIT^{LQ}$	$VIIT^{HQ}$	$VIIT^{LQ}$
Italy	$VIIT^{HQ}$	$VIIT^{HQ}$	HIIT	HIIT	$VIIT^{HQ}$	HIIT	HIIT	$VIIT^{HQ}$	$VIIT^{HQ}$	$VIIT^{HQ}$
Germany	HIIT	$VIIT^{HQ}$	$VIIT^{HQ}$	$VIIT^{HQ}$	$VIIT^{HQ}$	$VIIT^{HQ}$	HIIT	$VIIT^{HQ}$	$VIIT^{HQ}$	HIIT
Belgium	$VIIT^{HQ}$	HIIT	$VIIT^{HQ}$	$VIIT^{HQ}$	$VIIT^{HQ}$	HIIT	$VIIT^{HQ}$	$VIIT^{HQ}$	HIIT	$VIIT^{HQ}$
Spain	$VIIT^{HQ}$	HIIT	HIIT	HIIT	$VIIT^{HQ}$	HIIT	HIIT	$VIIT^{HQ}$	$VIIT^{HQ}$	HIIT
Romania	HIIT	HIIT	$VIIT^{LQ}$	HIIT	$VIIT^{LQ}$	$VIIT^{HQ}$	HIIT	$VIIT^{HQ}$	$VIIT^{HQ}$	$VIIT^{HQ}$
France	HIIT	$VIIT^{HQ}$	HIIT	$VIIT^{HQ}$	$VIIT^{HQ}$	HIIT	HIIT	$VIIT^{HQ}$	$VIIT^{LQ}$	$VIIT^{HQ}$
United Kingdom	$VIIT^{HQ}$	$VIIT^{HQ}$	HIIT	$VIIT^{HQ}$	HIIT	HIIT	HIIT	$VIIT^{HQ}$	HIIT	$VIIT^{HQ}$
Mexico	$VIIT^{LQ}$	$VIIT^{HQ}$	HIIT	HIIT	$VIIT^{HQ}$	HIIT	HIIT	$VIIT^{HQ}$	HIIT	$VIIT^{HQ}$
India	HIIT	$VIIT^{LQ}$	$VIIT^{LQ}$	$VIIT^{LQ}$	HIIT	$VIIT^{LQ}$	HIIT	$VIIT^{LQ}$	HIIT	n.a.
China	HIIT	$VIIT^{LQ}$	$VIIT^{LQ}$	$VIIT^{LQ}$	$VIIT^{LQ}$	$VIIT^{LQ}$	$VIIT^{LQ}$	$VIIT^{LQ}$	HIIT	$VIIT^{HQ}$

5. Conclusion

Many countries have witnessed a significant transformation in the structure of their industries through the globalization process. Classical foreign trade theories point out that each country may benefit from trade based on products that have absolute advantages depending upon variations in the field of technology and factor endowment. When classical foreign trade theories became insufficient to clarifying the export and import status of products in the same sector since the late 1960s, new foreign trade theories were introduced. The main theme of these theories depends on scale economies, monopolistic competition, diversification of products in relation to the requests of consumers in the globalization process, and on increasing competitiveness by reducing unit cost and producing goods as part of a global manufacturing structure. These factors are the most important determinants of intra-industry trade.

The structure of Turkey’s intra-industry trade at the global level is determined by the G-L index which is used to determine on which level Turkey takes its place in recent years. First, the trade structures of sectors which include the 60% of Turkey's manufacturing industry are introduced with the IIT rate of these sectors. Then, the HIIT and VIIT situations of the sectors, which have over 50% of IIT values, are determined with export and import unit values. Although the IIT rates for most of the sectors, which have a 60% share of Turkey's export, have a tendency to increase over time, they are not very high. Moreover, it is observed that many sectors with high IIT rates have VIIT values that indicate low-quality production or low value-added. Turkey has high competitiveness in the sectors coded SITC 672 (ingots etc. iron or steel), SITC 653 (fabrics, man-made fibres), SITC 651 (textile

yarn), SITC 781 (passenger motor vehicles excluding bus), and SITC 713 (internal combustion piston engines).

In another part of the study, within the framework of sectors which have a 60% share in Turkey's total export the IIT values and their horizontal and vertical specialization were analyzed for selected countries from among Turkey's most important trade partner. In conclusion, it is observed, in particular, that EU member countries generally have high IIT rates in these sectors and they are in the process of horizontal or high quality vertical specialization in the global production process.

It is important to keep costs low with a low wage policy and thus price competition is important in increasing competitiveness in the global economy. In addition, due to the existence of markets based on differences in the structure of demand and consequently the presence of a monopolistic competitive market, the appropriate policies to be followed are very important. Production is no longer conducted in only one single country or region anymore. Products are produced in different supply chains, countries or regions. As in the example of China, which is a very important manufacturer and exporter in world markets, the IIT rates computed for the studied sectors generally indicate the low quality of IIT.

It is controversial whether the competitive structure of China's export is sustainable in the long term. Turkey takes its place in the global production process with comparative advantages based on factor endowment. However, it is necessary that for a sustainable growth Turkey produce and export in sectors which are based on knowledge and have higher value-added. The most important advantages for Turkey are its geographical location, the structure of its young population, and its underground and above-ground resources. This analysis was carried out for a dynamic manufacturing industry; if for example it is carried out for the health sector to the service sector, it will also reveal some other advantageous sectors other than those mentioned above.

References

Abd-El-Rahman, K. (1991), Firms' Competitive and National Comparative Advantages as Joint Determinants of Trade Composition. Weltwirtschaftliches Archiv, 127, 83-97.

Andresen, M.A. (2003), Empirical Intra-Industry Trade: What We Know and What We Need to Know. Institute for Canadian Urban Research Studies, 1-60.

Aydın, A. (2008), Endüstri İçi Ticaret ve Türkiye: Ülkeye Özgü Belirleyicilerin Tespitine Yönelik Bir Araştırma. Marmara Üniversitesi İ.İ.B.F Dergisi, Cilt XXV, Sayı 2, 881-921.

Aydın, F., Saygılı, H., Saygılı, M., Yılmaz, G. (2010), Dış Ticarette Küresel Eğilimler ve Türkiye Ekonomisi. Türkiye Cumhuriyeti Merkez Bankası Çalışma Tebliği, No. 10/01, 1-107.

Balassa, B. (19659, Trade Liberalization and Revealed Comparative Advantage. The Manchester School, 33, 99-123.

Başkol, M.O. (2010), Türkiye ile Orta Asya Türk Cumhuriyetleri Arasındaki Endüstri-İçi Ticaretin Analizi. International Conference on Eurasian Economies, 386-391.

Brülhart, M. (1995), Scale Economies, Intra-Industry Trade and Industry Location in the New Trade Theory. Trinity Economic Paper Series Technical Paper, No. 95/4, 1-30.

Clark, D.P., Stanley, D.L. (1999), Determinants of Intra-Industry Trade Between Developing Countries and the United States. Journal of Economic Development, 24(2), 79-95.

Çakmak, Ö.A. (2006), Türkiye ile Almanya, İtalya, Fransa ve İngiltere Arasında İmalat Endüstrisinde Endüstri-içi Ticaretin Yapısı: 1991-2004. Ekonomik ve Sosyal Araştırmalar Dergisi, 3(2), 30-47.

Dağlı, G., Kılıc, D. Türkiye İmalat Sanayinin Endüstri-içi Ticaret Profili. http://www.academia.edu /1633990/Turkiye_Imalat_Sanayinin_Endustri-ici_Ticaret_Profili, April 2013.

Erkekoğlu, H. (2007), Intra-Industry Trade Between Turkey and European Union Perspective on Turkish Economy. Selected Proceeding of the Third International Conference On Business, Management and Economics (ICBME), Organized by Yasar University13-17June 2007, Çeşme-İzmir, Turkey, Edited by Coskun Can Aktan and Sabah Balta, 3, 73-91, İzmir.

Eşiyok, B.A. (2010). İmalat Sanayinde Dış Ticaret, Net İthalatçı ve İhracatçı Sektörler, Rekabet Gücü ve Endüstri-İçi Ticaret. Kalkınma Dergisi, 57, 17-33.

Fukao, K., Ishido, H., Ito, K. (2003), Vertical Intra-Industry Trade and Foreign Direct Investment in East Asia. Journal of the Japanese International Economies, 17, 468-506.

Grubel, H.G., Lloyd, P.J. (1975), Intra-industry trade: The Theory and Measurement of International Trade in Differentiated Products. New York: Wiley, ISBN 0-470-33000-7.

Gullstrand, J., Country-Specific Determinants of Vertical Intra-Industry Trade with Application to Trade between Poland and EU. http://www.snee.org/filer/papers/71.pdf, April 2013.

Helpman, E., Krugman, P.R. (1985), Market Structure and Foreign Trade: Increasing Returns, Imperfect Competition, and the International Economy. Cambridge MIT Press, Seventh Printing, England.

Jenseni, M., Barfield, C. (2012), Global Value Chains and the Continuing Case for Free Trade Theory and Illustrations from the United States and East Asia. American Enterprise Institute Conference, 1-51.

Keyder, N., Saglam, Y., Oztürk, M.K. (2004), International Competitiveness and the Unit Labor Cost Based Competitiveness Index. METU Studies in Development, 31(1), 43-70.

Mezo, I. (2007), Vertical and Horizontal Intra-Industry Trade Between the EU 15 and the 2004 Enlargement Countries. European Trade Study Group Working Paper, 1-15.

Pittiglio, R. (2012), Horizontal and Vertical Intra-Industry Trade: An Empirical Test of the Homogeneity Hypothesis. The World Economy, 35(11), 919-945.

Sharma, K. (1999), Pattern and Determinants of Intra-Industry Trade in Australian Manufacturing. Yale University Center Discussion Paper, No. 813, 1-23.

Sharma, A. (2007), Industrial Structural Transformation For Chinese Manufactured Exports: 1980-2003. http://www.etsg.org/ETSG2007/papers/sharma.pdf, April 2013.

Şenoğlu, D. (2003), Measuring Vertical and Horizontal Intra-Industry Trade for Turkish Manufacturing Industry Over Time. a Thesis Submited to the Graduate School of Social Sciences of Middle East Technical University.

Şimşek, N. (2005), Türkiye'nin Yatay ve Dikey Endüstri İçi Dış Ticareti. D.E.Ü İ.İ.B.F. Dergisi, 20(1), 43-62.

TUSIAD (2011), Uluslararası Üretim Zincirlerinde Dönüşüm ve Türkiye'nin Konumu. Koç Üniversitesi Ekonomik Araştırma Forumu, Yayın No: EAF-RP/11-01, 1-190.

UNIDO (2009), Structural Change in the World Economy: Main Features and Trends. Research and Statistics Branch Working Paper, Vienna.

UNIDO, Indian Manufacturing Industry Technology Status and Prospects. Available at: <http://www.unido.org/fileadmin/user_media/Publications/Pub_free/Indian_manufacturing_industry_technology_status_and_prospects.pdf, April 2013.

UN Comtrade, United Nations Commodity Trade Statistics Database. http://comtrade.un.org/db/, April 2013.

U.S. International Trade Commission (2009), The Economic Effects of Significant U.S. Import Restraints. Investigation No. 332-325, Washington.

Vergil, H. (2005), Gümrük Birliği Sonrası Türkiye'nin Endüstri-içi Ticaret Düzeyi. web.deu.edu.tr/istetme/ifddergi/web_files/526177.pdf, April 2013.

World Economy, Intra-Industry Trade. Princeton University Press, http://www2.econ.uu.nl/users/marrewijk/pdf/marrewijk/Intra%20Industry%20Trade.pdf, April 2013.

Appendix

Appendix 1. Manufacturing Industry SITC Rev. 3 and 3 Digit Sectors

Code	SITC Rev.3 Name
057	Fruit, Nuts Excluding Oil Nuts
334	Petroleum Products
625	Rubber Tyres, Tubes, etc.
651	Textile Yarn
653	Fabrics, Man-Made Fibres
655	Knitted, Crocheted Fabrics n.e.s.
658	Textile Articles n.e.s.
659	Floor Coverings, etc.
661	Lime, Cement and Construction Materials
672	Ingots etc. Iron or Steel
673	Flat-Rolled Iron etc.
676	Iron, Steel Bars, Shapes etc.
679	Tubes, Pipes etc. Iron Steel
684	Aluminium
691	Metallic Structures n.e.s.
699	Manufactures Base Metal, n.e.s.
713	Internal Combustion Piston Engines
761	Television Receivers etc.
773	Electricity Distributing Equipment n.e.s.
775	Domestic Electrical, Non-Electrical Equipment
781	Passenger Motor Vehicles Excluding Bus
782	Goods, Special Transport Vehicles
784	Parts, Tractors, Motor Vehicles
821	Furniture, Cushions, etc.
841	Men, Boys Clothing, X-Knit
842	Women, Girls Clothing, X-Knit
844	Women, Girls Clothing Knit
845	Other Textile Apparel, n.e.s.
893	Articles, n.e.s., of Plastics
897	Gold, Silverware, Jewellery n.e.s.
931	Special Transactions Not Classified
971	Gold, Non-Monetary Excluding Ores

Source: UN Comtrade, United Nations Commodity Trade Statistics Database, *http://comtrade.un.org/db/*, April 2013.