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The Effects of Free Trade Agreement on Intra-Industry Trade (A Case Study of Textile Sector in Turkey)

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Abstract: This research studies the effects of Free Trade Agreements on Intra-Industry Trade. The textile sector of Turkey which has an important role on Turkey's external trade is based on while the effects of Free Trade Agreement on Intra-Industry Trade are studied. The textile sector has been examined in three subgroups as classified by SITC within the 1996-2003 time internal. These subgroups are SITC-26 which is made up of textile fibers (other than wool tops) and their wastes, SITC-65 made up of textile yarn, fabrics, made up articles, n.e.s related products and SITC-84 made up of apparel and clothing accessories. As a consequence of all studies done, it can be said that agreements have a positive effect on Intra-Industry Trade based on textile sector. And it also can be said that this effect is more intense on SITC-65 products.

Key words: Intra-industry trade, textile, free trade agreement, export, import

INTRODUCTION

For developing countries, the conditions under which development is achieved bears importance. According to the competitive advantage principle, it has suggested that developing countries specialize in certain industrial goods, produce them at low cost and that these goods be traded at IIT (Intra-Industry Trade) level (Balassa, 1966). The major effects of IIT are issues such as product differentiation, economies of scale, border trade and re-export.

IIT is defined as the simultaneous import and export of the same product group between two countries. For that reason, it makes up a large portion of world trade for developed market economies (Culem and Lundberg, 1986). The concept of simultaneous import and export has first been mentioned by Ohlin (1933) and Hilgerdt (1935) before the second world war. IIT had been largely ignored until the 1960's, when it was empirically studied by Dreze, Verdoorn and Balassa (Dreze, 1961; Verdoorn, 1960; Balassa, 1965).

The theoretical and methodology studies that the empirical studies about IIT have been based on were started by Grubel and Lloyd (1975).

After Grubel and Lloyd (1975), IIT has began to be analyzed in context of many countries and industries. Besides the increasing importance of IIT in world trade, there are only a few research papers concerning Turkey

(Schüller, 1995; Çepni and Köse, 2000; Erk and Tekgül, 2001) calculated IIT levels for Turkey's total trade. Gönel (2001) measured the IIT levels for Turkey's traditional export industry, textiles. Whilst these papers measured IIT levels, none of them attempted to test the determinants of IIT for Turkey. So this study aims to fulfill this shortage in the literature. The aim of this study is to analyze the IIT of Turkey and to test empirically the determinants of IIT among countries and across industries. Emirhan (2002) measured the IIT levels for various industry and country groups for Turkey and to test the determinant of these calculated levels empirically.

In this study measured the IIT levels for textile sector and the country with which Turkey has a Free Trade Agreement (FTA).

MATERIALS AND METHODS

In this study, the IIT levels are calculated by using the Unadjusted Grubel and Lloyd (1975) Index which is the most appropriate method for measuring IIT. The Grubel-Lloyd Index (GL index) measures the share of IIT in an industry:

$$GL_{IIT} = 1 - [|X_i - M_i|/(X_i + M_i)]$$

Where, X_i and M_i are exports and imports of industry I, respectively. This index GL takes values between 0 and 1,

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where 1 represents all trade being IIT. This index was adjusted for trade imbalances by Grubel-Lloyd and some other researchers but Vona (1991) suggested that index does not need to be adjusted.

In the literature, it has been accepted that the determinants of vertical IIT and horizontal IIT are different. Vertical IIT is a term that is used to describe the IIT of commodities that are at different qualities; whereas horizontal IIT is used to define IIT of commodities that are at the same qualities. In order to test whether the above proposition is valid in Turkey or not, the determinants of these two types of IIT are tested in different regression equations. For disentangling IIT into vertical and horizontal components, quality differences within exports and imports of an industry are used. Quality differences in trade are measured by export and import unit values per ton. Stiglitz (1987) argued that prices of commodities are reflections of their qualities so, prices can be used as an indicator of quality.

An industry is subject to horizontal IIT when the unit value of exports relative to unit value of imports lies within a specified range. This condition can be shown with the equation

$$1-\alpha \le (Uv^{x}_{ij}/UV^{m}_{ij}) \le 1+\alpha$$

where, UV^{x}_{ij} is country j's unit value of exports in commodity I and UV^{m}_{ij} is country j's unit value of imports in commodity I. When relative unit values lie outside this range, the industry is facing vertical IIT. The condition for vertical IIT is shown as follows:

$$(Uv^{x}_{ij}/UV^{m}_{ij}) < 1-\alpha \quad or \quad (Uv^{x}_{ij}/UV^{m}_{ij}) > 1+\alpha$$

where, $\alpha = 0,15$. The transportation and freight costs are usually assumed to account for ±15% of the value of the product, so α is taken as 0,15.

Horizontal or vertical differences have not been taken into consideration while the level of IIT is calculated in this study.

The study textile sector has been examined in three subgroups as classified by SITC within the 1996-2003 time internal. These subgroups are: SITC-26 which is made up of textile fibers (other than wooltops) and their wastes; SITC-65 made up of textile yarn, fabrics, made up articles, n.e.s and related products; and SITC-84 made up of apparel and clothing accessories. Data received Under secretaries of the Prime Ministry for Foreign Trade of Turkey (Anonymous, 2004).

The GL indices have been calculated for these groups with the aim of displaying the developments concerning IIT within the textile sector, in which Turkey has competitive advantage.

EMPIRICAL EVALUATION AND CONCLUSIONS

In the first phase of the study, the following table has been formed of GL indices between 1996 and 2003 of several sectors to demonstrate the position of the textile sector.

In the Table 1 the GL index for Turkey's agricultural trade has been calculated to be 1,00 for 2003. The presence of high values for other years shows that full specialization exists in agricultural IIT. It is worth noting that IIT has risen in industrial goods in recent years. High GL values for icon and steel and other raw material means that IIT is a common in industry sub-sectors.

In textiles, the IIT values are high in SITC-65 subgroup, medium in SITC-26 subgroup and very low in SITC-84 subgroup.

The poor performance of SITC-26 subgroup and especially SITC-84 subgroup with relevance to IIT demonstrates that trade is being carried out in one direction (import or export) in these two groups. When examined, it is seen that import figures are five times as large as export figures in SITC-26 subgroup and export figures are thirty-five times as large as import figures in SITC-84 subgroup. As a result, it can be concluded that Turkey has shown poor performance in IIT apparel although it is among countries with biggest competitive advantage in this sector.

In this study, the annual average percentage rate of change in the textile trade of Turkey between the year 2003 and the years when the agreements were started to be applied by the countries with whom Turkey had signed FTA and all the data is given in Table 2.

In this Table 2, the FTA effective data and average changes in the foreign values are presented. FTAs has affected Turkey's textile trade in different ways and different rates for each country. In Table 1, it is especially noted that the annual average rate of change in textile trade between Latvia and Bulgaria is significantly high. Of the two countries, export-based trade was done with Latvia whereas import-based trade was done with Bulgaria in the years studied. On the other hand, when the results in Table 1 are generally studied, it can be said that free trade agreements were affected Turkey's textile import much more and more positively.

In the last part of the study, the IIT concept which expresses the event of Turkey's both importing and

Table 1: GL index for main sectors

Sectors	1996	1997	1998	1999	2000	2001	2002	2003
Iron and steel	0.99	0.98	0.90	0.95	0.87	0.84	0.87	0.99
Chemicals	0.29	0.31	0.30	0.30	0.29	0.36	0.32	0.31
Other raw material	0.78	0.85	0.89	0.95	0.90	0.89	0.92	0.91
Machinery and transport equipment	0.32	0.31	0.37	0.49	0.44	0.72	0.71	0.73
Textile yarn, fabrics, made-up articles, n.e.s. and related products	0.87	0.82	0.79	0.71	0.73	0.66	0.80	0.79
Articles of apparel and clothing accessories	0.05	0.07	0.07	0.06	0.08	0.07	0.07	0.08
Other consumption goods	0.59	0.60	0.61	0.64	0.61	0.80	0.84	0.89
Textile Fib.(other than wool tops) and their wastes	0.55	0.33	0.35	0.50	0.30	0.40	0.37	0.44
Agricultural raw materials	0.32	0.26	0.31	0.42	0.27	0.36	0.31	0.35
Agricultural goods	0.99	0.95	0.92	0.87	0.96	0.83	0.99	1.00
Industrial goods	0.72	0.72	0.75	0.83	0.74	0.97	0.94	0.93
Total IIT in Turkey	0.69	0.70	0.74	0.79	0.68	0.86	0.82	0.81

Table 2: Rates of change in foreign trade after FTA (SITC-26, SITC-65, SITC-84 products subgroup)

Countries	Date of FTA	Entry into force	Export by entry into force (1000 $)	2003 export (1000 $)	Average percentage rate of change	Import by entry into force (1000 $)	2003 import (1000 $)	Average percentage rate of change
EFTA								
Switzerland	1991	1992	103298	99618	-0.3	31871	36411	1.2
Norway	1991	1992	31491	52922	7.7	263	2164	35.1
Iceland	1991	1992	855	879	0.4	143	8	-33.8
Israel	1996	1997	67689	143040	13.2	43508	26078	-8.2
Romania	1997	1998	200029	198711	-0.1	24777	27216	1.9
Hungary	1997	1998	73865	47792	-8.3	3874	4953	5.0
Czech Republic	1997	1998	23148	43840	13.6	7092	50979	48.4
Slovak Republic	1997	1998	5.928	10820	12.8	4979	4349	-2.7
Lithuania	1997	1998	13560	18376	6.3	638	509	-4.4
Estonia	1997	1998	1648	4139	20.2	153	102	-7.8
Bulgaria	1998	1999	85099	155738	16.3	6322	53690	70.7
Poland	1999	2000	66810	143901	29.1	2401	5923	35.1
Slovenia	1998	2000	7179	18215	36.4	738	2530	50.8
Latvia	1998	2000	582	3.021	73.1	268	735	40.0
Croatia	2002		-	-	-	-	-	-

Source: Anonymous, 2004

Table 3: GL index for textile sectors with countries party to an FTA

Switzerland (STA 1992) / ***Norway (STA 1992)***

Years	SITC26	SITC 65	SITC 84	Years	SITC 26	SITC 65	SITC 84
1992	0.40	0.84	0.02	1992	-	-	-
1996	0.97	0.90	0.02	1996	0.00	0.11	0.00
1997	0.97	0.70	0.03	1997	0.07	0.15	0.00
1998	0.85	0.77	0.04	1998	-	0.43	0.01
1999	0.92	0.99	0.05	1999	0.00	0.75	0.00
2000	0.35	0.82	0.04	2000	-	0.45	0.00
2001	0.98	0.83	0.02	2001	0.68	0.68	0.00
2002	0.46	0.73	0.02	2002	0.65	0.37	0.00
2003	0.73	0.82	0.03	2003	0.66	0.47	0.00

Iceland (STA 1992) / ***Israel (STA 1997)***

Years	SITC26	SITC 65	SITC 84	Years	SITC 26	SITC 65	SITC 84
1992	-	-	-				
1996	-	0.29	0.00	1996	0.28	0.11	0.33
1997	0.00	0.93	0.00	1997	0.13	0.14	0.24
1998	-	0.39	0.00	1998	0.20	0.18	0.17
1999	-	0.01	0.00	1999	0.14	0.14	0.06
2000	-	0.34	0.00	2000	0.20	0.20	0.04
2001	0.00	0.00	0.00	2001	0.74	0.30	0.04
2002	0.00	0.06	0.00	2002	0.88	0.44	0.04
2003	0.00	0.00	0.03	2003	0.93	0.42	0.03

Table 3: Continued

Romania (STA 1998)

Years	Product group		
	SITC26	SITC 65	SITC 84
1996	0.46	0.29	0.05
1997	0.53	0.24	0.01
1998	0.28	0.15	0.02
1999	0.55	0.12	0.06
2000	0.82	0.23	0.22
2001	0.67	0.22	0.25
2002	0.64	0.20	0.33
2003	0.81	0.15	0.51

Hungary (STA 1998)

Years	Product group		
	SITC 26	SITC 65	SITC 84
1996	0.77	0.30	0.01
1997	0.16	0.22	0.00
1998	0.24	0.18	0.02
1999	0.67	0.14	0.04
2000	0.99	0.11	0.10
2001	0.69	0.05	0.12
2002	0.26	0.06	0.14
2003	0.23	0.07	0.25

Czech Republic (STA 1998)

Years	Product group		
	SITC26	SITC 65	SITC 84
1996	0.26	0.35	0.00
1997	0.78	0.44	0.01
1998	0.96	0.50	0.03
1999	0.16	0.93	0.05
2000	0.11	0.84	0.12
2001	0.10	0.88	0.04
2002	0.10	0.77	0.04
2003	0.09	0.80	0.04

Slovak Republic (STA 1998)

Years	Product group		
	SITC 26	SITC 65	SITC 84
1996	0.21	0.61	0.00
1997	0.00	0.77	0.00
1998	0.10	0.44	0.01
1999	0.26	0.72	0.10
2000	0.00	0.97	0.04
2001	0.00	0.88	0.11
2002	0.00	0.77	0.04
2003	0.01	0.71	0.16

Lithuania (STA 1998)

Years	Product group		
	SITC26	SITC 65	SITC 84
1996	0.00	0.74	0.00
1997	0.74	0.04	0.00
1998	-	0.34	0.00
1999	0.00	0.33	0.00
2000	0.00	0.19	0.06
2001	0.00	0.32	0.46
2002	0.00	0.21	0.11
2003	0.84	0.05	0.06

Estonia (STA 1998)

Years	Product group		
	SITC 26	SITC 65	SITC 84
1996	-	0.00	0.80
1997	0.00	0.00	0.85
1998	-	0.01	0.99
1999	-	0.01	0.29
2000	-	0.00	0.69
2001	0.00	0.00	0.30
2002	0.00	0.01	0.00
2003	0.00	0.01	0.10

Bulgaria (STA 1999)

Years	Product group		
	SITC26	SITC 65	SITC 84
1996	0.28	0.72	0.28
1997	0.16	0.84	0.16
1998	0.16	0.84	0.16
1999	0.46	0.54	0.46
2000	0.25	0.75	0.25
2001	0.20	0.80	0.20
2002	0.26	0.74	0.26
2003	0.63	0.37	0.63

Poland (STA 2000)

Years	Product group		
	SITC 26	SITC 65	SITC 84
1996	0.74	0.85	0.00
1997	0.51	0.64	0.00
1998	0.42	0.34	0.00
1999	0.00	0.18	0.00
2000	0.90	0.07	0.04
2001	0.23	0.03	0.08
2002	0.22	0.08	0.11
2003	0.01	0.07	0.11

Slovenia (STA 2000)

Years	Product group		
	SITC26	SITC 65	SITC 84
1996	0.12	0.53	0.04
1997	0.01	0.51	0.02
1998	0.05	0.49	0.12
1999	0.02	0.25	0.18
2000	0.10	0.52	0.23
2001	0.00	0.50	0.11
2002	0.00	0.42	0.09
2003	0.57	0.47	0.10

Latvia (STA 2000)

Years	Product group		
	**SITC 26	SITC 65	SITC 84
1996	-	0.00	0.52
1997	-	0.72	0.60
1998	-	0.36	0.04
1999	-	0.61	0.00
2000	-	0.82	0.01
2001	-	0.04	0.04
2002	-	0.22	0.01
2003	-	0.70	0.07

* It could not find for Foreign Trade value of Iceland and Norway. ** It could not find for Foreign Trade value of Textile fiber and their wastes of Latvia and Turkey

exporting synchronically in textile sector. It is studied one by one for each country party to an FTA and for each sub-product group and the results are given in Table 3.

The presence of IIT with any of the countries in Table 3 depends on the condition $GL_{IIT}>0.5$. In the case of $GL_{IIT}<0.50$ or $GL_{IIT} = 0$, the presence of IIT can not be mentioned. The absent values on the table denote that foreign trade was not carried out for that year in the given product category. It can be seen that the effect of FTA's on IIT varies from one country to another, one year to another and one product category to another. The IIT values with Romania have improved since 1998 (the year the FTA come into force) in SITC-26 subgroup, while for Hungary, Poland and Czech Republic these values have only risen in the year of the FTA coming into force and subsequently have fallen. The reason for this drop is the skew towards one way trade. The FTA has increased exports to Poland and decreased exports to Hungary and Czech Republic in SITC-26 subgroup. It is noted that the effects of the FTA with Norway have been observed after 2001 and that they have been bi-directional. With Switzerland it is seen that IIT exists in SITC-26 subgroup and best performance has been 2001.

In SITC-65 subgroup, IIT exists with Switzerland, Bulgaria and Slovakia regardless of the FTA's. The impact of the FTA's with the Czech Republic and Latvia can be observed. In SITC-84 subgroup IIT has been done for several years with Iceland and Latvia and in 2003 only with Bulgaria. Among countries Turkey has signed on FTA with exports have grown to Estonia, Iceland, Latvia, Norway and Slovenia and imports have grown faster from the Czech Republic, Israel, Switzerland, Lithuania, Hungary, Poland and Romania. Although exports to Bulgaria have been strong, the sharp rise in imports from this country in 2003 has caused IIT to improve.

Naturally, it would be fallacious to claim that Turkey's IIT performance in SITC-84 subgroup has been impressive for the years studied.

When all the results are considered generally, it can be said that Turkey's free trade agreements have positive effects on Intra-Industry Trade.

Turkey shows a very high performance in textile export. In this study, it is noted that the agreements have positive effects especially in textile import of Turkey. So it enables the Intra-Industry Trade which is done synchronically and containing the phenomenon of both import and export to rise. By the rise of IIT, while taking advantage of different markets in textile sector, Turkey will give opportunity of a wide variety of products to consumers, also can produce all the products more effectively, at low cost and in big quantities by producing less variety of products.

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