ANALYSIS OF INTRA-INDUSTRY TRADE BETWEEN TURKEY-BOSNIA AND HERZEGOVINAANDALTERNATIVE INDEX

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Abstract

Intra-Industry Trade(IIT)expressed as both the export and import of the same goods (those in statistical product line), that traditional trade theories could not explain, within the period has been adressed within the scope of the "new foreign trade theory", and occupies an important place in today's world trade.Indexes were developed in order to measure IIT rates and applied studies related to the subject were carried out.In this study,the IIT between Turkey and Bosnia and Herzegovina were examined at the "Level 1 Digit SITC Rev. 3" and a general tendency of the trade was tried to be determined. Grubel-Lloyd index and the alternative index were used in this study.In this study, the effects of "Free Trade Agreement (FTA)" which took effect in 2002 between Turkey and Bosnia and Herzegovina were analyzed.Moreover, positive-negative aspects of Grubel-Lloyd index were analyzed, and because of not measuring intra-industry sectoral competitiveness, an alternative index was used.

Key Words: Intra-Industry Trade, Bosnia and Herzegovina, Turkey, Sectorel Competitive Power, Alternative Index.

Jel Codes:F12,F14,F15

1-Definition and Historical Development of Intra-Industry Trade

Foreign trade theories can be examined in two sections as the Traditional and the New International Trade Theories.While the traditional foreign trade theories attempt to explain foreign trade within the framework of "Interindustry Trade" (IT), "the New International Trade Theory", in wide context, are described within the framework of Intra-Industry Trade under conditions of imperfect competition. In particular, the studies carried out in the the economic integration arouse as a result of close economic relationship between the European countries, Dreze (1961), Verdorn (1960), resulted in a way that trade is two-way. In a sampling carried out, it was expressed that 0.44 of world trade in the digit 3 aggregation level consisted of Intra-Industry Trade (Brulhart, 2008).Bernhofen (1997), Balassa (1966), Grubel (1967), Grubel-Lloyd (1975), in their applied studies, pointed out that trade was made more between countries with similar factor endowment, and made comparisons between the Interindustry Trade and Intra-Industry Trade.

Intra-Industry Trade which occurs between the countries with the similarfactor endowment is becoming more and more important nowadays. While Intra-Industry Trade is defined as the simultaneousimport and export of the same goods, Krugman (1988) described as the goods in the same group within Standard International Trade Classification (SITC) while Grubel (1967) defined the "sameness"concept as to take part in the same statisticalgroup.Emirhan (2002), Aynagoz and Çakmak described the "sameness" concept as the sameindustry.Intra-industry trade was called the "intra-industry trade" by Balassa (1966), and Grubel and Lloyd (1975); the "two-way trade" by Gray (1980); the "trade expansion" by Finger (1979); and the "two-way trade in similar products" by Abd-El Rahman (1991).Aquino (1988)definedasthe simultaneous import and export of the same goods in case of elemination of fundamental uncertainty of being homogeneousin the goods, considering the fact that it shouldbe accepted within each statistical group mainly based on the degreeandtype (Aquino, 1988).

Applied studies were started after the theoretical approaches related to Intra-Industry Trade, of which the theoretical background was created by the Leontief paradox, and indexes began to be developed on the subject.While the studies by Balassa (1966), Grubel and Lloyd(1971,1975)Greenaway and Milner (1981, 1983) Aquino (1978),Greenaaway (1981, 1983) andBalassa (1986) create the database in a wide range related to the subject, Abd-El Rahman(1991), with his study, have chosen to differentiate the Intra-Industry Trade as the horizontaland vertical Intra-Industry Trade."In the same type of industry, contemporaneously, as the unit value difference of exportand import values, it applies only when there is a difference of maximum 15%, and it refers to vertical andhorizontal diversification" (Abd-El Rahman,1991).Currently, although there are objections related to Intra-Industry Trade regarding the facts that the products are put together in a statistical compulsion, Czarny (2003), a combinationofinappropriate industries, differences in levels of consolidation, Marvel and Roy (1987), as well as horizontaland vertical separation of the Intra-Industry Trade, today, studies are ongoing under the fact of a statistical grouping.

2. Structure of Foreign Trade Between Turkey and Bosnia and Herzegovina

In Table 2.1., import, export and foreign trade volume between Turkey and Bosnia andHerzegovina is given. While foreign trade volume in 2000 was $34 million, it has reached $300 million following an increasing trend in 2010.When foreign trade view is examined,Turkey is mostly the exporting country and Bosnia and Herzegovina is rather the importing country. But in general, the volume of foreign trade is lower.

Table 2.1. Turkey-Bosnia and HerzegovinaForeign Trade Data(1.000 $)

YEARS	EXPORT	IMPORT	VOLUME	BALANCE
2000	26.871	7.497	34.368	19.374
2001	27.586	4.926	32.512	22.660
2002	43.264	6.317	49.581	36.947
2003	63.227	8.343	71.570	54.884
2004	99.938	11.476	111.414	88.462
2005	128.217	15.399	143.616	112.818
2006	150.862	9.379	160.241	141.483
2007	445.173	21.469	466.642	423.704
2008	572.349	24.545	596.894	547.804
2009	226.522	52.058	278.557	174.377
2010	224.351	72.328	296.679	152.023

Source: Undersecretariat of Foreign Trade

As can be observed from Table 2.1., in the export of Bosnia and Herzegovina, take part mineral ore (18%),mineral products (15%), machinery and mechanicalappliances(11%), wood and wood products (% 7), andother products (47%), respectively. And its imports consist of mineral products (16%),machinery (14%), food (% 2), metalore (% 8), and other products (49%).As can be seen in Table 2.1., Turkey's place in Bosnia andHerzegovina'sforeign tradeisquitesmall. Turkey has only a 0.6% share in Bosnia and Herzegovina's exports,while in its imports, has a share of 6.5%. Foreiign trade volume is far from the desired level between these two countries which have strong historical and cultural ties.Bosnia and Herzegovina exports goods to Croatia (19.1%), Slovenia(18.6%),Italy(16.9%),Germany (13.4%), Austria (10.3%),and ***Turkey (0.6%)***, respectively.Bosnia and Herzegovina imports goods from Croatia (22.2%),Germany (14%), Slovenia(13.5%),Italy (11.9%), Austria (6.6%), ***Turkey (% 6.5)*** and Hungary (5.7%).

Table 2.2. Major Products and Countries in the Foreign Trade of Bosnia and Herzegovina

Major Products in Exports :	Mineral Ore (%18,9), Mineral Products (%15,6), Machinery and Mechanical Appliances(%11,2), Wood and Wood Products (%7,1), Others (%47,2)
Major Products in Imports :	Mineral Products (%16,2), Machinery (%14,9), Food (%2), Metal Ore (%8,7), Others (%49)
Major Countries in Exports :	Croatia (%19,1), Slovenia (%18,6), Italy (%16,9), Germany (%13,4), Austria (%10,3), ***Turkey (%0,6)***
Major Countries in Imports :	Croatia (%22,2), Germany (%14), Slovenia (%13,5), Italy (%11,9), Austria (%6,6), ***Turkey (%6,5)*** Hungary (%5,7).

Source: Undersecretariat of Foreign Trade

3. Deficiencies of Grubel-Lloyd Intra-Industry TradeIndex and Our Alternative Index

For the measurement of Intra-Industry Trade which can be identified as the demand for close substitute goods from different countries with the different preferences of the consumers, Grubeland Lloyd have revealed the following index in 1975.

$$\boldsymbol{G-L=1-\frac{|X-M|}{(X+M)}} \quad (4.1)$$

Despite the widespread use of this index, it can not measure sectoral competitiveness. In other words,whether imports or exports is higher in the sector concerned can not be determined by the outcome of this index.[1]

Our Alternative Index:

$$\boldsymbol{HM=\frac{X-M}{(X+M)}\ G-L=1-|HM|} \quad (4.2)$$

The coefficient value of Intra-Industry Trade varies between 0 (zero) and 1. Intra-Industry Trade coefficient being 0 states that trade in the sector stems completely from interindustry relationship (either we only import the related goods or export), Intra-Industry Trade coefficient being 1states that trade in the sector completely stems from intra-industry trade.

HM Intra-İndustry Trade (HM-IIT) index can take values between -1 and +1. If this value is approaching to 0, Intra-Industry Trade increases; if the the index value is equal to 0, trade completely folds into the structure of Intra-Industry Trade. On the other hand, this value's taking the value of -1 or +1 shows that the trade is completely Interindustry Trade. However, if the index value is +1, comments can be made in the direction that the changes in the currents of trade are connected to exports; if it is -1, it is entirely connected to the imports. In addition, it is possible to estimate the sectoral competitiveness with the HM index. If the sectoral competitiveness is defined as changes in relations between imports and exports in the related sector, high competitiveness indicates higher exports in a specificsector, low competitiveness indicates high imports in a specific sector. If HM> 0, X> M; If HM <0,X <M.

HM index, unlike the G-L index, does not give meaningful results when two or ore industries are summed up. While HM's taking the value -1 or +1 expresses Interindustry Trade alone; (Intra-Industry Trade = 0) summing up index values of two different industries with these results at the same time means to reach a value of 0, which leads to a misleading result that marginal trade is in the structure of Intra-Industry Trade.

In the sample table, import, export, G-L index of any commodity, and Intra-Industry Trade values calculated with our alternative index are given.

Table3.1

YEARS	X	M	G-L-Intra-IT	HM-Intra-IT
1990	70	30	0,6	0,4
1991	30	70	0,6	-0,4
1992	50	50	1	0
1993	80	0	0	1
1994	0	80	0	-1

Because the G-L-Intra-Industry Trade (G-L-IIT) index value was close to 1 in 1990 and 1991, the vast majority of foreign trade was the Intra-Industry Trade.In 1990, exports was high, and in 1991, imports was high but because the G-L-Intra-Industry Trade index value was the same, thissituation can not be distinguished.Because index values in the years 1990 and 1991 in alternative HM-Intra-Industry Trade were close to 0 (zero), it can be stated that the vast majority of foreign trade was intra-industry trade. Index value's being positive in 1990, unlike the G-L-Intra-Industry Trade index, can be considered evidence to exports' being more than imports in foreign trade, in other words to high sectoral competitiveness. Negative index value in 1991 can be shown evidence to imports's being more than exports in foreign trade, in other words, to low sectoral competitiveness.

G-L-Intra-Industry Trade index value's being equal to 1 in 1992, or HM-Intra-Industry Trade index value's being equal to 0 indicates that foreign trade was entirely Intra-Industry Trade.

[1] In marginal intra-industry trade calculations, this problem has been overcome with Brülhart (1994) 's"BIndex".

In 1993, G-L-intra-industry trade index value's being equal to 0 and HM-intra-industry trad index value's being equal to 1 indicates that foreign trade was entirely inter-industry trade. Because HM-intra-industry trade is positive, the country is completely exporter in the relevant sector concerned. In 1994, G-L-intra-industry trade index value's being equal to 0 and HM- intra-industry trade index value's being equal to -1 indicates that foreign trade was entirely inter-industry trade is completely inter-industry trade. Because HM-intra-industry trade is negative, the country is completely importer in the relevant sector.In the years 1993, 1994, G-L-Intra-Industry Trade index value is the same, and it is not clear from the index value weather export or import is intense in foreign trade. In case of HM-Intra-Industry Trade index value's being equal to 1, foreign trade is completely export originated, in case of being equal to -1, it states that foreign trade is completely import originated.As can be seen from the examples, HM-Intra-Industry Trade index, unlike G-L-Intra-Industry Trade index, both measures Intra-Industry Trade, and allows the measurement of sectoral competitiveness by identifying if export or import is intense in foreign trade.

4.Intra-Industry Trade with Bosnia and Herzegovina in Respect to Total Figures and Alternative Index[2]

Table4.1. Bosnia and Herzegovina–Turkey Livestock and Food Products Intra-Industry Trade and AlternativeIndex

	X*	M*	X+M(Thousand$)	Intra-IT	HM-Intra-IT
1997	5.931.714	0	5932	0,00	1,00
1998	3.453.921	58,131	3454	0,00	1,00
1999	4.628.496	0	4628	0,00	1,00
2000	3.234.661	7,066	3235	0,00	1,00
2001	3.435.734	35,462	3436	0,00	1,00
2002**	**6.512.301**	**24,123**	**6512**	**0,00**	**1,00**
2003	10.906.576	0	10907	0,00	1,00
2004	14.231.468	179	14231	0,00	1,00
2005	14.231.468	179	14232	0,00	1,00
2006	24.218.261	132,691	24218	0,00	1,00
2007	24.242.053	241,537	24242	0,00	1,00
2008	37.442.856	5.102.855	42546	0,24	0,76
2009	34.298.983	17.727.347	52026	0,68	0,32
2010	29.742.831	27.442.927	57186	0,96	0,04
2011***	7.516.051	4.071.665	11588	0,70	0,30

Note: (*) Source Turkish StatisticalInstitute (TURKSTAT) (www.tuik.gov.tr)Indices are calculated by us. Figure of export and import belong to Turkey. Grubel-Lloyd index (G-L) was used as the Intra-Industry Trade index. HM-Intra-Industry Trade index has been developed by the authors. (**) Free Trade Agreement (FTA) between Turkey and Bosnia and Herzegovina was signed. (***) 2011 data includes the first three months.

Table 5.1 shows the Intra-Industry Trade regarding the "Livestock and Foodstuff" products between Bosnia and Herzegovina and Turkey. When Bosnia and Herzegovina and Turkey are examined in terms of the Intra-Industry Trade, in the period before and after the Free Trade Agreement (FTA), Intra-Industry Trade figures are at low levels until 2008. Especially in the period after 2008, a significant increase occured in the volume of foreign trade between the two countries. In parallel to this increase, Intra-Industry Trade increased and in 2010 reached its highest value.In post-FTA period, Intra-Industry Trade value has remained at zero, ie all the change in foreign trade consists of Interindustry Trade. Although Turkey held the commercial advantage during the period, its performance in foreign trade changing due to unstable export-import figures has also changed over the years. In 1997, total foreign trade volume which was zero in terms of this group of goods increased to $ 57 million 186 thousand in 2010.When HM-Intra-Industry Trade index is examined, the index's being 1 (one) (GL index's being 0), refers to that the entire foreign trade has occured from Interindustry Trade and the Intra-Industry Trade share is 0 (zero).

[2]This index was presented forthe first time with the title " the Effect of Foreign Trade and Customs Union between Turkey and EU (15 countries) on Marginal Intra-Industry Trade, its Comparison with the Intra-Industry Trade and the Alternative Index" in the 12th International Symposium of Econometrics Operations Research and Statistics (Yergin and Mercan, 2011).

HM-Intra-Industry Trade index's approaching to 0 (zero) in the period after 2008 indicates that the entire foreign trade changed to the structure of the Intra-Industry Trade.It can be said that because HM-Intra-Industry Trade is positive for all the years, Turkey has a relative advantage, and has a better performance than Bosnia and Herzegovina in these sectors.

Table4.2. Bosna and Herzegovina-TurkeyBeverages and TobaccoIntra-Industry Trade and AlternativeIndex

	X	M	X+M(Thousand$)	Intra-IT	HM-Intra-IT
1997	95	0	0,1	0,00	1,00
1998	54	0	0,1	0,00	1,00
1999	71	0	0,1	0,00	1,00
2000	29	0	0,0	0,00	1,00
2001	34	0	0,0	0,00	1,00
2002	**44**	**0**	**0,0**	**0,00**	**1,00**
2003	103	0	0,1	0,00	1,00
2004	88	0	0,1	0,00	1,00
2005	38	0	0,0	0,00	1,00
2006	39	0	0,0	0,00	1,00
2007	69845	0	69,8	0,00	1,00
2008	73542	0	73,5	0,00	1,00
2009	135060	106948	242,0	0,88	0,12
2010	373386	0	373,4	0,00	1,00
2011	72870	0	72,9	0,00	1,00

When Table 5.2 is examined in terms of Bosnia and Herzegovina and Turkey Intra-Industry Trade, in all the the pre-and post-periods of Free Trade Agreement (FTA), Intra-Industry Trade figures at low levels can be seen. Since 2007, foreign trade volume between the two countries increased at very low levels. In parallel to this increase, Intra-Industry Trade did not show an increase and foreign trade has continued one-sided.In pre-and post-FTA period, the value of Intra-Industry Trade stayed at the level of zero, iethe entire change in foreign trade consists of Interindustry Trade. Although Turkey has commercial advantage during the period, foreign trade volumeis very low.When HM-Intra-Industry Trade index is examined, the time index's being 1 (one) (GL index's being 0), refers to that the entire foreign trade has consisted of Interindustry Trade and Intra-Industry Trade share is 0 (zero).It can be said that because HM-Intra-Industry Trade has been positive for all years (more exports than imports), Turkey has a relativeadvantage and hadbetter performance than Bosnia and Herzegovina in these sectors.

Table4.3. Bosnia and Herzegovina–TurkeyInedible Raw Materials Except Fuel Intra-Industry Trade and Alternative Index

	X	M	X+M(Thousand$)	Intra-IT	HM-Intra-IT
1997	146	61	0,2	0,59	0,41
1998	188	334	0,5	0,72	-0,28
1999	20	241	0,3	0,15	-0,85
2000	236	848	1,1	0,43	-0,57
2001	43	1868173	1868,2	0,00	-1,00
2002	**64**	**3287990**	**3288,1**	**0,00**	**-1,00**
2003	105	3149228	3149,3	0,00	-1,00
2004	82	4729660	4729,7	0,00	-1,00
2005	65	2823567	2823,6	0,00	-1,00
2006	285	1625728	1626,0	0,00	-1,00
2007	583258	2085593	2668,9	0,44	-0,56
2008	666958	1362538	2029,5	0,66	-0,34
2009	1022594	7440665	8463,3	0,24	-0,76
2010	852241	8137341	8989,6	0,19	-0,81
2011	852242	8137341	8989,6	0,19	-0,81

As can be observed from Table 5.3, Bosnia and Herzegovina and Turkey are examined in termsof the Intra-Industry Trade, foreign trade volume is low in the period before the FreeTradeAgreement (FTA), and in the period after, there has been the increase, and the volumeincreased to $ 9 million. It can be said that FTA had positive contribution to foreign trade, but this contribution has not been much reflected to the Intra-Industry Trade. In parallel with the increase in foreign trade, Intra-Industry Trade did not show any increase, only despite the increasein the period after 2007, it was at a low level.It can be said that because HM-Intra-Industry Trade is negative for the years except 1997, Bosnia and Herzegovina had the relative superiorityand had better performance than Turkey in these sectors.

Table4.4 Bosnia and Herzegovina–TurkeyMineral Fuels, Oils and Alkali Products Intra-Industry Trade and Alternative Index

	X	M	X+M(Thousand$)	Intra-IT	HM-Intra-IT
1997	91	0	0	0,00	1,00
1998	89	0	0	0,00	1,00
1999	136	1	0	0,02	0,98
2000	221	0	0	0,00	1,00
2001	69	0	0	0,00	1,00
2002	**257**	**0**	**0**	**0,00**	**1,00**
2003	594	0	1	0,00	1,00
2004	817	0	1	0,00	1,00
2005	995	5051287	5052	0,00	-1,00
2006	1610747	390	1611	0,00	1,00
2007	206219026	635467	206854	0,01	0,99
2008	255281311	5182943	260464	0,04	0,96
2009	1885603	2401440	4287	0,88	-0,12
2010	2579839	4427	2584	0,00	1,00
2011	888868	0	889	0,00	1,00

As can be observed from Table 5.4, when Bosnia and Herzegovina and Turkey are examinedin terms of the Intra-Industry Trade,it is low and unstable in pre-and post-FTAperiod. It can be said that FTA had no effect on Intra-Industry Trade. In the period after 2006 when foreign trade volume increased, HM-Intra-Industry Trade's beingpositiveshows that Turkey's sectoralperformance was much stronger.

Table4.5 Bosnia and Herzegovina–TurkeyAnimal Vegetable Fat and Oil, Candles Intra-Industry Trade and Alternative Index

	X	M	X+M(Thousand$)	Intra-IT	HM-Intra-IT
1997	293	0	0	0,00	1,00
1998	34	0	0	0,00	1,00
1999	44	0	0	0,00	1,00
2000	10	0	0	0,00	1,00
2001	859	0	1	0,00	1,00
2002	**41**	**0**	**0**	**0,00**	**1,00**
2003	38	0	0	0,00	1,00
2004	38	0	0	0,00	1,00
2005	4	0	0	0,00	1,00
2006	19	0	0	0,00	1,00
2007	318914	2139	321	0,01	0,99
2008	561910	7575	569	0,03	0,97
2009	306457	10279	317	0,06	0,94
2010	95068	0	95	0,00	1,00
2011	13751	0	14	0,00	1,00

As can be seen from Table 5.5, when Bosnia and Herzegovina and Turkey are examined in terms of the foreign trade and Intra-Industry Trade, it follows a very low and erratic course during all the periods. It can be said that FTA had no effect on Intra-Industry Trade.Turkey has no import except for a few years and is rather the exporter.

HM-Intra-Industry Trade's being 1 (G-L index's being 0) shows that the entire foreign trade consisted of Interindustry Trade, and its being positive shows that Turkey had stronger sectoral performance.

Table4.6. Bosnia and Herzegovina–TurkeyChemical Industry and Related Industrial ProductsIntra-Industry Trade and Alternative Index

	X	M	X+M(Thousand$)	Intra-IT	HM-Intra-IT
1997	1.877.107	136	1877	0,00	1,00
1998	2.168.604	623	2169	0,00	1,00
1999	2.212.865	881	2214	0,00	1,00
2000	1.862.222	869	1863	0,00	1,00
2001	2.836.915	382	2837	0,00	1,00
2002	**3.123.646**	**517**	**3124**	**0,00**	**1,00**
2003	4.961.857	42	4962	0,00	1,00
2004	7.485.533	2.463.693	9949	0,50	0,50
2005	9.189.702	4.377.451	13567	0,65	0,35
2006	12.382.361	2.811.002	15193	0,37	0,63
2007	16.264.404	9.251.049	25515	0,73	0,27
2008	21.477.398	3.781.236	25259	0,30	0,70
2009	18.462.075	8.657.602	27120	0,64	0,36
2010	20.762.359	8.439.506	29202	0,58	0,42
2011	6.323.045	1.363.881	7687	0,35	0,65

As can be observed from Table 5.6, when Bosnia and Herzegovina and Turkey are examinedin terms of the Intra-Industry Trade, foreign trade volume is low in the period before the FreeTrade Agreement (FTA), there has been an increase in the period after, and the volume increasedto $ 29 million. İt can be said that FTA had positive contribution to foreign trade,butthis contribution reflected to Intra-Industry Trade in low levels. Parallel to the increase in foreign trade, Intra-Industry Trade showed and increase but was in low level.

It can be said that because HM-Intra-Industry Trade is positive, Turkey has a relative advantage and has a better performance than Bosnia andHerzegovina in these sectors. Although HM-Intra-Industry Trade index's being positive shows that Turkey has a better sectoral performance, index value's approach to 0 refers to that Turkey's sectoral competitiveness decreased over time.

Table4.7 Bosnia and Herzegovina–TurkeyProcessed Goods Allocated to Main GroupsIntra-Industry Trade and Alternative Index

	X	M	X+M(Thousand$)	Intra-IT	HM-Intra-IT
1997	7.307.542	828	7308	0,00	1,00
1998	10.922.356	1.691.599	12614	0,27	0,73
1999	13.326.373	1.054.693	14381	0,15	0,85
2000	11.050.993	723	11052	0,00	1,00
2001	9.524.396	443	9525	0,00	1,00
2002	**15.350.229**	**181**	**15350**	**0,00**	**1,00**
2003	22.412.877	386	22413	0,00	1,00
2004	35.086.938	1.214.468	36301	0,07	0,93
2005	42.266.085	1.182.853	43449	0,05	0,95
2006	43.248.574	982	43250	0,00	1,00
2007	65.787.043	1.148.869	66936	0,03	0,97
2008	85.052.370	1.701.577	86754	0,04	0,96
2009	60.032.644	9.089.820	69122	0,26	0,74
2010	61.366.816	16.773.115	78140	0,43	0,57
2011	13.612.637	5.226.591	18839	0,55	0,45

As can be observed from Table 5.7, when foreign trade between Bosnia and Herzegovinaand Turkey are examined in terms of Intra-Industry Trade, in the years following FTA, an increase can be seen.

Following the year of 2002, foreign trade followed a significant and steady increase, and this increase reached to $ 86 million in 2008. In these years, a large part of the change in trade resulted from the Interindustry Trade.

As HM-Intra-Industry Trade is positive, it can be said that Turkey had a relative advantage and had better performance than Bosnia and Herzegovina in these sectors.

Tablo 4.8 Bosnia and Herzegovina–TurkeyMachinery and Motor VehiclesIntra-Industry Trade and Alternative Index

	X	M	X+M(Thousand$)	Intra-IT	HM-Intra-IT
1997	5.043.955	265	5044	0,00	1,00
1998	8.723.696	1.807.494	10531	0,34	0,66
1999	10.576.104	11.040.447	21617	0,98	-0,02
2000	5.000.452	1.976.942	6977	0,57	0,43
2001	5.998.991	1.324.599	7324	0,36	0,64
2002	**10.408.410**	**986**	**10409**	**0,00**	**1,00**
2003	13.397.498	3.010.431	16408	0,37	0,63
2004	25.696.081	1.757.810	27454	0,13	0,87
2005	28.519.814	883	28521	0,00	1,00
2006	29.280.206	1.054.300	30335	0,07	0,93
2007	65.135.829	2.332.615	67468	0,07	0,93
2008	85.675.932	1.675.930	87352	0,04	0,96
2009	45.976.158	3.633.405	49610	0,15	0,85
2010	48.860.407	8.701.583	57562	0,30	0,70
2011	15.804.199	1.731.877	17536	0,20	0,80

As can be observed from Table 5.8, when Bosnia and Herzegovina and Turkey are examined in terms of the Intra-Industry Trade, in the period before the Free Trade Agreement (FTA), foreign trade volume is low, and in the period after, there has been and increase and the volume increased to $ 57 million. It can be said that FTA had positive contribution to foreign trade, but this contribution reflected to Intra-Industry Trade in low levels. Parallel to the increase in foreign trade, Intra-Industry Trade showed an increase but it is at low level. As HM-Intra-Industry Trade is positive, it can be said that Turkey has a relative advantage and has better performance than Bosnia andHerzegovina in these sectors.

Tablo 4.9 Bosnia and Herzegovina–Turkey Miscellaneous Manufactured Articles Intra-Industry Trade and Alternative Index

	X	M	X+M(Thousand$)	Intra-IT	HM-Intra-IT
1997	11.085.472	5	11085	0,00	1,00
1998	12.430.110	783	12431	0,00	1,00
1999	8.876.438	3.003.768	11880	0,51	0,49
2000	5.228.096	3.073.430	8302	0,74	0,26
2001	5.315.866	294	5316	0,00	1,00
2002	**7.411.965**	**1.320.986**	**8733**	**0,30**	**0,70**
2003	10.709.619	1.686.815	12396	0,27	0,73
2004	16.354.142	1.309.927	17664	0,15	0,85
2005	22.802.834	948	22804	0,00	1,00
2006	39.325.755	2.179.277	41505	0,11	0,89
2007	60.987.847	4.026.204	65014	0,12	0,88
2008	86.116.375	5.728.670	91845	0,12	0,88
2009	64.447.171	2.991.283	67438	0,09	0,91
2010	59.327.838	2.829.597	62157	0,09	0,91
2011	11.908.008	782.206	12690	0,12	0,88

As can be observed from Table 5.9, when Bosnia andHerzegovina and Turkey are examined in terms of foreign trade, foreign trade volume which was $ 11 million in1997, increased to $ 90 million. Because Turkey's imports is very low compared to its exports, Intra-Industry Trade is at low levels in general.

Despite the increase in foreign trade volume with FTA, Intra-Industry Trade value has remained at zero, in other words, the entirechangeinforeign trade consisted of InterindustryTrade.Because HM-Intra-Industry Trade is positive, it can be said Turkey has a relative advantage and its performance in these sectors is better than Bosnia and Herzegovina. But the value's being close to 1 shows that Interindustry Trade is more in foreign trade.

Results

In the study, the foreign trade and intra-industry trade between Turkey and Bosnia and Herzegovina have been analyzed taking into account the "Free Trade Agreement"(FTA)which became valid in 2002.Also, positive and negativeaspects of Grubel-Lloyd index have been analyzed and for it did not measure inter-industries sectoral competitiveness, an alternative index is used.By giving Grubel-Lloyd index, and the alternative index (HM-Intra-industry trade), it was allowed for the comparison. It was seen that HM-Intra-industry trade index could measure whether the countries are importers or exporters in foreign trade ie sectoral competitiveness, as well as intra-industry trade.As an example, HM-Intra-industry trade value's being positive in all sectors except for the goods of "Inedible Raw Materials Except Oil", shows that Turkey is exporter ie its sectoral competitiveness is higher.When the foreign trade between Turkey and Bosnia and Herzegovina is examined, it has been seen that the volume is not very large, but especially since the "Free Trade Agreement" (FTA) in 2002, foreign trade volume increased from $ 19 million to the level of $ 500 million.When the intra-industry trade between Turkey and Bosnia and Herzegovina is examined, verylow intra-industry trade figures are outstanding in parallel with a low volume of foreign trade. But in parallel to increasing foreign trade in recent years, increases in intra-industrytrade were seen.

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Table 2.1. Turkey-Bosnia and HerzegovinaForeign Trade Data (1.000 $)

YEARS	EXPORT	IMPORT	VOLUME	BALANCE
2000	26.871	7.497	34.368	19.374
2001	27.586	4.926	32.512	22.660
2002	43.264	6.317	49.581	36.947
2003	63.227	8.343	71.570	54.884
2004	99.938	11.476	111.414	88.462
2005	128.217	15.399	143.616	112.818
2006	150.862	9.379	160.241	141.483
2007	445.173	21.469	466.642	423.704
2008	572.349	24.545	596.894	547.804
2009	226.522	52.058	278.557	174.377
2010	224.351	72.328	296.679	152.023

Source: Undersecretariat of Foreign Trade

Table 2.2. Major Products and Countries in the Foreign Trade of Bosnia and Herzegovina

Major Products in Exports :	Mineral Ore (%18,9), Mineral Products (%15,6), Machinery and Mechanical Appliances (%11,2), Wood and Wood Products (%7,1), Others (%47,2)
Major Products in Imports :	Mineral Products (%16,2), Machinery (%14,9), Food (%2), Metal Ore (%8,7), Others (%49)
Major Countries in Exports :	Croatia (%19,1), Slovenia (%18,6), Italy (%16,9), Germany (%13,4), Austria (%10,3), ***Turkey (%0,6)***
Major Countries in Imports :	Croatia (%22,2), Germany (%14), Slovenia (%13,5), Italy (%11,9), Austria (%6,6), ***Turkey (%6,5)*** Hungary (%5,7).

Source: Undersecretariat of Foreign Trade

Table 3.1

YEARS	X	M	G-L-Intra-IT	HM-Intra-IT
1990	70	30	0,6	0,4
1991	30	70	0,6	-0,4
1992	50	50	1	0
1993	80	0	0	1
1994	0	80	0	-1

Table4.1. Bosnia and Herzegovina–Turkey Livestock and Food Products Intra-Industry Trade and AlternativeIndex

	X*	M*	X+M(Thousand$)	Intra-IT	HM-Intra-IT
1997	5.931.714	0	5932	0,00	1,00
1998	3.453.921	58,131	3454	0,00	1,00
1999	4.628.496	0	4628	0,00	1,00
2000	3.234.661	7,066	3235	0,00	1,00
2001	3.435.734	35,462	3436	0,00	1,00
2002**	**6.512.301**	**24,123**	**6512**	**0,00**	**1,00**
2003	10.906.576	0	10907	0,00	1,00
2004	14.231.468	179	14231	0,00	1,00
2005	14.231.468	179	14232	0,00	1,00
2006	24.218.261	132,691	24218	0,00	1,00
2007	24.242.053	241,537	24242	0,00	1,00
2008	37.442.856	5.102.855	42546	0,24	0,76
2009	34.298.983	17.727.347	52026	0,68	0,32
2010	29.742.831	27.442.927	57186	0,96	0,04
2011***	7.516.051	4.071.665	11588	0,70	0,30

Note: (*) Source Turkish Statistical Institute (TURKSTAT) (www.tuik.gov.tr) Indices are calculated by us. Figure of export and import belong to Turkey. Grubel-Lloyd index (G-L) was used as the Intra-Industry Trade index. HM-Intra-Industry Trade index has been developed by the authors. (**) Free Trade Agreement (FTA) between Turkey and Bosnia and Herzegovina was signed. (***) 2011 data includes the first three months.

Table4.2. Bosna and Herzegovina-TurkeyBeverages and TobaccoIntra-Industry Trade and AlternativeIndex

	X	M	X+M(Thousand$)	Intra-IT	HM-Intra-IT
1997	95	0	0,1	0,00	1,00
1998	54	0	0,1	0,00	1,00
1999	71	0	0,1	0,00	1,00
2000	29	0	0,0	0,00	1,00
2001	34	0	0,0	0,00	1,00
2002	**44**	**0**	**0,0**	**0,00**	**1,00**
2003	103	0	0,1	0,00	1,00
2004	88	0	0,1	0,00	1,00
2005	38	0	0,0	0,00	1,00
2006	39	0	0,0	0,00	1,00
2007	69845	0	69,8	0,00	1,00
2008	73542	0	73,5	0,00	1,00
2009	135060	106948	242,0	0,88	0,12
2010	373386	0	373,4	0,00	1,00
2011	72870	0	72,9	0,00	1,00

Table4.3. Bosnia and Herzegovina–TurkeyInedible Raw Materials Except Fuel Intra-Industry Trade and Alternative Index

	X	M	X+M(Thousand$)	Intra-IT	HM-Intra-IT
1997	146	61	0,2	0,59	0,41
1998	188	334	0,5	0,72	-0,28
1999	20	241	0,3	0,15	-0,85
2000	236	848	1,1	0,43	-0,57
2001	43	1868173	1868,2	0,00	-1,00
2002	**64**	**3287990**	**3288,1**	**0,00**	**-1,00**
2003	105	3149228	3149,3	0,00	-1,00
2004	82	4729660	4729,7	0,00	-1,00
2005	65	2823567	2823,6	0,00	-1,00
2006	285	1625728	1626,0	0,00	-1,00
2007	583258	2085593	2668,9	0,44	-0,56
2008	666958	1362538	2029,5	0,66	-0,34
2009	1022594	7440665	8463,3	0,24	-0,76
2010	852241	8137341	8989,6	0,19	-0,81
2011	852242	8137341	8989,6	0,19	-0,81

Table4.4 Bosnia and Herzegovina–TurkeyMineral Fuels, Oils and Alkali Products Intra-Industry Trade and Alternative Index

	X	M	X+M(Thousand$)	Intra-IT	HM-Intra-IT
1997	91	0	0	0,00	1,00
1998	89	0	0	0,00	1,00
1999	136	1	0	0,02	0,98
2000	221	0	0	0,00	1,00
2001	69	0	0	0,00	1,00
2002	**257**	**0**	**0**	**0,00**	**1,00**
2003	594	0	1	0,00	1,00
2004	817	0	1	0,00	1,00
2005	995	5051287	5052	0,00	-1,00
2006	1610747	390	1611	0,00	1,00
2007	206219026	635467	206854	0,01	0,99
2008	255281311	5182943	260464	0,04	0,96
2009	1885603	2401440	4287	0,88	-0,12
2010	2579839	4427	2584	0,00	1,00
2011	888868	0	889	0,00	1,00

Table4.5 Bosnia and Herzegovina–TurkeyAnimal Vegetable Fat and Oil, Candles Intra-Industry Trade and Alternative Index

	X	M	X+M(Thousand$)	Intra-IT	HM-Intra-IT
1997	293	0	0	0,00	1,00
1998	34	0	0	0,00	1,00
1999	44	0	0	0,00	1,00
2000	10	0	0	0,00	1,00
2001	859	0	1	0,00	1,00
2002	**41**	**0**	**0**	**0,00**	**1,00**
2003	38	0	0	0,00	1,00
2004	38	0	0	0,00	1,00
2005	4	0	0	0,00	1,00
2006	19	0	0	0,00	1,00
2007	318914	2139	321	0,01	0,99
2008	561910	7575	569	0,03	0,97
2009	306457	10279	317	0,06	0,94
2010	95068	0	95	0,00	1,00
2011	13751	0	14	0,00	1,00

Table4.6. Bosnia and Herzegovina–TurkeyChemical Industry and Related Industrial ProductsIntra-Industry Trade and Alternative Index

	X	M	X+M(Thousand$)	Intra-IT	HM-Intra-IT
1997	1.877.107	136	1877	0,00	1,00
1998	2.168.604	623	2169	0,00	1,00
1999	2.212.865	881	2214	0,00	1,00
2000	1.862.222	869	1863	0,00	1,00
2001	2.836.915	382	2837	0,00	1,00
2002	**3.123.646**	**517**	**3124**	**0,00**	**1,00**
2003	4.961.857	42	4962	0,00	1,00
2004	7.485.533	2.463.693	9949	0,50	0,50
2005	9.189.702	4.377.451	13567	0,65	0,35
2006	12.382.361	2.811.002	15193	0,37	0,63
2007	16.264.404	9.251.049	25515	0,73	0,27
2008	21.477.398	3.781.236	25259	0,30	0,70
2009	18.462.075	8.657.602	27120	0,64	0,36
2010	20.762.359	8.439.506	29202	0,58	0,42
2011	6.323.045	1.363.881	7687	0,35	0,65

Table4.7 Bosnia and Herzegovina–TurkeyProcessed Goods Allocated to Main GroupsIntra-Industry Trade and Alternative Index

	X	M	X+M(Thousand$)	Intra-IT	HM-Intra-IT
1997	7.307.542	828	7308	0,00	1,00
1998	10.922.356	1.691.599	12614	0,27	0,73
1999	13.326.373	1.054.693	14381	0,15	0,85
2000	11.050.993	723	11052	0,00	1,00
2001	9.524.396	443	9525	0,00	1,00
2002	**15.350.229**	**181**	**15350**	**0,00**	**1,00**
2003	22.412.877	386	22413	0,00	1,00
2004	35.086.938	1.214.468	36301	0,07	0,93
2005	42.266.085	1.182.853	43449	0,05	0,95
2006	43.248.574	982	43250	0,00	1,00
2007	65.787.043	1.148.869	66936	0,03	0,97
2008	85.052.370	1.701.577	86754	0,04	0,96
2009	60.032.644	9.089.820	69122	0,26	0,74
2010	61.366.816	16.773.115	78140	0,43	0,57
2011	13.612.637	5.226.591	18839	0,55	0,45

Tablo 4.8 Bosnia and Herzegovina–TurkeyMachinery and Motor VehiclesIntra-Industry Trade and Alternative Index

	X	M	X+M(Thousand$)	Intra-IT	HM-Intra-IT
1997	5.043.955	265	5044	0,00	1,00
1998	8.723.696	1.807.494	10531	0,34	0,66
1999	10.576.104	11.040.447	21617	0,98	-0,02
2000	5.000.452	1.976.942	6977	0,57	0,43
2001	5.998.991	1.324.599	7324	0,36	0,64
2002	**10.408.410**	**986**	**10409**	**0,00**	**1,00**
2003	13.397.498	3.010.431	16408	0,37	0,63
2004	25.696.081	1.757.810	27454	0,13	0,87
2005	28.519.814	883	28521	0,00	1,00
2006	29.280.206	1.054.300	30335	0,07	0,93
2007	65.135.829	2.332.615	67468	0,07	0,93
2008	85.675.932	1.675.930	87352	0,04	0,96
2009	45.976.158	3.633.405	49610	0,15	0,85
2010	48.860.407	8.701.583	57562	0,30	0,70
2011	15.804.199	1.731.877	17536	0,20	0,80

Tablo 4.9 Bosnia and Herzegovina–Turkey Miscellaneous Manufactured Articles Intra-Industry Trade and Alternative Index

	X	M	X+M(Thousand$)	Intra-IT	HM-Intra-IT
1997	11.085.472	5	11085	0,00	1,00
1998	12.430.110	783	12431	0,00	1,00
1999	8.876.438	3.003.768	11880	0,51	0,49
2000	5.228.096	3.073.430	8302	0,74	0,26
2001	5.315.866	294	5316	0,00	1,00
2002	**7.411.965**	**1.320.986**	**8733**	**0,30**	**0,70**
2003	10.709.619	1.686.815	12396	0,27	0,73
2004	16.354.142	1.309.927	17664	0,15	0,85
2005	22.802.834	948	22804	0,00	1,00
2006	39.325.755	2.179.277	41505	0,11	0,89
2007	60.987.847	4.026.204	65014	0,12	0,88
2008	86.116.375	5.728.670	91845	0,12	0,88
2009	64.447.171	2.991.283	67438	0,09	0,91
2010	59.327.838	2.829.597	62157	0,09	0,91
2011	11.908.008	782.206	12690	0,12	0,88