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INTRA-INDUSTRY TRADE PATTERNS OF TURKEY: A PANEL STUDY

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ABSTRACT:

Intra Industry Trade (IIT) produces extra gains from international trade, over and above those from comparative advantages, because IIT allows countries to benefit from larger markets and to exploit product diversification. In this study, firstly the effects of the post-1980 policies, especially trade liberalization policies on IIT index are analysed by using Adjusted Grubel-Lloyd index and Standard Industrial Trade Classification (SITC) at the 2-digit level. The answer of "whether the customs union membership have promoted IIT index of Turkey or not" question is searched. Secondly, the country specific hypotheses are tested for Turkey by using pooled cross-section and time series regression analysis for Turkey's trade with 14 countries (taking place in the list of top 50 countries of Turkey's foreign trade)

Keywords: Intra-industry trade, foreign trade policies

1. INTRODUCTION

Intra-Industry Trade (IIT) is the simultaneous import and export of goods within the same industry.

Economists have found that there is an evidence that there is intra-industry trade, and it forms a significant portion of all trade for developed economies. For example, in 1960 Verdoorn found that specialisation and trade between the European Union countries had taken place within similar categories rather than between different product categories and also Grubel and Lloyd estimated that 71 percent of the increase in trade between the European Economic Community countries from 1959 to 1967 was IIT.

The discovery of high and growing IIT levels in the 1970's had produced a wave of new thinking by trade theorists, which shifted the emphasis of the models away from country-specific trade determinants, generically termed ²comparative advantage², towards industry specific factors such as increasing returns and external economies.

The large share of IIT in the overall trade of European Union countries, and more generally of other industrialized countries, has been a great challenge to the traditional theory of international trade based Hecksher-Ohlin-Samuelson theorems.

In searching for more general models of such trade, economists have been led into the field of imperfect competition, developing what are often referred to as the ²new trade theories². These new trade theories have been put forward to complement and/ or substitute for the simple Hecksher-Ohlin model. Explanations of IIT typically involve all or some of product differentiation, economies of scale, monopolistic competition or oligopolistic behaviour, the workings of multinational companies.

Greenaway and Milner (1986), Balassa and Bauwens (1987) and other studies provide the theoretical rationale for the following hypotheses concerning country characteristics as sources of IIT.

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The extent of IIT between any two countries will be positively correlated; a) with their average per capita income, b) with their average size (economies of scale) (weak hypothesis), c) with the existence of common borders, d) with their joint participation in a regional integration and negatively correlated; a) with the differences between their per capita income (differences in their demand structure), b) with the difference between their size, c) with the distance between them, d) with their average level of trade barriers (Balassa and Bauwens, 1988,p.95).

Shortly, all models developed by theorists suggest that factors conducive to IIT include similar taste/culture, similar factor endowments, economies of scale, geographical closeness and low barriers to trade. The relative importance of intra-industry and inter-industry trade depends on how similar countries are. If home and foreign countries are similar in their capital-labour ratios, then there will be little inter-industry trade and IIT based ultimately on economies of scale will be dominant.

IIT produces extra gains from international trade, over and above those from comparative advantage, because IIT allows countries to benefit from larger markets by engaging in IIT. A country can simultaneously reduce the number of products it produces and increase the variety of goods available to domestic consumers. By producing fewer varieties, a country can produce each at larger scale, with higher productivity and lower costs. At the same time, consumers benefit from the increased range of choice.

Turkey applied to the European Economic Community on 31 September 1959 and signed the Ankara Agreement on the twelfth of September 1964, which opened the way for Turkey to become full member of the European Union (E.U).

On the 24 January 1980, very liberal macroeconomic policies have become effective in Turkey. This date was the beginning of the reversal of earlier policies, and from then on, a series of changes and measures were introduced amounting to a stabilisation and liberalisation.

Turkey has been trying to take all necessary steps to integrate its market both to the World and the European market. Also a customs union has become effective on the January-1 1996.

To understand whether these liberalisation policies and the customs union membership have promoted IIT of Turkey or not, IIT indices between Turkey and a group of selected countries have to be examined. This is one of the main purposes of this study but also the country specific hypotheses will be tested for Turkey in this study as well. We are going to search whether Turkey's results are supporting the country-specific hypotheses or not.

It is believed that there is the scarcity of empirical work on IIT especially for Turkey.

In this study IIT indices are calculated for the 1988-1998 period by using adjusted Grubel Lloyd index and by using Standard Industrial Trade Classification (SITC) at the 2-digit level. Also above country specific hypotheses are tested by using pooled cross section and time series regression analysis for Turkey's trade with 14 countries namely England, Germany, France, Italy, Israel, U.S.A, Japan, China, South Korea, India, Egypt, Canada, Greece, Spain. IIT index shown in Table.2 includes IIT indices of the Russian Federation and of two aggregates (OECD and the European Union Countries) as well.

2. THEORY

Over the last decade the literature on IIT has grown enormously. Both 'broadening' and 'deepening' has taken place with regard to measurement, the enriching of theoretical models and econometric analysis. (D. Greenaway and J. Torstensson, 1996)

Classical and neoclassical trade theorists ignored several important factors influencing the nature and direction of international trade. The new approaches take into account the impact of other influences on trade flows that had been ignored before. They relax several assumptions employed in the basic trade model. Some of the implications of this relaxation are presented in theories that incorporate differences in technology across countries, an active role for demand conditions, economies of scale, imperfect competition, and a time dimension to comparative advantage. IIT is a common element in several theories and it is a prominent feature in the international trade of manufactured goods. The causes of trade are more complex than portrayed in the basic Hecksher-Ohlin Model. (D.Appleyard and A.J. Field, 1995, p.163)

The theoretical literature on imperfect competition and IIT developed rapidly in the late 1970's and early 1980's through work on two different cases. The first group includes large number cases by inter alia Krugman(1979), Dixit and Norman (1980) and Helpman (1981). The second group includes small number cases by others, Shaked and Sutton (1984) and Brander (1981).

Large numbers of cases have in common explicit assumption of free entry into the market, and an assumption that consumer preferences are sufficiently diverse to ensure that a large number of single product firms co-exist in the equilibrium. The treatment of consumer preferences differs from model to model with in some cases consumers demanding a single horizontally differentiated variety (e.g. Lancaster,1980; Helpman, 1981) or a single vertically differentiated variety (Falvey, 1981), or demanding all available varieties (e.g. Krugman, 1979; 1980; Venables, 1984).

Small numbers model are differing in their treatment of conjectural variation. Some of these models assume Cournot assumption of zero conjectural variation in a single stage game, some use the Bertrand assumption in a three stage decision making process. As well as differing in their treatment of conjectural variation these models also differ with regard to product type; identical products (e.g. Brander, 1981), horizontally differentiated products (differences in their characteristics), (e.g. Eaton, Kierzowski, 1984) or vertically differentiated products (differences in quality between similar products), (e.g. Shaked, Sutton, 1984) being assumed; and on entry conditions -some assume blocked entry, others free entry. (D.Greenaway and C.Milner, 1987. p.43)

All the 'large numbers' models assume that each firm ignores the impact of its decisions on the market as a whole. The other broad class of models is the 'small number' or 'oligopolistic' models. There are more than one, but still not many firms compete in a market. In these models there is a strategic interdependence between firms in the industry (strategic interaction). For this reason the appropriate tool for its analysis is the game theory.

In small number models, it has been showed that oligopolistic interaction between firms can cause trade in the absence of any of the usual motivation for trade; neither cost differences nor economies of scale are necessary. (E.Cepni, 1999, p.18)

New trade theories have increased the consonance between theory and reality. Trade theory now can explain why similar countries will engage in trade and why that trade may not generate such distributional conflicts as commonly arise when exchange takes place between countries at different levels of development.

3. MEASUREMENT OF INTRA-INDUSTRY TRADE

The preferred measure of IIT and the measure adopted in this paper is the adjusted Grubel and Lloyd index using Standard Industrial Trade Classification (SITC) at the 2-digit level. In order to show the levels of IIT of Turkey with selected 15 countries and two aggregates (the OECD and the European Union) we have made 3 classifications. First IIT indices for Turkey's total trade (SITC 0-8) were calculated, then section zero (food and live animals) was excluded from calculation and indices were found from 1to 8 categories. Finally indices for manufacturing industries (SITC 5-8) were calculated. Table.1 shows the one-digit level sections of Standard Industrial Trade Classification Rev.3.

Table 1: SITC Rev.3 Sections at 1-digit level

SITC SECTION
0 Food and live animals 1 Beverages and tobacco
2 Crude materials, inedible, except fuels
3 Mineral fuels, lubricants and related materials
4 Animal and vegetable oils, fats and waxes
5 Chemicals and related products, n.e.s
6 Manufactured goods classified chiefly by material
7 Machinery and transport equipment
8 Miscellaneous manufactured articles

The empirical literature of IIT uses almost exclusively an index proposed by Grubel and Lloyd (1975), which is given by:

$$B_j = 1 - | Xij - Mij | / (Xij + Mij)$$

Where j is the country, i is the industry, X is export, M is import. (H. G. Grubel and P. J. Lloyd, 1975a)

The index will be equal 1 if exports are equal to imports in each category. This means there is a complete matching in any industry. The index will be zero if, in each category, there are exports or imports but not both. Therefore, zero means complete inter-industry specialisation of the Hecksher-Ohlin-Samuelson nature, while 1 means complete IIT specialisation. (J. Pelkman, 1984, p.100)

One problem with Grubel-Lloyd index is that the mean is biased downward if the country's total trade is imbalanced or if the mean is an average of some subset of all industries for which exports are not equal to imports. With an imbalance between exports and imports the mean must be less than 100 no matter what the pattern of exports and imports, because export cannot match imports in every industry. This is an undesirable feature of a measure of average IIT. (H.G. Grubel and P.J.Lloyd, 1975b, p.22)

In this study to find IIT by country adjusted Grubel-Lloyd (G.L) index will be used.

$$B_j = 1 - \Sigma \mid X_{ij} / X_j - M_{ij} / M_j \mid / \Sigma (X_{ij} / X_j + M_{ij} / M_j)$$

This formula makes adjustment for the imbalance in total trade, when Xj stands for total exports and Mj for total imports. Again the index takes values from 0 to 1 as the extent of IIT increases. This formula is the IIT of individual country with the rest of the world.

For the index of IIT for any pairs of countries (IIT jk) the following formula will be used and the adjustment will be made on a bilateral basis.

$$B_{jk} = 1 - \Sigma \mid X_{jki} / X_{jk} - M_{jki} / M_{jk} \mid / \Sigma (X_{jki} / X_{jk} + M_{jki} / M_{jk})$$

This is the formula for the adjusted exports and imports of commodity i in trade between countries j and k.

4. THE IIT PATTERN OF TURKEY

Table.2 shows the average levels of IIT indices of Turkey at the two-digit level for different categories (SITC 0-8, SITC 1-8, SITC 5-8) with the selected countries, with the European Union and with the OECD countries from 1989 to 1999.

IIT indices with selected countries from 1989 to 1999 at 2-digit level were multiplied by 100. Table.2 also explains the way in which patterns of IIT evolve.

As expected from the theoretical work, IIT is the highest in those categories, which could be classified as manufactures (defined as SITC 5-8) as this is where there is greatest scope for product differentiation. It can be seen from the Table.2 that all IIT indices are higher for 5-8 sections than 1-8 sections.

According to industry specific hypotheses we know that, IIT will be greater, the

greater the potential for product differentiation. Also economies of scale, monopolistic competition or oligopolistic market structure play very important roles to explain IIT. Industries between 5-8 are capital-intensive sectors. These are the sectors that product differentiation, technology, economies of scale and oligopolistic market structure are the determinants of production. Apart from seasonal and border trade, IIT specialization is not expected to take place in standardized commodities.

Table 2: Intra-Industry Trade With Turkey (%)

	France			England			Italy		
	0-8	1- 8	5- 8	0-8	1- 8	5- 8	0-8	1- 8	5- 8
1989	31,51	31,31	34,70	26,48	29,49	33,23	31,33	31,87	41,21
1990	29,13	29,65	28,65	28,80	29,36	30,76	30,19	33,37	42,18
1991	23,88	22,00	23,44	28,31	27,82	32,96	33,14	32,00	37,26
1992	28,94	27,16	26,73	27,65	26,75	28,10	30,88	31,19	38,16
1993	27,84	27,71	27,57	27,17	27,14	28,51	31,22	33,73	42,35
1994	32,19	31,69	31,10	32,57	32,67	33,60	33,11	34,19	38,02
1995	32,51	32,17	34,58	28,66	28,59	31,81	31,97	33,98	40,98
1996	34,89	37,39	43,99	36,13	35,41	37,07	35,48	35,57	41,96
1997	40,30	42,14	42,07	34,28	33,45	37,95	35,73	36,27	42,94
1998	36,00	36,29	41,12	31,88	33,62	39,74	38,80	40,70	42,30
1999	38,73	40,11	44,51	34,63	37,18	44,06	36,70	37,70	40,95
	Germany			Greece			Spain		
	0-8	1- 8	5- 8	0-8	1- 8	5- 8	0-8	1- 8	5- 8
1989	24,12	22,70	24,32	27,92	31,42	35,40	16,33	16,05	22,92
1990	27,23	26,47	28,73	33,53	37,67	37,54	20,22	21,24	26,98
1991	28,27	28,48	30,50	35,01	38,37	42,66	20,27	18,28	20,37
1992	24,49	24,70	28,56	32,97	35,90	40,78	22,87	21,07	25,76
1993	23,75	23,68	27,39	29,95	33,16	37,60	23,80	24,80	27,64
1994	27,33	27,47	33,83	30,72	34,54	37,26	30,04	30,04	35,24
1995	31,21	30,99	37,45	36,97	38,53	38,70	31,77	30,76	36,01
1996	30,10	30,73	37,83	39,94	43,33	45,77	34,29	33,71	36,82
1997	33,82	32,41	38,50	33,38	36,27	39,93	36,79	36,83	41,22
1998	31,99	30,80	37,24	32,69	33,99	37,50	39,17	39,11	43,21
1999	33,71	35,43	39,32	33,35	35,88	38,62	38,37	38,36	46,30
	Russian Federation			USA			Canada		
	0-8	1- 8	5- 8	0-8	1- 8	5- 8	0-8	1- 8	5- 8
1989	-	-	-	-	24,01	26,74	15,03	15,26	16,51
1990	-	-	-	-	27,08	31,99	15,24	15,23	16,21
1991	-	-	-	-	26,73	28,28	11,47	11,68	13,30
1992	23,02	25,78	27,09	27,46	30,40	33,11	20,41	23,05	27,86
1993	15,81	18,40	20,94	25,65	28,01	31,46	14,45	16,82	20,74
1994	19,67	20,99	22,62	26,76	26,46	28,56	25,98	28,78	33,61
1995	16,84	14,83	15,78	27,48	30,67	34,86	16,55	17,36	20,93
1996	15,36	16,50	17,44	28,79	30,00	34,80	20,58	22,36	25,50
1997	19,78	19,81	23,24	30,44	32,93	36,11	23,06	25,17	23,96
1998	17,67	18,02	21,01	27,56	30,03	31,57	23,38	24,74	24,88
1999	19,98	20,19	19,91	32,40	36,40	40,71	25,27	26,44	26,51
	China			South Korea			Japan		
	0-8	1- 8	5- 8	0-8	1- 8	5- 8	0-8	1- 8	5- 8
1989	11,61	12,69	12,94	10,65	11,47	12,60	9,97	11,02	11,08
1990	10,87	9,81	11,29	8,52	9,56	8,85	11,83	13,90	16,89
1991	7,44	8,55	9,85	8,45	9,63	9,60	14,72	16,67	20,20
1992	11,42	12,30	8,35	16,22	18,86	15,53	11,94	13,09	17,19
1993	6,83	7,43	5,72	13,52	15,02	16,33	9,71	10,81	15,22
1994	10,66	11,19	12,45	16,46	17,96	17,90	17,32	18,97	21,54
1995	14,94	14,01	17,24	19,73	21,92	23,31	15,37	17,66	23,17
1996	23,79	25,35	31,89	21,80	24,70	28,40	17,01	19,75	23,02
1997	19,74	20,38	26,71	18,93	21,69	25,76	19,63	18,74	24,55
1998	22,91	23,45	26,64	13,70	15,38	19,79	16,13	17,20	23,63
1999	29,56	30,85	35,62	20,24	22,82	25,07	16,82	18,62	25,29

Table 2: Continued

	Egypt			Israel			India		
	0-8	1- 8	5- 8	0-8	1- 8	5- 8	0-8	1- 8	5- 8
1989	8,65	7,44	8,46	28,69	33,81	37,79	10,37	10,79	12,80
1990	10,31	7,54	8,02	26,39	28,96	30,82	11,16	11,31	10,44
1991	10,06	10,55	9,55	22,45	26,01	28,11	11,95	13,89	13,62
1992	12,37	13,36	16,53	26,36	31,58	36,95	11,85	13,49	15,75
1993	15,10	15,86	16,54	24,74	28,23	32,26	11,21	13,02	10,65
1994	12,00	12,62	13,93	24,69	28,16	34,27	13,15	15,10	14,73
1995	16,68	16,14	18,25	27,86	30,48	35,67	20,67	25,97	27,06
1996	19,97	20,85	20,74	26,50	29,28	35,26	21,74	25,16	30,87
1997	18,49	16,65	17,82	27,12	31,20	39,62	30,98	35,65	37,72
1998	16,17	16,32	17,71	33,02	36,39	44,44	30,68	32,93	36,04
1999	23,42	22,72	27,60	27,21	28,90	35,19	27,32	30,57	31,08
	Europen Union			**OECD Countries**					
	0-8	1- 8	5- 8	0-8	1- 8	5- 8			
1989	34,94	34,99	37,65	36,07	35,33	38,17			
1990	36,03	36,15	35,80	36,11	36,71	38,26			
1991	35,40	34,50	34,84	38,15	38,10	37,02			
1992	36,79	36,60	35,33	39,35	40,06	38,68			
1993	34,89	34,58	35,19	35,56	36,29	37,13			
1994	39,96	38,97	39,08	40,40	39,95	40,52			
1995	39,09	40,18	42,16	40,13	41,73	42,73			
1996	39,70	40,21	44,57	43,43	45,68	46,83			
1997	41,58	41,82	44,16	41,43	43,36	45,31			
1998	41,98	43,32	46,08	41,75	44,49	46,32			
1999	42,22	44,07	47,53	43,90	46,84	49,24			

Table.2 shows that IIT for Turkey is highest with the OECD countries and with the European Union countries. This is consistent with theory as well. In theory there are three grounds that integration can exert positive impact on IIT. First, if integration should result in incomes per head in the bloc rising faster than they otherwise would have done, then since the demand for variety is known to increase as income per head rises, trade in differentiated products might be expected to rise faster than otherwise, giving more scope for IIT. Secondly, customs unions and other forms of integration normally entail a reduction or elimination of non-tariff barriers to intra-union trade. This might be expected to reinforce the IIT component of trade in expansion in a customs union. Thirdly, a custom union may, as is the case of the European Union, be a component of a common market in which factor as well as product markets are integrated. IIT may than be generated partly as a result of foreign direct investment conducted by transnational corporations that may adopt a strategy of specializing on the production of

particular varieties of their products in their affiliated enterprises within the bloc. But these are only possibilities (P.Robson,1987, p.42).In 1999, 47,5 per cent of Turkey's trade with the European Union was IIT. The IIT indices for the E.U members are between 38,62% and 46,30 in 1999. IIT is highest with Spain and lowest with Greece (in the E.U). It can be seen that IIT with the E.U has been increasing over the last 10 years.

In 1999, IIT between the USA and Turkey was around 40 per cent. Although the USA market is a far market for Turkish producers, this relatively high IIT can be explained by historical political closeness with the USA. IIT with other far markets namely Canada, South Korea, Japan, are relatively low. It is 26,51 per cent with Canada, 25,07 per cent with South Korea and 25,29 per cent with Japan in 1999. Lowe (1991) notes that Japan has very low IIT with all OECD nations and attributes this to protectionist trade and development policy. Although formal tariff and non-tariff barriers are not high, the perception is that Japan's manufacturing sector is highly protected by long-standing business relationships and control of the distribution system, which make it difficult for foreigners to penetrate. (K.Matthews, 1998, p. 95)

IIT with China, with Israel and with India were close to each other in 1999. They are at around 35.5 %, 35.1 % and 31 % respectively.

The Russian Federation is of considerable importance to Turkey. This market is geographically very close to Turkey and has been adapting itself to the free market economy. But IIT with the Russian Federation is relatively low and it is just around 20 %. This can be explained by their low per capita income level. The more their income rises, the more the variety they can consume.

As a result it can be said that IIT is highest with our traditional trading partners, the European Union countries.

5. DETERMINANTS OF TURKISH IIT and EMPIRICAL RESULTS

A variety of hypotheses have been put forward as to the effects of country characteristics on IIT. Greenaway and Milner (1986), Balassa and Bauwens (1987) and other studies provide the theoretical rationale for the following hypotheses concerning country characteristics as sources of IIT.

The extent of IIT between any two countries will be positively correlated; a) with their average per capita income, b) with their average size (economies of scale) (weak hypothesis), c) with the existence of common borders, d) with their joint participation in a regional integration and negatively correlated; a) with the differences between their per capita income (differences in their demand structure), b) with the difference between their size, c) with the distance between them, d) with their average level of trade barriers.(Balassa and Bauwens, 1988,p.95)

These hypotheses are tested using pooled cross-section and time series regression analysis for Turkish trade with 14 countries, namely England, Germany, Canada, France, Italy, Spain, Israel, Egypt, the USA, Greece, India, Japan, China, South Korea (because of the lack of adequate data for the Russian Federation, this country was excluded from the regression).

The basic model is:

$$IIT_{Tj} = \alpha + \beta_1 APC_{Tj} + \beta_2 DPC_{Tj} + \beta_3 WDIST_{Tj} + \beta_4 TO_{Tj} + \beta_5 D_T + U_{Tj}$$

Which all variables (except TO) are in logs.

IIT_{Tj} : bilateral IIT (SITC 5-8) of Turkey with country j,

APC_{Tj} : Average per capita income for Turkey and country j. The expected sign is positive. As average per capita income increases, and the demand for differentiated products increases, then IIT is expected to rise. This variable was obtained by using GDP, exchange rate and population time series.The data was obtained from IMF's International Financial Statistics CD-ROM.

DPC_{Tj} : relative difference in per capita income between Turkey and country j. The expected sign is negative. As the relative difference in per capita income declines, and tastes become more similar, then IIT is expected to rise. The data used are the same as for APC. Rather than taking absolute values of intercountry differences in per capita incomes, a relative inequality measure that takes values 0 and 1 was used. The relative inequality measure is shown:

$$DPC_{Tj} = 1 + [(w) \ln (w) + (1-w) \ln(1-w)] / \ln 2$$

Where w refers to the ratio of average per capita income in country j to the sum of this characteristic in country j and partner country.

$WDIST_{Tj}$:The direct line distance in kilometres between Istanbul and the capital city of country j weighted by the size of country j. That is

$WDIST_{Tj} = DIST_{Tj} * GDP_j / \Sigma GDP$ of 14 countries.

The expected sign is negative. The distances in kilometres between Istanbul and the capital cities of sample counties were obtained from the web site of International Air Transport Association (IATA).

TO_{Tj} : trade orientation. (the existence of trade barriers). This is the sum of the trade orientation index for Turkey and country j. Trade orientation index is proxied as the residuals from panel data regression of per capita import (M) of country j on respective per capita income (Y) and population (P). The extent of IIT will be larger, the lower trade barriers between Turkey and country j. Consequently, a proxy for trade barriers, follow-

ing Balassa and Bauwens (1987), is defined in terms of percentage deviation of actual from hypothetical values of per capita trade. Positive deviations indicate relatively open trade orientation and expected sign on this proxy is positive.

Table 3: Panel Data Regression For TO Indices

Dependent Variable: M				
Method: GLS (Cross Section Weights)				
Sample. 1 15				
Total Panel Observations: 150				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
P	-0,27	0,021	-12,74	0,0000
Y	0,89	0,020	43,92	0,0000
Fixed Effects				
89_C	-6,55			
90_C	-6,54			
91_C	-6,57			
92_C	-6,59			
93_C	-6,59			
94_C	-6,52			
95_C	-6,45			
96_C	-6,42			
97_C	-6,37			
98_C	-6,41			
R Squared: 0,964931 Adjusted R Squared:0,9621				

Summary statistics of trade orientation for each country from 1989 to 1998 are presented in Table.4. If countries are ranked according to their openness on average level, the list in Table.5 is obtained. According to this measure China, South Korea and England have the most open trade orientation on average over the period , while Japan is the most closed economy. Although formal tariff and non-tariff barriers are not high in Japan, similar results were found by other studies as well. It is believed that because of the long-standing relationships of Japanese firms, it is difficult for foreigners to penetrate the Japanese market.

D_T : dummy is used for the European Union members. To understand whether integration effect is statistically significant or not, dummy has been used for The European Union members. D= 1 for England, Germany, Italy, Spain, Greece, France and D= 0 for all other countries.

To find the IIT indices, the data for imports and exports of Turkey with these selected countries has been obtained from the State Statistical Institute (according to SITC Rev.3 at 2-digit level) and all other data again has been obtained by scanning International Financial Statistics.

Table 4: Trade Orientation Indices

	1989	1990	1991	1992	1993	1994	1995	1996
GER	0,4	0,41	0,43	0,35	0,23	0,21	0,18	0,17
FRA	0,18	0,16	0,18	0,14	0,02	0,05	0,03	0
SPA	-0,02	-0,06	-0,03	-0,03	-0,9	-0,01	0	0,01
GRE	-0,18	-0,18	-0,12	-0,13	-0,12	-0,27	-0,31	-0,33
ITA	0,07	0,02	0,01	-0,01	-0,06	-0,01	0,06	-0,06
ENG	0,36	0,33	0,26	0,28	0,32	0,28	0,29	0,32
USA	-0,2	-0,22	-0,23	-0,16	-0,12	-0,11	-0,11	-0,11
CAN	0,09	0,06	0,08	0,16	0,26	0,3	0,27	0,26
EGY	-0,02	0,11	-0,02	-0,1	-0,22	-0,15	-0,22	-0,23
JAP	-0,57	-0,48	-0,56	-0,64	-0,73	-0,75	-0,71	-0,59
KOR	0,34	0,33	0,41	0,35	0,29	0,27	0,32	0,39
IND	-0,5	-0,44	-0,47	-0,28	-0,34	-0,36	-0,29	-0,26
CHI	0,43	0,31	0,42	0,56	0,56	0,67	0,49	0,4
ISR	-0,05	-0,05	-0,03	-0,17	0,15	0,04	0,02	-0,04
TUR	-0,32	-0,31	-0,35	-0,31	-0,17	-0,15	-0,02	0,1

The model is estimated in Eviews using 'pool' command. The empirical results largely support the hypotheses presented in the theory of IIT. Most variables have the expected sign and statistically significant. (With one exception)

Table 5: From the Most Open to Most Closed TO Ranking

Average (1989-1998)	
CHINA	0,44
KOREA	0,37
ENGLAND	0,29
GERMANY	0,28
CANADA	0,22
FRANCE	0,08
ITALY	0
SPAIN	-0,01
ISRAEL	-0,04
TURKEY	-0,14
EGYPT	-0,14
USA	-0,15
GREECE	-0,23
INDIA	-0,35
JAPAN	-0,63

Table 6: Model Results

Dependent Variable: LIIT				
Method: GLS (Cross Section Weights)				
Sample: 1989 1999				
Total Panel Observations: 140				
Variable (expected sign)	Coefficient	Std. Error	t-Statistic	Prob.
C	1,64	0,51	3,15	0,0020
LAPC (+)	0,25	0,05	4,69	0,0009
LDPC (-)	0,24	0,07	3,39	0,0000
LWDIST (-)	-0,11	0,012	-9,82	0,0000
TO (+)	0,17	0,059	2,96	0,0036
D (+)	0,19	0,042	4,62	0,0000
R-squared (Weighted Statistics): 0,988611 Adjusted R squared: 0,988186				
R-squared (Unweighted Statistics) : 0,515				

Looking at the comparison of estimated coefficients in Table.6, the APC variable has the right sign and is statistically significant. So as average per capita incomes rise, demand for differentiated products rises, Turkey would expect a significant increase in the proportion of trade that is IIT.

The estimated coefficient on the DPC variable interestingly suggests that differences in relative incomes have a positive and statistically significant impact on IIT. This positive and statistically significant result may be explained by Turkey's European Union membership. IIT for Turkey is highest with the European Union members and these are the countries, which have big differences with Turkey in terms of per capita income.

The estimated coefficient on the distance variable has the right sign and is statistically very significant.

The estimated coefficient on TO variable has the right sign and is statistically significant as well. This proxy suggests that a more open trade orientation between Turkey and other countries would lead to a significant rise in IIT between Turkey and these countries. Larger the extent of IIT, lower trade barriers.

The estimated coefficients on Dummy variable has the right sign and statistically significant. This result supports the hypothesis that IIT will be greater in the trade of economies subject to some form of economic integration. The integration effect dummy for Turkey is consistent with the theory.

6. UNSOLVED PROBLEMS OF IIT

To measure IIT, there are two important problems. The first one is this; there is no agreed single definition for 'industry'. The second one is, to decide on the appropriate level of disaggregation to use. Since Grubel and Lloyd (1975), as a definition for industry, two main criteria have been used, but neither is dominant. First, the degree of substitutability on the demand side (similarity of end-use characteristics, determined by cross-elasticities). Second, the set and proportions of input requirements.

According to the first criterion, two different products are the output of a single industry if it is relatively easy to substitute one for the other in the production process. So cars, lorries, buses could all be considered to be outputs of the same industry.

According to the second criterion, different products are the output of the same industry if the consumers of the product put them to the same use. So, glass, plastic and cardboard milk containers could be considered to be outputs of the same industry.

The measurement problem is that trade or industry statistics do not exactly follow this criteria, or sometimes only at a high level of disaggregation, but then different products may need to be studied at different levels of aggregation and this is either impossible or somewhat arbitrary in practice (B.Sodersten and G.Reed, 1994,p.174)

Although there is no unanimity on what level of international trade classification is most suitable for IIT indices, in practice, the two-.three- or four digit levels of the Standard Industrial Trade Classification (SITC) are often used in the estimates. Three digit is most preferred level in empirical works but three-digit groups often contain products of heterogeneous characteristics. SITC categories sometimes group goods with similar consumption uses, but different factor inputs. Trade in this industry would be measured as intra-industry, when in fact it is motivated by relative factor abundance(D.Hummels and J.Levinsohn, 1995,p.824) However, the use of more detailed systems of classification in the estimates does not necessarily solve the problem. Too-detailed system of disaggregation would tend to separate commodities that are good substitutes in production (P.K.M.Tharakan and G.Calfat,1996,p.72).So , it is possible to say that SITC is a product-based, not an industry-based classification. Hence, each SITC category necessarily involves some aggregation of products produced in different industries.

7. CONCLUSION

Turkish IIT has been growing as a proportion of total trade over the past 10 years. IIT is highest with the European Union members and at around 50 percent level, largely reflecting the high degree of integration of these economies.

IIT with other countries ranges between 20 (the Russian Federation) per cent to 40 percent (the USA) which is relatively low.

The empirical evidence presented in this paper approves that average and relative per capita incomes, distance, trade orientation and economic integration membership are all important factors explaining trends of IIT for Turkey.

The growing econometric literature on IIT suggests that it is related to various determining factors, such as country and industry characteristics. The results of these studies suggest some general conclusions.

Some of these studies have found the right sign for the explanatory variables but statistically insignificant, some have found the wrong sign. But majority of these studies suggests some general conclusions on the country specific hypotheses (Loertscher and

Wolter(1980)- Havrylyshyn and Civan(1983)- Tharakan (1984)- Balassa(1986).

The major country specific hypotheses are that average levels of IIT will be higher: a) in Developed Economies rather than Less Developed Countries because of differences in incomes and in economic structure; b) in 'large ' countries than in small ones since the scope for product diversity and economies of scale may be expected to be higher in the former (a weak hypotheses); c) when there is taste overlap between trading partners, since this may increase the scope for the exchange of differentiated commodities; d) when trading partners are geographically close, either because proximity means lower transport costs or because physical proximity is positively correlated with similarity of cultures and tastes.

There is broad similarity between the studies. The general consistency of the signs of estimated coefficients with those expected, and the significance levels of the coefficients give very strong support for the country-specific hypotheses. It is reasonable to make the overall conclusion is that, there is strong support for the view that there are consistent inter-country variations in average levels of IIT, related to their level of development, market size and physical-cultural proximity.

Also in this study it has been found that Turkish case is consistent with theory. The estimated coefficients have right sign and statistically significant except one. This may be explained by the special case of Turkey. 'Differences of per capita incomes' variable not only has wrong sign for Turkey but also statistically significant. The highest IIT is with the European Union countries and the differences of per capita incomes with these countries are quite high. All other explanatory variables have right sign and statistically significant.

There are also some deficiencies of this study as well. First, because of the lack of adequate data we have limited the time length. The classification system of State Statistic Institute was different before 1989 that it will take time to make necessary adjustments and expand the length of the time (this expanding is also being prepared).

Second important point that should be noted is this; the sample countries were chosen arbitrarily. It can be chosen by using some criterion such as ranking countries according to their per capita trade with Turkey in descending order. Foreign trade must be high between countries in order to test hypotheses of IIT effectively.

Although there are some deficiencies, it is believed that this study is setting interesting information about the Turkish Economy and its foreign trade patterns.

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