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Determinants of Intra-Textile and Clothing Trade: The Case of OECD Countries

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ABSTRACT

This paper examines the extents and determinants of intra-industry textile and clothing trade for the OECD countries. Trade overlap is used as the measurement of intra-industry trade (IIT). The general trend of intra-OECD trade and the extents of IIT for textile and clothing trade in year 2000 were examined. Hypotheses relating to 5 country-specific variables tested showed strong significance reflecting the different roles of the factors in the determination of IIT. It was also identified that bilateral IIT in textile and clothing between OECD countries are highly correlated.

Keywords: intra-industry trade, textile and clothing, OECD, country-specific, trade overlap

1. Introduction

International trade has grown rapidly after the World War II. According to WTO trade statistics, trade of manufacture products has grown by more than 100 folds, from US$ 41 bn in 1955 to US$4,630 bn in 2000, which also represented 74.9% of the world merchandise trade in 2000.[1] In the trade of manufactures, a significant proportion of trading between market economies are intra-industry trade (IIT), i.e. the simultaneous exports and imports within the same product category classification[2]. IIT is of great importance as it is regarded as more beneficial than inter-industry trade or able to stimulate innovation and exploit economies of scale in order to get profits in trade. Moreover, IIT is less disruptive than inter-industry trade in that productive factors remain within the same industry and do not switch from one industry to another. In 1996, IIT constitutes 57% of the US trade and more than 60% of the trade in Europe [3].

The Organization for Economic Cooperation and Development (OECD) is an international organization consisting of 24 developed countries and 6 developing countries(1) with an aim to

(1) OECD countries include:
Developed countries - Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Korea, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom and United States
Developing countries - Czech Republic, Hungary, Mexico, Poland, Slovakia and Turkey
Source: World Bank website (www.worldbank.org); Economies are divided according to 2001 GNI per capita, calculated using the World Bank Atlas method. High income countries (US$ 9206 or more) are regarded as developed countries

help governments to tackle economic, social and governance challenges in the globalized economy. In 2000, OECD economies consisted of only 19% of total world population but contributed to 83% of the world's GDP.[4] With its significant role in global economy and trade, the potential of IIT within the OECD member countries is expected to be quite high.

The textile and clothing (T&C) industry is one of the most important and closely related manufacturing industries for the OECD economies. It is a diverse and heterogeneous industry with products being used by both private households and business alike. The activities range from the production of raw materials to the manufacture of a wide variety of semi-finished and finished products. The T&C industry also intertwined with other sectors such as the agricultural, chemical and other industrial sectors. Statistics showed that the growth of global T&C exports has grown by more than 60 times, from US$ 5.5 bn in 1955 to US$ 356.4 bn in 2000. In 2000, 9 of the 15 leading T&C exporters and 13 of the top 15 T&C importers in the world were OECD countries. Moreover, T&C trade within OECD countries (intra-OECD trade) is also significant and amounted to US$ 66.9 bn and US$ 71 bn respectively in 2000. In terms of world share, these values represented 42.5% and 35.7% respectively of the global T&C trade.

Over the past four decades, there have been many theoretical and empirical studies relating to the phenomenon of IIT. However, many studies have discussed United States trade or selected OECD nations and basically most of the studies that examined IIT related to data of all 'industries' or all 'manufacturing industries'. This paper studies the IIT of 2 closely related industries - the T&C industry of the OECD countries.

The following content highlights the importance and assesses the determinants of IIT of the T&C trade within the OECD countries by examining and analyzing the general trend of intra-OECD trade and the extents of IIT for the T&C industry in 2000. For the determinants of IIT, hypothesis for the country-specific factors including total GDP per capita, difference in GDP per capita, differences in distance, population, the effects of border trade and trade blocs were tested.

2. Literature Review

The existence of IIT as one of the alternatives of contemporary trade theories, was first acknowledged by Ohlin [5]. However, it was not until the 1960s that the phenomenon of IIT was empirically studied and presented when economists began to assess the impact of the formation of Benelux and the European Economic Community (EEC) on the trade patterns of its member countries. To name a few, Verdoorn [6], using a sample of 121 products at comparable level of international trade classification, for 2 different points in time, found that specialization and exchange since the formation of the Benelux customs union took place within rather than between different categories of products, thus suggesting a trend towards *intra-industry trade* (IIT) rather than *inter-industry trade*. Similarly, Balassa [7] examined eighty-five commodity groups (3-digit SITC categories in Section 5-8) and found that between 1958 and 1961, much of the increased trade in manufactures among the members of the EEC also occurred within rather than between commodity groups. These studies provided the grounds for the existence of IIT trade and the motivations for the subsequent economical work on various issues, including the methods of measurement, levels, trends, theory and determinants of IIT.

Empirical studies concerning the determinants of IIT were then followed by applying cross-sectional examinations which focused on industry-specific factors. The industry-specific determinants included product differentiation, transportation costs, scale economies, offshore assembly provisions, size of foreign markets, marketing costs, export concentration ratio and degree of aggregation. For examples, Caves [8] examined the trade flow within all 14 OECD countries in his study using independent variables included the economies of scale, R&D expenditures and other 4 variables such as the number of product groups or tariff positions for each industry, Hufbauer index(2), input into sales activities and advertising/sales ratio as proxies for product differentiation and the extent of foreign investment activities as a measurement of foreign direct investment (FDI) to determine the industry-specific factors affecting the extent of IIT.

In contrast, some studies employed a country-specific approach or a mixture of both county and industry approach. Loertscher and Wolter [9] tried to explain the extent of IIT using a sample of bilateral trade flows among OECD countries. They postulated that IIT among countries will be higher if the average of their development (average per capita income) is high, differences in their levels of development are relatively small, the average of their markets size is large, the differences in their market size are small, barriers to trade are low, geographical, linguistic and cultural differences are small and if the trading partners belong to the same customs union or have common borders. Results indicated that IIT intensity across countries was significant and negatively correlated with development stages differentials, market size differentials and the distance between the trading partners whereas the correlation was significant and positive for the average market size and the existence of customs union. Balassa [10] tested the determinants of IIT in manufactured goods in bilateral trade among countries whose manufactured exports exceeded $300 US million. The share of IIT was modeled as a function of log of average per capita GNP, differences in per capita GNP, weighted difference in GNP, differences in geographical distance, a trade orientation index as a proxy of the extent of trade restrictions and dummy variables for common border, language, and economic integration. Regression models were built for 4 different groups of countries – 'developed and developing countries combined', 'developed countries only', 'developing countries only' and 'trade between developed and developing countries'. It was found that for all of the 4 different groups, the regression coefficients of the average per capita income, average country size, trade orientation and border were all statistically significant at 1% level and positively correlated with the share of IIT while the coefficients of inequity in country size and geographical distance were significant but negatively correlated with the share of IIT. For the coefficient of income inequality, it was negatively correlated with the share of IIT but was only significant for the groups of 'developed and developing countries combined' and 'trade between developed and developing countries'. Balassa further explained the lack of statistical significance of the income inequality variables in the groups of 'developed countries only' and 'developing countries only' by the fact that with income differences being much smaller among developed countries or developing countries than in the entire group of countries, the demand structure of the countries concerned was also more similar. Accordingly, one may not expect large variations to occur in the extent of IIT as a function of income differences. For the dummy variables of language, and economic integration, it was identified that only some of the language variables and economic integration variables are significant in some of the regression equations.

Although there are many studies similar to those previously discussed, most of these studies have examined IIT using data of all trades or the entire manufacturing industries. However, empirical studies relate to a

(2) Hufbauer index equals to (δij / Mij) where δij = standard deviation of export unit values for shipments of goods i to country j, and Mij = outweighed mean of those united values.

specific set of industries or a single industry (case studies) are lacking. Tharakan [11] suggested the compilation of case studies could probably yield us as much useful insight into the phenomenon of IIT. Therefore, this study attempts to fill this gap by focusing specifically on the T&C industry.

Since only T&C industries were considered in this study, it would be more appropriate to examine the issue of IIT under a country-specific approach. Besides, there are certain advantages in taking a country-specific over an industry-specific approach. According to Stone [12], first, the variables used to explain inter-country differences, such as income levels as proxy for extent of the market, would not need the elaboration of construction that are required for many industry-specific studies. Secondly, these studies have implications relating to the differences between nations at different stages of development and income growth and may offer policy prescription for the future. Thirdly, the theoretical models of country-specific determinants are far better developed as many industry-specific studies rely largely on assumptions about variables that 'should' affect such trade, and it would be difficult to find adequate proxies to explain many of the assumed relationships.

3. The Measurement of Intra-Industry Trade

Intra-industry trade flows are conventionally defined as the two-way exchange of goods within the standard industrial classification. Although various measures of IIT are available, the one proposed by Grubel and Lloyd [13] may well be the most popularly recognized. The extent of intra-industry trade is measured by the Grubel-Lloyd (GL) index. For a particular industry (k), the ***bilateral*** GL index, B_{ijk} of country (i) with country (j) for an industry (k) is defined as:

$$B_{ijk} = [2 \min (X_{ijk}, M_{ijk})] / (X_{ijk} + M_{ijk}) \quad (1)$$

where X and M are the value of exports and imports, respectively. The term $[2 \min (X_{ijk}, M_{ijk})]$ is the amount of trade equal to twice the minimum of exports and imports, and is defined as the ***trade overlap*** of a country (i) with country (j) in an industry (k). Thus the bilateral GL index, B_{ijk}, measures intra-industry trade (i.e. trade overlap) as a percentage of total trade of industry (k) between the trade with countries (i) and (j). The range of B_{ijk} varies from 0 (when either X_{ijk} or M_{ijk} is zero, i.e. no IIT in industry (k)) to 1 (when $X_{ijk} = M_{ijk}$ so that all trade in industry (k) is IIT).

Grubel and Lloyd further suggested that the bilateral GL index may also apply to measure trade of country (i) in products of industry (k) with *different partner countries* or *country groups* (j), where the trade with each country is taken separately and gets a weighted average accordingly to the relative importance of its trade in the total trade. The corresponding *aggregate bilateral* GL index is defined as follows:

$$B^A_{ijk} = [\Sigma\, 2 \min (X_{ijk}, M_{ijk})] / [\Sigma\, (X_{ijk} + M_{ijk})] \quad (2)$$

where B^A_{ijk} measures the total trade overlap as a percentage of total exports plus imports of countries (i) with all partner countries(j) in an industry (k).

4. Significance of Intra-OECD Textile and Clothing Trade

Table A.1 in the Appendix shows the aggregate bilateral GL index, trade overlap and the total trade in the T&C industry for each OECD country with other OECD member countries, using data of the year 2000. Intra-OECD trade as a percentage of total world trade for each OECD member country is also presented.

For textile trade, the share of intra-OECD trade(3) for each individual OECD country as

(3) The calculation for the share of intra-OECD trade for each OECD country is the total exports and imports to and from OECD countries divided by the total exports and imports to and from the world.

a percentage of its total trade (total imports and exports) in 2000 was generally very high, except with 3 cases – Australia, Japan and Korea. This reflects the significant role of intra-OECD trade for most of the OECD countries. The share of intra-OECD trade for Australia was 47%. Whereas for the 2 Asian countries, Japan and Korea, their shares only attained 28% and 26%, respectively. This shows the reliance of intra-Asian trade for the 2 Asian OECD countries[4]. Apart from these 3 countries, the shares of intra-OECD textile trade for other OECD members ranged from 66% to 92%.

For clothing trade, the share of intra-OECD trade was generally lower than that of the textile industry for most of the OECD countries. One of the major reasons was probably the relatively large proportion of imports and heavy reliance of garment supplies from non-OECD countries where labor costs of apparel production are much lower than most of the OECD countries. Nevertheless, the shares of intra-OECD clothing trade for the OECD countries in Europe were still high, reaching 60% or higher.

For other non-European OECD nations, the variations in the shares of intra-OECD trade was large, with a low share of 16% for Japan to the highest share of 94% for Mexico. Two countries – Korea and USA, worth further mentioning. For Korea, the share of intra-OECD clothing trade was 76%, which was 50% higher than its share of intra-OECD textile trade. In fact, clothing trade between Korea and USA represented 39% of total clothing trade in 2000 for Korea. For USA, in contrast, the share of intra-OECD clothing trade was 29%, which was 35% lower than its share of intra-OECD textile trade. This can be illustrated by the fact that there were substantial intra clothing trade between USA and the non-OECD countries in Asia as well as those in Central and South America.

4.1 The Aggregate Bilateral Intra Textile and Clothing Trade for OECD Countries

In 2000, the aggregate bilateral GL indices of textile trade for all the OECD countries in Asia, N. America and Europe were higher than the clothing trade. This indicated that all these OECD countries had higher trade overlaps with respect to the total trade in the textile industry. The exceptional cases were the 2 Oceania countries with their total trade values with other OECD members in both T&C trade were very low compared with most of the other OECD nations. In terms of trade values, the OECD countries in N. America and Western Europe, on the average, had higher trade overlaps in both T&C trade with other OECD countries. For the Oceania region, Northern Europe and Eastern Europe, their trade overlaps were relatively lower, though some of the Eastern European countries had moderate trade overlaps in the textile industry. This situation was more obvious in the clothing industry, where only Denmark out of 13 countries in these regions sustained a trade overlap of over US$ 1 bn. For the 2 Asian countries Japan and Korea, the situation was somewhat different, while they achieved moderate trade overlaps in textile trading, their clothing trade overlaps were fairly low.

5. Models of Determinants for Intra-Industry Trade (between OECD Countries): The Dependent Variable

It is common that the analysis of IIT normally takes the bilateral GL index as defined in equation (1) as the dependent variable. In this study, we measure the *extent of bilateral IIT* - the trade overlap (TO) of the 2 countries as the dependent variable, which is shown in equation (3) as:

[4] The shares of intra-Asian trade in textiles for Japan and Korea were 78.1% and 68.1% respectively.

$TO_{ijk} = 2 \min (X_{ijk}, M_{ijk})$ (3)

where X_{ijk} and M_{ijk} are country 'j's' export and imports respectively, of commodity 'i' trading with country 'k'.

An analysis using the value of bilateral trade overlap rather than bilateral GL index is preferred as deficiency exists with the bilateral GL index, and is illustrated in Table 1 below:

Table 1 Illustration of deficiency using bilateral GL index for the measurements of bilateral IIT of trade between 2 countries

Case	Trade between	**Import (US '000)**	**Export (US '000)**	**Bilateral GL index**	**Trade overlap (US '000)**
1	Countries A and B	0.01	0.01	1.00	0.02
2	Countries A and C	10000	10000	1.00	20000
3	Countries A and D	60000	20000	0.50	40000

The disadvantage of using bilateral GL index to measure bilateral IIT is that the index only represents the *proportion* of trade overlap to the total trade between the 2 trading countries, without considering the *magnitude* of the trade overlap. Therefore, the bilateral GL index will be 1 when the export is equal to the import trade between the 2 countries, no matter the total trade value is US$ 20 or US$ 20 million (cases 1 and 2). Moreover, a trade overlap of merely US$ 20 (case 1) can get a higher bilateral GL index than a trade overlap of US 40 million (case 3). The trade overlap, on the other hand, can provide a clearer concept for the extent of bilateral IIT between the 2 countries. The range for the trade overlap theoretically varies from 0 to infinity, and simply the higher the value of trade overlap, the higher is the bilateral IIT between the 2 countries.

As the range of the bilateral IIT, the trade overlap, between 2 countries can be very broad, it would violate the consumption of "constant variance" for the residuals in multiple regression analysis. A variance stabilizing transformation, In (Y+1)[5] is thus more appropriate [14] with Y as the original dependent variable.

Thus the dependent variable in the regression analysis is shown in equation (4) as:

IIT65 or IIT 84 = In (TO + 1) = In [2 min (X_{ijk}, M_{ijk}) + 1] (4)

where IIT65 and IIT84 represent respectively the transformed bilateral IIT for the T&C trade.

5.1 Hypotheses on Intra-Industry Trade – The Independent Variables

In examining the possible hypotheses to explain the extent of IIT between pairs of OECD countries, general national characteristics such as the stage of economic development and difference thereof, the difference in market size and distance, the existence of common border etc. will be considered. The determinants of IIT will be analyzed in the bilateral trade flows between each pair of OECD countries with respect to these country variables. The hypotheses (*independent variables)* to be tested are discussed as follows.

HYPOTHESIS ONE: The value of bilateral IIT is expected to be higher between countries which are similar in economic conditions.

According to Linder hypothesis [15], when nations' per capita incomes become more equal, demand structures are likely to become more similar, and thus the extent of trade in differentiated products will be greater. The independent variable tested is *DGDPPC* (difference between GDP per capita, in USD, for the 2 trading countries) and the expected sign is *negative*.

(5) In (Y+1) is used instead of ln Y since some cases such as the bilateral IIT in the textile trade between Iceland to Mexico equals to 0.

HYPOTHESIS TWO: The value of bilateral IIT is expected to be higher when the average level of income for the 2 trading countries are higher.
When the average level of income for the 2 countries is higher, consumers will increase the demand for variety and production of differentiated products [16]. The independent variable tested is *AGDPPC* (average GDP per capita in US$, for the 2 trading countries) and the expected sign is *positive*.

HYPOTHESIS THREE: The value of bilateral IIT is expected to be lower when the distance between the 2 trading countries is longer.

In general the longer the distance between the 2 trading countries, the higher is the transportation costs. Taking this into consideration, the prices of imported goods will become higher and thus resulting in lower volume of bilateral IIT. The independent variable tested is *DS* (distance, in KM, between the 2 trading countries) and the expected sign is *negative*.

HYPOTHESIS FOUR: The value of bilateral IIT is expected to be higher when the 2 trading countries bare a common border.

For 2 trading partners having a common land border, IIT is likely to be higher owing to cultural affinity, historical ties, and/or language similarity. The independent variable tested is CB (common border) which takes a value of 1 if the 2 trading countries share a land border and 0 otherwise. The expected sign is *positive*.

HYPOTHESIS FIVE: The value of bilateral IIT is expected to be higher for bilateral trade between countries under NAFTA.

Under the NAFTA agreement, all tariffs and quotas on trade among Canada, Mexico and U.S.A. are to be eliminated in a 15-year period, which may serve as a stimuli for the bilateral IIT between the 3 countries. The independent variable tested is *NAFTA* which takes a value of 1 if the 2 trading countries are NAFTA countries, and 0 otherwise. The expected sign is *positive*.

HYPOTHESIS SIX: The value of bilateral IIT is expected to be lower if the population of either one of the pair of countries is lower.

For the population factor, to a certain extent, (i) it reflects the factor endowment of labor force in the supply side structure, and (ii) the demand of T&C in the demand side structure. Thus, the lower the population of a country is, the lower the exports or imports of textile and clothing in a country are expected, which in turn may limit the magnitude of IIT. The independent variable tested is MINPOP (Population), which equals to the minimum value of the population of the 2 trading countries. The expected sign is *positive*.

5.2 Methodology and Data Sources

Multiple regression analysis is employed to determine the IIT between the OECD countries. The T&C export and import trade data (SITC 65 and 84) between pairs of 30 OECD countries(6) and the data for the dependent variable were taken and complied from OECD, ITCS International Trade by Commodities, SITC Revision 3. The year selected for the data was 2000 in the model fitting analysis. For the independent variables, DGDPPC and AGDPPC and MINPOP were calculated from the data obtained from World Bank and DS is measured between economic centers of trading partners using 'distance calculator' on the web.

The estimated regression equation is defined in equation (5) as shown below:

$$IIT65 \text{ or } IIT84 = \text{In}\ (TO + 1) = \beta_0 + \beta_1 (DGDPPC) + \beta_2 (AGDPPC) + \beta_3 (DS) + \beta_4 (CB)$$

(6) Trade data for Luxembourg and Belgium are combined in the analysis.

$$+ \beta_5 (NAFTA) + \beta_6 (MINPOP) + \varepsilon \quad (5)$$

where ε is the error term

6. Results and Discussion

Table 2 shows the regression results for the hypotheses proposed in Section 5.2. Regression models ‘1’ and ‘4’ show the estimated equations using all proposed country variables for the T&C trade, respectively. Regression models ‘2’ and ‘5’ show the estimated equations by retaining those variables of models ‘1’ and ‘4’ respectively which were statistically significant at the 0.1 level. Regression models ‘3’ and ‘6’ are alternative models for explaining the unexpected observations and are discussed in Sections 6.1 and 6.2.

Table 2 Regression models of IIT for the T&C trade within OECD countries in 2000

Trade	Regression Model	Constant	Variables						F - value	Adjusted R^2
			DGDPPC	AGDPPC	DS	MINPOP	CB	NAFTA		
Textile	‘1’	7.69 *	-3.22E-02 (-0.096) *	5.68E-02 (0.142) *	-2.6E-04 (-0.484) *	7.52E-02 (0.47) *	2.25 (0.206) *	-0.86 (-0.025)	78.1*	0.536
	‘2’	7.72 *	-3.31E-02 (-0.099) *	5.64E-02 (0.141) *	-2.6E-04 (-0.484) *	7.52E-02 (0.47) *	2.16 (0.198) *		94.7*	0.536
	‘3’	9.16 *	-3.59E-02 (-0.107) *	4.64E-02 (0.116) *	-2.63E-04 (-0.491) *			4.22 (0.125)	41.5*	0.286
Clothing	‘4’	6.49*	-5.86E-02 (-0.17) *	8.85E-02 (0.214) *	-2.47E-04 (-0.446) *	6.87E-02 (0.415) *	2.6 (0.231) *	-0.302 (-0.009)	75.6*	0.525
	‘5’	6.49*	-5.89E-02 (-0.171) *	8.83E-02 (0.214) *	-2.47E-04 (-0.446) *	6.84E-02 (0.414) *	2.57 (0.228) *		90.9*	0.526
	‘6’	7.93*	-6.46E-02 (-0.187) *	7.83E-02 (0.189) *	-2.57E-04 (-0.463) *			4.85 (0.139)	47.0*	0.312

Note: N = 406; standardized regression coefficients in parenthesis; *p < 0.01, (2 tailed tests)

6.1 Empirical Results for Textile Trade

For the textile industry, the results generally support the hypotheses in Section 5.2 for all the variables concerning the common characteristics of the OECD countries. The regression coefficients of the average per capita income (AGDPPC), income inequality (DGDPPC), limitation in country size (MINPOP), distance (DS) and border trade (BD) variables are all statistically significant at 0.01 level and all have the expected signs in model ‘1’. The coefficient of the trade agreement variable NAFTA, in contrast, showed an unexpected sign and was statistically insignificant. While this may seem surprising in view of the significant impacts on the T&C trade among NAFTA countries [17], it can be explained by the fact that the country variables, BD and MINPOP, largely explain the extent of IIT among the NAFTA countries. The correlation matrix for the independent variables is shown in Table A.2 in the Appendix as a reference. The results shown in regression model ‘3’, which excludes the 2 variables that are significantly correlated with the variable *NAFTA* support our explanation. The coefficient of the variable *NAFTA* is significant at 0.1 level and have the expected positive sign.

Although both of the regression equations (2) and (3) are significant models to explain IIT, model '2' is preferred since it has a much higher adjusted R^2. The adjusted R^2 is 0.536 for model '2', meaning that 53.6% variability of bilateral IIT between OECD countries for the textile industry are accounted by the 5 independent variables.

In terms of the importance of the factors affecting the bilateral IIT within the OECD countries, comparison of the standardized coefficients of the independent variables can be made. DS and MINPOP (with standardized coefficients of –0.484 and 0.470) are the most important factors, followed by the variables CB (0.198), AGDPPC (0.141) and DGDPPC (-0.099).

6.2 Empirical Results for Clothing Trade

For the clothing industry, the empirical results are quite similar to that of the textile industry. The regression coefficients of the country variables - average per capita income (AGDPPC), income inequality (DGDPPC), limitation in country size (MINPOP), distance (DS) and border trade (BD) are all statistically significant at 0.01 level and all have the expected signs in model '4'. The variable *NAFTA* is again an exceptional case but its effect is 'corrected' and the expected positive sign is shown in regression model '6'. However, the adjusted R^2 is only 0.312, a relatively low value comparing with model '5', with the adjusted R^2 equals 0.526.

The importance of the significant country variables affecting bilateral IIT within the OECD countries is reviewed by the standardized coefficients in model '5'. Again, the most important factors are DS and MINPOP, followed by CB, AGDPPC and DGDPPC.

The similarity for the empirical results in the T&C trade entails further analysis. The Pearson correlation between the 2 dependent variables, IIT65 and IIT 84, is very high (0.892) and also significant at 0.01 level. This implies that for pairs of OECD countries, it is highly likely that the higher is the bilateral IIT in the textile industry, the higher is the bilateral IIT in the clothing industry and vice versa. Such a phenomenon may be explained by the intra-firm trade between multi-nationals. However, the link between multi-nationals and bilateral IIT cannot be estimated in this analysis due to data deficiencies.

7. Conclusion

In this paper, multiple regression analysis is employed to verify empirically the proposed country-specific determinants of bilateral IIT using bilateral trade data of the OECD countries. Hypotheses concerning the country-specific variables were tested, with results showing that all of the variables proposed are highly significant and have the expected effects for the bilateral intra T&C trade within the OECD countries. Besides, it was identified that the bilateral IIT between OECD countries for the T&C trade is highly correlated. This would be due to the supply chain linkage in T&C production activities and the intra-firm trade in the multi-nationals of the T&C industry.

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Appendix

Table A.1 Descriptive Statistics for the Intra-OECD Textile and Clothing Trade, 2000

Region and Country	*Textile* Trade				Clothing Trade			
	Bijk (%)	Trade overlap	Intra-OECD trade (a)	(a) as a % of total world trade	Bijk (%)	Trade overlap	Intra-OECD trade (b)	(b) as a % of total world trade
OCEANIA								
Australia	*40*	350	865	*47*	*65*	238	364	*18*
New Zealand	*52*	174	337	*67*	*86*	146	170	*35*
ASIA								
Japan	*77*	2530	3292	*28*	*16*	526	3272	*16*
Korea	*45*	1866	4162	*26*	*8*	374	4823	*76*
NORTH AMERICA								
Canada	*77*	4240	5475	*86*	*37*	1188	3247	*56*
Mexico	*60*	4632	7712	*92*	*53*	6092	11518	*94*
US	*59*	9926	16851	*64*	*35*	7354	21312	*29*
WESTERN EUROPE								
Austria	*79*	2354	2987	*88*	*57*	1690	2986	*77*
Belgium	*63*	5154	8214	*84*	*63*	4078	6427	*75*
Germany	*75*	11728	15710	*77*	*34*	5378	15618	*60*
Spain	*71*	3430	4837	*77*	*68*	2374	3493	*60*
France	*81*	8356	10326	*78*	*55*	4722	8599	*52*
UK	*67*	5492	8136	*76*	*57*	4422	7824	*46*
Ireland	*79*	720	906	*89*	*49*	514	1045	*69*
Italy	*63*	8492	13578	*74*	*30*	4136	13648	*71*
Netherlands	*75*	2964	3935	*77*	*62*	2942	4780	*66*
Portugal	*64*	2034	3167	*90*	*46*	1718	3695	*97*
Switzerland	*84*	1978	2363	*83*	*29*	944	3266	*86*
NORTHERN EUROPE								
Denmark	*66*	1074	1619	*81*	*42*	1182	2797	*71*
Finland	*46*	266	574	*68*	*46*	248	535	*50*
Iceland	*44*	22	49	*80*	*9*	6	63	*64*
Norway	*45*	242	538	*79*	*15*	102	696	*52*
Sweden	*65*	878	1361	*78*	*38*	628	1654	*61*
EASTERN EUROPE								
Czech Republic	*85*	1734	2051	*85*	*38*	308	808	*76*
Greece*	*58*	774	1345	*81*	*36*	814	2250	*79*
Hungary	*49*	634	1290	*89*	*44*	668	1527	*88*
Poland	*46*	1324	2851	*80*	*19*	400	2057	*84*
Slovakia**	*69*	506	732	*92*	*35*	224	640	*94*
Turkey	*56*	2158	3827	*66*	*6*	342	6179	*90*

Note: Value in US$ million; * Data in 1998; ** Data in 1999

Table A.2 Pearson correlation matrix for the independent variables

Variables	DISTANCE	DGDPPC	AVGGDPPC	MINPOP	BORDER	NAFTA
DISTANCE	1.00 .					
DGDPPC	0.003 (-0.956)	1.00 .				
AVGGDPPC	-0.047 (0.344)	-0.032 (0.52)	1.00 .			
MINPOP	0.081 (0.105)	0.060 (0.227)	-0.042 (0.399)	1.00 .		
BORDER	-0.247* (0.000)	-0.135* (0.006)	-0.012 (0.812)	0.049 (0.32)	1.00 .	
NAFTA	-0.049 (0.327)	0.071 (0.153)	0.021 (0.67)	0.186* (0.000)	0.300* (0.000)	1.00 .

Note: p values in parenthesis; * significant at 0.01 level