

# **The Determinants of GCC Intra-industry Trade in Agricultural Products**

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# The Determinants of GCC Intra-industry Trade in Agricultural Products

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## Abstract

Similar economic structures and high per capita income levels in GCC countries are expected to promote economic integration in the region. However, despite the implementation of a unified economic agreement to promote free trade among member countries in 1981, the process of economic integration remains weak as reflected by intra-regional trade ratios. The objective of this paper is to assess the extent of GCC intra-regional trade and estimate the determinants of intra-industry trade in agricultural and food products. Results indicate that the Intra-Industry Trade (IIT) index is particularly high for the United Arab Emirates and Saudi Arabia indicating a potential for competition based on product differentiation and economies of scale for these two countries. Other countries like Oman and Qatar mostly trade in raw agricultural commodities with little scope for product differentiation. The econometric analysis shows that IIT is positively correlated with the frontier variable and the GDP of the country of destination but negatively correlated with relative income inequality.

## مؤثرات التجارة البينية الصناعية للمواد الزراعية والغذائية في دول مجلس التعاون لدول الخليج العربية

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## ملخص

يعتبر تشابه الهياكل الاقتصادية وارتفاع مستوى الدخل الفردي في دول مجلس التعاون لدول الخليج العربية من العوامل المساعدة على التكامل الاقتصادي في المنطقة. لكنه بالرغم من تطبيق الاتفاقية الاقتصادية الموحدة لتحرير التجارة بين الدول الأعضاء منذ عام 1981، إلا أن عملية التكامل الاقتصادي بين دول الخليج ظلت ضعيفة كما تنعكس في المعايير النسبية للتجارة البينية. تهدف هذه الدراسة إلى تقييم مدى وطبيعة مؤشر التجارة البينية بين دول الخليج وقياس العوامل المؤثرة في التجارة البينية الصناعية للمواد الزراعية والغذائية. تشير النتائج إلى أن مؤشر التجارة البينية مرتفع بالنسبة لدولة الإمارات العربية والمملكة العربية السعودية، باعتبار أن هاتين الدولتين لهما القدرة على المنافسة على أساس التمييز السعوي والإنتاج على مدى واسع، على عكس بعض البلدان الأخرى مثل عمان وقطر، اللتين تقتصر تجارتهما على المواد الخام الزراعية دون التركيز على عنصر التمييز السعوي. يشير التحليل القياسي إلى أن مؤشر التجارة البينية الصناعية مرتبط إيجابياً مع عامل الحدود وعامل الدخل القومي للدولة الموردة لكنه مرتبط سلباً مع عامل التفاوت النسبي للدخل.

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## Introduction

The Gulf Cooperation Council (GCC)<sup>(1)</sup> is considered to be the most mature and organized body among the various regional trade blocks in the Arab world (Taher, 1998; Al-Faqi, 1997). The GCC countries share demographic and economic similarities that have the potential to facilitate economic integration and promote economic growth. They have a common language, culture and religion (neighborhood characteristics) but also have similar economic structures and per capita income levels. However, despite the implementation of the Unified Economic Agreement (UEA) to promote free trade among member countries in 1981, the process of economic integration remains weak as reflected by intra-regional trade ratios. For example, in 1988, intra-GCC exports comprised only 5.5% of GCC global exports<sup>(2)</sup>. This is rather small compared to other regional trade blocks such as the Andean Pact Countries where intra-trade is 50% higher than intra-trade of all Arab countries (Al-Atrash and Youssef, 2000).

The major goal of the Unified Economic Agreement(UEA) of the GCC was the unification of economic and financial policies as well as the establishment of a common legislation in the areas of commerce, industry and customs (GCC, 1999). In other words the ultimate aim of the GCC was the formation of an economic union. A recent review of the GCC achievement indicated that significant progress was made in terms of tariff and non tariff elimination and harmonization of trade laws and the region was operating as an effective free trade area. During the 2002 GCC Summit, member countries announced the establishment of a Custom Union to be effective on January 2002, with an external common tariff on imports from non-members countries set at 5% (Al-Ghorfa, 2002). The Summit also announced the year 2007 as the deadline for setting up the Common Market and totally liberalizing investment by removing the remaining economic activities from the list of activities restricted to the citizens of a particular countries (Al-Ghorfa, 2002).

Free trade in agricultural and food products was particularly emphasized in the UEA as a way to promote growth and development of non-oil producing sectors. The agricultural sector represents a small portion of the Gross Domestic Products (GDP) in all GCC countries but constitutes an important source of income for a large portion of the population and plays a major role in enhancing food security in the region. Despite the remarkable growth of agricultural production recorded in the region during the last two decades, little intra-regional trade is conducted between member states compared to trade with the rest of the world (Al-Belushi, 2001). This lack of integration between GCC countries reduces the ability of the GCC countries to compete in a more open and integrated world environment as witnessed by the World Trade Organization trading system and the emergence of new trading blocks worldwide.

The objective of this paper is to analyze the trade structure of GCC countries in agricultural products and use the intra-industry trade index (ITT) for the GCC as an indicator of economic integration to shed light on the determinants of ITT in the region.

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<sup>(1)</sup> The GCC countries include Saudi Arabia, Kuwait, Qatar, Bahrain, United Arab Emirates (UAE) and Oman. The Council was founded in 1980 and a free trade agreement was implemented three years later, under the Unified Economic Agreement (UEA).

<sup>(2)</sup> This includes trade in oil which exaggerates the level of trade with the rest of the world, as GCC countries are oil exporting countries

## Agricultural Production and Trade in the GCC Region

The scarcity of agricultural resources, notably land and water, constitutes the main constraint for agricultural growth in the GCC region. Table 1 shows land availability for agriculture in GCC member countries. The total arable land of the GCC region amounts only to 4.1 million ha (1.61% of total area) of which 91% is held by Saudi Arabia. Because of limited rainfall, agriculture depends quite heavily on irrigation, as shown by the ratio of irrigated to cultivated land (43%). Water availability is estimated at less than 500 cubic meters per year compared to a world average of more than 5000 cubic meters (Esslimi, 2000).

**Table 1. Land Use in GCC Countries, 2000**

	Total area (1000 ha)	Arable land and per- manent crops(1000ha)	%of arable to total land	Irrigated land (1000ha)	%of irrigated to arable land
Bahrain	71	6	8.45	4	66.67
Kuwait	1782	10	0.56	7	70.00
Oman	30950	80	0.26	62	77.50
Qatar	1100	21	1.91	13	61.90
Saudi Arabia	214969	3785	1.76	1620	42.80
UAE	8360	247	2.95	76	30.77
Total GCC	257232	4149	1.61	1782	42.95

Source: FAOSTAT, 2002

Despite the harsh environment, the region is able to produce a variety of agricultural products. The composition of agricultural production for the year 2001 is shown in Table 2. The GCC region produces 2.2 million tons of cereals, 3.3 million of vegetables, 1.1 million of milk, 0.5 million of poultry meat, 0.2 million tons of eggs, 0.3 million tons of red meat, and 1.9 million tons of fruits. Saudi Arabia is the major producer of all commodities: cereals (99%), vegetables (54%), milk (74%), poultry (83%), eggs (73%), meat (53%), and fruit (61%). The next major producers are UAE in fruits (19.5%), vegetables (33%), and meat (20%); Kuwait in poultry (8%) and eggs (12%) and Oman in milk(12%)

**Table 2. Agricultural Production in GCC Countries(Metric Tons), 2001**

	Cereals	Vegetables	Milk	Poultry	Eggs	Red Meat	Fruit
Bahrain	0	10369	14390	5700	3000	8095	21518
Kuwait	3513	150678	44540	42182	22500	38293	11570
Oman	5450	193000	122920	4400	7000	24420	318100
Qatar	5810	55475	36200	4200	3600	9764	18390
Saudi Arabia	2214000	1821000	830800	419000	136357	160000	1191500
UAE	380	1128739	75529	29934	13317	58618	377652
Total GCC	2229153	3359261	1124379	505416	185774	299190	1938730

Source: FAOSTAT, 2002.

Due to significant investment in agriculture during the last 2 decades, some countries in the region have reached high levels of self-sufficiency in many commodities (Table A.1, Appendix), particularly UAE in milk (97%), Saudi Arabia in eggs (100%) and Oman in fruits (95%).

The GCC region has long been a heavy net food importer. Food trade deficits are indicated by the amount by which imports of food exceed exports. Table 3 shows that food trade deficit (negative figure) for the region has reached US\$7.98 billion in 1999, compared to US\$ 5.71 billion in 1990, i.e. an increase of almost 40%. Oman had experienced the highest trade deficit growth (152%) during the 1990s, followed by Kuwait (136%) and UAE (86%). The significant increase in trade deficit is the result of a growth in demand much faster than the growth in domestic production. Population growth and high incomes explain much of the demand changes.

**Table 3. Agricultural Trade Deficits of GCC Countries, 1990 - 1999, (US\$1000)**

Country	1990	1999	Change(%)
Bahrain	-231430	-269286	16.36
Kuwait	-517032	-1221523	136.3
Qatar	-282692	-251115	-11.17
Saudi Arabia	-3667481	-4222646	15.14
Oman	-211204	-532611	152.2
UAE	-802315	-1491328	85.88
Total GCC	-5712154	-7988509	39.85

Source:FAOSTAT, 2002

Agricultural imports in the region amount to US\$9.1 billion, representing approximately 10% of total imports (Table A.2, Appendix). The share of imports is highest for Saudi Arabia (16.5%), Kuwait (12%) and Oman (11%). Agricultural imports (Table A.3) are dominated by cereals (25.75%), followed by fruits and vegetables (14.13%), dairy and eggs (11.46%), and meat (9.79). Major importers in the region are Saudi Arabia (58%), UAE (22%) and Kuwait (10%).

Agricultural exports, however, represent a small proportion of total exports of the region (0.92%). Exports are dominated by fruits and vegetables (15.96%), dairy and eggs (11.23%), sugar (10.41%) and cereals (9.39%). The bulk of GCC exports originates from UAE (42.7%), Saudi Arabia (41.4%) and Oman (10.8%).

### **GCC Intra-regional trade**

It is instructive to present the GCC intra-trade within the context of the Arab region and other regional groupings. Intra-GCC trade still represents a small proportion of total GCC trade. In 1998, exports by GCC countries to GCC countries amounted to US\$5.3 billion representing 5% of GCC exports to the world (Table 4)<sup>(3)</sup>. This compares unfavorably with other regional trade blocks, such as Andean Pact Countries, East Asia Economies, NAFTA and EU where intra-regional exports as a proportion of total exports are 11.4%, 22.2%, 51% and 56% respectively (Al-Atrash And Yousef, 1998). Trade within these regional groupings has increased significantly over time while intra-GCC trade has grown slowly.

Within the Arab region, the GCC intra-trade proportion is however, higher than that of the Maghreb region (3.1%) but lower than that of both the Mashreq (8.6%) and the whole Arab region (8.4%). It is to be noted that 57% of the Arab intra-regional exports

<sup>(3)</sup> This share would improve significantly if trade in oil is excluded.

go to GCC countries, whereas 22% go to the Mashreq countries and 7% to the Maghreb countries. These differences are attributed to the higher per capita incomes of the GCC countries.

Al-Atrach and Yousef (2000) cited several factors that hinder intra-Arab trade in general, some of which apply to GCC countries. In particular, the lack of product complementarity and the similarity of production structures, due to similar resource endowments (e.g. oil) argues against intra-GCC trade since the comparative advantage of these countries is broadly in the same products. They also cite the difference in per capita income in the Arab region as a factor constraining intra-Arab trade, as richer countries prefer importing high quality products, most likely produced by industrial countries. However, this argument may not fit well for GCC countries where per capita incomes are high and comparable. In theory, high income levels argue for intra-trade on the basis of product differentiation (intra-industry trade) .

It is also interesting to note that the proportion of intra-trade within the Arab sub-groupings is significantly much higher than the overall intra-Arab trade. In particular, 70% of GCC exports to the Arab countries is to other GCC countries. This could partially lend support to the argument that neighborhood characteristics are important in the formation and success of regional trading blocks.

A closer look into the composition of GCC trade shows that agricultural products made up approximately 7.9% of total intra-GCC exports (Table 5). This proportion varies from a low of 0.73% in Bahrain to a high of 28.79% in Oman. The high agricultural proportion in Oman's exports to GCC suggests that Oman may hold a comparative advantage in agricultural production within the region.

**Table 4: Indicators of Intra-Arab Trade, 1998**

	Exports by				
	GCC Countries	Maghreb Countries	Mashreq Countries	Other Countries	All Arab Countries
<b>Exports to:</b>	(Billions US\$)				
GCC	5.3	0.1	1.2	0.2	6.8
Maghreb	0.6	1	0.4	0	2
Mashreq	1.2	0.5	1.2	0	2.6
Other	0.4	0	0	0.1	0.6
All Arab Countries	7.5	1.6	2.6	0.3	12
	% of Exports to World				
GCC	5.5	0.4	10.2	7.5	4.6
Maghreb	0.6	3.1	3.3	0	1.4
Mashreq	1.2	1.4	8.6	0.1	1.8
Other	0.4	0	0.6	4.9	0.4
All Arab Countries	7.7	4.9	22.7	12.5	8.2
	% of exports to Arab Countries				
GCC	70.7	6.3	46.2	66.7	56.7
Maghreb	8.0	62.5	15.4	0.0	16.7
Mashreq	16.0	31.3	46.2	0.0	21.7
Other	5.3	0.0	0.0	33.3	5.0
All Arab Countries	100.0	100.0	100.0	100.0	100.0

Source: Al-Atrach and Yousef, 2000

Intra-GCC agricultural exports make up a significant proportion (around 70%) of GCC agricultural exports to the world. This concentration of GCC agricultural exports within the region can be explained, among other things, by the lower transport cost among neighboring countries, but also by the lower trade impediment within the region. However, intra-regional agricultural imports remain small relative to the region's world imports of food (5.6%). This is because the GCC potential to supply the products imported from the rest of the world is quite limited, given the small size and the low competitiveness of its production base

**Table 5. Intra-GCC Exports in Agricultural and Animal Products (US\$ billion), 1998**

	Exports by						
	BA	KU	QA	OM	SA	UAE	GCC
<b>Exports to:</b>							
Bahrain		0.20	0.09	0.80	56.00	4.25	61.34
Kuwait	0.27		0.57	0.14	126.76	8.26	136.00
Qatar	0.27	0.07		1.33	51.20	2.48	55.35
Oman	0.27	0.02	0.02		21.87	12.53	34.71
Saudi Arabia	3.19	2.50	11.62	13.40		15.17	45.88
UAE	1.60	0.01	1.32	39.92	119.50		162.35
GCC	5.60	2.80	13.62	55.59	375.33	42.69	495.63
%of total exports	0.73	1.84	4.74	28.79	8.19	13.33	7.87

Source: GCC Secretariat, 2000

### **Intra-Industry Trade in GCC Countries**

The concept of IIT developed from the observation that a significant proportion of trade between market economies is a two-way exchange of products within the same product category (Grubel and Lloyd, 1975). This trade, called Intra-industry, describes trade in similar but slightly differentiated products based on imperfect competition and economies of scale. This contrasts with the one-way trade predicted by the classical trade theory and based on differing resource endowments and factor intensities in a perfectly competitive markets. In the latter theory, trade occurs in complementary goods produced with differing levels of factor intensities.

A distinction has been made in the literature between horizontal and vertical IIT on the basis of different set of theories (Falvey 1981, Falvey and Kierszkowski 1989). Horizontal IIT is for products that are of different characteristics, based on models that relax the assumptions of the Hecksher-Ohlin model and assume a market structure that is monopolistically competitive (Helpman and Krugman, 1985). Vertical IIT is for products of different qualities and is linked to the capital-labor ratio, which is assumed to be the basis that leads to specialization in products with different qualities.

Although the IIT was first applied to the manufacturing sectors, the extent of product differentiation in agricultural and food products prompted the use of this index to analyze the two-way trade in the food sector. For example, Hartman et al. analyzed the determinants of variation across industries in the level of IIT for the food and beverage industries. Their results indicate that variation of IIT across the food and beverage industries is positively related to product differentiation, economies of scope, and

similarity of trade barriers among trading partners but negatively related to industry concentration (Hartman et al. 1993). More recently, Sun and Koo evaluated the IIT of US food industry by analyzing its horizontal and vertical components. They use a technique of unit value deviation to separate between the two components and where quality differences are reflected in the difference between import and export unit values. The results of their study indicate that most of IIT in the US food industries is vertical in nature and industries characteristics show more significant effects than country characteristics in explaining the variation in the vertical and horizontal IIT index (Sun and Koo, 2002).

In this paper, the aggregate “agricultural products” includes both primary agricultural commodities and processed food. At this high level of aggregation, some two-way trade will be expected, the extent of which will depend on the degree of product differentiation and the degree of processing of farm products. The agricultural and food sector in GCC countries have undergone important changes in terms of volume and value of the production due to investment in high value farm products and re-export food processing activities. This has increased the supply of various varieties of farm commodities and differentiated food products which are regionally traded to meet changing consumer taste and preferences.

More generally, the theoretical literature on IIT predicts that the extent of IIT would be larger with higher and more similar income levels of the trading partners. The reason for this is that as income increases, demand for variety and differentiated products increases (Hellvin, 1996). Furthermore, the more similar per capita income is, the more similar the demand structure and the larger the demand for varieties of a product in the partner country will be (Hellvin, 1996). In other words, intra-industry trade may be explained on the demand side by focusing on product differentiation.

The implication is that IIT will be higher in more developed countries than in developing countries, given the more specialized structure of the developed economies. The process of economic integration and trade liberalization have allowed firms in industrialized countries to take advantage of scale economies in the production process, which permit higher levels of IIT. Furthermore, Havrylyshyn and Kusnel (1997), in discussing intra-industry issues in the Arab region, argue that higher levels of IIT reflect a greater ability to compete internationally in a changing trade environment. Therefore countries that show an increasing trend of IIT are better prepared for trade liberalization and more likely to succeed in adapting to the new multi-lateral or regional trading systems.

The Index that is often used to measure IIT is given as follows (Grubel and Llyod, 1975):

$$IIT_{jk} = 1 - \left[ \frac{|X_{jk} - M_{jk}|}{X_{jk} + M_{jk}} \right]$$

where  $X_{jk}$  and  $M_{jk}$  are country  $j$  exports and imports with country  $k$  for a given commodity. The IIT has a maximum value of 1 when all trade is intra-industry and a minimum of zero

when all trade is inter-industry<sup>(4)</sup>. Inter-industry reflects trade that occurs along comparative advantage, whereas intra-industry reflects trade based on economy of scale and product differentiation. The latter trade is most often observed in countries and regions with high levels of economic integration.

The Grubel-Lloyd IIT index is used to compute the extent of intra-industry for agricultural products within the GCC countries (Table 6) for two periods (1984-1990) and (1991-1997). This partition reflects decisions that set the stage for more trade liberalization between GCC countries. Further trade liberalization is expected to increase the IIT level.

The level of IIT in agricultural and food products during the study period may be classified into three categories: high (over 50% of total agricultural products trade is of IIT); medium level of IIT (25% to 50%); and low level of IIT (<25%). The UAE has, on the average, the highest level of IIT within the GCC region with 82%, followed by Saudi Arabia (72%) and Bahrain (55%). The high level of IIT in these countries is due to their relatively more developed agricultural and food processing activities, which allow them to trade in differentiated products. Three countries, i.e. Oman, Qatar, and Kuwait have a low IIT index (<25%), indicating that the nature of their trade is mostly inter-industry trade.

The share of IIT has slightly increased for some GCC countries and declined for other GCC countries over the two periods (the 1980s and the 1990s) lending little support to the argument that more trade liberalization is associated with more IIT.

**Table 6. Intra-Industry Trade Index for GCC Trade in Agricultural and Food Products, 1984-1990 and 1991-1997**

Year	UAE	SA	KU	OM	QA	BA
1984	0.81	0.65	0.89	0.43	0.78	0.73
1985	1.00	0.87	0.18	0.34	0.26	0.59
1986	0.75	0.78	0.12	0.12	0.21	0.26
1987	0.59	0.64	0.07	0.07	0.18	0.44
1988	0.69	0.70	0.08	0.07	0.18	0.36
1989	0.57	0.60	0.07	0.02	0.04	0.42
1990	0.70	0.64	0.08	0.07	0.04	0.26
AV(84-90)	<b>0.73</b>	<b>0.70</b>	<b>0.21</b>	<b>0.16</b>	<b>0.24</b>	<b>0.44</b>
1991	0.83	0.44	0.01	0.05	0.18	0.99
1992	0.75	0.53	0.02	0.06	0.39	0.41
1993	0.47	0.57	0.02	0.06	0.35	0.46
1994	0.90	0.66	0.06	0.21	0.47	0.54
1995	0.91	0.70	0.03	0.07	0.22	0.83
1996	0.82	0.83	0.06	0.14	0.13	0.15
1997	0.99	0.73	0.08	0.15	0.10	0.89
AV(91-97)	<b>0.81</b>	<b>0.64</b>	<b>0.04</b>	<b>0.11</b>	<b>0.26</b>	<b>0.61</b>
AV(84-97)	<b>0.82</b>	<b>0.72</b>	<b>0.14</b>	<b>0.14</b>	<b>0.27</b>	<b>0.55</b>

Source: Computed from GCC Secretariat Trade data, 2000

<sup>(4)</sup> The IIT value will depend on the level of product aggregation. For highly aggregated products, the IIT level will be high (much trade is IIT) and vice-versa. Because of the lack of data in the GCC trade data base, this study used a SITC1 digit data disaggregation level.

## Econometric analysis of intra-industry trade in GCC countries

To estimate the determinants of intra-industry trade, an econometric model is used (logistic specification) in which the dependent variable is the IIT index. This specification avoids the problem of having a predicted value that may fall outside the range of the IIT which is between zero and one. The logistic function (Griffith et al., 1993) takes the following form:

$$IIT_{ij} = \frac{1}{1 + \exp^{-X_{ij}'\beta}} + e_{ij}$$

where  $X$  is a vector of explanatory variables,  $\beta$  is the coefficient vector, and  $e$  is the disturbance term.

The independent variables included to explain the IIT variations are drawn from the theoretical and empirical literature (Balassa and Bauwens, 1988; Frahan and Tharakan, 1999). The retained variables and their expected effects on IIT are as shown below:

$$IIT_{ij}^k = F(\text{GDP}_i, \text{GDP}_j, \text{DPCI}, \text{IGDP}, \text{BORD}, \text{DIST})$$

+        +        -        -        +        -

Where  $IIT_{ij}$  is bilateral intra-industry index between country  $i$  and country  $j$  in industry  $k$ ;  $\text{GDP}_i$  is the gross domestic product in country  $i$ ;  $\text{GDP}_j$  is the gross domestic product in country  $j$ ;  $\text{DPCI}$  is the relative difference of per capita income between each pair of countries;  $\text{IGDP}$  is the relative inequality of market size between countries<sup>(5)</sup>;  $\text{DIST}$  is the geographical distance between the capital cities of two trading countries; and  $\text{BORD}$  is a dummy variable to capture special bilateral trade relations as well as characteristics specific to particular countries.

Time-series data for 1984-1997 period are used to estimate the model specified above. The data are gathered from various issues of the Statistical Bulletin of the General Secretariat of the GCC. Most trade data arise as an export from a country and an import by another, although the figures are not usually equal due to FOB/CIF factors, timing and reporting differences.

Results of the Logit procedure in TSP are presented in Table 7. They underscore the importance of country-specific variable in explaining IIT. Almost all variables have the expected sign predicted by trade theory and are statistically significant with exception of the distance variable used as a proxy for transportation cost.

<sup>(5)</sup>Balassa and Bauwens (1988) defined a relative inequality measure as follows:

$INEQ = 1 + \{w \cdot \log w + (1-w) \log (1-w)\} / \ln 2$  where:  $w = \text{GDP}_i / (\text{GDP}_i + \text{GDP}_j)$ . This is the inequality measure used by the authors in the empirical analysis.

As expected, the extent of IIT is positively correlated with the two country market size (GDP<sub>i</sub> and GDP<sub>j</sub>)<sup>(6)</sup>. The results support the hypothesis that the greater the market size of the two trading countries, the higher is the number of differentiated goods produced and traded, reflecting higher IIT share.

**Table 7. Estimation Results of the Econometric Model**

Independent variables	Expected sign	Parameters estimation	t-statistics
Constant		-5.39964	-2.68615**
GDP <sub>i</sub>	Positive	0.649778E-05	0.441731
GDP <sub>j</sub>	Positive	0.576867E-04	2.75485**
IGDP	Negative	-12.4485	-2.30359**
Bord	Positive	5.19739	1.81012*
DPCI	Negative	-0.417881E-03	-2.30685**
Dist	Negative	0.340043E-02	1.64958*
OBS=210			
$R^2=0.105$			

\* Significant at 5% level

\*\* Significant at 10% level

The per capita income difference variable (DPCI) is significant and negatively correlated with the IIT index. The smaller the relative difference in per capita income between two countries, the higher is the level of bilateral IIT. DPCI is a proxy variable indicating the degree of similarities in demand and consumer taste structure between two countries. Similarities in demand structure would create markets for differentiated products, thereby increasing IIT (Frahan and Tharakan, 1999).

Market size dissimilarity (IGDP) is correlated negatively with bilateral share of IIT and is highly significant. This means that the less dissimilar, i.e. the more similar, the countries in terms of market size, the higher the trade flow in differentiated goods between the pairs of countries.

Both the sign and significance of the dummy variable (BORD) confirm that intra-industry is more intense between neighboring countries than between non-neighboring countries as would be expected, because of lower transactions costs and greater taste similarities between neighboring countries.

Finally, the goodness of fit of the model is relatively low ( $R^2 = 0.105$ ), but is in conformity with most food IIT studies that are based on cross sectional data.

<sup>(6)</sup> As reported by Havrylyshyn and Kunzed, the effect of the size of the economy or GDP is somewhat unclear from a theoretical point of view. Scale effect would likely increase the IIT but smaller countries at closer proximity would also likely do more IIT than larger ones as trade between them may be viewed as a continuation of internal trade.

## Conclusion

The objective of this paper is to review the pattern of intra-regional trade in agricultural products and estimate an econometric model to explain agricultural IIT in the region. Free trade in agricultural and food products is particularly emphasized in the GCC's Unified Economic Agreement, as a way to promote growth and development of non-oil producing sectors.

Intra-trade among GCC countries as a proportion of their total trade is still very low (5%) compared to other regional trade arrangements. This reflects the huge predominance of oil in GCC trade with the rest of the world. However, excluding oil, intra-regional trade represents a respectable proportion of total trade (19%) which compares favorably to some other regional groupings such as MERCOSUR and the ASEAN (Dervis et al. 1998).

Despite the remarkable growth of agricultural production during the last two decades, GCC countries are still heavy net importers of food. Agricultural trade deficit has increased significantly during the last decade to reach approximately US\$8 billion in 1999, i.e., 40% increase compared to 1990. Intra-trade in agricultural products can have the potential to promote efficiency in the sector, hence reducing the deficit, and provide the basis to develop international competitiveness in the non-oil sector.

The UEA was relatively successful in terms of promoting GCC intra-exports in agricultural products. Unlike aggregate intra-regional exports, agricultural intra-regional exports make up a significant proportion of global GCC exports (77%). However, in terms of imports, intra-trade still constitutes a small proportion of total regional imports. The region imports the bulk of its food from the rest of the world as the potential of GCC agriculture to provide consumption need of its population is still limited.

The IIT of the intra-regional trade is particularly important since it reflects the degree of specialization in a particular activity and the ability of a country to compete in differentiated products. Higher levels of IIT reflects better preparedness for trade liberalization and adaptation to the new multi-lateral or regional trading systems. The IIT index is particularly high for UAE, Saudi Arabia and to a lesser extent Bahrain, indicating that these countries are relatively more specialized in processed food products where the potential for competition based on product differentiation is greater. Oman, Kuwait and Qatar are mostly trade raw commodities with little scope for product differentiation.

The econometric analysis of intra-industry trade shows that border variable is positively correlated with the level of IIT indicating a concentration of IIT between countries sharing a common border. The extent of IIT is also positively correlated with market size of two countries, while it is negatively related to the per capita income differences between two countries. The larger income differences between countries, the more dissimilar is their demand structure leading to a lower intra-industry trade.

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## **Statistical Appendix**

**Table A.1. Self-sufficiency Ratios of GCC countries (%),1995**

	Grains	Vegetables	Fruits	Red Meat	Poultry Meat	Eggs	Dairy
Bahrain		17	6	5	24	52	71
Kuwait		39.1		7.3	31.7	52.1	20.5
Oman	18.4	50.8	94.6	34.3	16	44.4	54
Qatar	7.8	38.7	34	20.1	19.5	53.8	65.6
Saudi Arabia	50	83	66	48	67	100	65.6
UAE	0.5	56	38	23	21	43	97

Source: Esslimi, 2000

**Table A.2. Total Merchandize and Agricultural Trade in GCC Countries, 2000**

	IMPORTS(Million\$)			EXPORTS (Million\$)		
	Total	Agriculture	Share%	Total	Agriculture	Share%
Bahrain	4612	142	3.07	5701	13	0.23
Kuwait	7621	908	11.91	19542	37	0.19
Oman	5040	563	11.16	5507	217	3.94
Qatar	3005	212	7.04	9378	91	0.97
Saudi Arabia	32000	5275	16.48	55000	474	0.86
UAE	44000	2007	4.56	61600	611	0.99
Total GCC	91670	9106	9.93	156729	1443	0.92

Source: FAOSTAT, 2002

**Table A.3. Imports by Commodities in GCC Countries (US\$1000), 2000**

	Live Animals	Cereals and preparation	Dairy and Eggs	Fruits and Vegetables	Meat and preperation	Sugar and Honey	Vegetable Oil
Ba	29	18761	20786	34168	16457	4339	3500
Ku	74025	116875	87807	123178	86203	28920	26554
Om	62045	94197	129213	44157	48298	6010	81686
Qa	13145	45544	40469	38681	29456	3216	2974
SA	250827	1577503	587698	689691	564296	158515	216429
UAE	197325	492240	177280	357143	146617	191932	65290
Total GCC	597396	2345120	1043253	1287018	891327	392932	396433
% of Ag	6.56	25.75	11.46	14.13	9.79	4.32	4.35

Source : Computed from FAOSTAT, 2002

**Table A.4. Exports by Commodities in GCC Countries (US\$1000), 2000**

	Live Animals	Cereals and preparation	Dairy and Eggs	Fruits and Vegetables	Meat and preparation	Sugar and Honey	Vegetab Oil
Ba	40	3845	331	2317	888	206	58
Ku	346	10340	4962	8014	1773	1109	2289
Oman	42431	14313	7628	19350	4438	593	5829
Qa	1844	732	161	668	3532	199	43
S A	6424	38655	137655	105638	40320	11004	21831
UAE	7969	67632	11359	94368	2920	137093	51500
Total GCC	59054	135517	162096	230355	53871	150204	81550
%	4.09	9.39	11.23	15.96	3.73	10.41	5.65

Source: Computed from FAOSTAT, 2002