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The Effects of Multilateral Trade Liberalization on Agriculture: The Case of the Gulf Cooperation Council (GCC) Countries

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Abstract

This study assessed the trade and welfare impacts of agricultural trade liberalization within the context of both unilateral and WTO multilateral trade liberalization in the GCC countries. The analysis focused on the specific effects of the agricultural sector as well as on the economy-wide effects, which were reflected in the exchange rate, balance of payment and changes in economic welfare. The assessment was undertaken using the World Trade Simulation Model (WTSM) to solve for the equilibrium prices and values of trade. Results showed that under all the trade liberalization scenarios considered, the economic effects on the GCC region in terms of trade and economic welfare will be positive. However, multilateral trade liberalization covering all the goods offered the greatest benefit to the GCC economies. Also, the study showed that changes in economic welfare were much higher under liberalization process covering all the sectors rather than liberalization covering only the agricultural sector. The effects of multilateral trade liberalization on domestic prices will depend on the type of commodity, the world price change and the initial level of protection.

Key Words: *GCC, trade liberalization, world trade simulation model, agriculture, welfare effects, GAMS*

Introduction

The WTO is currently the host to new negotiations under the "Doha Development Agenda" launched in 2001 and expected to conclude by the end of year 2006. At the conclusion of these negotiations, countries are expected to commit themselves to new reductions in their trade barriers, beyond their commitments in the previous round of trade negotiations. The new Doha round places agriculture and rural development concerns at the center of its agenda. Agriculture remains in many developing countries, an important part of overall economic activity. It continues to play a major role in overall

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production and employment and is of central concern for food security, the environment, poverty and rural development.

The Gulf Cooperation Council (GCC) countries – Saudi Arabia, Oman, Bahrain, Qatar, Kuwait and the United Arab Emirates are all now members of the multi-lateral trading system[1].

Despite the exclusion of oil from WTO negotiations, GCC countries still have a stake in the Doha Round, as one of the important item on the agenda -agricultural trade liberalization- is of most relevance to the region. All GCC countries are net food importing countries and rely heavily on trade to meet their food consumption needs. Although the share of agriculture in overall production is small due to the predominance of the oil sector, agriculture still employs a large number of people (more than one third of the population in Saudi Arabia and Oman). Also, agriculture plays a major role in reducing poverty, preserving the environment, and ensuring food security. In a recent article, two of the GCC countries- Saudi Arabia and United Arab Emirates are classified as having significant risk to food security (Diaz Bonilla et al., 2001).

The objective of this paper is to analyze the effects of multilateral trade liberalization on the GCC countries' economy with a particular focus on the agricultural sector. The analysis is intended to provide policy makers involved in WTO negotiations an insight into the likely direct and indirect trade and welfare effects of eliminating tariffs and non tariff barriers. The analysis uses the World Trade Simulation Model (WTSM), a computable partial equilibrium and trade focused model which simultaneously solves for the domestic and international prices, import and export values and the exchange rate of each country involved in the model (De Rosa, 2000).

The remainder of this paper will be organized as follows: Section 2 presents the current trade and trade protection in the GCC countries; Section 3 reviews the relevant literature on the effects of trade liberalization on agriculture; Section 4 presents the structure of the WTSM model and the data used in the analysis; Section 5 interprets and discusses the results, and Section 6 concludes and draws some policy implications.

Current Review of Trade and Trade Protection in the GCC Countries

The GCC countries are heavily dependent on trade with an export to GDP ratio varying from 74% in Bahrain to 40% in Saudi Arabia. The region as a whole exports annually the equivalent of $155 billions, out of which 83% is oil (Table 1). Saudi Arabia is the most important trader, accounting for 47% of total region's exports and 37% of the region's imports, followed by UAE with a share of 22% and 33% respectively[2]. Most imports comprise machinery and equipment (39%), manufacturing (17%), and food (11%).

Although overall trade balance is positive, the GCC is a net food importing region with a food deficit amounting approximately to $9 billions. Saudi Arabia accounts for 44% of the regional deficit, followed by UAE (24%), and Kuwait (12%).

The GCC region exports the equivalent of $1401 millions of food to the world (0.91% of total GCC exports)[2]. United Arab Emirates, Saudi Arabia and Oman are the most important food exporters, with $606 millions, $390 millions and $300 Millions respectively (Table 2).

Table 1. Commodity GCC Trade (US$ Millions); Year: 2003

	UAE	OM	BA	KW	KSA	QA	GCC	%
Commodity Exports	**33669**	**11365**	**6632**	**16164**	**73403**	**13383**	**154615**	**100.0**
Food & live animals	606	300	43	44	393	15	1401	0.9
Beverages and tobacco	536	229	20	10	20	1	815	0.5
Crude materials	189	51	260	45	175	17	737	0.5
Mineral fuels	22152	9050	4681	14930	65208	12180	128201	82.9
Animal & vegetable oils	38	36	0	4	26	0	105	0.1
Chemicals	600	123	198	803	5203	620	7546	4.9
Manufactured goods	3061	343	1028	118	1163	291	6004	3.9
Machinery& transport equip.	4346	934	156	134	955	149	6674	4.3
Misc. manufactured articles	1536	200	245	52	225	110	2369	1.5
Unclassified	606	99		25	33	0	762	0.5
Countries' export share (%)	22	7	4	10	47	9	100	
Commodity Imports	**30544**	**6572**	**4425**	**7869**	**31223**	**4897**	**85531**	**100.0**
Food & live animals	2681	749	442	1103	4226	413	9615	11.2
Beverages and tobacco	224	306	442	64	334	45	1417	1.7
Crude materials	399	292	442	164	630	151	2079	2.4
Mineral fuels	218	216	442	38	67	28	1010	1.2
Animal & vegetable oils	82	88	442	36	156	25	830	1.0
Chemicals	2177	459	442	598	3070	312	7059	8.3
Manufactured goods	6091	1015	442	1363	5192	1041	15144	17.7
Machinery& transport equip.	11391	2827	442	2888	13111	2322	32982	38.6
Misc. manufactured articles	4704	410	442	1112	3529	556	10752	12.6
Unclassified	2576	210	442	501	909	4	4643	5.4
Countries' import share (%)	36	8	5	9	37	6	100	

Source: UN COMTRADE and own calculation
Note: UAE: Unites Arab Emirates; OM: Oman; BA: Bahrain; KW: Kuwait; KSA: Kingdom of Saudi Arabia; QA: Qatar

The mostly exported food product category in the region is fruit & vegetables, with 26% of total food exports, followed by cereal & cereal preparations (17%), Dairy products & eggs (18%), and Fish & fish preparations (10%).

Food imports (Table 2) constitute a large share of the total import bill of the region (11%). The most important items in the import bill are fruit& vegetables (22%), cereal& cereal preparations (20%), dairy products& eggs (14%) and meat& meat preparations (12%).

Tariff and non tariff barriers in the GCC countries are relatively low compared to other Middle East and North African (MENA) countries. Kuwait, Qatar and UAE apply a uniform tariff of 4% while Bahrain and Oman have an escalating tariff rates ranging from a standard rate of 5% for most commodities and 20% for commodities that are produced locally. Saudi Arabia has a similar escalating regime but ranging from 12% to 20%.

Applied tariff rates for agricultural products in the GCC countries range from duty free, for basic imported food products, to 100% for some beverages. In addition, many GCC countries (particularly Oman and, to lesser extent, Saudi Arabia) use seasonal quantitative restrictions and higher tariff rates for certain commodities to protect local producers. For example Oman has a “seasonal calendar” during which imports are re-

Table 2. Structure of the GCC Food Trade, Year: 2003

	UAE	OM	BA	KW	KSA	QA	GCC
Food Exports (US$ Mill.)	**606**	**300**	**43**	**44**	**393**	**15**	**1401**
Composition of Food Exports (%)	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Live animals	1.3	7.2	0.4	1.4	1.0	42.2	2.9
Meat and meat preparations	1.5	1.8	1.1	5.0	12.4	13.7	4.9
Dairy products and eggs	2.8	27.7	13.3	13.2	36.3	2.2	18.2
Fish and fish preparations	5.6	26.4	27.2	7.2	2.7	14.0	10.0
Cereals and cereal preparations	23.0	16.8	22.7	22.4	9.5	5.4	17.7
Vegetables and fruit	33.7	8.4	30.0	37.0	28.3	6.6	26.5
Sugars& honey	7.3	1.0	1.2	6.0	2.9	0.8	4.4
Coffee, tea, cocoa, spices	16.8	4.2	3.3	6.5	3.8	2.0	9.6
Feeding stuff for animals	0.4	1.1	0.1	0.7	0.4	0.0	0.5
Miscellaneous	7.5	5.3	0.8	0.5	2.7	13.1	5.3
Food Imports (US$ Mill.)	**2681**	**749**	**442**	**1103**	**4226**	**413**	**9615**
Composition of Food Imports (%)	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Live animals	2.8	7.3	5.5	6.3	3.9	8.2	4.4
Meat and meat preparations	11.0	12.8	11.3	12.1	13.2	16.9	12.5
Dairy products and eggs	11.4	21.9	19.4	14.6	13.4	18.1	14.1
Fish and fish preparations	4.0	1.4	1.8	2.1	3.0	1.6	2.9
Cereals and cereal preparations	14.8	18.7	15.1	16.6	25.8	14.0	20.1
Vegetables and fruit	28.7	20.6	28.4	25.8	16.1	21.1	21.8
Sugars and honey	4.3	3.0	3.5	3.5	5.5	2.9	4.5
Coffee, tea, cocoa, spices	13.4	8.0	6.5	9.1	7.9	8.7	9.6
Feeding stuff for animals	1.5	2.3	1.2	2.7	3.4	2.0	2.6
Miscellaneous	8.1	4.0	7.4	7.0	7.9	6.6	7.4

Source: UN COMTRADE and own calculation

stricted, and requires an import license, for bananas, dates and other fruits and vegetables. As part of its WTO commitments, and in order to maintain a certain level of protection to local producers, Oman has bound its tariffs for these products at a high level[2]. Although applied tariffs are lower than bound tariffs, Oman has the leverage to increase its tariffs to the bound rates (WTO, 2000).

Apart from tariff protection, most GCC countries provide support to agriculture in the form of free or low cost provision of agricultural inputs (fertilizers, pesticides, veterinary services, seeds, water, credits, equipment). However no commitments are made by GCC countries, in their WTO negotiations, to reduce these subsidies as the level of this support falls under the "de minimis 10%" provision, which exempts countries from reduction commitment if the agricultural support level is less than 10% of the total value of agricultural production.

Literature review

Several studies have attempted to assess the implications of multilateral as well as unilateral liberalization on developing countries (see Martin and Winters, 1996). But studies that focus on GCC countries are scarce. Among the few, Yeats (1996), using a partial equilibrium analysis estimated that the Uruguay Rounds agreement would expand Middle Eastern Countries' export, as a group, to the EU, Japan, and the United

States. No estimates were made, however, for individual countries. Goldin and Kherallah (1996) focused specifically on the impact of the Uruguay Rounds on MENA countries. Among the oil exporting countries, only Saudi Arabia was included in the study. The findings showed possible gains for producers of fruits and vegetable, meat and grain. The authors argued, however, that these gains would materialize only if trade reforms were accompanied by economy-wide trade and macroeconomics policy reforms. De Rosa (1996), in a broader study, examined agricultural trade and rural development of the MENA countries. The author suggested that agricultural rural development would be served best by an outward- looking development strategy based on free trade. Among the GCC countries, Oman was shown to hold comparative advantage in the production of fruits and vegetables and could expand its exports in a more open trade environment.

More recently, Burfisher (2001) analyzed, in a global study relevant to MENA countries, the potential commodity impacts from the full elimination of trade barriers and domestic supports in agriculture. The author estimated that the elimination of agricultural trade and domestic policy distortions could raise, in the long run, world agricultural prices by 12%. Based on results reported by Burfisher (2001), the largest increase will occur in livestock and dairy products (22.3%), wheat (18%), sugar (16%), vegetable oil (11%) and rice (10%). Furthermore, the expected price increase will have a negative effect on the import bill of MENA countries, including GCC countries, as their self-sufficiency in these products is low. On the hand, world price for fruits and vegetable, an export commodity group for most MENA countries, were estimated to increase by only 8%. This declining terms of trade (export price relative to import price) will make consumers worse off and will cause, in the presence of high pre-existing distortions, a misallocation of resources in the agricultural sector.

However, as argued by Dasgupta et al (2004), the results found in Burfisher 92001) and similar global studies suffer from the lack of realism in the models used in the analysis. The analysis used GTAP, a general equilibrium model, which did not capture domestic distortions in MENA adequately, and most MENA countries were not represented individually in the model data base. Dasgupta et al (2004) argued that with better estimates for domestic distortions in MENA countries, the negative effects (welfare loss) of the removal of trade barriers and domestic supports would turn into positive effects.

The WTSM Model

The World Trade Simulation Model (WTSM) developed by ADR international Ltd (http://www.adr-intl-com) belongs to the class of market equilibrium models where prices adjust to clear the markets. The model is based on the familiar log linear import demand and export supply and covers all merchandize trade for the entire world regions. A market clearing condition for each category of traded goods determine world prices, and an equilibrium balance of payment condition determines the nominal exchange rate for each country in the model.

Import Demand

Import demand $M^{d}_{k(i)}$ for traded good k by each country i is given by the relationship

$$M^{d}_{k(i)} = A^{m}_{k(i)}\left[P^{m}_{k(i)}\right]^{\eta k(i)} \quad (1)$$

$$P^{m}_{k(i)} = (1+\tau_{k(i)})^{f_{k(i)}}\left[P^{w}_{k}(1+t_{k(i)})/e_{(i)}\right] \quad (2)$$

Where: $P^{m}_{k(i)}$ is the domestic price for imports of good k in country i.

P^{w}_{k} is the world price of good k denominated in U.S dollars.

$t_{k(i)}$ is the applied ad valorem tariff rate for good k in country i.

$e_{(i)}$ is the exchange rate of country i's currency in terms of U.S dollar.

$f_{k(i)}$ is the proportion of imports of good k by country i subject to administered protection (non-tariff barriers).

$\eta_{k(i)}$ is the own price elasticity of import demand for good k in country i.

$A^{m}_{k(i)}$ is a scale demand parameter calibrated for the base year.

Export Supply

Export supply ($X^{s}_{k(i)}$) of good k in each country i is given by the relationship:

$$X^{s}_{k(i)} = A^{x}_{k(i)}\left[P^{x}_{k(i)}\right]^{\alpha k(i)} \quad (3)$$

$$P^{x}_{k(i)} = P^{w}_{k} / e_{(i)} \quad (4)$$

Where $A^{x}_{k(i)}$ is a scale supply parameter calibrated to the base year.

$P^{x}_{k(i)}$ is the domestic price for exports of good k in country i

$\alpha_{k(i)}$ is the own price elasticity of export supply of good k in country i.

World Market Equilibrium

Countries in the model are assumed to be price-takers in international market. That is, the world price is determined largely by the market clearing condition:

$$\Sigma_{i} M^{d}_{k(i)} = \Sigma_{i} X^{d}_{k(i)} \quad (5)$$

International Payment Equilibrium

In the model, net earning from trade and international resource flows to finance trade imbalances are exogenously determined. The condition for the balance of payment equilibrium for each country i in the model is given by:

$$\Sigma_{\mathrm{k}} \mathrm{P}_{\mathrm{k}}^{\mathrm{w}} X_{k(i)}^{s} = P_{k}^{w} \mathrm{M}_{\mathrm{k(i)}}^{\mathrm{d}}) + \mathrm{K}_{\mathrm{(i)}} = 0 \quad (6)$$

Where $\mathrm{K}_{\mathrm{(i)}}$ is the sum of the net services export and net financial inflows from abroad denominated in U.S dollar. The balance of payment conditions in equation (6) is essential for "closure" of the model and determines the real exchange rate of each country (De Rosa, 2000).

Data and Parameters

The import and export trade data were accumulated from the UN Commodity Trade Statistics Database (COMTRADE)) for the year 2002. Data were collected for 18 countries or regions, including GCC countries (6), others MENA countries (6), the EU (15), USA, Japan, Canada, Australia and the "Rest of the World" as a group comprising most of the developing countries. The trade data were disaggregated into 14 agricultural commodities and 6 non agricultural products according to the Standard International Trade Product Classification (SITC.Rev.3)

The import tariff rates were compiled from the UN Conference on Trade and Development (UNCTAD-TRAINS, 2003) database and computed as a simple average of the various tariff lines constituting a particular commodity. Non tariff barriers were not explicitly considered in the model as the information for GCC countries is not available. However, the influence of non tariff barriers was captured in the model by the calibrated import scale parameter (De Rosa and Kernohan, 2004).

The remaining parameters of the model consist of own price elasticities of demand and supply for traded goods. Based on De Rosa (2000) and Schiff and Valdes (1992), these elasticities were assumed equal to –2.0 and 1.0 for demand and supply, respectively. These values are somewhat higher in absolute terms than estimates found in the empirical studies but as Krueger et al. (1988) argued, large price elasticities insure that the magnitude of simulated price and exchange rate effects under trade liberalization scenarios are not biased upward. In any case, results in this analysis were found to be quite insensitive to the values of the elasticity parameters.

The model was constructed and solved using GAMS (General Algebraic Modeling Systems)[3], which is specifically designed for modeling complex linear and non-linear optimization problems.

Simulation Scenarios

The analysis examines the outcome of two scenarios: multilateral liberalization and unilateral liberalization scenario. Both scenarios involve two sub-scenarios where trade liberalization is assumed to take place first in the agricultural sector only (mainly capturing direct effects) and then in all sectors (capturing economy wide effects). These sub-scenarios reflect the WTO agricultural built-in agenda as well as a comprehensive multilateral trade negotiations covering world trade in all goods. The multilateral trade liberalization assumes that all countries remove their tariff protection simultaneously whereas unilateral trade liberalization assumes that only GCC countries remove their tariff barriers in the sector targeted for liberalization.

Trade liberalization gives rise to economy-wide effects operating through adjustment of the real exchange rate. This adjustment results in a balance of payment deficit, which is brought into equilibrium by the depreciation of the real exchange rate. This increases domestic prices and quantities of agricultural exportable. Depreciation of the real exchange rate also serves to moderate the fall in domestic prices and the corresponding increase in the volume of agricultural importable.

Results and Discussions

The results of the effects of both scenarios are summarized in Table 4. The summary presents the average changes in the exchange rate, agricultural prices, trade, and economic welfare. For comparison purposes, the interpretation of the results will follow the lines of De Rosa (2000).

Exchange Rate

In each scenario, the real exchange rate depreciates in order to maintain balance of payment equilibrium. However, the depreciation is less under multilateral than under unilateral trade liberalization (0.3% and 0.67% versus 3.4% and 2.0%). This implies that WTO multilateral liberalization requires less exchange rate adjustment than unilateral liberalization because the former stimulates demand for exports and imports simultaneously in each country (De Rosa, 2000). The small depreciation of the exchange rate in both scenarios reflects the liberal and open trade regime of the GCC countries.

Table 4. The Impacts of Trade liberalization on GCC Agricultural Sector and Economic Welfare (% change)

	Multilateral Liberalization		Unilateral Liberalization	
	All goods	Agriculture	All goods	Agriculture
Exchange Rate (US$/local currency)	-0.33	-0.67	-3.33	-2
Price of Exportable Products	5.93	8.37	4.62	2.06
Price of Importable Products	-1.37	0.62	-2.53	-4.91
Quantity of Agricultural Exports	3.06	4.69	2.38	0.89
Quantity of Agricultural Imports	6.16	4.43	14.86	22.63
Economic Welfare (Millions of US$)	7021	821	6816	2592

Notes: 1. Changes in variable are relative to base period (2002) value; 2. The model is calibrated in such a way that prices and exchange rates are equal to one in the base period; 3. Changes in economic welfare are equivalent income computed with respect to expenditure on imports at base period world prices.

Prices and Quantities for Exportable Products

For all scenarios, average agricultural prices for exportable products increase. However, prices increase more under multilateral trade liberalization scenario than under unilateral trade liberalization scenario (5.93% and 8.37% versus 4.62% and 2.06%). Broad-based trade liberalization results in greater stimulus to domestic prices for agricultural exportable than sector-specific trade liberalization. This causes the volume of exports to increase more significantly in the former scenario than in the latter. The price

differential is explained principally by the difference in the economy-wide effects on the real exchange rate.

The results show important price variation (2-25%) among products for the multilateral trade liberalization scenario under both the broad based and sector specific cases (see Table A2 and A3 in the Appendix). Prices increase more significantly for dairy products, fruits and vegetable, sugar, beverage and tobacco. The high price increase in these categories of products can be explained by their relatively high level of protection during the base-line period.

Prices and Quantities for Importable Products

The results show that average agricultural prices for importable products under all scenarios fall except for the multilateral sector specific trade liberalization. Prices fall

by less under broad based unilateral trade liberalization than under sector specific unilateral trade liberalization. The most important price decrease is attributed to the beverage and tobacco product category where price changes vary, according to the scenario, between 35% and 46% (Table A2 and A3, appendix). This price variation is explained by both the initial high level of protection and changes in world prices.

The average agricultural import volumes increased proportionally more under unilateral trade liberalization than multilateral liberalization. The important changes in the average import volumes under unilateral trade liberalization are again explained by the significant increase in the imports of the beverage and tobacco product category.

Economic Welfare

Results show that successful multilateral trade liberalization in all goods will increase GCC economic welfare by $7 billion, compared to $6.8 billion for unilateral trade liberalization in all goods (Table 4)). They also show that the outcome of the multilateral trade liberalization in all goods is superior to the outcome of multilateral trade liberalization in the agriculture sector only.

Even though the gain via multilateral trade liberalization is approximately of the same magnitude as the gains obtained through unilateral trade liberalization, pursuing multilateral trade liberalization has a number of advantages. The most important one is that economic gains are captured in GCC at appreciably less cost in terms of exchange rate depreciation. The second advantage is that agricultural exports are much more stimulated, as export price increases proportionately more, under multilateral trade liberalization than under unilateral trade liberalization (8.37% increase compared to 2.061%). Moreover agricultural price of imports are negatively less affected by multilateral trade liberalization than by unilateral trade liberalization (0.68% price increase compared to 4.91% price decrease).

Conclusion

The objective of this study was to assess the trade and welfare impacts of agricultural trade liberalization within the context of both unilateral and WTO multilateral trade liberalization. The World Trade Simulation Model (WTSM)) was used to analyze the agri-

cultural sector specific effects as well as on the economy-wide effects that are reflected in the exchange rate, volume of trade and economic welfare.

Results showed that under all the trade liberalization policy options, the economic gains for the GCC region were positive. Multilateral trade liberalization covering all the goods offered the greatest benefit to the economy in terms of economic welfare and stimulus to agricultural exports and exchange rate adjustment cost (less depreciation). Although unilateral liberalization also offered positive gains, the change in economic welfare was much higher under a liberalization process that covered all the sectors rather than liberalization covering only the agriculture sector.

This research provides general directions on the effects of trade liberalization on the GCC economy. These effects are sensitive to the assumptions inherent to the partial equilibrium nature of the model. Further research is needed to improve the robustness of the results and to take into consideration some aspects of recent trade reforms that the GCC region has engaged in at the regional and international level. For example, the GCC countries have established in 2003 a custom union with a common external tariff and have also engaged in negotiation with the EU to establish a free trade area. All these dynamic developments in the region would impact trade but also investment and overall economic growth.

Notes

[1] Saudi Arabia and Oman joined WTO only in 2005 and 2000 respectively although the negotiations for accession started in 1993. The slow progress toward accession was attributed mainly to the significant regulatory reforms required to meet the need of a transparent and competitive global economy.

[2] Much of the export figures for some countries include re-exports. For example, a country such as UAE is a major trans-shipment hub for the region where a significant proportion of trade destined to other GCC countries flows thorough its ports.

[3] Excluding oil, food exports constitute approximately 5% of total exports.

[4] Bound tariffs are 100% for bananas and dates, 80% for fruits and vegetables produced in Oman, 75% for milk, 75% and 30% respectively for eggs during the production periods and outside the production periods.

[5] The WTSM as used in the literature is implemented using VORSIM, a stand-alone modeling software. VORSIM presents the advantage of using the familiar Excel template but lacks the flexibility that is provided by GAMS to handle large and complex problems.

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Appendix

Table A1. Product Coverage of the Model

No.	Items	SITC Rev. 3	HS1996
	Agricultural Products		
1	Live Animals	00	01
2	Meat & Meat Preparation.	01	02+16
3	Dairy Products & bird eggs	02	04 - 0409
4	Cereals And Cereal Preparation	04	10 + 19
5	Fruits and Vegetable	05	07 + 08 + 20
6	Sugar, Sugar Preparation and Honey	06	17 + 0409
7	Animal Feed Stuff	08	2309
8	Coffee, Tea, Cocoa, Spices	07	12
9	Oilseeds	22	09 + 18
10	Beverage and Tobacco	1	22 + 24
11	Hides & Skins	21	41
12	Crude Rubber	23	40
13	Crude Animal & Vegetable Material	29	13 + 14 + (23 - 2309)
14	Animal & Vegetables Oil & Fats	4	15
	Non Agricultural Products		
15	Crude Fertilizers & Minerals	27	31
16	Mineral Fuels, Lubricants & Related Materials	3	27
17	Chemicals & Related Products	5	28 + 29
18	Manufactures Goods	6	42+44+48+64+72+73
19	Machine & Trans. Equipment	7	85+86+87+88+89
20	Others	9	

Table A2. Effect of Trade Liberalization on Commodity Import and Export Prices (% change)

Item	Multilateral liberalization		Unilateral liberalization	
	Agriculture	All goods	Agriculture	All goods
Export price(% change)				
Live Animals	4.67	3.00	1.83	4.50
Meat & Meat Preparation	4.50	3.00	2.00	4.50
Dairy Products & bird eggs	11.17	9.00	2.00	4.67
Cereals & Cereals Preparation	5.50	3.00	2.00	4.67
Fruits & Vegetables	10.00	8.00	2.00	4.67
Sugar, Sugar Preparation& Honey	10.50	7.00	2.00	4.67
Animal Feed Stuff	5.83	2.00	2.00	4.50
Coffee, Tea, Cocoa, Spices	7.50	5.00	2.00	4.50
Oilseeds	4.67	2.00	2.00	4.50
Beverage & Tobacco	26.50	25.00	3.00	5.50
Hides & Skins	9.83	7.00	2.00	4.50
Crude Rubber	3.50	1.00	2.00	4.50
Crude Animal & Vegetable Mate-rial	3.50	2.00	2.00	4.50
Animal & Vegetable Oil & Fats	9.50	6.00	2.00	4.50
Crude Fertilizers	0.67	1.00	2.00	4.50
Mineral Fuels	0.67	2.00	1.83	4.50
Chemicals	0.67	3.00	2.00	4.50
Manufactured Goods	0.67	7.00	2.00	4.50
Machine & Transport Equipment	0.67	3.00	2.00	4.67
Other Goods	0.67	5.00	2.00	4.50
Import price (% change)				
Live Animals	2.34	1.04	-0.42	2.18
Meat & Meat Preparation	2.18	1.04	-0.26	2.18
Dairy Products & Bird Eggs	5.81	4.37	-2.90	-0.38
Cereals & Cereals Preparation	0.43	-1.81	-2.90	-0.38
Fruits & Vegetables	4.71	2.79	-2.90	-0.38
Sugar, Sugar Pre., & Honey	6.08	3.33	-2.06	0.47
Animal Feed Stuff	-0.76	-4.06	-4.37	-2.04
Coffee, Tea, Cocoa, Spices	5.12	3.00	-0.26	2.18
Oilseeds	-1.84	-4.20	-4.37	-2.04
Beverage & Tobacco	-15.37	-15.86	-31.13	-29.35
Hides & Skins	0.81	-1.50	-6.39	-4.12
Crude Rubber	-2.14	-4.52	-3.55	-1.20
Crude Animal & Vegetable Mat.	-2.89	-3.99	-4.29	-1.96
Animal & Vegetable Oil & Fats	4.24	1.20	-2.90	-0.55
Crude Fertilizers	0.64	-3.40	1.91	-0.37
Mineral Fuels	0.63	-3.25	1.74	-1.20
Chemicals	0.63	-2.47	1.90	-1.20
Manufactured Goods	0.64	5.27	1.94	2.16
Machine & Trans. Equipment	0.63	-3.21	1.88	-1.80
Other Goods	0.76	-2.44	1.83	-3.22

Source: own calculation Notes: multilateral liberalization scenario is the elimination of trade barriers by all countries simultaneously whereas unilateral liberalization is the elimination of trade barriers by GCC countries only.

Table A3. Effect of Trade Liberalization on Commodity Import and Export Quantities (% change)

Item	Multilateral Liberalization		Unilateral Liberalization	
	Agriculture	All goods	Agriculture	All goods
Export quantity (%change)				
Live Animals	8.33	8.50	8.33	7.30
Meat & Meat Pre.	0.00	0.00	0.00	3.70
Dairy Products & bird eggs	2.78	2.78	0.00	1.39
Cereals & Cereals Pre.	0.00	0.00	0.00	0.00
Fruits & Vegetables	1.67	1.67	0.00	1.67
Sugar, Sugar Pre., & Honey	0.00	0.00	0.00	0.00
Animal Feed Stuff	0.00	0.00	0.00	0.00
Coffee, Tea, Cocoa, Spices	0.00	0.00	0.00	0.00
Oilseeds	0.00	0.00	0.00	0.00
Beverage & Tobacco	26.07	26.07	1.71	19.23
Hides & Skins	0.00	0.00	0.00	0.00
Crude Rubber	0.00	0.00	0.00	0.00
Crude Animal & Vegetable Mat.	1.61	1.61	1.61	3.23
Animal & Vegetable Oil & Fats	11.11	11.11	0.00	0.00
Crude Fertilizers	25.00	25.00	25.00	25.00
Mineral Fuels	0.81	2.13	1.58	3.66
Chemicals	1.55	4.57	1.85	5.27
Manufactured Goods	0.67	7.42	1.58	4.47
Machine & Trans. Equipment	0.45	2.02	1.22	2.94
Other Goods	0.69	5.49	1.86	3.86
Import quantity (%change)				
Live Animals	-6.49	-2.09	-3.66	-6.49
Meat & Meat Pre.	-4.35	-1.74	-0.66	-4.65
Dairy Products & bird eggs	-8.71	-8.26	9.46	0.44
Cereals & Cereals Pre.	-0.58	3.99	10.10	0.14
Fruits & Vegetables	-8.79	-5.12	8.32	0.66
Sugar, Sugar Pre., & Honey	-2.08	-6.11	22.32	2.38
Animal Feed Stuff	22.50	8.99	25.00	22.50
Coffee, Tea, Cocoa, Spices	-3.98	-5.41	10.65	-1.39
Oilseeds	0.00	9.71	0.00	0.00
Beverage & Tobacco	64.73	70.46	151.31	143.24
Hides & Skins	0.00	5.29	0.00	0.00
Crude Rubber	0.00	10.01	0.00	0.00
Crude Animal & Vegetable Mat.	6.25	8.73	6.25	6.25
Animal & Vegetable Oil & Fats	-0.96	-2.00	4.62	3.08
Crude Fertilizers	0.00	7.49	0.00	0.00
Mineral Fuels	-0.84	6.69	-1.81	3.35
Chemicals	-1.36	5.44	-3.71	2.59
Manufactured Goods	-1.73	-9.69	-3.34	-4.11
Machine & Trans. Equipment	-1.57	6.96	-3.28	4.28
Other Goods	-1.78	5.43	-3.18	6.62

Source: own calculation

Notes: multilateral liberalization scenario is the elimination of trade barriers by all countries simultaneously whereas unilateral liberalization is the elimination of trade barriers by GCC countries only.