

Towards OIC Economic Cooperation: Impacts of Developing 8 (D-8) Preferential Trade Agreement

By

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Abstract

The Developing 8 (D-8) comprises 8 developing countries with large Muslim populations that have formed a freer trade alliance, all of which are OIC members. Among its objectives are to create new opportunities and enhance intra-trade relations while providing better standards of living amongst its citizens. This paper examines the trade impacts of possible trade liberalization among the D-8: Turkey, Malaysia, Indonesia, Bangladesh, Pakistan, Iran, Egypt, and Nigeria using a multi-country computable general equilibrium model, i.e., GTAP. Results indicate that while D-8 intra-trade is expected to increase very substantially, not all countries will experience a welfare gain under a free trade arrangement. Likewise, impact on economic sectors differs substantially across countries.

Key Words: Developing 8, Organization of Islamic countries, Trade Liberalization, Preferential Trade Arrangement, Economic Integration, GTAP.

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Background

The Organization of the Islamic Conference (OIC) with its 57 members is the second largest inter-governmental organization after the UN. As of 2007, the OIC collectively stands for 22 percent of world population, 7 percent of world GDP, 9 percent of world trade, and 12 percent of intra trade. This compares to EU with only 8 percent of world population; it commands a world trade share of 35 percent and an impressive intra trade of 60 percent. The hard fact is that Muslim countries do not trade with or invest in each other's economies the way they do with the industrialized or other developing countries. Ironically, when seen from the standpoint of ownership of global crucial resources, OIC's potential is enormously striking with more than 70 percent of oil and nearly 50 percent of natural gas reserves of the world.

Intra-OIC trade stands only about 12 percent of the total trade. However, in recent years there have been clear efforts to enhance trade among OIC member states. Especially relevant is the OIC Ten-Year Program of Action, adopted in 2005, which identified increased economic cooperation among OIC members as a key strategy for higher economic growth and welfare. Thus far a dozen member states have signed the Protocol on Preferential Tariff Scheme (PRETAS), which proposes a preferential trade regime among the member countries to be effective as of January, 2009. A special grouping within OIC - the so-called D-8 (developing 8) group was established in 1997 to strengthen economic relationships and to provide the impetus for greater economic integration within the larger OIC community.

The D-8 group comprises eight major countries within OIC - Malaysia, Iran, Indonesia, Turkey, Bangladesh, Nigeria, Pakistan, and Egypt. The D-8 member countries have signed a preferential trade agreement with the aim of strengthening intra-trade and their economic relationships for improvements in living standards as well as for world harmony and stability. Various sectors have been identified for cooperation and project development in this trade agreement. These include intra-trade, industry, telecommunications and information, finance, banking and privatization, rural development, science and technology, poverty alleviation and human resources development, agriculture, energy, environment and health.

This paper investigates the intra-trade and welfare effects of the preferential trade agreement among the D-8 countries by looking at the possibility of a full-fledge trade liberalization through the expansion of the coverage of the preferential tariff reduction. This paper applies the computable general equilibrium (CGE) modeling approach using the Global Trade Analysis project (GTAP) model and the accompanying V7 database for a quantitative analysis of the economic effects of a free trade arrangement between the contracting countries. A full-fledge trade liberalization of tariff barriers is examined with special focus on Malaysia, Turkey and Indonesia. An important aim of the paper is to appraise whether there will be significant gains in

intra-trade and welfare amongst the D-8 member countries when tariff barriers and enhancement measures are being entirely dismantled.

State of Intra-trade within the D-8 Countries

Table 1 depicts the intra trade levels among the D-8 countries in comparison with other OIC countries (ROIC) and the Rest-of-the-World (ROW) aggregate. It clearly indicates that intra trade among D-8 countries has been dismally minute ranging mainly from 0-4 percent of their respective total trade. However, trade with ROW is overwhelmingly high at about 90 percent on average. Among the D-8 countries, Indonesia-Malaysia trade has been the top trading pair. Malaysian trade with Indonesia accounts for 1.7 percent of total trade while Indonesian trade with Malaysia is somewhat larger at 3.9 percent. Pakistan is the second biggest Malaysian trade partner followed by Turkey. The second top trading pair within the D-8 grouping is between Iran and Turkey. Iran's trade with Turkey comprises 3.5 percent of her total trade. All other bilateral trade between the D-8 countries has only been 'microscopic'; mainly less than 1 percent of each country's total trade. Overall, intra-trade within the D-8 forms only 3.7 percent, relative to 6 percent with ROIC and 90 percent with the ROW (Table 2). As noted at the outset, it will be interesting to examine whether removals of trade impediments particularly tariff barriers will enhance intra-trade among D-8 countries substantially.

Table 1: Decomposition of Trade Among D-8, ROIC and ROW (percentage)

		Partner Country										Total
		Malaysia	Iran	Turkey	Indonesia	Nigeria	Pakistan	Bangladesh	Egypt	ROIC	ROW	
Reporter Country	Malaysia	0	0.25	0.36	1.69	0.06	0.47	0.26	0.24	3.07	93.59	100
	Iran	0.45	0	3.47	0.37	0.04	0.7	0.27	0.04	7.48	87.17	100
	Turkey	0.31	1.05	0	0.25	0.14	0.16	0.07	0.51	13.22	84.3	100
	Indonesia	3.88	0.25	0.57	0	0.21	0.53	0.41	0.26	3.42	90.47	100
	Nigeria	0.06	0.02	0.05	0.35	0	0.08	0.02	0.02	1.42	97.97	100
	Pakistan	0.57	0.71	1.45	0.49	1.88	0	1.4	0.14	11.28	82.08	100
	Bangladesh	0.23	0.41	0.72	0.21	0.04	0.47	0	0.13	2.57	95.24	100
	Egypt	0.43	0.08	1.32	0.44	0.17	0.35	0.09	0	12.64	84.49	100
	ROIC	0.47	1.44	1.89	0.63	0.1	1.15	0.18	0.32	7.37	86.44	100
	ROW	1.04	0.33	0.89	0.73	0.2	0.2	0.11	0.21	3.77	92.52	100
	Total	1.01	0.38	0.93	0.72	0.2	0.26	0.12	0.22	4.04	92.13	100

Source: GTAP V7 database

**Table 2: Baseline Bilateral Export at World Prices
(in percent value)**

	D8	ROIC	ROW	Total
D8	3.7	6.0	90.2	100
ROIC	6.2	7.3	86.4	100
ROW	3.7	3.8	92.5	100
Total	3.8	4.0	92.1	100

Source: GTAP V7 database

Methodology

The GTAP Model

This study uses the GTAP model to appraise the economic-wide impacts of free trade among the D-8 countries. The GTAP (The Global trade analysis Project) model, developed by the Center for Global Trade Analysis, Purdue University is a multiregional, comparative static, exogenous policy, applied general equilibrium (CGE) model based on neoclassical theories (Walras law). The model to date has been the most widely used tool for the ex ante analysis of economy-wide trade effects of multilateral or bilateral trade agreement. Bilateral trade is handled via the Armington assumption, household's preferences based on non-homothetic CDE functional form. The model assumes constant return to scale production technology, competitive markets and utility maximization behavior of consumers. The model is linearised and uses a common global database. Dynamic effects and other technology variant for certain sectors were not considered in the study. Therefore, the effects and potential gains from trade liberalization espoused in this study are highly likely to be modest or underestimated. Details of the model can be found in Hertel (1997).

The GTAP database

This study uses the latest available GTAP database (V7), which carries a snapshot of the 2004 world economy. The database has 113 regions (aggregate of 226 countries) and 57 sectors. The database is formatted as an input-output structure within each country with bilateral trade values expressed in USD million. Bilateral trade data extends down to the sector level which enables the analyst to examine the effect of trade policy changes to the sector level. The sectoral definitions in the database follow the Central Product Classification (CPC) for agricultural & food processing and international Standard Industrial Classification (ISIC) for all others.

Sectoral and Regional Aggregation

In this study, the world economy was modeled to comprise the individual D-8 members, Rest of OIC (ROIC), and Rest-of-the-World (ROW) aggregate while 8 major economic sectors were considered. Table 3 shows the sectoral aggregations and Appendix 1 provides a description of the products for each sectoral aggregate.

Table 3: Regional and Sectoral Aggregation

	Regions		Code	Sectors
1	Malaysia	1	RAWAG	Primary agriculture
2	Indonesia	2	MINERAL	Natural resources, extractive and related industries
3	Turkey	3	FOOD	Processed food
4	Iran	4	MANU	Manufacturing products
5	Pakistan	5	VEGOIL	Vegetable oil products
6	Egypt	6	F&FISH	Forest and fisheries product
7	Nigeria	7	ANIMAL	Animal product
8	Bangladesh	8	TEXT	Textile and wearing apparel
9	ROIC (Rest of OIC)	9	SVCS	Services
10	ROW (Rest of the World)			

Source: Sectoral and regional aggregation by the authors

Baseline Bilateral Trade Relations

This section examines the baseline (pre free trade simulation) bilateral trade relations between D-8 members with emphasis on intra D-8 trade particularly Malaysia, Turkey and Indonesia.

Exports

For Malaysia, total export to D-8 constitutes only 3.3 percent of total trade to the world (Table 4). Commodity-wise, only VEGOIL, TEXT and FOOD have made quite substantial inroads into the D-8 markets at 15, 10, and 9 percent, respectively. All other exports to D-8 have been rather minute (1-4 percent) of total trade for each commodity. Of total trade to D-8, the MANU sector constitutes the largest share at 47 percent and followed by VEGO (25 percent) (Table 5).

Turkish export share to D-8 markets has been even lower at 2.5 percent. Relative to other markets, none of its products made significant inroads into D-8 (Table 4). Table 5 indicates the major commodities exported to D-8 are MANU (44 percent), SVCS (27 percent) and RAWAG (10 percent).

Of the three countries, Indonesia's export share to D-8 markets is largest at 6.1 percent. Sectoral-wise, only three commodities - RAWAG (20 percent), VEGOIL (19 percent) and F&FISH (9 percent) have made significant presence in D-8 markets. The major commodities exported to D-8 are MANU (45 percent), TEXT (19 percent) and VEGOIL (16 percent).

Table 4: Decomposition of Exports by Partner Countries and Sector (percentage)

	Total Export of Malaysia				Total Export of Turkey				Total Export of Indonesia			
	D-8	ROIC	ROW	Total	D-8	ROIC	ROW	Total	D-8	ROIC	ROW	Total
RawAg	0.043	0.044	0.913	1	0.031	0.064	0.905	1	0.203	0.030	0.767	1
Animal	0.026	0.055	0.919	1	0.007	0.137	0.856	1	0.008	0.059	0.933	1
F&Fish	0.013	0.005	0.982	1	0.005	0.035	0.960	1	0.086	0.009	0.905	1
Food	0.090	0.057	0.852	1	0.024	0.243	0.733	1	0.056	0.026	0.918	1
Text	0.102	0.033	0.865	1	0.014	0.074	0.912	1	0.070	0.050	0.879	1
Manu	0.025	0.025	0.950	1	0.031	0.204	0.765	1	0.063	0.034	0.903	1
Svcs	0.020	0.033	0.947	1	0.022	0.033	0.945	1	0.019	0.048	0.933	1
Mineral	0.041	0.000	0.958	1	0.039	0.138	0.823	1	0.017	0.001	0.982	1
Vegoil	0.150	0.161	0.689	1	0.027	0.360	0.613	1	0.179	0.106	0.715	1
Total	0.033	0.031	0.936	1	0.025	0.132	0.843	1	0.061	0.034	0.905	1

Source: GTAP database V 7

Table 5: Decomposition of Exports by Partner Countries and Sector (percentage)

	Total Export of Malaysia				Total Export of Turkey				Total Export of Indonesia			
	D-8	ROIC	ROW	Total	D-8	ROIC	ROW	Total	D-8	ROIC	ROW	Total
RawAg	1.94	0.36	0.24	0.25	10.09	1.9	4.22	3.93	5.1	1.72	1.65	1.95
Animal	1.41	0.35	0.19	0.2	1.41	0.25	0.25	0.24	1.37	0.66	0.4	0.39
F&Fish	0.62	0.11	0.75	0.71	0.48	0.05	0.2	0.17	0.7	0.17	0.62	0.62
Food	3.18	2.93	1.44	1.58	3.8	6.62	3.13	3.6	3.25	2.82	3.74	3.69
Text	7.86	2.19	1.89	2.05	9.18	12.5	24.18	22.35	19.05	14.91	9.86	10.14
Manu	47.33	64.05	79.21	78.06	44.43	71.25	41.82	46.09	45.53	54.07	54.15	54.26
Svcs	10.2	7.81	7.46	7.38	27.28	5.63	25.1	22.4	6.44	9.33	6.87	6.66
Mineral	2.63	0.09	5.71	5.57	2.94	0.93	0.87	0.89	2.38	0.66	18.71	17.23
Vegoil	24.85	22.1	3.1	4.21	0.41	0.88	0.24	0.32	16.19	15.65	4.01	5.07
Total	100	100	100	100	100	100	100	100	100	100	100	100

Source: GTAP database V7

Imports

The decomposition of imports by partner countries and sectors are depicted in Table 6 and 7.

The D-8 has been Malaysia's source of imports for 28 percent of RAWAG, 36 percent F&FISH, 18 percent MINERAL, 12 percent TEXT and 51 percent VEGOIL. Overall imports from D-8 represent 4.2 percent of Malaysia's total imports (Table 6).

The D-8 has also been a substantial source of Turkish imports for the same commodities, i.e., TEXT (13 percent), MINERAL (15 percent) and VEGOIL (18 percent). Overall Turkish imports from D-8 at 3.5 percent are lower than Malaysia.

For Indonesia, MINERAL and F&FISH have been quite substantially sourced from D-8 markets at 11 and 15 percent, respectively. Of the three countries, Indonesia's share of imports from D-8, similar to exports, has been the highest at 4.6 percent.

Table 7 indicates Malaysia, Turkey and Indonesia's imports from D-8 have been largely composed of SVCS, MANU, TEXT, MINERALS and RAWAG.

Table 6: Decomposition of Import by Partner Country and Sector

	Total Import of Malaysia				Total Import of Turkey				Total Import of Indonesia			
	D-8	ROIC	ROW	Total	D-8	ROIC	ROW	Total	D-8	ROIC	ROW	Total
RawAg	0.149	0.0058	0.8451	1	0.025	0.0965	0.8785	1	0.0306	0.0131	0.9564	1
Animal	0.0073	0.0144	0.9783	1	0.0189	0.0995	0.8817	1	0.0148	0.005	0.9802	1
F&Fish	0.3567	0.0044	0.6389	1	0.0098	0.0377	0.9525	1	0.1472	0.0164	0.8364	1
Food	0.0693	0.004	0.9268	1	0.0343	0.0514	0.9143	1	0.0914	0.0101	0.8986	1
Text	0.1156	0.0049	0.8794	1	0.1263	0.0437	0.83	1	0.0334	0.0033	0.9634	1
Manu	0.0297	0.0136	0.9566	1	0.012	0.0458	0.9421	1	0.0473	0.0129	0.9398	1
Svcs	0.026	0.0286	0.9453	1	0.0269	0.0382	0.9349	1	0.0225	0.0308	0.9466	1
Mineral	0.1784	0.4055	0.416	1	0.1552	0.5814	0.2633	1	0.1061	0.4699	0.424	1
Vegoil	0.514	0.0065	0.4796	1	0.1824	0.0411	0.7765	1	0.0452	0.0411	0.9137	1
Total	0.042	0.0226	0.9354	1	0.0347	0.0994	0.8659	1	0.0457	0.0417	0.9126	1

Source: GTAP database V 7

Table 7: Decomposition of Import by Partner Country and Sector (percentage)

	Total Import of Malaysia				Total import of Turkey				Total import of Indonesia			
	D-8	ROIC	ROW	Total	D-8	ROIC	ROW	Total	D-8	ROIC	ROW	Total
RawAg	5.13	0.55	1.95	2.16	6.00	2.24	2.34	2.30	10.28	1.30	4.34	4.14
Animal	1.45	0.25	0.42	0.40	1.48	0.73	0.74	0.73	1.40	0.07	0.64	0.60
F&Fish	4.94	0.03	0.12	0.17	0.47	0.08	0.23	0.21	0.55	0.04	0.09	0.10
Food	6.75	0.48	2.72	2.74	3.14	0.62	1.27	1.20	3.55	0.75	3.05	3.10
Text	10.24	0.46	1.99	2.12	30.73	2.33	5.08	5.30	10.43	0.32	4.27	4.05
Manu	26.04	47.07	79.87	78.10	27.57	33.57	79.15	72.75	33.15	19.12	63.78	61.93
Svcs	34.29	14.57	11.64	11.52	11.95	2.76	7.74	7.17	28.45	14.64	20.53	19.80
Mineral	9.34	36.35	0.90	2.03	16.38	57.46	2.99	9.82	11.85	63.08	2.60	5.60
Vegoil	1.83	0.22	0.39	0.77	2.28	0.21	0.46	0.51	0.34	0.68	0.69	0.69
Total	100	100	100	100	100	100	100	100	100	100	100	100

Source: GTAP database V7

Decomposition of Import and Export Taxes/Subsidies

Tables 8 and 9 depict the baseline levels of trade policies among D-8, ROIC and ROW economies. Table 8 shows import taxes instituted on FOOD especially to D-8 markets have been the heaviest in each country. Malaysia levied the highest FOOD import levy (64 percent) relative to Turkey and Indonesia. The RAWAG sector in Malaysia is the second most protected sector, followed by TEXT. Turkey also protected highly its FOOD, RAWAG, VEGOIL and TEXT sectors from D-8 and other countries. On the other hand, Indonesia's import taxes against D-8 and other countries are far smaller relative to Malaysia and Turkey. For export subsidies, generally they have been very low across countries and commodities (Table 9).

Table 8: Import Taxes

	Import Taxes by Malaysia				Import Taxes by Turkey				Import Taxes by Indonesia			
	D-8	ROIC	ROW	Total	D-8	ROIC	ROW	Total	D-8	ROIC	ROW	Total
RawAg	18.56	10.69	12.65	41.90	25.05	10.60	12.45	48.10	2.96	2.00	1.67	6.63
Animal	0.62	0.36	0.62	1.60	1.00	2.01	13.31	16.32	0.90	1.22	2.45	4.57
F&Fish	1.69	1.11	1.00	3.80	2.93	14.69	1.31	18.93	1.77	2.86	2.11	6.74
Food	64.38	42.77	23.67	130.81	35.05	22.26	18.11	75.42	8.55	8.64	13.81	30.99
Text	8.01	15.35	14.87	38.22	6.35	3.62	2.65	12.62	5.68	8.33	8.10	22.11
Manu	2.15	8.78	4.99	15.92	3.20	1.33	1.23	5.76	1.76	2.06	4.30	8.11
Svcs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mineral	0.91	2.22	0.68	3.82	0.02	0.28	0.06	0.36	0.13	0.02	0.46	0.61
Vegoil	0.26	0.14	0.92	1.31	9.53	15.66	14.85	40.04	0.73	0.00	0.40	1.13
Total	96.58	81.41	59.39	237.38	83.13	70.45	63.97	217.54	22.48	25.13	33.30	80.90

Source: GTAP database V7

Table 9: Export Subsidies

	Export Subsidy by Malaysia				Export Subsidy by Turkey				Export Subsidy by Indonesia			
	D8	ROIC	ROW	Total	D8	ROIC	ROW	Total	D8	ROIC	ROW	Total
RawAg	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Animal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
F&Fish	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Food	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Text	0.00	0.00	-0.77	-0.77	0.02	0.13	-0.85	-0.69	-0.79	-0.74	-1.60	-3.12
Manu	0.00	0.00	0.00	0.00	-0.52	-1.37	-0.44	-2.33	-1.25	-1.22	-1.17	-3.64
Svcs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mineral	1.26	-1.33	-0.45	-0.52	0.00	0.00	0.00	0.00	-0.61	-1.19	-0.58	-2.39
Vegoil	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	1.26	-1.33	-1.21	-1.29	-0.49	-1.24	-1.29	-3.02	-2.65	-3.15	-3.35	-9.15

D-8 FTA Simulation Results

The simulation scenario examined in this paper is a complete liberalization of merchandise trade, which is the removal of all bilateral trade policies (import tariff and export subsidies/taxes) on goods trade among D-8 members from the 2004 base year, while all other trade distortion in other countries remained unchanged. The results are presented and discussed in the following sub-sections.

Impact on D-8 Intra-Trade

The most important examination in this study is whether complete removals of trade impediments among D-8 members would enhance trade among them. Table 10 below shows the expected share of trade across the three aggregated regions following the removals of such impediments. To appreciate the magnitude of changes, the figures should well be contrasted to that of the baseline levels as in Table 2. Intra-trade within the D-8 members is expected to increase to 6.7 percent. This represents a substantial increase from the baseline level of 3.7 (Table 2). However, the share of total D-8 intra-trade to total global trade remains somewhat unchanged.

Table 10: Free Trade Simulation of Bilateral Export Share at World Prices (percentage)

	D8	ROIC	ROW	Total
D8	6.69	5.84	87.46	100
ROIC	6.12	7.38	86.49	100
ROW	3.65	3.77	92.57	100
Total	3.91	4.04	92.05	100

Source: Simulation Results

Table 11 shows the change in export in terms of absolute values as compared to the baseline levels. As shown, trade within the D-8 members following a free trade would increase by USD 14,708 million or 87 percent. Further, exports of D-8 to ROIC and ROW are expected to decline by 2.1 percent, respectively. The results suggest that if increasing intra-trade is an important objective of the D-8 preferential trade arrangement, then very likely it would succeed. However, the quantum of D-8 intra-trade following the removals of trade impediments would still be small relative to trade with other regions, particularly ROW due to the small baseline level.

Table 11: Impact on D-8 Intra-trade

	Baseline Export Levels (mill USD)				Change in Exports Post Simulation – Absolute values (mill USD)		
Regions	D-8	ROIC	ROW	Total	D-8	ROIC	ROW
D-8	17014	27235	407499	451748	14708	-553	-8675

Source: Simulation Results

Effect on Real GDP and Output

As shown in Table 12, the effects of removals of trade enhancement and protectionist policies among D-8 countries on real GDP are highly insignificant due to the very small trade base between the D-8 nations. Malaysian GDP is expected to gain most (albeit very slightly - only a 0.56 percent change), followed by Pakistan and Indonesia. Bangladesh, Nigeria, Iran and Egypt may however, see a small decline in real GDP, while the GDP of Turkey, ROIC and ROW would remain unchanged.

For the different commodity sectors in the economy, the output of TEXT followed by VEGOIL especially in Malaysia and Indonesia are poised to increase markedly. However, VEGOIL in other D-8 regions especially Nigeria, Pakistan and Bangladesh would experience the largest output fall relative to other countries.

Animal products in most regions are projected to decline, resulting in gains to both Malaysian and Nigerian ANIMAL (animal production) sector. The expected decline in Malaysia's RAWAG is about 5 percent, which is quite substantial in relation to other countries. Forest and fisheries products (F&FISH) across most of the D-8 countries would decline, generating some small benefits to Egypt and ROW.

While Malaysia and Indonesia would experience, respectively, 8 and 2 percent increase in processed food products (FOOD), other D-8 members would only experience marginal changes. The effect of D-8 FTA on mineral products (MINERAL) also seems to be very small and only Bangladesh is expected to experience a decline of some 2 percent decrease.

Table 12: Changes on Real GDP and Impact on Output by Sector (Percent Change)

	Malaysia	Iran	Turkey	Indonesia	Nigeria	Pakistan	Bangladesh	Egypt	ROIC	ROW
Real GDP	0.56	-0.14	+0	0.03	-0.15	0.14	-0.18	-0.02	0	0
RawAg	-4.96	0.66	1.9	0.22	-0.47	-0.43	-0.17	0.05	-0.04	-0.08
Animal	8.1	-0.28	-0.41	-0.29	0.83	-0.24	-0.38	-0.06	-0.01	0
F&Fish	-0.41	-0.08	-0.12	-0.02	-1.13	-0.82	-0.16	0.06	0	0.01
Food	7.61	-0.59	-0.32	2.22	0.51	0.14	-0.26	0.74	-0.04	-0.04
Text	19.78	-2.39	-1.18	3.19	-34.37	4.2	3.57	-0.72	-0.41	-0.1
Manu	-1.37	0.42	-0.01	-0.77	0.48	-0.79	-1.81	0.24	-0.02	0.02
Svcs	-0.1	-0.04	-0.12	-0.01	0.39	-0.14	-0.14	-0.03	0	0
Mineral	-0.67	-0.01	-0.62	-0.72	0.15	0.09	-2.29	0.01	0.03	0.01
Vegoil	15.34	-4	-1.28	1.27	-39.61	-32.32	-21.87	-3.88	-0.92	-0.26

Source: Simulation Results

Effects on Trade Balance

Overall, the trade balance for the entire D-8 moves in a negative direction, in complete contrast to that of ROIC and ROW (Table 13). In Malaysia, VEGOIL, TEXT and RAWAG are not capable of covering the negative trade balance from MANU and SCVS sector. For Turkey, RAWAG is the only sector that yields positive trade balance changes. Indonesia will also experience a negative change in trade balance but at a lower magnitude relative to Malaysia and Turkey due to her more resilient MANU sector. Appendix 2 provides the details of percentage changes estimates in Malaysian exports and imports by her partners and sectors.

Table 13: Changes in Trade Balance by Sector (Million USD)

	Malaysia	Iran	Turkey	Indonesia	Nigeria	Pakistan	Bangladesh	Egypt	ROIC	ROW
RawAg	188.73	103.46	680.18	-201.34	21.01	-53.67	12.13	-11.42	-6.78	-684.01
Animal	69.02	5.13	-42.68	-45.14	0.23	-5.91	0.02	-3.2	8.34	10.39
F&Fish	-20.85	0.13	-5.71	-12.14	1.03	-7.97	11.94	-0.13	2.03	32.64
Food	171.65	-99.05	-92.63	721	-4.49	87.21	-8.05	74.03	-15.79	-895.38
Text	491.69	-237.86	-160.73	437.55	-330.81	732.99	170.12	-82.32	-111.29	-1022.98
Manu	-1629.1	24.38	-195.83	-586.79	-179.24	-318.77	-193.93	32.01	-3.66	2814.1
Svcs	-414.02	12.37	-598.52	-459.67	94.08	-312.3	-2.9	-31.75	205.37	1959.36
Mineral	18.17	-68.52	-26.08	-75.4	37.39	42.18	-34.39	-14.47	90.18	-59.9
Vegoil	972.01	7.84	-31.41	148.69	-21.99	-633.68	-99.82	-7.88	-57.49	-383.74
Total	-110.51	-253.07	-473.41	-61.59	-380.84	-468.16	-145.51	-45.08	111.42	1811.98

Source: Simulation results

Impacts on Welfare

The effect of a change in trade policies on the welfare of a region depends on the impacts of changes in world prices on the welfare of the trading country and the efficiency gains associated with output changes. The welfare measure in the analysis employs the equivalent variation (EV) criterion, a measure of absolute welfare gains for each regional household, expressed in millions of USD. The EV can be interpreted as the change in regional household income at constant prices that is equivalent to the proposed changes. Because the EV uses initial period prices as its base, welfare results from any given simulation can be compared directly.

Changes in welfare as a result of trade liberalization could be due to changes in terms of trade, better use of resources (allocative efficiency) and others, i.e. less costly imports and scale effects. Results in Table 10 suggest that improvement in effectiveness of use of resources, followed by increases in terms of trade contribute to the increase in Malaysian societal welfare that includes poverty alleviation. Aggregate effects of other factors seem to have a small negative effect on social welfare.

The increase in Malaysian GDP results in the decline of dead welfare loss and this implies that Malaysian aggregate supply before trade liberalization has been inefficient.

Iran and Bangladesh are expected to be worse off among D-8 nations following the D-8 trade liberalization. Turkey gains from freer trade due to increases in terms of trade while resources efficiency seems unchanged. Pakistan and Indonesian welfare is expected to improve. The reduction in Nigerian GDP is manifested by the decline in the efficiency of resource use as well as terms of trade, while less costly imports of Nigeria from other D-8 members and improvements in economic of scale are translated into a net gain in Nigerian welfare. The

increase in Egypt's social dead loss weight is due to the reduction in GDP brought by the decline in resource allocation process and economics of scale.

The wide range of effects from the D-8 freer trade suggests that not every country will benefit from trade liberalization. As is obvious from Table 14, Iran, Bangladesh and Egypt may experience a reduction in welfare while other D-8 nations (Malaysia, Turkey, Indonesia, Nigeria and Pakistan) will gain.

Table 14: Impact on Regional Welfare (EV, Million USD)

	Decomposition of Welfare Change			Total
	Allocative Efficiency	Terms of trade	Other	
Malaysia	647.3687	413.4625	-91.691	969.1402
Iran	-215.345	-14.417	9.6223	-220.14
Turkey	0.3661	596.2694	95.0018	691.6373
Indonesia	70.5443	597.7478	-85.6323	582.6599
Nigeria	-104.108	-23.695	239.1854	111.3824
Pakistan	129.2085	154.3294	71.4629	355.0009
Bangladesh	-97.9	-88.5247	-7.0515	-193.476
Egypt	-13.5048	8.3821	-0.2328	-5.3555
ROIC	-42.571	-162.538	9.6924	-195.417
ROW	-213.889	-1476.36	-237.036	-1927.28

Source: Simulation results

Table 15 illustrates the allocative efficiency effects by sectors. Especially it shows the RAWAG followed by FOOD have contributed most to allocative efficiency in Malaysia. For other D-8 nations, changes in allocation of resource do not seem to affect welfare significantly (except for Pakistan's vegetable oil sector).

Table 15: Allocative Efficiency Effect by Commodity Groups

	RawAg	Animal	F&fish	Food	Text	Manu	Svcs	Mineral	vegoil	Other	Total
Malaysia	534.6862	-0.091	0.1861	104.652	9.549	-1.6843	-0.1474	-0.3122	0.5303	-	647.3687
Iran	5.9036	-0.4866	0.0627	-37.9528	-140.073	-79.0864	1.7411	0.6628	34.792	-	-215.345
Turkey	18.0614	4.3012	-0.0094	8.6888	-8.3805	-6.8357	-5.3357	1.6416	1.0671	-	0.3661
Indonesia	4.7418	1.7519	0.1694	9.1121	9.2553	35.2025	7.7353	1.9739	0.7803	-	70.5443
Nigeria	-0.2931	0.1533	0.0009	-10.1618	-7.2609	-90.4061	1.7826	-0.0145	1.4155	-	-104.108
Pakistan	0.4884	0.1612	0.3441	3.2189	9.6818	-18.178	-5.1212	20.8976	112.0015	-	129.2085
Bangladesh	0.5614	-0.2092	-0.0182	-1.3745	-63.3479	-37.1368	0.0756	-32.6505	23.9568	-	-97.9
Egypt	1.8617	0.1257	0.004	0.9936	-10.3065	-8.4275	-0.0037	-0.1652	2.4134	-	-13.5048
ROIC	-2.3255	-3.3592	-0.118	-3.9573	-9.3122	-29.951	1.1391	8.6245	-3.344	-	-42.571
ROW	-2.223	0.5918	-0.6368	-33.673	-74.4428	0.0863	-100.248	20.2512	-89.1402	-	-213.889
Total	561.4628	2.9391	-0.015	39.5459	-284.638	-236.417	-98.382	20.9091	84.4726	-	142.6357

Source: Simulation results

Conclusion and Remarks

Simulation results show that the D-8 free trade would increase intra-trade very pronouncedly by 87 percent. This clearly indicates if increasing intra-trade is an important objective of the D-8 preferential trade arrangement, very likely it would succeed. However, the proposed intra D-8 free trade is likely to have a small effect on member countries' GDP due to the particularly minute intra-trade base between them. It is expected that Malaysia's GDP and her overall national welfare would show the highest gain relative to other D-8 member nations. Besides Malaysia, Turkey, Indonesia and Pakistan are also expected to benefit from D-8 freer trade in terms welfare increases and hence poverty alleviation.

The GDP fall in Bangladesh, Iran and Egypt is associated with a reduction in national welfare. Nigeria is the only D-8 member that will see an increase in welfare, despite its declining GDP. This can be attributed to declining import costs and improvements in economics of scales.

The direction and magnitude of impacts for each sector across countries are projected to be considerably different. For Malaysia, increased outputs are expected for textiles, vegetable oils, animal products and processed food while other sectors may experience marginal contraction. Turkey's agriculture (RAWAG) is the only sector, which cushions a further decline in her GDP. Textile (TEXT), processed food (FOOD), vegetable oil (VEGOIL) and agricultural (RAWAG) sector in Indonesia would also experience some expansion.

More comprehensive studies are warranted utilizing alternative methodologies in order to ascertained further the repercussions of free trade on the individual disaggregated commodity and especially to take into account emerging issues such as agricultural multi-functionality,

trade-environment effects and the so-called ‘development box’ which has taken the limelight in recent trade negotiations.

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Appendix 1: Sectoral Aggregation and Codes

Sector	Code	Coverage of Commodities
Agriculture	RawAg	paddy rice, wheat, cereal grains not elsewhere classified(nec), vegetables, fruit, nuts, oil seeds, sugar cane, sugar beet, plant-based fibers crops nec, sugar, processed rice
Animal Products	Animal	cattle, sheep, goats, horses, animal products nec , raw milk, wool, silk-worm cocoons, meat: cattle, sheep, goats, horse, meat products nec
Vegetable oil	Vegoil	vegetable oils and fats
Forestry And Fishing	F&Fish	forestry, fishing

Mineral	Mineral	coal, oil, gas, minerals nec
Processed Food	Food	dairy products, processed rice, sugar, beverages and tobacco products, food products nec
Textiles	TEXT	textiles, wearing apparel
Manufactures	Manu	leather products, wood products, paper products, publishing, petroleum, coal products, chemical, rubber, plastic prods, mineral products nec , ferrous metals, metals nec , metal products, motor vehicles and parts, transport equipment, electronic equipment, machinery and equipment nec, manufacturing nec.
Services	SVCS	electricity, gas manufacture, distribution, water, trade, transport nec, construction, sea transport, air transport, communication, financial services nec,, insurance, business services nec, recreation and other services, pub admin /defence/health/education, dwellings

Source: Adapted from GTAP7 Database

Appendix 2:

Table A2.1 Decomposition of Bilateral Export Changes by Malaysia and by Sector (percentage change)

	Malaysia	Iran	Turkey	Indonesia	Nigeria	Pakistan	Bangladesh	Egypt	ROIC	ROW
RawAg	-36.32	923	221.02	50.24	1219.31	131.12	325.73	173.37	31.16	27.24
Anima	17.78	21.38	26.64	32.89	19.67	151.25	209.87	23.01	20.88	20.28
F&Fish	-0.59	141.62	-1.13	5.78	-8.17	17.2	-3.06	0.09	-2.25	-2.13
Food	-16.7	151.99	140.32	61.03	1028.35	154.38	133.77	343.39	14.63	14.84
Text	7.74	133.79	73.19	34.54	102.18	411.5	366.02	176.48	9.1	9.32
Manu	-3.25	95.34	21.71	10.37	313.86	163.6	181.31	89.01	-2.74	-2.8
Svcs	-1.07	-3.01	-0.8	-0.84	-3.63	0.38	-2.78	-2.57	-2.79	-2.72
Mineral	-2.35	328.08	-10.29	-12.58	228.03	108.91	211.31	-13.55	0.55	0.58
Vegoil	11.95	272.83	70.92	7.93	419.04	122.11	70.87	55.44	-0.54	-0.82

Source: Simulation results

Table A2.2. Decomposition of Bilateral Import Changes by Malaysia and by Sector (Percentage change)

	Malaysia	Iran	Turkey	Indonesia	Nigeria	Pakistan	Bangladesh	Egypt	ROIC	ROW
RawAg	-36.32	-49.45	8436.38	-25.85	-52.04	103.78	-48.81	-40.47	-52.93	-52.95
Animal	17.78	30.43	-12.45	-6.7	-0.76	-8.78	2.37	5.14	-3.39	-3.56
F&Fish	-0.59	2.79	-1.15	0.11	6.17	11.68	44.05	1.09	2.27	2.07
Food	-16.7	66.01	-13.15	625.93	-26.11	-29.27	66.12	254.46	-28.49	-28.55
Text	7.74	161.19	200.85	37	162.02	235.73	366.79	278.16	-1.87	-1.95
Manu	-3.25	92.98	89	15.44	255.53	64.75	101.26	31.31	-0.13	-0.27
Svcs	-1.07	1.88	-1.91	-2.36	3.6	-4.35	1.17	1.3	1.82	1.67
Mineral	-2.35	16.27	0.93	7.22	-3.56	4740.97	36.69	-1.39	-2.89	-2.92
Vegoil	11.95	62.71	15.22	7.01	26.54	18.27	39.28	12.4	14.07	13.97

Source: Simulation results