

# Gains from the India–GCC Free Trade Agreement: A General Equilibrium Analysis

*Nitin Arora and Pouria Mohajeri*

## 10.1 INTRODUCTION

India and the Gulf Cooperation Council (GCC) are partners in various trading arrangements around the world. Until now, India has been party to 37 such trading arrangements, out of which 9 have been proposed but not acted on, 4 have been signed but not enacted, 11 have had negotiations launched, and 13 have been signed and put into effect.

The GCC group is the latecomer in adopting the policies of regional trade agreements. Currently, it is a party to 9 such trading arrangements, of which 1 is proposed but not acted on, 5 have had negotiations launched, 2 are signed but not enacted, and 1 has been signed and put into effect.

Figure 10.1 presents the engagements of both parties with other regions in the world through the policy of regional trade agreements (RTAs) of the World Trade Organization (WTO). The table included in the figure shows the number of trade agreements through which both are linked with other

---

N. Arora (✉)  
Panjab University, Chandigarh, India

P. Mohajeri  
ICCR Fellow from Iran, Panjab University, Chandigarh, India



**Fig. 10.1** List of free trade partners of India and the GCC (*Source:* The pattern of figures adapted from Arora et al. 2015)

regions of the world. The first column shows the corresponding partner region with which both states/parties are linked through a trade agreement.

It is worth mentioning that any trade agreement between countries passes through four stages before its implementation. An agreement is firstly proposed (PA) by the policymakers of member countries after which the extent of the proposed agreement is linked to via joint study groups. Subsequently, the agreement is officially signed (SO) by the member countries. After they offer approval, negotiations (NL) are held on the items to be included in positive and negative lists as per the trade agreement. Finally, after the successful negotiations and consensus, an agreement is signed and brought into effect (SE).

Table 10.1 and Fig. 10.1 present a statewide number of trade agreements through which both countries are linked with other major regions of the world. They have also signed a free trade agreement with each other. The Framework Agreement on Economic Cooperation between India and the GCC was signed on August 25, 2004. As per the agreement, both parties shall consider ways and means for extending and liberalizing trade relations.

The GCC as a collective entity has tremendous geographical and economic significance for India. The Gulf countries constitutes the “immediate” neighborhood of India separated only by the Arabian Sea. India,

**Table 10.1** List of free trade partners of India and the GCC

<i>Region</i>	<i>India</i>				<i>GCC</i>			
	<i>SE</i>	<i>NL</i>	<i>SO</i>	<i>PA</i>	<i>SE</i>	<i>NL</i>	<i>SO</i>	<i>PA</i>
Australia		✓				✓		
Japan	✓					✓		
Korea	✓					✓		
China				✓		✓		
New Zealand		✓				✓		
Malaysia	✓							✓
Singapore	✓				✓			

*SE* signed and effective, *NL* negotiation level, *SO* officially signed, *PA* proposed agreement

therefore, has a vital stake in the stability, security, and economic well-being of the Gulf nations. As a group, the GCC has increasingly determined the economic, political, and security policies of its member states. The GCC countries are moving ahead rapidly with their economic integration efforts. The GCC has emerged as a major trading partner for India. It has vast potential as India's investment partner for the future. The GCC's substantial oil and gas reserves hold vital importance for India's energy needs. The GCC countries are collectively host to a large Indian expatriate community. In short, the GCC offers tremendous potential for cooperation in trade, investment, energy supply, manpower, and so on.

In this chapter, we study the impact of trade liberalization between India and the GCC using the GTAP model framework. For this purpose, the entire study has been divided into six sections including the present introductory one. Section 2 presents the economic and commercial relations between India and GCC countries. In Sect. 3, simulation scenarios and data aggregations have been defined. In Sect. 4, implications of tariff reforms in the GTAP model have been discussed in brief. Section 4 presents the simulation results of the GTAP model, and the final section concludes the study.

## 10.2 ECONOMIC AND COMMERCIAL RELATIONS OF INDIA AND THE GCC

### 10.2.1 Trade Profile

India enjoys longstanding ties with GCC states. It has increased imports of oil and gas from the GCC. Its trade and investment opportunities have been

growing. There is a presence of approximately 6.5 million Indian workers in the region. All these factors are of vital interest to India. India's economic linkages with the GCC have increased steadily, especially due to growth in oil imports. These linkages continue to make steady progress to date. During 2013–2014, India's exports to the GCC were US\$ 48,221 billion. The bilateral two-way trade during the period was US\$ 147,615 billion, and it has been growing at a steady pace. India's trade with the GCC states during the years 2010–2011, 2011–2012, 2012–2013 and 2013–2014 are given in Table 10.2. Further, Table 10.3 shows the trend of India–GCC trade over the past five years. This table shows that India's trade balance with the GCC is highly negative, to the tune of US\$ 51,172.69 million in the year 2013–2014.

In terms of total trade figures, the GCC is the largest trading partner of India and also has a share of 19.31% in total trade with India. The major items of Indian exports and imports to the GCC are the main commodities of Indian exports to the GCC including commodities with HS code 27 (mineral fuels; mineral oils and products of their distillation; bituminous substances; mineral waxes), commodities of HS code 71 (natural or cultured pearls, precious or semiprecious stones, premetals clad with premetal and articles thereof; imitation jewelry; coins), and products of HS code 10 (cereals); Similarly, products in categories 27 and 71 have a major share in Indian imports from PGC.

### 10.2.2 *Tariff Profile of India and GCC*

The tariff profile of a region provides the level of protection of that region over the traded products. A country's level of protection is determined by its own tariffs and nontariff barriers imposed on imports from partner countries. It is calculated by evaluating the annual average tariff rate over all the products. A higher level of protection from member countries is associated with significant trade creation and trade diversion effects.

Table 10.4 illustrates various indicators of the level of protection from all partner countries in the world. It shows that India's level of protection relative to the GCC is much higher. If the level of trade between the member countries is very high, then the gains associated with the policy of regional trade agreements are highly dependent upon the level of protection of the member countries. A higher level of initial protection or barriers (i.e., initial tariff rate and nontariff barriers) would lead to larger gains afterwards.

**Table 10.2** India's trade with GCC

Countries	2010-2011			2011-2012			2012-2013			2013-2014		
	Imports	Exports	Total	Imports	Exports	Total	Imports	Exports	Total	Imports	Exports	Total
UAE	32,753	33,822	66,575	36,756	35,926	72,682	39,138	36,317	75,455	29,020	30,520	59,540
Saudi Arabia	20,385	4684	25,069	31,818	5683	37,501	31,818	9786	43,784	33,998	12,218	46,216
Kuwait	10,314	1856	12,170	16,440	1181	17,621	16,588	1061	17,649	17,154	1061	18,215
Qatar	6820	375	7195	12,916	808	13,724	15,693	687	16,380	15,708	969	16,677
Oman	4002	1086	5088	3346	1322	4668	2010	2599	4609	2951	2812	5763
Bahrain	641	652	1293	906	440	1346	665	603	1268	563	639	1202
GCC	74,915	42,477	117,392	102,182	45,360	147,542	108,092	51,053	159,145	99,394	48,221	147,615

Source: Export-Import Databank, Ministry of Commerce and Industry, India

**Table 10.3** India's balance of trade with the GCC US\$ Million

<i>Year</i>	<i>Exports (X)</i>	<i>Imports (M)</i>	<i>Total trade (X + M)</i>	<i>India's total trade</i>	<i>Trade balance (X - M)</i>
2009–2010	30,479.97 (17.05)	53,497.43 (18.55)	83,977.40 (17.98)	467,124.31	-23017.46
2010–2011	42,476.50 (17.00)	74,915.27 (20.26)	117,391.77 (18.95)	619,584.68	-32,438.77
2011–2012	45,360.29 (14.83)	102,181.93 (20.88)	147,542.22 (18.55)	795,283.41	-56,821.
2012–2013	51,053.65 (17.00)	108,092.06 (22.03)	159,145.71 (20.12)	791,137.23	-57,038.41
2013–2014	48,221.20 (15.34)	99,393.89 (22.61)	147,615.09 (19.31)	764,605.09	-51,172.69

*Note:* Figures in parentheses are the percentage of India's total exports, imports, and total trade, respectively

*Source:* Export–Import Databank, Ministry of Commerce and Industry, India

### 10.2.3 Comparative Advantage Statistics for India and the GCC

Vast differences in comparative advantage over products are beneficial for member countries to be in a trade agreement. The present study calculates bilateral Revealed Comparative Advantage (RCA) productwide to show the comparative advantage of both the countries (see Table 10.5). It may be noticed that India enjoys the highest comparative advantage in processed rice followed by plant-based fibers. However, the GCC's highest comparative advantage is observed in oil products, where the observed difference between the Indian comparative advantage index and that of the GCC is very high. The value of the comparative advantage index for India in oil production is zero and that of the GCC is 94.17.

Further, the second highest RCA value for GCC partners is observed for petroleum and coal products, with a value of 5.85. The third most important product in the GCC's trade basket is gas with an RCA value of 2.06. From Table 10.5, it is evident that for the GCC, a few products have an RCA above unity, while India has a number of products with values above unity in the same index. Thus, India has a huge potential to enhance trade relations with the GCC and the partner can offer oil, petroleum, coal products, and gas to purchase the products for which India enjoys a relative comparative advantage. In the same way, both partners may explore the gains of international trade.

**Table 10.4** Indicators of level of protection

<i>India</i>					
<i>Indicator/year</i>	<i>2009</i>	<i>2010</i>	<i>2011</i>	<i>2012</i>	<i>2013</i>
AVE MFN applied tariff (%) (Simple average at HS-6 digit subheadings)	12.9	13	12.6	13.7	13.5
Non-AV MFN applied duties (%) (Share of HS-6 digit subheadings)	5.2	5.2	5.0	4.9	4.9
Maximum duty (%) (Ad valorem duty)	246	170	315	150	150
Duty-free tariff lines (%) (Share of duty-free HS-6 digit subheadings)	2.8	2.8	3.5	3.0	2.9
Duty > 15 (%) (Share of HS-6 digit subheadings)	17.1	16.6	16.5	19.6	19.0
Number of MFN applied tariff lines (Country-specific)	11,360	11,359	11,377	11,477	11,471
<i>GCC (average)</i>					
AVE MFN applied tariff (%) (Simple average at HS-6 digit subheadings)	5.1	5.0	5.0	4.8	4.7
Non-AV MFN applied duties (%) (Share of HS-6 digit subheadings)	0.8	0.8	1.0	1.25	1.4
Maximum duty (%) (Ad valorem duty)	195	186	170	200	200
Duty-free tariff lines (%) (Share of duty-free HS-6 digit subheadings)	8.9	8.9	9.2	10.3	10.3
Duty > 15 (%) (Share of HS-6 digit subheadings)	0.5	0.5	0.4	0.3	0.2
Number of MFN applied tariff lines (Country-specific)	7104	7103	7117	7041	7288

*Notes:* AVE Ad valorem equivalent, MFN most-favored nation, Non-AV non ad valorem

*Source:* World Tariff Profiles, 2010–2014

### 10.2.4 Trade Intensity Index for India and the GCC

Further, calculation of the trade intensity index in Table 10.6 is used to measure the country's export competitiveness in a particular market. This helps to shed light on the issue of the extent of domestic substitution in production by partner countries. The index explains the role of any country/region in another country's trade. The comparison of Table 10.6 with Table 10.5 produces interesting evidence; it may be inferred from comparison of the two that the TII is high for the products in which the nation gain's comparative advantage, and vice versa. For food products, the trade

**Table 10.5** RCA index value for the year 2013

<i>GTAP code</i>	<i>Description</i>	<i>Index value</i>		<i>GTAP code</i>	<i>Description</i>	<i>Index value</i>	
		<i>India</i>	<i>GCC</i>			<i>India</i>	<i>GCC</i>
01	Paddy rice	2.15	0.02	23	Processed rice	17.21	0.00
02	Wheat	1.25	0.00	24	Sugar	1.56	0.21
03	Cereal grains n.e.c.	1.48	0.00	25	Food products	1.18	1.42
04	Vegetables, fruit, nuts	1.00	0.05	26	Beverages, tobacco products	0.24	0.01
05	Oil seeds	0.77	0.00	27	Textiles	2.76	0.08
06	Sugar cane, sugar beet	0.00	–	28	Wearing apparel	2.16	0.00
07	Plant-based fibers	13.07	0.00	29	Leather products	1.31	0.01
08	Crops n.e.c.	2.20	0.03	30	Wood products	0.20	0.02
09	Cattle, sheep, goats, horses	0.04	0.00	31	Paper products, publishing	0.28	0.11
10	Animal products	0.21	0.51	32	Petroleum, coal products	3.24	5.85
11	Raw milk	–	–	33	Chemical, rubber, plastic products	0.97	1.14
12	Wool, silk-worm cocoons	0.00	0.00	34	Mineral products n.e.c.	0.77	0.01
13	Forestry	0.61	0.01	35	Ferrous metals	1.32	0.28
14	Fishing	1.40	0.12	36	Metals n.e.c.	0.73	0.13
15	Coal	0.07	0.00	37	Metal products	1.01	0.05
16	Oil	0.00	94.17	38	Motor vehicles and parts	0.42	0.06
17	Gas	0.01	2.06	39	Transport equipment n.e.c.	1.17	0.00
18	Minerals n.e.c.	0.99	0.12	40	Electronic equipment	0.17	0.00
19	Meat: cattle, sheep, goat, horse	3.86	0.00	41	Machinery, equipment n.e.c.	0.36	0.03
20	Meat products n.e.c.	0.06	0.09	42	Manufacturers n.e.c.	6.00	0.01
21	Vegetable oils and fats	1.70	0.13	43	Electricity	0.00	–
22	Dairy products	0.37	0.27	44	Gas manufacture, distribution	0.03	–

*Source:* Author's calculations



**Table 10.6** Trade intensity index for India and the GCC for the other's market access in the year 2013

GTAP code	Description	Index value		GTAP code	Description	Index value	
		India	GCC			India	GCC
01	Paddy rice	46.65	–	23	Processed rice	7.12	–
02	Wheat	57,974.74	–	24	Sugar	4.17	–
03	Cereal grains n.e.c.	1.87	–	25	Food products	5.76	0.00
04	Vegetables, fruit, nuts	11.64	1.07	26	Beverage, tobacco products	24.33	0.33
05	Oil seeds	3.00	–	27	Textiles	3.75	0.16
06	Sugar cane, sugar beet	–	–	28	Wearing apparel	5.76	0.01
07	Plant-based fibers	1.47	–	29	Leather products	3.34	17.29
08	Crops n.e.c.	4.16	0.02	30	Wood products	3.75	0.51
09	Cattle, sheep, goats, horses	0.02	–	31	Paper products, publishing	10.97	5.38
10	Animal products	11.43	0.12	32	Petroleum, coal products	15.37	0.02
11	Raw milk	–	–	33	Chemical, rub- ber, plastic products	6.91	1.95
12	Wool, silk- worm cocoons	8.25	84,255.14	34	Mineral products n.e.c.	5.06	20.56
13	Forestry	17.52	0.02	35	Ferrous metals	4.45	1.44
14	Fishing	65.22	0.00	36	Metals n.e.c.	9.02	12.28
15	Coal	32.94	–	37	Metal products	11.84	0.45
16	Oil	–	4092.18	38	Motor vehicles and parts	2.05	0.21
17	Gas	–	1272.85	39	Transport equipment n.e.c.	6.23	–
18	Minerals n.e.c.	4.75	2.32	40	Electronic equipment	11.27	0.02
19	Meat: cattle, sheep, goat, horse	11.47	2.52	41	Machinery, equipment n.e.c.	6.79	0.46

*(continued)*

**Table 10.6** (continued)

GTAP code	Description	Index value		GTAP code	Description	Index value	
		India	GCC			India	GCC
20	Meat products n.e.c.	2.30	–	42	Manufacturers n. e.c.	4.37	0.53
21	Vegetable oils and fats	2.47	0.14	43	Electricity	–	–
22	Dairy products	14.08	0.04	44	Gas manufac- ture, distribution	–	–

*Note:* Trade intensity index has been calculated for each market

*Source:* Author's calculations

intensity of India is very high, while for oil and gas products, the trade intensity of the GCC is high enough.

### 10.3 CONSTRUCTION OF SIMULATION SCENARIOS AND DATA AGGREGATIONS

#### 10.3.1 *Simulation Scenarios*

Table 10.7 provides data on the tariff reduction for the GCC and India in the two models taken for consideration. In model I, both the regions have to levy the same tariff rate on all the sectors. India charges more in all sectors so it needs to cut more on the tariffs to bring the duty to a level equal to the GCC region's duty. The proposed reduction for both regions is reported in the table under the column for model I. In model II, both regions need to cut the tariff duties to a zero level. Again, it is observed that India reduces more compared to the GCC. From Table 10.7, it is observed that India charges more tariffs in the sector of processed foods by 58.67% and in sector HS-10 it charges less duty by 2.3%.

#### 10.3.2 *Data Aggregations*

In both of the above models, 19 regions—namely, India, the GCC, China, Japan, the Republic of Korea, New Zealand, Malaysia, Singapore, Australia, the Rest of Oceania, the Rest of East Asia, the Rest of Southeast Asia, the

**Table 10.7** Reduction in tariff values by India and the GCC

<i>Commodity</i>	<i>Level duty Model I</i>		<i>Zero duty Model II</i>	
	<i>GCC</i>	<i>India</i>	<i>GCC</i>	<i>India</i>
HS-27	0	−6.5015	−4.1612	−10.6627
HS-71	0	−11.9444	−3.0577	−15.0021
HS-10	0	−2.3114	−0.0051	−2.3165
HS-85	0	−10.9196	−0.2897	−11.2093
HS-84	0	−10.0171	−4.8115	−14.8286
HS-63	0	−10.1097	−4.9998	−15.1095
HS-62	0	−9.8517	−5.0000	−14.8517
Grains	0	−26.8952	−2.5362	−29.4314
Meat and live stock	0	−2.7372	−3.6266	−6.3588
Extraction	0	−4.7698	−4.9523	−9.7221
Processed food	0	−45.6701	−13.0256	−58.6957
Light manufacture	0	−9.4320	−4.5189	−13.9509
Heavy manufacture	0	−10.1700	−4.6997	−14.8697
Utility and consumption	0	0	0	0
Other services	0	0	0	0

*Source:* Author's calculations

Rest of South Asia, North America, Latin America, European Union-25, the Middle East and North Africa, Sub-Saharan Africa, and the Rest of World—have been taken into consideration in details furnished in Table 10.8. These regions include all the countries of the world to see the impact of the FTA between India and the GCC countries.

In addition, 15 commodity groups have also been created to portray the impact of the FTA on commodity trading. The groups in these models cover all goods and services used in the GTAP-8 model. However, these 15 groups—namely, HS-27, HS-71, HS-10, HS-85, HS-84, HS-63, HS-62, Grains Crops, Meat and livestock, Extraction, Processed food, Light Manufacture, Heavy Manufacture, Utility and Consumption Goods, and Other Services—are categorized on the basis of their share in India's trade with the GCC countries. In Table 10.9, the commodity groups with the prefix HS have been created for those commodities that have the highest shares in India–GCC trade.

**Table 10.8** Region's aggregations

<i>S.N.</i>	<i>Region</i>	<i>Description (countries)</i>	<i>S.N.</i>	<i>Region</i>	<i>Description</i>
1.	India	India	11.	New Zealand	New Zealand
2.	China	China	12.	Australia	Australia
3.	Japan	Japan	13.	Malaysia	Malaysia
4.	Korea, Rep. of	Korea, Rep. of	14.	Singapore	Singapore
5.	GCC	United Arab Emirates, Saudi Arabia, Qatar, Kuwait, Oman, Bahrain	15.	North America	Canada, United States, Mexico, Rest of North America
6.	Rest of East Asia	Hong Kong, Taiwan, Mongolia, Rest of East Asia	16.	Middle East and North Africa	Rest of Western Asia, Egypt, Morocco, Tunisia, Rest of North Africa
7.	Rest of Southeast Asia	Cambodia, Indonesia, Laos PDR, the Philippines, Thailand, Rest of Southeast Asia	17.	Rest of South Asia	Bangladesh, Nepal, Pakistan, Sri Lanka, Rest of South Asia
8.	Sub-Saharan Africa	Benin, Burkina Faso, Cameroon, Cote d'Ivoire, Ghana, Guinea, Nigeria, Senegal, Togo, Rest of Western Africa, Central Africa, South Central Africa, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Mozambique, Rwanda, Tanzania, Uganda, Zambia, Zimbabwe, Rest of Eastern Africa, Botswana, Namibia, South Africa, Rest of South African Customs	18.	European Union	Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, United Kingdom

*(continued)*

**Table 10.8** (continued)

<i>S.N.</i>	<i>Region</i>	<i>Description (countries)</i>	<i>S.N.</i>	<i>Region</i>	<i>Description</i>
9.	Latin America	Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Paraguay, Peru, Uruguay, Venezuela, Rest of South America, Costa Rica, Guatemala, Honduras, Nicaragua, Panama, El Salvador, Rest of Central America, Caribbean	19.	Rest of World	Iran, Switzerland, Norway, Albania, Bulgaria, Belarus, Croatia, Russian Federation, Ukraine, Rest of Eastern Europe, Rest of Europe, Kazakhstan, Kyrgyzstan, Rest of Former Soviet Union, Armenia, Azerbaijan, Georgia, Israel, Turkey, Rest of the World
10.	Rest of Oceania	Rest of Oceania			

*Notes:* SSA Sub-Saharan Africa, EU European Union countries, EFTA European free trade association  
*Source:* Authors' elaboration from GTAP-8 database

## 10.4 IMPLICATIONS OF TARIFF REFORMS

### 10.4.1 Trade Effects

With the formation of a free trade agreement, prices of imported goods from countries in the free trade area will decrease due to the reduction in tariffs on the imports. This will permit countries entering into an FTA to shift from expensive imports from the outside world to purchase cheaper imports from within the circle of member nations, thereby resulting in trade creation among them. Thus, a change in trade policy (e.g., tariff liberalization) affects not only the price index/level of the composite goods, but also the relative prices of other goods/products. Any trade policy shock will also have an effect on the entire trade flow (i.e., Imports from different countries).

Trade diversion results when shifting imports from a country selling at a high price to a country with a comparative advantage in the traded commodity (in this case commodity  $g$ ) to a country that is less efficient in producing the goods in question. This shift takes place due to the formation of a trade bloc. Trade diversion in our example is neutral because an increase in imports from the partner countries is balanced by reduction in the imports from all the other countries. The net effect is a reallocation of the market share among the exporting countries with the overall imported

**Table 10.9** Sector description of the GTAP

<i>S.N.</i>	<i>Name of group</i>	<i>Group description</i>
1.	HS-27	Coal (15); oil (16); gas (17); minerals n.e.c. (18); petroleum and coal products (32); chemical, rubber, plastic products (33)
2.	HS-71	Fishing (14), metals n.e.c. (36), manufactures n.e.c. (42)
3.	HS-10	Wheat (2), cereals and grains n.e.c., (3), processed rice (23)
4.	HS-85	Transport equipment n.e.c. (39)
5.	HS-84	Metal products (37), motor vehicles and parts (38), machinery and equipment n.e.c. (41)
6.	HS-63	Textiles (27)
7.	HS-62	Wearing apparel (28)
8.	Grains	Paddy rice (1); vegetables, fruits, nuts (4); oil seeds (5); sugar cane, sugar beet (6); plant-based fiber; (7), crops n.e.c. (8)
9.	Meat and livestock	Cattle, sheep, goats, horses (9); animal products n.e.c. (10); raw milk (11); wool, silkworm cocoons (12); meat: cattle, sheep, goat, horse (19); meat products n.e.c. (20)
10.	Extraction	Forestry (13)
11.	Processed food	Vegetable oils and fats (21), dairy products (22), sugar (24), food products n.e.c. (25), beverages and tobacco products (26)
12.	Light manufacture	Leather products (29), wood products (30), paper products and publishing (31)
13.	Heavy manufacture	Mineral products n.e.c. (34), ferrous metals (35), electronic equipment (40)
14.	Utility and consumer	Electricity (43), gas manufacture-distribution (44)
15.	Other services	Water (45), construction (46), trade (47), transport n.e.c. (48), sea transport (49), air transport (50), communication (51), financial services n.e.c. (52), insurance (53), business services n.e.c. (54), recreation and other services (55), PubAdmin/defense/health/education (56), dwellings (57)

*Notes:* SSA Sub-Saharan Africa, EU 25 European Union with 25 countries, EFTA European free trade association

*Source:* Authors' elaboration from GTAP-8 database

quantity not changing. As per the main concepts of trade creation and trade diversion given by Viner, the above concepts are very difficult to test because calculation of the costs of production of various tradable commodities in different countries is complex. Also, Viner's analysis is in the nature of a partial equilibrium, which does not explain how the welfare can be calculated in the case of a multigood trading world.

In most studies, the concepts of trade creation and trade diversion are generally used in the sense of an increase in trade from a member country and a shift of trade from a nonmember to a member country. In view of the foregoing, instead of using the terms “trade creation” and “trade diversion,” we use the terms trade “generation” and “shifting” which can be calculated in the GTAP model by using the following equations:

$$VIWS(i, r, s) = pcif(i, r, s) * qxs(i, r, s) \quad (10.1)$$

$$VXWD(i, r, s) = pfob(i, r, s) * qxs(i, r, s) \quad (10.2)$$

$$qxs(i, r, s) = qim(i, s) - \sigma_M(i) \times [pms(i, r, s) - pim(i, s)] \quad (10.3)$$

where  $VIWS(i, r, s)$  is the value of imports of  $i$  from  $r$  to  $s$  valued  $CIF$  tradable only;  $VXWD(i, r, s)$  are the exports of  $i$  from  $r$  to  $s$  valued  $FOB$  (tradable only);  $PCIF$  is the  $CIF$  world price of commodity  $i$  supplied from  $r$  to  $s$ ;  $PFOB$  is the  $FOB$  world price of a commodity supplied from  $r$  to  $s$ ;  $QXS$  is the quantity of exports of product  $i$  from  $r$  to  $s$ . The variables in lowercase letters are the percentage counterparts of the original level variables as defined above. To calculate the changes in imports and exports in a post-simulation environment, one can simply subtract the new value of imports from the existing value of imports in the base data. Similarly, changes in the values of exports can be calculated.

#### 10.4.2 Welfare Effect

In the GTAP model, measurement of economic welfare depends on a household’s own consumption expenditure, government consumption expenditure (government spending on public goods and services), and the net national savings that will benefit future consumption. Any distortion in the model has an effect on these variables and thus affects the economic welfare of a region. Estimation of the GTAP model provides the regional equivalent variation (EV) measure in monetary terms, which represents the welfare effect in this model.

From a household point of view, the GTAP model measures the cost to the household of the same bundle of goods, before and after a given policy shock. In other words, it is the difference between the expenditure required to obtain the new level of utility at initial prices and the initial expenditure. The regional household utility level depends on the per capita household consumption, per capita government expenditure, and per capita savings.

Any change in this aggregate utility level provides the welfare effect of this model.

In other words, welfare change in the GTAP model is measured by a change in the aggregate utility, due to any distortion, specified over per capita private household consumption, per capita government expenditure, and per capita savings. The calculation of EV provides the value of the same percentage change in the level of utility in terms of money value. Let us consider two policy options, the existing one with prices  $p^0$  and income  $m^0$  and a policy shock with price  $p^1$  and income  $m^1$ ; then the equivalent variation can be expressed as:

$$EV = \mu(p^0; p^1, m^1) - \mu(p^0; p^0, m^0) = \mu(p^0; p^1, m^1) - m^0 \quad (10.4)$$

where  $\mu(q; p, m)$ , called the money metric indirect utility function, measures how much income the consumer would need at price  $q$  to be as well off as he or she would by facing price  $p$  and having income  $m$ . McDougall (2001) obtained the EV associated with a perturbation to the GTAP model (see Chap. 8 for details on GTAP methodology and welfare effect).

### 10.4.3 Terms of Trade Effect

Terms of trade in a region are defined as the ratio of the price index received for tradable goods produced in region  $r$  ( $PSW$ ) compared to the price index paid for tradable goods used in the same region ( $PDW$ ). This measure in the GTAP model includes the sales of net investments to the global bank and purchases of savings from the global bank. Equation (10.5) shows the percentage change in terms of trade ( $tot$ ) as the difference between percentage change in  $PSW$  and  $PDW$ .

$$tot(r) = psw(r) - pdw(r) \quad (10.5)$$

Further, the trade balance of any region is defined as the difference between exports and imports. The variable defined in Eq. (10.6) is the change in the trade balance, which represents changes in the current accounts of each region:



$$DTBAL(r) = \left[ \frac{VXWREG(r)}{100} \right] * vxwreg(r) - \left[ \frac{VIWREG(r)}{100} \right] * viwreg(r) \quad (10.6)$$

where  $VXWREG$  is the value of exports from region  $r$  evaluated at *FOB* prices and  $VIWREG$  is the value of imports in region  $r$  evaluated at *CIF* prices;  $vxwreg$  and  $viwreg$  are the percentage changes in the actual variables.

## 10.5 GTAP SIMULATION RESULTS

In this section, the results of changes in imports and exports, welfare, and terms of trade have been compared for both models. By looking at EV for India in Table 10.10, in FTA with the GCC, the value of EV is found to be negative under the framework of both the level duty and zero duty models. However, although India's EV in model II is negative, the loss in model II is less than expected under model I. However, for the GCC, a positive EV has been observed under both models. A positive EV reflects the welfare gain while the negative value indicates a welfare loss. We may conclude that Indian welfare will deteriorate while the GCC countries' welfare will improve because of the India–GCC trade agreement. The model II of zero duty must be preferred, under which the loss of India is less and the gain of welfare for the GCC countries is higher.

Further, to analyze the causes of expected loss and gains to India and the GCC countries, the components of EV have been reported in Table 10.10. Among three components, namely, allocative efficiency gains, terms of trade gains (current account), and investment saving (capital account) gains, the latter two components are negative for India under model I. However, under model II, terms of trade become unfavorable to India while favorable to the GCC countries after the agreement becomes effective.

The product market efficiency will improve while the factor market efficiency will remain stagnant for India. For the GCC countries, the product market efficiency will improve while the factor market allocative efficiency will deteriorate little bit. An improvement in the allocative efficiency in the product market will signify that the products will be available in both countries at cheaper rates while the factor prices will increase a little bit in the GCC countries which will adversely affect the allocative efficiency of these countries in the factor market.

**Table 10.10** Comparison of India FTA with PGC and GCC

<i>Region</i>	<i>India in FTA with GCC</i>		<i>GCC in FTA with India</i>	
	<i>Model I</i>	<i>Model II</i>	<i>Model I</i>	<i>Model II</i>
<b>Panel A: welfare gain</b>				
Equivalent variation	-656.63	-413.54	2430.2	4036.85
<b>Panel B: sources of welfare gain</b>				
(a) Allocative efficiency	180.4	145.02	169.32	178.56
(a1) Product market	180.4	145.02	168.88	174.67
(a2) Factor market	0	0	-0.44	-3.89
(b) Terms of trade	-811.02	-698.11	3133.63	5155.41
(c) Investment-saving	-24.17	148.27	-872.13	-12.96.2

*Source:* Author's calculations

In sum, the major cause of welfare loss to India under the India–GCC agreement seems to be unfavorable/deteriorated terms of trade. To analyze the causes of deterioration in terms of trade, we need to analyze the impact of said trade agreement on India–GCC imports and exports; unfavorable terms of trade may be noticed either because of lower exports or higher imports. In both models, India tends to import more from the GCC after the trade agreement is in effect. Table 10.11 provides this change: the value of Indian imports will rise on entering into the FTA with the GCC, as per both models, and also in all sectors.

In model II, India's total imports will increase more than in model I. The expected increase of imports for India from the GCC in model I is US\$ 4577.89 million (i.e., US\$ 235,426.53 million – US\$ 230,848.11 million), while in model II it is US\$ 9988.41 million (i.e., US\$ 240,836.52 million – US\$ 230,848.11 million). However, for the GCC countries, the expected increase in imports is US\$ 1365.81 million under model I in comparison to US\$ 3718.66 million in model II. The highlight products in the Indian import bill from the GCC group include HS-27 and Other Services. By looking at the distribution of all products, the condition of India's FTA with the GCC following model II seems better as compared to model I.

From Table 10.12, it can be observed that Indian exports under the FTA with the GCC will reach US\$ 226,114.94 million under model I, while the same figure will be US\$ 231,188.58 million under model II when tariffs are reduced to zero. Thus, in reducing duty to a zero level, the increase in Indian exports to the GCC will be higher to a level of US\$ 5073.64 million.

**Table 10.11** Changes in the value of imports of India and the GCC after the FTA in effect

<i>Commodity</i>	<i>India</i>		<i>GCC</i>			
	<i>Pre-shock</i>	<i>Model I</i>	<i>Model II</i>	<i>Pre-shock</i>		
		<i>Model I</i>	<i>Model II</i>	<i>Model I</i>		
HS27	56,991.53	60,453.25	63,530.5	437,282.03	438,647.84	441,000.69
HS71	25,600.79	26,322.07	27,792.92	14,178.88	18,876.75	20,559.98
HS10	2723.32	2734.64	2707.91	191.23	186.89	185.07
HS85	1985.95	2003.36	1974.2	3261.6	3317.57	3243.86
HS84	20,198.22	20,541.71	21,211.23	9982.28	9744.98	9645.04
HS63	14,885.94	14,916.72	14,973.9	1345.98	1327.3	1328.24
HS62	9058.74	9061.28	9182.92	688.32	661.09	649.32
Grains	6124.32	6116.03	6084.79	611.19	612.22	608.27
Meat and live stock	1357.54	1352.26	1426.44	457.86	448.19	441.49
Extraction	191.8	190.5	189.2	14.75	14.76	14.78
Processed food	7303.83	7308.51	7639.24	3963.73	4151.99	4296.77
Light manufacture	5102.8	5104.05	5100.88	2109.59	2149.62	2187.62
Heavy manufacture	13,267.46	13,505.25	14,083.84	9122.7	9229.33	9380.55
Utility and consumption	32.89	33.11	32.78	407.48	396.16	389.37
Other services	66,022.99	65,783.81	64,905.76	38,575.51	37,835.97	37,458.5
Total	230,848.11	235,426.53	240,836.52	522,193.13	527,600.67	531,389.57

*Source:* Author's calculations

**Table 10.12** Changes in the value of imports of India and the GCC after an FTA is in effect

Commodity	Regions					
	India			GCC		
	Pre-shock	Model I	Model II	Pre-shock	Model I	Model II
HS-27	53,590.02	56,818.82	59,688.5	417,942.28	419,340.72	421,657.03
HS-71	25,353.87	26,068.58	27,534.48	13,968.65	18,655.43	20,337.09
HS-10	2367.53	2377.05	2354.66	165.67	162.03	160.5
HS-85	1877.81	1893.98	1866.08	3071.01	3120.11	3050.63
HS-84	19,304.26	19,630.01	20,266.8	9527.37	9303.17	9209.05
HS-63	13,952.04	13,980.56	14,035.54	1263.62	1246.62	1247.79
HS-62	8596.66	8599.07	8715.57	656.74	630.99	619.87
Grains	5531.01	5523.42	5492.75	515.93	517.58	514.57
Meat and live stock	1275.53	1270.65	1340.34	427.77	418.87	412.68
Extraction	178.98	177.79	176.66	13.27	13.29	13.3
Processed food	6735.18	6739.45	7045.27	3601.9	3770.73	3899.76
Light manufacture	4779.35	4780.42	4776.6	1904.33	1940.86	1975.42
Heavy manufacture	12,222.2	12,438.21	12,956.78	8484.51	8587.94	8733.31
Utility and consumption	32.89	33.11	32.78	407.48	396.16	389.37
Other services	66,022.99	65,783.81	64,905.76	38,575.51	37,835.97	37,458.5
Total	221,820.33	226,114.94	231,188.58	500,526.03	505,940.48	509,678.89

*Source:* Author's calculations

Consequently, model II is a better choice for Indian planners to gain from an India–GCC free trade agreement.

Further, if the gains in imports and exports are compared, the Indian imports will increase at higher rate (US\$ 9988.41 million) than its exports (US\$ 9368.25 million) and, therefore, will adversely affect the terms of trade. In the case of the GCC countries, a gain in exports (US\$ 9152.86 million) is higher than the gain in imports (US\$ 3718.66 million), thus the terms of trade will be positively affected for the GCC nations. Therefore, it may be inferred that the unfavorable terms of trade between India and the GCC nations after the trade agreement is in effect will be noticed because of the higher growth of Indian imports than the growth rate of Indian exports to the GCC nations. Consequently, the welfare loss will occur to India. The converse argument is valid for the GCC nations to whom the welfare gain will be noticed because of more favorable terms of trade with India.

## 10.6 CONCLUDING REMARKS

The aim of this study was to work out the possible gains from an India–GCC free trade agreement that has been signed by these two regions but is still not in effect. Some trade indices such as RCA and TII in the GCC trade with India have been provided to substantiate the argument in favor of present study. The composition of commodities in the GCC trade with India have been constructed to highlight important products. The degree of protection in India–GCC trade has been discussed in terms of tariff rates levied by both sides in all sectors.

After studying the GCC trade and tariff profile with India, two models have been simulated. Firstly, the countries are assumed to impose equal duties, so that there will be zero variation in duties among the partner countries. Secondly, the partner countries are assumed to reduce the duties up to a zero level, that is, a free trade area will be established among partner nations.

From comparison of the two models, it appears that model II (i.e., the zero duty model) is the better option under which an Indian loss is minimum and a gain by the GCC group of countries is higher. Indian trade will surely be enhanced by the agreement, but Indian imports are expected to increase at a higher rate than its exports. Thus, the agreement will adversely affect Indian terms of trade with the GCC countries. The adverse effect on terms of trade will be reflected in welfare changes that appear to be negative for India.

However, affiliates of the GCC group are found to be the beneficiaries of the FTA under evaluation. The exports of these countries are found to be increasing at a higher rate than their imports. Thus, the terms of trade effect will be positive and favorable to the GCC countries. The favorable terms of trade effect has been reflected in the positive welfare gain to these nations. Thus, it may be inferred that zero duty trade agreement is better for partner countries of the India–GCC trade agreement. The expected gains to the GCC countries are high while the gains to India are only in terms of allocative efficiency in the product market. The share of India will increase marginally in world trade but the adverse impact on its welfare, deterioration in its current account, and so on, are the grey areas of the India–GCC free trade agreement. Indian policy planners are advised to work out suitable policy packages so that the growth of exports under such an agreement may surpass the growth of imports and so that a favorable effect of such an agreement on current accounts may be generated.

#### REFERENCES

- Arora, R., Singh, S., & Mathur, S. K. (2015). Assessment of the proposed India-China Free Trade Agreement: A general equilibrium approach. *Journal of Centrum Cathedra*, 8(2), 81–108. <https://doi.org/10.1108/JCC-08-02-2015-B002>
- McDougall, R. (2001). *A new regional household demand system for GTAP. Revised in 2003*. GTAP technical paper no. 20, Purdue University.