

THE ECONOMIC EFFECT OF INDIA'S PARTICIPATION INTO RCEP
— AN ANALYSIS USING COMPUTABLE GENERAL EQUILIBRIUM MODELS —

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ABSTRACT

The aim of this paper is to examine the impact of the proposed Regional Comprehensive Economic Partnership (RCEP) in the case that India participate in RCEP and conduct trade liberalization in heavy manufacture goods. This study utilized Computable General Equilibrium (CGE) models and the Global Trade Analysis Project (GTAP) version 9 for empirical computation. For the purpose of analyzing the proposed specific scenarios, 57 sectors are aggregated into 18 sectors. Likewise, 140 regions are classified to 8 regions: India, China, Japan, Korea, ASEAN, Australia and New Zealand, the United States, and the rest of the world. The simulations were designed based on the two scenarios: 50 percent tariff reduction, and 100 percent tariff reduction in heavy manufacture goods exporting from RCEP members to India. As the preliminary findings, India would maximize the benefits only in terms of its GDP. The other all members in RCEP has a positive result in real GDP while the U.S. and the rest of the world has a negative one mainly due to the exclusion of trade liberalization. In addition, economic welfare will increase in China, Japan, Korea, ASEAN, Australia, New Zealand. From the view of sector-wise analysis, India's export will increase in Agricultural goods, livestock and meat products, fishing, processed foods, textile and clothing, oil and petroleum and services industries. Conversely, India's export will decrease in the case of forestry, mining, light manufacture, chemical, steel, mortar vehicle and parts, transport, electronic products, machinery and manufacture, electricity and gas, utilities and construction.

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LIST OF ABBREVIATIONS

AFTA	ASEAN Free Trade Area
ASEAN	Association of South- East Asian Nations
CER	Australia and New Zealand Closer Economic Relations Agreement
CGE	Computable general equilibrium
EFTA	European Free Trade Association
EV	Equivariant variation
EU	European Union
FTA	Free Trade Agreement
GCC	Gulf Cooperation Council
GTAP	Global Trade Analysis Project
HS	Harmonized System Code
MERCOSUR	Mercado Común del Cono Sur
NAFTA	North American Free Trade Agreement
RCEP	Regional Comprehensive Economic Partnership
TPP	Trans-Pacific Partnership Agreement
WTO	World Trade Organization

CHAPTER ONE

INTRODUCTION

1.1 Objective of Study

The purpose of this thesis is to estimate economic effects when the proposed RCEP is concluded, in particular India reduced importing tariff from other members in RCEP. The impact will be evaluated by means of the terms of trade, Real Gross Domestic Products (GDP), equivariant variation (EV) and the balance of trade. This trade liberalization assumes the two cases, which are 50 percent and complete free trade in heavy manufacture goods among RCEP partners. Is trade liberalization in RCEP let India lose under brutal competition? Or would it be possible for India or all to prosper by shared growth? If so, which sectors will increase or reduce in their trade? In order to answer those questions, this paper investigated an empirical research to compute the expected economic effects under the selected scenarios by utilizing the GTAP models.

1.2 Significance of this research

The depth of globalization has been deepening in the 21st century. The wave of globalization called interconnected economy in the world, represented as multinational corporations and international division of labor through the processes of production, sales and research and development. Along with that world trends, nations and regions have formed economic cooperation under the umbrella of international organization such as World Trade Organization (WTO). Subsequently, bilateral or specific regional integration has preferred because nations are able to negotiate and bargain precisely rather than huge international frameworks. For example, North American Free Trade Agreement (NAFTA) or

Association of South- East Asian Nations (ASEAN) are well known as multi regional FTA. On the other hands, the world economy also observed the backflow of regional integration with the rise of protectionism; for instance, British withdraws from European Union (EU) and the US from TPP, respectively. Now that trade-war between the U.S. and China leads instability of the world economy. In such a situation, the President Trump's decision to pull out of TPP made the world aware of the great presence of Regional Comprehensive Economic Partnership (RCEP), that is Asia centered free trade agreement. RCEP is a proposed mega trade deals between 16 Asia-Pacific nations: India, China, Japan, South Korea, Australia, New Zealand, Brunei, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam. If RCEP finally enters in force, it holds the participants which have a total population over 3 billion and an estimated trade share of 28 percent (WTO, 2017), consisting GDP of around 21 trillion (International Monetary Union, 2017). RCEP covers one third of world GDP only in Asia-Pacific regions, including the two Asian giants: India and China. Considering the growth of Asian nations, Asia is recognized as a central area of global chain due to the existence of each different phase in terms of industrialization. Therefore, the volume of trade within intra regions consist great amount. Thus, if free trade is achieved in RCEP, that would bring huge economic effects to the world. As a current progress, the members of RCEP have been negotiating since 2011, yet they do not reach an agreement because there are complicated and intertwined nations' interests between different parties in both of domestic and international field. The latest meeting among RCEP members was hold on 13 October 2018 in Singapore and revealed that the proposed goal to reach an agreement until 2018 not feasible. At the meeting, India represented the strong oppositions for tariff elimination (Nikkei, 2018). India has suffered from having negative balance of trade, that reached around 148 billion U.S.

dollars in 2017 (Ministry of commerce of India, 2018). Therefore, India is keenly reluctant to eliminating tariffs in order to protect domestic industries and the poor in rural areas. Indian government would not be able to maintain the current regime without their supports. However, it does not mean there is no prospect that India will participate in RCEP. It is obvious that India has opened its market though the history and it has great potentials and motivation to negotiate with RCEP partners. In this study, it investigates the situation that India reduced tariff rates for sensitive products categorized as heavy manufacture goods such as Petroleum, coal products, Chemicals, Steel, Mortar Vehicle and Parts, Transport, Electrotonic products, Machinery and Manufacture, and Utilities and Construction. Negotiations for those products are the last frontier where Indian governments requires difficult decisions for creating new trade policy. In academic studies, this is the first attempts to estimate the possible economic effects for India and the other members countries in RCEP, in the case India lowered its tariffs in order to discuss the feasibility of RCEP.

1.3 Thesis Layout

To pursue the research objectives, this thesis is divided into five sections. **The chapter two**, following this section, conducts literature review by firstly introducing the concept of regional integrations. Secondly, the current status of India's engagement in various FTA will be presented as well in this section. Further, this chapter provide detailed information on India's trade and tariff, and lastly existing studies to investigate Indian economy. **The chapter three** explain methodology and data source for simulations by revealing overview and details of the GTAP models. Also, this chapter specifies aggregations of sectors and selection of scenarios to estimate in this research. **The chapter four** shows the result of simulations under the selected

scenarios. Finally, **the chapter five** summarizes analysis from the result, and notes limitation and future area of this study.

CHAPTER TWO

LITERATURE REVIEWS

2.1. Regional Integration

This section provides the idea, which will be stepping stones for the research question in this thesis. Firstly, it will introduce overview and definition of regional integration and then follows historical backgrounds of India's regional agreements. Secondly, the next section highlights trade and tariff profile to reveal trading patterns of India. Thirdly, the present studies on evaluating trade agreements using GTAP will be presented. Finally, this section is concluded by stating the significance of this research based on the contents discussed beforehand.

2.1.1 Overview of Regional Integration

Generally speaking, there are the five possible levels of regional integration depending on its forms. The following categorization was developed by Balassa (1963) .

(1) Free Trade Agreement (FTA), Economic Partnership Agreement (EPA)

Members agree to eliminate tariffs and non-tariff trade barriers with each other but maintain their own trade barriers with non-members countries. Each country has sovereignty to decide tariff rates for non-members countries. The differences from FTA and EPA are that the latter covers not only tariffs but also protection of intellectual property and rules for investments. Examples are: Trans-Pacific Partnership Agreement (TPP), North American Free

Trade Agreement (NAFTA), ASEAN Free Trade Area (AFTA), European Free Trade Association (EFTA), Association of South-East Asian Nations (ASEAN) and New Zealand Closer Economic Relations Agreement (Australia and CER)

(2) Custom Union

Members levy common external tariffs beside free trade within members. An example is: Mercado Común del Sur (MERCOSUR)

(3) Common Market

Members allow free movement of products, labor and capital. An example is: Pre-1992 European Economic Community.

(4) Economic Union

Members form united monetary and fiscal policy by a central authority. An example is: European Union (EU).

(5) Political Union

Members reach perfect unification of all policies by a common organization; submersion of all separate national institutions. Political Union remains an ideal and yet to be achieved.

This study discusses RCEP, mega FTA in Asia-Pacific regions. In order to graphs the concept of FTA, following part shows pro and cons of regional integration. One of the advantages is potentials for increasing economic growth following with increasing investments, competitiveness, reallocation of resources. Productivity in industries would rise. Conversely, some possible disadvantages are applied in the case that domestic firms do not have comparative advantages and suffer from competing with cheaper and better products coming from overseas. Generally speaking, almost all countries and governments have domestic

industries to protect. In some sense, consumers must take burdens on paying a higher price for lower qualities of goods, which are domestically produced. That are interpret as decreasing welfare effect.

As described above, there are great deal of benefits when nations move toward to trade liberalization. FTA is the first level of integration for bilateral relationship. However, conducting FTA is not that easy and simple yet including many controversial discussions for nations interests. In the next section, it will touch to historical backgrounds and current status India's FTA.

2.1.2 India's engagement in FTA

Nowadays, the numbers of concluded FTA/EAP has cumulated to nearly 300 in the world. (JETRO, 2018). Since India joined in GATT in 1948 and later WTO in 1995, traditional India's trade policies were apt to prefer negotiating in world frameworks. Historically, India has been leaned on protectionism and that result as stagnation of negotiations with WTO (Sally and Sen, 2010). In recent years, as same as other countries, India gradually shifted to bilateral and multilateral FTA because it is easier to adjust and settle each country interests by negotiating details of FTA. The table 2.1 illustrates the lists of major FTA of India and progresses of each FTA. Before nations successfully conclude and implement FTA, they go through different stages. As the first; an agreement is proposed (*PA*) by policy makers among member countries and forming joint study groups (*JSG*) to study the proposed FTA; secondly, negotiations are launched (*NL*) and begin to concert which items should be included and what policy they conclude under the FTA; thirdly, the proposed FTA is finally signed and enters into force (*EF*).

Table 2.1 List of India's Regional Agreement

Bilateral Agreement			
	Status	Year of SE	Year of JSG, NL
India-Sri Lanka Free Trade Agreement	SE	2001	
India-Afghanistan Preferential Trading Agreement	SE	2003	
India-Singapore Comprehensive Economic Cooperation Agreement	SE	2005	
India-Chile Preferential Trading Agreement	SE	2007	
Indo-Nepal Treaty of Trade	SE	2002	
India-Korea Comprehensive Economic Partnership Agreement	SE	2010	
India-Bhutan Trade Agreement	SE	2006	
Malaysia-India Comprehensive Economic Cooperation Agreement	SE	2011	
Japan-India Comprehensive Economic Partnership Agreement	SE	2011	
India-Thailand Free Trade Area *	SE	2004	
India-China Free Trade Agreement	NL		2003
India-Australia Free Trade Agreement	NL		2011
India-Russian Federation Comprehensive Economic Cooperation Agreement	NL		2006
India-Israel Free Trade Agreement	NL		2004
Peru-India Free Trade Agreement	NL		2015
New Zealand-India Free Trade Agreement	NL		2007
India-Indonesia Comprehensive Economic Cooperation Arrangement	NL		2005
India-Canada Economic Partnership Agreement	NL		2009
India-Egypt Preferential Trade Agreement	NL		2002
India-Mauritius Comprehensive Economic Cooperation and Partnership Agreement	NL		2005
Multilateral Agreement			
ASEAN-India Comprehensive Economic Cooperation Agreement	SE	2010	
India-MERCOSUR Preferential Trade Agreement	SE	2009	
South Asian Free Trade Area	SE	2006	
Asia-Pacific Trade Agreement	SE	1975	
Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation	NL		2004
India-Southern African Customs Union Preferential Trade Agreement	NL		2004
India-European Union Free Trade Agreement	NL		2006
India-European Free Trade Association Free Trade Agreement	NL		2007
India - Eurasian Economic Union	NL		2006

Notes: SE= Signed and In Effect, NL= Negotiations Lunched, JSG= Joint Study Group

* India and Thailand conducted 50% tariff reduction in 2004 and 75% in 2006 for 84 products in the assigned early harvest lists. Now they are negotiating for concluding FTA.

Source: Author using several websites down below (Accessed in December, 2018)

Governments of India, Ministry of Commerce

(<http://commerce.gov.in/InnerContent.aspx?Type=InternationalTrademenu&Id=32>)

Asia Regional Integration Center (<https://aric.adb.org/fta-country>)

JETRO (https://www.jetro.go.jp/world/asia/in/trade_01.html)

From viewing Table 2.1, it can be observed that India has strengthen relationships with

Asian nations, specifically in East Asia. India pause “Look East Policy” and East Asia is ideal modeling countries because they have achieved industrialization and integrated in global chain through trade and foreign capital investments (Hukumi, 2012). Therefore, India is eager to join trade agreement in Asian regions considering with negative impacts of exclusion from East Asian frameworks.

In Asia, India has the most severe trade deficit to China, that will be discussed in next section, and bilateral FTA with China has been going through difficulties. Further, negotiation between India and China plays significant role in RCEP as well. Therefore, this following part put more focus on India-China relationships. Department of Commerce, India and Ministry of Commerce, PRC announced that in 2003, both countries formed a joint study group and based on its report, a task force is organized: a temporal organization aiming to solve shared objectives. In 2007, the report examined potentials for regional agreement in the field of trade and investment. Moreover, in 2012, India and China again decided to form a joint group and they agreed that the regional agreement with each other is recommended. In diplomatic perspectives, Mr. Modi: the prime minister of India, and Mr. Xi Jinping: the president of the PRC, has kept taking official and unofficial meetings over the time. China has officially announced they conduct future investments in industrial park, railways and nuclear power plants in India. Their relations seem present; however, the two nations have been facing severely controversial obstacles each other for long time such as regional dispute. For example, some of them are Sino-Indian border dispute, refugees from Tibet and defense in sea channels. In other words, India keenly oppose the idea of “One Belt, One Road” by PRC. As same as the various political issues, their movements regarding trade has been undergone tangled ways. In July 2017, China reduced importing tariff rates from the member countries of ATPA; India,

Bangladesh, Laos, South Korea and Sri Lanka. The 2,323 goods out of 8,545 in 8 digit-based HS code¹ were included in the tariff reduction, that covered broad products including chemicals, agricultural goods, apparel and clothes, irons and aluminum² (JETRO, 2018). Medias analyzed this reduction in APTA was done behind the rise of US-China trade war caused by Trump, the 45th president of the United States. Under the current international situation surrounding US-China trade war, India recognizes itself to being able to increase export to China as a substitute of US. (the Sankei news, 2018) For China, they have hidden motivations that they are willing to increase exports and imports from other countries rather than the U.S. in order to be independent from the U.S. and lobby economic sanctions. Although it seemed that trade between India and China was going to liberalization, the things are not that easy for them. On September 27th 2018, Indian government suddenly raised their tariff rates in the range of 2.5 to 10 points for 19 items including electronics and jet motor. Modi administration pose a propaganda “Make in India” and take protective policies for nurturing domestic manufacturing industries. (the Nikkei news, 2018). On November 12th 2018, a preparatory RCEP meeting among 16 countries including India and China, was conducted, but they could not reach an agreement mainly because of India’s strong oppositions for tariff reduction. In summary, India is motivated to realize trade liberalization in the future; however, in reality India could not simply open its market among RCEP countries, especially to China. Hence, RCEP remains far away from implementation in force. The next section will introduce details from the view of Indian trade patterns to analyze the feasibility of proposed RCEP.

¹ Harmonized System code is a six-digit code for classifying goods. Approximately there are 5,3000 products description and aggregated in 99 chapters.

² The details of listed items and tariff rate are published in Announcement of No.27 [2018] Announcement on Implementing the Conventional Tariff Rates under the Second Amendment to the Asia-Pacific Trade Agreement. See <http://gss.mof.gov.cn/zhengwuxinxi/zhengcefabu/201806/P020180626540874117547.pdf>

2.2 Trade Profile of India

This section reveals information on foreign trade of India. Starting from over-viewing trade status in the world, and then it will focus on product-wise analysis to discuss the features of Indian economy.

India have grown rapidly with nearly 7% annual GDP growth rate. Compared to world economy, according to World Trade Organization and the Observatory of Economics Complexity, as well is known, China is the largest exporting country and the second largest importing countries, owing \$ 2.27 trillion exports and \$1.23 trillion imports. In both exports and import, the United States, Germany and Japan are top 4 ranked countries including China. India exported \$261 billion, as the 17th largest exporting economy and imported \$339 billion as the 14th largest market in the world in 2017. The Table 2.3 shows major trading partners for India, their shares and the volume of trade. In India's perspective, the top export destinations are the United States (\$46 B), the United Arab Emirates (\$30 B), Hong Kong (\$15 B), China (\$12.4 B) and so on. Likewise, the top import destinations are following: China (\$71 B), the United States (\$24 B), the United Arab Emirates (\$23 B). RCEP members countries are also ranked in the chart such as Korea, Japan, Indonesia, Australia, Malaysia, Singapore and Viet Nam. Here, it is clear that the volume of trade with the members countries in RCEP consist large percentage in India's foreign trade. In addition, as indicated in the table, great amount of trade deficit is one significant feature for Indian trade, which account for \$149 billion in total. The largest deficit is Chinese trade, approximately \$60 billion. Those facts illustrate the reasons why India need to take protectionism policy and difficult to conduct instant liberalization. Table 2.3 shows exporting and importing products of India, which gives ideas of the features of Indian industries.

**Table 2.2 Top 20 Trading Partners of Indian Foreign trade in Goods
with Values and their share in 2017**

	Exporters	Share in value (%)	Values US Dollar thousand	Importers	Share in value (%)	Values US Dollar thousand
1	China	16.2	71,971,173	United States of America	15.6	46,059,047
2	United States of America	5.4	24,099,310	United Arab Emirates	10.1	30,011,802
3	United Arab Emirates	5.2	23,088,317	Hong Kong, China	5.1	15,016,199
4	Saudi Arabia	4.7	21,062,814	China	4.2	12,492,392
5	Switzerland	4.6	20,392,606	Singapore	3.9	11,573,109
6	Indonesia	3.7	16,229,115	United Kingdom	3	8,961,521
7	Korea, Republic of	3.6	16,111,063	Germany	2.8	8,241,383
8	Iraq	3.4	15,309,425	Viet Nam	2.7	8,119,827
9	Australia	3.2	14,318,879	Bangladesh	2.4	7,208,556
10	Germany	2.9	12,671,251	Belgium	2.1	6,215,492
11	Iran, Islamic Republic of	2.5	11,057,794	Italy	1.9	5,653,822
12	Hong Kong, China	2.5	11,003,582	Malaysia	1.9	5,535,809
13	Japan	2.4	10,471,041	Nepal	1.9	5,517,766
14	Malaysia	2	8,900,006	Netherlands	1.8	5,431,974
15	Area Nes	1.9	8,634,088	Saudi Arabia	1.8	5,220,099
16	Nigeria	1.9	8,339,501	France	1.7	5,040,384
17	Qatar	1.8	8,093,479	Turkey	1.7	4,923,323
18	Russian Federation	1.8	7,988,996	Japan	1.5	4,503,130
19	Singapore	1.6	7,223,071	Sri Lanka	1.5	4,415,866
20	South Africa	1.5	6,881,081	Korea, Republic of	1.5	4,370,079
Total	World	100	444,052,638	World	100	295,846,887

Unit: US dollar thousand

Note: Trade in services is no included

Source: Author using International Trade Center, *Trade Map-International Trade Statistics in 2018*

Table 2.3 Top 25 Exporting and Importing items of India in 2017

Export				Import			
No.	HS Code	Product label	Share in value (%)	HS Code	Product label	Share in value (%)	
1	'71	Natural or cultured pearls	14.39	'27	Mineral fuels, mineral oils and products of their distillation	27.71	
2	'27	Mineral fuels, mineral oils and products of their distillation	12.13	'71	Natural or cultured pearls, precious or semi-precious stones	16.75	
3	'84	Machinery, mechanical appliances	5.63	'85	Electrical machinery and equipment and parts thereof	10.55	
4	'87	Vehicles other than railway or tramway rolling stock	5.48	'84	Machinery, mechanical appliances, nuclear reactors, boilers	8.11	
5	'29	Organic chemicals	4.59	'29	Organic chemicals	4.05	
6	'30	Pharmaceutical products	4.36	'39	Plastics and articles thereof	2.93	
7	'72	Iron and steel	3.95	'15	Animal or vegetable fats and oils and their cleavage products	2.67	
8	'62	Articles of apparel and clothing accessories	3.04	'72	Iron and steel	2.24	
9	'85	Electrical machinery and equipment and parts thereof	2.97	'90	Optical, photographic, cinematographic, measuring	1.9	
10	'61	Articles of apparel and clothing accessories	2.82	'26	Ores, slag and ash	1.32	
11	'10	Cereals	2.48	'28	Inorganic chemicals	1.26	
12	'52	Cotton	2.33	'87	Vehicles other than railway or tramway rolling stock	1.24	
13	'03	Fish and crustaceans	2.25	'38	Miscellaneous chemical products	1.18	
14	'73	Articles of iron or steel	2.25	'89	Ships, boats and floating structures	0.98	
15	'39	Plastics and articles thereof	2	'74	Copper and articles thereof	0.96	
16	'63	Other made-up textile articles	1.68	'31	Fertilisers	0.96	
17	'89	Ships, boats and floating structures	1.55	'88	Aircraft, spacecraft, and parts thereof	0.94	
18	'02	Meat and edible meat offal	1.46	'76	Aluminium and articles thereof	0.94	
19	'38	Miscellaneous chemical products	1.25	'99	Commodities not elsewhere specified	0.9	
20	'76	Aluminium and articles thereof	1.24	'07	Edible vegetables and certain roots and tubers	0.89	
21	'74	Copper and articles thereof	1.14	'73	Articles of iron or steel	0.84	
22	'09	Coffee, tea, maté and spices	1.12	'08	Edible fruit and nuts; peel of citrus fruit or melons	0.77	
23	'90	Optical, photographic, cinematographic, measuring	0.98	'40	Rubber and articles thereof	0.73	
24	'40	Rubber and articles thereof	0.96	'48	Paper and paperboard	0.69	
25	'32	Tanning or dyeing extracts	0.94	'25	Salt, sulphur, earths and stone	0.52	

Note: HS code at the same level (2 digits)

Source: Author using International Trade Center, *Trade Map-International Trade Statistics*

Following after traditional export item: jewelry (14.4%), mineral fuels and petroleum products (12.1%) are ranked in top 2. Other major exporting products are machinery (5.6%), vehicles (5.5%), chemicals (4.6%), pharmaceutical products (4.4%), iron and steel (4.0%), apparel and clothing (3.0%) and so on. Japanese automobile company; Suzuki and Korean company; Hyundai produce vehicles in India for both of Indian and EU markets. Therefore, machinery and vehicles are one of major products for India. In imports side, major products are: Mineral fuels (27.7%), cultured pearls (16.8%), Electrical machinery (10.6%), Machinery (8.1%), chemicals (4.0%), Plastics (3.0%), Animal or vegetable fats (2.8%), and Iron and steel (2.2%). Oil and petroleum, and jewelry appease in both of imports and export products, which means India is in charge of “processing trade” in the world. From this picture, India mostly export intermediate products over finished goods, representing in developed countries trade and partly Chinese import toward India. Indian government pursue the policy of “Make in India” and that require controlling import goods, namely manufacture and finished goods, in order to gain time for India to achieve industrialization.

This next part provides tariff profiles of RCEP members. Tariffs are indicators of the level of protection. The table 2.3 indicates levied tariff rates by each member of RCEP to all other countries in the world. From Table 2.3, it is obvious that India’s average tariff rates is highest among RCEP partners. Moreover, the tariff rates of ASEAN countries are relatively high and differentiating within ASEAN framework. Thus, negotiations between various parties like Japan, Korea, Australia toward India or ASEAN nations, let difficulties to achieve an agreement among RCEM partners even though the reduction of India’s tariff rates would lead larger economic benefits for other countries.

Table 2.4 Indicators of Level of Protection in RCEP Member Nations

Country	Simple average (%)	Duty-free	Non ad valorem duties	Duties > 15 %	Maximum duty (%)	Number of MFN applied tariff lines
	Share of HS 6 digit subheadings in per cent (%)					
India	13.8	3.0	4.8	19.4	150	11,775
China	9.8	7.1	0.3	15.1	65	8,906
Japan	4.0	52.4	3.3	3.4	736	9,750
Korea	13.7	15.1	0.5	10.7	887	12,489
Brunei	0.2	95.8	0.3	0.0	131	11,205
Cambodia	11.1	16.0	0.0	9.7	35	10,810
Indonesia	8.1	13.1	0.2	9.8	150	10,812
Laos	8.5	1.5	0	9.2	40	9,724
Malaysia	5.7	66.2	0.7	13.3	> 1000	11,690
Myanmar	6.5	4.6	0	5.7	40	11,166
Philippines	6.3	3.4	0	3.2	65	10,256
Singapore	0.0	100.0	0.0	0.0	89	9,557
Thailand	9.5	36.6	9.9	21.1	330	10,812
Viet Nam	9.6	35.0	0	24.7	135	9,623
Australia	2.5	51.0	0.2	0.1	163	6,494
New Zealand	2.0	64.5	0.4	0.0	45	7,777
USA	3.4	46.7	8.4	2.8	350	11,621

Note: MFN= Most Favored Nation

Source: Author using World Tariff Profiles, 2017

2.3 Empirical Exercises

Here, this section introduces previous studies which measured impacts of FTA based on the GTAP models. One of notable research topic is an examination of one nation entry into WTO. Ianchovichina et al. (2004) found that most of East Asian nations gained from trade liberalization resulting from China's assertions to WTO nonetheless competition increased in the third market. Freund et al. (2006) examined the effect of China's trade liberalization for Latin regions. As their findings, Latin America loss under brutal competitions from importing Chinese goods. Lately, studies on bilateral and regional integration called academic attentions. Arawal and Ghosh (2011) evaluated the proposed India-China FTA taking time into consideration. The study created two scenarios: immediate and gradual tariff reduction using

the GTAP-6 database and they found that a gradual tariff reduction is preferable for India because it gives time for India to protect important sectors to adjust and minimize losses in the terms of trade. Using GTAP-7 database, Reserve Bank of India (RBI) published its report on India-China FTA, which reveals that the unilateral liberalization in agricultural products result in a negative impact for India on the sectoral outputs, specifically on food grain, processed food, and animal products sectors. (2014) As a one of recent research, Rahul et al. (2015) utilized GTAP-9 and assessed the impact depending on selected scenarios based on which products India and China has comparative advantages. Regarding India, they choose plant-based fiber, vegetable oil and fat, food products, textiles, and leather products as India's comparative advantageous goods. On the other hand, Chinese ones are: textile, wearing apparel, leather products, wood products, mineral products, metal products, electronical equipment and machinal and equipment. The simulations were covered 50 percent reduction and 100 percent reduction on tariffs for both of specified and all goods. They concluded that a tariff reduction in all goods would be more beneficial for both countries rather than that of specialized products. Regions where lose significantly from India-China FTA are: the EU, South East Asia, the United States, Japan, Korea, West Asia, and the European Trade Association (EFTA).

Regarding multilateral agreements in Asia such as ASEAN, ASEAN + 3³, ASEAN + 6⁴ and APEC, Ando (2009), and Urayasu and Ando (2011) investigated several scenarios by using GTAP version 6. They aggregated 18 countries and regions out of 87; Japan, China, Korea, Indonesia, Malaysia, Philippine, Singapore, Thailand, Vietnam, other south east Asian countries, Australia, New Zealand, India, Hongkong, Taiwan, NAFTA, EU and the rest of the

³ ASEAN nations and Japan, Korea and China

⁴ ASEAN nations and Japan, Korea, China, Australia, New Zealand and India. The same members in RCEP.

world. Their simulations are calculated based on five scenarios; 1. free trade in all industries other than agriculture, 2. 50% tariff reduction in agriculture and free trade in other all sectors, 3. free trade in all sectors, 4. free trade and trade facilitation such as simplification for custom clearance when nations import goods, 5. free trade in all sectors, trade facilitation and technical aids for developing countries. As their findings, firstly, the more countries join a FTA framework, the more economic impacts they gain. Secondly, trade facilitation leads economic benefits for nations. In all scenarios, most of the nation's gain GDP growths rather than having negative results including India.

In this chapter, the literature review covered majorly three contents. The first part dealt with the core concepts of regional integration and India's historical engagements in FTA frameworks. The second part assessed trade profiles of India by talking about trading partners, products and the level of protection. The last part noted previous studies regard to regional integration in Asia using the GTAP model. Prior research has investigated various FTA and scenarios as discussed above sections. However, little research has been conducted to show economic impacts of trade liberalization in RCEP. In particular, there is no studies yet to focus on India's trade liberalization in sensitive industries, heavy manufacture goods, among RCEP partners. When nations consider which policy options are chosen, empirical estimation plays a vital role to evaluate possible effects. In recent years, much attentions have been drawn to RCEP as a new Asia centered trade agreement. It is not an exaggeration that the success of RCEP is depends on India's policy decision. Hence, this paper will attempt to answer an empirical question that what economic effect would be observed when India enter into RCEP and conduct trade liberalization. This study targeted sensitive goods for India because it would be one of the most controversial items for Indian policy makers and economy. The result of

simulations and analysis would be helpful to consider future proposed of RCEP.

CHAPTER THREE

RESEARCH METHODOLOGY AND SOURCE

This chapter demonstrates methodology for Computable General Equilibrium (CGE) models. In particular, implications for tariff reform in GTAP model will be explained. Firstly, this chapter offers the basic information of GTAP. Secondly, it interprets how GTAP works by identifying the two components: regional household and producer household. The last section explains measurements to evaluate the result of simulation.

3.1 The basis of CGE Models

The basic ideas behind CGE models are the economic theory that resources are distributed efficiently under the rule of price mechanism. The CGE models compared two worlds with equilibrium, that is before and after policy change. This research assumes tariff reduction in India among RCEP members and compare the result before and after the trade liberalization.

3.2 GTAP models

3.2.1 The basics of GTAP

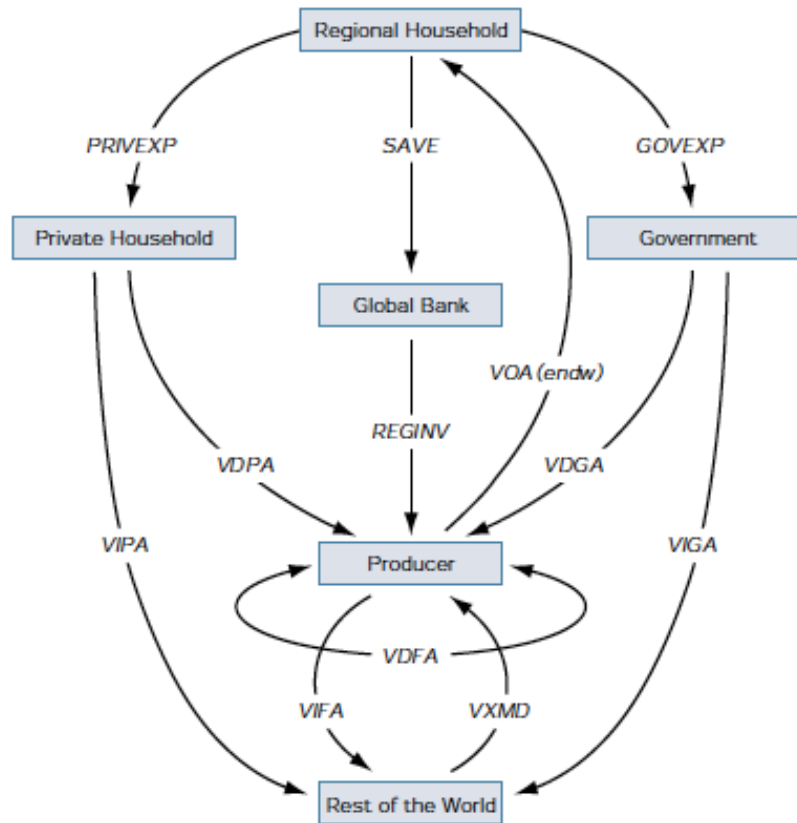
In this section, it will introduce basic information on GTAP and how GTAP has been developed. Global Trade Analysis Project (GTAP) was established in 1992, by professor Hertel, at

Purdue University, aiming to conduct quantitative analysis of economic effect of trade policy in an international framework. As global interdependence has deepened, it became more important to conduct quantitative analysis on policy evaluation in global scale. The project contains several motivated objectives: to construct global database, to develop computing model of Computable General Equilibrium (CGE), to distribute publicly available software, and to build a network for researchers including universities, international organizations or governments. The crucial contributions of GTAP is that they provide computing tools to publics and enhance transparency for computing results. After international actors joined this project, such as developing nations' government, World Bank and OECD, GTAP kept upgrading and increasing applicable nations and industries in the tool. Thanks to GTAP, each nation became able to discuss policy effects with using same database across nations. Moreover, GTAP has a function which allows researchers to combine or divide classification of nations and industries along with research purposes. By utilizing GTAP, now that not only trade issues, but also other models such as Imperfect competition model and environmental model are available to conduct simulation.

3.2.2 Structure of GTAP

The basic structure of GTAP is constituted by those four actors: Producer, Regional Household, Global Bank and Global Transportation as figure 3.1 showed. Even though GTAP is a multinational model, in order to simplify explanations of GTAP here, the following graphic will show One Region Closed Economy without Government Interventions such as taxes or subsidies. As a premise, this model do not consider transportation cost.

**Figure 3.1 Macro structure of GTAP,
One Region Closed Economy without Government Interventions**



Where,

PRIVEXP: Private Expenditure

GOVEXP: Government Expenditure

VDPA: Value of Domestic Private household purchases, evaluated at Agents' prices

VDGA: Value of Domestic Government purchases, evaluated at Agents' prices

VIPA: Value of Import payments to Rest of the World from private households

VIGA: Value of Import payments to Rest of the World from governments households

SAVE: Savings

VDFA: Value of Domestic Firm Purchases, evaluated at Agents' prices

VOA: Value of Output at Agent's prices

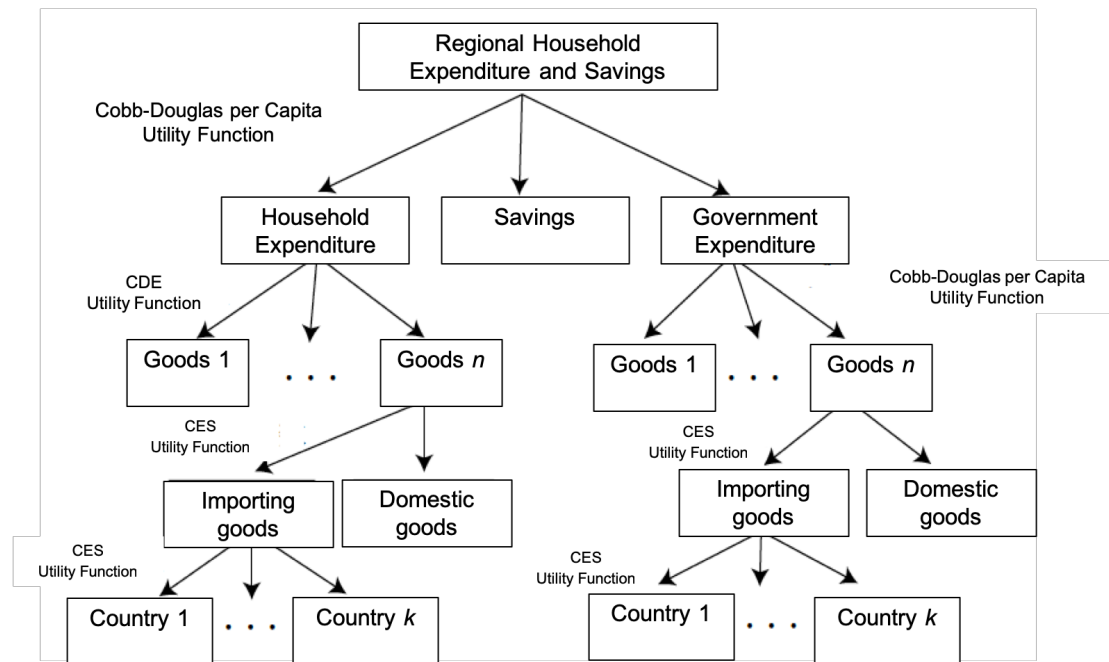
VIFA: Value of Import Payments to Rest of the World from Firms

Source: Heltel (1997) "Global Trade Analysis"

The arrow symbols in Figure 3.1 represents flow of payment for gained value. Every country has its regional household, producer and government. Global bank is a hypothetical organization which adjust imbalanced savings and investments in each county. In order to explain how GTAP work, regional household, producer household, savings and investments will be adequately discussed in following parts.

Regional household

Regional household is a unique concept in GTAP associated with private household and government. The structure of regional household is explained in the figure 3.2. Each regional household has Cobb Douglas unity function composed by household expenditure, savings and government expenditure. Consumers will decide how they act or use their resources for household expenditures, savings and government expenditure to maximize the unity function. Regional expenditure is divided for good 1 to good n using CES function, in which numerical difference of elasticity of substitution is equal, and then goods is also classified import good or domestic one. This basic concept is also applied to government expenditure. Thus, government expenditure is considered as endogenous variable, though government expenditure is normally exogenous variables in Macro measurement model. Moreover, CES model is on the premise that market is equivalent. In this model, economic effect means a shift from previous equilibrium point to new one. In so doing, a concept of government expenditure multiplier, such as imbalance equilibrium due to unemployment, is not applied in this model.

Figure 3.2 Regional Household in GTAP

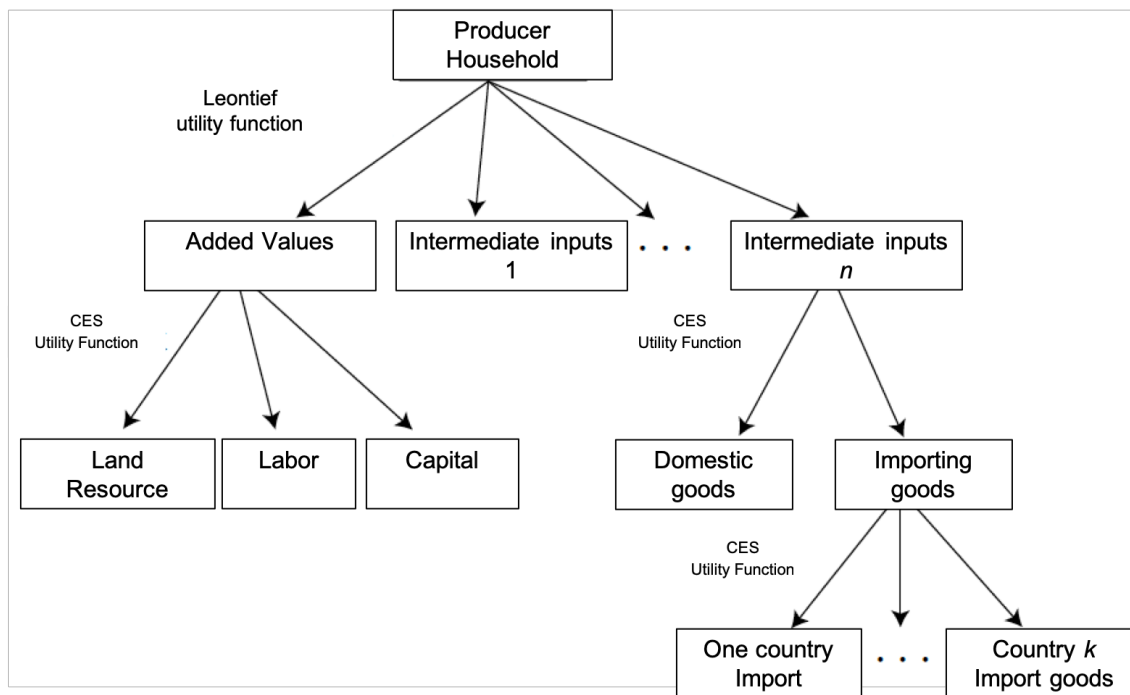
Source: Fujikawa and Watanabe (2003)

Producer Household

The figure 3.3 explains producer behavior. Like consumption part, producer part has three layers in the structure. Firstly, added value and intermediate elements are based on Leontief function. In this point, change of price for goods do not affect intermediate elements; however, domestic and import goods is CES function and so the share will change depending on change in relative prices. Also, this structure corresponds to international price change and substitute of importer with CES function. On the other hand, added value contains labor, capital and land and natural resources. Those are also calculated by utilizing CES function. An important notice is that a country and region have same parameters which contains substitutes of elasticity in factors of production: in domestic and import good as intermediate input, and in import goods. Though that estimation is similar to Heckscher-Ohlin theorem, it would be a

problem if a result of calculation is really match to the real world in terms of quantitative figures of the world economy.

Figure 3.3 Producer Household in GTAP



Source: Fujikawa and Watanabe (2003)

Under the model of one region closed economy without government intervention, investment will be decided to equalize to savings as a residual, that is decided after quantities of consumption and production. Conversely, international trade makes it possible for savings and investments to be equilibrated in the real economy. Therefore, GTAP model is under the unique premise that savings are put in a hypothetical organization: global bank, which decides how to distribute money in the whole world.

As additional information, economic effect of FTA is classified as a static model or dynamic model. The former is implicating economic effects when tariff rate is decreased. The

latter is economic effect which explain how decreased tariff rates affect increasing capitals and productivity. Furthermore, a static model is classified into the two effect: trade creation effect and trade division effect. Trade creation effect expects that trade would grow without a tariff wall. When two countries eliminate a tariffs barrier, an importing country would buy goods with lower price. Similarly, an exporting country also gain benefits from increased the volume of trade. Under this situation, both of two countries enjoy increased economic welfare. On the other hand, trade division effect supposes that eliminating trade barriers does not affect beyond specific FTA. So, increased terms of trade in the countries concluded FTA might be simply a conversion from trade beyond FTA frameworks. In this study, simulation is focused on only a static effect.

3.3 Measurement

This section provide explanations for several measurements used in GTAP and analysis on simulation results. The analysis is taken on places by the terms of trade, GDP, equivalent variation (EV) and the balance of trade. The following explanation are written based on by Rahman et al. (2015).

3.3.2 Terms of trade

Terms of trade of a region is defined as the ratio of price index received for tradable produced in region r (PSW) to the price index paid for tradable used in the same region (PDW). This measure in GTAP model includes the sales of net investment to the global bank and purchases of savings from the global bank. Following equation (1) shows the percentage change in terms of trade (tot) is the difference between percentage change in

PSW and *PDW*.

$$tot(r) = psw(r) - pdw(r) \quad \dots(1)$$

3.3.1 Real GDP

As the study has assumed fixed endowments in pre and post simulation environment therefore, the quantity index of GDP (QGDP) represents only the shift in the economy's production possibilities frontier owing to the improved allocation of a fixed resource base.

$$qgdp(r) = vgdp(r) - pgdp(r) \quad \dots(2)$$

Where *vgdp* is the percentage change in value of GDP in region *r* and *pgdp* is the percentage change in price index for GDP in region *r*.

3.3.3 Equivalent variation

Equivalent variation (*EV*) represents the welfare effect in the GTAP model. EV measures the cost for the household to gain goods, pre and post policy change. The cost can be translated that the difference between the initial expenditure and required expenditure to gain the new level of utility at the initial prices. The utility for the regional household is decided by per capita household consumption, per capita government expenditure, and per capita savings. The following explanation are written based on by Rahman et al. (2015).

When there are two policy options, the existing piece p^0 and a policy shock with price p^1 and income m^1 ; then, the equivalent variation can be expressed as:

$$EV = \mu(p^0; p^1, m^1) - \mu(p^0; p^0, m^0) = \mu(p^0; p^1, m^1) - m^0 \quad \dots(3)$$

where $\mu(p^0; p, m)$, called money metric indirect utility function, measures how much income the consumer would need at prices p^0 to be as well off as he would be if facing price p^1 and having income m^1

For the GTAP model, McDougall (2001) obtained the EV associated with a perturbation to the GTAP model as follows:

$$EV = Y_{EV} - \bar{Y} \quad \dots(3.1)$$

where Y_{EV} is the expenditure required to obtain the new level of utility at initial prices, that is equal to $\mu(p^0; p^1, m^1)$ in (3), whereas Y is the initial expenditure, that is, m^0 in (3).

Differentiating (3.1) it can obtain:

$$dEV = 0.01Y_{EV}y_{EV} \quad \dots(3.2)$$

where y_{ev} is the percentage change in Y_{EV} required to achieve the current actual utility level, in which the prices are fixed.

3.3.4 Balance of Trade

The balance of trade (*bot*) in region *r* is decided as the value of exports(*vox*) minus the value of import (*voi*) as the following formula (4).

$$bot(r) = vox(r) - voi(r)$$

A nation has a positive balance of trade, which express that the value of its export is larger than its imports, known as a trade surplus. Conversely, having a negative trade balance is trade deficits.

3.4 Data Aggregation and Scenarios

In the GTAP-9 model, data on 140 regions and 57 sectors are available for simulation (Narayanan, Aguiar and MacDougall, 2015). In analysis purpose, 140 regions are aggregated to eight regions: India, China, Japan, Korea, ASEAN, Australia and New Zealand, Unites States, and the rest of the world as Table 1 in appendix shows. Here, one notion about an aggregation for ASEAN are that available are only for those 9 countries as follows: Brunei, Cambodia, Indonesia, Laos, Malaysia, Philippines, Singapore, Thailand and Viet Nam. In the GTAP-9 database, individual data of Myanmar is not available. Therefore, in simulation of this research, ASEAN is indicating all ASEAN nations except Myanmar due to the structural problem of GTAP. With reference to the reason behind an aggregation to 9 regions is that the primely objective of this simulation is to estimate impacts of India's join into RCEP framework, so the member countries of RCEP are extracted individually and others are aggregated into the rest of the word. In addition, United States is also picked up as a major country affecting both

imports and exports to the RCEP members countries. In regard of sectoral aggregation, 57 sectors are classified into 18 sectors, indicated in Table 3.1. For specified simulations, heavy manufacture goods are divided finely into 10 sectors: Petroleum, coal products, Chemicals, Steel, Motor Vehicle and Parts, Transport, Electronic products, Machinery and Manufacture, and Utilities and Construction.

Table 3.1 Sectoral Aggregations

No	Sector	Description
1	Agricultural goods	Paddy rice, Wheat, Cereal grains nec, Vegetables, fruit, nuts, Oil seeds, Sugar cane, sugar beet, Plant-based fibers, Crops nec
2	Livestock and Meat Products	Cattle, sheep, goats, horses, Animal products nec, Raw milk, Wool, silk-worm cocoons, Meat: cattle, sheep, goats, horse, Meat products nec
3	Fishing	Fishing
4	Forestry	Forestry
5	Mining	Coal, Oil, Gas, Minerals nec
6	Processed Food	Vegetable oils and fats, Dairy products, Processed rice, Sugar, Food products nec, Beverages and tobacco products
7	Textiles and Clothing	Textiles, Wearing apparel, Leather products
8	Light Manufacture	Wood products, Paper products, publishing
9	Oil and Petroleum	Petroleum, coal products
10	Chemical	Chemical, rubber, plastic prods
11	Steel	Mineral products nec, Ferrous metals, Metals nec, Metal products
12	Motor Vehicle and Parts	Motor vehicles and parts
13	Transport	Transport equipment nec
14	Electronic products	Electronic equipment
15	Machinery and Manufacture	Machinery and equipment nec, Manufactures nec
16	Electricity and Gas	Electricity
17	Utilities and Construction	Gas manufacture, distribution, Water, Construction
18	Transport and Communication	Trade, Transport nec, Sea transport, Air transport, Communication, Financial services nec, Insurance, Business services nec, Recreation and other services, PubAdmin/Defence/Health/Educat, Dwellings

Source: Author using GTAP database¹

Simulation Scenarios

In order to estimate how different economic impacts would be generated depending on the level of liberalization, the simulations will be undertaken on the following two scenarios.

- I . 50 percent reduction of tariffs on selected heavy manufacture goods from RCEP countries to India
- II . 100 percent reduction of tariffs on selected heavy manufacture goods from RCEP countries to India

In these scenarios, it assumes that India enter into RCEP framework and reduce import tariffs from the member countries of RCEP. (i) partial liberalization, and (ii) full liberalization scenarios are conducted under the selected 10 manufacture goods such as Petroleum, coal products, Chemicals, Steel, Mortar Vehicle and Parts, Transport, Electrotonic products, Machinery and Manufacture, and Utilities and Construction. The simulation is measured by the terms of trade, GDP, EV and the balance of trade explained in above former sections.

CHAPTER FOUR

EMPIRICAL TESTS AND ITS RESEARCH

4.1 Introduction

This chapter reveals the results of the estimation utilized by GTAP-9 in the two scenarios: (i) 50 percent tariff reduction, (ii) 100 percent tariff reduction on the selected heavy manufacture goods when India imports from RCEP countries. The table 4.1 shows the initial tariff rates for RCEP countries which are imposed exporting goods to India. For instance, in the initial position, India impose 6.9837% tariff duty on Oil and Petroleum imported from China. Under the scenario (i), it is lowered to the level of 3.4919 %, and scenario (ii), 0 % tariff is levied, here it means complete free trade in RCEP.

Table 4.1 Initial Tariff Rates used in GTAP program

	China	Japan	Korea	ASEAN	Aus & NZ
Sector	Tariff Rates (%)				
Oil and Petroleum	7.0	7.6	4.1	5.1	8.8
Chemical	6.7	7.6	7.0	8.0	7.1
Steel	7.2	6.4	6.7	6.5	8.3
Mortar Veichle and Parts	10.9	13.6	10.7	9.9	14.4
Transport	8.8	8.2	9.1	8.3	7.4
Electrotonic products	1.5	2.5	2.7	2.6	3.2
and Manufacture	7.2	7.0	6.8	6.7	7.1
Electricity and Gas	0	0	0	0	0
Utilities and Construction	0	0	0	0	0

Source: Author using GTAP database

4.2 Simulation Results

The result is analyzed by utilizing the terms of trade, qgdp, EV and the balance of trade respectively. The table 4.2 presents the impacts of the assumed two shocks for each

country. Under the both of two scenarios, India, the U.S. and the rest of the world show a negative variation. Conversely, the other countries in RCEP: China, Japan, Korea, ASEAN, Australia and New Zealand gain benefits from India's trade liberalization. In terms of EV, the welfare in India decrease nonetheless the consumers would be able to buy imported products with often with lower prices from other nations after policy change. The level of increase in China's EV are much larger than that of the others in RCEP. It is also showing the U.S. and the rest of the world would be losers when trade became open to not for them but also the RCEP countries.

4.2 Region-wise Impacts on the selected variables

	Terms of Trade		Real GDP		EV	
	I	II	I	II	I	II
India	-0.2290	-0.4580	0.0603	0.1206	-349.4787	-698.9752
China	0.0487	0.0973	0.0040	0.0080	1,398.2792	2,796.6265
Japan	0.0324	0.0647	0.0009	0.0019	407.0664	814.0991
Korea	0.0445	0.0891	0.0054	0.0108	353.9249	707.8084
ASEAN	0.0344	0.0687	0.0025	0.0049	494.1463	988.3243
Aus & NZ	0.0437	0.0873	0.0032	0.0065	200.5402	401.0986
USA	-0.0168	-0.0336	-0.0005	-0.0009	-495.6025	-991.4816
ROW	-0.0069	-0.0138	-0.0014	-0.0027	-918.8750	-1,837.8452

Source: Author's calculations using simulation results

Note. Real GDP are in percentage change.

Terms of Trade, Real GDP and EV are in USD Millions.

The Table 3.4 and 3.5 presents the balance of trade for each sectors in scenario (i) and (ii) respectively. In terms of trade balance, India, Japan and the U.S. will face to deteriorating trade deficits, on the other hand, China, Korea, ASEAN, Australia and New Zealand, and the rest of the world have a positive trade balance.

Table 4.3 Region and Sector-wise Impact on the Balance of Trade under Scenario I

Sectore	India	China	Japan	Korea	ASEAN	Aus & NZ	USA	ROW
Agricultural goods	765.82	-4,519.97	-2,351.91	-936.16	-1,248.77	1,237.27	3,828.14	-2,031.99
Livestock and Meat Products	274.88	-623.80	-1,521.73	-524.52	-243.17	1,654.16	1,235.69	-1,045.41
Fishing	5.03	-2.30	-238.71	-29.60	65.99	67.29	-168.55	-16.03
Forestry	-165.34	-826.26	-135.79	-101.20	85.92	206.37	182.34	517.73
Mining	-16,500.11	-40,293.64	-25,379.15	-16,280.39	-1,080.76	11,386.61	-32,404.25	103,362.60
Processed Food	611.92	7.39	-3,831.82	-919.31	4,514.97	913.63	-2,966.68	-3,671.29
Textiles and Clothing	3,599.24	27,853.73	-3,923.94	-21.44	2,556.77	-999.50	-14,051.13	-19,748.90
Light Manufacture	-418.08	3,193.99	-1,783.69	-310.26	1,169.62	-525.38	-3,246.66	-2,536.17
Oil and Petroleum	3,822.14	-447.81	-2,907.79	2,016.71	-2,296.65	-1,363.34	3,699.80	-7,159.56
Chemical	-1,953.10	-3,397.82	2,814.98	2,044.00	3,053.53	-2,585.72	-654.40	-10,301.53
Steel	-6,395.38	6,426.82	4,025.51	-787.99	-5,863.31	1,757.77	-4,979.24	-2,078.31
Mortar Veicle and Parts	-148.66	-3,550.58	13,460.83	5,033.42	-747.78	-2,525.64	-10,731.17	-4,745.69
Transport	-475.82	2,172.79	1,128.38	3,882.20	-2,033.55	-817.73	4,018.12	-8,805.64
Electronic products	-1,750.24	23,426.07	967.29	3,921.16	6,958.60	-1,995.35	-18,925.91	-14,786.09
Machinery and Manufacture	-1,212.57	17,248.51	16,779.62	3,278.55	-4,067.84	-4,338.57	-11,781.38	-24,895.36
Electricity and Gas	-38.04	44.08	-0.18	-0.14	-95.11	0.06	-281.47	370.81
Utilities and Construction	-21.58	287.48	13.49	778.99	-122.37	-73.55	526.03	-1,388.50
Services	3,949.78	2,585.43	1,291.85	1,109.98	5,861.81	548.09	7,880.23	54,670.08
Total	-16,050.11	29,584.12	-1,592.76	2,154.01	6,467.88	2,546.48	-78,820.47	55,710.77

Note. Unit is USD Millions

Source: Author's calculations using simulation results

Table 4.4 Region and Sector-wise Impact on the Balance of Trade under Scenario II

Sectore	India	China	Japan	Korea	ASEAN	Aus & NZ	USA	ROW
Agricultural goods	814.90	-4,572.19	-2,367.05	-937.25	-1,249.15	1,214.78	3,832.06	-1,998.51
Livestock and Meat Products	291.69	-643.69	-1,529.42	-528.58	-255.78	1,593.84	1,255.42	-976.27
Fishing	5.95	-3.09	-239.83	-30.14	64.70	67.36	-168.30	-13.75
Forestry	-158.85	-834.85	-136.65	-101.04	82.48	204.39	184.32	523.71
Mining	-16,123.86	-41,006.00	-25,454.66	-16,408.99	-1,308.57	11,132.42	-32,312.40	104,267.88
Processed Food	729.61	-76.39	-3,868.96	-931.56	4,359.75	848.50	-2,923.82	-3,474.95
Textiles and Clothing	4,214.67	26,881.84	-3,968.28	-69.58	2,371.62	-1,024.97	-13,947.80	-19,165.57
Light Manufacture	-364.13	2,950.70	-1,813.88	-330.19	1,083.67	-556.64	-3,162.29	-2,244.25
Oil and Petroleum	3,669.61	-280.64	-2,885.67	2,029.48	-2,229.55	-1,366.17	3,678.07	-7,276.02
Chemical	-2,376.49	-2,545.41	2,827.74	2,281.01	3,628.46	-2,620.08	-897.37	-11,321.57
Steel	-6,924.99	7,663.43	4,201.25	-559.35	-5,740.03	2,486.89	-5,005.19	-4,167.39
Mortar Veichle and Parts	-456.81	-3,603.39	13,472.93	5,053.96	-704.75	-2,561.63	-10,642.80	-4,524.58
Transport	-651.72	2,343.71	1,085.41	3,823.96	-2,015.48	-846.34	4,077.05	-8,782.08
Electronic products	-1,756.70	22,553.14	801.55	3,747.81	6,801.48	-2,030.46	-18,594.10	-13,697.91
Machinery and Manufacture	-1,943.14	17,819.15	17,009.42	3,322.80	-3,768.77	-4,434.47	-11,721.00	-25,332.07
Electricity and Gas	-36.00	40.64	-0.19	-0.14	-97.51	0.04	-280.87	374.03
Utilities and Construction	-14.26	264.39	-18.64	753.49	-148.80	-77.10	534.84	-1,293.93
Services	4,429.89	2,228.58	1,065.46	918.04	5,368.53	341.71	8,054.50	55,784.79
Total	-16,650.64	29,179.94	-1,819.47	2,033.75	6,242.31	2,372.07	-78,039.67	56,681.56

Note. Unit is USD Millions

Source: Author's calculations using simulation results

From the view of each sector-wise results, for India, labor intensive sectors such as agricultural goods and textiles have a positive balance; however, balance became negative in capital intensive sectors, namely the selected heavy manufacture goods on the simulation. On the other hand, the opposite results occurred in China, that are a positive balance for manufacture goods and a negative balance for primary industries. This pattern is applied to Japan and Korea as well though Japan's trade balance is negative in total. ASEAN countries gain the second largest positive trade balance in total due to the rise of light manufacture sectors while they lost in several primary and heavy manufacture goods. Australia and New Zealand follows the same patterns of India, improvement in prime sectors but deterioration in capital intensive sectors. The U.S. trade balance transformed as the largest negative one. While the rest of the world have a negative balance in manufacture goods, the positive trade balance is achieved in total.

CHAPTER FIVE

CONCLUSION

5.1 Major Findings

The present study tried to estimate the economic effects associated with India's trade liberalization with the RCEP members. The simulation focused on trade in heavy manufacture goods as one of the most sensitive goods for Indian economy. For the analysis purpose, the GTAP model estimated under the partial and full tariff liberalization compared to existing tariff rates provided by GTAP version 9 database with data of 2011 reference year. The results of the simulation were reported by various measurement variables such as change in country's

terms of trade, GDP, equivalent variation and balance of trade. The overall results show that India would gain maximum in terms of its GDP. However, India's welfare effect would be negative and that were also applied to the U.S and the rest of the world. The benefits of this trade liberalization have a positive welfare effects on the all other countries except India in RCEP framework. Moreover, sector-wise results shows that India's export will increase in case of agricultural goods, livestock and meat products, processed foods, textile and clothing, oil and petroleum and services. In contrast, India's export will decrease in the case of forestry, mining, light manufacture, chemical, steel, mortar vehicle and parts, transport, electronic products, machinery and manufacture, electricity and gas, utilities and construction. In summary, this paper demonstrated that India's trade liberalization in heavy manufacture goods would be losses for Indian economy although other RCEP members countries gain the benefits.

5.2 Limitation and Future area of this Research

The major limitations of this study are that the usage of data is uncomprehensive in the simulation, which are referenced in 2011 year. In GTAP-9, there is not reliable and individual data of Myanmar even though it is a one of a member country in ASEAN, and Myanmar is recently opening up the market and growing fast in Asia. Subsequently, as a structural problem on the data in GTAP, the tariff is not placed on products in Electricity and Gas, and Utility and Construction. Thus, the reliability of calculated results is not completely applied in the real-world economy. For further improvement, the dynamic GTAP model (Ianchovichina & Walmsley, 2012) can answer the impact of policy change in a long-run and estimated the time for nations to eliminates all tariffs in each other. The updated data or GTAP dynamic model would allow an empirical research to estimate the impact more precisely under

the proposed scenarios. In addition, the method fails to detailed approach for service sectors. For India, the percentage of service sectors in total export account for approximately 35 percent, the higher than the average of 22 percent in the world. In Indian's service industry, growing IT-enable service and Business Process Outsourcings (ITES-BPO) are a unique phenomenon. For example, developing countries outsource business functions of call center or accounting processing to India. Obviously, IT and software are the main players in services and that industries are expected grow rapidly in the future. Therefore, more studies reflecting that India's large service sectors are recommended to discuss for economic impacts associated with India's entry into RCEP.

APPENDICES

Table1. Country and regional aggregations

No.	Region	Country in GTAP database
1	India	India
2	China	China
3	Japan	Japan
4	Korea	Korea
5	ASEAN	Brunei Darassalam, Cambodia, Indonesia, Lao People's Democratic Republ, Malaysia, Philippines, Singapore, Thailand, Viet Nam
6	Australia and New Zealand	Australia, New Zealand
7	United States of America	United States of America
8	Rest of the World	Rest of Oceania, Hong Kong, Mongolia, Taiwan, Rest of East Asia, Rest of Southeast Asia, Bangladesh, Nepal, Pakistan, Sri Lanka, Rest of South Asia, CanadaMexico, Rest of North 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, Dominican Republic, Jamaica, Puerto Rico,Trinidad and Tobago, Caribbean, Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, United Kingdom, Switzerland, Norway, Rest of EFTA, Albania, Bulgaria, Belarus, Croatia, Romania, Russian Federation, Ukraine, Rest of Eastern Europe, Rest of Europe, Kazakhstan, Kyrgyztan, Rest of Former Soviet Union, Armenia, Azerbaijan, Georgia, Bahrain, Iran Islamic Republic of Israel, Jordhan, Kuwait, Oman, Qatar, Saudi Arabia, Turkey, United Arab Emirates, Rest of Western Asia, Egypt, Morocco, Tunisia, Rest of North 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, Rest of the World

Source: Author using GTAP database

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