Chapter 2
Regional Comprehensive Economic Partnership (RCEP): Impact on the Integration of Textile and Apparel Supply Chain in the Asia-Pacific Region

Sheng Lu

1 Introduction

The Regional Comprehensive Economic Partnership (RCEP) is an ambitious free trade agreement (FTA) currently under negotiation between ten member states of the Association of Southeast Asian Nations (ASEAN) and other six large economies in the Asia-Pacific region (i.e., Australia, China, India, Japan, South Korea, and New Zealand) (Lee 2016). The RCEP is one of the most significant mega-FTAs in the world, both economically and politically. In 2015, the group of 16 RCEP members, which comprised more than 3 billion people, had a combined Gross Domestic Product (GDP) of about US$22.7 trillion and accounted for nearly 30% of the world trade volume (ASEAN 2015; WTO 2017). As a modern FTA, the RCEP deals with not only traditional trade policies such as tariff barriers but also some twenty-first century trade agendas, such as e-commerce, competition policy, and trade facilitation, that most existing FTAs in the region have never addressed (Lewis 2013; Wilson 2015). Regarded as China's strategic move in response to the pivot to Asia strategy proposed by the USA, the RCEP also has profound geopolitical implications for the future peace, prosperity, and development of the Asia-Pacific region (Rahman and Ara 2015; Kim 2016).

Textile and apparel (T&A) is a critical sector under the RCEP negotiation. In 2015, the sixteen RCEP members altogether exported US$405 billion worth of T&A (54% of the world share) and imported US$115 billion (31% of the world share) (WTO 2017). Notably, many of these T&A products are made through a collaborative supply chain in the Asia-Pacific region. For example, a clothing labeled "Made in Vietnam" often contains fabrics made in China from yarns spun in Japan (Lopez-Acevedo and Robertson 2016). Because the RCEP intends to eliminate existing trade barriers between its members substantially, implementation of the agreement has the potential

S. Lu (✉)
Department of Fashion and Apparel Studies, University of Delaware, Delaware, USA
e-mail: shenglu@udel.edu

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to facilitate the integration of regional T&A supply chain further and significantly shift the current pattern of T&A trade in the Asia-Pacific region.

This study intends to quantitatively evaluate how the implementation of the RCEP will affect the integration of T&A supply chain in the Asia-Pacific region. While some studies have started to assess the macroeconomic impact of the RCEP, how might the agreement affect the T&A sector has been studied little (Lewis 2013; Rahman and Ara 2015). For the academia, findings of this study will make a significant contribution to our understanding of the T&A sectoral impact of the RCEP. Results of the study will also address the concerns of the T&A business community regarding the new market environment and the possible scenarios after the implementation of the RCEP. Moreover, for policymakers, findings of the study will provide valuable inputs that could support the T&A sectoral negotiation under the RCEP as well as related trade policy making in response to the implementation of the agreement.

The paper is composed of four parts. The second part provides an overview of related theories and literature that suggest the impact of the RCEP from a theoretical perspective. The third part is a detailed description of the research methods and data source of this study. The fourth part presents empirical results and discussion of them. Moreover, the last part includes key findings and the discussion of future research agendas.

2 Literature Review

To holistically evaluate how the RCEP might affect the integration of T&A supply chain in the Asia-Pacific region, we need to examine the following three questions critically: first, what is the development stage of RCEP members' T&A industry? Second, what is the pattern of T&A trade and supply chain that includes RCEP members? Third, how will the RCEP change "rules of the game" and consequentially affect related T&A trade flows and supply chains in the Asia-Pacific region. The following sections will address each question respectively.

2.1 The Development Stage of RCEP Members' Textile and Apparel Industry

While T&A is often treated as one single industry, textile manufacturing and apparel manufacturing are heterogeneous in nature (Dickerson 1999). In general, textile manufacturing, which mainly involves the spinning, weaving, and fabric finishing processes, is primarily based on sophisticated machinery for production. In comparison, apparel manufacturing, which includes the cloth cutting and sewing operations, primarily relies on labor inputs (Dickerson 1999). Even today in the twenty-first

century, manufacturing of apparel is still highly labor intensive and has a relatively low requirement for technology and capital (Lu and Dickerson 2012).

Because of the heterogeneous nature of T&A production regarding capital and labor intensity, the stage of development theory proposed by Toyne et al. (1984) argues that T&A industry in a country generally will go through six development stages. As shown in Table 1, each development stage can be observed with distinct production structure and trade patterns (Jin et al. 2013). Specifically, from the process moving from the stage of embryonic to the stage of significant decline, textile products will gradually account for an increasing share of a country's total T&A industry output while the share of apparel products will fall. The evolution process of a country's T&A industry is also in parallel with that country's overall economic advancement level. While many developing countries are capable of producing apparel, they are unable to produce textiles, especially made-made fiber products, until their national economies reach a certain advancement level with sufficient cumulation of capital and technology (Toyne et al. 1984).

Empirical studies show that the state of RCEP members' T&A industry, in general, follows the pattern suggested by the stage of development theory. For example,

Table 1 Development stage of RCEP members' textile and apparel industry

Development state	T&A output structure	Pattern of trade	Typical RCEP members
Embryonic	Natural fiber raw material	Net importer of textiles; Net exporter of apparel	Some ASEAN members such as Myanmar
Early export of apparel	Natural fiber apparel articles		
More advanced production of fabric and apparel	Natural fiber apparel and fabrics; beginning stage of producing manufactured fibers		Some ASEAN members such as Vietnam
Golden age	Sophisticated apparel articles; increased share of textiles in total industry output		China, India
Full maturity	Textiles exceed apparel in total industry output, mostly are manufactured fiber products	Net exporter of textiles; Net importer of apparel	South Korea
Significant decline	Most industry outputs are manufactured fiber textiles		Japan, New Zealand, Australia

References Compiled based on Toyne et al. (1984), Dickerson (1999), Jin et al. (2013) and Lopez-Acevedo and Robertson (2012)

based on a comprehensive review of official government statistics, Lopez-Acevedo and Robertson (2012), Fukunishi and Yamagata (2014), and Lopez-Acevedo and Robertson (2016) found that the T&A industry in many developing members of the RCEP was still at the early stages of development. Specifically, restrained by the availability of capital and technology skills, developing countries such as Cambodia, Vietnam, and Myanmar mostly undertook labor-intensive and low-skill level functions like fabric cutting, garment sewing, and packing. Related, because of the nascent stage of development, apparel production in these three countries also had a high concentration on limited categories of products that only require simple to moderate skill sets, such as men's and boys' shirts, trousers, and skirts (WTO 2017). Meanwhile, these developing countries relied heavily on imports for textile inputs, such as yarns, threads, and fabrics due to the lack of local manufacturing capability (Lopez-Acevedo and Robertson 2012).

In comparison, the T&A industry in the developed RCEP members, such as Japan and South Korea, has mostly reached the development stage of "full maturity" or "significant decline" (Dickerson 1999). On the one hand, these developed countries are the world's most competitive textile producers and exporters today (WTO 2017). The advantages of Japan and South Korea's textile production, for example, are especially visible for high-tech and capital-intensive categories, such as synthetic fibers, functional fabrics, and industrial textiles (Japan Textile Federation 2017; Textile Outlook International 2017). However, because of the high labor cost, both Japan and South Korea have substantially move apparel manufacturing overseas in the past decades and rely on imports to meet the domestic demand for apparel consumption (Dickerson 1999; Rasiah and Ofreneo 2009).

2.2 Regional T&A Supply Chain in the Asia-Pacific

The regional supply chain or regional production and trade network refers to a vertical industry collaboration system between countries that are geographically close to each other (Ando and Kimura 2005; Dicken 2015). Within a regional supply chain, each country specializes in certain portions of supply chain activities based on its respective comparative advantages so as to maximize the efficiency of the whole supply chain (Lu and Ha-Brookshire 2009).

The regional supply chain is a distinct pattern of T&A trade in the Asia-Pacific, particularly among RECP members located in East and Southeast Asia. As illustrated in Fig. 1, within this regional T&A supply chain, more economically advanced Asian countries (such as Japan, South Korea, and China) supply textile raw material to the less economically developed countries in the region (such as Myanmar, Cambodia, and Vietnam) (Dicken 2015; Lopez-Acevedo and Robertson 2016). Based on relatively lower wages, the less-developed countries typically undertake the most labor-intensive processes of apparel manufacturing and then export finished apparel to major consumption markets around the world. Meanwhile, because of the particular stage of development (see Table 1) and size of the country, mega emerging

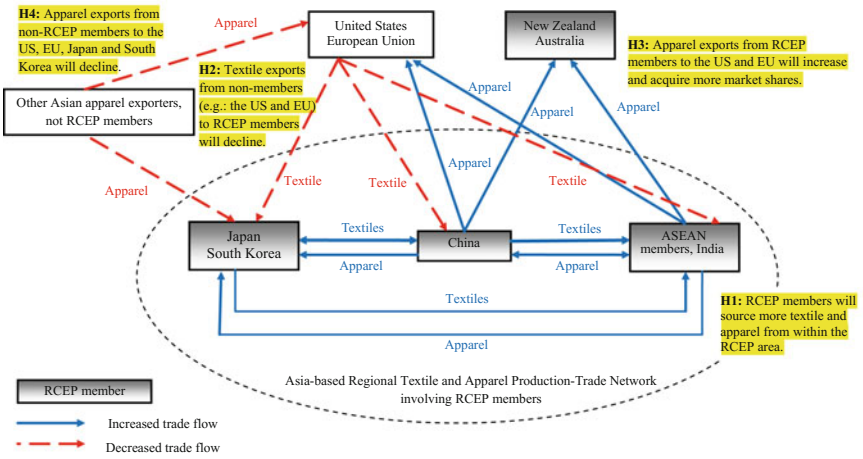

Fig. 1 Potential impact of the RCEP on the textile and apparel supply chain in the Asia-Pacific

economies in the region such as China may produce some T&A products primarily based on its domestic supply chain (Zhu and Pickles 2014). Nevertheless, as a developing country, China still had to import US$2.3 billion and US$1.8 billion worth of textiles from Japan and South Korea, respectively, in 2015 for some high-quality or technologically-advanced products it could not produce (Textile Outlook International 2017; WTO 2017).

Related trade flows also indicate the existence of this unique regional T&A supply chain among RCEP members. As shown in Tables 2 and 3, most East and Southeast Asian RCEP members import a substantial share of textiles and apparel from other RCEP members rather than trading with countries outside the region. For example, as much as 80.3% of textiles imported by ASEAN members, 39.9% in China, 75.2% in India, 86.5% in Japan, and 77.7% in South Korea came from other RCEP members in 2015 measured by value (GTAP 2016; WTO 2017). Similarly, as much as 81.0% of ASEAN members' apparel imports, 40.6% in India, 88.5% in Japan, and 78.3% in South Korea also came from RCEP members in 2015 measured by value (GTAP 2016; WTO 2017). Moreover, 65.4 and 53.1% of textile exports from Japan and South Korea went to other RCEP members in 2015, respectively. Meanwhile, apparel made by RCEP members are both consumed within the region and exported to other key consumption markets in the world, particularly the USA and the European Union (EU).

Several factors may have contributed to the formation of the regional T&A supply chain among RCEP members. First, East and Southeast Asian countries have a long history of forming a regional division of labor in manufacturing through a so-called flying geese model (Kojima 2000; Goto 2017). Specifically, based on the hierarchy of economic development in the region, more advanced economies undertake relatively more capital and technology-intensive production process whereas

Table 2 Source of RCEP members' textile and apparel imports in 2015 (by value) Unit: %

Exporters/Importers	ASEAN	Australia	China	India	Japan	South Korea	New Zealand
Textile							
ASEAN	11.0	6.0	7.5	8.1	11.5	17.6	4.9
Australia	/	/	0.2	1.1	0.2	0.7	12.6
China	46.5	53.2	/	58.9	70.3	49.7	43.7
India	2.2	5.6	3.1	/	1.3	4.4	4.4
Japan	5.9	0.8	16.8	3.0	/	5.2	0.5
South Korea	14.2	2.6	11.7	3.2	3.1	/	3.1
New Zealand	0.1	5.3	0.5	1.0	0.1	<0.1	/
RCEP total	80.3	73.5	39.9	75.2	86.5	77.7	69.2
Apparel							
ASEAN	11.2	5.5	5.3	5.3	9.2	19.3	4.4
Australia	0.2	/	0.3	0.2	<0.1	0.1	11.4
China	60.6	70.8	/	33.9	77.2	57.4	65.1
India	2.3	2.9	1.5	/	1.0	0.4	2.2
Japan	1.6	0.1	1.9	0.3	/	1.0	0.1
South Korea	4.9	0.3	4.5	0.7	1.1	/	0.2
New Zealand	0.2	1.2	<0.1	0.3	<0.1	<0.1	/
RCEP total	81.0	80.7	13.5	40.6	88.5	78.3	83.3

Data source GTAP (2016), WTO (2017)
Note Rows are exporters and columns are importers; figures in the table = value of imports from a particular source/total value of imports

the less advanced economies engage in relatively more labor-intensive productions (Dickerson 1999). Further, when a more advanced economy shifts to more capital and technology-intensive industries (such as textile fiber production), it will relocate the production of labor-intensive products (such as apparel) to the less-developed economy in the region. The flying geese model explains how apparel manufacturing gradually moved from Japan to newly industrialized economies (like South Korea, Hong Kong, and Taiwan), to China and more recently to even less-developed ASEAN members (Kojima 2000; Dicken 2015). Second, investment and sourcing strategies of T&A multinationals have also contributed to the creation of the regional T&A supply chain in the Asia-Pacific. Gereffi (1999) and Lopez-Acevedo and Robertson (2012) found that many apparel factories in low-wage Asian countries were wholly-owned subsidiaries or joint ventures invested by Japanese, South Korean, and Chinese T&A firms. These T&A multinationals mostly dispatch production orders to their overseas subsidiaries and supply needed textile raw material in the format of intra-firm trade. Additionally, free trade agreements (FTAs) have further strengthened the regional T&A supply chain in the Asia-Pacific. By the end of September 2016, there were 168 FTAs in force between Asian countries (Solís and Wilson 2017). Through lowered

Table 3 Destination of RCEP members' textile and apparel exports in 2015 (by value) Unit: %

Exporters/Importers	ASEAN	Australia	China	India	Japan	South Korea	New Zealand	RCEP total	USA	EU
Textile										
ASEAN	12.7	0.9	6.6	1.7	7.7	4.9	0.2	34.7	21.9	15.4
Australia	14.0	/	7.9	8.8	4.8	7.3	14.2	57.0	6.9	12.3
China	10.7	1.6	/	2.5	9.4	2.8	0.3	27.4	15.1	17.3
India	3.2	1.1	3.4	/	1.1	1.6	0.2	10.6	19.3	25.7
Japan	18.6	0.4	40.7	1.8	/	4.0	0.0	65.4	6.6	9.3
South Korea	29.1	0.7	18.2	1.2	3.7	/	0.2	53.1	8.0	8.5
New Zealand	3.5	29.7	17.2	7.6	2.0	0.4	/	60.4	5.4	21.9
Apparel										
ASEAN	2.3	0.7	1.1	0.1	6.7	3.6	0.1	14.6	52.1	21.9
Australia	4.1	/	6.0	0.3	1.1	2.8	25.6	39.9	7.9	15.5
China	2.8	2.2	/	0.1	12.8	2.4	0.3	20.6	20.9	29.4
India	1.1	0.9	0.6	/	1.6	0.2	0.1	4.5	23.2	48.4
Japan	16.4	0.5	19.1	0.2	/	9.2	0.1	45.5	6.5	13.1
South Korea	21.6	0.9	19.0	0.2	16.8	/	0.1	58.7	11.5	12.8
New Zealand	12.1	46.5	1.7	1.3	3.1	0.8	/	65.6	5.2	11.3

Data source GTAP (2016), WTO (2017)

Note Rows are exporters and columns are importers; figures in the table = value of imports from a particular source/total value of imports; EU refers to 28 members of the European Union

tariff and non-tariff barriers, these FTAs significantly decreased the cost of trade between related countries and facilitated the integration of T&A supply chain in the region, (Lewis 2013; Kawasaki 2015).

2.3 *Potential Impact of the RCEP on the T&A Supply Chain in the Asia-Pacific*

Based on the computable general equilibrium (CGE) models, some studies have quantitatively evaluated the potential economic impact of the RCEP. Consistent with the prediction of standard trade theories, most of these studies suggest that the implementation of the RCEP will benefit the overall economic welfare of its members and promote the economic integration in the Asia-Pacific region (Cheong and Tongzon 2013; Itakura 2014; Rahman and Ara 2015). However, because of different research design and source of data, researchers could not reach a consensus about the potential winners and losers of the agreement. For example, Itakura (2014), Cheong and Tongzon (2013), and Kawasaki (2015) contended that the substantial trade diversion effect of the RCEP would affect exports from the non-RCEP countries in the Asia-Pacific region negatively and make them big losers of the agreement. However, Mikic and Jetin (2016) estimated that the potential trade diversion effect of the RCEP on Asian countries that are not members of the agreement would be minimal because of the highly integrated regional supply chain already formed and other regional trade agreements currently in force. Some other studies suggest that winners and losers of the RCEP could vary from sector to sector. For example, Thuy Anh and Minh Ngoc (2016) found that among all industries in Vietnam, its agriculture exports would benefit mostly from the trade creation effect of the RCEP. In comparison, Yuh et al. (2015) argued that the RCEP could make ASEAN T&A producers more vulnerable to the increasing imports from China after losing the tariff protection.

Despite the fruitful research outcomes, very few studies have empirically investigated the T&A-specific economic impact of the RCEP. However, most existing studies agree that the implementation of a mega free trade agreement like the RCEP would affect trade patterns of related countries as well as economic integration in the region to a great extent (Cheong and Tongzon 2013; Das 2013). Specifically, as shown in Table 4, T&A imports currently are subject to a relatively high tariff rate in most RCEP members, with the applied simple average tariff rate in 2015 up to 12.0% for textiles and as high as 29.6% for apparel. While the RCEP intends to eliminate the import tariff (i.e., the rates listed in Table 4) for T&A products traded between RCEP members, the tariff will remain unchanged for T&A products traded between RCEP members and countries that are not members of the agreement (ASEAN 2015). Because T&A products are with a relatively high price elasticity of substitution (Dickerson 1999), the proposed tariff cut under the RCEP would directly affect the cost competitiveness of T&A products from a particular source and result

Table 4 Applied simple average tariff rate of RCEP members in 2015 Unit: %

	Textile	Apparel
Brunei[a]	0.82	0.00
Cambodia[a]	5.36	14.14
Indonesia[a]	9.24	14.40
Lao[a]	8.84	9.98
Malaysia[a]	8.82	0.20
Myanmar[a]	8.31	16.88
Philippines[a]	9.08	14.84
Singapore[a]	0.00	0.00
Thailand[a]	8.66	29.56
Vietnam[a]	9.59	19.81
Australia	4.31	8.84
New Zealand	1.88	9.68
China	9.52	15.99
India	12.03	12.54
Japan	5.39	9.02
South Korea	9.03	12.47

Data source WTO (2016)
[a]ASEAN members

in several critical changes to the existing trade patterns and T&A supply chains in the region (Fig. 1).

First, as the tariff on T&A traded between members of the RCEP falls, some domestic T&A production in an RCEP member would be replaced by more efficient products from other RCEP partners, resulting in expanded T&A trade flows between RCEP members or the so-called trade creation effect (Baldwin and Wyplosz 2006). The lowered cost of trade could encourage RCEP members to use more textile inputs locally made in the RCEP area and strengthen the existing regional T&A supply chain. With that, this study proposes that:

H1: RCEP members will source more textile and apparel from within the RCEP area after the implementation of the agreement.

Second, since the RCEP discriminates against non-members of the agreement, T&A imports from RCEP partners would replace products from outside producers, resulting in declined T&A trade flows between RCEP members and their non-RCEP trading partners or the so-called trade diversion effect (Fukao et al. 2003). RCEP's trade diversion effect could particularly affect US and EU textile producers, which are the primary source of textile inputs from outside the Asia region for RCEP members (WTO 2017). With that, this study proposes:

H2: Textile exports from non-RCEP members (e.g., the USA and the EU) to RCEP members will decline after the implementation of the agreement.

Further, based on a more integrated and efficient T&A supply chain facilitated by RCEP's trade creation effect, apparel exports from RCEP members could demon-

strate even more cost competitiveness and acquire more market shares in leading apparel import markets such as the USA, EU, Japan, and South Korea (Dicken 2015). In comparison, other apparel suppliers for these markets but are not members of the RCEP, such as Bangladesh, could see a decline of their exports because of the intensified competition. With that, this study proposes that:

H3: Apparel exports from RCEP members to the USA and EU would increase and acquire more market shares after the implementation of the RCEP.

H4: Apparel exports from non-RCEP members to the USA, the EU, Japan, and South Korea would decline and lose market shares to RCEP members after the implementation of the RCEP.

3 Methods and Data

3.1 Measuring the Economic Impact of the RCEP

The computable general equilibrium (CGE) model developed by the Global Trade Analysis Project (GTAP) was adopted in this study to evaluate the potential impact of the RCEP. The GTAP CGE model is one of the most popular analysis tools for assessing the economic effects of free trade agreements (Dixon and Jorgenson 2012). Compared with a single-equation econometric model or the partial equilibrium analysis method, the CGE model has the advantage of capturing the input–output relationship between the T&A industry and other sectors in the setting of an open global economy and thus improve the robustness of the estimation (Adams 2005). Many quantitative studies that assess the macroeconomic impact of the RCEP also adopted the CGE method (such as Cheong and Tongzon 2013; Itakura 2014; Rahman and Ara 2015).

Specifically, the GTAP CGE model assumes that in a perfectly competitive market, the production follows the principle of constant returns of scale (Hertel and Hertel 1997). The model establishes a multi-country and multi-sector framework of production, trade, and consumption by using a series of behavioral equations and parameters. The values of the endogenous variables are determined when both the product and factor markets across all sectors in all countries covered by the model reach their equilibrium status (i.e., the status of market clearance) based on the aggregate demand and supply (Burfisher 2016).

To provide a linearized representation of equations, behavioral components of the GTAP CGE model are expressed as a percentage change (Hertel and Hertel 1997). Regarding trade flows, on the supply side, the value of industry output of product i in country r[qo(i, r)] can be expressed as:

$$\mathrm{qo}(i,r) = \mathrm{SHRDM}(i,r) \times \mathrm{qds}(i,r) + \sum_{k \in r} \mathrm{SHRXMD}(i,k,s) \times \mathrm{qxs}(i,k,s) \quad (1)$$

where SHRDM(i, r) denotes the share of domestic sales of product i in country r; qds(i, r) denotes the value of domestic sale of product i produced in country r; SHRXMD(i, k, s) denotes the proportion of export sale of product i supplied by country k to region s and there are r number of regions in total; qxs(i, k, s) denotes the value of export sale of product i provided by country k to region$s$; r refers to the set of regions.

On the demand side, we can express the import demand for product i supplied by country r to region s as:

$$\text{qxs}(i, r, s) = \text{qim}(i, s) - \sigma_M(i) \times [\text{pms}(i, r, s) - \text{ams}(i, r, s) - \text{pim}(i, s)] \quad (2)$$

where in Eq. 2, qxs(i, r, s)denotes the import value of product i supplied by country r to region s; qim(i, s) denotes the value of aggregate import demand for product i in region s; ams(i, r, s) denotes the external price reduction factor for product i supplied by country r to region s; pim(i, s) denotes the composite price of imports for product i in region s;

$$\text{pim}(i, s) = \sum_{k \in r} \text{MSHRS}(i, k, s) \times \text{pms}(i, k, s) \quad (3)$$

Moreover, as expressed in Eq. 3, pim(i, s) in Eq. 2 mathematically equals the weighted average price of imports from all import sources for product i. MSHRS(i, k, s) denotes the share of product i supplied by country k to region s, and pms(i, k, s) denotes the import price of product i supplied by country k to region s. r refers to the set of region s. $\sigma_M(i)$ denotes the elasticity of substitution between imports and domestically made commodity for product i in region s. The value of $\sigma_M(i)$ is usually positive, suggesting a competing relationship between imports and the domestically made commodity in an importing country (Burfisher 2016).

$$\text{pms}(i, r, s) = \text{tms}(i, r, s) + \text{pcif}(i, r, s) \quad (4)$$

Additionally, as illustrated in Eq. 4, pms(i, r, s) in Eq. 3 is affected by the tariff rate applied to product i supplied by country r to region s[tms(i, r, s)] and the cost, insurance, and freight (CIF) price of product i supplied by country r in region s[pcif(i, r, s)].

When using the CGE model to assess the economic impact of a policy shock (such as the elimination of tariff) under the framework of a multi-country and multi-sector open economy, the exogenous variable representing the policy shock [such as tms(i, r, s)] will be assigned a corresponding new value. Specifically, to quantify RCEP's tariff elimination effect, we followed the practices of similar studies (such as Narayanan and Sharma 2016; Burfisher 2016) and reduced the tariff on T&A traded between RCEP members from their current rates (as shown in Table 4) to zero for the exogenous variable tms(i, r, s) in Eq. 4. The CGE model then calculated the new equilibrium status for the product and factor markets by solving Eqs. 1–4 simultaneously. The economic impact of the policy shock is reflected by the value

change of the endogenous variables pms(i, r, s), qxs(i, r, s), qo(i, r), qds(i, r), and pim (i, s) at their initial and the new equilibrium status (Hertel and Hertel 1997; Dixon and Jorgenson 2012).

3.2 Data Source

We used data from the latest GTAP9 database to run the CGE model in this study (Aguiar et al. 2016; GTAP 2016). To assess the T&A-specific sectoral impact of the RCEP, we categorized the 57 industry sectors included in the GTAP9 database into three groups: *Textile* (International Standard Industry Classification System, ISIC code 17 and code 243), *Apparel* (ISIC code 18), and *Others* (including all other 55 sectors). We further categorized the 140 countries included in the GTAP9 database into twelve groups: *ASEAN, Australia, China, India, Japan, South Korea, New Zealand, USA*, *EU* (refers to 28 members of the European Union), *Bangladesh*, *Rest of Asia* (refers to Asian countries other than RCEP members and Bangladesh), and *ROW* (refers to rest of the world). The categorization allowed us to compare winners and losers of the RCEP at the country level, including both RCEP members and other critical stakeholders that are not members of the trade agreement (Das 2013).

4 Results and Discussions

First, results of the CGE model estimation support *H1* that the implementation of the RCEP would significantly encourage its members to source more textile and apparel from within the RCEP area. Regarding textiles, RCEP members, particularly those located in East or Southeast Asia, will increasingly use more regional textile inputs because of RCEP's tariff elimination effect. Specifically, as shown in Table 5, when other factors remain constant, the implementation of the RCEP will result in an increase in the value of ASEAN's annual textile imports from the RCEP area by US$4905 million compared with the base-year level in 2015. The increase will be US$5235.7 million in China, US$2729.9 million in India, US$2163.5 million in Japan, and US$1805.8 million in South Korea. Understandably, Japanese, South Korean, and Chinese textile suppliers will be among the biggest winners of the RCEP and enjoy a notable increase in their exports to other developing RCEP partners that have no capacity for making textiles, such as ASEAN countries (Lopez-Acevedo and Robertson 2012) (Table 6). Further, as shown in Table 7, RCEP members will raise the proportion of their textile imports from the RCEP area by 8.1 percentage points on average, after the implementation of the trade agreement.

Similarly, RCEP members would also place more apparel sourcing orders from within the RCEP area because of the trade creation effect of the agreement (Lewis 2013). As shown in Table 6, when other factors remain constant, the implementation

Table 5 Impacts of the RCEP: volume change of textile imports (base year = 2015) Unit: $million

Exporters/Importers	ASEAN	Australia	China	India	Japan	South Korea	New Zealand
RCEP total	$4095.5	$554.6	$5,235.7	$2729.9	$2163.5	$1805.8	$95.0
ASEAN	−$186.0	−$18.5	−$7.8	$251.8	−$394.2	$251.1	$6.2
Australia	−$6.1	/	$149.3	$1.1	−$8.5	−$8.3	−$21.7
China	$2625.9	$589.6	/	$2226.3	$2494.2	$1279.8	$109.3
India	$120.3	$30.9	$187.3	/	−$57.0	$105.4	<$0.1
Japan	$521.2	−$6.8	$2924.6	$95.8	/	$177.9	$0.3
South Korea	$1016.7	$11.8	$1994.4	$157.2	$131.7	/	$0.9
New Zealand	$3.5	−$52.4	−$12.1	−$2.3	−$2.7	−$0.1	/
Non-RCEP total	−$1533.9	−$265.8	−$1611.2	−$490.6	−$600.5	−$418.9	−$55.8
USA	−$112.3	−$46.0	−$142.8	−$48.5	−$89.5	−$84.1	−$11.3
EU(28)	−$246.4	−$93.7	−$261.3	−$154.3	−$229.4	−$148.9	−$17.7
ROW	−$1175.2	−$126.1	−$1207.1	−$287.8	−$281.6	−$185.9	−$26.8

Note Rows are exporters and columns are importers

Table 6 Impacts of the RCEP: volume change of apparel imports (base year = 2015) Unit: $million

Exporters/Importers	ASEAN	Australia	China	India	Japan	South Korea	New Zealand	USA	EU
RCEP total	$1714.4	$764.2	$729.7	$183.5	$3453.5	$1402.3	$134.3	$1267.8	$837.5
ASEAN	−$84.7	$19.0	$18.0	$29.4	−$551.1	$366.2	$11.2	$1443.1	$741.3
Australia	−$1.0	/	$28.1	$0.8	−$0.9	$5.8	−$29.1	$0.7	$2.0
China	$1381.8	$738.6	/	$147.2	$3987.6	$982.5	$146.8	−$209.5	−$56.9
India	$15.3	$23.4	$101.4	/	−$69.1	$7.3	$4.7	$18.8	$126.9
Japan	$49.2	−$0.8	$200.7	$1.6	/	$39.9	$0.2	$2.6	$6.1
South Korea	$357.5	−$0.6	$381.2	$3.5	$85.1	/	$0.5	$12.0	$17.7
New Zealand	−$3.7	−$15.4	$0.3	$1.0	$1.9	$0.6	/	$0.1	$0.4
Non-RCEP total	−$420.5	−$260.8	−$329.3	−$67.1	−$846.8	−$371.8	−$43.3	−$429.0	−$501.4
Bangladesh	−$12.5	−$46.7	−$3.6	−$8.3	−$74.3	−$25.1	−$6.1	−$24.5	−$14.5
Rest of Asia	−$81.5	−$29.2	−$235.7	−$9.8	−$163.9	−$94.4	−$3.1	−$89.3	−$390.5
ROW	−$326.5	−$184.9	−$90.0	−$49.0	−$608.6	−$252.3	−$34.1	−$315.2	−$96.4

Note Rows are exporters and columns are importers. EU refers to 28 members of the European Union

Table 7 Impacts of the RCEP: share of textile and apparel imports from RCEP members (by value) Unit: %

Scenario/Importers	ASEAN	Australia	China	India	Japan	South Korea	New Zealand		
Textile									
Base year = 2015	80.3	73.5	39.9	75.2	86.5	77.7	69.2		
After RCEP	85.9	80.5	52.4	87.9	90.2	85.2	76.3		
After RCEP versus base year	5.7	7.1	12.5	12.7	3.8	7.6	7.1		
Apparel									
Scenario/importers	ASEAN	Australia	China	India	Japan	South Korea	New Zealand	U.S.	EU
Base year = 2015	81.0	80.7	13.5	40.6	88.5	78.3	83.3	65.4	40.7
After RCEP	89.4	87.9	22.9	60.9	92.8	86.7	90.7	66.3	41.2
After RCEP versus base year	8.4	7.2	9.4	20.3	4.3	8.4	7.4	0.8	0.5

Note EU refers to 28 members of the European Union

of the RCEP will result in an increase in the value of Japan's annual apparel imports from the RCEP area by US$3453.5 million compared with the base-year level in 2015. The increase will be US$1714.4 million in ASEAN, US$1402.3 million in South Korea, US$764.2 million in Australia, US$729.7 million in China, US$1835 million in India, and US$134.3 million in New Zealand. Further, as shown in Table 7, RCEP members will raise the proportion of their apparel imports from the RCEP area by 9.3 percentage points on average as a result of the RCEP.

However, it does not seem apparel producers in all RCEP member countries will benefit from the agreement equally. For example, while China's annual apparel exports to Japan and ASEAN will increase by US$3987.6 million and US$1381.8 million, respectively, because of the RCEP, ASEAN members will suffer a decline in their apparel exports to Japan (down US$551.1 million) and other ASEAN partners (down US$84.7 million). The result echoes some previous studies that were worried about ASEAN apparel exporters being negatively affected by China's competition after the two regions form a free trade agreement (Yuh et al. 2015).

Second, results of the CGE model estimation support *H2* that textile exports from non-members to RCEP members will decline after the implementation of the agreement. As shown in Table 5, when other factors remain constant, implementation of the RCEP will result in a substantial fall in the value of ASEAN's annual textile imports from non-RCEP members by US$1533.9 million compared with the base-year level in 2015. The decrease will be US$1611.2 million in China, US$600.5 million in Japan, US$490.6 million in India, and US$418.9 million in South Korea. Moreover, results indicate that US and EU textile suppliers could be among the stakeholders most adversely affected by RCEP's trade diversion effect (Thuy Anh and Minh Ngoc 2016). For example, China's annual textile imports from the USA and the EU altogether will be US$404.1 million less than otherwise because of the RCEP (or 25% of China's total decline of textile imports from non-RCEP members). US and EU textile suppliers will face a similar drop in their exports to Japan (US$318.9 million less), ASEAN (US$358.7 million less), South Korea (US$233.0 million less), and India (US$202.8 million less) after the implementation of the trade agreement. Consequently, only around 6.5% of RCEP members' textile imports will come from the USA and the EU after the RCEP, down from 9.4% in 2015 measured by value (GTAP 2016; WTO 2017).

Third, results of the CGE model estimation support *H3* that apparel exports from RCEP members would benefit from a more integrated regional T&A supply chain facilitated by the RCEP and demonstrate more competitiveness in the world's leading apparel import markets, such as the USA and the EU (WTO 2017). Specifically, as shown in Table 6, when other factors remain constant, implementation of the RCEP will result in an increase in the value of annual US and EU apparel imports from RCEP members by US$1267.8 million and US$837.5 million, respectively, compared with the base-year level in 2015. Thanks to the RCEP, market shares of RCEP members will also jump from 65.4 to 66.3% in the USA and from 40.7 to 41.2% in the EU.

Among RCEP members, apparel exports from ASEAN countries to the USA and EU notably will enjoy the largest expansion. Related, compared to the base-year level in 2015, implementation of the RCEP will reduce the unit price of apparel

exports from ASEAN countries to the USA and EU by 1.15% on average, versus only 0.58% for other RCEP members [i.e., the value of pcif(i, r, s) in Eq. 4]. Not like those RCEP members at a more advanced stage of economic development such as China, apparel producers in ASEAN countries rely heavily on imported textile inputs (Zhu and Pickles 2014; Lopez-Acevedo and Robertson 2016). The results suggest that the RCEP will particularly help ASEAN countries more easily get access to needed textile inputs locally made by Asian-based RCEP suppliers such as China, South Korea, and Japan and consequently improve the overall cost competitiveness of ASEAN's apparel exports through a more efficient regional T&A supply chain (Goto 2017).

Additionally, results of the CGE model estimation support *H4* that apparel exports from non-RCEP members will somewhat suffer a decline and lose market shares to their RCEP competitors in the world's leading apparel import markets. As shown in Table 6, when other factors remain constant, implementation of the RCEP will result in a decrease in the value of annual US apparel imports from non-RCEP members by US$429.0 million compared with the base-year level in 2015. The decline will be US$501.4 million in the EU, US$846.8 million in Japan, and US$371.8 million in South Korea.

Not surprisingly, results suggest that Asian apparel suppliers in non-RCEP member countries would be negatively affected the most by the implementation of the agreement. For example, when other factors remain constant, implementation of the RCEP will result in a decrease in the total value of annual US apparel imports from Bangladesh and *Rest of Asia* by US$113.8 million (or market shares down 0.5 percentage points) compared with the base-year level in 2015. The decline will be US$405.0 million in the EU (or market shares down 0.1 percentage points), US$238.2 million in Japan (or market shares down 1.2 percentage points), and US$119.5 million in South Korea (or market shares down 3.0 percentage points). The results reflect the fact that apparel made by these Asian countries that are not members of the RCEP, such as Bangladesh and Sri Lanka, are mostly basic items with a high price elasticity of substitution (Dickerson 1999; Saxena 2014). Without additional support, apparel producers in these countries would be vulnerable to the intensified competition from RCEP members that make the similar products and target the same export markets.

5 Conclusions and Future Research Agenda

This study provides a quantitative evaluation of how the implementation of the RCEP will affect the integration of T&A supply chain in the Asia-Pacific region. By adopting the GTAP CGE model based on the GTAP9 database and focusing on the effect of tariff elimination, key findings of the study include:

First, the trade creation effect of the RCEP will significantly encourage its members to source more textile and apparel from within the RCEP area and form an ever more integrated regional T&A supply chain. Second, the trade diversion effect of the RCEP will affect textile exports from non-RCEP members, particularly the

USA and the EU, to RCEP members negatively. Third, apparel exports from RCEP members would benefit from a more integrated regional T&A supply chain facilitated by the RCEP and demonstrate more competitiveness in the world's leading apparel import markets, including the USA and the EU. Meanwhile, apparel exports from non-RCEP member countries to these markets would suffer a decline and lose market shares because of the intensified competition from RCEP members.

Findings of this study augment our understanding of the T&A-specific sectoral impact of the RCEP and shed light on the new market environment after the implementation of the agreement. For policymakers, findings of this study also provide valuable inputs that could support the T&A sectoral negotiation under the RCEP and related policy making in response to the implementation of the agreement. The findings have two additional important implications:

First, results of the study confirm that the RCEP will lead to a more integrated T&A supply chain among its members. When other factors remain constant, after the implementation of the agreement, as much as 78.5% of RCEP members' textile imports measured by value will come from within the RCEP area, up from 70.0% in 2015 (GTAP 2016). The RCEP will particularly strengthen the role of Japan, South Korea, and China as the primary textile suppliers in the regional T&A supply chain that involves RCEP members. Measured by value, approximately 65.8% of textiles imported by RCEP members will come from these three countries, up from 56.4% in 2015 (GTAP 2016). The RCEP will also enlarge the role of ASEAN, India, and China as the leading apparel producers in the regional T&A supply chain. Measured by value, approximately 68.1% of apparel imported by RCEP members will come from these three members, up from 61.0% in 2015 (WTO 2017). Considering the positive impacts of expanded investment and other trade facilitation provisions of the agreement, we can expect a further integration of the regional T&A supply chain among RCEP members in the long-term (Lee 2016; Kim 2016).

Second, findings of the study suggest that as a trading bloc, the RCEP will make it even harder for non-RCEP members to get involved in the regional T&A supply chain in the Asia-Pacific. Because an entire regional T&A supply chain already exists in the Asia-Pacific, plus the factor of speed to market, few incentives are out there for RCEP members to partner with suppliers from outside the region in T&A production (Ando and Kimura 2005). The discriminatory tariff elimination under the RCEP will put T&A producers that are not members of the agreement at a greater disadvantage in the competition (Baldwin and Wyplosz 2006). Not surprisingly, measured by value, only around 21.5% of RCEP members' textile imports will come from outside the area after the implementation of the agreement, down from the base-year level of 29.9% in 2015. Likewise, the RCEP will make its members source less apparel from outside the region, with the proportion of imports down from the base-year level of 25.1% in 2015 to approximately 17.4% measured by value (GTAP 2016; WTO 2017).

Despite the meaningful results, this study also has several limitations that future research might overcome. First, although this study applies the latest GTAP9 database to assess the impact of the RCEP, the fast-changing economic landscape in the RCEP area could affect the accuracy of some parameters used in the GTAP model, such as

the elasticity of substitution. Future studies might update values of these parameters based on more recent data available from other sources or adopt a dynamic GTAP model to include data of multiple years in the analysis. Second, assessment of the impact of the RCEP is limited to trade patterns in this study. Given the labor-intensive nature of the apparel sector, future studies can continue to investigate the employment impact of the RCEP, particularly in those developing Asian countries that are not members of the agreement, such as Bangladesh and Sri Lanka. Third, several new free trade agreements that involve RCEP members might take effect in the coming years, such as the EU-Vietnam free trade agreement (EVFTA) and the updated version of the Trans-Pacific Partnership that excludes the USA (TPP11) (William and Fergusson 2017). It could be interesting to investigate further how EVFTA, TPP11, and RCEP jointly might affect the current pattern of T&A trade and regional T&A supply chain collaboration on a broader global scale.

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