Global Trade Analysis Project
https://www.gtap.agecon.purdue.edu/

This paper is from the
GTAP Annual Conference on Global Economic Analysis
https://www.gtap.agecon.purdue.edu/events/conferences/default.asp

Winner and Loser in Terms of the FTAs and the Trade War: Case Study of the Japanese Market.

Examination of the GTAP10 Database.

Onur BIYIK

2-chome-50-6 Arai, Nakano-ku, Tokyo-to, Japan, 165-0026
biyik-onur@fuji.waseda.jp

Graduate School of Asia-Pacific Studies

Waseda University

TABLE OF CONTENT

ABSTRACT

The US raised trade war issues under protecting national security against China in July 2018. Likewise, the trade war has spread out across other regions such as India, the EU, Canada, Mexico, Russia, and Turkey through an additional tariff on products such as steel and aluminum. Clearly, the uncertainty has shown an increase since this friction created a pessimistic environment for the future world economy and did hurt economic development. Therefore, it has had negative effects for welfare -especially those (low-income consumers) who prefer to buy cheap imported goods. Contrary to protectionism, Japan has signed new FTAs with the EU and the US. In that context, this paper quantitatively examines the Japanese new FTAs under the trade war. It employs the general equilibrium approaches in order to not only investigate the economic structure of each country trade flow but also address the FTAs and the impacts of the welfare and sectoral value chains of the trade war. Essentially, the paper scenarios depend on the official list of the FTAs and the trade war-related goods. As a result of the FTAs under the trade war, the new Japanese trade agreements have provided some opportunities for its market as well as targeted countries. For instance, the Japanese benefit from the EU-Japan FTA would be $4.11 billion U.S.D. and the EU would gain $768 million U.S.D. within the 15-year. Evidently, the US not only would get a huge advance but also could get back its export market share from Pacific island nations in Japan when Japan would eliminate the tariff on concerned sectors for the US goods. For example, the US and Japan would improve their welfare by $4.09 billion U.S.D. and $398 million U.S.D., respectively through the limited USA-Japan FTA. That is, the US market would comparatively earn much more than Japan. Lastly, those who participate in the FTAs would boost their GDP, welfare, and value-added (productivity). For example, not only would Japan provide some opportunities for its market and then enhance its welfare and GDP, but also the EU and the US would boost their macro variables. However, from the perspective of the other regions/countries, those regions/countries which are not in the trade deal could lose their export market share in Japan, the US, and the UE28 and would, therefore, have a negative impact on their GDP and welfare.

Keywords: FTAs, Trade War, Welfare, Value-Added, GDP, GCE

JEL No: C68 F13 F14 F15 F17 N74

FIGURES AND TABLES

ABBREVIATIONS AND ACRONYMS

FTAs	Free Trade Agreements
GVCs	Global Value Chains
EPAs	Economic Partnership Agreements
FDI	Foreign Direct Investment
GTAP	Global Trade Analysis Project
GCE	General Equilibrium Model
SAM	Social Accounting Matrices
TPP	Trans-Pacific Partnership
CPTPP	Comprehensive and Progressive Agreement for Trans-Pacific Partnership
ASEAN	Association of South-East Asian Nations
EUJEPA	European Union-Japan Economic Partnership Agreement
USJTA	U.S.-Japan Trade Agreement
ROOs	Rules of Origin's
SPA	Strategic Partnership Agreement
WIOD	World Input-Output Database
JPEPA	Japan-Philippines Economic Partnership Agreement
ROW	Rest of the World
WTO	World Trade Organization
US-CHFT	USA-China Friction Total
USATC	USA's Tariff Change for China
CTC	Chinese Tariff Change for the USA
OR	USA Tariff Change for the Six regions
EU-JFTA	Japan-EU FTA
J-EU	Japanese Tariff Elimination for the EU
EU-J	The EU's Tariff Elimination for Japan
USA-JFTA	Limited USA-Japan FTA
JapanE	Japan Tariff Elimination for USA's Import Goods
USAE	USA Tariff Elimination for Japan's Goods

1. INTRODUCTION

Akamatsu's model states that it is not possible to protect domestic goods entirely because of the flying geese pattern of development (Akamatsu, 1962) besides, global value chain (GVC) leads to economically integrate all countries and then boosts international trade among countries. Krugman et al. (1995) pointed out that global trade has increased faster and faster even when world output has been growing relatively slow than because of tariff reduction and trade liberalization, boundary issue, technological change, income convergence, and intermediate input trade (vertical specialization) (Feenstra, 1998)

Economic partnership agreements (EPAs) and foreign direct investment (FDI) have evidently boosted macro variables and sustainable development and reduced the poverty rate in Asia through international production networks (Aldaba, 2017). In the perspective of existing Southeast and East Asian studies, involving the multi/bilateral trade agreements has promoted their markets to not only become more productive (Choi & Hahn, 2013) and competitive (Aldaba, 2012), but also engage in innovation-enhancing activities due to learning-by-exporting (Hahn & Park, 2011; Nabeshima et al., 2018). Therefore, Asian countries have economically and strategically thrived vibrantly through free-trade agreements (FTAs) such as the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) and the Association of South-East Asian Nations (ASEAN).

As an example, Japan, which has taken to waving the free trade flag, joined the Trans-Pacific Partnership (turned CPTPP) agreement in February 2016, as well as signing an EPA with the European Union (EUJEPA) on July 2018. Moreover, the Trump administration has recently started negotiating a free trade agreement with Japan -called the limited US-Japan Trade Agreement (USJTA)- since April 15th, 2019 and finalized a limited bilateral trade agreement consisting of tariff cuts on agricultural and industrial goods and commitments on digital trade on September 25, 2019 (Osaki, 2019). It seems that the United States' trade strategy would set a bilateral trade agreement instead of multilateral agreements such as withdrawal from TPP12 because of the national security threat or power-based trading environment (Urata, 2019; Kuwayama, 2019).

On one hand, in terms of trade conflict due to trade deficit issues, the US raised trade friction issues under protecting national security against China in July 2018, calling trade war since then

(see Appendix). Likewise, the trade war has spread out other regions such as India, the EU, Canada, Mexico, Russia, and Turkey through an additional tariff on products such as steel and aluminum. The trade war has had many negative impacts on some countries' macro variables such as welfare through GVC (Ahir, 2019; IMFBlog, 2019), especially low-income consumers from both developing and developed countries who prefer to buy cheap import-related goods (Bellora & Fontagne, 2009; Amiti et al, 2019). Also, the trade war created a pessimistic environment for the future world economy and undermined the multilateral trade agreements under the World Trade Organization (WTO). Accordingly, trade uncertainty was expected to reach its highest point on record in 2019 (The Economist, 2019).

Obviously, scholars have pointed out that imposing tariffs between those countries has hurt the flow of international trade between those countries and a positive atmosphere in the world (Li et al., 2018), and especially low-income consumers who prefer to buy cheap import-related goods (Fajgelbaum et al., 2019). In that context, this study investigated the Japanese new FTAs (with the EU and the US) and analyzed these FTAs under the trade war by using the GTAP10 database. It employed the CGE model which is the most appropriate not only for investigating the economic structure of each country's trade flow but also addressing the FTAs and the impacts of the welfare and sectoral value chains of the trade war. Essentially, the scenarios rely on the official list of the FTAs and the trade war-related goods (see Appendix). In literature, we are not the first to separately examine the impact of the FTAs and the trade war, but the objective of this paper is to examine the new FTAs under the trade war in terms of the Japanese market in GTAP10 database for the first time. Accordingly, this paper aims to answer the questions; does the FTAs help to reduce the trade war negativity impact on the selected countries and other regions/countries in terms of welfare and GDP; Who is winner and loser, or Which tariff reductions under the FTAs gain the most benefits for which countries?

As a result of the FTAs under the trade war, the new Japanese trade agreements have provided some opportunities for its market as well as targeted countries. For instance, the Japanese benefit from EU-Japan FTA would be $4.11 billion U.S.D. and the EU would gain $768 million U.S.D. within the 15-year. Evidently, the USA not only would get a huge advance but also could get back its export market share from Pacific island nations in Japan when Japan would eliminate the tariffs on concerned sectors for the USA goods. For example, the U.S. and Japan would improve their

welfare by $4.09 billion U.S.D. and $398 million U.S.D., respectively through the limited USA-Japan FTA within the 15-year. Lastly, those who participate in the FTAs would boost their GDP, welfare, and value-added (productivity). For example, not only would Japan provide some opportunities for its market and then enhance its welfare and GDP, but also the EU and the US would boost their macro variables. However, from the perspective of the other regions/countries, those regions/countries which are not in the trade deal could lose their export market share in Japan, the US, and the UE28 and would, therefore, have a negative impact on their GDP and welfare.

This paper is organized as follows: after the introduction and literature review, the third section portrayed the framework of the GVC, the FTAs, and the trade war. The fourth section provided an explanation of the methodology and the data. The fifth section discussed and presented the empirical result of the GTAP database. The sixth section concludes the paper.

2. LITERATURE REVIEW

This section reviews recent literature with reference to the argument concerning Japanese international trade with the EU and the U.S. agreements under the trade war. Existing studies have widely investigated international trade analysis with GTAP database in which scholars have examined the trade-in value-added to analyze vertical specialization (VS) and decompose export-the measurement of VS, VS1, VS1*, VAX ratio, and double counting- (Hummels, Ishii, & Yi, 2001; Johnson & Noguera, 2012; Koopman, Wang, & Wei, 2014) and tariff and non-tariff liberalizations in a multinational and preferential free trade agreement (M/PFTAs) (Felbermayr et al, 2019; Anderson & Martin, 2005; Bekkers & Francois, 2018; Burfisher, 2016).

Obviously, economists theoretically and quantitatively documented that the trade liberalization leads to market share reallocations towards more productive firms, thereby increasing aggregate productivity, (Antràs & Yeaple, 2014; Melitz & Redding, 2014). Narjoko and Urata (2019) qualitatively investigated the benefit of the trade and investment liberalization and questioned how firms respond to globalization or changes in trade and investment liberalization. Specifically, Ando and Urata (2018) examined Japanese imports in 2015 under each FTA scheme/utilization rate in terms of preferential margins and rules of origin's (ROOs) restrictiveness and documented that the more restrictive ROOs in Japan's FTAs have, the less the FTAs utilization rate have and the more preferential margins raise. Moreover, Kuwayama (2019) examines TPP11 (especially Japan-Latin

America Trade). He pointed out that building a rules-based trading system would help positively to shape the Asia-Pacific region in order to gain benefits from trade for all. Urata (2016) studied mega-FTAs and WTO (Doha Round of multinational trade negotiations) relationships. He pointed out that they were complementary and would help to improve the agreements/relationships, instead of competing.

More specifically, Nakanishi (2019) and Tsuruoka (2019) investigated the legal policy of the Economic Partnership Agreement (EPA) and the Strategic Partnership Agreement (SPA). Moreover, Grübler et al. (2019) examined Japan-EU EPA with a partial comparison of the FTA with South Korea through structural gravity. They concluded that non- tariff policy playing a significant role and has a positive impact on both countries' macro variables as well as supporting rule-based trading principles. Similarly, Felbermayr et, al. (2019) examined Japan-EU EPA quantitatively by using the World Input-Output Database (WIOD) and the GTAP9 database to show welfare gain from the agreement regarding tariff reduction. They documented that while Japanese manufacture and services sectors gain the most, EU agriculture sectors gain the most. On the other hand, Urata (2019) discussed the China-US trade war as an example from the perspective of the economic history of the Japan-US trade issue. Bellora and Fontagné (2019) analyzed the trade war between China-USA by using cross-country data and a general equilibrium model. They quantitatively provided that there were maybe few winners regarding sectoral gain but, in general, the imposing tariff hurt not only the targeted countries and the country imposing the tariffs but also others through GVC (Freund et al., 2018; Berthou et al., 2018; Bellora & Fontagné, 2019). For example, Amiti et al. (2019) studied the Trump administration's trade policy on prices and welfare in 2018. They similarly experienced that the trade war increases the prices of intermediates and final goods and decreased the real income in the U.S.

In terms of Japanese international trade study in regard to the new FTAs and the trade war, Chang et al., (2019) investigated the impact of the trade war on Japanese multinational corporations (especially China and North America) by examining Japanese firms' data. Also, there are some peer-review researches about mentioning U.S.-China trade friction scenarios to conduct an impact on the Japanese market (Yane & Nishioka, 2019) and the Japanese export market (Liu and Woo, 2018). However, Scholars have not comprehensively argued the FTas under the trade war. Therefore, the objective of this paper is to examine the impact of Japan's new FTAs under

the trade war on the welfare and the sectoral global value chain for the first time. Specifically, we first implemented the US-China friction and the USA's trade tariff policies against India, the EU, Canada, Mexico, Russia, and Turkey in order to present the economic issues. After that, we comprehensively analyzed the Japan-EU EPA and the limited Japan-USA FTA to observe the likely impacts from the new FTAs.

3. THE OVERVIEW OF THE GVCs, THE FTAs, AND THE TRADE WAR

In this section, we introduce the GVCs, the Japanese new FTAs with the EU and the limited USA agreement, and lastly touch an upon the trade war under USA national security law.

Primarily, GVCs are a specific form of trade where a country uses import products to domestically consume or to use these products for its export products that are consumed in other countries. In other words, when a country produces its goods for either domestic market or export market, she imports and assembles parts and components to finalize its final goods which are domestically consumed or are exported to other countries. Therefore, firms break up their production progresses in many different countries and this hereafter has helped firms to specialize in specific parts and components instead of the whole parts. Consequences of hyper-specialization, this fragmentation has helped to reduce production costs and gained benefit from comparative advances (costs) due to the differences in wages and skills through developed/developing countries, particularly under the decreasing (iceberg) trade costs conditions such as tariffs, transport costs, and information.

Traditionally, trade in the two countries had simple relations such as each product that was made in a different country and then could trade with each other regarding the law of absolute advantage. That is, each country has to prefer one industry in order to be specialized because of the comparative advantages (costs). Eventually, this process has helped business works with each other across countries where firms relocated their productions such as designing, producing and assembling parts to the most cost-effective location. That is, multinational firms have been allocating, relocating, and then assembling their products into different stages and countries due to the factor intensity and technological levels (Gaulier et al., 2007). Accordingly, international trade has become more integrated with the GVC. It can be said that the world has, therefore, become a small village, such as even a machine tool consisting of parts from many countries.

For example, Japanese car company, specifically, that has produced their lobar-intensive parts in developing countries such as China, their capital-intensive parts in developed countries such as the US and the EU and then have imported/assembled all their parts and components in Japan in order to finalize its final products which have been domestically consumed or exported to other countries such as the US and the EU (Haddad, 2017). In that context, China where selected countries' companies have mostly relocated to produce their parts and components as much cheap input price as was the main player due to the deepening of triangular trade which is specifically a kind of production progress that splits running different locations, three or more, in order to assemble the same final goods in home country (Kuroiwa & Kuwamori, 2010). To understand this integration, the triangular trade structure -a form of international fragmentation of production- of a country works out the regional and sectoral interconnection (Deardorff, 1998). Likewise, the American labor-intensive progress is relocated to labor-abundant countries like China. These products import and assemble in the USA and then ship their final goods to the Japanese and the EU's markets. Therefore, it can be said that selected countries would highly correlate with boosting their macro variables if they are deeply involved in a production network. Indeed, the magnitude of the impact on triangular trade between selected countries depends on the networks of (I) part and component (computer and electronics sector), (II) industrial material (chemical and metal goods, (III) primary commodities (mining sector), and (IV) service (trade and transport services) (Kuroiwa & Kuwamori, 2010).

Diagram 1: Framework for GVC-led Development

Source: World Bank (WB) (2020)

Here is the question that how do GVCs work? As can be seen in Graph 1, the main drivers are factor endowments, geography, market size, and institution quality. WB (2020) in chapter 2 documented that the participation of the GVCs should undertake deeper regulations/reforms and make predictable policies. For example, the liberalizing and regulating market, participating in deep integration agreements, and attracting foreign direct investment (FDI) policies can address the shortage of capital, technology, management skill, trade infrastructure, and governance qualities. After joining the GVCs which account for strong firm-to-firm relationships and hyper-specialization (specializing in specific parts and components) can boost growth, create more jobs, and importantly reduce poverty (Aldaba, 2012; Hahn & Park, 2011; Nabeshima et al., 2018). This has also had many benefits for countries that do not have the full capabilities to produce heavy machinery/advanced technological tools such as cars and software chips. Therefore, developing countries would easily join and get benefits from trade by producing parts and components. Indeed, countries currently import and export parts and components which lead to boosts in international trade by around 50% according to the World Bank (WB) report (WB, 2020). More interestingly, international trade has stimulated innovative products by exchanging information relying on GVC due to competition and creativity (Plotnikova & Romanenko, 2019). Overall, trade not only has improved global trade and welfare but also has drastically decreased the poverty rate through GVC.

3.1.Japan-EU and Limited Japan-USA FTAs and the Trade War

3.1.1. Japan-EU Economic Partnership Agreement

Japan and the US have differently transformed and switched the ideology of trade strategy/opinion. That is, Japan has gradually become more liberal in relation to trade, specifically reducing the tariff level in manufacturing sectors mostly. For example, they started signing bilateral trade agreements such as the Japan-Philippines Economic Partnership Agreement (JPEPA) and then considered joining plurilateral trade agreements such as CPTPP and EUJEPA (Ing et al., 2019). Precisely, Japan and the EU finalized their FTA[1] and started tariff reduction on February 1, 2019. They will have eliminated concurred tariffs within 15 years, 99% by the EU and 97% by Japan for commodities (Felbermayr et, al., 2019). In general, the EU has a high tariff on all manufacturing industry which japan has a low-level tariff on while the Japanese agriculture

[1] More detail: https://www.mofa.go.jp/policy/economy/page6e_000013.html.

tariff rate is comparatively higher (see Appendix). More importantly, they stabilize and regulate their economies such as an example of the EU-Korea FTA by implementing rule-based-trade[2].

Basically, Japanese trade is considerably contributed to its GDP growth, considering the 4th largest exporter and the 4th largest importer in the world in 2017. To understand the importance of the trade between the EU and the Japanese market, Japan importing from the EU was the 6th largest destination and the EU importing from Japan was the 7th largest partner (Ministry of Finance, 2018). Moreover, the US market is still an important and big market for Japanese exports, especially the trade chain of the US, Japan, and East Asia.

3.1.2. Limited Japan-USA FTA

Japan added new bilateral trade agreements with the USA on its FTAs list. This agreement would help the Japanese market to easily access the US market under concurred tariffs for specific sectoral agreements. After the USA withdrew TPP12, CPTPP could have lost its attraction because the US market in which developed/developing countries have mostly aimed to trade with FTA is still big enough for CPTPP. Since then, Japan and Australia have been driving this agreement and inviting some developing countries such as Vietnam and the Philippines in order to replace the lost US market. In terms of the USA, they lost their export market share to Australia in terms of agricultural products such as pork and beef in Japan because of the CPTPP through which Australian farmers have serviced these products at a cheaper price than US farmers (Urata, 2018; Kuwayam, 2019). For this concern, Japan and the US have started negotiations in order to equally deal with trade tariff reduction for the first period. Under the Abe administration, the Japanese trade agreement strategy concerned mutually to eliminate tariff levels as much same elimination in TPP12. However, the negotiations agreed to eliminate the tariff on just Agricultural and digital products. This means just the US strategically picked up the strongest sector for its economy instead of considering Japanese tradeable sectors such as an automobile. It is clear that the USA tries to get its export market back due to tariff elimination in agricultural sectors. Here the question is, is it the same benefits from trade for the Japanese and American markets?

[2] See European Commission (http://trade.ec.europa.eu/doclib/press/index.cfm?id=1684)

The limited Japan-USA FTA[3] as preferential tariff access covers certain food and agricultural products for U.S. import goods to Japan and certain agriculture goods, machine tools, fasteners, steam turbines, bicycles, bicycle parts, and musical instruments for Japanese import goods to the USA. Moreover, the two countries agreed to be duty-free on digital products. It seems that the USA would comparatively gain more profit because the USA tariff rate on Japanese machine tools is a lower level than the Japanese tariff rate on USA agriculture (see Appendix). Indeed, the American farmers selling into the Japanese market would have the same benefits and profits as it used to be in TPP12. Urata (2019) stated that the USA trade strategy relies on bilateral trade due to the threat or power-based trading environment, as an example, they have not mentioned the automobile sector in which the Japanese market could get the most benefits as much as USA's agriculture sector would get.

On the other hand, the US started implementing protectionist trade policy, regardless of the many benefits from FTAs. The Trump administration has increased tariff rates against China, Canada, Mexico, the EU, Russia, India, and Turkey. To understand the American trade policy which has concerned the trade deficit and the firm resettlement, would the first America strategy in relation to trade work for the long term to reduce the trade deficit and increase GDP/productivity, or would the market relocate their company to be back in the USA?

3.1.3. The Trade War

Through 2018 and 2019, the US administration has announced and imposed several import tariffs, with rates ranging between 10% and 50% (see Appendix). The tariff policy has started to be invoked is that the US says the Chinese trade strategy is unfair and intellectual property theft which China has. Also, This policy aimed at encouraging consumers to buy American goods entitled a "much stronger, much richer nation"(Bellora & Fontagné, 2019; Amiti et al., 2019).

For example, the USA's tariff rate started increasing in January which was the first wave of tariffs on solar panels by 30% and washing machines by 20-50% (see Appendix; Amiti et al., 2019). Moreover, the US imposed tariffs of 25% on Chinese goods in June and July, which affected 50 bn USA imports. In response to this, China increased its tariff rate by 25%. Interestingly, the

[3] More detail: https://ustr.gov/countries-regions/japan-korea-apec/japan/us-japan-trade-agreement-negotiations/us-japan-trade-agreement-text.

US started targeting its confederates such as Canada and Mexico and imposed the additional tariffs on the targeted countries (Bellora & Fontagné, 2019, see Appendix). As for changing tariff information, we documented the official list in the appendix which our scenarios rely on. How are these tariff shocks implemented? In response to this question, we employed the CGE model, which is the appropriate way to interpret this trade war impact on welfare and GVC.

4. METHODOLOGY AND DATA SOURCES

This paper relies on the CGE model and GTAP10 database because this paper clearly presents not only trade interdependence between the countries of concern but also trade policy impact on their future economies through tariff policy. In literature, applied general equilibrium helps us to stimulate the FTAs and the trade war through tariff policy. In general, the CGE model stimulates possible policy change impact if the certain condition changes in the long term.

4.1. Methodology

This paper employed the CGE model, which is the appropriate way to interpret the FTAs and the trade war impact on welfare and other variables. Moreover, this paper used the uncondensed GTAP model, which is more sensitive to tariff and productivity parameters. This data relies on the linkage model by implementing the GTAP v10 database with the 2014 base-year. Moreover, global bilateral trade patterns, international transport margins, and protection matrices were also addressed in this data (Aguiar et al., 2019). In the GCE model, we implemented simple non-tariff and tariff policy in order to examine and simulate the result of Non-Tariff Measurements and tariff policy. This analysis allows us to change a certain condition such as tariffs/subsidies (policy) and then policymakers could select the optimal tradeable scenarios through the CGE simulations.

4.2. Data Resources

To investigate Japan's economic integration with the EU and the USA, this paper used the Global Trade Analysis Project (GTAP) Data Base, version 10 (also referred to as GTAP 10) which was launch in 2019. The database, which implies global general equilibrium models (calling CGE), provides time series of input-output tables, bilateral trade flows, transport costs, tax (income and factor) and tariff information, and all other data calculating based on Social Accounting Matrices (SAM) and elasticity parameters (Burfisher, 2016; Aguiar et al., 2019). This paper run version 3.70 RunGTAP model and the database relies on 4 reference years (2004, 2007, 2011, and 2014)

which account for 65 sectors in each of the 141 countries/regions (Aguiar et al., 2019). Accordingly, this study used the 2014-year base as the last reference year and aggregated the regional and sectoral basis to focus on 17 (from 141) regions and to distinguish 17 (from 65) sectors regarding this study question (see Appendix).

5. RESULTS OF THE ANALYSIS

To analyze the Japanese gain from Japan-EU EPA and limited Japan-US FTA under the US-China friction, this paper basically followed the FTAs papers (Felbermayr et al, 2019; Anderson & Martin, 2005; Francois et al., 2013) for the FTAs concept and the trade war and global value chains (Bellora, C., & Fontagné, L., 2019) for the imposing tariff concept. The assumptions are: If two countries sign an agreement, they eliminate tariffs on the selected-sectors; if there are tariffs policy in relation to trade, they impose the tariffs on selected-sectors. Accordingly, this paper started implementing the USA-China friction and then examined the Japanese new FTAs in order to investigate how Japanese new FTAs eliminated the trade war negativity impact on its macro variables. Hence, it had four different scenarios: (I) USA-China Friction total (US-CHFT) which provides USA's tariff change for China (USATC) and Chinese tariff change for the USA (CTC), (II) USA tariff change for the five regions (OR), (III) Japan-EU FTA (EU-JFTA) which provides Japanese tariff elimination for the EU (J-EU) and the EU's tariff elimination for Japan (EU-J), (IV) limited USA-Japan FTA (USA-JFTA) which accounts for Japan tariff elimination for USA's import goods (JapanE) and USA tariff elimination for Japan's goods (USAE).

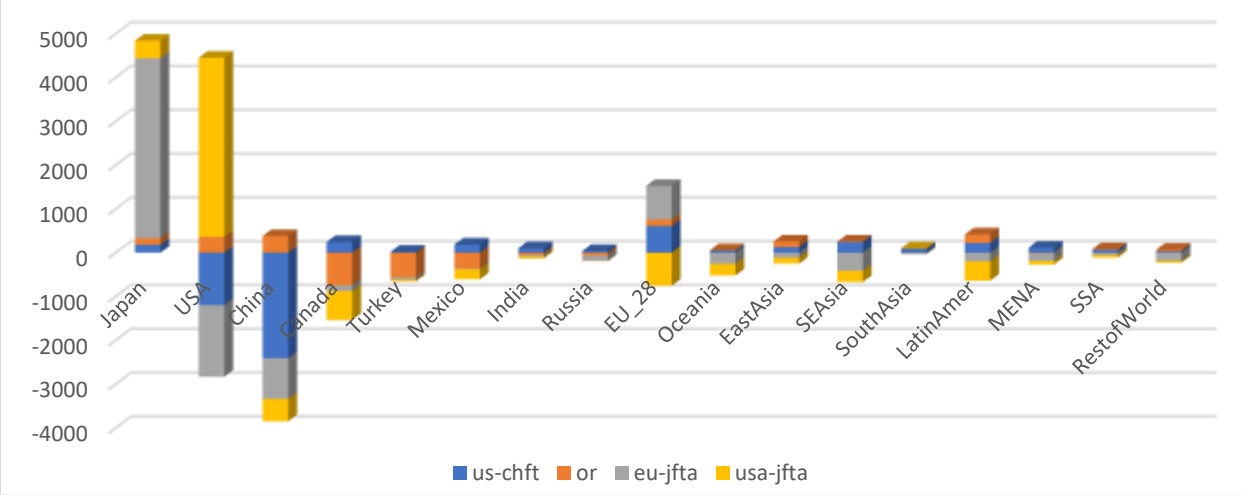
5.1. Aggregate Impact on Welfare

Briefly, after the trade agreement deal, some product prices would comparatively decrease more than others due to the reduction of the tariffs and trade costs. Therefore, consumers start maximizing their utility by purchasing more cheaper goods based on their good CES and then they can improve their welfare. Therefore, the total world welfare effect of the policy reforms is positive. The equivalent variation depicts what increase in the welfare the consumers would have needed to consume the new basket.

As scholars stated that the trade war has punished most of those countries experience the effect of the US-China friction (Li et al., 2018; Balistreri et al., 2018) due to the sectoral integration across countries. Surprisingly, the USA-China friction did not directly have a negative impact on

Japanese welfare and others because these countries' companies relocated their parts and components of concern due to the Armington CES[4] for domestic/imported allocation (Figure 1 and 2). Likewise, after the US (China) has imposed a tariff for Chinese (the US) goods, they have started managing and shipping their products to East and South Asia, and Africa in which have actually seen an economic benefit. For example, South and East Asia have gained most of the benefit from this trade war through USATC because the American market switched its production portfolio from China to South Asia and neighbors. Similarly, China traded its tariff targeted products to South/East Asian and neighboring countries instead of the American market (Figure 1; see Appendix). In addition to the trade friction, the trade war was pervaded to other regions by imposing additional tariffs on India, the EU, Canada, Mexico, Russia, and Turkey. Canada and Turkey have had the most negative impact on their welfare due to their sector tariff rates and their export market share in the US.

Figure 1: Welfare Effects of Trade Liberalization by Region and by Policy, $U.S. Millions



Source: GTAP10 database, author's calculation.

On the other hand, the Japanese new FTAs have provided some opportunities for its market as well as targeted countries. For instance, the Japanese benefit from the EU-Japan FTA would be $4.11 billion U.S.D. and the EU would gain $768 million U.S.D. within the 15 years. This paper also documented that each agreement had a different contribution to the welfare in total (see Appendix). Especially, the EU is quite a big and attractive market for Japanese firms. Therefore,

[4] The constant elasticity of substitution (CES) specification for the trade substitution elasticity is derived from Armington (1969) and explain the degree of substitution between imported and domestic goods.

the Japanese market would get more benefits than the EU under two-tariff elimination (EU-J and J-EU) due to their market size, their export market share in each country, and their exchange currency rate. While the EU's market would have a positive impact on welfare through the J-EU, the EU-J has a negative effect on its welfare because of their sectoral tariff differences and their CES. As we investigated that GVC magnifies not only trade gain but also trade cost/conflicts. That is, GVC has a positive and negative impact on countries by FTAs and there, therefore, are winners and losers, consequences of the substitution through opportunity cost. The perspective of other regions/countries, while J-EU would have a positive impact on Turkey, India, Mexico, and South Asia because the more market increases the more welfare increases due to the sectoral integration, those regions which are not in the trade deal could lose their export market share in Japan and the UE28 due to EU-Japan FTA in general and would have, therefore, negative effect on their macro variables (Figure 1).

Figure 2: Decomposition of the Total Welfare Effect, Percentage in Total

Source: GTAP10 database, author's calculation

In addition, after the US withdrawal from the TPP12, they then have lost their export market share in Japan because of CPTPP. Evidently, the US not only would get a huge advance but also would get back its export market share from Pacific island nations in Japan when Japan would eliminate the deal tariffs on concerned sectors for the USA goods within 15-year. For example, the U.S. and Japan would improve their welfare through the limited USA-Japan FTA by $4.09 billion U.S.D. and $398 million U.S.D., respectively. That is, the US market would comparatively earn much more than Japan because this literally relied on their sectoral tariff level and their sectoral contribution. This trade deal would have a mostly negative impact on not only their

neighbors such as Latin America and Southeast Asia but also the EU28 market. Indeed, the trade deal helps to reduce the trade war cost for the US market and relocated the USA's firm in the Japanese market, especially agricultural sectors (Figure 1).

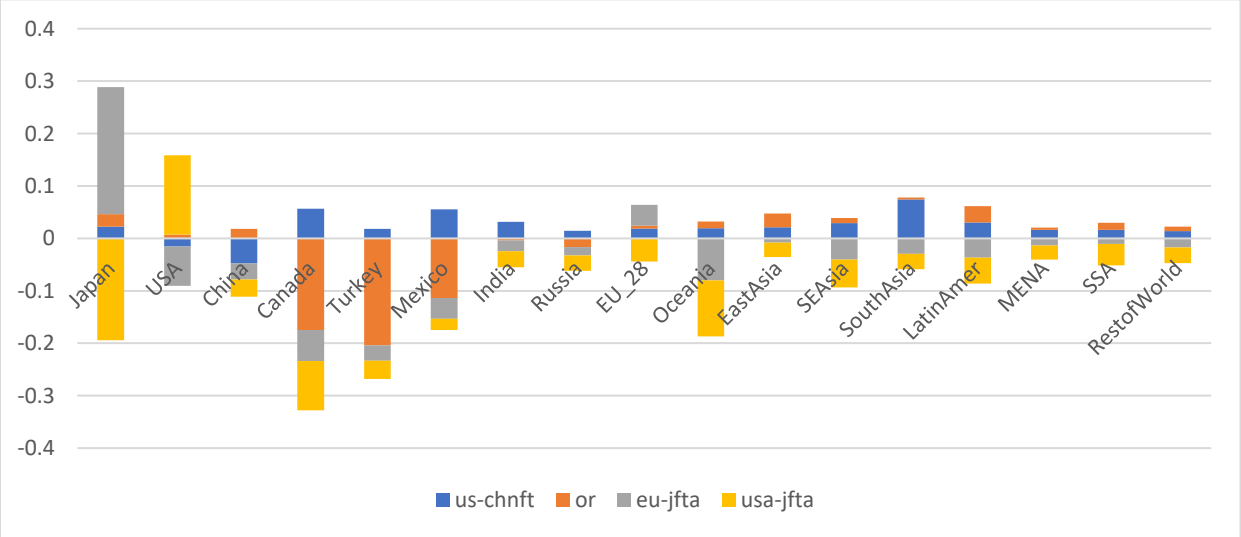
Table 1: Decomposition of the Import Tariff Welfare Effect ($U.S. Millions)

TRADE	Japan	USA	EU_28
Japan	0	-1	328.22
USA	1446.78	0	-45.24
EU_28	1531.04	12.64	0
Total	2977.82	11.64	282.98

Source: GTAP10 database, author's calculation.

Interestingly, allocative efficiency in Japan would boost welfare by 60 % while it could have a negative effect on the USA and the EU. Likewise, terms of trade in goods and services would improve welfare in the EU, the USA, and Japan by 80%, 60%, and 40%, respectively because of the import substitution elasticities (Figure 2).

Figure 3: Changes in GDP (in Percent) Due to the FTAs and the Trade War



Source: GTAP10 database, author's calculation.

We investigated welfare decomposition based on gaining from import tariff policy. Therefore, the Japan-EU FTA would significantly boost their welfare from import tariffs by $1531 million U.S.D. in Japan and $328 million U.S.D. in the EU. Moreover, Japan-USA FTA could considerably improve welfare by $1447 million U.S.D. in Japan, but it could cause welfare to decrease by -$1 million U.S.D. in the USA (Table 1) because the US ship mainly agriculture to Japan would cause its agriculture good price to increase.

Lastly, our result for GDP change suggested that those who participate in the FTAs would boost their GDP. Interestingly, Japanese and American consumers would improve their welfare through limited FTA, while American GDP could increase, Japan's GDP could have a negative impact because Japan heavily protects its agriculture sectors (tariff rate differences) which provide comparatively high tariff level (see Appendix). The more the EU's consumers improve the welfare, the more they have a positive impact on their GDP (Figure 3). This means the USA and the EU could recovery the trade war case of GDP. However, China, Canada, Turkey, Mexico, India, and Russia would shrink not only their welfare but also their GDP due to the trade friction. The most loser in GDP would be Canada, Turkey, Mexico, and Pacific island nations due to the US tariff policy and the FTAs.

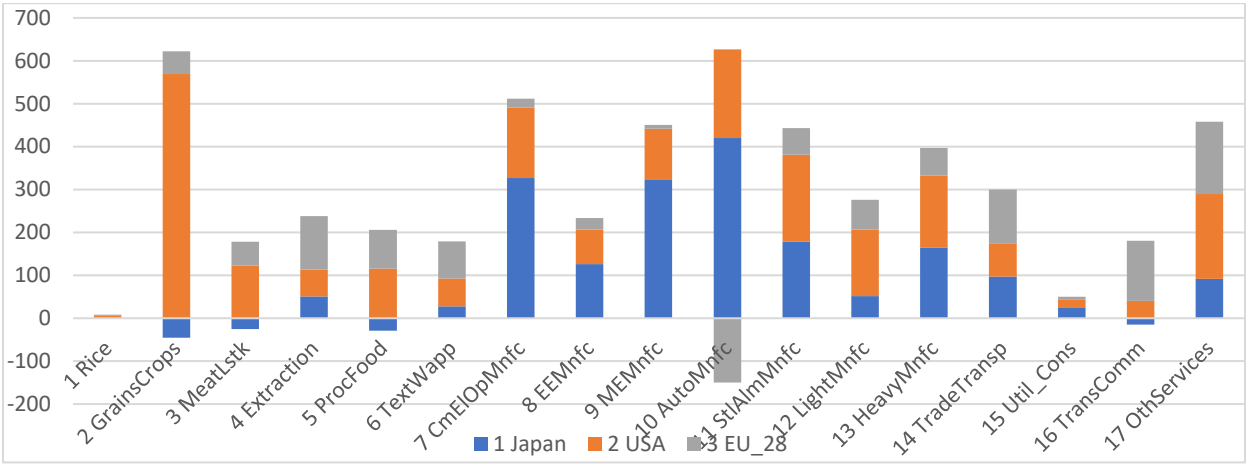
5.2. Sectoral Value-Added

We investigated the global value chain or sectoral value-added effect of the FTAs under the trade war. Consequences of the current tariff rate reduction, each country's sector has a different reaction from each agreement. In other words, if one of the selected countries heavily protects its sectors, she can get a negative impact on its GDP and GVC in relation to its sectoral tariff rate and its CES when she signs an FTA. Moreover, the import substitution elasticity affects the terms of trade most directly because it affects the quantity of import demanded by Japan's consumers when its import tariffs are removed. For example, if Japanese import substitution elasticity is high, consumers in Japan will readily substitute domestic goods for relatively "cheaper" imported goods when import tariffs are removed. As a result, as Japanese consumers move away from domestic goods, more will be available for export. The elasticity of substitution between the domestic and the aggregate imported variety can also affect the terms of trade results in our model. The removal of tariffs reduces the price paid by consumers in Japan for manufactured and agri-food imports from the other regions and causes the Japanese import demand quantity to increase.

In general, the value-added would tend to increase in all sectors regardless of the individual country because FTAs reducing trade cost (i.e. iceberg) would boost productivity. As a result of the non-tariff barrier would help to build great opportunities for the Japanese manufacturing sector, increasing by a total of $1619 million U.S.D. The second value-added sector would be the service sector, enhancing by $200 million U.S.D. However, the Japanese agri-food sector could have a negative value, $121 million U.S.D. Expressly, Automobile, Machinery and Equipment, and

Computer, Electronic and optic would be the most value-added sectors. The FTAs, therefore, could improve productivity in the competitive sectors (Figure 4).

Figure 4: Term of Trade Effect on the Sector, ($U.S. Millions)



Source: GTAP10 database, author's calculation

In addition, the EU would obviously tend to improve its sectoral value-added. In particular, agri-food, some manufacturing, and service sectors could be the most advantageous sectors while only the automobile sector could shrink by $150 million U.S.D. through Japan-EU EPA. Moreover, the sector with the largest changes would be agri-food in the USA and could follow the manufacturing and service sectors (Figure 4). Moreover, value-added in Japanese manufacturing and service would comparatively increase more than the value-added in the USA's and the EU's manufacturing and service. However, value-added in agriculture would have the opposite ration for the markets that while the Japanese value-added would decrease, the others would increase in the agriculture sectors (Table 2).

Stated briefly, value-added in agri-food increase in the USA and EU while it would decrease in Japan because Japan has the highest tariff rate and this effect symmetrically works (see Appendix). Another example is that the EU has the highest tariff rate for the automobile that's why the value-added would decrease in the EU while the opposite reaction could appear in Japan. In short, manufacturing and service in Japan would be the strongest growth, agri-food and service in the EU would be substantial growth, and agri-food and textile sectors in the USA would be performing well in general (Table 2).

Table 2: The Value-Added and the Substitution of the Demand (%)

	Value Added			Domestic Substation			Import Substation		
	Japan	USA	EU_28	Japan	USA	EU_28	Japan	USA	EU_28
Rice	-0.4174	-0.5911	-0.1231	-0.44	0	-0.2	-2.53	0.94	0.21
GrainsCrops	*-5.2309*	0.8759	-0.0038	-5.45	0.09	0.18	5.64	1.49	0.27
MeatLstk	*-20.2439*	1.7488	1.5202	-20.61	0.53	0.36	45.22	2.06	0.36
Extraction	-0.1764	-0.0599	-0.0434	-0.2	-0.05	-0.02	0.26	-0.11	-0.04
ProcFood	-0.7164	0.2016	0.2557	-0.82	0.1	0.13	4.1	0.34	0.18
TextWapp	0.5172	0.3585	0.416	-1.07	0.49	0	1.28	-0.99	0.16
CmElOpMnfc	-0.0216	-0.3778	-0.3166	-0.2	-0.26	-0.27	0.8	0.05	-0.01
EEMnfc	0.5275	-0.3086	-0.2999	0.3	-0.12	-0.25	1.37	-0.08	-0.01
MEMnfc	0.6073	-0.374	-0.206	0.29	-0.22	-0.16	1.35	0.52	0.1
AutoMnfc	*1.7927*	-0.5176	-0.3573	1.14	-0.17	-0.41	1.81	0.03	0.11
StlAlmMnfc	0.1737	0.1715	-0.2251	0.27	0.4	-0.18	1.23	-2.29	-0.12
LightMnfc	-0.622	-0.0243	0.177	-0.7	0.07	0.01	2.55	-0.43	0.09
HeavyMnfc	0.3153	-0.0977	-0.0673	0.02	0	-0.08	0.96	-0.02	0.06
TradeTransp	-0.0357	-0.0151	-0.0099	-0.01	-0.01	0	0.53	0.12	0.03
Util_Cons	0.2564	-0.0109	0.026	0.27	-0.01	0.03	0.91	0.27	0.02
TransComm	0.1855	-0.0002	-0.0115	0.19	0	0	0.12	0.13	0.05
OthServices	-0.0238	0.0071	-0.0125	-0.01	0.01	-0.01	0.55	0.09	0.01

Source: GTAP10 database, author's calculation

6. CONCLUSION REMARKS

Scholars quantitatively and theoretically documented that the trade liberalization leads to market share reallocations towards more productive firms, thereby increasing aggregate productivity (Antràs & Yeaple, 2014; Melitz & Redding, 2014). However, the US raised the trade war issues under protecting national security against China in July 2018. Scholars quantitively provided that there were maybe few winners regarding sectoral gain but, in general, the imposing tariffs hurt not only the targeted countries and the country imposing the tariffs but also others through GVC (Freund et al., 2018; Berthou et al., 2018; Bellora & Fontagné, 2019).

Contrary to protectionism, Japan has signed new FTAs with the EU and the US. In that context, this paper quantitively examined the Japanese new FTAs under the trade war. It employs the general equilibrium approaches in order to not only investigate the economic structure of each country trade flow but also address the FTAs and impact on the welfare and sectoral value chains of the trade war. The paper scenarios depend on the official list of the FTAs and the trade war-related goods. Specifically, we first implemented the USA-China friction and the USA's trade policy against India, the EU, Canada, Mexico, Russia, and Turkey in order to present the economic

issues. After that, we analyzed the Japan-EU EPA and the limited Japan-US FTA to present the new FTAs profits.

As a result of the CGE model suggested that the Japanese new FTAs have provided some opportunities for its market as well as targeted countries. For instance, the Japanese benefit from the EU-Japan FTA would be $4108 million U.S.D. and the EU would gain $768 million U.S.D. within the 15-year. Evidently, the USA not only would get a huge advance but also could get back its export market share from Pacific island nations in Japan when Japan would eliminate the tariffs on concerned sectors for the US goods. For example, the U.S. and Japan would improve their welfare through the limited USA-Japan FTA by $4090 million U.S.D. and $398 million U.S.D., respectively. That is, the US market would comparatively earn much more than Japan. Lastly, our result for GDP change suggested that those who participate in the FTAs would boost their GDP. Interestingly, Japanese and US consumers would improve their welfare, while the US GDP could increase, Japan's GDP could have a negative impact through the limited Japan-US FTA. Moreover, the more the EU's consumers would improve the welfare, the more they would have a positive impact on their GDP. This means Japan, the US, and the EU could recovery the trade war case of GDP and welfare growth. On the one hand, value-added in agri-food would increase in the US and EU while it would decrease in Japan because Japan has the highest tariff rate and this effect symmetrically works. Moreover, the EU has the highest tariff rate for the automobile that's why the value-added would decrease in the EU and the USA while the opposite reaction could appear in Japan. indeed, manufacturing and service in Japan would be the strongest growth, agri-food and service in the EU would be substantial growth, and agri-food and textile sectors in the USA would be performing well in general.

In summary, there are winners and losers due to the consequences of the FTAs between these countries. Firstly, those who participate in the FTAs would boost their GDP, welfare, and value-added (productivity). For example, not only would Japan provide some opportunities for its market and then enhance its welfare and GDP, (or as well as the UE and the US) but also the EU and the US would boost their macro variables, as well. However, the perspective of the other regions/countries, those regions/countries which are not in the trade deal could lose their export market share in Japan, the US, and the UE28 and would have, therefore, a negative impact on their GVC, GDP, and welfare.

REFERENCES

Aguiar, A., Chepeliev, M., Corong, E. L., McDougall, R., & van der Mensbrugghe, D. (2019). The GTAP Database: Version 10. *Journal of Global Economic Analysis, 4*(1), 1-27.

Ahir, H. (2019). *Trade uncertainty could hurt economic development worldwide*. World Economic Forum. https://www.weforum.org/agenda/2019/07/how-trade-uncertainty-is-impacting-the-global-economy/

Akamatsu, K. (1962). A historical pattern of economic growth in developing countries. *The Developing Economies,* 1, 3-25. doi:10.1111/j.1746-1049.1962.tb01020.

Aldaba, R. M. (2012). "Trade Reforms, Competition, and Innovation in the Philippines*", ERIA Discussion Paper Series, No. 5,* Jakarta: ERIA.

Aldaba, R. (2017), "The Philippines in the Electronics Global Value Chain: Upgrading Opportunities and Challenges," in L.Y. Ing and F. Kimura (eds.), *Production Networks in Southeast Asia (Routledge-ERIA Studies in Development Economics)*, London: Routledge, pp. 161–184.

Amiti, M., Redding, S. J., & Weinstein, D. (2019). ''The Impact of the 2018 Trade War on US Prices and Welfare'', *Journal of Economic Perspectives, 33 (4): 187-210*

Ando, M., & Urata, S. (2018). *Determinants of FTA Utilization for Japan's Imports: Preferential Margins and Restrictiveness of Rules of Origin,* RIETI Discuss Paper Series 18-E078.

Antràs, P., & Yeaple, S. R. (2014). Multinational firms and the structure of international trade. *Handbook of international economics* (pp. 55-130) Elsevier.

Balistreri EJ, Böhringer C, and Rutherford TF (2018) Quantifying Disruptive Trade Policies. CESifo Working Paper, 7382.

Bekkers, E., & Francois, J. (2018). A parsimonious approach to incorporate firm heterogeneity in CGE-models. *Journal of Global Economic Analysis, 3*(2), 1-68.

Bellora, C., & Fontagné, L. (2019). *Shooting oneself in the foot? trade war and global value chains*, mimeo, CEPII.

Berthou, A., Jardet, C., Siena, D., & Szczerbowicz, U. (2018). Quantifying the losses from a global trade war. *Banque De France ECO Notepad, 19*

BUI, C., KO, J., AMEKAWA, Y., ISODA, H., & ITO, S. (2018). A computable general equilibrium analysis of the potential impacts of TPP/TPP–11 and RCEP on agriculture in Vietnam. *九州大学大学院農学研究院紀要, 63*(1), 169-175.

Burfisher, M. E. (2016). *Introduction to Computable General Equilibrium Models*. GB: Cambridge University Press - M.U.A. doi:10.1017/CBO9780511975004

Chang, S., Zhigang, T., Hongjie, Y., & Hongyong, Z. (2019). *The Impact of the US-China Trade War on Japanese Multinational Corporations,*

Deardorff, A. V. (1998), "Fragmentation in Simple Trade Models," RSIE Discussion Paper No.422, University of Michigan, January 1998.

Dimaranan, B. V., McDougall, R. A., & Center for global, t. a. (2002). *Global trade, assistance, and production: The GTAP 5 database* Center for Global Trade Analysis, Purdue University. Retrieved from http://ci.nii.ac.jp/ncid/BB20317124

Dixon, P., Jerie, M., & Rimmer, M. (2016). Modern trade theory for CGE modeling: The Armington, Krugman and Melitz models. *Journal of Global Economic Analysis*, *1*(1), 1-110.

ENKHBAYAR, S., & NAKAJIMA, T. (2018). Economic effects of free trade agreements in northeast Asia: CGE analysis with the GTAP 9.0a database. *The Northeast Asian Economic Review*, *6*(1), 37-53.

Fajgelbaum, P. D., Goldberg, P. K., Kennedy, P. J. & Khandelwal, A. K. (2019), The return to protectionism, Working Paper 25638, National Bureau of Economic Research.

Feenstra, R. C. (1998). Integration of trade and disintegration of production in the global economy. *Journal of Economic Perspectives*, *12*(4), 31-50.

Felbermayr, G., Kimura, F., Okubo, T., & Steininger, M. (2019). Quantifying the EU-japan economic partnership agreement. *Journal of the Japanese and International Economies*, Elsevier, vol. 51(C), pages 110-128, doi: 10.1016/j.jjie.2018.12.007.

Foster-McGregor, N., & Stehrer, R. (2013). Value-added content of trade: A comprehensive approach. *Economics Letters*, *120*(2), 354-357.

Francois, J., Manchin, M., Norberg, H., Pindyuk, O., & Tomberger, P. (2015). *Reducing Transatlantic Barriers to Trade and Investment: An Economic Assessment.*

Freund, C., Ferrantino, M., Maliszewska, M., & Ruta, M. (2018). Impacts on global trade and income of current trade disputes. *Macroeconomics, Trade Investment (MTI) Practice Notes, July*, *2.*

Gaulier, G., F. Lemoine and D. Ünal-Kesenci (2007), "China‟s emergence and the reorganization of trade flows in Asia," *China Economic Review* 18, pp.209-243.

Grübler, J., Reiter, O., & Stehrer, R. (2019). The EU-japan EPA: A case for non-tariff Measures1. Paper presented at the *CESifo Forum, 20*(2) 17-25.

Haddad, M. (2007), "Trade Integration in East Asia: The Role of China and Production Networks," *The World Bank Policy Research Working Paper* 4160.

Hahn, C.H. and C-G Park (2011), "Direction of Causality in Innovation-Exporting Linkage: Evidence on Korean 79 Manufacturing," in C.H. Hahn and D. Narjoko (eds.), *Globalization and Innovation in East Asia,* ERIA Research Project Report 2010, No. 4, Jakarta: ERIA, pp. 79–115.

Hummels, D., Ishii, J., & Yi, K. (2001). The nature and growth of vertical specialization in world trade. *Journal of International Economics, 54*(1), 75-96.

Ikuo, K. (2018). *Structure and Comparison of the Electronics and Motor Vehicle Value Chains in East Asia,* IDE Discussion Papers 694, JETRO.

Ikuo. (2016). Mapping Agricultural Value Chains with International Input-Output Data, IDE Discussion Papers 623, JETRO.

IMFBlog. (2019). New Index Tracks Trade Uncertainty Across the Globe. *IMF Blog*. https://blogs.imf.org/2019/09/09/new-index-tracks-trade-uncertainty-across-the-globe/

Ing, L., Richardson, M., & Urata, S. (2019). *East Asian Integration: Goods, Services, and Investment (1st ed.)*. https://doi.org/10.4324/9780429433603.

Jiang, X., & Liu, Y. (2015). Global value chain, trade, and carbon: Case of information and communication technology manufacturing sector. *Energy for Sustainable Development, 25*, 1-7.

Johnson, R. C., & Noguera, G. (2012). Accounting for intermediates: Production sharing and trade-in value-added. *Journal of International Economics, 86*(2), 224-236.

Koopman, R., Powers, W., Wang, Z., & Wei, S. (2010). *Give Credit Where Credit is Due: Tracing Value Added in Global Production Chains.* 10.3386/w16426

Koopman, R., Wang, Z., & Wei, S. (2014). Tracing value-added and double counting in gross exports. *The American Economic Review, 104*(2), 459-494. doi:10.1257/aer.104.2.459

Krugman, P., Cooper, R. N., & Srinivasan, T. (1995). Growing world trade: Causes and consequences. *Brookings Papers on Economic Activity, 1995*(1), 327-377.

Krugman, P., & Venables, A. J. (1995). Globalization and the inequality of nations. *The Quarterly Journal of Economics, 110*(4), 857-880.

Kuroiwa, I. (2016). *Mapping Agricultural Value Chains with International Input-Output Data,* IDE Discussion Papers 623, Institute of Developing Economies, Japan External Trade Organization(JETRO).

Kuroiwa, I., & Kuwamori, H. (2010). The shock transmission mechanism of the economic crisis in East Asia: An application of international input-output analysis. *Institute of Developing Economies, Japan External Trade,*

Kuwayama, M. (2019). *TPP11 (CPTPP): Its Implications for Japan-Latin America Trade Relations in Times of Uncertainty,* Discussion Paper Series DP2019-05, Research Institute for Economics & Business Administration, Kobe University.

Kwangmoon, K., Secretario, F., Trinh, B., & Kaneko, H. (2016). Developing a bilateral input-output table in the case of Thailand and Vietnam: Methodology and applications.

Li, M., Balistreri, E. J., & Zhang, W. (2018). The 2018 trade war: Data and nascent general equilibrium analysis.

Liu, T., & Woo, W. T. (2018). Understanding the US-china trade war. *China Economic Journal, 11*(3), 319-340.

Melitz, M. J., & Redding, S. J. (2014). Heterogeneous firms and trade. *Handbook of international economics* (pp. 1-54) Elsevier.

Nabeshima, K., Kashcheeva, M., & Kang, B. (2018). The impacts of export competition on international technology flows. *Applied Economics Letters, 25(15),* 1058-1061.

Nakanishi, Y. (2019). The economic partnership agreement and the strategic partnership agreement between the European Union and japan from a legal perspective. *Hitotsubashi Journal of Law and Politics, 47,* 1-15.

Narjoko, D. A., & Urata, S. (2019). Firm adjustment to trade policy changes in east Asia.

OSAKI, Y. (2019, 2019-04-29T17:56:25+09:00). **U.S.-japan trade agreement negotiations: Why now?**. *The Japanese Time* Retrieved from https://www.japantimes.co.jp/opinion/2019/04/29/commentary/japan-commentary/u-s-japan-trade-agreement-negotiations-now/#.XMgAZugzY2y

Peltonen, T., & Pula, G. (2009). *Has Emerging Asia Decoupled? an Analysis of Production and Trade Linkages using the Asian International Input-Output Table,*

Peters, G. P., Andrew, R., & Lennox, J. (2011). Constructing an environmentally-extended multi-regional input-output table using the GTAP database. *Economic Systems Research, 23*(2), 131-152. doi:10.1080/09535314.2011.563234

Plotnikova, L., & Romanenko, M. (2019). Creative methods of innovation process management as the law of competitiveness. *Management Science Letters, 9(5),* 737-748.

Pula, G., & Peltonen, T. A. (2011). Chapter 11 has an emerging Asia decoupled? an analysis of production and trade linkages using the Asian international Input-Output table. *The evolving role of Asia in global finance* (pp. 255-286) Emerald Group Publishing Limited.

Solis, M., & Urata, S. (2018). Abenomics and japan's trade policy in a new era. *Asian Economic Policy Review, 13*(1), 106-123.

The Economist. (2019, September 10). Trade uncertainty is at its highest point on record. The Economist. https://www.economist.com/graphic-detail/2019/09/10/trade-uncertainty-is-at-its-highest-point-on-record

Tsuruoka, M. (2019). The European Union as seen by japan in an age of uncertainty. *Shaping the EU global strategy* (pp. 127-146) Springer.

Urata, S. (2016). Mega-FTAs and the WTO: Competing or complementary? *International Economic Journal, 30*(2), 231-242.

Urata, S. (2019). US-Japan trade frictions: The past, the present, and implications for the US-China trade war. *Asian Economic Policy Review*,

World Bank (WB). (2020). *World development report 2020: Trading for development in the age of global value chains* Washington, DC: World Bank. doi:10.1596/978-1-4648-1457-0

Yane, H., & Nishioka, S. (2019). A CGE Analysis on Trade War, Grave Divide in Future Paths of the World Economy, *Japanese Center for Economic Research*, 10

Ying, S., Miao, L., & Yibo, C. (2014). High-tech products export competitiveness, BRIC countries in US market: A comparative analysis. *The Journal of Developing Areas,* 195-218.

Zhao, Y., Liu, Y., Qiao, X., Wang, S., Zhang, Z., Zhang, Y., & Li, H. (2018). Tracing value added in gross exports of china: Comparison with the USA, Japan, Korea, and India based on generalized LMDI. *China Economic Review, 49*, 24-44.

APPENDIX

Appendix I: American and Chinese Trade Policy

For the products lists[5]:

For aluminum:

- 8 March 2018: https://www.govinfo.gov/content/pkg/FR-2018-03-15/pdf/2018-05477.pdf;
- 22 March 2018: https://www.govinfo.gov/content/pkg/FR-2018-03-28/pdf/2018-06420.pdf
- 30 April 2018: https://www.govinfo.gov/content/pkg/FR-2018-05-07/pdf/2018-09841.pdf

For steel:

- 8 March 2018: https://www.govinfo.gov/content/pkg/FR-2018-03-15/pdf/2018-05478.pdf
- 22 March 2018: https://www.govinfo.gov/content/pkg/FR-2018-03-28/pdf/2018-06425.pdf
- 30 April 2018: https://www.govinfo.gov/content/pkg/FR-2018-05-07/pdf/2018-09841.pdf

USA-China friction[6]

For the US:

- July 6: https://www.govinfo.gov/content/pkg/FR-2018-06-20/pdf/2018-13248.pdf
- August 23: https://www.govinfo.gov/content/pkg/FR-2018-08-16/pdf/2018-17709.pdf
- September, 24: https://www.govinfo.gov/content/pkg/FR-2018-09-21/pdf/2018-20610.pdf

For China:

- July 6: http://gss.mof.gov.cn/zhengwuxinxi/zhengcefabu/201806/P020180616034361843828.pdf
- August 23: http://gss.mof.gov.cn/zhengwuxinxi/zhengcefabu/201806/P020180616034362364988.pdf
- September, 24: http://gss.mof.gov.cn/zhengwuxinxi/zhengcefabu/201808/t20180803_2980950.html

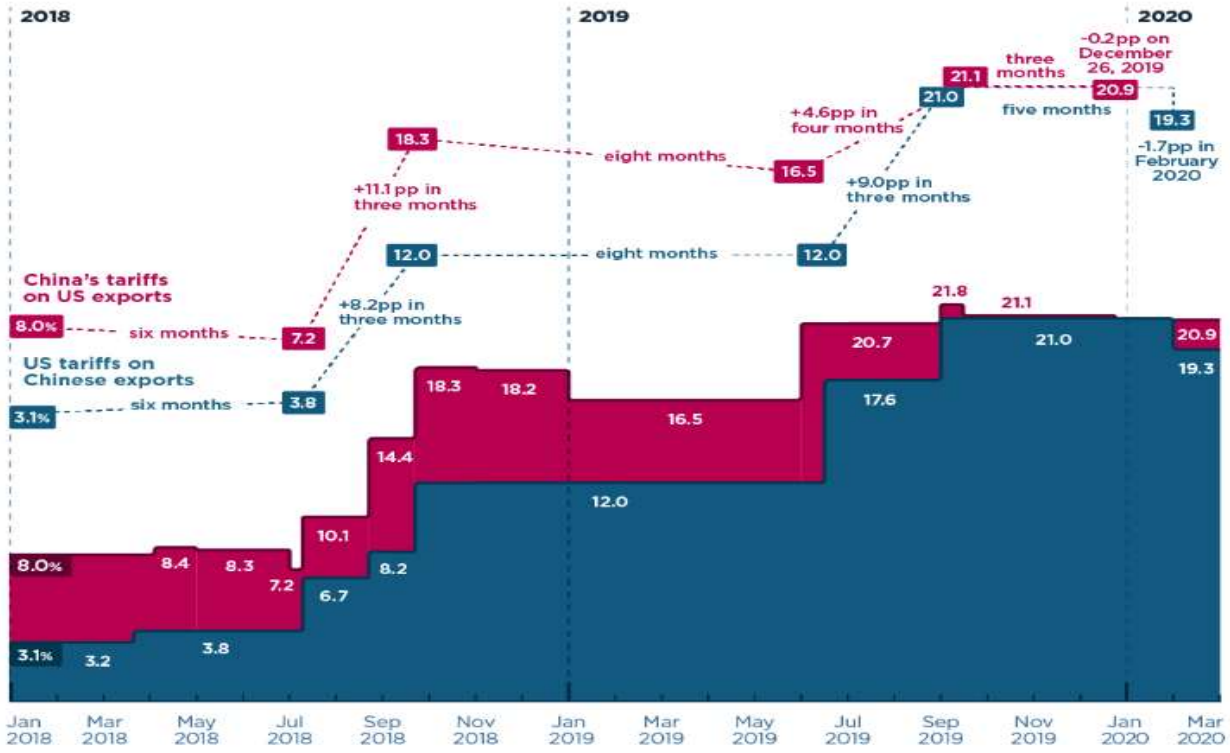
[5] Up-date-line: https://www.piie.com/blogs/trade-investment-policy-watch/trump-trade-war-china-date-guide
[6] https://www.govinfo.gov/content/pkg/FR-2019-03-05/pdf/2019-03935.pdf

Appendix I1: The USA's Trade Policy

Country / Region	Product List and Tariff	Effective Date
China	232 Retaliation List, 25%	April 2, 2018
China	301 Retaliation List One *Released June 16, 2018* 25%	July 6, 2018 Exclusion requests accepted between June 3, 2019 - July 5, 2019
China	301 Retaliation List Two, Version 2 *Originally Released June 16, 2019.* *Amended August 8, 2018*	August 23, 2018 Exclusion requests accepted between June 3, 2019 - July 5, 2019
China	301 Retaliation List 3.1 - 10% & 25% Tariff 301 Retaliation List 3.2 - 10% & 20% Tariff 301 Retaliation List 3.3 - 5% & 10% Tariff 301 Retaliation List 3.4 - 5% & 5% Tariff (no rate change) *Released August 3, 2018* *Finalized September 17, 2018* *Amended May 13, 2019*	September 24, 2018, at lower tariff rate, specified June 1, 2019, at higher tariff rate, specified Exclusion requests accepted between September 2, 2019 - October 18, 2019
China	301 Retaliation List In Response to US List 4A 301 Retaliation List In Response to List 4B *Released August 23, 2019*	September 1, 2019 December 15, 2019
EU	232 Retaliation List One, 10-25%	June 22, 2018
EU	232 Retaliation List Two 10-25%	March 23, 2021
EU	301 Airbus Retaliation *Released April 17, 2019*	TBD - the level of damages depends on WTO arbitration verdict expected in late 2019 or early 2020.
India	232 Retaliation List 10-50%	June 16, 2019 (previously 6/21/2018, 9/18/2018, 11/2/2018, 12/17/2018, 3/2/2019 & 4/1/2019)
Turkey	232 Retaliation List *Certain Duties Doubled as of August 15, 2018, 4-70%*	June 21, 2018
Russia	232 Retaliation List, 25-40%	August 5, 2018

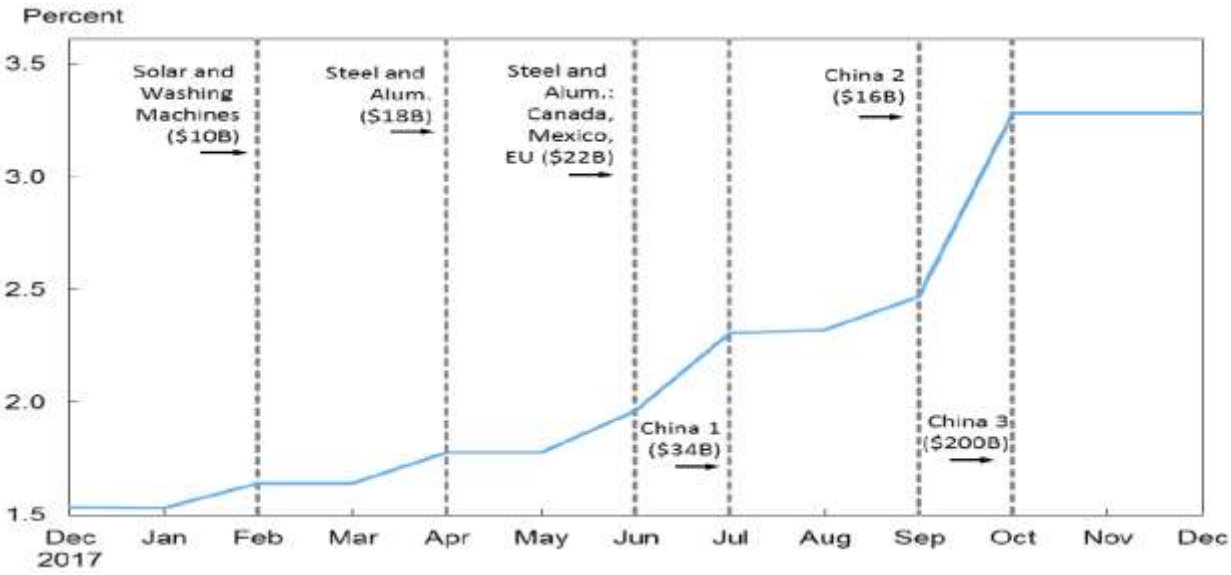
Source: CRS, U.S. Census Bureau, USTR, USITC

Appendix I2: Average Tariff Rate



Source: CRS, U.S. Census Bureau, USTR, USITC

Appendix I3: Average Tariff Rate of the USA[7]

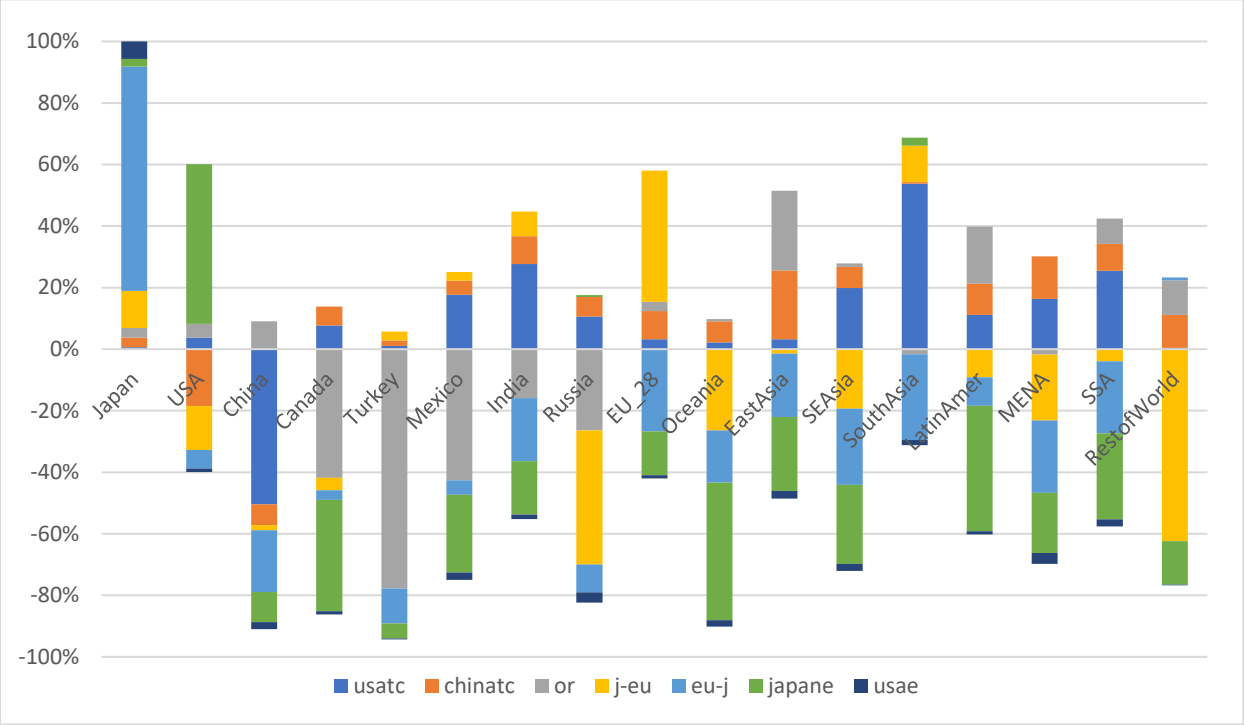


Source: Amiti et al. (2019).

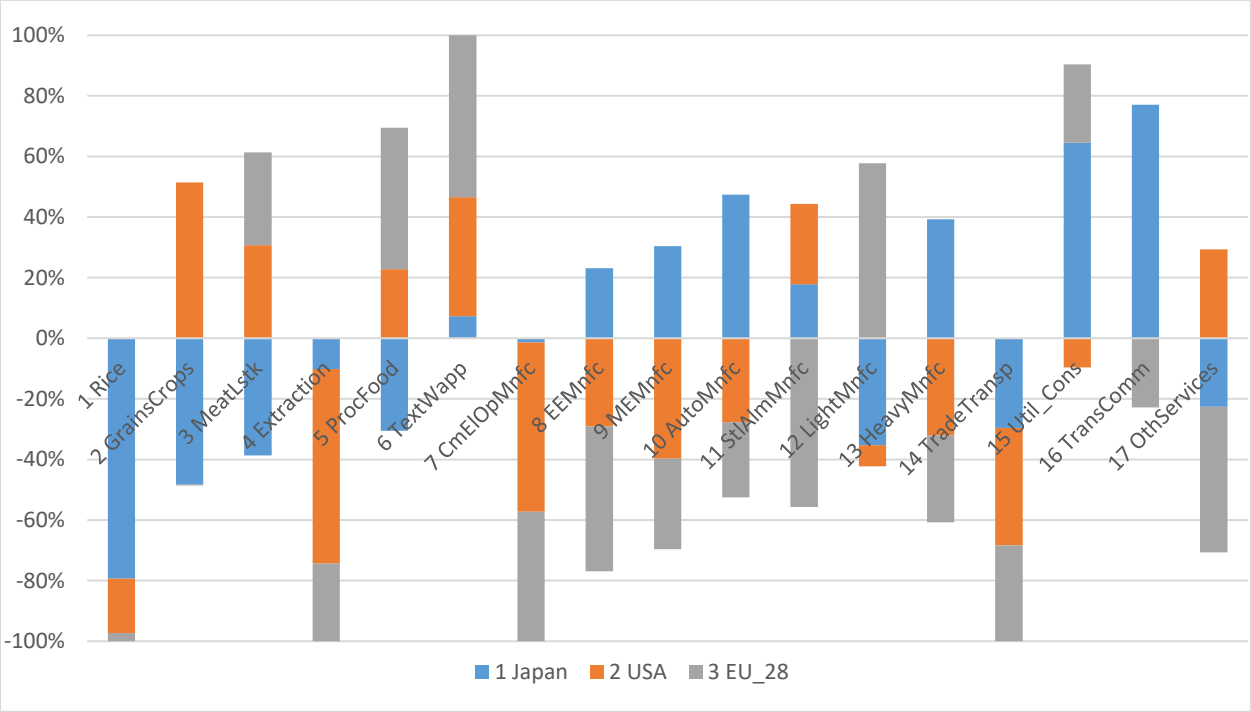
[7] More information from 2019 to 2020: https://www.piie.com/blogs/trade-investment-policy-watch/trump-trade-war-china-date-guide.

Appendix II: GTAP Output

Appendix II1: Each Agreement Contribution to Welfare, Percentage in Total



Appendix II2: Each Sectoral contribution to the countries in total



Appendix II3: Import Tariff and Export Subsidies

Sectoral Tariff Rate	Japan				EU_28		USA	
	Import		Export Subs.		Import	Export Subs.	Import	Export Subs.
	USA	EU_28	USA	EU_28	Japan	Japan	Japan	Japan
1 GrainsCrops	22	6	0	0	3	0	2	0
2 MeatLstk	35	46	0	0	2	0	3	0
3 Extraction	0	1	0	0	4	0	0	0
4 ProcFood	10	12	0	0	5	0	3	0
5 TextWapp	7	9	0	0	5	0	5	0
6 CmElOpMnfc	0	0	0	0	3	0	1	-1
7 EEMnfc	0	0	0	0	6	0	1	-1
8 MEMnfc	0	0	0	0	5	0	1	-1
9 AutoMnfc	0	0	0	0	6	0	1	0
10 StlAlmMnfc	2	1	0	0	5	0	2	0
11 LightMnfc	1	4	0	0	5	0	1	0
12 HeavyMnfc	1	1	0	0	6	0	2	-1
13 Util_Cons	0	0	0	0	0	0	0	0
14 TransComm	0	0	0	0	0	0	0	0
15 OthServices	0	0	0	0	0	0	0	0

Appendix II4: Sectoral Aggregation

Sector	**Aggregation Label**	GTAP 10 sector
Paddy Rice	**Rice**	pdr, pcr
Grains and Crops	**GrainsCrops**	wht, gro, v_f, osd, c_b, pfb, ocr
Livestock and Meat Products	**MeatLstk**	ctl, oap, rmk, wol, cmt, omt
Mining and Extraction	**Extraction**	frs, fsh, coa, oil, gas, oxt
Processed Food	**ProcFood**	vol, mil, sgr, ofd, b_t
Textiles and Clothing	**TextWapp**	tex, wap
Computer, Elecronic and optic	**CmElOpMnfc**	ele
Electrical equipment	**EEMnfc**	eeq
Machinery and Equipment nec.	**MEMnfc**	ome
Automobile	**AutoMnfc**	mvh, otn
Steel and Aliminium	**StlAlmMnfc**	i_s, nfm, fmp
Light Manufacturing	**LightMnfc**	lea, lum, ppp, omf
Heavy Manufacturing	**HeavyMnfc**	p_c, chm, bph, rpp, nmm
Trade and Transport	**TradeTransp**	trd, otp, atp
Utilities and Construction	**Util_Cons**	ely, gdt, wtr, cns
Transport and Communication	**TransComm**	afs, wtp, whs, cmn
Other Services	**OthServices**	ofi, ins, rsa, obs, ros, osg, edu, hht, dwe

Appendix II5: Regional Aggregation

Region	Aggegation Label	GTAP10 regions
Japan	**Japan**	jpn
United States of America	**USA**	usa
China	**China**	chn, hkg
Canada	**Canada**	can
Turkey	**Turkey**	tur
Mexico	**Mexico**	mex
India	**India**	ind
Russian Federation	**Russia**	rus
European Union 28	**EU28**	Aut, bel, bgr, hrv, cyp, cze, dnk, est, fln, fra, deu, grc, hun, irl, ita, lva, ltu, lux, mlt, nld, pol, prt, rou, svk, svn, esp, swe, gbr
Oceania	**Oceania**	Aus, nzl, xoc
East Asia	**EastAsia**	Kor, mng, twn, xea, brn
Southeast Asia	**SEAsia**	Khm, idn, lao, mys, phl, sgp, tha, vnm, xse
South Asia	**SouthAsia**	Bgd, npl, pak, lka, xsa
Latin America	**LatinAmer**	Arg, bol, bra, chl, col, ecu, pry, per, ury, ven, xsm, cri, gtm, hnd, nic, pan, slv, xca, dom, jam, pri, tto, xcb
The Middle East and North Africa	**MENA**	Bhr, irn, isr, jor, kwt, omn, qat, sau, are, xws, egy, mar, tun, xnf
Sub-Saharan Africa	**SSA**	Ben, bfa, cmr, civ, gha, gin, nga, sen, tgo, xwf, xcf, xac, eth, ken, mdg, mwi, mus, moz, rwa, tza, uga, zmb, zwe, xec, bwa, nam, zaf, xsc
Rest of World	**RestofWorld**	Xna, che, nor, xef, alb, blr, ukr, xee, xer, kaz, kgz, tjk, xsu, arm, aze, geo, xtw