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MEASURING THE POTENTIAL ECONOMIC IMPACT OF A JAPAN–US FREE TRADE AGREEMENT: CAN IT ENABLE THE US TO ELIMINATE ITS TRADE DEFICIT IN GOODS WITH JAPAN?

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Abstract:
Japan and the US are two major global trading partners that have at times been at odds regarding each other's international trade policies. In particular, the ongoing US trade deficit in goods with Japan has been one of the primary disputes between Japan and the US. However, the recent withdrawal of the US from the Trans-Pacific Partnership (TPP) sent a clear signal that the US would take a new approach to international trade issues and has potentially paved the way for a bilateral free trade agreement (FTA) with the remaining TPP countries, including Japan. This paper contributes to the debate on the potential economic impact of a Japan–US FTA (JUFTA) by evaluating whether it could enable the US to eliminate its trade deficit in goods with Japan. To do this, we measure the potential impact of a JUFTA using a dynamic Global Trade Analysis Project (GTAP) model. We find that a JUFTA is unlikely to enable the US to eliminate its trade deficit in goods with Japan, although the deficit will certainly decrease as a result.

Keywords:
Free Trade Agreement, Trade Deficit in Goods, GTAP Model
JEL Codes:
F15, F17

1. Introduction

Japan and the US are two major countries in the global trading system, which at times have been at odds regarding each other's international trade policies. Overall, the US has fears about its ongoing trade deficit, with the trade deficit between it and northeast Asian countries a major concern (Park, 2018). The US trade deficit in goods with Japan has also been one of the major disputes between Japan and the US. Recently, the US withdrawal from the Trans-Pacific Partnership (TPP) sent a clear signal that the US would take a new approach to trade issues and paved the way for a potential bilateral free trade agreement (FTA) with the remaining TPP countries, including Japan (Office of the United States Trade Representative, 2017). Consequently, the so-called Trade Agreement between Japan and the United States of America came into effect in early 2020 (Ministry of Foreign Affairs of Japan, 2020). However, if the US trade deficit were to increase because of this trade agreement, it could become a major flashpoint for future Japan–US relations.

The purpose of this paper is to contribute to the debate on the potential economic impact of a Japan–US FTA (JUFTA) by questioning whether it would enable the US to eliminate its trade deficit in goods with Japan. To respond to this research question, we measure the potential impact of a JUFTA using a dynamic Global Trade Analysis Project (GTAP) model. A JUFTA is an example of one of the so-called "mega" FTAs, which in addition to the TPP, includes the Regional Comprehensive Economic Partnership and the Japan–China–Korea FTA (Kim et al., 2015). The potential economic impacts of FTAs have been most widely evaluated using numerical simulation with a computable general equilibrium model such as the GTAP model, with several studies quantifying the effects of mega FTAs using both static (e.g., Akahori et al., 2014; Areerat et al., 2012) and dynamic (e.g., Akahori et al., 2021; Bhattacharyay and Mukhopadhyay, 2015; Lee and Itakura, 2016) GTAP models.

However, to our knowledge, there is no existing assessment using the dynamic GTAP model to determine the economic impact of an FTA between the US as the world's largest economy and Japan. In this study, we assume that a JUFTA is implemented from 2017 onwards, with tariffs uniformly reduced over five years and tariffs on all items eliminated by 2021.

2. Methodology

2.1. The Dynamic GTAP Model

The dynamic GTAP model is a recursively dynamic computable general equilibrium model of the world economy that extends the standard static GTAP model to improve the treatment of the long run but retains all other features of the model (Ianchovichina and Walmsley, 2012). Within a recursively solvable discrete-time framework, a given database refers to a given period. A simulation then takes the database to the next period, with simulation results representing changes between the initial period and the next (Ianchovichina and Walmsley, 2012).

To understand policy effects using the dynamic GTAP model, two types of simulation are possible. The first is a baseline simulation, which assumes an economy in which the policy is not implemented. The second is a policy simulation, which assumes an economy in which the policy is implemented. We compare the results of these simulations to evaluate the effects of the policy (Itakura, 2012).

The baseline scenario contains information on macroeconomic variables. These variables include projections of real GDP, gross investment, capital stock, population, and the total labor force (Lee and Itakura, 2016). Ianchovichina and Walmsley (2012) provide additional details on the key features of the dynamic GTAP model.

2.2. Data and Scenario

In this study, we employ GTAP Database Version 9a, which covers 140 countries/regions and 57 sectors with 2011 as the base year. For the present analysis, we aggregate the data into nine countries/regions and 25 sectors (see Appendix-1 and Appendix-2).

This regional aggregation highlights the importance of the major trading partners of Japan and the US. The sector aggregation framework was designed to distinguish between the agricultural sectors that are important for the present analysis. The farm sector comprises 12 sectors, ranging from No. 1 (paddy rice) to No. 12 (wool, silkworm cocoons), and the food sector includes eight sectors, ranging from No. 13 (meat: cattle, sheep, goats, horses) to No. 20 (beverages and tobacco products). In this paper, we define the agricultural sector as including all farm and food sectors (Nos. 1–20). We define the goods sector as comprising sectors Nos. 1–23 (the manufacturing industry) and the service sector as including No. 24 (transport) and No. 25 (services). Table 1 provides details on the initial bilateral tariffs between Japan and the US. As shown, Japan's highest tariff on US imports is levied on paddy rice (410.0%), while the US's highest tariff on Japanese imports is levied on sugar (26.5%).

To evaluate the effects of a JUFTA using the dynamic GTAP model, the baseline scenario was first established, showing the path of each of the nine countries/regions over the period 2011–2021. Real GDP projections and capital stocks were obtained from Fouré et al. (2010). Projections for the population were taken from the United Nations (2015), whereas those for labor are based on the working-age population (14–65-year-olds). Labor is divided into skilled and unskilled labor. In the base case scenario, tertiary education is used to estimate the amount of skilled labor (Walmsley et al., 2000).

For the dynamic GTAP model, we applied the same scenario, which assumes the complete removal of all import tariffs, not only those on the agricultural sector but also those applying in the nonagricultural sector. Although it is

unlikely that the JUFTA would remove all import tariffs across all sectors between the two countries, this scenario provides an upper bound of the economic impact of the import tariff reduction only.
For the dynamic GTAP simulation, we assume that the JUFTA is implemented from 2017, tariffs are uniformly reduced over a five-year period, and tariffs on all items are eliminated by 2021. We assume that there is no productivity change in each sector resulting from the JUFTA. Although a JUFTA will likely affect productivity in some sectors, it is extremely difficult to determine such effects, and thus there is little basis for estimating specific values for productivity change (such as a 1% increase in a year) in each sector resulting from the JUFTA.

Table 1: Initial Bilateral Tariffs on Different Sectors

Sector	Japanese tariffs on imports from the US (%)	US tariffs on imports from Japan (%)
Paddy rice	410.0	1.3
Wheat	18.6	1.6
Cereal grains nec	7.6	0.1
Vegetables, fruit and nuts	9.9	7.6
Oil seeds	2.8	0.0
Sugar cane, sugar beets	0.0	0.1
Plant-based fibers	0.0	0.3
Crops nec	0.1	1.5
Bovine cattle, sheep, goats, horses	11.0	2.8
Animal products nec	4.3	1.0
Raw milk	0.0	0.0
Wool, silkworm cocoons	27.9	2.1
Bovine cattle meat products	38.4	2.2
Meat products nec	56.5	3.0
Vegetable oils and fats	1.7	0.3
Dairy products	88.8	19.6
Processed rice	241.0	3.2
Sugar	23.1	26.5
Food products nec	11.0	3.6
Beverages and tobacco products	2.6	3.3
Forestry, fishing	0.6	0.5
Natural resources	0.0	0.1
Manufacturing	0.7	1.2
Transport	0.0	0.0
Services	0.0	0.0

Source: Version 9a of the GTAP Database. nec – not elsewhere classified.

In addition to measuring the impact on the economy, the JUFTA simulations in this analysis particularly focus on the economic impacts on agricultural sector output. Changes in real GDP are used as the indicator of the impact on the entire economy and these are then compared with the changes in agricultural sector output.

Note that an FTA may result not only in a trade creation effect but also in a trade diversion effect. This trade diversion effect may discriminate against non-FTA member economies. The inefficiencies resulting from the trade diversion effect may mean that the benefits accrued from the trade creation effect are overestimated. To shed light on this, we estimate movements in bilateral trade flows under the JUFTA in terms of both trade creation and trade diversion effects (Siriwardana, 2007).

3. Results

The impact of the JUFTA on the GDP of the two countries is less than one percentage point when compared with their baselines. However, Japan is likely to experience a more substantial gain in real GDP than is the US (Table 2). As a result of the JUFTA, the real GDP of Japan in 2021 will be 0.14 percentage points higher than its baseline. In contrast, the real GDP of the US in 2021 will be 0.01 percentage points higher than its baseline.

Table 2: Impact of the JUFTA on Real GDP (percentage point differences from baseline).

Year	2017	2018	2019	2020	2021
Japan	0.02	0.04	0.07	0.11	0.14
US	0.00	0.00	0.00	0.01	0.01

The impact on the agricultural output of the two countries in 2021 is more than one percentage point compared with the baseline (Table 3). The impact of full trade liberalization is more observable in terms of agricultural output, as shown in Table 3, than in terms of real GDP, as shown in Table 2. Indeed, the agricultural sector output of Japan in 2021 is predicted to decline by 5.22 percentage points compared with the baseline because of the JUFTA. In contrast, the agricultural sector output of the US in 2021 is predicted to increase by 2.44 percentage points compared with the baseline.

Table 3: Impact of the JUFTA on Agricultural Outputs (percentage point differences from baseline).

Year	2017	2018	2019	2020	2021
Japan	–0.40	–1.02	–1.93	–3.26	–5.22
US	0.30	0.69	1.17	1.74	2.44

Table 4 provides details of the impact of the sectoral output changes in 2021 in percentage point terms. As shown, output from the agricultural sector tends to decline in Japan, whereas that from the agricultural sector in the US tends to increase because of the JUFTA. In percentage point terms, the largest decline in sectoral outputs in Japan occurs in the paddy rice sector (–30.49 percentage points from the baseline). Correspondingly, in the US, the largest increase in sectoral outputs occurs in the processed rice sector (61.11 percentage points from the baseline), with the second-largest increase in the paddy rice sector (18.91 percentage points from the baseline), followed by the meat products sector (9.61 percentage points from the baseline).

Table 5 displays the movements in bilateral trade flows under the JUFTA. The results show that the JUFTA not only has huge impacts on the trading relationships between Japan and the US but also has adverse impacts on the trading relationships with third-party countries that trade with Japan and the US because of trade diversion effects. Japan experiences a substantial increase in imports from the US (27.72 percentage points from the baseline), indicating a trade creation effect. However, Japan experiences trade diversion from non-FTA member economies toward the US. These trade diversions are most significant for the Rest of North America, followed by Australia and New Zealand. In 2021, Japan's imports from the Rest of North America (Australia and New Zealand) decline 11.11 (4.21) percentage points from the baseline. The US experiences trade creation effects with Japan as well as with all other non-FTA member economies, except for the Rest of the World category. In addition, the trade diversion that seems to occur with the Rest of the World is almost negligible.

Table 4: Impacts of the JUFTA on Sectoral Outputs in 2021 (percentage point differences from baseline).

Sector	Japan	US
Paddy rice	–30.49	18.91
Wheat	–22.50	–0.62
Cereal grains nec	–4.84	1.87
Vegetables, fruit and nuts	0.28	–0.34
Oil seeds	2.88	–1.37
Sugar cane, sugar beets	–0.91	0.27
Plant-based fibers	3.38	–1.91
Crops nec	–2.76	–2.08
Bovine cattle, sheep, goats, horses	–11.94	3.73
Animal products nec	–19.40	5.63
Raw milk	–12.71	3.71
Wool, silkworm cocoons	–0.55	–4.84
Bovine cattle meat products	–13.87	3.86
Meat products nec	–25.44	9.61
Vegetable oils and fats	1.20	–0.45
Dairy products	–15.77	4.43
Processed rice	–26.58	61.11
Sugar	–0.99	0.18
Food products nec	0.83	0.66
Beverages and tobacco products	0.46	0.01
Forestry, fishing	0.36	–0.12
Natural resources	0.02	–0.06
Manufacturing	0.69	–0.39
Transport	–0.08	–0.03
Services	0.09	0.02

nec –not elsewhere classified.

Table 5: Movements in Bilateral Trade Flows under the JUFTA in 2021 (percentage point differences from baseline).

Country/Region	Japan		US	
	Trade creation	Trade diversion	Trade creation	Trade diversion
Japan			8.32	
US	27.72			
China		–1.79	0.37	
Korea		–0.61	0.23	
ASEAN		–1.54	0.38	
Australia and New Zealand		–4.21	1.54	
Rest of North America		–11.11	0.23	
EU27		–1.90	0.23	
Rest of World		–0.51		–0.03
Total (World)	2.10		0.64	

Finally, to answer our main research question, the JUFTA is unlikely to eliminate the US's trade deficit in goods with Japan, although the deficit will decrease (Figure 1). More precisely, the trade deficit in goods will decrease from –40,088 million USD for the 2021 baseline scenario to –20,251 million USD for the full trade liberalization scenario. This result occurs because of the increase in the trade surplus for agricultural goods (rising from 23,514 million USD in the baseline 2021 scenario to 53,525 million USD for the 2021 full trade liberalization scenario), which exceeds the increase in the trade deficit for nonagricultural goods (which increases from –63,602 million USD for the 2021 baseline scenario to –73,776 million USD for the 2021 full trade liberalization scenario).

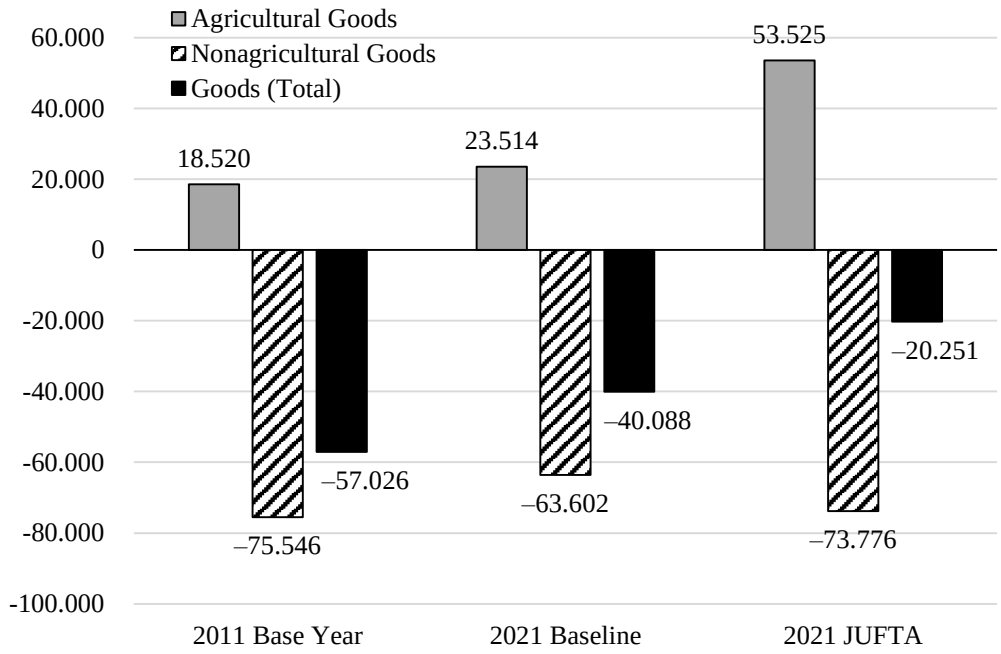

Figure 1: US Trade Balance with Japan (USD Millions).

4. Conclusion

We aimed to contribute to the debate on the potential economic impact of a JUFTA by asking the following question: can a JUFTA enable the US to eliminate its trade deficit in goods with Japan? To address this question, we measured the potential impact of a JUFTA using a dynamic GTAP model. We assumed that the JUFTA is implemented from 2017, tariffs are uniformly reduced over five years, and tariffs on all items are eliminated by 2021.

The main results are as follows. First, Japan is likely to experience a more substantial gain in real GDP than is the US because of the JUFTA. Second, the impact of the JUFTA is more observable in terms of agricultural output than in terms of real GDP in both Japan and the US. Third, the JUFTA not only has large impacts on the trading relationship between Japan and the US but also adverse impacts, resulting from trade diversion effects, on trading relationships with third-party countries that trade with Japan and the US. Finally, to answer our main research question, the JUFTA is unlikely to enable the US to eliminate its trade deficit in goods with Japan, although the deficit will decrease because of the JUFTA.

These results should be treated as preliminary because of the inevitable limitations associated with this type of simulation research task. For example, future research should consider simulations of other trade liberalization scenarios, such as a scenario excluding sensitive products, and the effect of nontariff barriers.

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Appendix–1: Regional Aggregation

No.	Aggregated country/region	GTAP country/region
1	Japan	Japan
2	US	United States
3	China	China
4	Korea	Korea
5	ASEAN	Indonesia, Singapore, Malaysia, Philippines, Thailand, Vietnam, Cambodia, Lao People's Democratic Republic, Brunei Darussalam, Rest of Southeast Asia
6	Australia and New Zealand	Australia, New Zealand
7	Rest of North America	Canada, Mexico
8	EU27	Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, United Kingdom
9	Rest of the world	All other economies/regions

Source: GTAP Database Version 9a.

Appendix–2: Sector Aggregation

No.	Aggregated sector	GTAP sector
1	Paddy rice	Paddy rice
2	Wheat	Wheat
3	Cereal grains nec	Cereal grains nec
4	Vegetables, fruit and nuts	Vegetables, fruit and nuts
5	Oil seeds	Oil seeds
6	Sugar cane, sugar beets	Sugar cane, sugar beets
7	Plant-based fibers	Plant-based fibers
8	Crops nec	Crops nec
9	Bovine cattle, sheep, goats, horses	Bovine cattle, sheep, goats, horses
10	Animal products nec	Animal products nec
11	Raw milk	Raw milk
12	Wool, silkworm cocoons	Wool, silkworm cocoons
13	Bovine cattle meat products	Bovine cattle meat products
14	Meat products nec	Meat products
15	Vegetable oils and fats	Vegetable oils and fats
16	Dairy products	Dairy products
17	Processed rice	Processed rice
18	Sugar	Sugar
19	Food products nec	Food products nec
20	Beverages and tobacco products	Beverages and tobacco products
21	Forestry, fishing	Forestry, Fishing
22	Natural resources	Coal, Oil, Gas, Mineral nec
23	Manufacturing	Textiles, Wearing apparel, Leather products, Wood products, Paper products, publishing, Petroleum, coal products, Chemical, rubber, plastic products, Mineral products nec, Ferrous metals, Metal nec, Metal products, Motor vehicles and parts, Transport equipment nec, Electronic equipment, Machinery and equipment nec, Manufactures nec
24	Transport	Transport nec, Water transport, Air transport
25	Services	Electricity, Gas manufacture, distribution, Water, Construction, Trade, Communication, Financial services nec, Insurance, Business services nec, Public administration, Defense, Education, Health, Dwellings

Source: GTAP Database Version 9a.
nec – not elsewhere classified.