GRIPS Discussion Paper 23-10

Review of Economic Impact of CPTPP

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October 2023

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Abstract

In the Asia-Pacific, free trade agreements (FTAs) and economic partnership agreements (EPAs) have been implemented intensively. However, a few major economies have been lagging behind that trend, and recent agreements have not always agreed on 100% tariff removals. This paper presents an overview of the development of EPAs in the Asia-Pacific and investigates quantitatively the relative significance of the impact of the expansion of the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), using a Computable General Equilibrium (CGE) model based on the most recent trade database and tariff data. The results of model simulations suggest that the impact of China joining CPTPP would be larger than that of the United States (US) joining, in terms of macroeconomic benefits to the CPTPP economies on average. That said, the macroeconomic effects of the US and/or China joining CPTPP vary in terms of both magnitude and direction among the CPTPP economies. Meanwhile, the impact at the sector level would also vary among those scenarios. The impact estimated by model simulations would also be dependent on the structure of the CGE model used. The impacts of EPAs in alternative scenarios are worth simulating (using the same model version) and comparing.

Key words: Asia-Pacific, Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), Computable General Equilibrium (CGE) model
JEL classification: C68, F13, F15, F17

Review of Economic Impact of CPTPP

I. Introduction

Trade and investment liberalization and facilitation have been promoted through bilateral and multilateral free trade agreements (FTAs) and economic partnership agreements (EPAs), alongside those global initiatives under the World Trade Organization (WTO). In the Asia-Pacific, two major pathways toward the Free Trade Area of the Asia-Pacific (FTAAP) have been implemented: the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), which took effect in December 2018; and the Regional Comprehensive Economic Partnership (RCEP) Agreement, in force as of January 2022. That said, a few major economies have been lagging behind those global trends. Meanwhile, recent trade agreements have not always agreed on 100% tariff removals.

In the meantime, analytical tools for economic impact assessment, including trade and economic databases and economic models, have been developed. The Global Trade Analysis Project (GTAP)[1] has updated its globally coordinated trade and tariff database every few years, with version eleven, the latest, released in 2023. Moreover, two key sets of trade protection data have been constructed: the tariff reduction schedules of EPAs entered into force over time by Market Access Map, International Trade Centre (ITC)[2]; and the estimated ad valorem equivalents (AVEs) of non-tariff measures (NTMs) initially created by the World Bank (WB) and the United Nations Conference on Trade and Development (UNCTAD).

The main objective of this policy analysis is to investigate the economic impact of possible expansion of CPTPP, which could be expected to be the next step forward in Asia-Pacific trade liberalization. A Computable General Equilibrium (CGE) model will be applied to the most recent trade database and tariff data,[3] focusing on the relative significance of the impact in a few alternative scenarios involving the United States (US) and/or China, the two major economies in the Asia-Pacific Economic Cooperation (APEC), joining CPTPP. With regard to that modeling, the methodology used in earlier studies to estimate the economic impact of EPAs will be reviewed. The absolute magnitudes of the estimated impact of EPAs would vary depending on the policy

[1] https://www.gtap.agecon.purdue.edu/
[2] https://www.macmap.org/
[3] This paper was drafted based on the data available as of the end of September 2023.

scenarios studied and the design of the framework of the economic models.

The remaining part of this paper is organized as follows. Chapter II will discuss the development of EPAs in the Asia-Pacific, including trends in tariff reductions. Chapter III will present the impact of possible alternative expansions of CPTPP. Chapter IV will analyze the sensitivity of model simulations with respect to the framework of economic models, including dynamic effects and parameter sizes. Chapter V will provide brief conclusions.

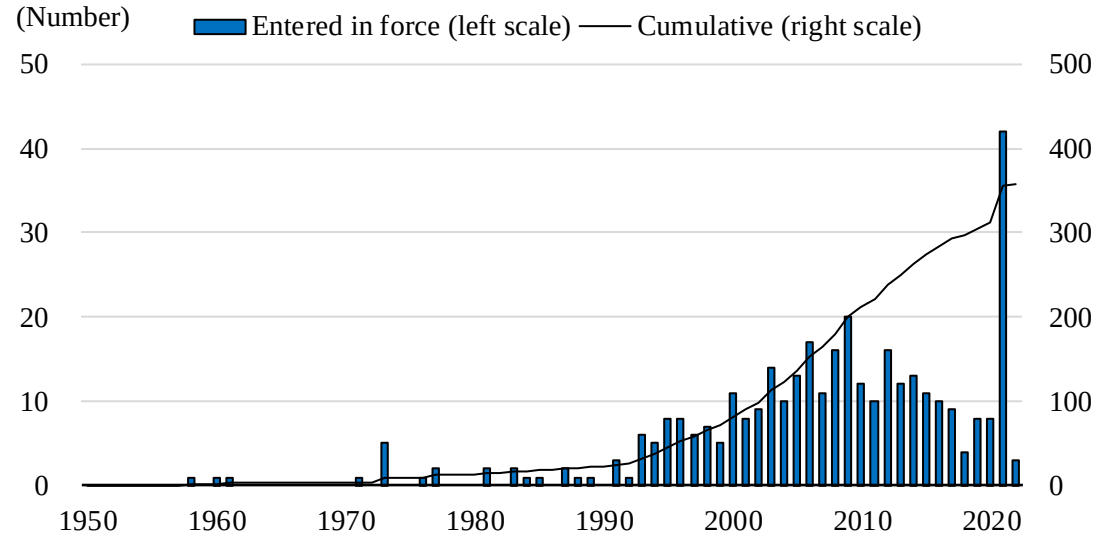
II. Development of EPAs in the Asia-Pacific

1) Progress of EPAs

The number of Regional Trade Agreements (RTAs) in force in the world has increased since the mid-1990s, particularly when the Uruguay Round negotiation was concluded in December 1993 under the General Agreement on Tariffs and Trade (GATT), as is shown in Chart 1. That number peaked once, around the end of the 2000s, but surged in 2021 mainly as a result of the RTAs implemented by the United Kingdom (UK), who left the European Union (EU) and individually re-concluded agreements with trade partners. There were 358 RTAs in force in the world in 2022.

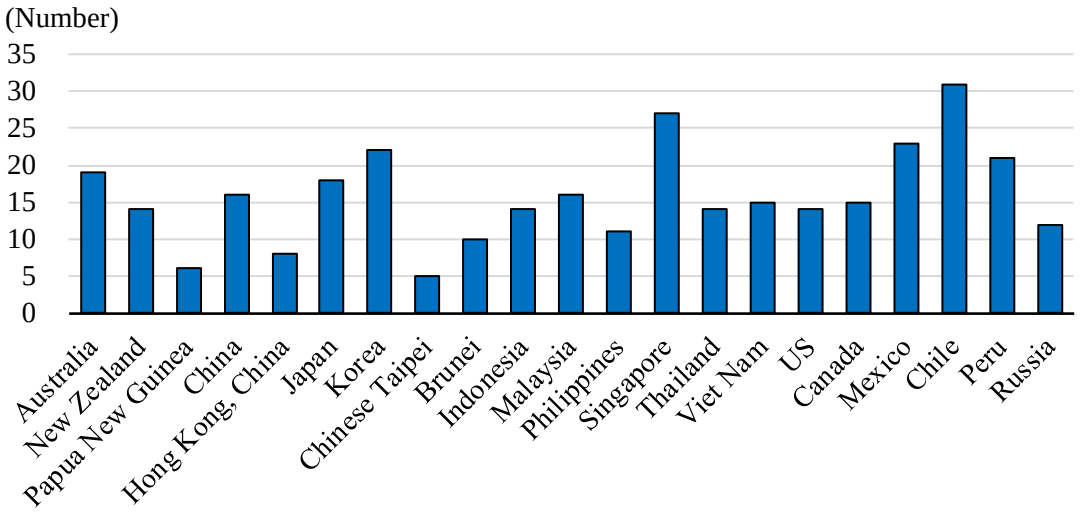
That said, the number of RTAs in the APEC economies varies by economy. as can be seen in Chart 2. Chile ranks first, with 31 RTAs, followed by Singapore (27). Major

Chart 1 Trends in RTAs entered in force in the world



Source: Based on Regional Trade Agreements Database, WTO.

Chart 2 Number of RTAs in the APEC economies



Source: Based on Regional Trade Agreements Database, WTO.

economies ranked around the APEC average (16) include the US (14), China (16) and Japan (18). On the other hand, a few economies, including Papua New Guinea; Hong

Table 1 Existing RTAs among the APEC economies

	AU	NZ	PG	CN	HK	JP	KR	TW	BR	ID	MY	PH	SG	TH	VN	US	CA	MX	CL	PE	RU
AUS	-	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	0
NZL	1	-	0	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0
PNG	1	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CHN	1	1	0	-	1	0	1	0	1	1	1	1	1	1	1	0	0	0	1	1	0
HKG	1	1	0	1	-	0	0	0	1	1	1	1	1	1	1	0	0	0	1	0	0
JPN	1	1	0	0	0	-	0	0	1	1	1	1	1	1	1	0	1	1	1	1	0
KOR	1	1	0	1	0	0	-	0	1	1	1	1	1	1	1	1	1	0	1	1	0
TWN	0	1	0	0	0	0	0	-	0	0	0	0	1	0	0	0	0	0	0	0	0
BRN	1	1	0	1	1	1	1	0	-	1	1	1	1	1	1	0	1	1	1	1	0
IDN	1	1	0	1	1	1	1	0	1	-	1	1	1	1	1	0	0	0	1	0	0
MYS	1	1	0	1	1	1	1	0	1	1	-	1	1	1	1	0	1	1	1	1	0
PHL	1	1	0	1	1	1	1	0	1	1	1	-	1	1	1	0	0	0	0	0	0
SGP	1	1	0	1	1	1	1	1	1	1	1	1	-	1	1	1	1	1	1	1	0
THA	1	1	0	1	1	1	1	0	1	1	1	1	1	-	1	0	0	0	1	0	0
VNM	1	1	0	1	1	1	1	0	1	1	1	1	1	1	-	0	1	1	1	1	1
USA	1	0	0	0	0	0	1	0	0	0	0	0	1	0	0	-	1	1	1	1	0
CAN	1	1	0	0	0	1	1	0	1	0	1	0	1	0	1	1	-	1	1	1	0
MEX	1	1	0	0	0	1	0	0	1	0	1	0	1	0	1	1	1	-	1	1	0
CHL	1	1	0	1	1	1	1	0	1	1	1	0	1	1	1	1	1	1	-	1	0
PER	1	1	0	1	0	1	1	0	1	0	1	0	1	0	1	1	1	1	1	-	0
RUS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	-

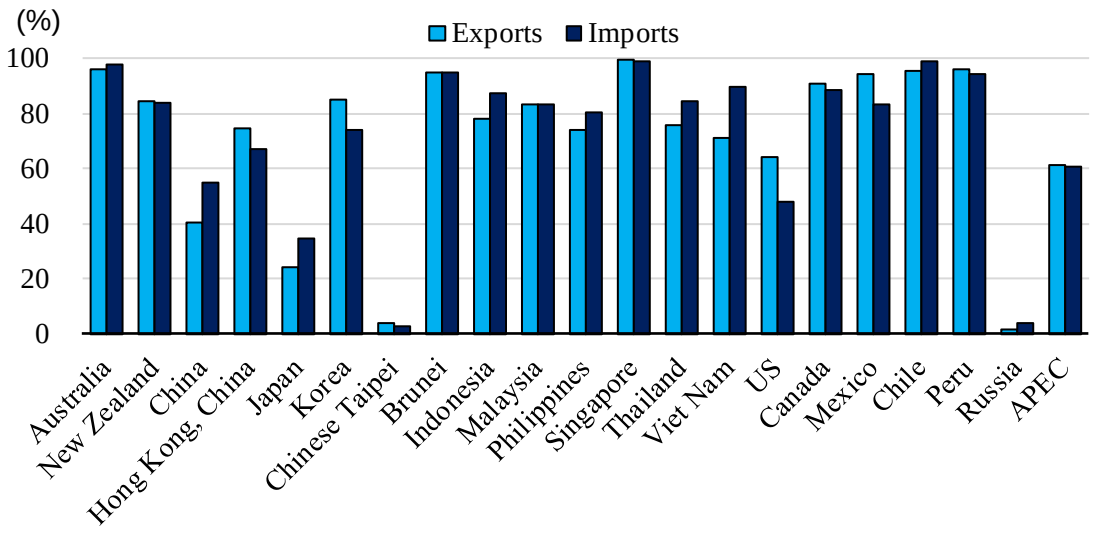
Note: 1 means there are at least one EPA and 0 means there are no EPAs.
Source: Author's compilation based on Regional Trade Agreements Database, WTO.

Kong, China; and Chinese Taipei, with fewer than 10 RTAs each, have been lagging.

The combination of the APEC economies between which bilateral and/or multilateral EPAs have entered into force are shown in Table 1,[4] based on the RTA Database, WTO. Association of Southeast Asian Nations (ASEAN) economies have implemented EPAs within ASEAN and with major Northeast Asia economies. Meanwhile, the RCEP members consist of East Asia economies. On the other hand, the CPTPP members consist of selected East Asian economies (Australia, New Zealand, Japan, Brunei, Malaysia, Singapore, Viet Nam) and economies in the Americas (Canada, Chile, Mexico and Peru but not the US). It is indicated that there have been intracontinental EPAs within both East Asia and the Americas, where trade relations are closer than with other economies, but to a lesser extent intercontinentally between East Asia and Americas.

The APEC economies on average have been indicated to implement EPAs with around 60% of the APEC trade partners in terms of trade shares, as can be seen in Chart 3. Three major economies, the US, China and Japan, are suggested to implement EPAs to a lesser extent than other economies. Meanwhile, the lagging behaviors of Chinese Taipei and Russia mentioned above are much more clearly indicated, and among the economies shown in Chart 3,[5] those two economies are indicated to be strikingly isolated from the

Chart 3 Trade shares with RTA partners in the APEC economies



Source: Author's calculations based on GTAP 11a Data Base, 2017, GTAP, and Regional Trade Agreements Database, WTO.

[4] It must be noted that as of September 2023, RCEP and the Japan-US Trade Agreement had not yet formally been included in the RTA Database, WTO. Therefore, the pairs Japan and China; Japan and Korea; and Japan and the US are indicated here as having no EPAs between them.

[5] Data for Papua New Guinea is not available in the GTAP database, so Papua New Guinea is not

other APEC economies.

2) Trends in tariff reductions

In 1994 Leaders' Declaration,[6] the APEC economic leaders agreed to adopt the "goal of free and open trade and investment in the Asia-Pacific no later than the year 2020," known as the Bogor Goal. The tariff rates in the APEC economies imposed on imports from the APEC economies have been reduced from 7.9% in 1995 to 1.9% in 2017 on average according to the most recent GTAP 11a Data Base,[7] as is shown in Table 2. The Bogor goal was not fully achieved and has been succeeded by the vision of the APEC Putrajaya Vision 2040 in 2020 Leaders' Declaration:[8] "an open, dynamic, resilient and peaceful Asia-Pacific community by 2040."

ITC has studied the tariff reduction schedules of existing EPAs in the world and provides that information in Market Access Map. Those tariff data, aside from the Trans-Pacific Partnership (TPP) in ITC (2015) and those under TPP in ITC (2016), have been used to analyze the impact of TPP in USITC (2016) and others. Those studies have been

Table 2 Trends in APEC tariff rates

(%)

	1995	2017	Future		1995	2017	Future
Australia	8.9	0.9	0.1	New Zealand	3.5	1.0	0.3
China	27.7	3.2	1.6	Hong Kong, China	0.0	0.0	0.0
Japan	14.1	2.2	1.0	Korea	10.4	2.6	0.9
Chinese Taipei	9.7	2.0	2.0				
Brunei	n.a.	0.1	0.0	Indonesia	8.4	1.4	0.8
Malaysia	10.4	1.2	0.6	Philippines	25.5	1.5	1.0
Singapore	1.4	0.0	0.0	Thailand	17.0	2.5	1.9
Viet Nam	19.6	2.1	0.8				
US	2.3	1.5	1.4	Canada	1.1	0.8	0.5
Mexico	1.5	0.9	0.8	Chile	10.4	0.2	0.2
Peru	n.a.	0.8	0.4				
Russia	12.2	5.7	5.4				
Average above	7.9	1.9	1.2				

Source: Author's calculations based on GTAP 4 and 11a Data Base, GTAP and Market Access Map, ITC.

included in Chart 3.

[6] https://www.apec.org/meeting-papers/leaders-declarations/1994/1994_aelm

[7] The methodology for computing tariff protection in the GTAP database in terms of average AVEs including the assessment of Tariffs Rate Quotas (TRQs) is described in Guimbard, H., S. Jean, M. Mondher and X. Pichot (2012).

[8] https://www.apec.org/meeting-papers/leaders-declarations/2020/2020_aelm

extended to cover all existing EPAs in the world in 2020, and subsequently were maintained and updated to include additional EPAs that had entered in force.

Tariff rates in the APEC economies would be reduced further, to 1.2%,[9] in the future when major in force EPAs[10] would fully be implemented (according to Market Access Map, ITC as is also shown in Table 2). It is expected that tariffs would be reduced to almost zero in Australia (0.1%); New Zealand (0.3%); Hong Kong, China (0.0%), Brunei (0.0%), Singapore (0.0%) and Chile (0.2%). On the other hand, higher than APEC average tariff rates would persist in a few economies, including China (1.6%), Chinese Taipei (2.0%), Thailand (1.9%), the US (1.4%) and in particular Russia (5.4%).

That said, it must be noted that recent EPAs in the Asia-Pacific have not always agreed on 100% tariff removals. One notable feature has been indicated in Japan. According to calculations of decreases in tariff revenues and payments by the Japanese Cabinet Secretariat and several ministries,[11] Japan's tariff revenues would be reduced by 53–66% under major EPAs other than the Japan-EU EPA. Japan's tariff payment would

Table 3 Calculated decreases in Japan's tariff values under major EPAs

(%)

Tariff revenues	Total	Agriculture	Manufacturing
TPP	65	64	66
CPTPP	53	55	43
Japan-US Trade Agreement	66	78	4
Japan-EU EPA	91	92	90
RCEP	57	10	87
Tariff payment	**Total**	**Agri. forest. fisheries**	**Manufacturing**
TPP	100	97	100
CPTPP	100	100	99
Japan-US Trade Agreement	82	50	82
Japan-EU EPA	100	96	100
RCEP	61	61	61

Sources: Author's calculations based on calculations by CAS, MOF, MAFF and METI.

[9] The average APEC tariff rate in terms of Most Favored Nation (MFN) tariffs under WTO is calculated to be around 3.3% in 2020 based on WTO Stats, WTO. This would indicate that APEC tariffs have been reduced by around two thirds, from 7.9% to 3.3%, on an MFN basis under WTO, and those would be reduced by around one third from 3.3% to 1.2% at a preferential basis under EPAs.

[10] Those include the Japan-US Trade Agreement entered in force in January 2020 and the US-Mexico-Canada Agreement (USMCA) entered in force in July 2020, in addition to CPTPP and RCEP.

[11] Cabinet Secretariat (CAS), Ministry of Finance (MOF), Ministry of Agriculture, Forestry and Fisheries (MAFF) and Ministry of Economy, Trade and Industry (METI).

be reduced by 61% under RCEP and by 82%[12] under the Japan-US Trade Agreement, as is shown in Table 3.

It should be noted that according to the GATT Article 24, "a free-trade area shall be understood to mean … in which the duties … are eliminated on substantially all the trade…" The definition of "substantially all the trade" may not have been made explicit yet, but Japan's EPAs, discussed above, would not necessarily cover substantially all the trade. As a matter of fact, in the RTA Database, as of August 2023, WTO has included CPTPP and the Japan-EU EPA but not the Japan-US Trade Agreement and RCEP, as mentioned earlier. WTO has argued that "the vast majority of such new plurilateral agreements have not…superseded existing bilateral agreements."[13]

III. Impact of CPTPP expansion

1) Earlier literature

Initial efforts to study the impact of APEC trade and investment liberalization and facilitation by means of CGE model simulations by the APEC Economic Committee are referred to in APEC (1997), with primary contributions by Japan and Singapore. It was concluded that "implementation of MAPA (the Manila Action Plan for APEC) by APEC member economies will bring substantial income and trade benefits" and "It should therefore provide considerable momentum to APEC's ongoing liberalization agenda." In the meantime, numerous studies on the impact of trade and investment liberalization and facilitation, including that of implementing EPAs in the APEC economies, have been carried out by international experts.

After TPP negotiations were concluded in 2015, the governments of the following five TPP members at that moment conducted impact assessments based on their own resources.[14]

Global Affairs Canada (GAC, 2016)
Japan Cabinet Secretariat (CAS, 2015)
Malaysia Ministry of International Trade and industry (MITI, 2015)
New Zealand Ministry of Foreign Affairs and Trade (MFAT, 2016)

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[12] This figure may even be elevated to include possible tariff reductions on motor vehicles, which have not necessarily been formally scheduled yet.
[13] https://www.wto.org/english/tratop_e/region_e/region_e.htm
[14] Meanwhile, Australia conducted National Interest Analysis (NIA) citing a study by the World Bank (WB, 2016).

Table 4 Framework of TPP impact analysis by government

	Canada	Japan	Malaysia	New Zealand	US
Policy scenarios					
Tariff reductions	Y	Y	Y	Y	Y
Trade facilitation		Y		Y	Y
NTMs (goods)			Y	Y	Y
NTMs (services)	Y		Y	Y	Y
Investment liberalization					Y
Economic effects					
Capital accumulation	Y	Y	Y	Y	Y
Endogenous labor supply		Y			Y
Productivity improvement		Y			

Source: Author's compilation based on GAC (2016), CAS (2015), MITI (2015), MFAT (2016) and USITC (2016).

United States International Trade Commission (USITC, 2016)[15]

All of the above CGE model analyses indicate macro level income gains from TPP. That said, the framework of the above TPP impact studies varied both in terms of policy scenarios and the economic effects incorporated in model simulations, as is shown in Table 4. It would be likely that the magnitudes of the estimated economic impacts would also vary among those studies. That possible variation among model simulations will be discussed further in Chapter IV.

TPP has been expected to be a new century EPA covering not just traditional market access issues of tariff reductions but also various issues related to reductions of NTMs in goods as well as services and investment barriers. Among others, MFAT (2016) argues that the GDP of New Zealand would increase much more due to the reductions in NTMs than to the reductions in tariffs and quota barriers based on the commissioned study (Strutt, Minor and Rae, 2015), which estimated the potential impact of TPP assuming possible levels of those reductions in tariffs, NTMs and others. On the other hand, Ciuriak, Dadkhah and Xiao (2016) points out that NTM reductions under TPP would be limited, and that Canada would mainly gain by tariff reductions and the binding of the services market access based on the quantification of the impact of the agreement. The actual impact of TPP needs to be verified based on a precise assessment of provisions in the agreement rather than on broad assumptions.

[15] This is based on Trade Promotion Authority (TPA) under the Bipartisan Congressional Trade Priorities and Accountability Act of 2015, which stated that "Not later than 105 calendar days after the President enters into a trade agreement …, the (International Trade) Commission shall submit to the President and Congress a report assessing the likely impact of the agreement on the United States economy as a whole and on specific industry sectors …."

When the US decided to withdraw from TPP, international experts compared the estimated impact of TPP without the US with that of TPP with the US (Ciuriak, Xiao and Dadkhah (2017), Kawasaki (2017), and Petri, Plummer, Urata and Zhai (2017)). Those studies found that the economic benefits from TPP without the US and CPTPP would still be significant. Among others, Kawasaki (2017) has attributed that impact to possible spillover effects of NTM reductions. Many NTMs would be related to regulations behind the border and could not be reduced in a preferential basis among the members of EPAs. The change in NTMs would be applied universally to non-member economies of EPAs as if on an MFN basis. In addition to the magnitudes of NTM reductions,[16] the degree of those spillover effects would need to be identified by means of detailed analysis.

2) Framework of model simulations

In this paper, the impact of EPAs is estimated using the standard GTAP model, version 7 (Corong, Hertel, McDougall, Tsigas and van der Mensbrugghe, 2017) based on the most recent GTAP database, i.e. GTAP 11a Data Base released in August 2023, which was the bug-fix version of the GTAP 11 Data Base (Aguiar, Chepeliev, Corong and van der Mensbrugghe, 2022).

The GTAP 11a Data Base provides global trade and protection data for 141 economies and 19 aggregated regions in 65 sectors in the five reference years up to 2017, extended from 2014 in version 10, released in July 2019. Those data are aggregated to 29 economies and 15 sectors for the model simulations in this study, as is shown in Tables 5-A and 5-B. The APEC member economies are disaggregated, except for Papua New

Table 5-A Sector aggregation

AFF	Agriculture, forestry and fisheries	MNG	Mining
PFD	Processed foods	TXL	Textiles and apparel
OMF	Other manufacturing	CHM	Chemical products
MTL	Metals	MVH	Motor vehicles
OME	Other machinery	ELE	Electronic products
EGW	Electricity, gas and water	CNS	Construction
T_T	Transportation	OSP	Other private services
OSG	Public services		

Source: Author's compilation based on GTAP 11a Data Base, GTAP.

[16] UNCTAD and World Bank have collected NTM data and estimated the AVEs of NTMs (UNCTAD and WB, 2018). The latest methodology for estimating the AVEs of NTMs is described in Kee and Nicita (2022). Those estimated AVE rates of NTMs have been somewhat lower than that, possibly guided by earlier data including Overall Trade Restrictiveness Indices (OTRI), WB. It is possible that in earlier studies, including Kawasaki (2017), those assumed higher AVEs of NTMs led to overestimation of the impact of NTM reductions.

Table 5-B Regional aggregation

AUS	Australia	NZL	New Zealand
CHN	China	HKG	Hong Kong, China
JPN	Japan	KOR	Korea
TWN	Chinese Taipei	BRN	Brunei
IDN	Indonesia	MYS	Malaysia
PHL	Philippines	SGP	Singapore
THA	Thailand	VNM	Viet Nam
USA	US	CAN	Canada
MEX	Mexico	CHL	Chile
PER	Peru	RUS	Russia
KHM	Cambodia	LAO	Laos
XSE	Myanmar*	IND	India
OAO	Other Asia-Pacific	CSA	Other central and south America
EUM	EU	GBR	UK
ROW	Rest of the world		

Note: * Proxied by the composite region of Myanmar and Timor-Leste.
Source: Author's compilation based on GTAP 11a Data Base, GTAP.

Guinea, where data is not available in the GTAP database. Sectors are aggregated in line with the standard medium classification of national account.

The APEC economies accounted for around 40% of the world population in 2017, with half of that contributed by China (18.5%) according to the GTAP 11a Data Base, as is shown in Table 6. The share of the APEC economies in terms of GDP is around 60% (led by the US (23.9%) and China (15.1%)), which is higher than the share in terms of population. On the other hand, the share of the APEC economies in world trade is less

Table 6 APEC economies in the world

(%)

	Population	GDP	Trade		Population	GDP	Trade
Australia	0.3	1.6	1.5	New Zealand	0.1	0.3	0.2
China	18.5	15.1	10.8	Hong Kong, China	0.1	0.4	1.0
Japan	1.7	6.1	4.1	Korea	0.7	2.0	3.0
Chinese Taipei	0.3	0.7	1.5				
Brunei	0.0	0.0	0.0	Indonesia	3.5	1.2	0.9
Malaysia	0.4	0.4	1.1	Philippines	1.4	0.4	0.6
Singapore	0.1	0.4	1.5	Thailand	0.9	0.6	1.2
Viet Nam	1.3	0.3	1.2				
US	4.3	23.9	12.0	Canada	0.5	2.0	2.4
Mexico	1.7	1.4	2.1	Chile	0.2	0.3	0.4
Peru	0.4	0.3	0.2				
Russia	1.9	1.9	1.6				
Above total	38.3	59.4	47.4				

Source: Author's calculations based on GTAP 11a Data Base, 2017, GTAP.

than 50% since the EU has a larger share of world trade than that in terms of GDP. The shares of trade of the US and China are also lower than those economies' GDP shares. On the other hand, the trade shares of Hong Kong, China; Korea, Chinese Taipei, Malaysia, Singapore, Thailand, Viet Nam and Mexico are notably higher than their shares of GDP.

The standard GTAP model is a multi-region, multi-sector CGE model linking economies through international trade, and introducing imperfect substitutes of commodities among economies through the Armington assumption (Armington, 1969). In the model used in this paper, trade balance is not fixed, and international capital movement is endogenously determined, with the expected rates of return on capital equalized among economies.

Moreover, a few dynamic effects are incorporated into the standard framework of fixed production endowments with perfect competition and constant return to scale. It must be noted that the magnitudes of the estimated impacts of EPAs would be dependent on the possible dynamic effects incorporated into the model used here, and others, as discussed later.

First, capital stock is endogenous incorporating the equation below (which links changes in investment to capital stock) employing the methodology in Francois, McDonald and Nordström (1996).

$$qinv\ (r) = qe\ (capital, r)$$

$qinv\ (r)$: change in demand for investment goods in region r
$qe\ (capital, r)$: change in supply of capital stock in region r

Second, labor supply is also endogenous incorporating the following equation, which links changes in real wage to labor supply, following the methodology in CAS (2015) and USITC (2016). The real wage elasticity of labor supply (EWL) is assumed here to be 0.8, equal to that used in CAS (2015).[17]

$$qe\ (labor, r) = EWL * (pe\ (labor, r) - ppriv\ (r))$$

$qe\ (labor, r)$: labor supply change in region r
EWL: real wage elasticity of labor supply
$pe\ (labor, r)$: labor price change in region r
$ppriv\ (r)$: change in private consumption price in region r

[17] USITC (2016) used 0.4 as the labor supply elasticity for developed economies and 0.44 as that of developing economies.

Third, productivity improvement of economy at region-wide levels (but not at individual sector levels) is introduced by the equation below, which links trade openness to output technology, following the methodology in CAS (2015). The trade openness parameter of productivity (ETP) is assumed here to be 0.15, based on empirical studies cited in CAS (2015).

$$aoreg\ (r) = ETP * (qxm\ (r) - qgdp\ (r))$$

$aoreg\ (r)$:	output technology change in region r
ETP:	trade openness parameter of productivity
$qxm\ (r)$:	exports and imports change in region r
$qgdp\ (r)$:	GDP change in region r

After the US withdrew from TPP, CPTPP entered into force among the remaining eleven members in December 2018. In addition, the UK formally signed its accession to CPTPP in July 2023. In the meantime, China, Chinese Taipei and another few economies have applied to join CPTPP. The impact of tariff reductions and removals will be compared here among the following scenarios, assuming that the UK would be the twelfth member of CPTPP. The possible impact of other policy measures, including reduction of NTMs and service and investment liberalization, are not included here. This study will focus on the impact of two major economies (the US and/or China) joining CPTPP. The macroeconomic impact of the UK joining CPTPP, and of other economies joining CPTPP along with the UK, are shown in Annex Table 1.[18]

CPTPP:	reductions among eleven CPTPP members
US:	removals between twelve CPTPP members and the US
China:	removals between twelve CPTPP members and China
US and China:	removals among twelve CPTPP members, the US and China

The impact of CPTPP is estimated assuming that the eleven CPTPP members would reduce tariffs, in line with the actual agreement, from their 2017 levels according to the GTAP 11a Data Base. This may overestimate the impact of CPTPP to some extent, as the tariffs in CPTPP economies would be reduced from those levels in 2017 in line with the implementation of EPAs entered in force before CPTPP. On the other hand, the impact of the US and/or China joining CPTPP is estimated assuming that tariffs remaining after implementation of existing EPAs between the twelve CPTPP members (including the UK) and the US and/or China would fully be removed, but the CPTPP members would not reduce the remaining tariffs among the CPTPP members. This would also overestimate the actual impact of the expansion of CPTPP to some extent, depending on

[18] The UK has implemented bilateral EPAs with all the CPTPP members except Brunei and Malaysia, and with Korea among the non-CPTPP members in the APEC economies.

the achievement of tariff reductions under alternative scenarios.

3) Estimated results

a) At the macro level

The estimated real GDP impacts of the alternative scenarios of CPTPP expansion are shown in Table 7. If the US joined CPTPP, US real GDP is estimated to increase[19] by 0.33%. Real GDP is also estimated to increase by similar magnitudes in the UK (0.24%) and the eleven CPTPP members (0.29% on average), which would account for around 60% of real GDP gains by the eleven CPTPP members under CPTPP (0.50%). The

Table 7 Real GDP impact of alternative CPTPP

(%)

	CPTPP	US	China	US and China
Australia	0.67	-0.10	0.05	-0.10
New Zealand	0.86	0.24	0.01	0.02
Japan	0.65	0.59	0.80	0.98
Brunei	0.03	-0.04	0.11	-0.05
Malaysia	0.50	0.40	0.26	0.26
Singapore	0.16	-0.11	-0.01	-0.45
Viet Nam	1.35	3.71	0.58	2.66
Canada	0.21	0.04	0.50	0.44
Mexico	0.16	-0.49	1.63	0.61
Chile	0.14	-0.27	0.13	-0.41
Peru	0.09	-0.14	0.31	-0.02
CPTPP above	0.50	0.29	0.66	0.62
UK	-0.02	0.24	0.95	1.00
US	-0.04	0.33	-0.04	1.27
China	-0.03	-0.13	1.28	2.78
Hong Kong, China	0.00	-0.09	0.23	0.26
Korea	-0.03	-0.16	-0.07	-0.52
Chinese Taipei	-0.02	-0.09	-0.09	-0.52
Indonesia	-0.06	-0.27	-0.13	-0.96
Philippines	-0.02	-0.25	-0.05	-0.79
Thailand	-0.31	-0.22	-0.24	-1.02
Russia	-0.02	-0.17	0.01	-0.37
APEC	0.08	0.14	0.45	1.28

Source: Author's simulations.

[19] This does not necessarily mean that there would be any increases and/or decreases from the current levels of real GDP to those in the future over time. The estimates by a CGE model compare the levels of real GDP and other economic variables at some point in the future between the two states of equilibrium, one business as usual without any policy shocks and the other with policy shocks.

remaining APEC economies would lose, due to adverse price effects which could be larger than possible income effects. APEC real GDP is estimated to increase by 0.14%, which would account for half of the magnitude of real GDP gain by the CPTPP members.

What is striking is that a few CPTPP members would be indicated to lose rather than gain as far as the impact of tariff removals are concerned. This is due to possible adverse trade diversion effects more than offset trade creation effects and income effects. The US has already implemented FTAs and EPAs with Australia, Singapore, Canada, Mexico, Chile, and Peru, as is shown in Table 1. Tariffs with the US would be reduced for the other CPTPP members but would not necessarily be further reduced with those economies. The trade of those economies with the US would no longer be boosted significantly and would largely be replaced by the trade of the other CPTPP members with the US.

If China joined CPTPP, China's real GDP is estimated to increase by 1.28%, which accounts for around four times the magnitude of US real GDP gain upon the US joining CPTPP. Real GDP of the UK (0.95%) and the eleven CPTPP members on average (0.66%) would increase more than that under the US joining CPTPP, as far as the impact of full tariff removals is concerned. Moreover, the real GDP of the individual CPTPP members would increase across the board except for Singapore, which would experience a negligible decrease. The real GDP of the remaining APEC economies would still decrease but to a lesser extent, and would result in a larger increase (0.45% in the APEC economies as a whole) than in the case of the US joining CPTPP.

The impact of both the US and China joining CPTPP would not necessarily be a simple combination of the effects of the US and China joining CPTPP separately (as discussed above) resulting from additional tariff removals between the US and China. Real GDP would increase more in the US (1.27%) and in China (2.78%) than the simple sum of the two impacts due to significant trade creation effects between the US and China. On the contrary, real GDP in the eleven CPTPP economies and the UK would increase less, or turn to decrease and even decrease more than the simple sum of the two impacts, due once again to the trade diversion effects discussed above. The real GDP of the APEC economies in total is estimated to increase the most (1.28%) among the alternative scenarios here, reflecting significant impact on the US and China themselves.

Another useful policy implication could be derived, looking at the estimated impact horizontally, by comparing the impact on individual economies across the alternative scenarios. Australia, New Zealand and Brunei would not significantly gain more from the US and/or China joining CPTPP. Japan would still gain equally from the

three scenarios of the US and/or China joining CPTPP. Singapore and Chile would lose from the US joining CPTPP and even more from both the US and China joining CPTPP. Malaysia, and even more so Viet Nam, would gain more from the US joining CPTPP than from China joining. Canada, Mexico and Peru would lose or gain little from the US joining CPTPP, but would gain from China joining CPTPP. The variation in significance of those economic impacts among alternative scenarios would be worth considering from the perspective of policy priorities among the CPTPP members.

b) At the sector level

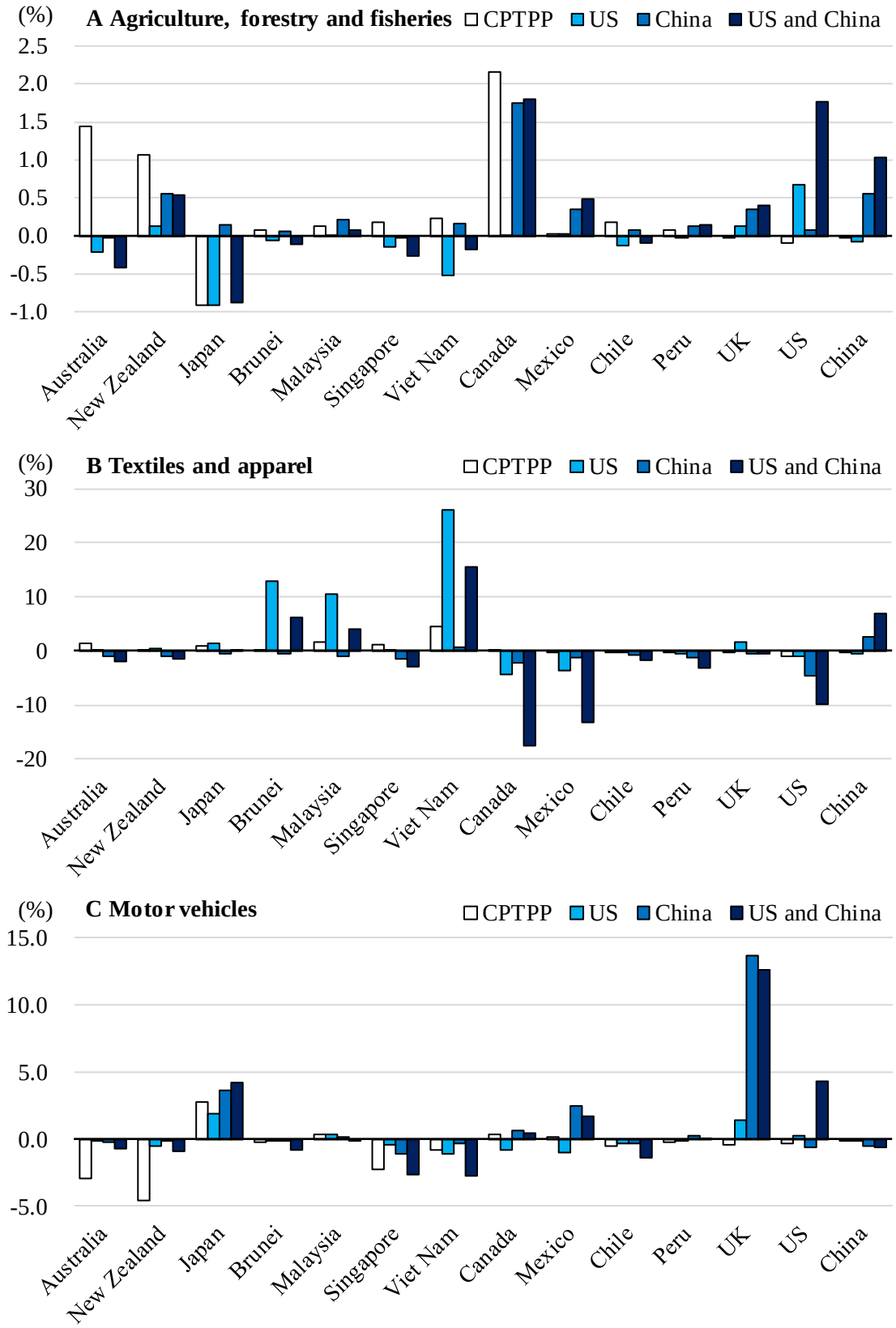
The impact of trade liberalization and structural reform measures would be much larger at the sector level than at the macro level. Winners and losers among sectors would be generated as the result of implementation of EPAs in line with the comparative advantage of economies. Agriculture production would be boosted in physically larger economies; light manufacturing production would be boosted in labor intensive economies; and heavy manufacturing production in capital intensive economies. Moreover, actual impact would be affected by the level of trade protection prior to liberalization, which would be higher in less competitive sectors among economies. The impact of alternative CPTPP scenarios on sector production, by economy, is shown in Annex Table 2-A to 2-D. Impacts on three representative sectors, by economy, are compared in Chart 4.

- In the agriculture, forestry and fisheries sector, production would increase in Australia, New Zealand and Canada under CPTPP and in the US if the US joined CPTPP, as well as in China if China joined CPTPP. Japan would be a loser in this sector under CPTPP,[20] and if the US joined CPTPP, but not necessarily if China joined CPTPP. That said, those rates of change in sector production would be in a limited range of a few percent as far as the impact on the agriculture, forestry and fisheries sector at an aggregated level is concerned. The impact on individual sectors at disaggregated levels could be sizable, depending on the sector.

- In the textiles and apparel sector, production would significantly increase in Brunei, Malaysia and notably in Viet Nam if the US joined CPTPP. On the other hand, it would decrease in Canada, Mexico and the US to a large extent if the

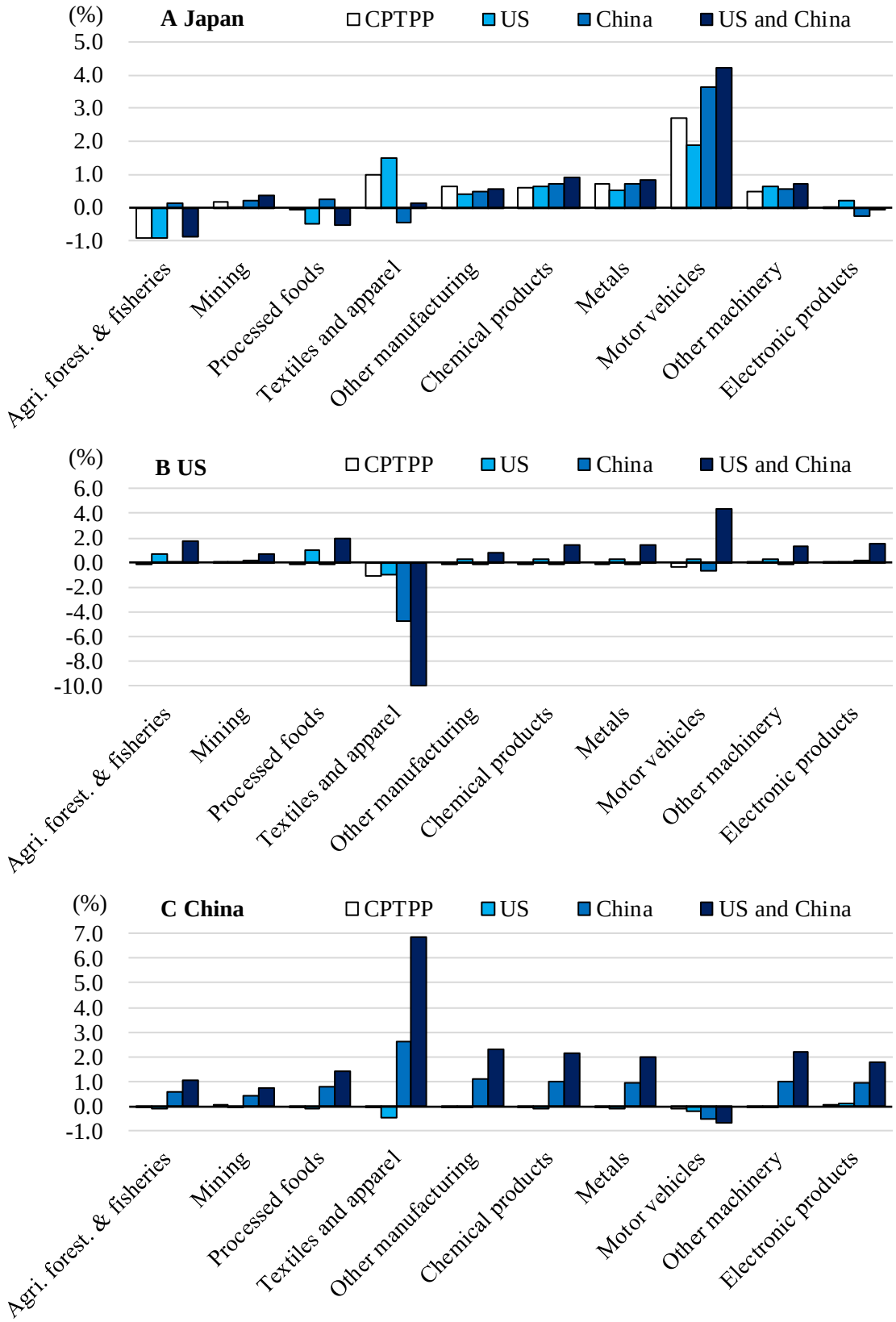
[20] Japan has been exempted from tariff reductions in several sensitive sectors including rice, wheat, sugar, meat and dairy products under TPP and CPTPP. The possible impact of tariff removals in those sectors is included in the current simulations.

Chart 4 Impact on production by economy



Source: Author's simulations.

Chart 5 Impact on production by sector



Source: Author's simulations.

US and China both joined CPTPP.

- In the motor vehicles sector, production would increase in Japan regardless of the alternative scenarios studied here. It would significantly increase in the UK if China joined CPTPP, and to a lesser extent in the US if both the US and China joined CPTPP. On the other hand, it would decrease in Australia, New Zealand and Singapore under CPTPP.

The impact on production in the three major APEC economies is again compared by sector in Chart 5.

- Japan's production in manufacturing sectors would be boosted widely under CPTPP and by the US and/or China joining CPTPP, and boosted most in motor vehicles. Meanwhile, production of textiles and apparel and of electronic products would increase if the US joined CPTPP, but would decrease if China joined CPTPP. On the other hand, production in agriculture, forestry and fisheries and in processed food would decrease if the US joined CPTPP but would not necessarily decrease if China joined CPTPP.

- The US would gain in agriculture, forestry and fisheries as well as in processed foods, but would lose in textiles and apparel upon the US joining CPTPP. If China joined CPTPP, production in textiles and apparel is estimated to decrease more than in the case of the US joining CPTPP, and much more significantly if the US and China both joined CPTPP. On the other hand, production would be boosted widely in other sectors, most notably in motor vehicles, if both the US and China joined CPTPP.

- China's production would increase widely across sectors, most notably in textiles and apparel, with the exception of motor vehicles. Those changes would be intensified if the US joined CPTPP along with China.

All in all, it is indicated that the key winners and losers in Japan, the US and China would be agriculture, forestry and fisheries; textiles and apparel; and motor vehicles, as observed above.

IV. Sensitivity of model simulations

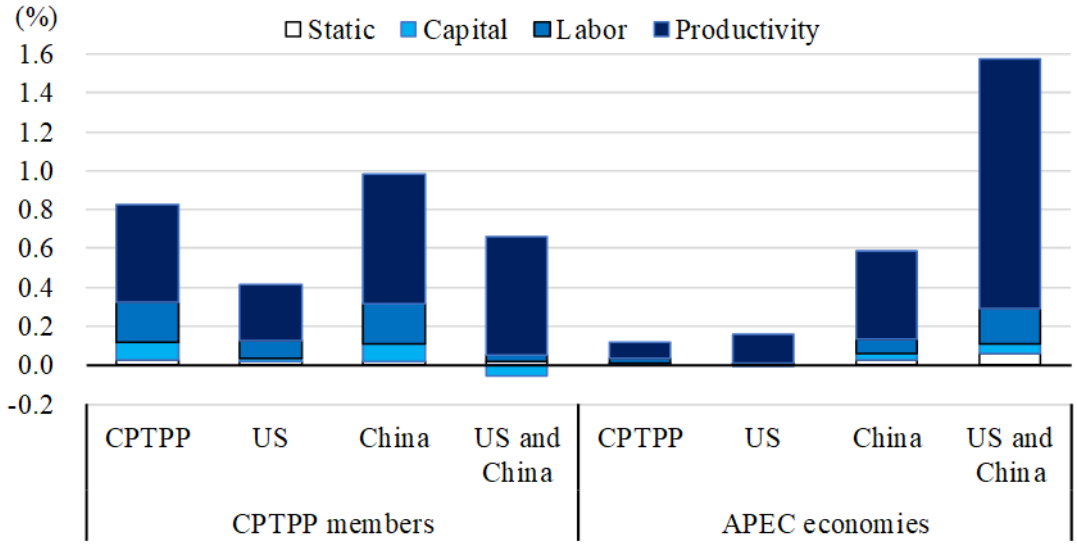
1) Dynamic economic effects

The magnitudes of estimated impacts of EPAs would be dependent on the dynamic effects incorporated in the theoretical framework of models. Real GDP impact of tariff reductions on the eleven CPTPP members and the APEC economies under the alternative CPTPP scenario are compared in Chart 6 using a few CGE model versions as shown below, incrementally incorporating the dynamic effects discussed earlier. The model used in the previous chapter corresponds to the fourth version below. Annex Table 3 provides the estimated impact on individual CPTPP economies and others. It is indicated that real GDP impact would be enlarged for some time every time additional dynamic effects were incorporated, with variation under alternative scenarios.

Static:	comparative static version without any dynamic effects
Capital:	capital accumulation effects incorporated into static version
Labor:	additional incorporation of endogenous labor supply
Productivity:	further incorporation of productivity improvement

Capital accumulation effect is suggested to add adverse impact on the selected CPTPP members in the case where the US and China joined CPTPP, despite the expectation that those effects would generate larger macroeconomic benefits through long term growth effects. This would be attributable largely to the assumption of the current model in which induced investment would be allocated such that the expected rate of return on capital would be equalized among economies. Under the alternative assumption

Chart 6 Dynamic real GDP impact of alternative CPTPP



Source: Author's simulations.

that investment would be allocated while maintaining the composition of capital stocks among economies, the real GDP of the CPTPP members on average is estimated to increase by 0.11% rather than decreasing by 0.05%, which indicates a possible positive impact resulting from capital accumulation effect. The flexibility of international capital movement is suggested to be one key element differentiating both the direction and magnitude of the impact of trade liberalization in reality.

The effects of endogenous labor supply would be dependent on the elasticity of labor supply. CAS (2015) has conducted a sensitivity analysis of the impact of TPP that indicates that Japan's real GDP would increase by 1.9% using alternative elasticity of 0.4, compared with that of 2.6% using elasticity of 0.8. The estimated impact of TPP would be larger than that estimated in USITC (2016), where the elasticity used ranges between 0.4 and 0.44, as noted earlier, and even larger than estimated by other studies in which labor supply remained exogenous. It may be noted that the estimated impact of EPAs would be with possible ranges depending on the size of the key parameters used in the model.

The effects of productivity improvement would also be dependent on the size of the parameter of productivity improvement. It is possible that this parameter would vary according to EPA trade partners. Productivity would be improved more by trade with developed economies, where productivity would be high, than with developing economies, where productivity would be low. The contribution of productivity improvement is indicated to be dominant across all alternative scenarios studied here, but it would include crossover effects with the other dynamic effects and exaggerate its own effects.

All in all, the estimated magnitudes of impact of EPAs would be affected largely by the choice of dynamic effects incorporated in model simulations. It would not be productive to focus on the likely magnitude of the impact of individual policy scenarios among the different versions of model simulations, but it would still be useful to compare the relative significance of impact among alternative policy scenarios under the same versions of model simulations.

2) Substitution parameters

The magnitude of the increases in exports and imports resulting from tariff reductions would be determined primarily by the size of the substitution elasticities of commodities by sector. The Armington parameters in this study, calculated based on the GTAP 11a Data Base, are shown in Table 8, where substitution elasticities of commodities

Table 8 Armington parameters by sector

(%)

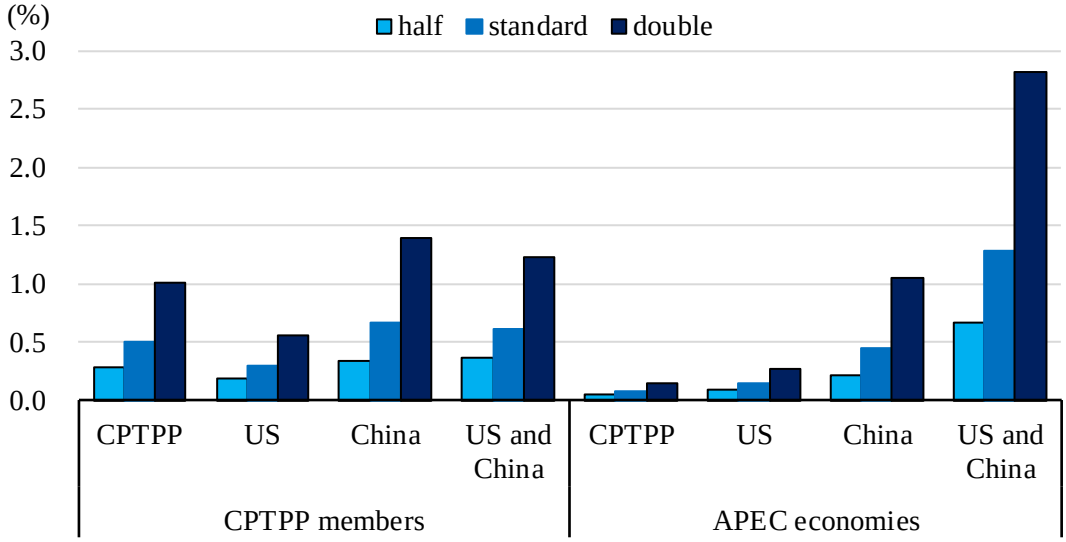
Agriculture, forestry and fisheries	2.3	Mining	5.1
Processed foods	2.5	Textiles and apparel	3.8
Other manufacturing	3.4	Chemical products	2.9
Metals	3.6	Motor vehicles	2.8
Other machinery	4.2	Electronic products	4.4

Source: Author's calculations based on GTAP 11a Data Base.

are uniformly set among economies in the current standard GTAP database. Meanwhile, the elasticities for the allocation of importing commodities among the different sources of economies are assumed to be the twice those for the allocation of domestic and imported commodities.

The estimated impacts of alternative CPTPP scenarios on the real GDP of the eleven CPTPP members and the APEC economies in total are summarized in Chart 7. It is indicated that the magnitudes of macroeconomic impacts would be proportional to the sizes of the substitution elasticities among economies. This would suggest that the key driver of macroeconomic gains from tariff reductions would be structural reforms of economies among sectors. The more structural reforms are promoted at the sector level, the larger the economic benefits at the macro level. The protection of certain sectors from

Chart 7 Sensitivity of real GDP impact to substitution effects



Source: Author's simulations.

trade liberalization would result in smaller macroeconomic benefits than for those without any exemptions.

It is not shown here, but the magnitude of the impact of tariff reductions on

productions at sector level is also estimated to be broadly proportional to the size of substitution elasticities with a few variations, in terms of both magnitudes and directions, depending on the tariff reduction policy scenario, due to the general equilibrium mechanism. Uncertainties of results estimated by model simulations would be noted to some extent. That said, the likely size of parameters in the models is an important subject for empirical study.

V. Conclusions

Implementation of EPAs in the Asia-Pacific has progressed steadily, now covering around 60% of the APEC trade. That said, three major economies, the US, China and Japan have been lagging behind those global trends. A few economies, including Chinese Taipei and Russia, have effectively been isolated from the other APEC economies. Further efforts would be required to achieve comprehensive, inclusive economic integration in the Asia-Pacific.

On the other hand, steady progress has also been made in tariff reductions, although recent EPAs in the Asia-Pacific have not always agreed on 100% tariff removals. The RTA Database, WTO has not included the Japan-US Trade Agreement and RCEP. Much remains to be done in trade and investment liberalization and facilitation, including resolution of traditional market access issues, i.e., tariff reductions.

The CGE model simulations in this paper suggest that macroeconomic effects among the CPTPP members (depending on the US and/or China joining CPTPP) vary in both magnitude and direction. It is estimated that the macroeconomic impact of tariff reductions resulting from China joining CPTPP would be larger than that from the US joining CPTPP, as far as the macroeconomic gains of the eleven CPTPP members in total are concerned. A few CPTPP members would lose rather than gain, due to possible adverse trade diversion effects from trade with the US. Meanwhile, if the US and China together joined CPTPP, CPTPP members would see decreased gains and/or even increased losses with the simple sum of the impact of the US and China joining CPTPP separately. From the perspective of third party interest, the decoupling of the US and China would be suggested to be more beneficial than the coupling of the two economies.

Variety in the impact of alternative CPTPP scenarios is also indicated at sector levels. Stylized features of winners and losers realizing the comparative advantage of economies would be seen in the impact on sector productions in agriculture, forestry, and fisheries; textiles and apparel; and motor vehicles. Japan would be a loser in agriculture,

forestry and fisheries, but a winner in motor vehicles. In textiles and apparel, Southeast Asia would be winners and America would be losers.

The impact estimated by model simulations would depend on the structure of the CGE model used, in addition to the assumptions underlying the EPA policy scenarios studied. The concerned structures of the model include the dynamic effects of capital accumulation, endogenous labor supply and productivity improvement, as well as the size of the substitution parameters of commodities. It would be valuable to study the impact of EPAs quantitatively with recognition of the possible range of estimates. It would not be productive to seek to determine the likely magnitude of the impact of individual policy scenarios among the different versions of model simulations, but it would still be useful to compare the relative significance of impact among the alternative policy scenarios, by means of simulations using the same model version.

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Annex Table 1 Real GDP impact of joining CPTPP

(%)

	CPTPP	GBR	USA	CHN	HKG	KOR	TWN	IDN	PHL	THA	RUS
AUS	0.67	-0.00	-0.10	0.05	-0.00	0.01	0.08	0.01	-0.00	0.05	0.00
NZL	0.86	-0.00	0.24	0.01	-0.00	0.02	-0.03	-0.00	-0.01	0.05	0.05
JPN	0.65	-0.00	0.59	0.80	0.00	0.18	0.27	0.04	0.01	0.24	0.15
BRN	0.03	0.03	-0.04	0.11	0.00	0.03	0.05	0.01	-0.01	0.07	0.01
MYS	0.50	0.29	0.40	0.26	0.02	0.10	0.44	0.01	-0.01	0.10	0.06
SGP	0.16	0.00	-0.11	-0.01	-0.00	0.01	0.01	0.03	-0.00	0.08	0.02
VNM	1.35	0.00	3.71	0.58	0.01	0.09	1.03	-0.01	0.02	0.01	0.02
CAN	0.21	-0.00	0.04	0.50	0.00	-0.01	0.02	0.02	0.02	0.01	0.01
MEX	0.16	-0.00	-0.49	1.63	-0.00	0.43	0.07	0.07	-0.00	0.30	0.02
CHL	0.14	-0.00	-0.27	0.13	-0.00	0.04	0.09	0.01	0.00	0.05	0.05
PER	0.09	0.00	-0.14	0.31	-0.00	0.02	0.04	0.04	0.01	0.04	0.01
CPTPP	0.50	0.01	0.29	0.66	0.00	0.14	0.18	0.03	0.01	0.16	0.08
GBR	-0.02	0.05	0.24	0.95	0.00	0.00	0.03	0.02	0.01	0.15	0.08
USA	-0.04	-0.00	0.33	-0.04	-0.00	0.01	0.00	0.00	-0.01	0.02	0.00
CHN	-0.03	-0.00	-0.13	1.28	-0.00	-0.01	-0.03	-0.01	-0.00	0.00	-0.01
HKG	0.00	0.00	-0.09	0.23	0.05	0.02	0.03	0.00	-0.00	0.05	0.00
KOR	-0.03	-0.00	-0.16	-0.07	-0.00	0.55	-0.01	-0.00	-0.01	0.01	-0.01
TWN	-0.02	-0.00	-0.09	-0.09	-0.00	-0.01	2.29	-0.00	-0.01	0.04	-0.00
IDN	-0.06	-0.00	-0.27	-0.13	-0.00	0.01	-0.02	0.56	-0.02	-0.00	-0.00
PHL	-0.02	-0.00	-0.25	-0.05	-0.00	0.01	0.02	-0.00	0.63	0.12	0.01
THA	-0.31	-0.01	-0.22	-0.24	-0.00	-0.01	-0.05	-0.01	-0.03	2.87	-0.02
RUS	-0.02	-0.00	-0.17	0.01	-0.00	0.02	0.01	0.00	-0.01	0.03	0.58
APEC	0.08	0.00	0.14	0.45	-0.00	0.05	0.06	0.02	-0.00	0.08	0.03

Source: Author's simulations.

Annex Table 2-A Impact of CPTPP on production by sector

(%)

	AFF	MNG	PFD	TXL	OMF	CHM	MTL	MVH	OME	ELE
AUS	1.44	0.10	4.24	1.30	0.59	0.57	0.11	-2.91	1.10	0.39
NZL	1.07	0.23	2.00	0.19	0.57	0.95	0.43	-4.56	0.05	-0.09
JPN	-0.91	0.19	-0.05	0.98	0.64	0.59	0.70	2.72	0.48	0.00
BRN	0.08	0.01	0.24	0.17	-0.04	-0.06	-0.10	-0.23	-0.26	-0.11
MYS	0.13	0.06	-0.13	1.60	1.95	0.48	0.44	0.30	0.98	0.46
SGP	0.19	-0.09	8.05	1.19	-0.09	-0.02	-0.18	-2.31	-0.26	-0.19
VNM	0.23	0.09	0.82	4.48	0.57	0.70	0.64	-0.82	0.71	0.84
CAN	2.16	0.02	0.17	0.29	0.03	0.19	0.02	0.36	0.06	-0.18
MEX	0.03	0.05	0.11	-0.38	0.23	0.16	0.18	0.13	0.32	0.26
CHL	0.18	-0.07	1.28	-0.17	-0.13	0.03	-0.40	-0.50	-0.21	-0.62
PER	0.07	0.09	0.09	-0.15	0.06	0.08	0.12	-0.20	0.07	0.03
GBR	-0.01	0.01	-0.02	-0.06	-0.03	-0.02	-0.04	-0.47	-0.02	-0.03
USA	-0.09	0.01	-0.07	-1.08	-0.03	-0.03	-0.05	-0.34	0.01	0.04
CHN	-0.02	0.01	-0.05	-0.05	-0.03	-0.02	-0.03	-0.08	-0.02	0.03

Annex Table 2-B Impact of the US joining CPTPP on production by sector

(%)

	AFF	MNG	PFD	TXL	OMF	CHM	MTL	MVH	OME	ELE
AUS	-0.20	-0.06	-0.40	0.02	-0.03	-0.11	-0.04	-0.16	-0.16	0.03
NZL	0.13	0.01	0.89	0.55	0.12	0.18	-0.01	-0.48	-0.19	-0.12
JPN	-0.92	0.02	-0.49	1.51	0.41	0.63	0.51	1.89	0.65	0.20
BRN	-0.06	-0.06	-0.42	12.95	-0.21	0.03	-0.12	-0.05	-0.84	-0.22
MYS	0.00	-0.02	-0.26	10.42	0.37	0.86	0.30	0.32	0.52	0.15
SGP	-0.13	-0.18	-0.64	0.31	-0.18	-0.20	-0.29	-0.47	-0.41	-0.19
VNM	-0.51	-0.72	-0.81	26.08	-1.45	0.38	-2.71	-1.07	-1.91	-2.98
CAN	0.02	0.03	0.14	-4.45	0.34	-0.07	0.08	-0.81	0.11	0.50
MEX	0.02	-0.09	-0.42	-3.73	-0.14	-0.52	-0.53	-1.04	-0.49	0.29
CHL	-0.12	-0.14	-0.58	-0.25	-0.14	-0.28	-0.31	-0.31	-0.25	0.16
PER	-0.00	-0.07	-0.10	-0.57	-0.12	-0.17	-0.05	-0.11	-0.09	-0.05
GBR	0.13	0.00	0.03	1.64	0.23	0.72	0.29	1.38	0.27	0.34
USA	0.68	0.08	1.06	-0.92	0.31	0.31	0.30	0.24	0.33	0.12
CHN	-0.08	-0.04	-0.11	-0.48	-0.01	-0.10	-0.08	-0.18	-0.05	0.12

Annex Table 2-C Impact of China joining CPTPP on production by sector

(%)

	AFF	MNG	PFD	TXL	OMF	CHM	MTL	MVH	OME	ELE
AUS	-0.00	0.17	-0.18	-0.88	-0.17	-0.13	-0.59	-0.23	-0.42	-0.53
NZL	0.55	0.11	-0.53	-0.97	0.01	-0.06	-0.03	-0.06	-0.25	-0.43
JPN	0.15	0.22	0.25	-0.45	0.49	0.72	0.70	3.62	0.58	-0.23
BRN	0.07	0.10	-0.14	-0.53	-0.28	-0.26	-0.26	-0.17	-0.90	-0.41
MYS	0.21	0.16	0.92	-0.96	0.11	0.27	0.13	0.16	0.11	0.24
SGP	-0.00	0.22	-0.20	-1.59	-0.23	-0.35	-0.27	-1.08	-0.41	-0.14
VNM	0.16	0.27	0.21	0.65	0.49	0.49	0.69	-0.34	0.81	1.05
CAN	1.76	0.17	1.34	-2.17	-0.10	0.74	0.07	0.61	0.43	2.01
MEX	0.36	0.50	0.78	-1.23	1.77	1.74	2.03	2.47	2.74	2.71
CHL	0.08	0.54	-0.10	-0.83	-0.07	0.20	0.02	-0.37	-0.24	-0.36
PER	0.14	0.62	0.22	-1.31	0.26	0.32	0.44	0.29	0.34	0.33
GBR	0.35	0.27	0.68	-0.49	0.63	1.12	1.53	13.64	0.76	0.61
USA	0.09	0.15	-0.07	-4.69	-0.15	-0.08	-0.07	-0.62	-0.09	0.16
CHN	0.56	0.42	0.78	2.63	1.11	1.03	0.95	-0.50	1.02	0.93

Annex Table 2-D Impact of the US and China joining CPTPP on production by sector

(%)

	AFF	MNG	PFD	TXL	OMF	CHM	MTL	MVH	OME	ELE
AUS	-0.41	0.18	-0.74	-1.86	-0.46	-0.52	-1.13	-0.71	-1.13	-0.98
NZL	0.53	0.11	0.08	-1.36	-0.21	-0.17	-0.39	-0.96	-0.97	-1.00
JPN	-0.87	0.38	-0.51	0.14	0.56	0.91	0.82	4.24	0.72	-0.02
BRN	-0.11	0.01	-0.99	6.23	-0.89	-0.71	-0.71	-0.79	-2.83	-1.28
MYS	0.07	0.18	0.51	4.05	0.13	0.52	-0.06	-0.04	-0.25	0.06
SGP	-0.26	0.06	-1.28	-2.80	-0.98	-1.42	-1.01	-2.67	-1.66	-0.88
VNM	-0.17	-0.05	-0.41	15.63	-0.34	0.64	-0.99	-2.74	-0.47	-0.71
CAN	1.81	0.34	1.44	-17.56	-0.14	0.13	-0.43	0.41	-0.27	2.54
MEX	0.49	0.47	0.05	-13.34	1.06	0.56	0.75	1.69	0.95	3.38
CHL	-0.10	0.58	-0.90	-1.74	-0.71	-0.55	-0.90	-1.42	-1.12	-0.87
PER	0.15	0.84	-0.01	-3.08	-0.02	-0.13	0.07	0.04	0.14	0.11
GBR	0.40	0.31	0.57	-0.49	0.65	1.53	1.53	12.59	0.60	0.86
USA	1.76	0.69	1.92	-9.98	0.79	1.41	1.44	4.31	1.31	1.55
CHN	1.04	0.74	1.43	6.86	2.29	2.15	2.02	-0.66	2.18	1.79

Source: Author's simulations.

Annex Table 3 Dynamic real GDP impact of alternative CPTPP

(%)

	CPTPP				US			
	Static	Capital	Labor	Prod.	Static	Capital	Labor	Prod.
AUS	0.08	0.22	0.40	0.67	-0.01	-0.03	-0.05	-0.10
NZL	0.02	0.25	0.48	0.86	0.01	0.05	0.10	0.24
JPN	0.02	0.07	0.19	0.65	0.03	0.05	0.16	0.59
BRN	0.00	-0.00	0.01	0.03	0.00	-0.02	-0.02	-0.04
MYS	0.01	0.16	0.29	0.50	0.02	0.19	0.30	0.40
SGP	0.01	0.07	0.15	0.16	-0.00	-0.05	-0.06	-0.11
VNM	0.04	0.40	0.83	1.35	0.24	1.28	3.05	3.71
CAN	0.03	0.04	0.11	0.21	-0.01	-0.02	-0.01	0.04
MEX	0.01	0.04	0.07	0.16	-0.01	-0.26	-0.41	-0.49
CHL	0.00	0.03	0.07	0.14	-0.00	-0.09	-0.15	-0.27
PER	0.00	0.01	0.01	0.09	-0.00	-0.03	-0.07	-0.14
CPTPP	0.03	0.09	0.21	0.50	0.02	0.02	0.09	0.29
GBR	-0.00	-0.01	-0.01	-0.02	0.03	0.05	0.11	0.24
USA	0.00	-0.02	-0.02	-0.04	0.00	0.02	0.04	0.33
CHN	-0.01	-0.01	-0.02	-0.03	-0.01	-0.03	-0.05	-0.13
APEC	0.00	0.01	0.03	0.08	0.00	-0.00	0.01	0.14

	China				US and China			
	Static	Capital	Labor	Prod.	Static	Capital	Labor	Prod.
AUS	-0.02	-0.03	-0.03	0.05	-0.05	-0.10	-0.15	-0.10
NZL	-0.00	-0.06	-0.08	0.01	-0.00	-0.11	-0.14	0.02
JPN	0.01	0.07	0.20	0.80	0.03	-0.02	0.11	0.98
BRN	-0.00	-0.04	-0.03	0.11	-0.00	-0.16	-0.17	-0.05
MYS	0.00	0.01	0.05	0.26	0.02	0.01	0.07	0.26
SGP	-0.00	-0.06	-0.06	-0.01	-0.01	-0.26	-0.35	-0.45
VNM	-0.01	0.06	0.15	0.58	0.13	0.73	1.83	2.66
CAN	0.08	0.11	0.28	0.50	0.01	0.02	0.13	0.44
MEX	0.06	0.45	0.73	1.63	0.04	-0.26	-0.32	0.61
CHL	-0.00	-0.05	-0.05	0.13	-0.00	-0.30	-0.44	-0.41
PER	0.01	-0.02	-0.02	0.31	0.01	-0.12	-0.21	-0.02
CPTPP	0.02	0.09	0.21	0.66	0.02	-0.05	0.03	0.62
GBR	0.07	0.15	0.39	0.95	0.07	0.15	0.41	1.00
USA	0.00	-0.05	-0.07	-0.04	0.02	0.03	0.14	1.27
CHN	0.08	0.17	0.29	1.28	0.18	0.36	0.65	2.78
APEC	0.02	0.03	0.08	0.45	0.06	0.06	0.18	1.28

Source: Author's simulations.