

Czech University of Life Sciences Prague

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Master's Thesis

**Geopolitics and Trade Relations in Comprehensive and
Progressive Agreement for Trans-Pacific Partnership
and Opportunities for EU**

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DIPLOMA THESIS ASSIGNMENT

Mubina Toirova, Ph.D.

Economics and Management

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Thesis title

Geopolitics and Trade Relations in Comprehensive and Progressive Agreement for Trans-Pacific Partnership and Opportunities for EU

Objectives of thesis

The aim of the diploma thesis is to determine and to evaluate the position and opportunities of EU in relation to the Comprehensive and Progressive Agreement for Trans-Pacific Partnership. The aim will be fulfilled based on the partial aims. Then, several hypotheses will be defined and verified. Based on the results of and empirical analysis the final conclusions will be introduced.

Methodology

The diploma thesis will cover both, theoretical and empirical part. Theoretical part will contain theoretical background of the selected topic as well as the methodological framework. Scientific literature will be used to prepare the literature overview. The empirical analysis will be based mainly on the gravity model. Based on the empirical analysis the results will be presented and some recommendations will be suggested.

The proposed extent of the thesis

60 – 80 pages

Keywords

Trade, CPTPP, EU, panel data, gravity model.

Recommended information sources

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Declaration

I declare that I have worked on my master's thesis titled "Geopolitics and Trade Relations in Comprehensive and Progressive Agreement for Trans-Pacific Partnership and Opportunities for EU" by myself and I have used only the sources mentioned at the end of the thesis. As the author of the master's thesis, I declare that the thesis does not break any copyrights.

In Prague on 31.03.2022

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Geopolitics and Trade Relations in Comprehensive and Progressive Agreement for Trans-Pacific Partnership and Opportunities for EU

Abstract

The nations have been involved in the establishment of the mega-regional trade deals, since 2018. The Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) is the first mega-regional trade agreement established between Australia, Brunei Darussalam, Canada, Chile, Japan, Malaysia, Mexico, Peru, New Zealand, Singapore, and Vietnam.

In this research, the total bilateral export flows of the CPTPP members have been analyzed with the constructed gravity model based on a balanced panel dataset of 11 CPTPP countries between 2001 and 2020. The degree of influence of the distance between members, common border, common language, and CPTPP membership has been evaluated. The parameters' estimations have been performed by three methods: Simple Ordinary Least Squares (OLS), OLS with exporter and importer time-varying fixed effects, and Poisson Pseudo Maximum Likelihood (PPML). Since the PPML method was found as the most well-performed method, it has been applied in further regression analysis of the disaggregated by industry bilateral exports of CPTPP countries. It was found that the distance and common border have a significant negative effect on bilateral exports both on total and disaggregated levels. The common language and the CPTPP membership do not have a significant effect on bilateral exports on the total level. However, the disaggregation by industries bilateral export analysis allowed capturing the significance of the common language and the CPTPP membership for selected industries. In addition, the revealed comparative advantage analysis of selected industries has been conducted to identify the opportunities both for CPTPP countries and EU members.

Keywords: Comprehensive and Progressive Agreement for Trans-Pacific Partnership, Mega-Regional Trade Agreement, Ordinary Least Squares, Poisson Pseudo Maximum Likelihood, Revealed Comparative Advantage, Gravity Model

Geopolitika a obchodní vztahy v komplexní a progresivní dohodě o transpacifickém partnerství a příležitostech pro EU

Abstrakt

Státy jsou zapojeny do vytváření megaregionálních obchodních dohod od roku 2018. Komplexní a progresivní dohoda o transpacifickém partnerství (CPTPP) je první megaregionální obchodní dohoda uzavřená mezi Austrálií, Brunejí Darussalamem, Kanadou a Chile, Japonskem, Malajsií, Mexikem, Peru, Novým Zélandem, Singapurem a Vietnamem.

V tomto výzkumu byly celkové bilaterální exportní toky členů CPTPP analyzovány pomocí sestrojeného gravitačního modelu založeného na vyváženém souboru panelových dat 11 zemí CPTPP v letech 2001 až 2020. Míra vlivu vzdálenosti mezi členy, společné hranice, společný jazyk a členství v CPTPP byly v rámci modelu hodnoceny. Odhady parametrů byly provedeny třemi metodami: Běžná metoda nejmenších čtverců (OLS), OLS s časově proměnnými fixními efekty exportéra a importéra a Poissonova pseudometoda maximální věrohodnosti (PPML). Protože byla metoda PPML shledána jako nejvýkonnější metoda, byla použita v další regresní analýze bilaterálních exportů zemí CPTPP v členění podle odvětví. Bylo zjištěno, že vzdálenost a společná hranice mají významný negativní vliv na bilaterální exporty jak na celkové, tak i na neagregované úrovni. Společný jazyk a členství v CPTPP nemají na bilaterální exporty na celkové úrovni významný vliv. Bilaterální exportní analýza podle odvětví však umožnila zachytit význam společného jazyka a členství v CPTPP pro vybraná odvětví. Kromě toho byla provedena analýza odhalených komparativních výhod vybraných odvětví s cílem identifikovat příležitosti jak pro země CPTPP, tak pro členy EU.

Klíčová slova: Komplexní a progresivní dohoda pro transpacifické partnerství, Mega Regionální obchodní dohoda, Obyčejné nejmenší čtverce, Poissonova pseudo maximální pravděpodobnost, Odhalená komparativní výhoda, Gravitační model

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1 Introduction

Until now, the global economy has grown due to the multilateral trade system leading first by GATT and then by WTO, and it cannot be denied that trade has acted as an important tool or means for economic growth.

For the last two decades, it has become more common for the world's most developed and developing nations to form strong geographical trading partnerships. Some of these regional trading agreements, or RTAs, show the growing tendency of big economies to trade in multilateral accords outside of the World Trade Organization system.

The WTO impasse over the Doha Development Agenda (DDA) enforcement has contributed significantly to the growth of RTAs in global commerce. China, India, and Brazil's growth as significant emerging economies have generated a multi-polarity in global trade discussions that has hampered the DDA's efforts to integrate low- and middle-income nations into global trade. In the WTO multilateral negotiations, the developed and the developing economies have been dissatisfied since they have not been able to promote their preferred agendas. As a result, they have been actively involved in the formation of market access arrangements outside of the WTO, resulting in the development of regional and bilateral free trade agreements. The endless attempts of the developed and developing countries not to allow trade discrimination have led to the continuous establishment of new free trade agreements and layering them one on another.

Since 2018, the countries have begun to establish mega-regional trade agreements (RTAs). The mega-RTAs are bigger and more comprehensive than ordinary free trade agreements (FTAs) in their covering of topics. They strive to extend market access benefits beyond tariffs by harmonizing laws and regulations that affect cross-border mobility of services, money, people, technology, information, and ideas. Mega-RTAs have the potential to have a significant impact on international trade since they include developed countries into their consists.

The involvement of countries such as Australia, Canada, Mexico, China, Japan, South Korea, and Indonesia in one or more of these mega-RTAs has a major impact on the size and influence of that mega-RTA. As members of key economic fora like the G7, G20, APEC, and BRICS, these big countries have a substantial voice in global and regional affairs. Thus, these trade alliances represent the convergence of interests of industrialized and developing countries in their rising preference for non-WTO trading arrangements.

Not only are mega-RTAs strategically important in terms of regulatory scope, but they also have a wide geographic reach. The two largest mega-RTAs include the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) and the Regional Comprehensive Economic Partnership (RCEP). While the CPTPP comprises eleven countries from the Asia–Pacific. The RCEP is an even larger fifteen-member grouping involving economies from Southeast Asia, Northeast Asia, and South Asia (UNCTAD, 2021).

Since RCEP entered into force on 1 January 2022, there is no sufficient data to analyze the effect of the mega-regional trade agreement on trade among members. The focus of the thesis is directed to the analysis of trade relations of member countries in the CPTPP agreement, that entered into force for the majority of members on 30 December 2018 (Australian Government DFAT, 2021).

In order to analyze the research topic from various dimensions, the thesis structure is divided into 6 chapters. The first chapter provides a general introduction to the topic and highlights the main recent developments in the area of free trade agreements. In the second chapter, the research objectives and goals are formulated and the methodology is described. The third chapter provides the analyses of the existing literature related to the Comprehensive and Progressive Agreement for Trans-Pacific Partnership and also reviews all the significant advancements in the literature on the gravity model. The fourth chapter is focused on the construction of the gravity model of bilateral exports among CPTPP members and associated empirical analysis and result discussions. The fifth chapter provides an analysis of the Revealed Comparative Advantage of selected industry products of CPTPP members in the European Union and vice versa. The sixth chapter summarizes all the results and continues with concluding remarks.

2 Objectives and Methodology

2.1 Objectives

The Comprehensive and Progressive Agreement for Trans-Pacific Partnership is the first mega-regional trade agreement followed by the RCEP. The main goal of the research is to analyze trade relations among CPTPP members and consider further directions of cooperation. Also, the goal is to analyze the opportunities of the CPTPP agreement for the European Union.

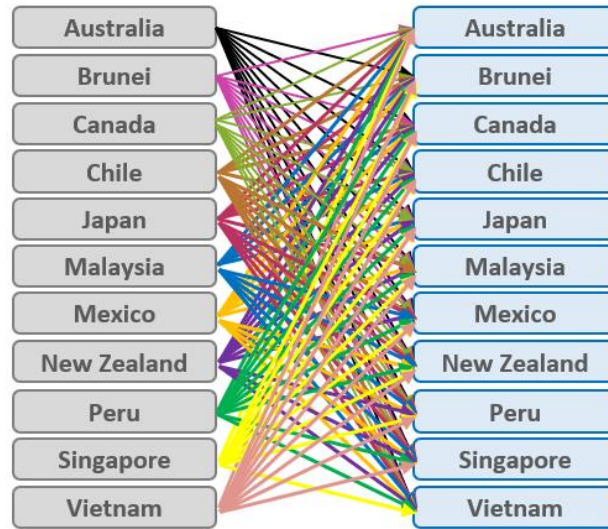
The aims are formulated as follows:

1. To analyze bilateral export flows of the CPTPP countries at the total level based on the constructed gravity model.
2. To analyze bilateral export flows on the industry level based on the constructed gravity model.
3. To analyze the degree of influence of the distance between countries, GDP, contiguity, common language, and CPTPP regional trade agreement on bilateral exports at both total and industry levels.
4. To analyze the competitiveness of CPTPP members' goods in the EU market (estimation of the Revealed Comparative Advantage Index).
5. To analyze the competitiveness of EU members' goods in the CPTPP market (estimation of the Revealed Comparative Advantage Index).

2.2 Methodology

The empirical analyses in the thesis are divided into two levels. On the first level, the total bilateral export flows of the CPTPP members are analyzed with constructed gravity model. Figure 1 schematically illustrates the way a pool of data is organized. The degree of influence of the distance between members, common border, common language, and CPTPP membership is evaluated. The parameters' estimations are performed by three methods: Simple Ordinary Least Squares (OLS), OLS with exporter and importer time-varying fixed effects, and Poisson Pseudo Maximum Likelihood (PPML). The models are compared based on economic, statistical, and econometric verifications, where the most well-performed method is identified for further analysis.

Figure 1. Bilateral Export Flows of CPTPP Countries



Source: Own computation

On the second level, each industry's bilateral exports flows of the CPTPP members are analyzed and estimated with the previously selected well-performed method. The list of selected industries is shown in Table 1. The industries are divided into three main sections: Agriculture, Forestry and Fishing (ACFF), Mining and Quarrying (MNQ), and Manufacturing (MNF). Later, the Manufacturing industry itself is divided into 10 sub-industries. The degree of influence of the distance between members, common border, common language, and CPTPP membership on industry level bilateral exports is evaluated. It is expected that the results vary in different industries.

Table 1. United Nations industry classification system, ISIC Rev.4

Section	Division	Designation	Abbreviation
A	01-03	Agriculture, forestry and fishing	ACFF
B	05-09	Mining and quarrying	MNQ
C	10-33	Manufacturing	MNF
	10-12	Food products, beverages and tobacco	FBT
	13-15	Textiles, textile products, leather and related products	TEX
	16	Wood and products of wood and cork	WOOD
	17-18	Pulp, paper, paper products, printing and publishing	PPP
	19-22	Coke and refined petroleum products, chemicals, rubber and plastics	CHE
	23	Other non-metallic mineral products	NONMET
	24-25	Basic metals and fabricated metal products	METAL
	26-28	Computer, electronic and optical products, electrical equipment, machinery	MACH
	29-30	Motor vehicles, trailers, semi-trailers, other transport equipment	TRANS
	31-32	Furniture and other manufacturing	FM

Source: United Nations ISIC Revision 4, UNStats

3 Literature Review

3.1 Comprehensive and Progressive Agreement for Trans-Pacific Partnership

The Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) is a new mega free trade agreement (FTA) between Australia, Brunei Darussalam, Canada, Chile, Japan, Malaysia, Mexico, Peru, New Zealand, Singapore, and Vietnam signed on 8 March 2018 in Chile (Australian Government DFAT, 2021). Figure 2 illustrates the geographical coverage of the CPTPP agreement.

Figure 2. Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) Members



Source: www.nippon.com

The CPTPP entered into force for Australia, Canada, Japan, Mexico, New Zealand, and Singapore on 30 December 2018. The CPTPP entered into force for Vietnam on 14 January 2019, and for Peru on 19 September 2021. The CPTPP will enter into force for Brunei Darussalam, Chile, and Malaysia 60 days after they complete their respective ratification processes (Australian Government DFAT, 2021).

The agreement provides access to 500 million people. It is important to mention that the combined GDP is worth US \$13.6 trillion, and the share of global GDP equals 13.5 percent, (down from 40 percent if the US stayed in the TPP) (Banga, 2014).

CPTPP was originally called TPP (Trans-Pacific Partnership Agreement), and it was a multilateral trade treaty. As the US withdrew from the TPP negotiations due to changes in US trade policy after the Trump administration took office, the TPP faced a crisis of stranding. However, Japan showed its leadership and reached a negotiation under the name of CPTPP with 11 countries excluding the United States as member states.

President Trump had continuously opposed the Trans-Pacific Partnership (TPP) supporting the idea that bilateral agreements would be more favorable to the U.S. economy than regional trade agreements. Japan was interested in TPP mainly because of the United States, since bilateral trade between countries fell by more than 10 percent due to U.S.-South Korea free trade agreement enter into force.

Japan led the remaining countries to conclude the regional trade agreement TPP-11 (CPTPP). Exports of grains, meats, dairy, wine, and other agricultural products from the United States to Japan, (which is one of the largest markets for U.S. agricultural products) have fallen. Japan after reaching an agreement with European Union (EU) on reducing tariffs and other barriers to trade, has begun to buy far more from TPP-11 and EU partners to the detriment of the United States.

The gap in tariffs on certain goods is considerable. It is obvious that certain American industries would lose their market share by facing increased tariffs due to the absence of free trade agreements with both Japan and the EU, while the last two enjoy favorable access to each other's markets.

Australian wine is taxed at 5.6 percent in Japan, but the tax will soon be eliminated. Wine from the EU and Chile is not subject to taxes, whereas 15 percent is imposed on California wine.

The number of CPTPP member states is likely to increase in the future as China, the United Kingdom, Taiwan, Thailand, and South Korea have officially expressed their intention to join the CPTPP. South Korea is one of the major players in the region and the Korean government initially decided to join the CPTPP by collecting opinions from the public during 2018, drawing an agreement between ministries, and initiating domestic procedures under the Trade Procedure Act to decide whether to join the CPTPP. If the US returns to the CPTPP in the future, the economic effect is expected to be maximized. South

Korea has already signed FTAs with 9 of the 11 CPTPP member countries, excluding Japan and Mexico. Despite the expected effects of expanding the export market in the manufacturing sector, South Korea is at a competitive disadvantage in several industries, including automobiles, compared to Japan, which leads the CPTPP. As it must be opened, the government has no choice but to be concerned about the negative impact on domestic-related industries.

The CPTPP is significant as a mega-FTA that reflects the most up-to-date trade rules. It is expected that the agreement will positively affect the member countries, by expanding export markets, establishing a global production network, and creating long-term economic ties.

Compared with other FTAs, CPTPP shows a very high level of liberalization and comprehensive coverage. CPTPP pursues broad liberalization across all sectors, and when fully implemented, tariff elimination will be achieved on more than 95 percent of the tariff line, although it varies by country. On the one hand, CPTPP is being evaluated as a new generation FTA agreement with new norms.

Table 2. Content of CPTPP Agreement in Chapters

Chapters	
1. Initial Provisions and General Definitions	16. Competition Policy
2. National Treatment and Market Access for Goods	17. State-Owned Enterprises and Designated Monopolies
3. Rules of Origin and Origin Procedures	18. Intellectual Property
4. Textile and Apparel Goods	19. Labour
5. Customs Administration and Trade Facilitation	20. Environment
6. Trade Remedies	21. Cooperation and Capacity Building
7. Sanitary and Phytosanitary Measures	22. Competitiveness and Business Facilitation
8. Technical Barriers to Trade	23. Development
9. Investment	24. Small and Medium-Sized Enterprises
10. Cross-Border Trade in Services	25. Regulatory Coherence
11. Financial Services	26. Transparency and Anti-Corruption
12. Temporary Entry for Business Persons	27. Administrative and Institutional Provisions
13. Telecommunications	28. Dispute Settlement
14. Electronic Commerce	29. Exceptions and General Provisions
15. Government Procurement	30. Final Provisions

Source: New Zealand Ministry of Foreign Affairs and Trade

The CPTPP agreement consists of a total of 30 chapters, dealing with various topics such as goods, services, investment, government procurement, intellectual property rights, competition, labor, and the environment (Table 2).

In particular, new topics such as development, Small and Medium-Sized Enterprises (SMEs), regulatory consistency, transparency, and anti-corruption that were not covered in previous FTAs are dealt with. Also, interestingly, CPTPP can be said to be the first FTA to explicitly express the value of inclusive growth in the agreement text. Inclusive growth is being treated as one of the important policy goals in international organizations such as the OECD, IMF, World Bank, WTO, and the United Nations, as well as in major international forums such as the G-20. There is a lively discussion on whether or not in this sense, the CPTPP is a new model that combines inclusive growth and FTAs and has great potential to become a standard for bilateral and multilateral negotiations in the future.

The tariff concessions for goods of the CPTPP reflected the contents of the tariff concessions for goods of the TPP, which were previously negotiated, and were set at a high concession level of 95-100 percent based on the number of items. The tariff concessions are carried out from abolition to abolition for the longest period of 21 years. Some country-specific sensitive items, such as agricultural products, are exempted through Tariff Rate Quotas (TRQ) and long-term abolition. According to the tariff concessions by country, based on the number of items, Japan accounts for 95 percent, Vietnam for 97.9 percent, Mexico, Malaysia, and Australia for more than 99 percent, and New Zealand, Brunei, and Singapore for 100 percent (Australian Government DFAT, 2021).

Cross-border trade in services (Chapter 10) includes provisions prohibiting the introduction of national treatment, Most-Favoured-Nation (MFN) treatment, market access restrictions on persons providing services to member countries and prohibiting the imposition of local presence obligations. In the CPTPP, the provisions related to communication (Chapter 13) were separated from the service, and contents related to the international mobile roaming service were newly introduced to reflect the recent communication business field. This can be seen to promote competition in the mobile roaming service field and to promote the use of alternative services related to roaming.

In the field of investment (Chapter 9), it includes the provision of national treatment before and after the establishment of the investment, guaranteeing Most-Favored-Nation treatment, imposing performance requirements, and prohibiting the introduction of measures to limit the nationality of senior management. In the CPTPP investment clause, provisions on dispute resolution between investors and countries are stipulated in detail, and corporate social responsibility is included.

In the CPTPP agreement, a separate chapter is stipulated on e-commerce, which is gradually increasing in importance. The e-commerce clause of the CPTPP is more detailed than in other FTAs, and it regulates the overall content for the use and promotion of e-commerce, such as the definition of e-commerce, the purpose of use, the scope of application, online personal information protection, and cyber security. In particular, trade in digital products was emphasized more by stipulating the obligation to treat digital products without discrimination.

Regarding Intellectual Property Rights (IPR), the TPP IPR clause (Chapter 18), which can be said to be the predecessor of CPTPP, includes provisions such as national treatment clause, transparency clause, patent right, trademark right, Electronic Trademarks System, pharmaceutical product. It stipulates even relatively detailed fields, such as provisions on experiments and data, and provisions on tests and data on agricultural chemical products. The IPR clause of the TPP is described in a vast amount of 75 pages in total due to the IPR strengthening the policy of the United States and the tendency of developed countries to protect the IPR. However, many aspects were suspended when the United States withdrew from the TPP. This seems to take into account the possibility of the US rejoining the country in the future. Among the deferred details, the extension of the duration of the patent due to unreasonable delay in patent registration and the extension of the duration of the patent due to the delay in marketing approval of drugs are also important. The Term of Protection for Copyright and Related Rights, etc. has been suspended.

The CPTPP introduced a new State-Owned Enterprise (Chapter 17) clause, which stipulates the obligation of state-owned enterprises or designated monopolies to consider commercial considerations when buying or selling goods or services consistent with the business practices of ordinary private enterprises. This is to prevent the government from obtaining unfair operating profits by giving preferential treatment or subsidies to state-owned enterprises. If another member country raises an objection with non-commercial support such as government subsidies to prove a causal relationship to industrial damage and wins the dispute resolution procedure, government support will be suspended or limited. This is a provision to align with private business practices against state-owned enterprises receiving preferential treatment through subsidies and operating differently from general enterprises to engage in unfair profit-making practices. However, various institutional flexibility was given so that member states could implement necessary public policies for each country through state-owned enterprises to minimize friction in the operation of state-

owned enterprises. This clause is a new clause that has not been introduced in previous regional or regional FTAs, and it can be said to be a characteristic of the CPTPP clause.

The economic objective of CPTPP is to create a platform of deep economic integration and comprehensive free trade agreement. Through CPTPP, participating countries seek to liberalize and establish new rules and disciplines in the region beyond those that already exist in the WTO (Fergusson et al. 2015). Banga (2014) points out that CPTPP would be beyond the existing trade agreements in the Asia-Pacific region with a vast coverage of new ideas, investments, services, financial services, competition, government procurement, labor, intellectual property, environment, etc. Cheong and Tongzou (2013) argue that CPTPP is a mega trade agreement. Therefore, the foremost objective should be its economic value and should be open for other economies fulfilling the preliminary requirements. CPTPP itself is a deep and targeting economic integration with provisions that range from goods, services, and investment to critical new issues such as the digital economy, intellectual property rights, regulatory coherence, labor, and the environment (Petri and Plummer 2016).

There have been many previous studies or papers dealing with the opportunities and challenges of TPP, from the perspective of economic integration or economic effect, and there are only a few papers dealing with the CPTPP perspective.

There are several studies discussing the impact of CPTPP on the trade of member countries. Typical examples include the studies by Lu (2018), Maliszewska, Olekseyuk, and Osorio-Rodarte (2018), Armstrong (2011), Nguyen (2019). However, these studies only focus on analyzing the general opportunities and challenges of the CPTPP to the economies of member countries, or specific industries in a certain country. There has been no research to estimate the level of change in import-export turnover of a particular country in the CPTPP when the Agreement's tariff elimination commitment is implemented.

3.1.1 Development of Regional Trade Agreements

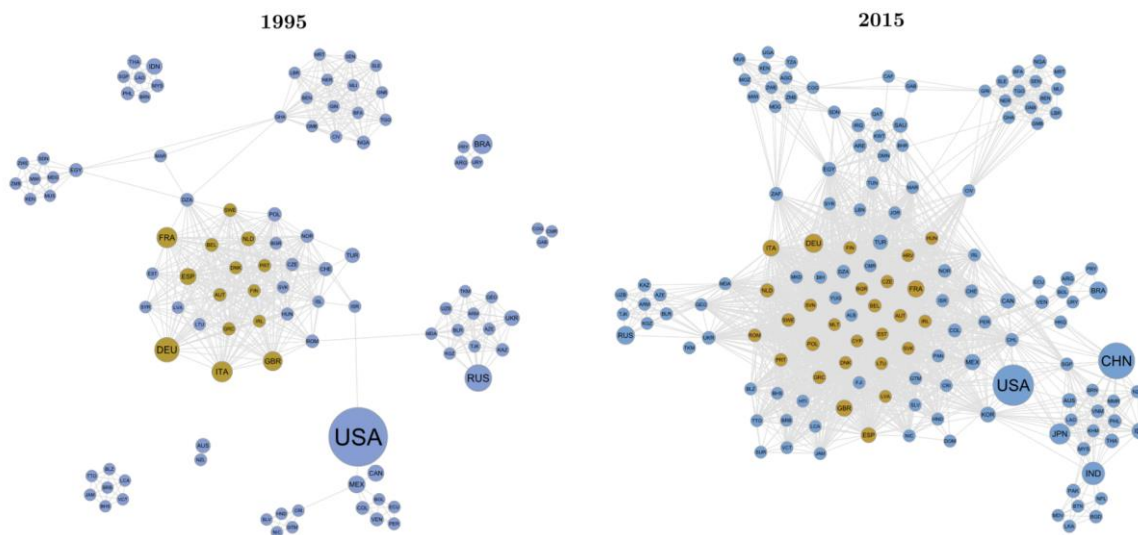
In recent two decades, the countries globally became more interconnected. Figure 3 illustrates the network of trade agreements in 1995 and 2015. The figure for the year 2015, clearly shows the 'spaghetti bowl' effect, the situation when different free trade agreements stratify on each other and slowing down the trade between members.

On the subject of 'spagetti bowls', Jagdish Bhagwati first wrote about it in 1995. Members of free trade agreements agree to cut their internal tariffs, but each member may

still impose its own external tariff on non-member nations' imports. In such case, 'Country of origin' is used to differentiate items from one another in an increasingly globalized environment where products typically transit through many nations throughout the manufacturing process. In addition, there are standards in international trade known as 'Rules of Origin' that specify the requirements for determining the 'country of origin'. The problem is that each FTA has its own 'Rules of Origin', and as the number of FTAs increases and they become more intertwined, the number of 'Rules of Origin's increases as well. It consequently becomes practically hard for manufacturers to comply with all of the 'Rules of Origin's at the same time (Osama, 2015).

The figure also indicates the growing influence of China both in the region and on the global stage.

Figure 3. The Network of Regional Trade Agreements in Different Years



Source: Fontagne and Santoni (2021)

The Regional Comprehensive Economic Partnership (RCEP), led by China is the largest regional trade agreement followed by CPTPP. RCEP was initiated in 2011 when ASEAN proposed RCEP as a multilateral trade agreement in the process of discussing economic integration in East Asia. Accordingly, in order for China and Japan to maximize economic benefits through economic integration in East Asia, trade in the form of ASEAN + Korea, China and Japan (3) and ASEAN (10) + Korea, China, Japan, Australia, New Zealand, and India (6) an agreement was proposed.

In 2011, ASEAN proposed a form of ASEAN + 6 countries to lead regional economic integration. China was interested in the creation of an East Asian regional economic integration body capable of responding to the TPP (in which the US participated) and cooperated in RCEP negotiations. Looking at the progress of the negotiations, the start of negotiations was first announced at the East Asia Summit (EAS) in November 2012. The first official negotiations were held in May 2013, and after that, until the end of October 2019, 28 formal negotiations, 7 inter-sessional meetings with senior representatives, and 16 ministerial meetings were held. At the second summit on November 14, 2018, the goal was to reach an agreement within 2019 (ASEAN Secretariat, 2022).

Table 3. Comparison of RCEP and CPTPP

	RCEP (15 countries)	CPTPP (11 countries)
Share of world population	30% (2.3 billion people)	6.9% (500 million people)
Share of world GDP	28.9 % (\$25.8 trillion)	13.5% (\$4.8 trillion)
World trade	\$12.7 trillion	\$4.8 trillion

Source: World Bank

At the 3rd Summit on November 4, 2019, 15 member countries except India declared the conclusion of the agreement among the 16 countries that participated in the initial negotiations (ASEAN Secretariat, 2022).

Among the participating countries, India withdrew its participation due to conflicts between the two countries due to the flood of Chinese products and the China border dispute. Finally, on November 15, 2020, the leaders of the 15 participating countries held and signed the RCEP summit and agreement signing ceremony held via video, and the RCEP was launched. The 15 countries participating in the RCEP include Korea, China, Japan, Australia, New Zealand, and 10 ASEAN countries.

3.1.2 Original Trans-Pacific Partnership

The Trans-Pacific Partnership (TPP) was tentatively concluded on October 5, 2016, after a total of 19 formal negotiations were held from March 2010 to August 2013. It started based on the multilateral free trade agreement that was launched in June 2005 by four countries including New Zealand, Singapore, Chile, and Brunei for the purpose of regional economic integration. After that, the United States, Australia, Peru, and Vietnam belonging to the Pacific Rim region, Malaysia, Mexico, Canada, and Japan increased the number of

participating countries in the order, resulting in a total of 12 countries participating in the negotiations (Banga, 2014).

The purpose of the agreement was to weaken the influence of China, which was expanding its economic influence in the Asia-Pacific region.

The US participated in Pacific 4 (New Zealand, Singapore, Chile, and Brunei) in 2008, which took effect in 2005, followed by Pacific coast countries such as Australia, Vietnam, Mexico, Canada, and Japan. In other words, the number of countries increased to 12 as the US, Australia, and Peru in 2008 participated in the negotiations in turn among the four countries (Pacific 4) in 2005, Vietnam, Malaysia in 2010, Mexico and Canada in 2012, and Japan in March 2013. From March 2010 to August 2013, a total of 19 formal negotiations were held, and finally, an agreement was reached in October 2015. The economies of the 12 TPP countries accounted for 37.4 percent of the world's GDP, the largest agreement in terms of share in global GDP.

However, as the Trump administration took office in January 2017, the ratification work pursued by each country was hampered by a change in US policy. As the United States withdrew from the TPP agreement in January 2017, the original purpose was overshadowed, but Japan led the 11 countries to discuss how to launch the TPP. The countries agreed to promote the agreement in May 2017, and in October 2017, the senior representatives of the 11 TPP countries held a meeting. At the APEC Summit in November 2017, the CPTPP Joint Declaration was announced to formalize the launch of the CPTPP. Afterward, 11 countries reached a final agreement and launched a new CPTPP in March 2018.

With the US declaration of withdrawal from the TPP, it was predicted that the entry into force of the TPP would be virtually impossible. For the early entry into force of the CPTPP, the entry requirements were relaxed compared to the TPP, and the provision of accession was simplified in preparation for the entry of new member states. In addition, some provisions, such as intellectual property protection and investment dispute resolution procedures, which were included in the TPP as claimed by the United States, were agreed to be deferred in the CPTPP.

Although the economic importance of the CPTPP, such as GDP, trade scale, and population, has significantly decreased compared to the previous TPP due to the US withdrawal from the CPTPP, it still accounts for 13.5 percent of global GDP and 15 percent of world trade.

Table 4. Comparison of TPP and CPTPP

	TPP (12 countries including the U.S.)	CPTPP (11 countries excluding the U.S.)
Share of world population	11.1% (800 million people)	6.9% (500 million people)
Share of world GDP	37.4 % (\$28.8 trillion)	13.5% (\$4.8 trillion)
World trade	25.9% (\$8.5 trillion)	15% (\$4.8 trillion)

Source: World Bank

In the CPTPP, some of the provisions agreed upon in the TPP were suspended, and they were stipulated in the annex to the agreement. Most of these were made by the United States at the time of the TPP negotiations and were raised by the United States. The deferred clauses are 27 clauses in 9 chapters including 5 clauses on customs administration and trade facilitation (Chapter 5) and investment (Chapter 9). In particular, in the CPTPP agreement, 13 clauses of the TPP clause in the field of intellectual property rights were largely suspended. This is because, in the TPP negotiations, the US raised a lot of content to match the IPR protection and transparency that developing countries were not taking sufficiently to match the level with their own. The deferred provisions in the IPR chapter include domestic treatment, patent subject matter, patent duration, information protection, copyright, and related rights protection period, technical protection measures, rights management information, protection of encrypted satellite and cable signals.

3.2 Gravity Model

The main feature of regional trade agreements is that they facilitate trade among participants and deflect trade from non-participants. The gravity model clearly illustrates that the affiliation to the same regional trade agreement together with the share of common border, common language, common colonial ties boost trade between countries, while the longer distance between countries may reduce trade. The main goal of this research is to analyze the trade relations of CPTPP members within the partnership using the gravity model. The outcome of the empirical analysis will help to understand the role of the regional trade agreement and its influence on the trade of member states. In addition, the analysis of the intra-industry bilateral trade between member countries will provide an in-depth picture of the trade relations.

Since the current research is based on the construction of the gravity model of trade among CPTPP member states, it is important to consider gravity model related literature. When it comes to analyzing trade policies, the gravity model has established itself

as a standard instrument. It is frequently employed in the evaluation of the consequences of preferential trade agreements and currency unions (Westerlund and Wilhelmsson, 2009).

The initial concepts on this subject were first proposed by Tinbergen (1962). In accordance with Newton's Universal Law, He proposed the existence of a connection between the value of exports from country i to country j (X_{ij}), economic size of exporter and importer (Y_i and Y_j) and trade costs between countries (T_{ij}) of the form:

$$X_{ij} = k * \frac{Y_i^\alpha * Y_j^\beta}{T_{ij}^\gamma}$$

Where $\alpha > 0, \beta > 0, \gamma > 0$. This was the earliest form of the gravity equation of international trade, that later was subject to considerable improvements and revisions.

There were some doubts about the theoretical framework, but they were later reaffirmed by Anderson (1979), Bergstrand (1989), Deardorff (1998), and Helpman et al (2008).

The Anderson (1979) model was further developed by Anderson and van Wincoop (2003). For the importer and exporter, they incorporated multilateral resistance terms as a proxy for the presence of undetected trade restrictions. Anderson and van Wincoop (2003), both emphasized the need of including multilateral resistance terms into the model.

Table 5. Literature Summary based on Included Effects and Estimation Methods

Authors	Effects included	Data included
Rose and van Wincoop (2003)	Importer, exporter, and time varying fixed effects;	200 countries from 1970 to 1995 (five-year intervals);
Baltagi et al (2003)	Importer, exporter, and time varying fixed effects;	EU15, USA, Japan with 57 trading partners from 1986 to 1997;
Ruiz and Vilarrubia (2007)	Importer, exporter, and time varying fixed effects;	205 countries from 1948 to 2005;
Authors	Estimation Methods	Data included
Santos Silva and Tenreyro (2006)	PPML, NLS, OLS;	136 countries – 1990;
Silverstovs and Schumacher (2009)	OLS, PPML;	22 OECD countries; 1988-1990; Disaggregated data: 25 three-digit ISIC Rev.2 industries
Westerlund and Wilhelmsson (2009)	OLS fixed effect, PPML;	EU and other developed countries; 1992-2002;

Source: Own computation based on different sources

The study of Subramanian and Wei (2003) further highlights the significance of the multilateral resistance variable. It is concluded that Rose (2002) obtained biased parameters of the effect of WTO on exports since the model failed to take into account multilateral resistance terms.

The importer and exporter fixed effects were discussed in detail by Feenstra (2002). Prior to that, fixed effects were presented by Feenstra et al. (2001) in order to account for the unique country multilateral resistance term. This should be reflected in the dummy coefficients for the importer and exporter. As can be seen from Table 5, the importer and exporter time-varying fixed effects, in order to capture multilateral resistance terms, have been already included in the estimations by several researchers (Rose and van Wincoop (2003), Baltagi et al (2003), Ruiz and Vilarrubia (2007)).

The occurrence of zero trade flows in the dataset should also be taken into consideration while developing the gravity model (Melitz, 2003). Furthermore, Helpman et al (2008) demonstrated that the inadequate processing of zero flows can result to skewed estimations and established a detailed framework to offer a justification for these flows.

Santos Silva and Tenreyro (2006) asserted that the OLS estimations might be subjected to significant bias as a result of the absence of any trade volume between trading partners. Because the whole component of the data with zero trade is deleted, the log-linearization of exports and imports may introduce some bias into the data. Poisson Pseudo-Maximum Likelihood (PPML) estimate was proposed by Santos Silva and Tenreyro (2006) to cope with the zero-trade dilemma since the independent variable in the model is presented in levels and not subject to log-linearization.

3.3 Revealed Comparative Advantage Index

Balassa (1965) developed the revealed comparative advantage (RCA) index, in which the world market is taken as a benchmark. In order to find the RCA for individual industry products, the formula is expressed as follows:

$$RCA_{ij}^m = \left(\frac{X_{ij}^m}{X_i^m} \right) / (X_{ij} / X_i)$$

where RCA_{ij}^m the revealed comparative advantage index. X_{ij}^m - exports of product j from country i to country m, X_i^m - total exports of country i to country m, X_{ij} - total exports of product j from country i, X_i - total exports of country i.

The RCA index is a numeric value between 0 and infinity, with 1 being the break-even point. If it surpasses 1, the nation i has a competitive advantage in exporting product j to the reference market m . This is because a value larger than unity indicates that the percentage of product j in country i 's exports to country m exceeds the share of product j in the overall exports of the nation. A value of less than one for the RCA index shows that the exports of product j suffer from a competitive disadvantage (Balassa and Noland, 1989).

There are four key industries for a country's economy: primary, secondary, tertiary, and quaternary. Primary industry is presented by agriculture, forestry, fishing, and mining, whereas secondary industry is presented by manufacturing. Tertiary is presented by the services sector and quaternary – by R&D and information and communication technologies (ICT). For the purposes of this research, the focus is drawn on primary and secondary industries that is agriculture, forestry, fishing, and manufacturing.

4 The Bilateral Export Analysis of CPTPP Countries Based on Gravity Model

4.1 Data Sources and Descriptive Statistics

The data set includes a balanced panel of 11 CPTPP countries between 2001 and 2020. According to the data set, 110 country pairs with 2200 observations are going to be analyzed. Because of the increased dataset size made possible by pooling, it is possible to obtain accurate estimations of the parameters.

Table 6. Sources of Data and Descriptive Statistics for the variables

Variable	Description	Original Source of Data	Min	Max	Mean	Std.Dev
t	year	-	2001	2020	2010.5	5.7676
$\ln X_{ijt}$	logarithm of Exports	IMF Direction of Trade Statistics / WITS (Millions of US dollars)	3.5835	24.6765	19.8879	2.7735
$\ln Y_{it}$	logarithm of GDP of exporting country	World Bank, (Current US dollars)	22.4462	29.4672	26.4074	1.6093
$\ln Y_{jt}$	logarithm of GDP of importing country	World Bank, (Current US dollars)	22.4462	29.4672	26.4074	1.6093
$\ln Dist_{ij}$	logarithm of Geographic distance	CEPII database, (km)	5.7543	9.8536	8.9754	0.8429
$Border_{ij}$	Dummy for common border between country i and j is 1, otherwise 0	CEPII database	0	1	0.0545	0.2271
$Lang_{ij}$	Dummy for common language between country i and j is 1, otherwise 0	CEPII database	0	1	0.2182	0.4131
$CPTPP_{ij}$	Dummy for CPTPP membership of country i and j is 1, otherwise 0	WTO Database	0	1	0.1000	0.3001

Source: Own computation

Table 6 presents summarized information regarding both independent and dependent variables. The table displays the description for each variable as well as variability in the data set. Table 6 also provides information on the sources from which the data was gathered.

4.2 Main Hypotheses and Model Construction

4.2.1 Hypotheses

Based on the analysis of the existing literature on the gravity model of trade, 5 hypotheses have been formulated:

Hypothesis 1

Distance has a negative impact on bilateral exports (both on total and industry level) meaning that the increase in distance between countries, will decrease the volume of exports.

Hypothesis 2

The membership in CPTPP has a positive impact on bilateral exports.

Hypothesis 3

GDP of countries has a positive impact on bilateral exports, meaning that the increase in GDP will increase the exports.

Hypothesis 4

Common language has a positive impact on bilateral exports, meaning that the countries speaking the same language will export more.

Hypothesis 5

Common border has a positive impact on bilateral exports, meaning that the countries sharing a common border will export more.

4.2.2 Model Construction

Economic Model

The economic model is defined as follows:

$$X_{ijt} = f(Y_{it}, Y_{jt}, Dist_{ij}, Border_{ij}, Lang_{ij}, CPTPP_{ij})$$

Econometric Model

The econometric model based on Anderson and van Wincoop (2003) theoretical model is defined as follows:

$$\ln X_{ijt} = a_1 \ln Y_{it} + a_2 \ln Y_{jt} + a_3 \ln Dist_{ij} + a_4 Border_{ij} + a_5 Lang_{ij} + a_6 CPTPP_{ij} + \gamma_{it} + \gamma_{jt} + \epsilon_{ijt} \quad (\text{equation 1})$$

$$\ln X_{ijt}^{industry} = a_1 \ln Y_{it} + a_2 \ln Y_{jt} + a_3 \ln Dist_{ij} + a_4 Border_{ij} + a_5 Lang_{ij} + a_6 CPTPP_{ij} + \gamma_{it} + \gamma_{jt} + \epsilon_{ijt} \quad (\text{equation 2})$$

In the first equation the dependent variable is the logarithm of total bilateral exports ($\ln X_{ijt}$) of the CPTPP member countries. In the second equation, the dependent variable is presented by $\ln X_{ijt}^{industry}$ that is the logarithm of disaggregated bilateral exports by each industry of the CPTPP countries. As was mentioned before, the industries include:

Agriculture, forestry and fishing (ACFF), Mining and quarrying (MNQ), Manufacturing (MNF), Food products, beverages and tobacco (FBT), Textiles, textile products, leather and related products (TEX), Wood and products of wood and cork (WOOD), Pulp, paper, paper products, printing and publishing (PPP), Coke and refined petroleum products, chemicals, rubber and plastics (CHE), Other non-metallic mineral products (NONMET), Basic metals and fabricated metal products (METAL), Computer, electronic and optical products, electrical equipment, machinery (MACH), Motor vehicles, trailers, semi-trailers, other transport equipment (TRANS), Furniture and other manufacturing (FM).

The independent variables $\ln Y_{it}$ and $\ln Y_{jt}$ represent the logarithms of GDPs of the exporter and importer countries, respectively. The independent variable $\ln Dist_{ij}$ is the logarithm of distance between the exporter and the importer country. The $Border_{ij}$ is an independent dummy variable for countries sharing common border. The $Lang_{ij}$ is an independent dummy variable for countries speaking the same language. The $CPTPP_{ij}$ is an independent dummy variable for both countries having membership in CPTPP agreement. The variables γ_{it}, γ_{jt} represent time varying fixed effects for the exporter and the importer. It is expected that these effects will account for the heterogeneity biases that exist in the data set. Baldwin and Taglioni (2006), suggest that exporter and importer time varying fixed effects correct biases that result from the model's estimate. $a_1, a_2, a_3, a_4, a_5, a_6$ are structural parameters. The ϵ_{ijt} is an error term.

The parameters in first equation are estimated by three estimation methods: simple OLS method, OLS method with taking into account time varying fixed effects of exporter and importer, and Poisson Pseudo Maximum Likelihood (PPML) method. Santos Silva and Tenreyro (2006) claim that PPML method is the preferred estimation method in the presence of heteroscedasticity. The comparison of the estimation results provides clear evidence of which estimation method better conforms with this research.

The estimations are conducted on the software STATA.

4.3 Data Analysis

4.3.1 Correlation Matrix

The correlation matrix for observing variables is presented in Table 7. The analysis of correlation shows whether the problem of multicollinearity exists. Multicollinearity occurs when two or more explanatory variables in a regression model are highly correlated,

meaning that one can be linearly predicted from another. High degree multicollinearity is confirmed if the absolute value of the correlation coefficient is greater than 0.8. It is obvious from Table 7, that there is no multicollinearity problem, as the absolute value of all correlation coefficients is less than 0.8.

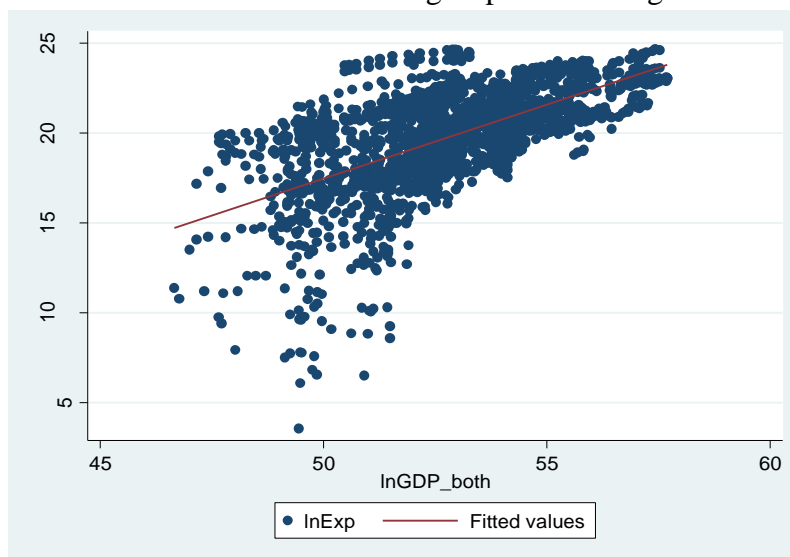
Table 7. Correlation Matrix of Observing Variables

	$\ln X_{ijt}$	$\ln Y_{it}$	$\ln Y_{jt}$	$\ln Dist_{ij}$	$Border_{ij}$	$Lang_{ij}$	$CPTPP_{ij}$
$\ln X_{ijt}$	1						
$\ln Y_{it}$	0.3874	1					
$\ln Y_{jt}$	0.4718	-0.0767	1				
$\ln Dist_{ij}$	-0.3881	0.1434	0.1309	1			
$Border_{ij}$	0.1391	-0.1495	-0.1499	-0.5815	1		
$Lang_{ij}$	0.2213	-0.0590	-0.0593	-0.4228	0.4531	1	
$CPTPP_{ij}$	0.0250	0.0653	0.0670	0.0030	-0.0014	-0.0030	1

Source: Own computation

As can be seen from Figure 4, Exports and GDP are strongly positively correlated, and that the correlation is approximately the same for exporter and importer GDP. This finding supports the basic intuition that bigger countries tend to trade more.

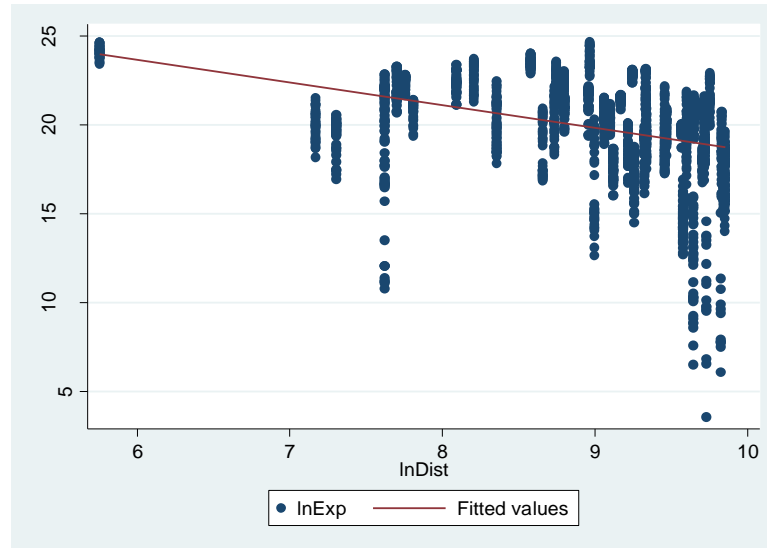
Figure 4. The Correlation between Log Exports and Log combined GDP



Source: Own computation

There is a strong negative correlation between trade and distance: country pairs that are further apart tend to trade less (Figure 5).

Figure 5. The Correlation between Log Exports and Log Distance



Source: Own computation

The Effect of Distance on exports is expected to be negative. It is expected that the more distance between countries the less trade they will be engaged in.

The effect of GDP on bilateral exports is expected to be positive. The bigger the country the more in trade it will be involved.

The $Border_{ij}$ dummy variable reflects the contiguity effect between country i and j , is expected positively affect the volume of exports, meaning that the countries in the vicinity having resembling preferences will trade more. The $Lang_{ij}$ is another dummy variable, that reflects the easiness to communicate and affects exports the same way as $Border_{ij}$.

In the case of industry level analyses, it is expected that the parameter of $lnDist_{ij}$ will significantly differ based on the industry.

It is expected that for selected industries the parameter of $Border_{ij}$ will be negative, since the economies of the adjacent countries are too similar and therefore, they trade less than expected because they all produce essentially the same goods.

4.3.2 Stationary Test

Prior to conducting the estimation, it is crucial to check the stationarity of the dataset. When constructing an econometric model across time series with diverse forms of stationarity, the OLS conditions may not be satisfied, and the model will be insufficient.

Non-stationary time series in regression models may lead to inaccurate so-called spurious regressions. Phillips and Perron (1988), Levin and Lin (1992, 1993), Hadri (2000) and Im et al (2002) have made significant advancements in investigations of panel unit root testing for data containing time series observations. In gravity models, Fidrmuc (2009) offers a thorough explanation of how various panel unit root tests might be used.

Table 8. Fisher-type Unit-root test Based on Phillips-Perron tests

		Statistic	<i>p</i> -value	Statistic	<i>p</i> -value
	lnX_{ijt}	Level		Difference	
P	Inverse chi-squared(258)	530.4269	0.0000	1982.0943	0.0000
Z	Inverse normal	-9.4259	0.0000	-36.0198	0.0000
L*	Inverse logit t(549)	-11.3534	0.0000	-52.7842	0.0000
Pm	Modified inv. chi-squared	14.9625	0.0000	84.9713	0.0000
	lnY_{it}				
P	Inverse chi-squared(220)	480.5138	0.0000	715.1821	0.0000
Z	Inverse normal	-11.5909	0.0000	-17.3340	0.0000
L*	Inverse logit t(554)	-11.4742	0.0000	-18.1445	0.0000
Pm	Modified inv. chi-squared	12.4195	0.0000	23.6069	0.0000
	lnY_{jt}				
P	Inverse chi-squared(220)	480.5138	0.0000	715.1821	0.0000
Z	Inverse normal	-11.5909	0.0000	-17.3340	0.0000
L*	Inverse logit t(554)	-11.4742	0.0000	-18.1445	0.0000
Pm	Modified inv. chi-squared	12.4195	0.0000	23.6069	0.0000

Source: Own computation

Table 8 indicates the results of the Fisher-type unit-root test based on Phillips-Perron (PP) tests. It combines *p*-values from panel-specific unit root tests, that apply inverse Chi-square (P test), inverse normal (Z test), inverse logit (L* test) and modified inverse chi-square (Pm test) transformations of *p*-values. Each method has different assumptions in the size of panel.

Ho: All panels contain unit roots

Ha: At least one panel is stationary

Since *p*-value is less than 0.05, both at level and at 1st difference, the null hypothesis “All panels contain unit root” is rejected. This states about the possibility of further analysis of the constructed model.

4.4 Regression Analysis of Total Bilateral Exports among CPTPP Countries

The results of the parameters estimation are shown in the Table 9.

Table 9. Results for alternative estimation methods

	Simple OLS (1)	OLS (2)	PPML (3)
Log of Exporter GDP	0.891*** (7.57)		
Log of Importer GDP	1.021*** (12.94)		
Log of Distance	-1.734*** (-7.21)	-1.434*** (-6.90)	-1.207*** (-14.40)
Common Border	-0.505 (-0.91)	-0.316 (-0.38)	-1.123*** (-4.52)
Common Language	0.546 (1.54)	0.846* (2.65)	0.159 (1.00)
CPTPP	-0.096 (-0.59)	-0.311 (-0.43)	0.768 (0.071)
Exporter-time dummy	No	Yes	Yes
Importer-time dummy	No	Yes	Yes
Constant	-15.30** (-3.37)	25.033*** (4.21)	32.479*** (42.03)
R ²	0.68	0.83	0.92
No. Observations	2134	2134	2200
LM-test (Heteroscedasticity)	[0.000]	[0.000]	Clustered standard errors applied
RESET test	F(1, 54) = 5.37 Prob > F = 0.0243	F(1, 54) = 22.94 Prob > F = 0.0000	chi2(1) = 1.30 Prob > chi2 = 0.2540

Source: Own computation

Note: *t* statistic is shown in parentheses. Significance levels are * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Based on the simple OLS estimation results (1), OLS estimation results with exporter and importer time varying fixed effects (2) and PPML estimation results (3) the quantified forms of the econometric model are defined as follows:

Simple OLS estimation results:

$$\ln X_{ijt} = -15.30 + 0.891 \ln Y_{it} + 1.021 \ln Y_{jt} - 1.734 \ln Dist_{ij} - 0.505 Border_{ij} + 0.546 Lang_{ij} - 0.096 CPTPP_{ij} + \gamma_{it} + \gamma_{jt} + \epsilon_{ijt} \quad (1)$$

OLS estimation results with exporter and importer time varying fixed effects:

$$\ln X_{ijt} = 25.033 - 1.434 \ln Dist_{ij} - 0.316 Border_{ij} + 0.846 Lang_{ij} - 0.311 CPTPP_{ij} + \gamma_{it} + \gamma_{jt} + \epsilon_{ijt} \quad (2)$$

PPML estimation results:

$$X_{ijt} = 32.479 - 1.207 \ln Dist_{ij} - 1.123 Border_{ij} + 0.159 Lang_{ij} + 0.768 CPTPP_{ij} + \gamma_{it} + \gamma_{jt} + \epsilon_{ijt} \quad (3)$$

4.4.1 Economic Verification of the Models

(1) Simple OLS estimation results:

If exporter country GDP increases by 1 percent, the bilateral exports will increase by 0.891 percent. If importer country GDP increases by 1 percent, the bilateral exports will increase by 1.021 percent. If distance between countries increases by 1 percent, the bilateral exports will decrease by 1.734 percent. The parameter of common border has been transformed: $(\exp(\text{parameter of } Border) - 1) * 100\%$, and 1 unit increase in common border is associated with 65.7 percent decrease in bilateral exports. The parameter of common language has been transformed: $(\exp(\text{parameter of } Lang) - 1) * 100\%$, and a change in common language by 1 is associated with 72.6 percent increase in bilateral exports. In the case of CPTPP membership, the parameter has also been transformed: $(\exp(\text{parameter of } CPTPP) - 1) * 100\%$, a change by 1 is associated with 10.1 percent decrease in bilateral exports.

(2) OLS estimation results with exporter and importer time varying fixed effects:

It is important to highlight that the exporter countries' GDPs and importer countries' GDPs are dropped from the estimation since the possible correlation with exporter and importer time-varying fixed effects. If the distance between countries increases by 1 percent, the bilateral exports will decrease by 1.434 percent. The parameters of Border, Lang, and CPTPP have been transformed as in the case of Simple OLS. A 1 unit increase in the common border is associated with a 37.2 percent decrease in bilateral exports. A change in common language by 1 is associated with a 133.0 percent increase in bilateral exports. As for CPTPP membership, a change by 1 is associated with a 36.5 percent decrease in bilateral exports.

(3) PPML estimation results:

It is important to highlight that the bilateral exports are in levels, since the gravity model is exponential the representation is equivalent to that of a log-log regression. 32.479 relates to the unit vector that was included in the model and represents some initial level of bilateral exports. If the distance between countries increases by 1 percent, the bilateral exports will decrease by 1.207 percent. The parameters of Border, Lang, and CPTPP have been transformed as in the previous two cases. A 1 unit increase in the common border is associated with a 207.4 percent decrease in bilateral exports. A change in common language by 1 is associated with a 17.2 percent increase in bilateral exports. In the case of CPTPP membership, a change by 1 is associated with a 115.5 percent increase in bilateral exports.

4.4.2 Statistical Verification of the Models

On the statistical side, verification focuses on determining how statistically significant each estimate is and how well the model performs. The *t*-test is used to determine the significance of the calculated parameters, and the results of the *t*-test vary in different estimation methods. Also, the coefficient of determination (R^2) an approach used to assess the overall quality of the model, differs according to the selected estimations techniques.

In the case of the simple OLS estimation method, the parameters of distance, exporter-country GDP, importer-country GDP are statistically significant on 0.001 level of significance, while the parameters of common border, common language, and CPTPP agreement are not statistically significant. The coefficient of determination (R^2) is the lowest compared to other estimation approaches, meaning that only 68 percent of variables in bilateral export flows are described by evaluated relationship.

The OLS estimation method with exporter and importer time-varying fixed effects indicates that the parameter of the distance between member countries is statistically significant at 0.001 level of significance and the parameter of common language is statistically significant at 0.05 level of significance. Other parameters in this estimation method found to be not significant. The coefficient of determination (R^2) in this estimation approach is higher than in the case of simple OLS and shows that 83 percent of variables in bilateral export flows are described by estimated relationship.

In the case of the PPML estimation method, it is obvious from the *t*-test output that the parameters of distance and common border are statistically significant at a significance level of 0.001, while the parameters of common language and CPTPP agreement are not

statistically significant. The coefficient of determination (R^2) is the highest in this case (92 percent), that is partly explained by the fact that the zero-bilateral exports flows are not excluded from the estimation (number of observations equals 2200).

4.4.3 Econometric Verification of the Models

The Heteroscedasticity test involves estimating the regression model by regressing the squared residuals \tilde{u} on a combination of independent variables and applying the Breusch-Pagan LM test for joint coefficient significance. The LM test results, both in the case of the Simple OLS estimation method and the OLS estimation method with exporter and importer time-varying fixed effects, indicate the presence of heteroscedasticity in bilateral exports. The null hypothesis is H_0 : heteroskedasticity not present. And the H_a : heteroskedasticity present. As the p -value [0.0000] is less than the 0.05 level of significance, the null hypothesis that there is no heteroscedasticity in the model is rejected and the alternative hypothesis is accepted. In the case of the PPML estimation method, the clustered (by distance) standard errors are applied in order to deal with the heteroscedasticity issue.

Based on the Ramsey RESET-test (Regression Equation Specification Error Test), if the model is adequately described, the square of the fitted values $\widehat{X_{ijt}}^2$ is not able to help to describe the bilateral export flows when added as additional regressor into the estimation. The null hypothesis is H_0 : specification is adequate. The rejection of the null hypothesis reflects a problem with the specification, namely nonlinearity. RESET-test results for the Simple OLS estimation method and the OLS estimation method with exporter and importer time-varying fixed effects indicate that the models suffer from misspecification. Since the p -value is less than the 0.05 level of significance, the null hypothesis is rejected. This means that the models need to be approved by adding new dependent variables. RESET-test results for the PPML estimation method show that the p -value (0.2540) is greater than the 0.05 level of significance, meaning that the null hypothesis of the adequate specification is not rejected.

4.5 Regression Analysis of Disaggregated Exports by Industry among CPTPP Countries

As a result of the above comparison of estimation methods, it is apparent that PPML is the preferred technique of estimation in the presence of heteroscedasticity and a high

prevalence of zeros in data. Since the data disaggregated by industry bilateral exports contains even more zero flows than total exports, it is decided to continuously apply the PPML method in this section.

Table 10 indicates all the estimation results for disaggregated by industry bilateral exports. It is clear from the *t*-test results that the parameters of (log) distance are statistically significant on significance level 0.001 for almost all 13 industries, except the Mining/Quarrying industry. Moreover, the distance has a negative impact on disaggregated by industry bilateral exports, meaning that the increase in distance between CPTPP countries will lead to a decrease in bilateral exports.

Table 10. PPML Estimation Results

	Cons	Log of Distance	Common Border	Common Language	CPTPP	R ²	No. Observations	RESET test
ACFF	31.309*** (26.58)	-1.613*** (-10.38)	-0.550 (-0.98)	-0.248 (-0.86)	0.302 (0.84)	0.90	2180	chi2(1) = 10.88 Prob>chi2=0.0010
MNQ	24.203*** (8.83)	-0.852* (-2.34)	-0.781 (-0.75)	-0.228 (-0.42)	0.564 (0.97)	0.96	2170	chi2(1)=3.51 Prob>chi2=0.0608
MNF	29.146*** (49.89)	-1.284*** (-17.40)	-1.602*** (-5.81)	0.413** (3.13)	0.860 (1.64)	0.97	2160	chi2(1)=1.93 Prob>chi2 =0.1644
FBT	27.593*** (30.27)	-0.933*** (-9.34)	-0.709 (-1.95)	0.463* (2.30)	0.980* (1.97)	0.90	2160	chi2(1)=2.49 Prob>chi2 =0.1148
TEX	31.403*** (19.22)	-1.206*** (-6.31)	-0.191 (-0.35)	1.319*** (3.63)	1.212** (2.91)	0.96	2160	chi2(1)=0.16 Prob>chi2= 0.6925
WOOD	25.448*** (14.85)	-0.994*** (-4.51)	0.112 (0.18)	1.189*** (2.62)	-0.162 (-0.27)	0.97	2160	chi2(1)=10.36 Prob>chi2 =0.0013
PPP	31.427*** (20.38)	-1.731*** (-8.99)	-2.615** (-3.12)	0.724* (2.50)	2.057*** (4.06)	0.87	2160	chi2(1)=10.11 Prob>chi2= 0.0015
CHE	30.155*** (36.00)	-1.388*** (-12.71)	-2.253*** (-5.55)	0.732*** (5.45)	0.825 (1.44)	0.97	2160	chi2(1)=0.28 Prob>chi2= 0.5989
NONMET	30.609*** (19.51)	-1.646*** (-7.61)	-3.152*** (-3.79)	0.909*** (3.36)	2.168*** (3.78)	0.92	2160	chi2(1)=1.27 Prob>chi2= 0.2603
METAL	30.663*** (20.42)	-1.527*** (-8.28)	-2.343*** (-3.87)	0.069 (0.22)	0.508 (0.75)	0.83	2160	chi2(1)=0.00 Prob>chi2= 0.9718
MACH	31.541*** (27.36)	-1.411*** (-9.22)	-2.400*** (-4.58)	0.565** (2.71)	0.274 (0.31)	0.97	2160	chi2(1)=31.77 Prob>chi2= 0.0000
TRANS	31.673*** (45.58)	-1.701*** (-17.85)	-2.751*** (-8.37)	0.658*** (3.42)	1.881* (2.35)	0.98	2160	chi2(1) = 6.50 Prob>chi2 =0.0108
FM	29.618*** (24.10)	-1.431*** (-9.60)	-2.108** (-3.22)	0.891*** (3.75)	2.093*** (4.48)	0.91	2160	chi2(1) = 0.89 Prob>chi2 =0.3444

Source: Own computation

Note: exporter and importer time varying fixed effects are included. *t* statistic is shown in parentheses. Significance levels are * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

In the case of common border, *t*-test results illustrate that the parameters are statistically significant on significance level 0.001 for manufacturing (MNF), chemicals/ rubber/ plastics (CHE), other non-metallic mineral products (NONMET), basic metals/ fabricated metal products (METAL), machinery/ electrical equipment (MACH), transport equipment (TRANS) industries. On the significance level of 0.01, the parameters are significant for paper products/ printing/ publishing (PPP) and furniture/other manufacturing (FM) industries.

The *t*-test findings suggest that the parameters of common language are statistically significant on a significance level of 0.001, for industries such as: textiles/ textile products (TEX), wood products (WOOD), chemicals/ rubber/ plastics (CHE), other non-metallic mineral products (NONMET), transport equipment (TRANS), furniture/other manufacturing (FM) industries. The parameters of common language are also significant for MNF, MACH (at 0.01 level of significance), and for FBT, PPP (at 0.05 level of significance).

As for CPTPP, the *t*-test outputs demonstrate that the parameters are statistically significant on a significance level of 0.001 for paper products/ printing/ publishing (PPP), other non-metallic mineral products (NONMET), and furniture/other manufacturing (FM) industries. The parameters of the CPTPP agreement are also significant for TEX (at 0.01 level of significance), and for FBT, TRANS (at 0.05 level of significance).

Although the coefficient of determination (R^2) varies by industry, it is still high for all 13 industries, meaning that approximately 90 percent of the variation in disaggregated by industry bilateral exports is described by the analyzed relationship. It is partly due to the fact that the zero-bilateral exports, which are prevalent in disaggregated data, are included in the estimation in the form of levels. The number of observations equals or higher than 2160.

Table 10 also indicates the output of the RESET test. For MNQ, MNF, FBT, TEX, CHE, NONMET, METAL, and FM, the model is properly specified since the *p*-value is larger than the 0.05 threshold of significance, indicating that the null hypothesis of the accurate specification is not rejected. The rest industries failed the RESET test, suggesting the misspecification problem.

4.6 Discussion of Results

The interpretation of the results is based on the PPML estimation output since PPML was found to be the most adequate method dealing with heteroscedasticity and omitted observations.

The distance between CPTPP countries has a significant negative effect on total bilateral exports, which tends to support the Hypothesis 1. Also, as was expected, the parameter of distance significantly differs over the industries. This can be explained by the difference in nature and properties of the industry products. It is also important to highlight the variability in “time to export” and “time to import” across the CPTPP countries, as it may affect the parameter of distance. Table 11 provides information regarding the time needed to complete border and documentary compliances both for exports and imports. It takes much longer to complete (export/import) border procedures in Brunei Darussalam, Chile, Vietnam, and Peru compared to other CPTPP countries. While it takes overall 3 hours to complete export/import procedures in Canada. The adoption of new regulations directed at simplifying the border procedures is needed in this area, as it will potentially bring countries closer to each other.

Table 11. Border and Documentary Compliance in Hours, 2019

Country	Time to export		Time to import	
	Border compliance (hours)	Documentary compliance (hours)	Border compliance (hours)	Documentary compliance (hours)
Australia	35.5	7.0	39.0	4.0
Brunei Darussalam	117.0	155.0	48.0	132.0
Canada	2.0	1.0	2.0	1.0
Chile	60.0	24.0	54.0	36.0
Japan	26.7	2.4	39.6	3.4
Mexico	20.4	8.0	44.2	17.6
Malaysia	28.0	10.0	36.0	6.5
New Zealand	37.0	3.0	25.0	1.0
Peru	48.0	24.0	72.0	48.0
Singapore	10.0	2.0	33.0	3.0
Vietnam	55.0	50.0	56.0	76.0

Source: World Bank Data. Own computation

The common border between CPTPP countries has a significant negative effect on total bilateral exports, which contradicts Hypothesis 5. In the case of disaggregated by industry bilateral exports, as was expected the parameter of the common border is negative and statistically significant for most industries, the economies of neighboring nations being too similar, trade less than anticipated due to the fact that they manufacture basically the same items. Brunei Darussalam and Malaysia share a common border, both have a high export strength in crude materials, mineral fuels/ lubricants, chemicals/related products, and manufactured goods, meaning that they are less involved in trade in those sectors. In

addition, Chile and Peru also have a common border, and both countries have an export specialization in food/live animals and crude materials sectors. Singapore and Malaysia share a common border, both countries have a strong export base in miscellaneous manufactured articles, machinery/transport equipment, and manufactured goods, which means they engage in less trade in those industries.

The parameter of common language, which determines the easiness to communicate, is positive but not statistically significant in the total bilateral exports analysis. As a result, Hypothesis 4 is dismissed. However, in the analyses of disaggregated by industry bilateral exports, the parameter of common language is positive and statistically significant for manufacturing, textiles, wood products, chemicals, other non-metallic mineral products, transport equipment, furniture/other manufacturing industries, meaning that the Hypothesis 4 is supported. The CPTPP countries are divided into three language groups. English-speaking countries include Australia, Canada, New Zealand, and Singapore. Chile, Mexico, and Peru represent Spanish-speaking countries. Whereas the Malay language is used in Brunei Darussalam, Malaysia, and Singapore. Based on the estimation results, it can be concluded, that common language significantly facilitates trade between CPTPP countries.

The parameter of CPTPP indicates the membership of a country in the agreement. All the latest information regarding the ratification processes is taken into account to provide reliable estimations. In the case of total bilateral export analysis, the parameter of CPTPP is positive but not statistically significant, meaning that Hypothesis 2 is rejected. Conversely, in the analyses of disaggregated by industry bilateral exports, the parameter of CPTPP is positive and statistically significant for food/beverages/tobacco, textiles, paper/publishing, other non-metallic mineral products, transport equipment, furniture/other manufacturing industries. The parameter of CPTPP illustrates the effect of tariff liberalization as a result of the establishment of the Comprehensive and Progressive Agreement for Trans-Pacific Partnership. It eliminates tariffs on 95 percent of products traded among members. The insignificance of the CPTPP parameter in other industries is explained by the fact that not all the tariffs are removed simultaneously, rather, each industry product has a stipulated period for tariff removal. Additionally, the data set only contains two years of operation of the CPTPP agreement, so to fully evaluate the effect of the established partnership the renewal of the analyses after a considerable period of time is preferable. The establishment of the CPTPP agreement coincided with the COVID-19 pandemics when significant disruptions in the global supply chain occurred that led to further export decreases. This fact

can also be related to the insignificance of the parameter of the CPTPP, as originally the establishment of the free trade agreement increases exports between members.

5 The Analysis of Bilateral Exports between CPTPP and EU Countries

5.1 The Analysis of Revealed Comparative Advantage of Selected Industries of CPTPP Members in EU

The revealed comparative advantage (RCA) has been calculated in order to specify the level of competitiveness of selected industry products of the CPTPP member countries within the European Union over years.

The analysis is based on annual data of exports of each CPTPP member country from 2001 to 2020. Chile and Malaysia are still included in the analyses although these countries have not completed the ratification yet. Brunei Darussalam is excluded from the calculation: first, due to the prevalence of zero trade flows in exports statistics, which can be partly explained by a difference in the country's specialization; and second due to not completion of the CPTPP ratification process.

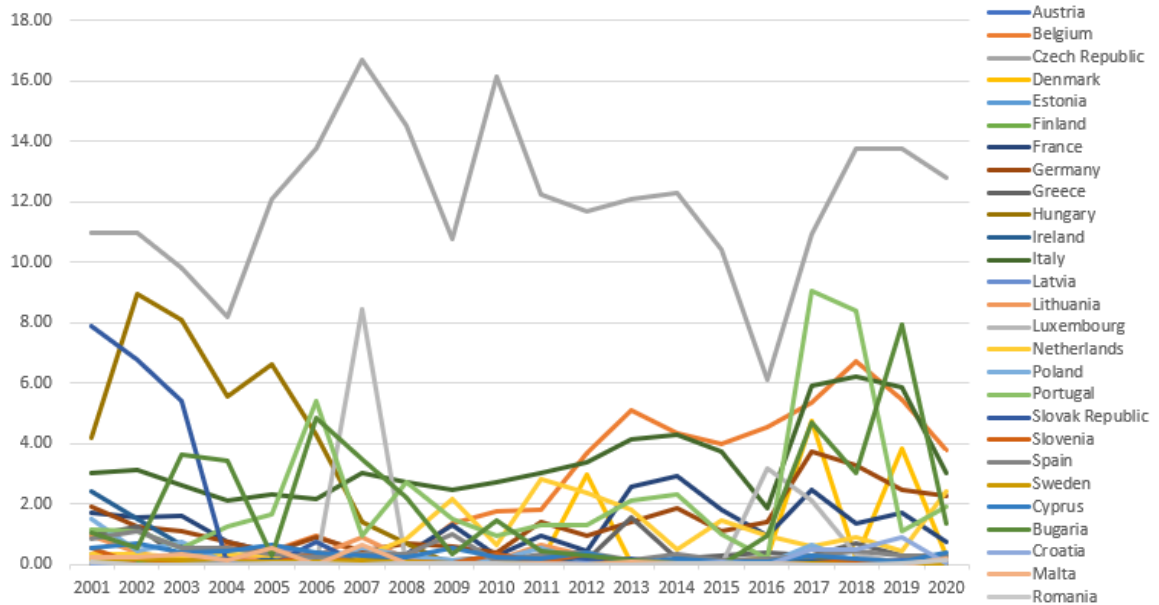
The RCA is calculated for each year in the time period, which allows observing the dynamics of changes in the level of competitiveness of selected products during the whole period. Since the world becomes more and more interconnected, and the countries establish new free trade agreements, some industries might lose competitiveness while others gain, which is explained by trade creation and trade diversion effects.

The industry level exports data is obtained from the World Integrated Trade Solutions (WITS) Database. The total exports data is obtained from the IMF Direction of Trade Statistics.

The revealed comparative advantage calculation results for Australian agriculture forestry and fishing (ACFF) products clearly illustrate comparative advantage in Belgium, Bulgaria, Portugal, Italy, Netherlands, Germany ($RCA \geq 1$), and a significantly high level in the Czech Republic ($RCA > 6$) during the considered period, as can be seen from Figure 6.

The main export items of the Australian ACFF industry in 2019 included frozen bovine meat (1.69 percent), sheep and goat meat (1.08 percent), wheat (0.94 percent), bovine meat (0.96 percent), barley (0.27 percent), cheese (0.25 percent) and concentrated milk (0.24 percent) (OEC Australia, 2019). The above numbers in parentheses indicate the share in the total country's exports.

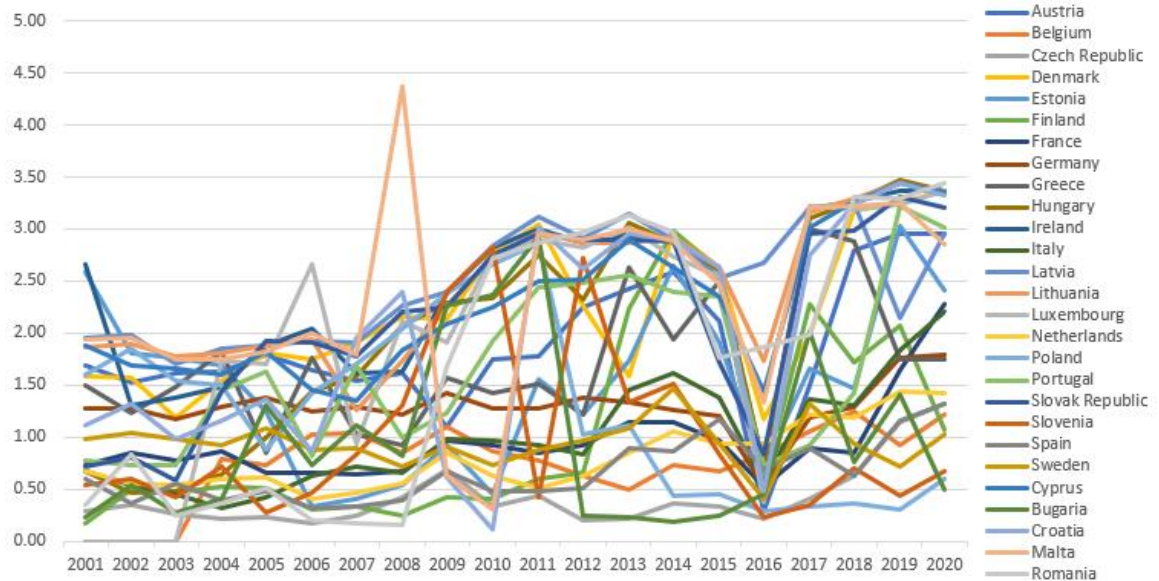
Figure 6. RCA of Australia Agriculture, Forestry and Fishing Products in EU Member States



Source: Own computation

As can be seen from Figure 7, Australian manufacturing (MNF) industry products have a high level of competitiveness ($RCA > 1$) in more than half of the EU countries, especially in Austria, Denmark, Estonia, Germany, Greece, Hungary, Ireland, Latvia, Lithuania, Luxembourg, Portugal, Slovak Republic, Cyprus, and Romania during 2001-2020.

Figure 7. RCA of Australia Manufacturing Products in EU Member States



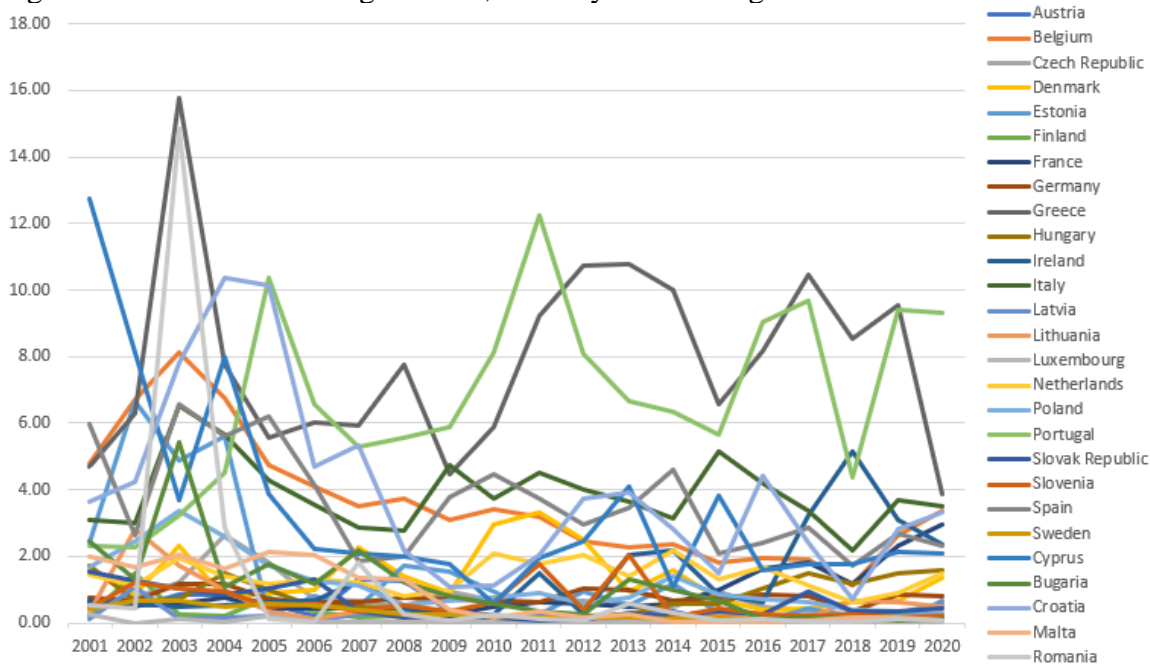
Source: Own computation

The main export items of the Australian MNF industry in 2019 is presented by chemicals (2.36 percent), machinery (1.63 percent), pharmaceutical products (1.36 percent), electrical machinery and equipment (1.12 percent), beverages and vinegar (0.91 percent), and wood products (0.61 percent) (OEC Australia, 2019).

The RCA calculation results for Canadian agriculture forestry and fishing (ACFF) products indicate a high level of competitiveness in Belgium, France, Hungary, Ireland, Italy, Netherlands, Spain, Cyprus, Croatia, ($RCA \geq 1$), and a significantly high level in Portugal and Greece ($RCA > 3$) during the considered period (Figure 8).

The main export items of Canadian ACFF industry in 2019 included meat and edible meat offal (1.07 percent), fish and crustaceans (0.98 percent), live animals (0.45 percent), cereals (1.63 percent), vegetables and roots (0.76 percent) and oil seeds (1.26 percent) (OEC Canada, 2019).

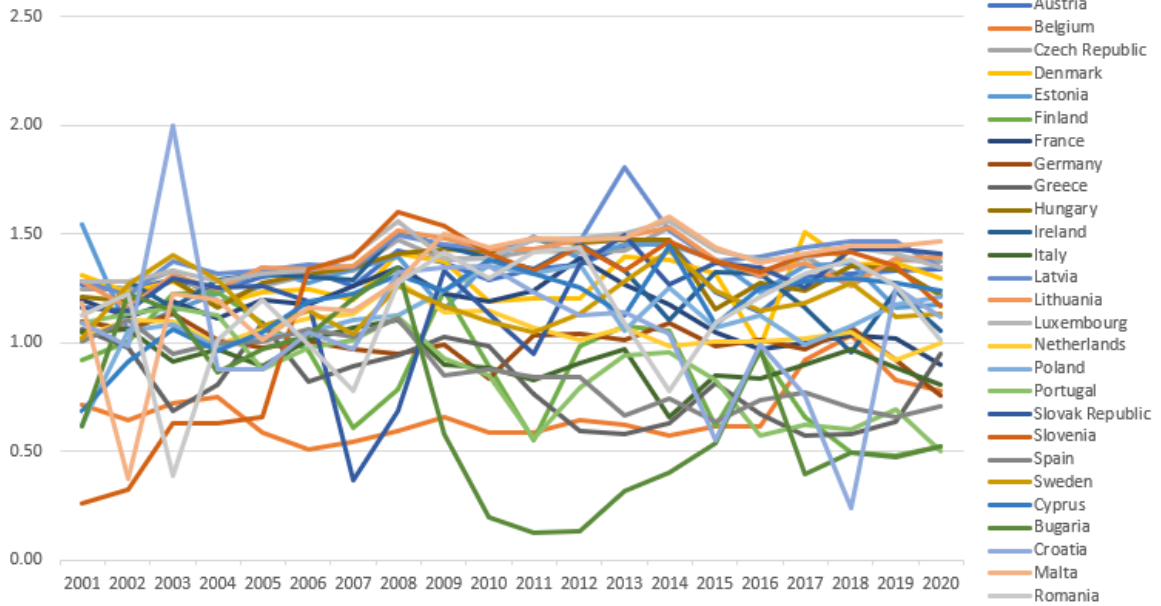
Figure 8. RCA of Canada Agriculture, Forestry and Fishing Products in EU Member States



Source: Own computation

As shown in Figure 9, Canadian manufacturing (MNF) industry products have a high level of competitiveness ($RCA > 1$) in more than half of the EU countries, especially in Austria, Czech Republic, Denmark, Estonia, France, Greece, Hungary, Ireland, Latvia, Lithuania, Luxembourg, Netherlands, Poland, Slovak Republic, Slovenia, Sweden, Cyprus, Malta, and Romania during the considered time.

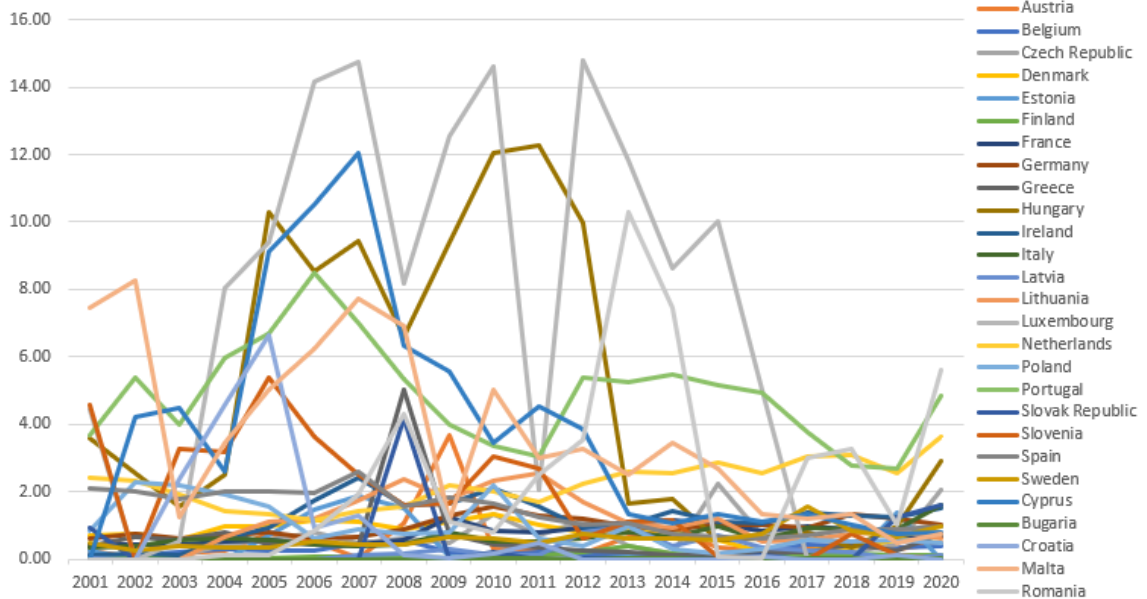
Figure 9. RCA of Canada Manufacturing Products in EU Member States



Source: Own computation

The main export items of the Canadian MNF industry in 2019 is presented by vehicles and their parts (16.5 percent), machinery (8.26 percent), electrical machinery and equipment (4.31 percent), wood articles (3.55 percent), paper products (3.07 percent), plastics (3.01 percent), aircraft, spacecraft, and parts (2.66 percent), pharmaceutical products (1.33 percent), fertilizers (1.23 percent) and furniture (1.52 percent) (OEC Canada, 2019).

Figure 10. RCA of Chile Agriculture, Forestry and Fishing Products in EU Member States



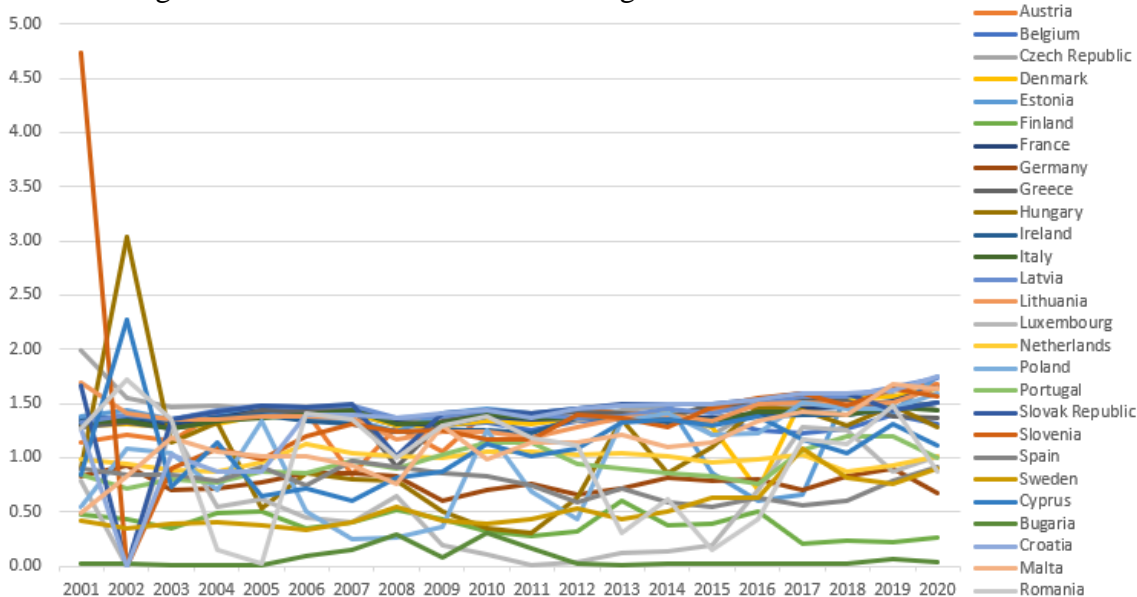
Source: Own computation

As can be seen from Figure 10, the RCA estimation results for Chile's agriculture forestry and fishing (ACFF) products clearly show a comparative advantage in Luxembourg, Hungary, Portugal, Netherlands, Cyprus, Malta, and Slovenia ($RCA > 1$), and in some countries show an upward tendency at the end of the period.

The main export items of Chile ACFF industry in 2019 included fish fillets (2.75 percent), grapes (2.26 percent), frozen fish (1.97 percent), apples and pears (1.21 percent), pitted fruits (1.05 percent), fresh fish (0.61 percent) and pig meat (0.54 percent) (OEC Chile, 2019).

It is clear from the Figure 11 that the Chile manufacturing (MNF) industry products have a stable high level of competitiveness ($RCA > 1$) in most EU countries, especially in Austria, Belgium, Czech Republic, Denmark, Estonia, France, Greece, Ireland, Italy, Latvia, Lithuania, Poland, Slovak Republic, Slovenia, Cyprus, Croatia, Malta, and Romania.

Figure 11. RCA of Chile Manufacturing Products in EU Member States



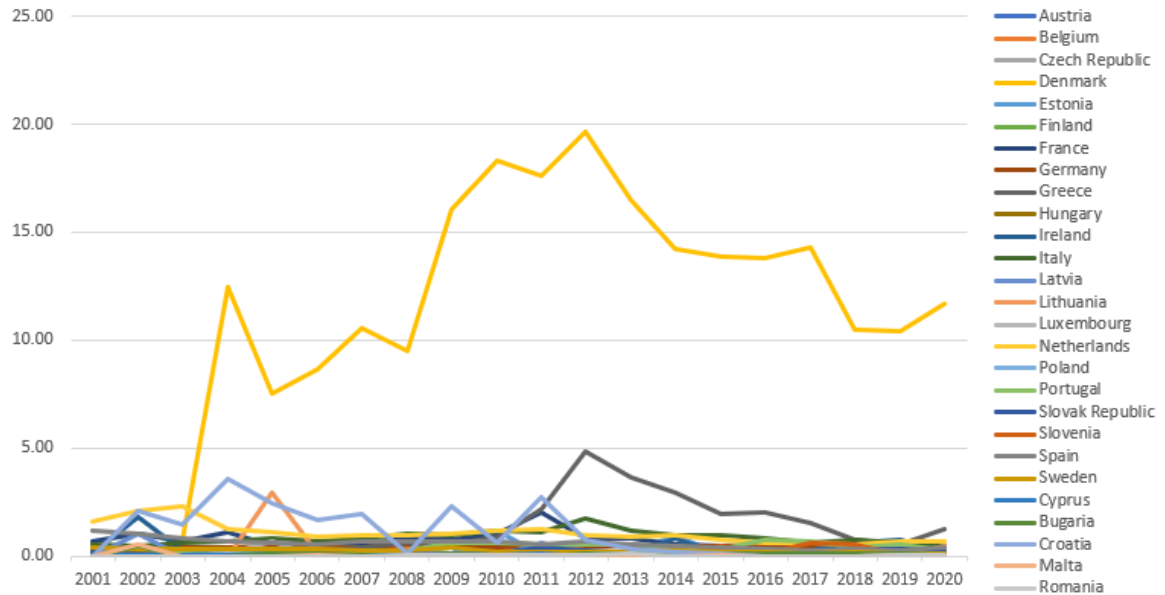
Source: Own computation

The main export items of Chile's MNF industry in 2019 is presented by chemical wood pulp (3.9 percent), wine (2.44 percent), sawn wood (1.24 percent), animal meal and pellets (0.88 percent), halogens (0.75 percent), and acyclic alcohols (0.62 percent) (OEC Chile, 2019).

ACFF products of Japan form an insignificant amount of the country's total exports. The RCA estimation results for Japan agriculture forestry and fishing (ACFF) products clearly show a comparative advantage only in Denmark ($RCA > 7$), and in Greece and Croatia

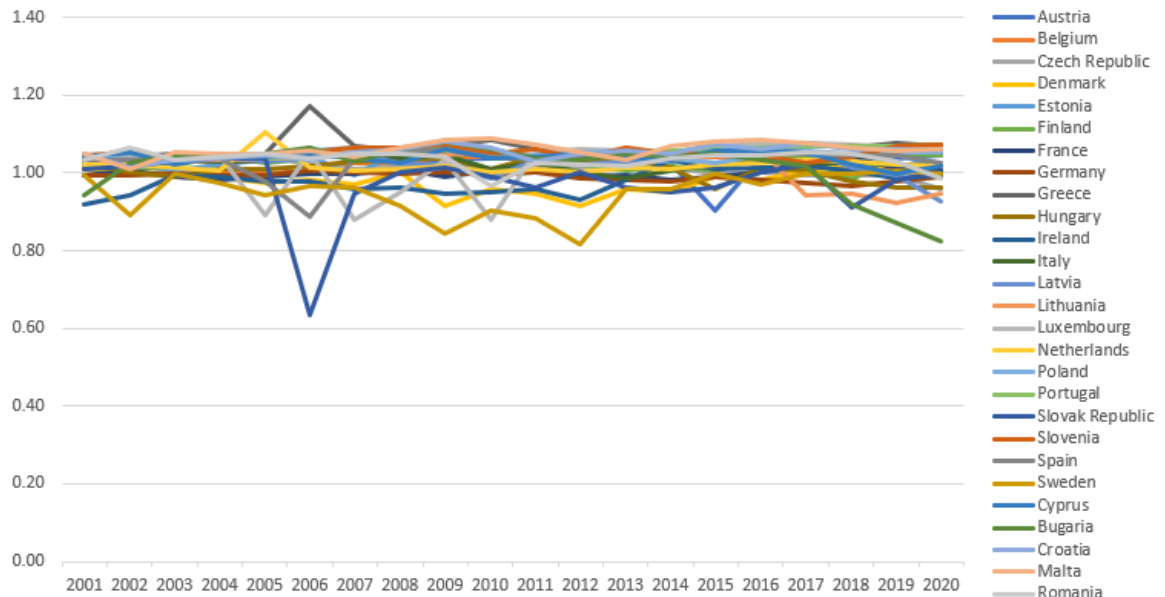
in selected years (Figure 12). The main export items of Japan's ACFE industry in 2019 included frozen fish fillets (0.077 percent), molluscs (0.07 percent), fish fillets (0.034 percent), and other vegetable products (0.042 percent) (OEC Japan, 2019).

Figure 12. RCA of Japan Agriculture, Forestry and Fishing Products in EU Member States



Source: Own computation

Figure 13. RCA of Japan Manufacturing Products in EU Member States



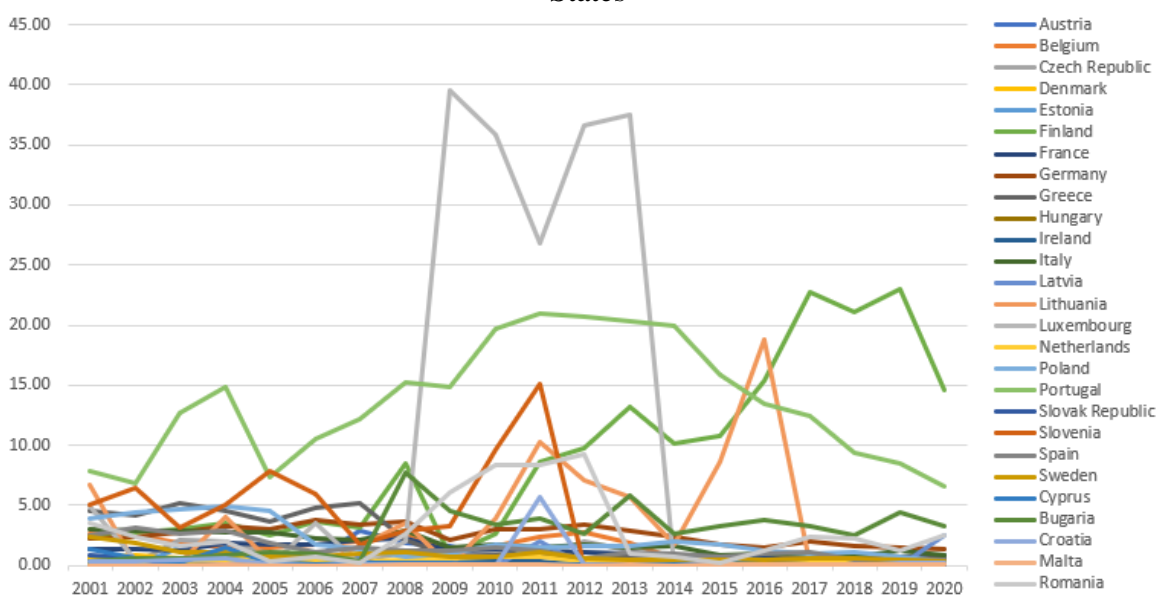
Source: Own computation

It is obvious from Figure 13, that the Japanese manufacturing (MNF) industry products have a significantly high level of competitiveness in all EU countries, the *RCA* is rather close to 1, or higher than 1.

Japan is highly focused on its manufacturing industry, and the export products are highly diverse. The main export items of Japan's MNF industry in 2019 is presented by cars (14.9 percent), vehicle parts (4.77 percent), integrated circuits (4.41 percent), machinery (2.88 percent), passenger and cargo ships (1.96 percent), photo lab equipment (1.7 percent), large construction vehicles (1.55 percent), industrial printers (1.37 percent), semiconductor devices (1.33 percent), delivery trucks (1.21 percent) and many more (OEC Japan, 2019).

The *RCA* estimation results for Malaysia agriculture forestry and fishing (ACFF) products clearly show a significant comparative advantage in Luxembourg, Finland, Portugal (*RCA*>6), and also in Germany, Italy, Poland (*RCA*>1). It is important to highlight that Malaysia's ACFF products were quite competitive in the majority of EU members from 2001 to 2010, and after started losing competitiveness (Greece, Slovenia, and Spain). It can be partly explained by the fact that Malaysia turned its focus on the manufacturing industry. Indeed, as in the case of Japan, the ACFF products of Malaysia constitute an insignificant number of total exports.

Figure 14. *RCA* of Malaysia Agriculture, Forestry and Fishing Products in EU Member States

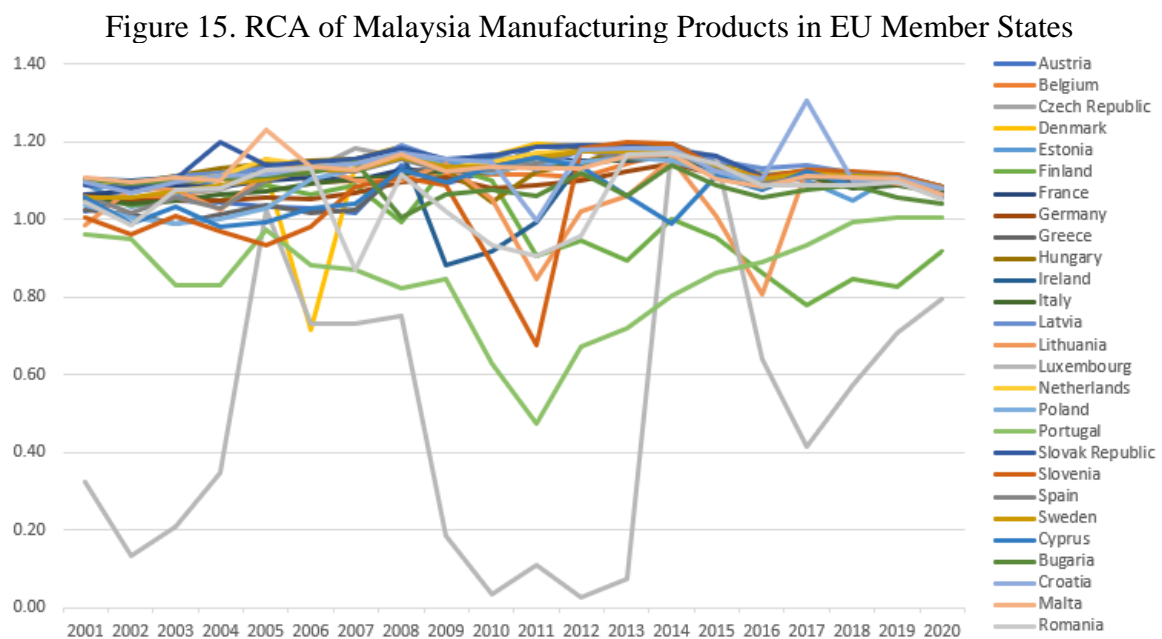


Source: Own computation

The main export items of Malaysia's ACFF industry in 2019 included concentrated milk (0.1percent), crustaceans (0.096 percent), poultry (0.068 percent), other vegetable products (0.13 percent), and eggs (0.054 percent) (OEC Malaysia, 2019).

It is clear from Figure 15, that the Malaysia manufacturing (MNF) industry products have a significantly high level of competitiveness in many EU countries ($RCA > 1$), except Luxembourg, Portugal, Finland, and Slovenia.

Malaysia, same as Japan, has a highly developed manufacturing industry, and the export products are quite diverse. The main export items of Malaysia's MNF industry in 2019 is presented by integrated circuits (23.1 percent), semiconductor devices (3.53 percent), palm oil (3.26 percent), office machine parts (2.21 percent), broadcasting equipment (2.01 percent), computers (1.62 percent), oscilloscopes (1.51 percent), rubber apparel (1.6 percent), industrial printers (1.12 percent) and aircraft parts (0.61 percent) and others (OEC Malaysia, 2019).

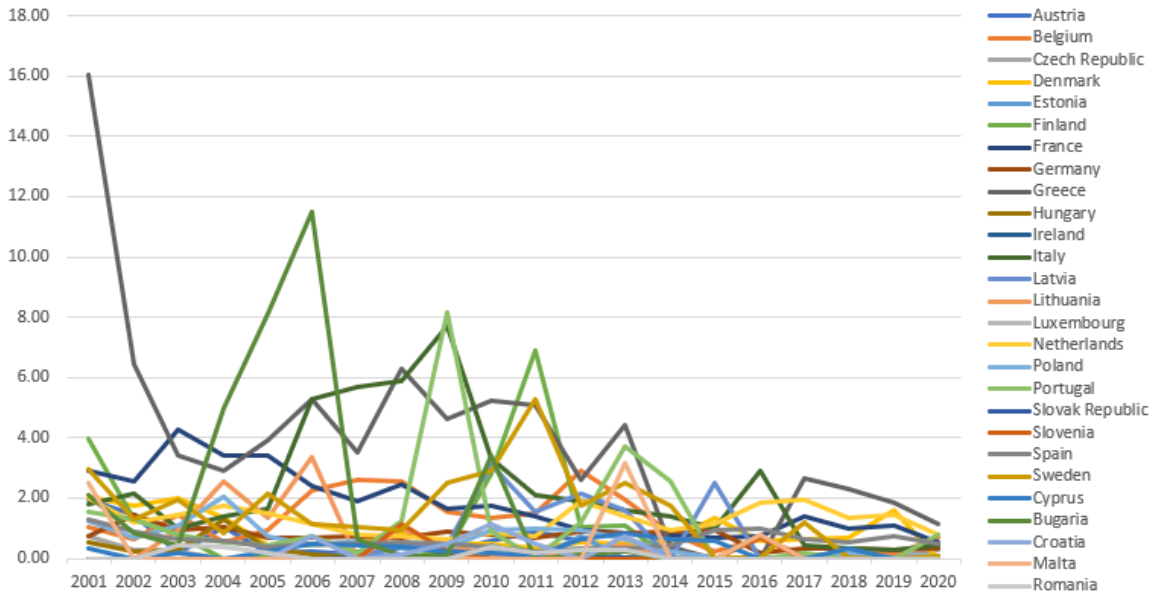


Source: Own computation

The revealed comparative advantage calculation results for Mexico's agriculture forestry and fishing (ACFF) products clearly illustrate comparative advantage in France, Greece, Italy, Netherlands, and Sweden. It is important to highlight that Mexico ACFF products were quite competitive in the many EU members during 2001-2015, and at the end of the considered period preserved competitiveness only in Greece and Netherlands (Figure 16).

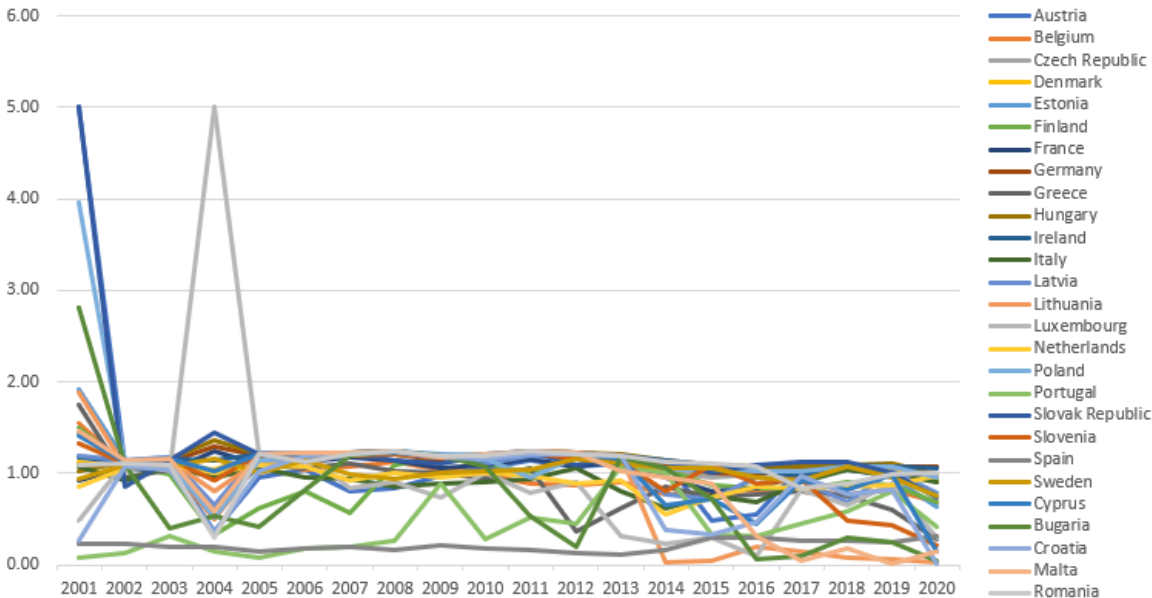
The main export items of Mexico's ACFE industry in 2019 included corn (0.7 percent), soybeans (0.48 percent), wheat (0.24 percent), pig meat (0.28 percent), poultry meat (0.26 percent), and concentrated milk (0.21 percent) (OEC Mexico, 2019).

Figure 16. RCA of Mexico Agriculture, Forestry and Fishing Products in EU Member States



Source: Own computation

Figure 17. RCA of Mexico Manufacturing Products in EU Member States



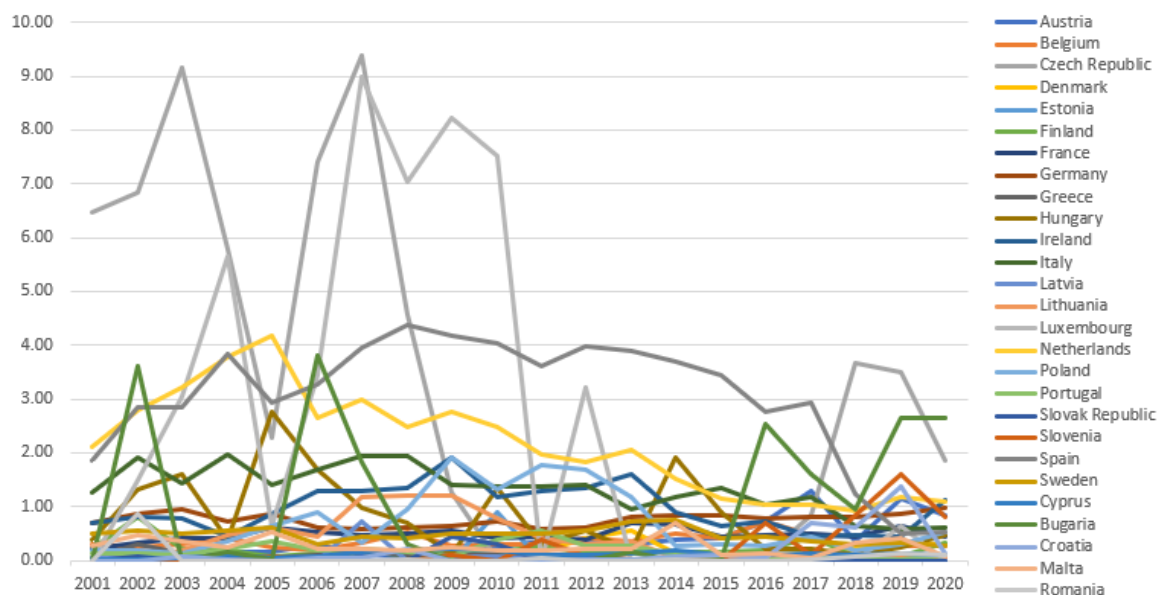
Source: Own computation

As can be seen from Figure 17, Mexico's manufacturing (MNF) industry products have a comparative advantage in more than half of the EU countries during 2001-2013. At the end of the considered period, Mexico ACFF products preserve their competitiveness only in Austria, Czech Republic, Denmark, Germany, Hungary, Ireland, Poland, and the Slovak Republic.

The main export items of Mexico's MNF industry in 2019 is presented by integrated circuits (6.89 percent), vehicle parts (6.3 percent), office machine parts (3.82 percent), cars (2.28 percent), telephones (1.89 percent), broadcasting equipment (1.64 percent), computers (1.64 percent), insulated wire (1.53 percent), combustion engines (1.28 percent) and low-voltage protection equipment (1.19 percent) (OEC Mexico, 2019).

As can be seen from Figure 18, the revealed comparative advantage calculation results for New Zealand agriculture forestry and fishing (ACFF) products clearly illustrate comparative advantage in the Czech Republic, Italy, Netherlands, Spain, and Luxembourg ($RCA > 1$). Over the considered period of time, New Zealand ACFF products continuously lost competitiveness in EU countries, only preserving their position in the Czech Republic, Bulgaria, and the Netherlands.

Figure 18. RCA of New Zealand Agriculture, Forestry and Fishing Products in EU Member States



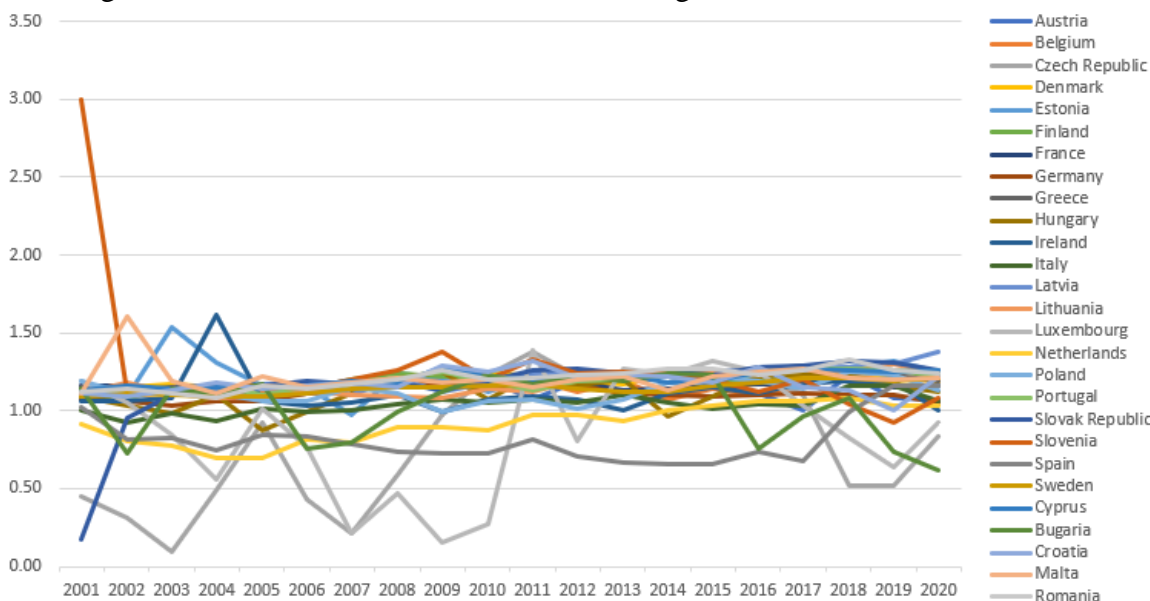
Source: Own computation

The main export items of New Zealand ACFF industry in 2019 included pig meat (0.35 percent), whey (0.19 percent), concentrated milk (0.18 percent), cheese (0.17 percent),

horses (0.16 percent), wheat (0.3 percent), coffee (0.17 percent), corn (0.16 percent), grapes (0.13 percent) and rice (0.13 percent) (OEC New Zealand, 2019).

As can be seen from Figure 19, New Zealand manufacturing (MNF) industry products have a high level of competitiveness ($RCA > 1$) in the majority of EU countries, except in Luxembourg, Spain, the Czech Republic, and Bulgaria during 2001-2020.

Figure 19. RCA of New Zealand Manufacturing Products in EU Member States



Source: Own computation

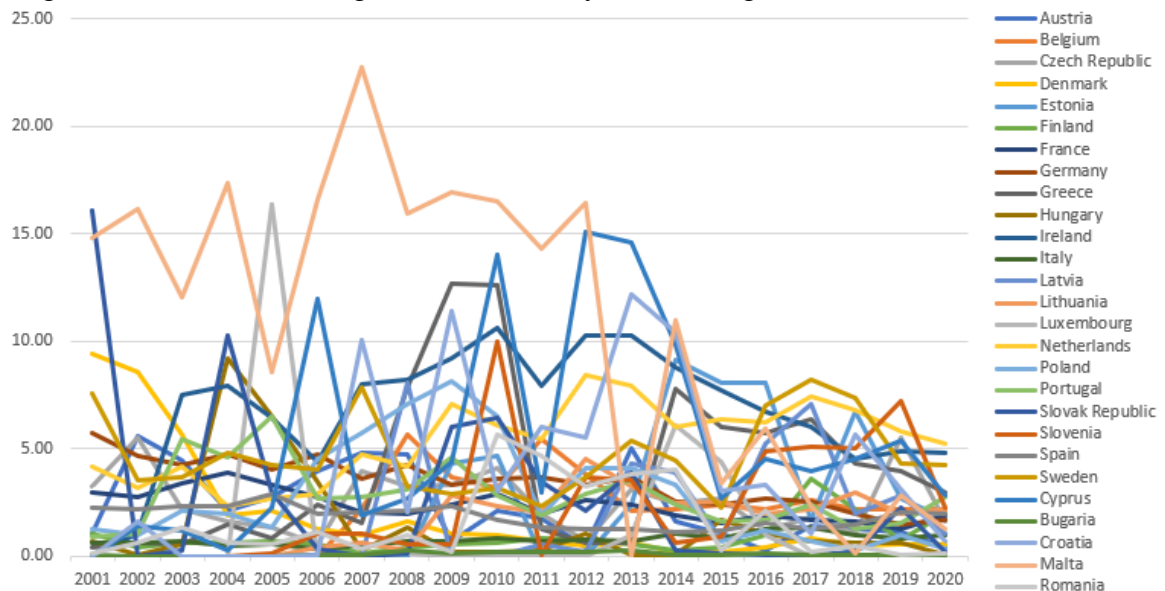
The main export items of the New Zealand MNF industry in 2019 is presented by cars (7.37 percent), delivery trucks (2.92 percent), gas turbines (2.52 percent), broadcasting equipment (2.52 percent), planes, helicopters, and spacecraft (2.11 percent), computers (1.94 percent), packaged medicaments (1.45 percent) and tractors (0.71 percent) (OEC New Zealand, 2019).

The revealed comparative advantage calculation results for Peru agriculture forestry and fishing (ACFF) products clearly illustrate a downward trend in RCA, but still during the whole period preserved high competitiveness in the majority of EU countries. As can be seen from Figure 20, Peru ACFF products have a comparative advantage in Belgium, the Czech Republic, Estonia, France, Germany, Greece, Portugal ($RCA \geq 1$), and a significantly high level in Malta, Cyprus, Ireland, Sweden, Netherlands, and Slovenia ($RCA > 6$) during the considered period.

The main export items of Peru ACFF industry in 2019 included molluscs (1.38 percent), tropical fruits (2.33 percent), other fruits (1.97 percent), grapes (1.96 percent),

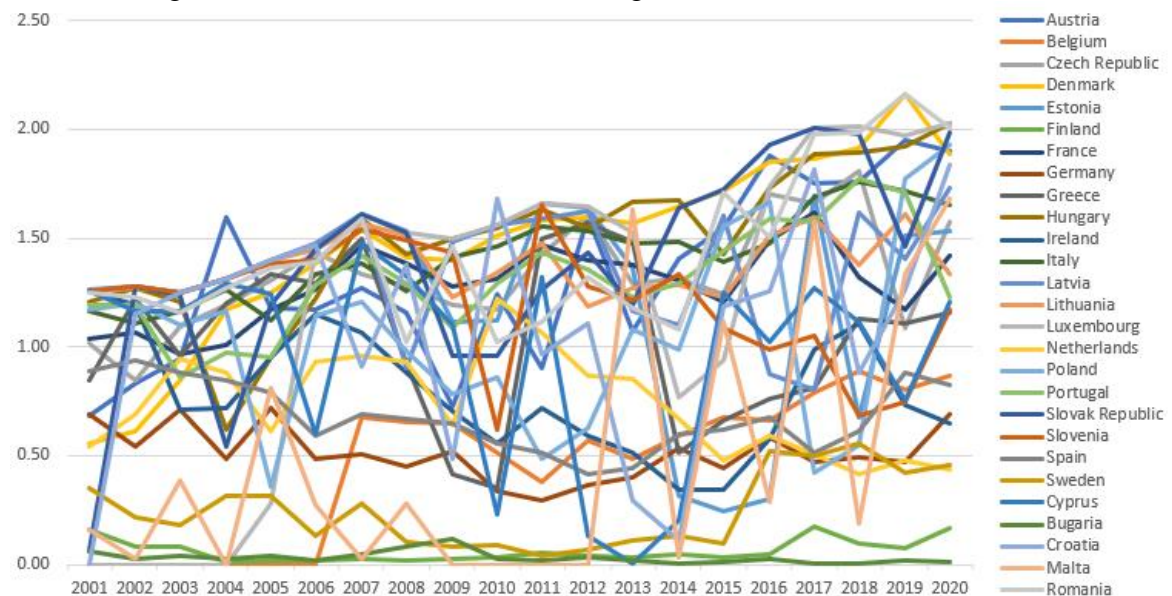
coffee (1.42 percent), other vegetables (0.89 percent) and crustaceans (0.49 percent) (OEC Peru, 2019).

Figure 20. RCA of Peru Agriculture, Forestry and Fishing Products in EU Member States



Source: Own computation

Figure 21. RCA of Peru Manufacturing Products in EU Member States



Source: Own computation

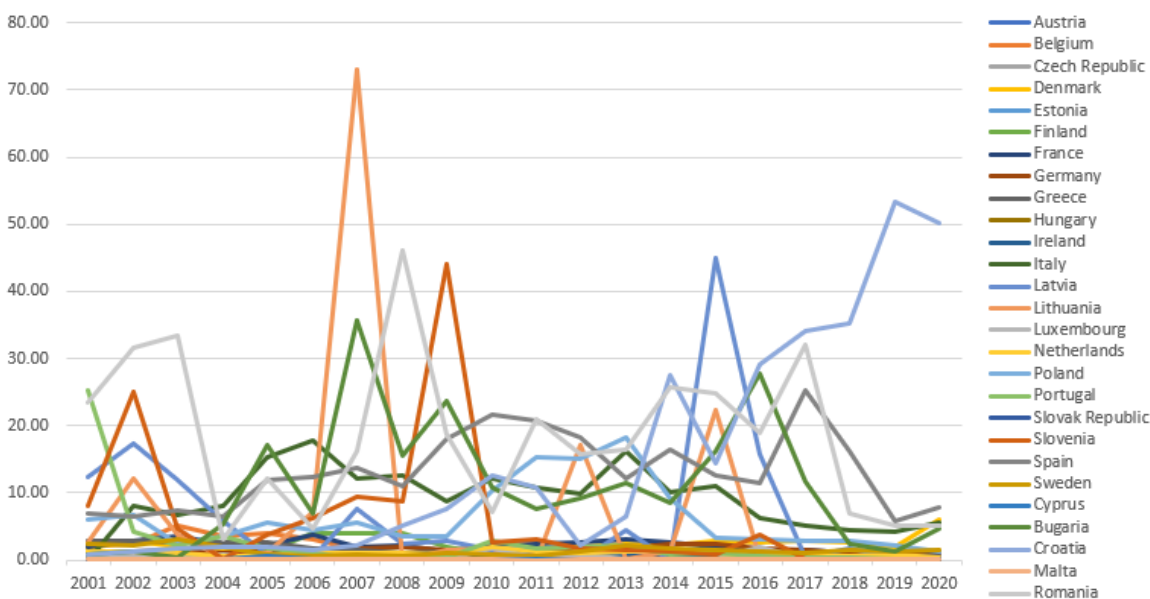
As can be seen from Figure 21, the results of RCA calculations for Peru manufacturing (MNF) industry products indicate an upward trend. Peru MNF products have a high level of competitiveness ($RCA > 1$) in more than half of the EU countries, especially

in Austria, Czech Republic, Denmark, Estonia, France, Greece, Hungary, Italy, Latvia, Lithuania, Luxembourg, Portugal, Slovak Republic, Slovenia, and Romania during 2001-2020.

The main export items of Peru’s MNF industry in 2019 is presented by animal meal and pellets (3.3 percent), fish oil (0.93 percent), knit T-shirts (0.86 percent), other processed vegetables (0.76 percent), processed crustaceans (0.71 percent) and raw plastic sheeting (0.58 percent) (OEC Peru, 2019).

The share of ACFF in Singapore’s total exports is significantly low. The RCA calculation results for Singapore agriculture forestry and fishing (ACFF) products clearly illustrate comparative advantage in Croatia, Romania, Spain, Bulgaria, Denmark, France, Germany, Poland and Italy ($RCA \geq 1$) during the considered period, as can be seen from Figure 22. The small share of ACFF products in total exports, as well as high levels of RCA of Singapore ACFF products in EU countries, indicate that the European Union is considered as a valuable export destination.

Figure 22. RCA of Singapore Agriculture, Forestry and Fishing Products in EU Member States

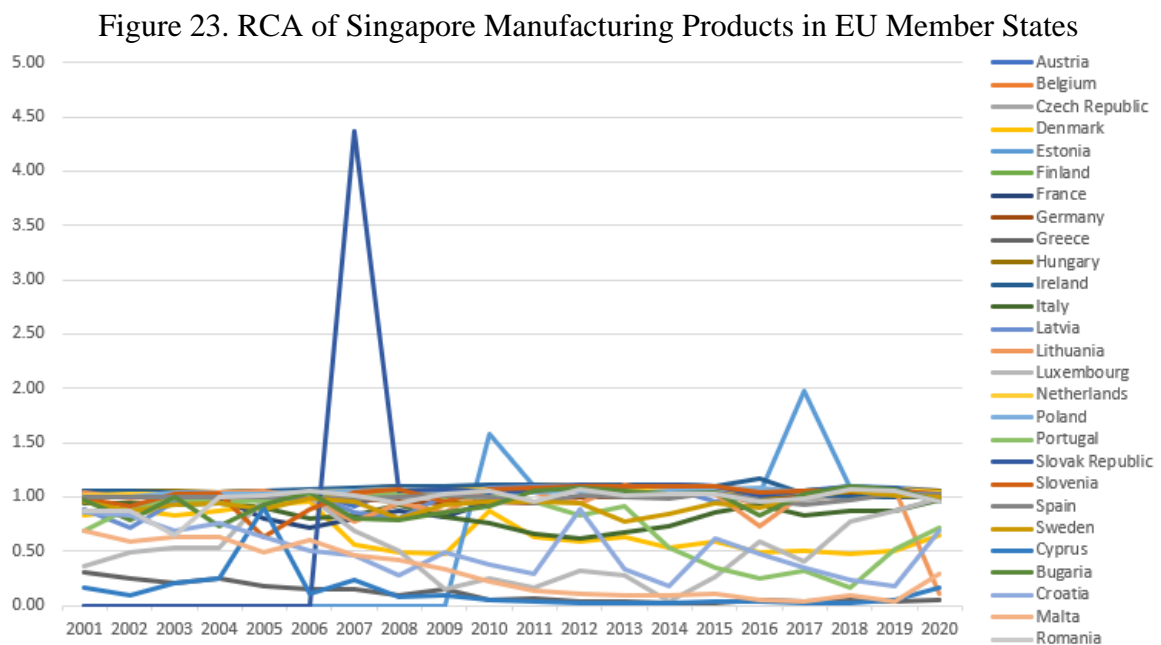


Source: Own computation

The main export items of the Singapore ACFF industry in 2019 included other vegetable products (0.083 percent), other animal products (0.063 percent), concentrated milk (0.054 percent), non-fillet frozen fish (0.021 percent), and coffee (0.011 percent) (OEC Singapore, 2019).

As can be seen from Figure 23, Singapore manufacturing (MNF) industry products have a high level of competitiveness ($RCA > 1$) in more than half of the EU countries, except in Luxembourg, Denmark, Portugal, Croatia, Malta, Cyprus, and Greece during 2001-2020.

The main export items of the Singapore MNF industry in 2019 is presented by integrated circuits (18.4 percent), gas turbines (3.41 percent), packaged medicaments (2.41 percent), office machine parts (1.78 percent), semiconductor devices (1.71 percent), machinery (1.68 percent), computers (1.55 percent), ethylene polymers (1.52 percent), photo lab equipment (1.28 percent), chemical analysis instruments (1.28 percent) and special-purpose ships (1.03 percent) (OEC Singapore, 2019).

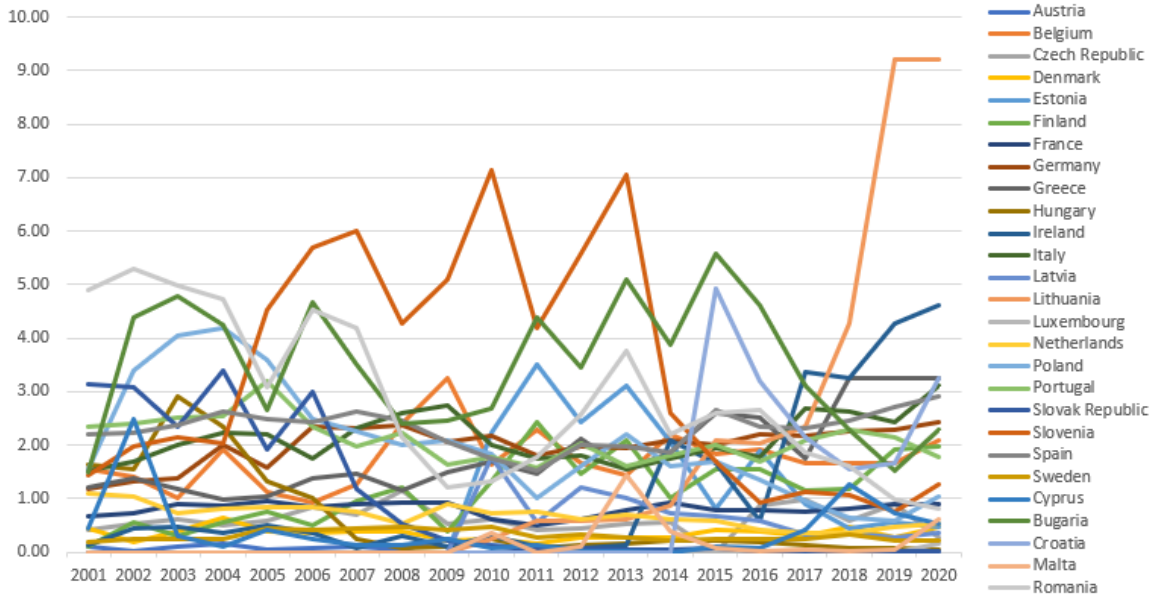


Source: Own computation

The revealed comparative advantage calculation results for Vietnam agriculture forestry and fishing (ACFF) products clearly illustrate comparative advantage in Belgium, Finland, Poland, and Portugal ($RCA \geq 1$), and significantly high level in Germany, Greece, Ireland, Italy, Lithuania, Slovenia, Spain, Bulgaria and Romania ($RCA > 2$) during the considered period, as can be seen from Figure 24.

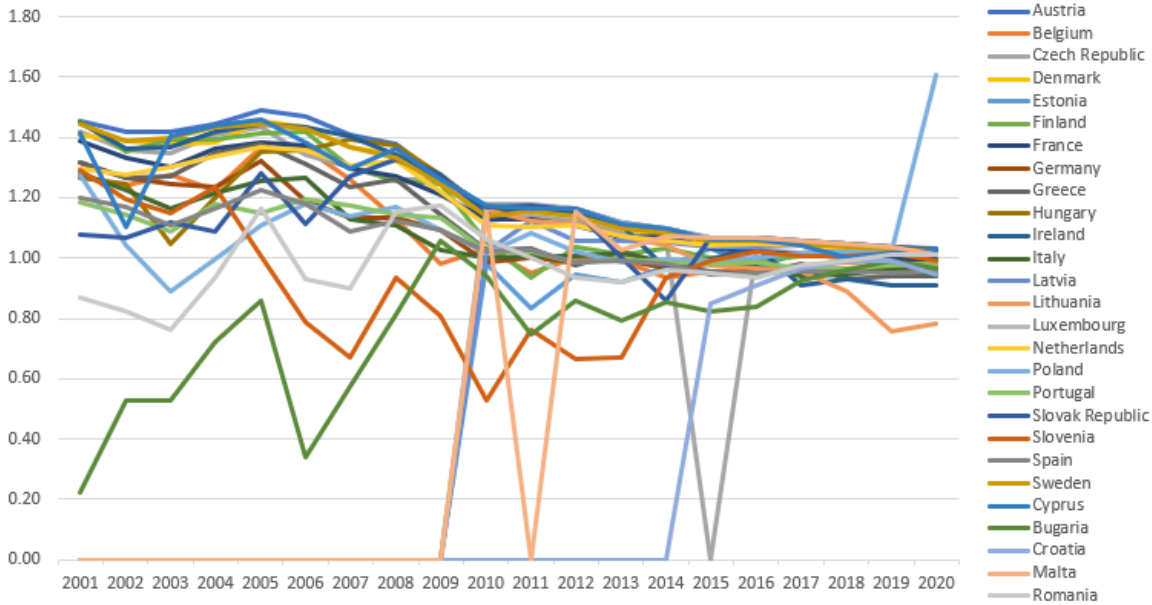
The main export items of the Vietnam ACFF industry in 2019 included fish fillets (1.02 percent), crustaceans (0.75 percent), coconuts, Brazil nuts, and cashews (1.13 percent), rice (0.87 percent), coffee (0.85 percent), other fruits (0.26 percent) and pepper (0.25 percent) (OEC Vietnam, 2019).

Figure 24. RCA of Vietnam Agriculture, Forestry and Fishing Products in EU Member States



Source: Own computation

Figure 25. RCA of Vietnam Manufacturing Products in EU Member States



Source: Own computation

As can be seen from Figure 25, Vietnam's manufacturing (MNF) industry products were highly competitive in many EU countries during 2001-2010, and at the end of the considered period still preserved their competitiveness with a slight downward trend. Vietnam MNF products have a high level of competitiveness ($RCA > 1$) in more than half of the EU countries, especially in Austria, Czech Republic, Denmark, Finland, France,

Hungary, Latvia, Luxembourg, Netherlands, Poland, Slovak Republic, Slovenia, Sweden, and Cyprus during 2001-2020.

The main export items of Vietnam's MNF industry in 2019 is presented by broadcasting equipment (15.1 percent), telephones (6.5 percent), integrated circuits (5.53 percent), textile footwear (3.77 percent), leather footwear (2.29 percent), office machine parts (1.77 percent), insulated wire (1.74 percent), computers (1.55 percent), knit sweaters (1.52 percent), video displays (1.08 percent) and other furniture (2.08 percent) (OEC Vietnam, 2019).

In terms of RCA analysis of CPTPP agriculture, forestry, and fishing products in European Union, it is obvious that Australia, Canada, Chile, New Zealand, Peru, Singapore and Vietnam ACFF products are highly competitive. While, in terms of manufacturing products, Australia, Canada, Chile, Japan, Malaysia, New Zealand, Peru, Singapore and Vietnam products have a comparative advantage in EU countries.

From the RCA analysis, it is clear that the CPTPP is a well-balanced partnership in terms of specializations of member countries.

5.2 The Analysis of Revealed Comparative Advantage of Selected Industries of EU Countries in CPTPP

In this section, the calculation results of the revealed comparative advantage (RCA) of selected industry products of the EU member countries in CPTPP countries are presented. The analysis is based on annual data of exports of each EU member country from 2001 to 2020. As in the case of the CPTPP, the selected industries include agriculture, forestry, fishing (ACFF), and manufacturing (MNF).

ACFF industry products of Austria, Belgium, France, Germany, Hungary, Latvia, Luxembourg, Portugal, Slovak Republic, Spain, and Sweden illustrate a comparative disadvantage in all CPTPP member countries, which is partly explained by the high prices of the exported items and trade specialization focus. Those, the share of ACFF in total country exports is significantly low (Appendix Tables).

The RCA calculation results show that the ACFF products of Greece, Ireland, Lithuania, Netherlands, Poland, Cyprus, and Bulgaria have a comparative advantage ($RCA > 1$) in many of CPTPP countries. The Greece ACFF products have a high competitiveness in Vietnam, Japan, Malaysia, and Canada during the considered period. It is important to

also highlight the case of the Netherlands, which ACFE products lost competitiveness in Canada and Japan, and gain a comparative advantage in Mexico and Vietnam (Appendix Tables).

The main export items of the European Union ACFE industry in 2019 included dairy products (0.98 percent), meat and edible meat offal (0.98 percent), fish and crustaceans (0.44 percent), live animals (0.22 percent), fruits and nuts edible (0.55 percent), vegetables and certain roots (0.49 percent) and cereals (0.43 percent) (OEC European Union, 2019).

The MNF industry products of the majority of EU countries except Denmark, Bulgaria, Croatia, Malta, and Romania illustrate a comparative advantage in all CPTPP member countries. The main export items of the European Union MNF industry in 2019 is presented by machinery and appliances (14.1 percent), vehicles and their parts (12.4 percent), electrical machinery and equipment (9.45 percent), pharmaceuticals products (6.9 percent), plastics (4.21 percent), instruments and apparatus (4 percent), organic chemicals (2.81 percent), aircraft, spacecraft, and parts thereof (2.22 percent), paper products (1.66 percent), furniture (1.61 percent) and essential oils (1.28 percent) (OEC European Union, 2019).

5.3 Opportunities for the European Union

The European Union already have established free trade agreements with the majority of the CPTPP members.

As can be seen from Table 12, agreements are being negotiated with Australia and New Zealand. Negotiations with Malaysia started in 2010 and is on pause since 2012. It is unlikely that the European Union will consider the global agreement with CPTPP, but most probably will continue to establish individual free trade agreements with CPTPP members. That means finalizing the agreements with Australia, New Zealand, and Malaysia. Individual free trade agreements are more preferable for the EU, due to the fact that they are faster to negotiate and come to a consensus.

Chile is ranked as the 36th trading partner of the European Union. Total imports from Chile in 2020 accounted for 5,886 million euros, which is 0.3 percent of the share in total EU imports. Agricultural and fishery products together accounted for 41.5 percent of total imports from Chile, while the manufactured products - for 58.5 percent. Total EU exports to Chile in 2020 accounted for 7,534 million euros, which is 0.4 percent of the share in total EU exports.

Table 12. Trade Agreements of EU with Individual CPTPP Countries

Country	Agreement Type	Date
Agreements in Place		
Chile	Association Agreement and Additional Protocol	In force since 2003, negotiations on modernisation began in 2017, on hold since 2019
Peru (with Colombia and Ecuador)	Trade Agreement	provisionally applied since 2013
Canada	Comprehensive Economic and Trade Agreement (CETA)	Provisionally applied since 2017
Mexico	Global Agreement	In force since 2000, negotiations on modernisation began in 2016
Japan	Global Agreement	In force since 2019
Singapore	Free Trade Agreement	In force since 2019
Vietnam	Free Trade Agreement	In force since 2020
Agreements being Negotiated		
Australia	Australia Agreement	negotiations started in 2018
New Zealand	New Zealand Agreement	negotiations started in 2018
Agreements on Hold		
Malaysia	Malaysia Agreement	Negotiations started in 2010, paused since 2012

Source: European Commission, 2021

Note: Brunei Darussalam is not included in the table

Agricultural and fishery products together accounted for 10 percent of total exports to Chile, while the manufactured products - for 90 percent (European Commission DGFT, 2021). It is expected that the EU and Chile will continue negotiations since the agreement would be beneficial for both sides. The EU is a favourable market for Chile's vegetable products, base metals, products of the chemical and allied industries, food beverages, and tobacco, while Chile is an advantageous market for the EU's machinery, transport equipment, chemicals, food beverages tobacco, and base metals.

Canada is ranked as the 11th trading partner of the European Union. Total imports from Canada in 2020 accounted for 20,035 million euros, which is 1.2 percent of the share in total EU imports. Agricultural and fishery products together accounted for 17.1 percent of total imports from Canada, while manufactured products - for 82.9 percent. Total EU exports to Canada in 2020 accounted for 33,460 million euros, which is 1.7 percent of the share in total EU exports. Agricultural and fishery products together accounted for 11.2 percent of total exports to Canada, while the manufactured products - for 88.8 percent (European Commission DGFT, 2021).

The EU-Canada CETA is not fully established, meaning that most of the EU members have already ratified the agreement, except Belgium, Bulgaria, Germany, Ireland, Greece, France, Italy, Cyprus, Hungary, Netherlands, Poland, and Slovenia. If CETA is fully

applied, it is expected that it would be highly beneficial for both sides. The EU is a favourable market for Canada's mineral products, products of the chemical and allied industries, machinery and appliances, vegetable products, while Canada is an advantageous market for the EU's machinery, transport equipment, chemicals, food beverages tobacco, and base metals.

Mexico is ranked as the 13th trading partner of the European Union. Total imports from Mexico in 2020 accounted for 20,407 million euros, which is 1.2 percent of the share in total EU imports. Agricultural and fishery products together accounted for 5.7 percent of total imports from Mexico, while the manufactured products - for 94.3 percent. Total EU exports to Mexico in 2020 accounted for 30,551 million euros, which is 1.6 percent of the share in total EU exports. Agricultural and fishery products together accounted for 4.6 percent of total exports to Mexico, while the manufactured products - for 95.4 percent (European Commission DGFT, 2021).

The EU is a favourable market for Mexico's machinery and appliances, miscellaneous manufactured products, mineral fuels, products of the chemical and allied industries, while Mexico is an advantageous market for the EU's machinery, transport equipment, chemicals, manufactured goods, miscellaneous manufactured products, mineral fuels, and lubricants.

Japan is ranked as the 7th trading partner of the European Union. Total imports from Japan in 2020 accounted for 54,934 million euros, which is 3.2 percent of the share in total EU imports. Agricultural and fishery products together accounted for 0.7 percent of total imports from Japan, while manufactured products - for 99.3 percent. Total EU exports to Japan in 2020 accounted for 55,119 million euros, which is 2.9 percent of the share in total EU exports. Agricultural and fishery products together accounted for 13.3 percent of total exports to Japan, while the manufactured products - for 86.7 percent (European Commission DGFT, 2021).

The EU is a favourable market for Japan's machinery and appliances, transport equipment, products of the chemical and allied industries, optical and photographic instruments, plastics and rubber, while Japan is an advantageous market for the EU's products of the chemical and allied industries, machinery, transport equipment, optical and photographic instruments, foodstuffs, beverages and tobacco.

Singapore is ranked as the 16th trading partner of the European Union. Total imports from Singapore in 2020 accounted for 17,098 million euros, which is 1.0 percent of the share

in total EU imports. Agricultural and fishery products together accounted for 1.5 percent of total imports from Singapore, while manufactured products - for 98.5 percent. Total EU exports to Singapore in 2020 accounted for 24,007 million euros, which is 1.2 percent of the share in total EU exports. Agricultural and fishery products together accounted for 6.7 percent of total exports to Singapore, while the manufactured products - for 93.3 percent (European Commission DGFT, 2021).

The EU is a favourable market for Singapore's products of the chemical and allied industries, machinery and appliances, optical and photographic instruments, while Singapore is an advantageous market for the EU's machinery, products of the chemical and allied industries, transport equipment, optical and photographic instruments.

Vietnam is ranked as the 15th trading partner of the European Union. Total imports from Vietnam in 2020 accounted for 34,420 million euros, which is 2.0 percent of the share in total EU imports. Agricultural and fishery products together accounted for 8.6 percent of total imports from Vietnam, while manufactured products - for 91.4 percent. Total EU exports to Vietnam in 2020 accounted for 8,788 million euros, which is 0.5 percent of the share in total EU exports. Agricultural and fishery products together accounted for 12.2 percent of total exports to Vietnam, while the manufactured products - for 87.8 percent (European Commission DGFT, 2021).

The EU is a favourable market for Vietnam's machinery and appliances, footwear, textile and textile articles, vegetable products, miscellaneous manufactured articles, while Vietnam is an advantageous market for the EU's machinery, transport equipment, products of the chemical and allied industries, manufactured goods, food and live animals, miscellaneous manufactured articles.

Australia is ranked as the 19th trading partner of the European Union. Total imports from Australia in 2020 accounted for 6,830 million euros, which is 0.4 percent of the share in total EU imports. Agricultural and fishery products together accounted for 17.1 percent of total imports from Australia, while manufactured products - for 82.9 percent. Total EU exports to Australia in 2020 accounted for 28,946 million euros, which is 1.5 percent of the share in total EU exports. Agricultural and fishery products together accounted for 11.4 percent of total exports to Australia, while the manufactured products - for 88.6 percent (European Commission DGFT, 2021).

The EU – Australia free trade agreement is still in the phase of negotiations. This is partly explained by the establishment of the AUKUS (a security pact between Australia, the

United Kingdom, and the United States) and as a result the abolition of the submarine contract with France.

The EU is a favourable market for Australia's mineral products, products of the chemical and allied industries, vegetable products, while Australia is an advantageous market for the EU's machinery, products of the chemical and allied industries, transport equipment, foodstuffs, beverages, and tobacco, optical and photographic instruments.

New Zealand is ranked as the 50th trading partner of the European Union. Total imports from New Zealand in 2020 accounted for 2,302 million euros, which is 0.1 percent of the share in total EU imports. Agricultural and fishery products together accounted for 70.5 percent of total imports from New Zealand, while the manufactured products - for 29.5 percent. Total EU exports to New Zealand in 2020 accounted for 4,195 million euros, which is 0.2 percent of the share in total EU exports. Agricultural and fishery products together accounted for 16.2 percent of total exports to New Zealand, while the manufactured products - for 83.8 percent (European Commission DGFT, 2021).

The EU – New Zealand free trade agreement is still in the phase of negotiations. This can be partly explained by the fact that the agricultural sector for both economies is highly important and protected. The FTA establishment will force both sides to eliminate tariffs on agricultural products, which is unlikely to happen in the near future as both sides apply protectionist measures.

The EU is a favourable market for New Zealand's live animals, animal products, optical and photographic instruments, products of the chemical and allied industries, foodstuffs, beverages, and tobacco, while New Zealand is an advantageous market for the EU's machinery, transport equipment, products of the chemical and allied industries, foodstuffs, beverages and tobacco, live animals, and animal products.

Malaysia is ranked as the 20th trading partner of the European Union. Total imports from Malaysia in 2020 accounted for 24,739 million euros, which is 1.4 percent of the share in total EU imports. Agricultural and fishery products together accounted for 9.2 percent of total imports from Malaysia, while manufactured products - for 90.8 percent. Total EU exports to Malaysia in 2020 accounted for 10,551 million euros, which is 0.5 percent of the share in total EU exports. Agricultural and fishery products together accounted for 8.5 percent of total exports to Malaysia, while the manufactured products - for 91.5 percent (European Commission DGFT, 2021).

The EU – Malaysia free trade agreement is still on pause. This can be partly explained by the unresolved WTO dispute between Malaysia and the EU over discriminatory restrictions of palm oil exports from Malaysia. Until recently, most of the campaigning on the EU-Malaysia trade was focused on the contentious subject of palm oil exports from Malaysia. To combat climate change, the European Union approved renewable energy regulations which would eliminate the use of palm oil in the region by 2030 due to environmental concerns.

The EU is a favourable market for Malaysia's machinery, transport equipment, miscellaneous manufactured articles, animal and vegetable oils, chemicals, manufactured goods, while Malaysia is an advantageous market for the EU's machinery, transport equipment, products of the chemical and allied industries, miscellaneous manufactured articles, manufactured goods, food, and live animals.

6 Conclusion

FTAs are essentially trade agreements. Thus, the primary objective is to stimulate economic development by reducing tariff and non-tariff obstacles to trade and investment among the participants. In this regard, the FTA may be viewed of as an arrangement that focuses heavily on economic considerations. Starting from 2018, the nations have been involved in the establishment of mega-regional trade deals. Mega-RTAs include a broader range of issues than conventional free trade agreements (FTAs). They seek to extend the advantages of market access not only by reducing/eliminating tariffs but also by removing non-tariff barriers to trade such as complicated/different technical standards, procedures for approving documents, and product conformity checking procedures.

The CPTPP being one of the first mega-regional trade agreements was originally called the Trans-Pacific Partnership Agreement (TPP) and was a multilateral trade treaty led by the United States. As the US withdrew from the TPP negotiations due to changes in US trade policy since the inauguration of the Trump administration, the TPP faced a crisis of stranding. However, Japan showed its leadership and reached a negotiation under the name of CPTPP with 11 countries excluding the United States as member states (Armstrong, 2011). The number of CPTPP member states is likely to increase in the future as China, the United Kingdom, Taiwan, Thailand, and South Korea have officially expressed their intention to join the CPTPP.

The CPTPP consists of a total of 30 chapters, and special attention is drawn to the product fields, services and investment, intellectual property rights, state-owned enterprise provisions, SPS regulations, and deferred provisions. CPTPP members share the goal of eliminating multilateral export subsidies for agricultural products, working with the WTO to eliminate export subsidies, and agree to prohibit the re-introduction of any form of export subsidy.

The empirical analyses in the thesis are divided into two levels. On the first level, the total bilateral export flows of the CPTPP members have been analysed with the constructed gravity model. The degree of influence of the distance between members, common border, common language, and CPTPP membership has been evaluated. The parameters' estimations have been performed by three methods: Simple Ordinary Least Squares (OLS), OLS with exporter and importer time-varying fixed effects and the Poisson Pseudo Maximum Likelihood (PPML). The models have been compared based on economic,

statistical, and econometric verifications, where it was found that the PPML method provides the most accurate results (coefficient of determination, RESET test) and deals with heteroscedasticity in data. In addition, the t-test output illustrates that the parameters of distance and common border are statistically significant at a significance level of 0.001, while the parameters of common language and CPTPP agreement are not statistically significant.

Since the PPML method was found as the most well-performed method, it has been applied in further regression analysis of the disaggregated by industry bilateral exports of CPTPP countries. Although the coefficient of determination varies by industry, it is still high for all 13 industries, meaning that approximately 90 percent of the variation in disaggregated by industry bilateral exports is described by analysed relationship. It is partly due to the fact that the zero-bilateral exports, which are prevalent in disaggregated data, are included in the estimation in the form of levels. Based on the RESET test, it can be concluded that for the majority of industries the model is correctly specified.

The distance between CPTPP countries has a significant negative effect on total bilateral exports, which tends to support the Hypothesis 1. Also, as was expected, the parameter of distance significantly differs over the industries. This can be explained by the difference in nature and properties of the industry products. It was found that the time needed to complete border and documentary compliances both for exports and imports significantly differs across the countries. The adoption of new regulations directed at simplifying the border procedures is needed in this area, as it will potentially bring countries closer to each other.

The common border between CPTPP countries has a significant negative effect on total bilateral exports, which contradicts the Hypothesis 5. In the case of disaggregated by industry bilateral exports, as was expected the parameter of the common border is negative and statistically significant for most industries, the economies of neighboring nations being too similar, trade less than anticipated due to the fact that they manufacture basically the same items.

The parameter of common language, which determines the easiness to communicate, is positive but not statistically significant in the total bilateral exports analysis. As a result, Hypothesis 4 is dismissed. However, in the analyses of disaggregated by industry bilateral exports, the parameter of common language is positive and statistically significant for manufacturing, textiles, wood products, chemicals, other non-metallic mineral products,

transport equipment, furniture/other manufacturing industries, meaning that the Hypothesis 4 is supported. The CPTPP countries are divided into three language groups: English-speaking, Spanish-speaking, and Malay-speaking countries. Based on the estimation results, it can be concluded, that common language significantly facilitates trade between CPTPP countries.

The parameter of CPTPP indicates the membership of a country in the agreement. All the latest information regarding the ratification processes is taken into account to provide reliable estimations. In the case of total bilateral export analysis, the parameter of CPTPP is positive but not statistically significant, meaning that Hypothesis 2 is rejected. Conversely, in the analyses of disaggregated by industry bilateral exports, the parameter of CPTPP is positive and statistically significant for food/beverages/tobacco, textiles, paper/publishing, other non-metallic mineral products, transport equipment, furniture/other manufacturing industries, meaning that Hypothesis 2 is supported. The parameter of CPTPP illustrates the effect of tariff liberalization as a result of the establishment of the Comprehensive and Progressive Agreement for Trans-Pacific Partnership. It eliminates tariffs on 95 percent of products traded among members. The insignificance of the CPTPP parameter in other industries is explained by the fact that not all the tariffs are removed simultaneously, rather, each industry product has a stipulated period for tariff removal. Additionally, the data set only contains two years of operation of the CPTPP agreement, so to fully evaluate the effect of the established partnership the renewal of the analyses after a considerable period of time is preferable. The establishment of the CPTPP agreement coincided with the COVID-19 pandemics when significant disruptions in the global supply chain occurred that led to further export decreases. This fact can also be related to the insignificance of the parameter of the CPTPP, as originally the establishment of the free trade agreement increases exports between members.

In terms of RCA analysis of CPTPP agriculture, forestry, and fishing products in the European Union, it is obvious that Australia, Canada, Chile, New Zealand, Peru, Singapore, and Vietnam ACFF products are highly competitive. While, in terms of manufacturing products, Australia, Canada, Chile, Japan, Malaysia, New Zealand, Peru, Singapore, and Vietnam products have a comparative advantage in EU countries.

Conversely, the RCA calculation results show that the ACFF products of Greece, Ireland, Lithuania, Netherlands, Poland, Cyprus, and Bulgaria have a comparative advantage in many of the CPTPP countries. In addition, the MNF industry products of the majority of

EU countries except Denmark, Bulgaria, Croatia, Malta, and Romania illustrate a comparative advantage in all CPTPP member countries.

From the RCA analysis, it is clear that the CPTPP is a well-balanced partnership in terms of specializations of member countries. The European Union already has established free trade agreements with the majority of the CPTPP members. Agreements are being negotiated with Australia and New Zealand. Negotiations with Malaysia started in 2010 and is on pause since 2012. It is unlikely that the European Union will consider the global agreement with CPTPP, but most probably will continue to establish individual free trade agreements with CPTPP members. That means finalizing the agreements with Australia, New Zealand, and Malaysia. The obstacles are associated with the AUKUS partnership, New Zealand agricultural products, and the EU-Malaysia dispute on palm oil.

The empirical model in the research is limited to four dependent variables. In further research, the number of dependent variables might be extended. The current research can be applied for further analysis of the regional integration in the CPTPP partnership and form a base for the regional input-output analysis.

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8.3 List of abbreviations

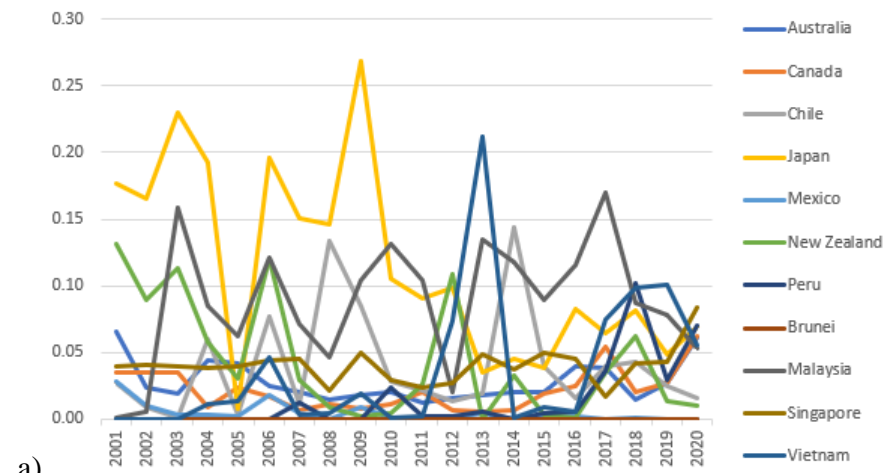
ACFF	Agriculture, Forestry and Fishing
APEC	Asia-Pacific Economic Cooperation
ASEAN	Association of South-East Asian Nations
AUKUS	Australia, the United Kingdom and the United States security pact
BRICS	Brazil, Russia, India, China, and South Africa (Acronym)
CEPII	Centre d'Études Prospectives et d'Informations Internationales (French Acronym)
CETA	Comprehensive Economic and Trade Agreement
CHE	Coke and refined petroleum products, chemicals, rubber and plastics
CPTPP	Comprehensive and Progressive Agreement for Trans-Pacific Partnership
DDA	Doha Development Agenda

DGFT	Directorate General for Trade
EAS	East Asia Summit
EU	European Union
FBT	Food products, beverages and tobacco
FM	Furniture and other manufacturing
FTAs	Free Trade Agreements
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
ICT	Information and communication technologies
IMF	International Monetary Fund
IPR	Intellectual Property Rights
ISIC	International Standard Industrial Classification
LM	Breusch-Pagan Lagrange multiplier
MACH	Computer, electronic and optical products, electrical equipment, machinery
METAL	Basic metals and fabricated metal products
MFN	Most Favoured Nation
MNF	Manufacturing
MNQ	Mining and Quarrying
NONMET	Other non-metallic mineral products
OECD	Organisation for Economic Co-operation and Development
OLS	Ordinary Least Squares
PPML	Poisson Pseudo Maximum Likelihood
PPP	Pulp, paper, paper products, printing and publishing
RCA	Revealed comparative advantage
RCEP	Regional Comprehensive Economic Partnership
R&D	Research and Development
RESET	Regression Equation Specification Error Test
RTA	Regional Trade Agreement
SMEs	Small and Medium-Sized Enterprises
TEX	Textiles, textile products, leather and related products
TPP	Trans-Pacific Partnership
TRANS	Motor vehicles, trailers, semi-trailers, other transport equipment

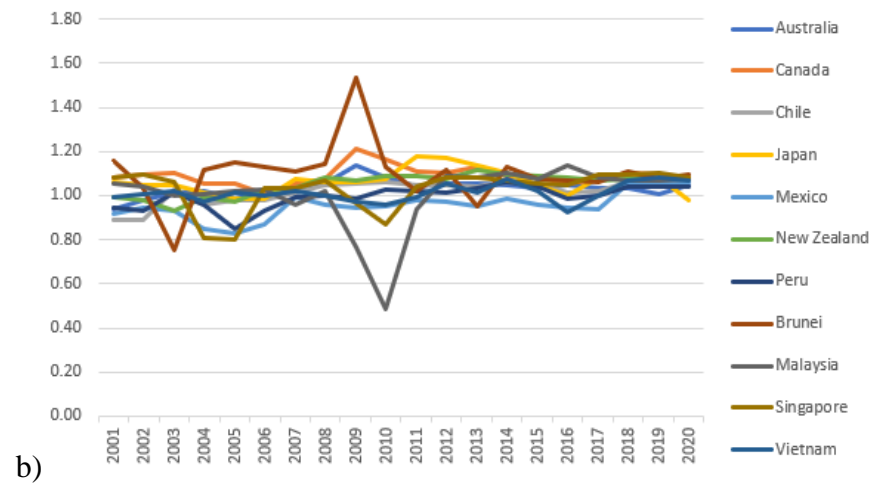
TRQ	Tariff Rate Quotas
UNCTAD	United Nations Conference on Trade and Development
US	United States
WITS	World Integrated Trade Solutions
WOOD	Wood and products of wood and cork
WTO	World Trade Organization

9 Appendix

Figure a. RCA of Austria Agriculture, Forestry, Fishing (a) and Manufacturing (b) Products in CPTPP Countries

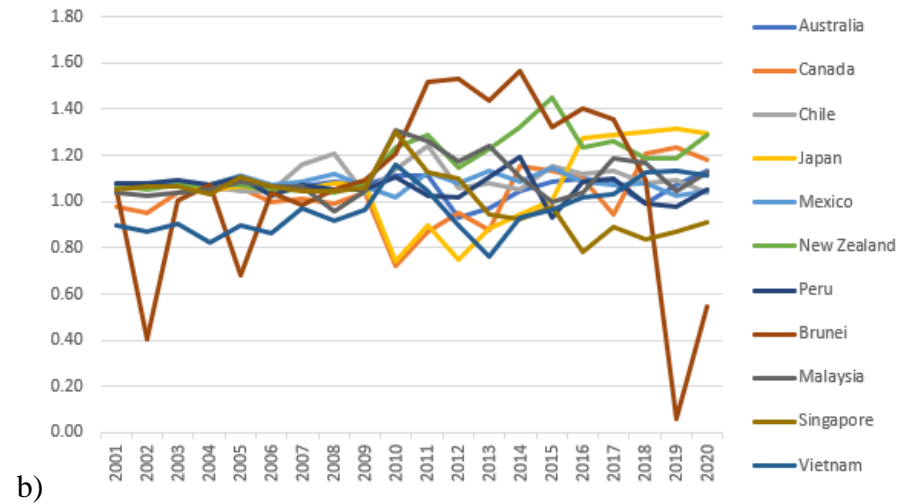
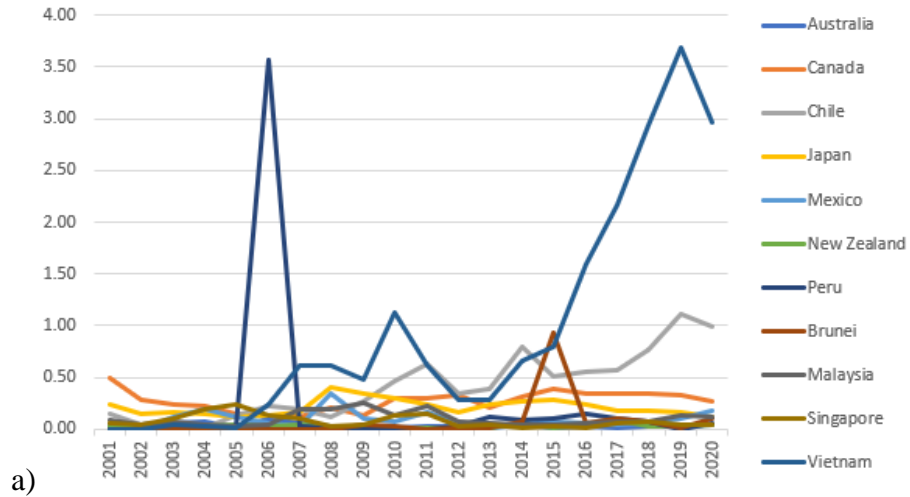


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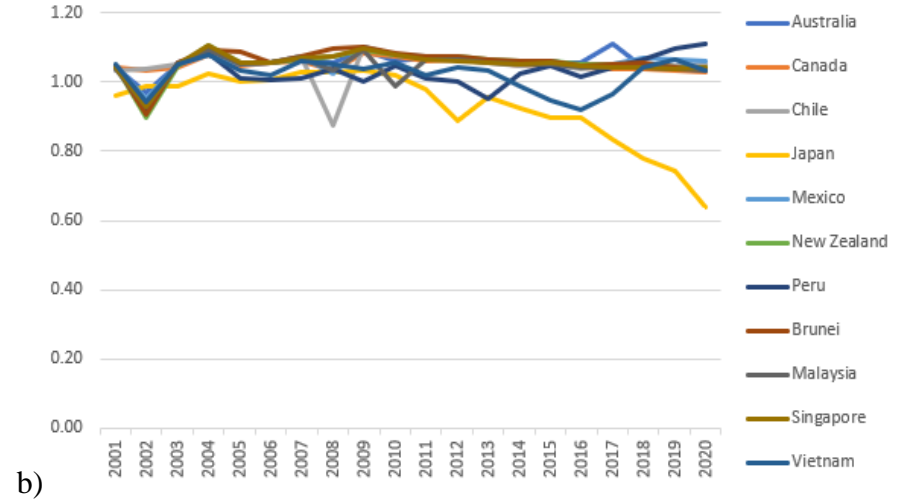
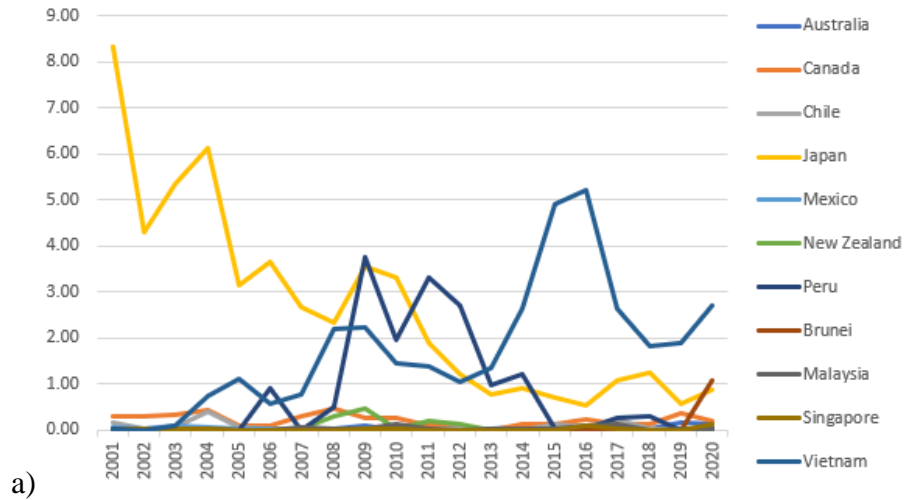
b)

Figure b. RCA of Belgium Agriculture, Forestry, Fishing (a) and Manufacturing (b) Products in CPTPP Countries



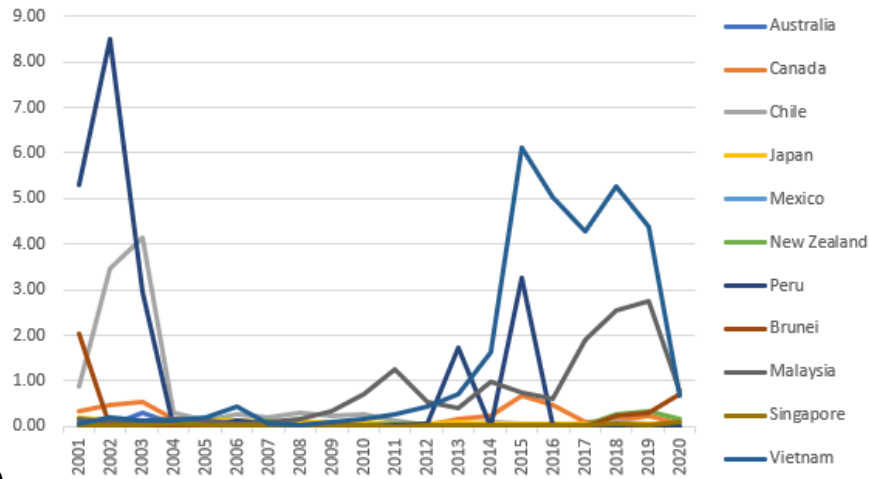
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Figure c. RCA of Czech Republic Agriculture, Forestry, Fishing (a) and Manufacturing (b) Products in CPTPP Countries

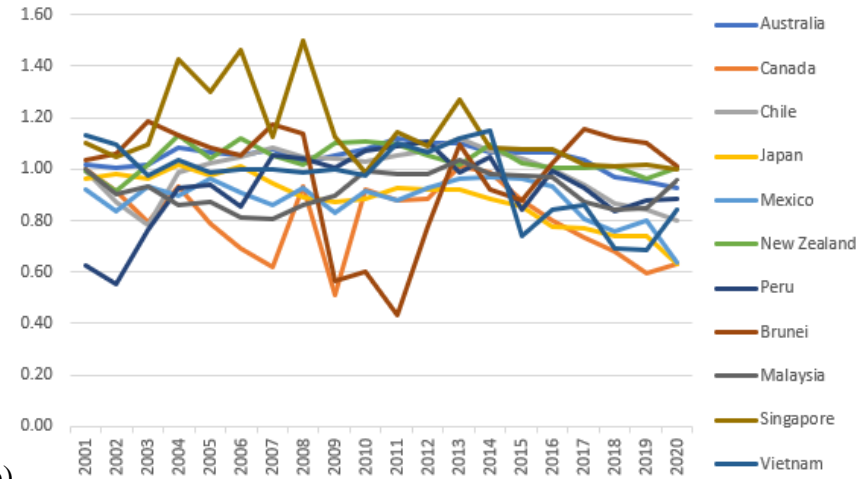


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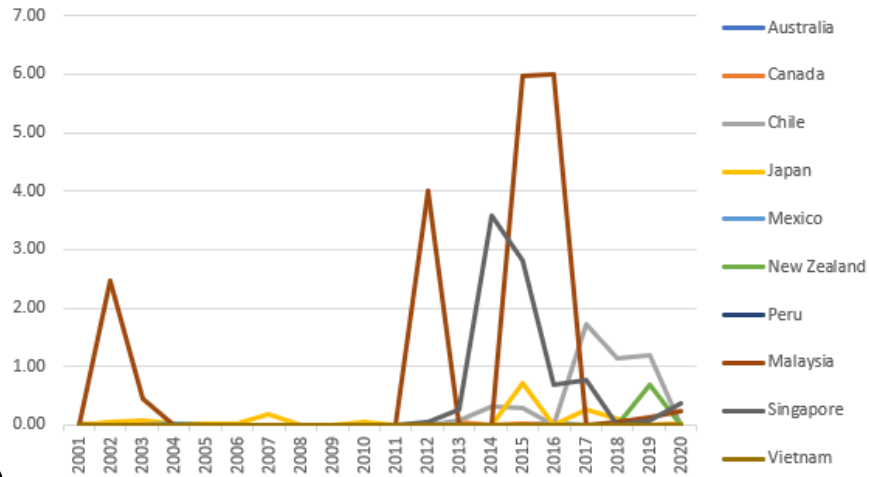


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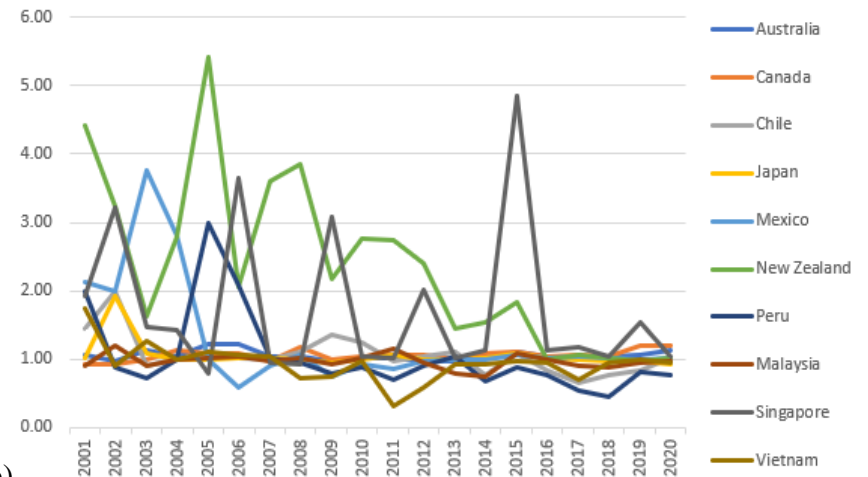


b)

Figure e. RCA of Estonia Agriculture, Forestry, Fishing (a) and Manufacturing (b) Products in CPTPP Countries

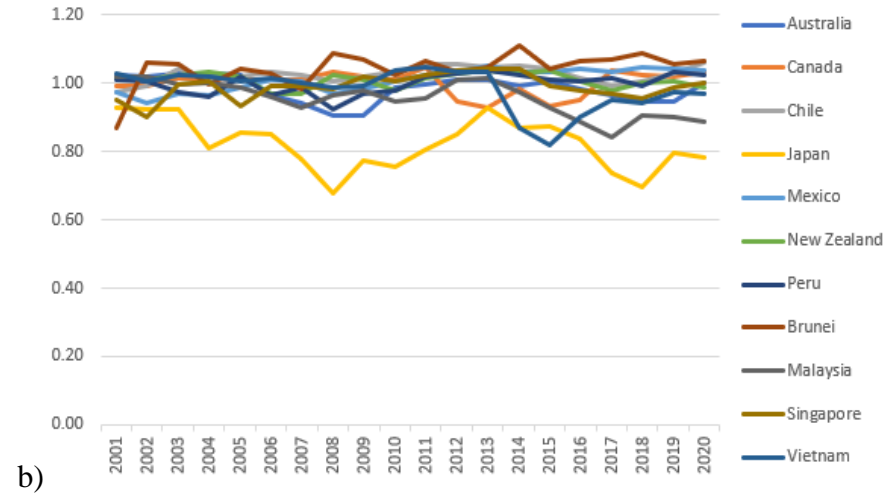
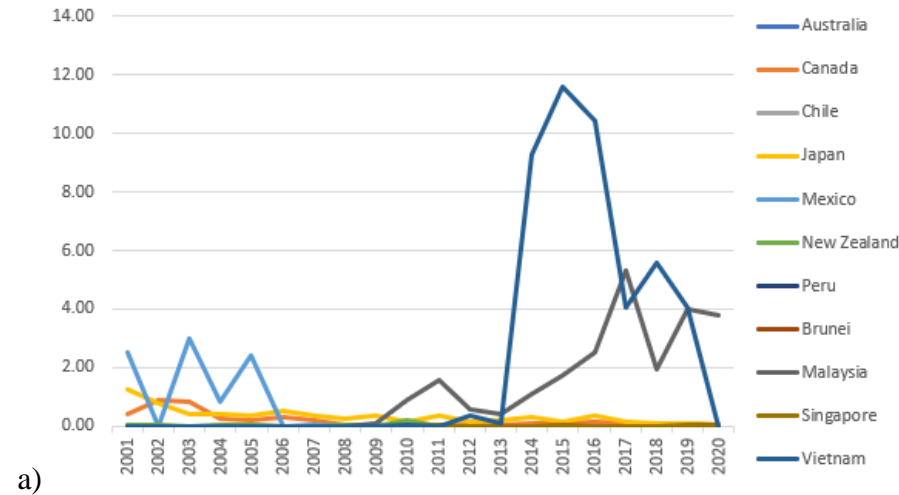


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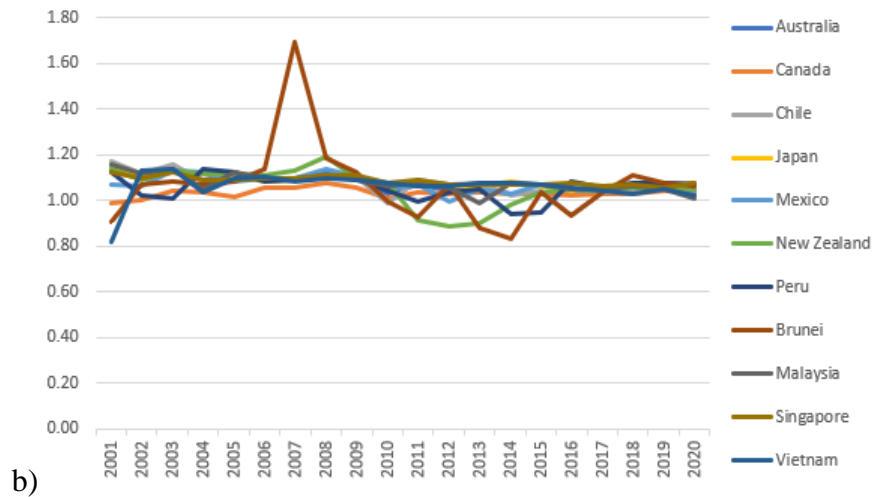
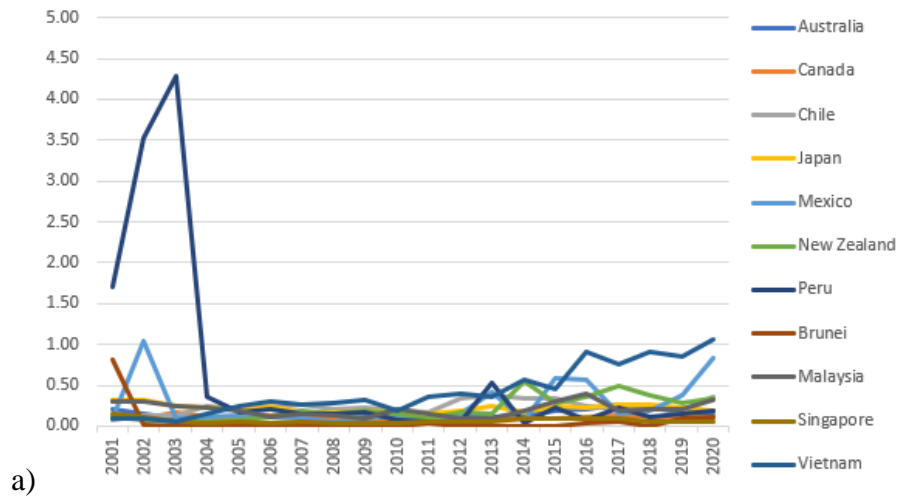
Figure f. RCA of Finland Agriculture, Forestry, Fishing (a) and Manufacturing (b) Products in CPTPP Countries



a) Source: Own computation

b) Source: Own computation

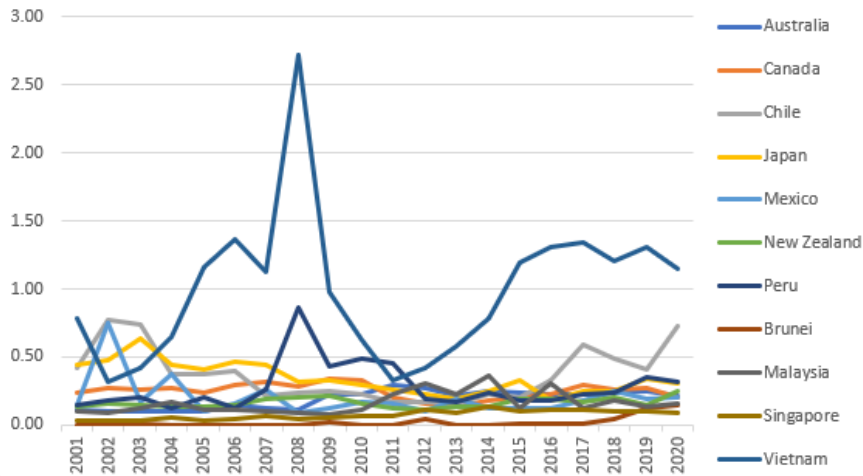
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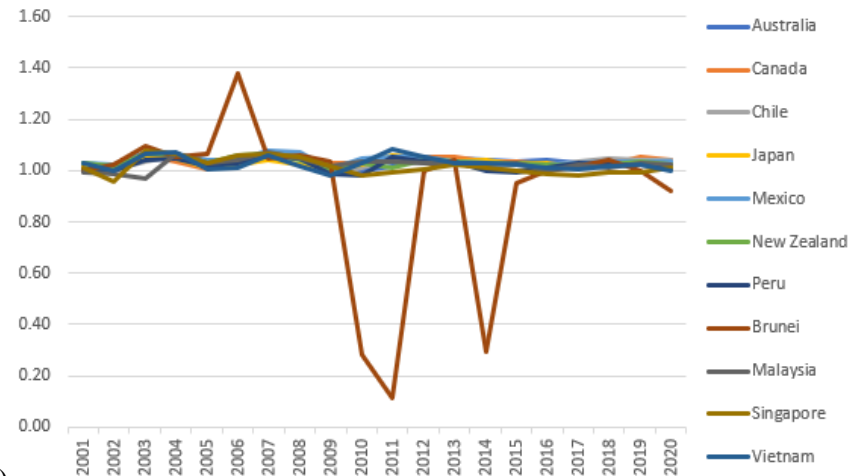
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b) Source: Own computation

Figure h. RCA of Germany Agriculture, Forestry, Fishing (a) and Manufacturing (b) Products in CPTPP Countries

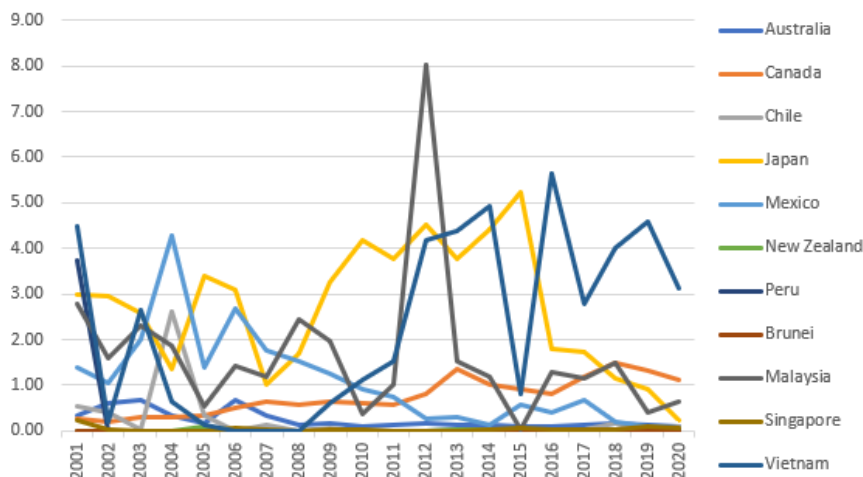


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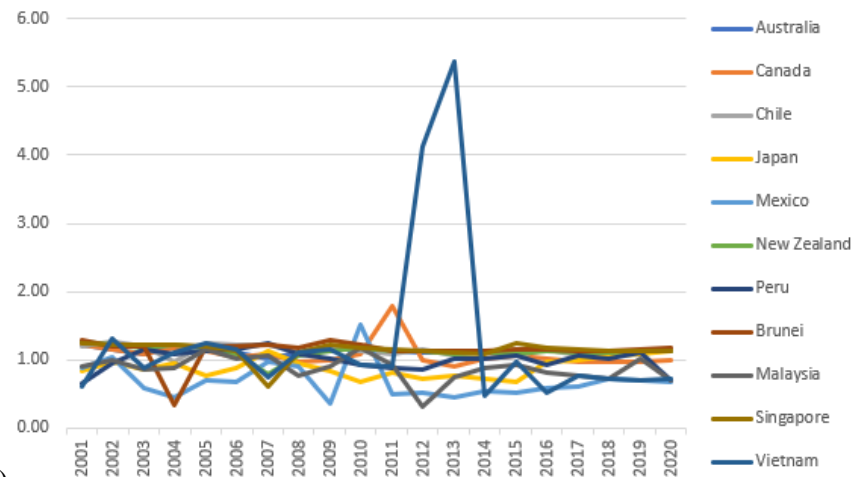


b)

Figure i. RCA of Greece Agriculture, Forestry, Fishing (a) and Manufacturing (b) Products in CPTPP Countries

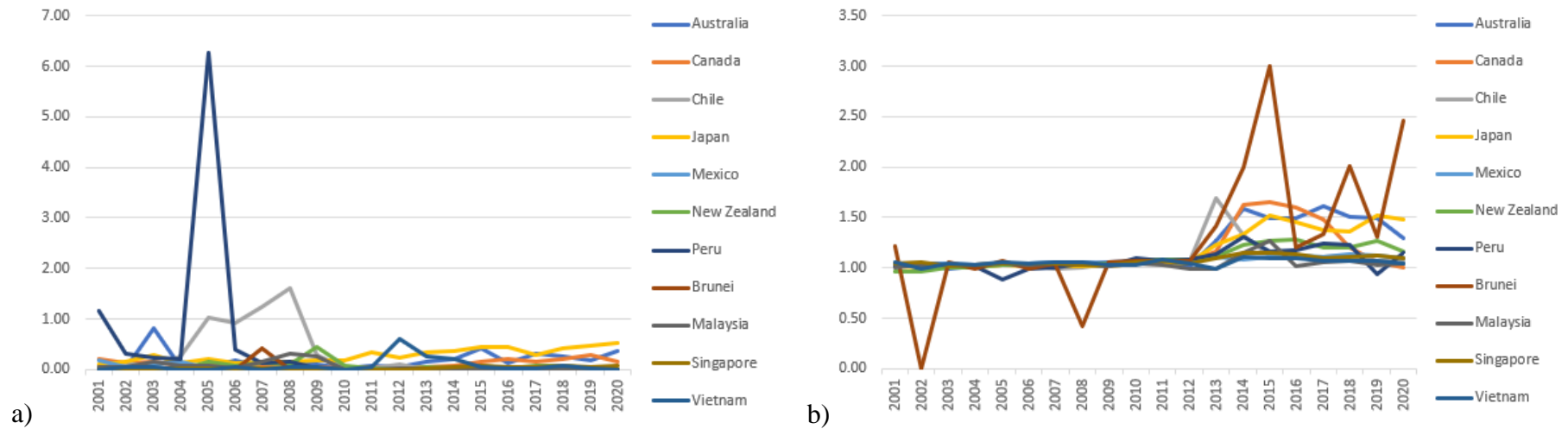


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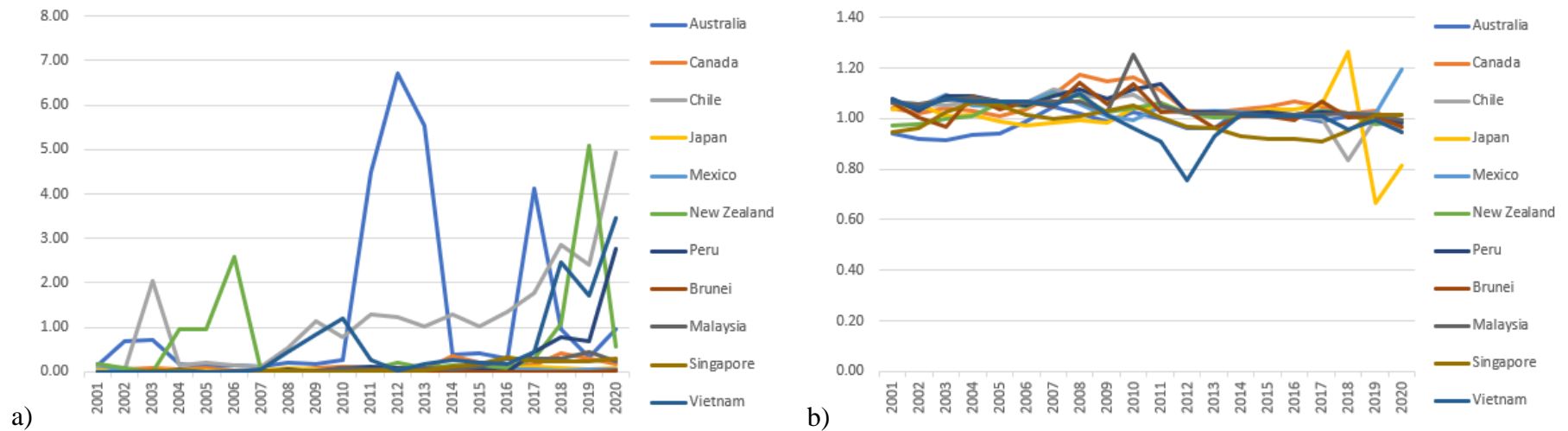
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Figure j. RCA of Hungary Agriculture, Forestry, Fishing (a) and Manufacturing (b) Products in CPTPP Countries



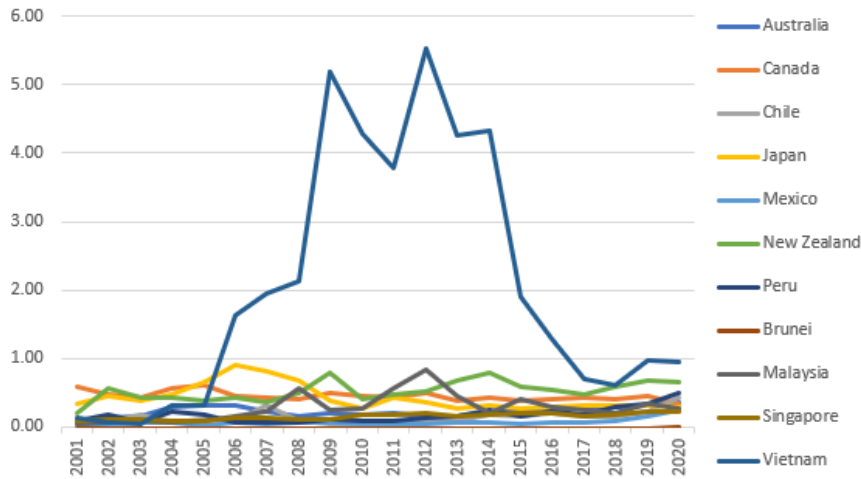
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Figure k. RCA of Ireland Agriculture, Forestry, Fishing (a) and Manufacturing (b) Products in CPTPP Countries

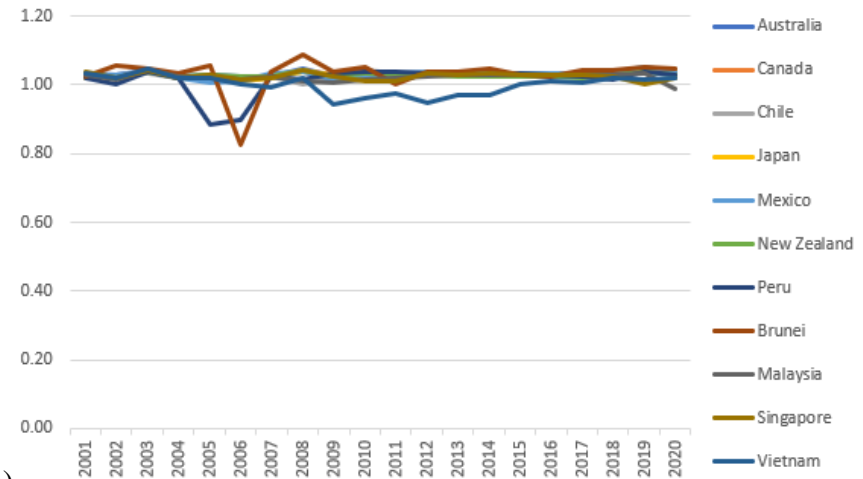


a) Source: Own computation

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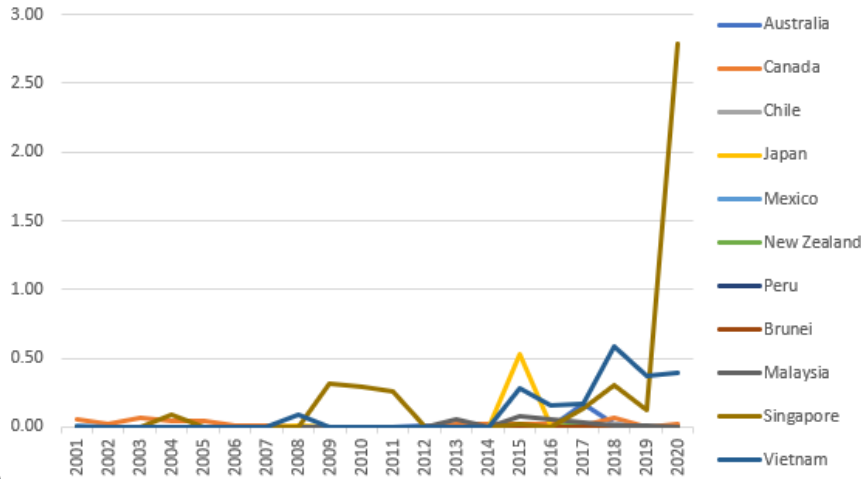


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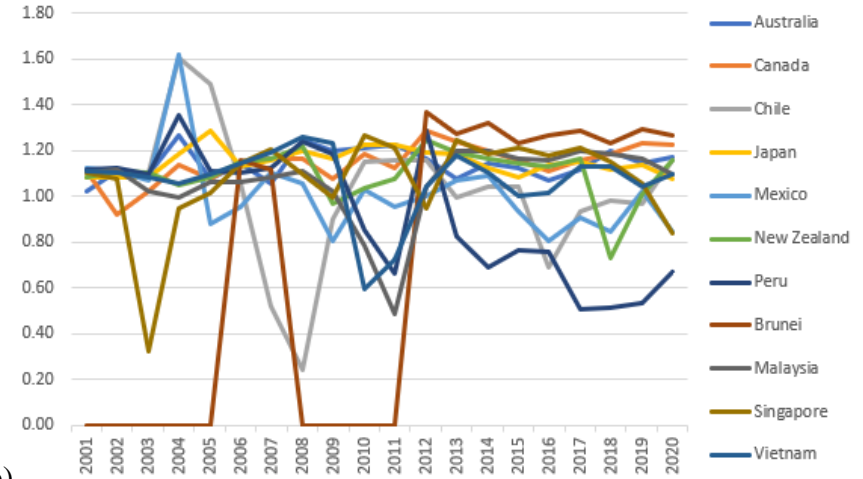


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Figure m. RCA of Latvia Agriculture, Forestry, Fishing (a) and Manufacturing (b) Products in CPTPP Countries

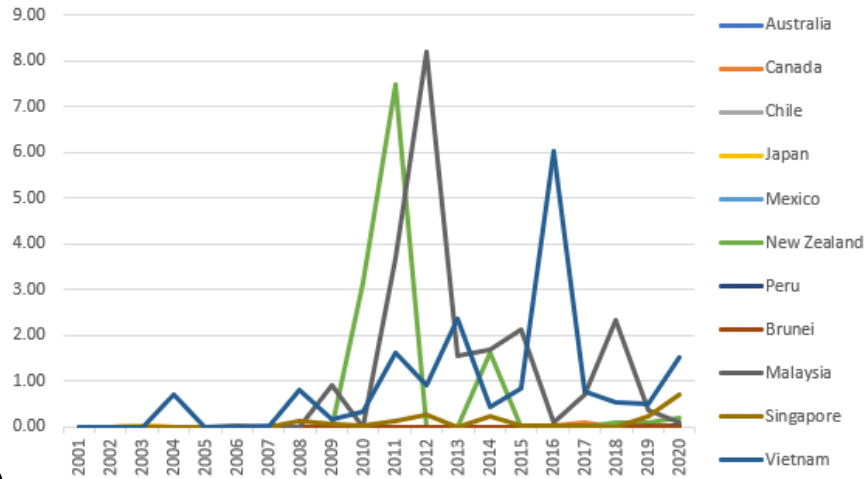


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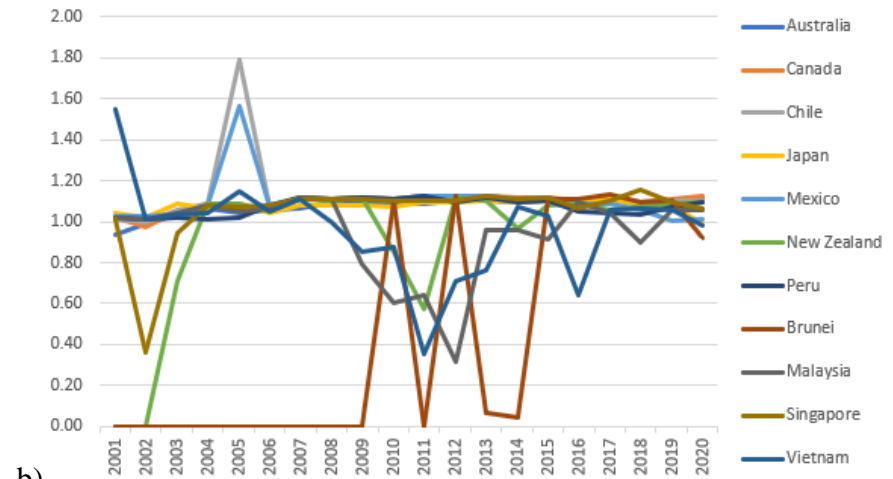


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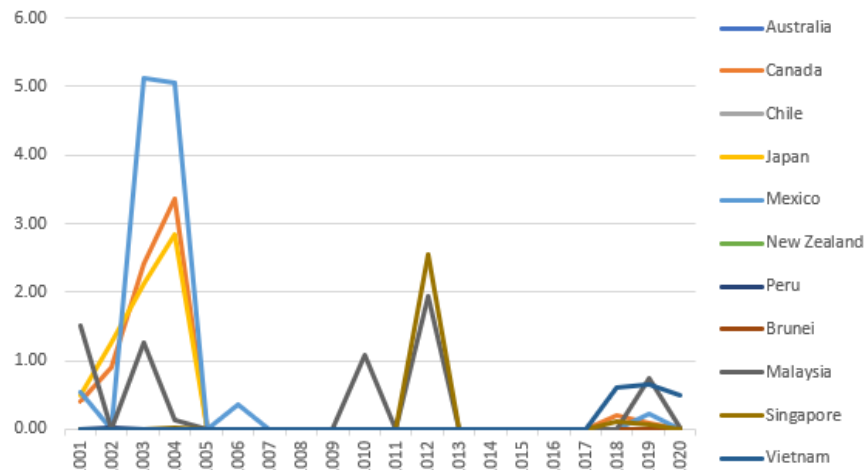


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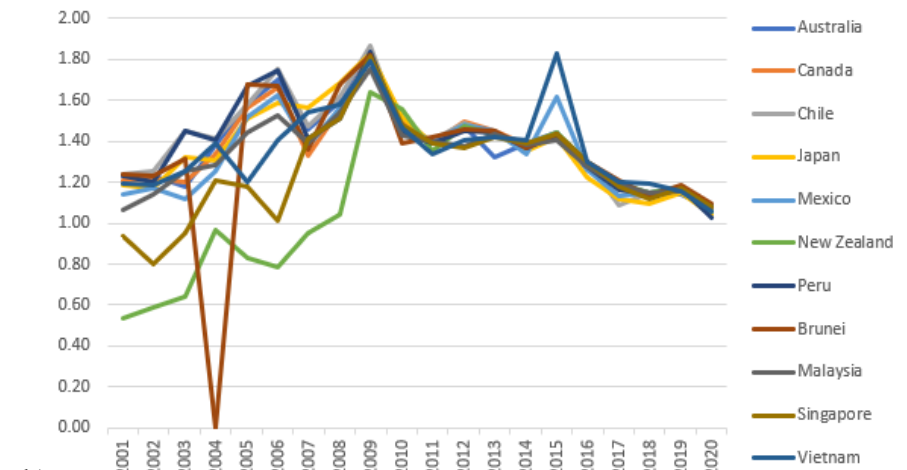


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Figure o. RCA of Luxembourg Agriculture, Forestry, Fishing (a) and Manufacturing (b) Products in CPTPP Countries

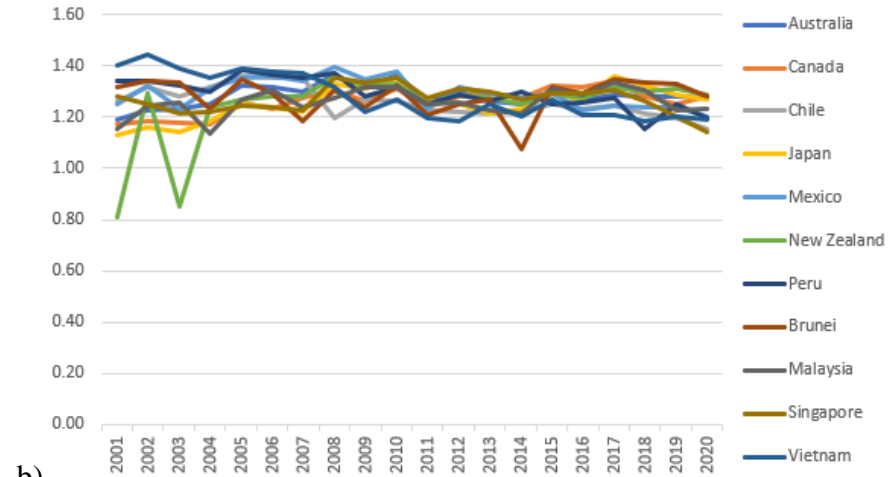
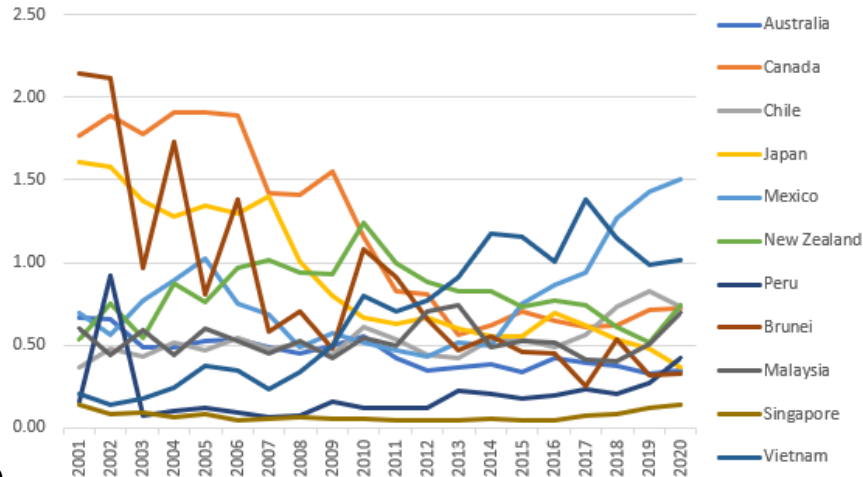


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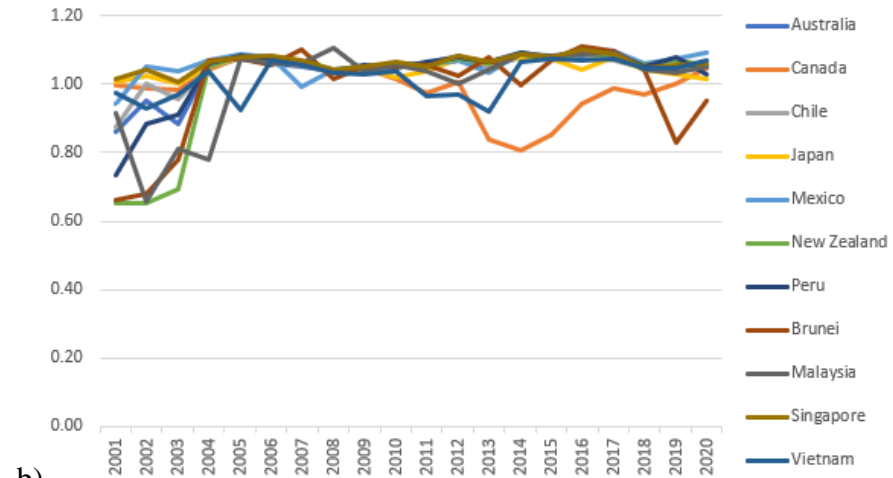
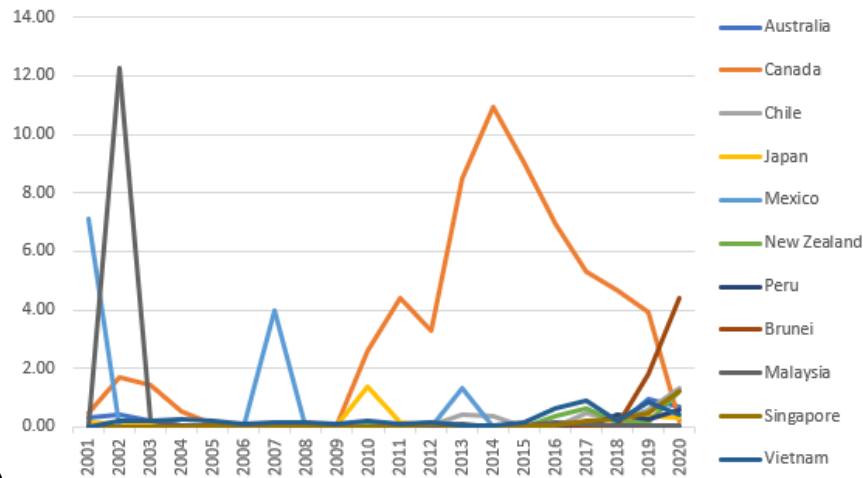
Figure p. RCA of Netherlands Agriculture, Forestry, Fishing (a) and Manufacturing (b) Products in CPTPP Countries



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b)

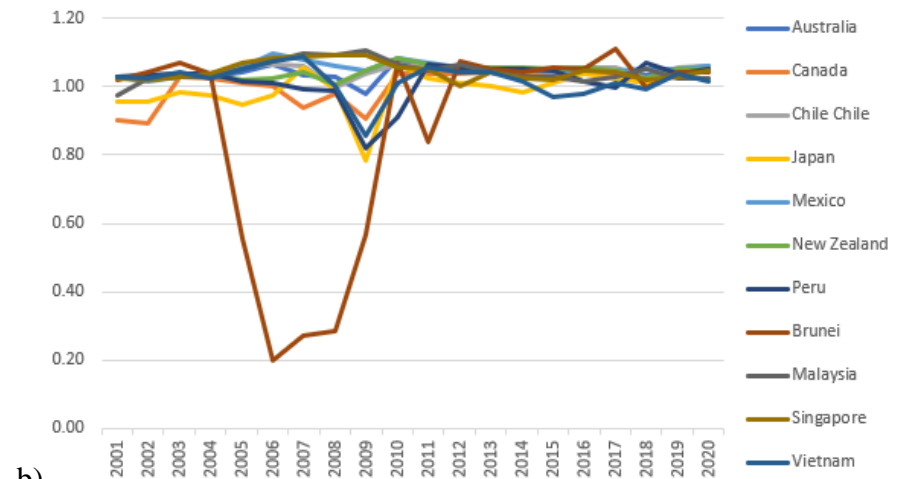
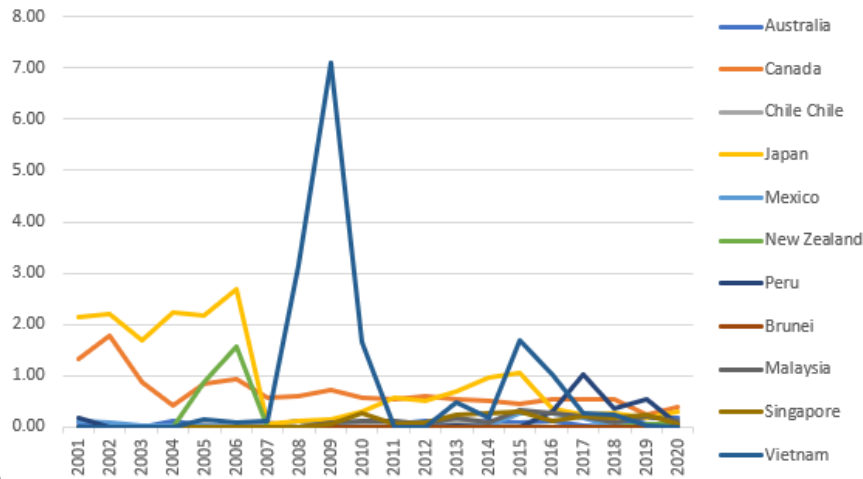
Figure q. RCA of Poland Agriculture, Forestry, Fishing (a) and Manufacturing (b) Products in CPTPP Countries



a) Source: Own computation

b)

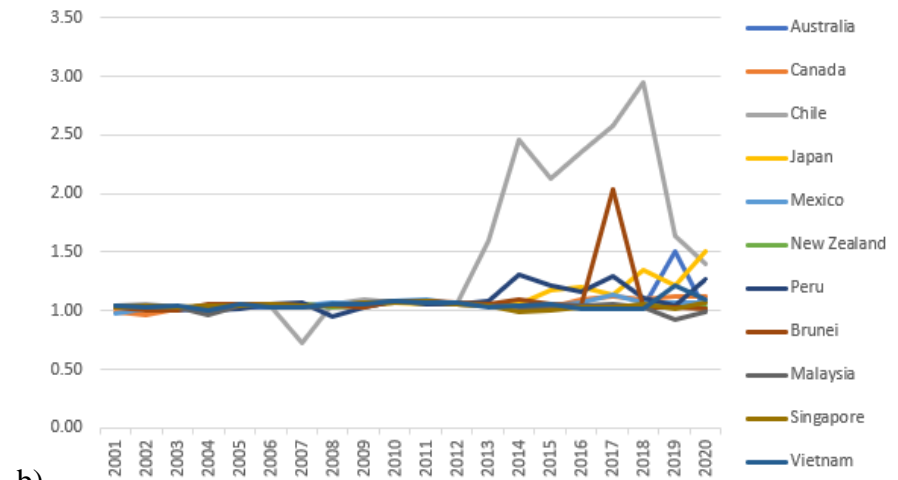
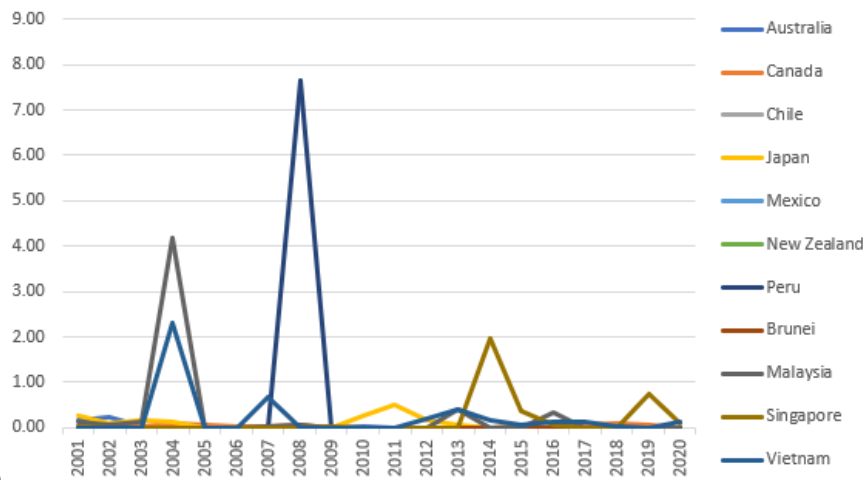
Figure r. RCA of Portugal Agriculture, Forestry, Fishing (a) and Manufacturing (b) Products in CPTPP Countries



a)
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b)

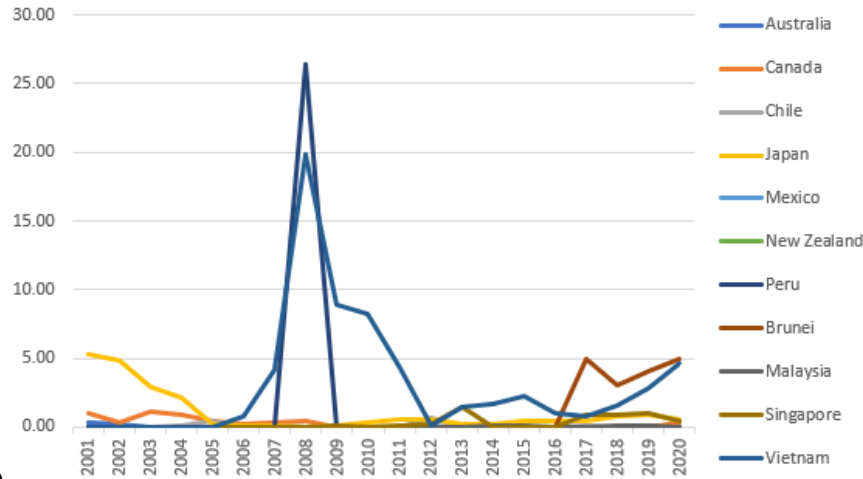
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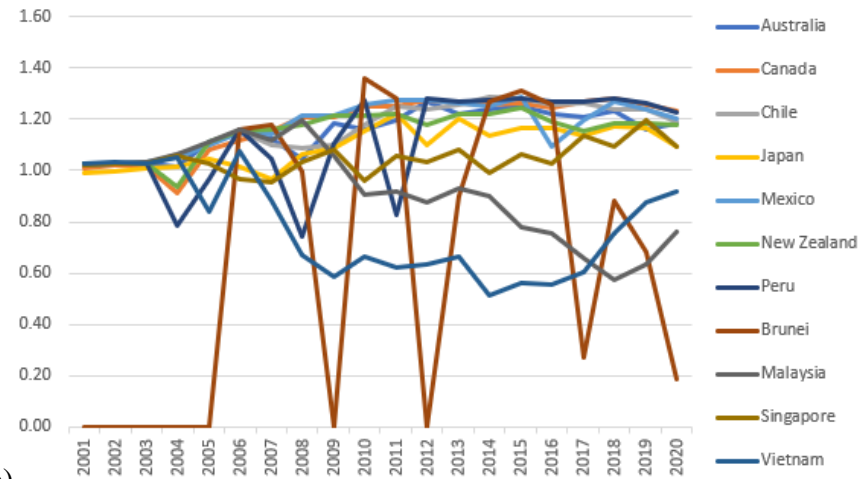
a)
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b)

Figure t. RCA of Slovenia Agriculture, Forestry, Fishing (a) and Manufacturing (b) Products in CPTPP Countries

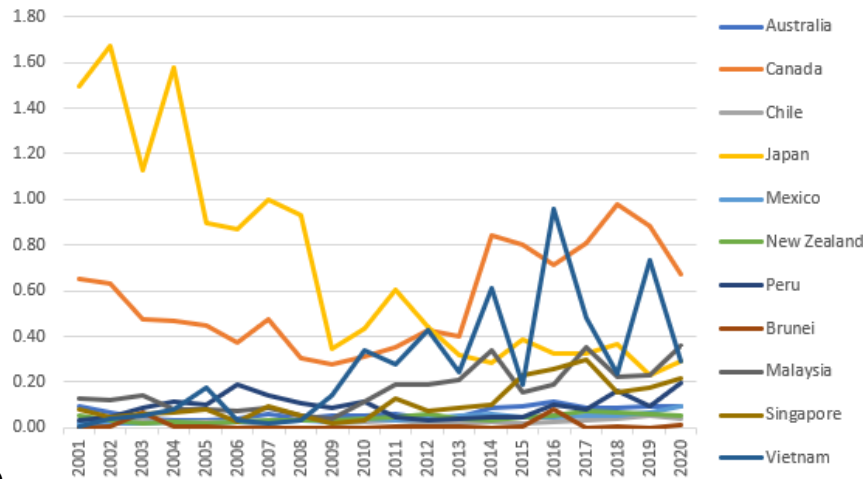


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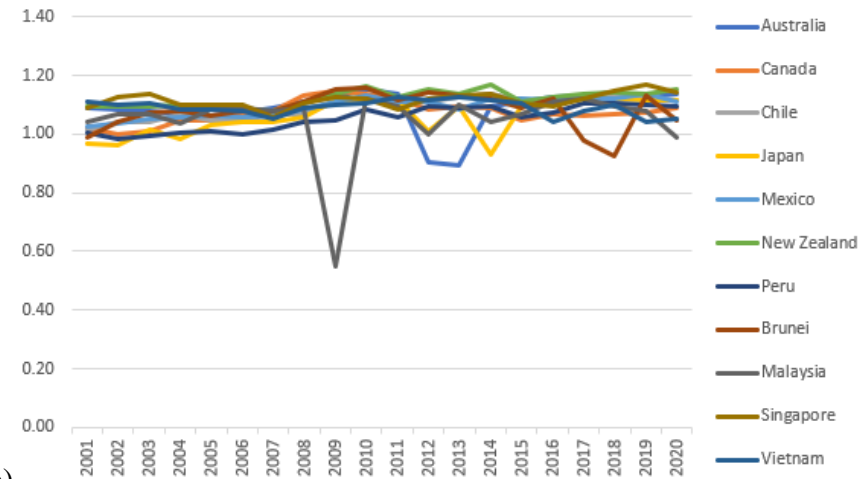


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Figure u. RCA of Spain Agriculture, Forestry, Fishing (a) and Manufacturing (b) Products in CPTPP Countries

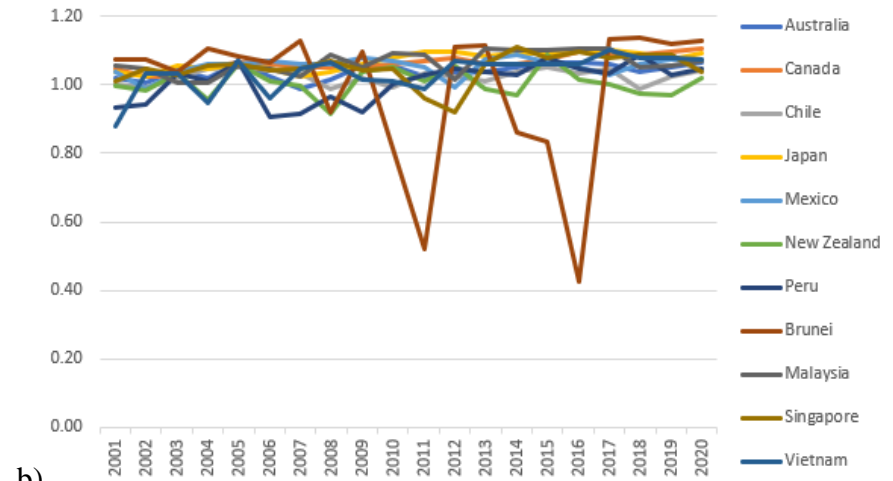
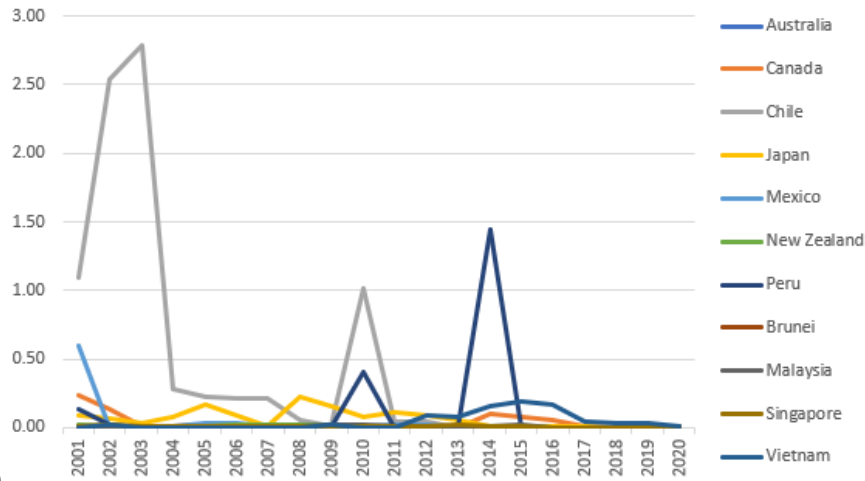


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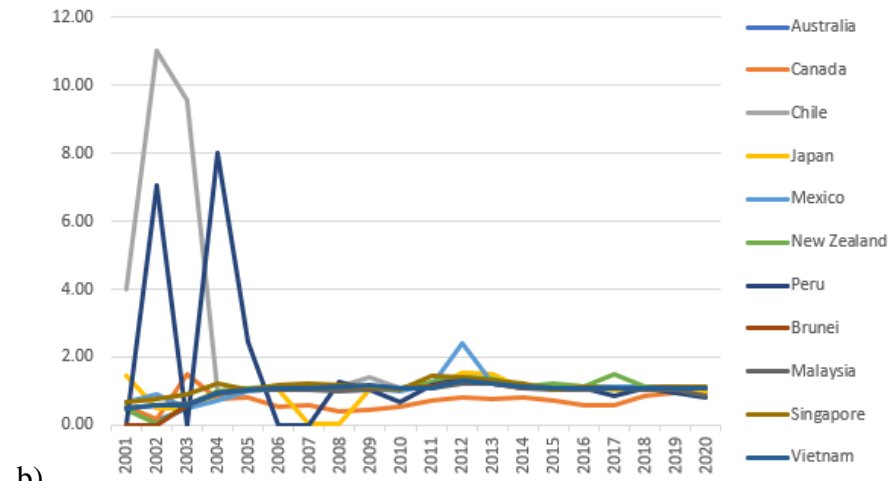
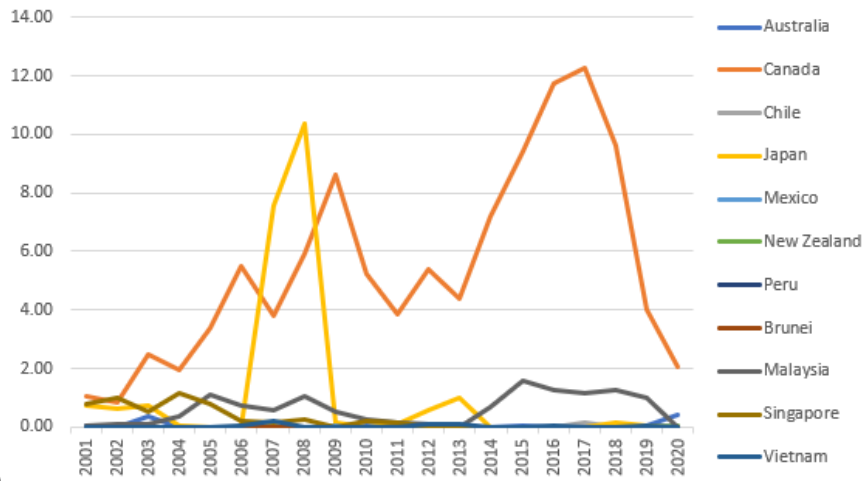
Figure v. RCA of Sweden Agriculture, Forestry, Fishing (a) and Manufacturing (b) Products in CPTPP Countries



a)
Source: Own computation

b)

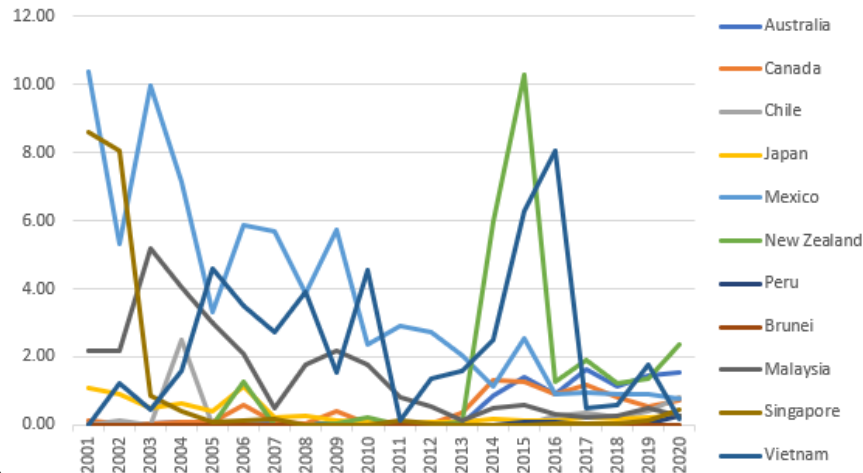
Figure w. RCA of Cyprus Agriculture, Forestry, Fishing (a) and Manufacturing (b) Products in CPTPP Countries



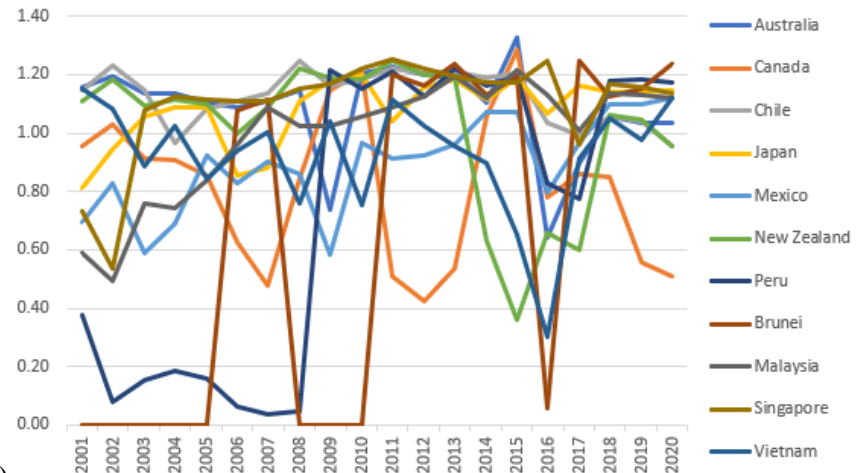
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b)

Figure x. RCA of Bulgaria Agriculture, Forestry, Fishing (a) and Manufacturing (b) Products in CPTPP Countries

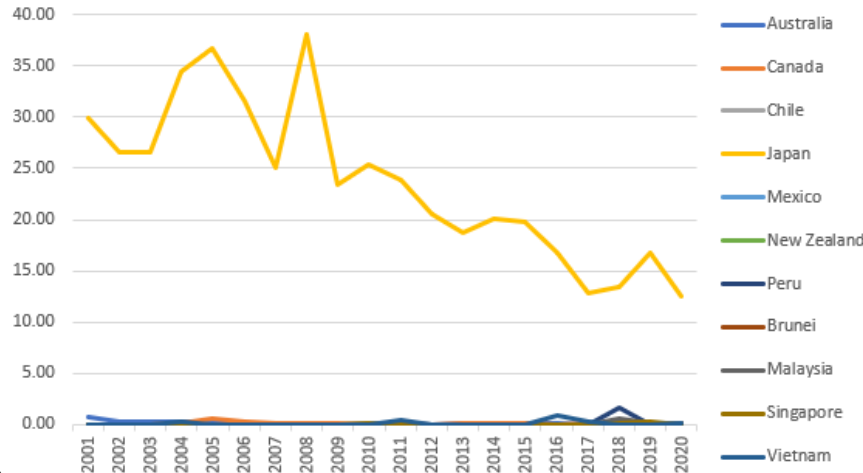


a)
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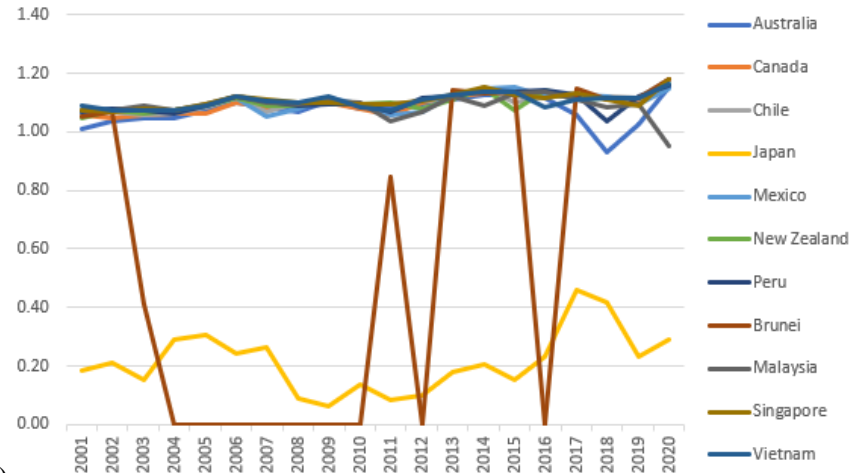


b)

Figure y. RCA of Croatia Agriculture, Forestry, Fishing (a) and Manufacturing (b) Products in CPTPP Countries

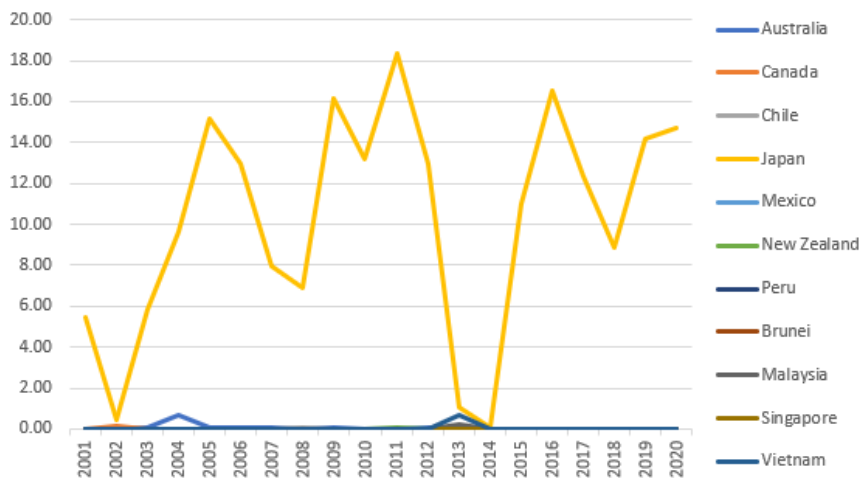


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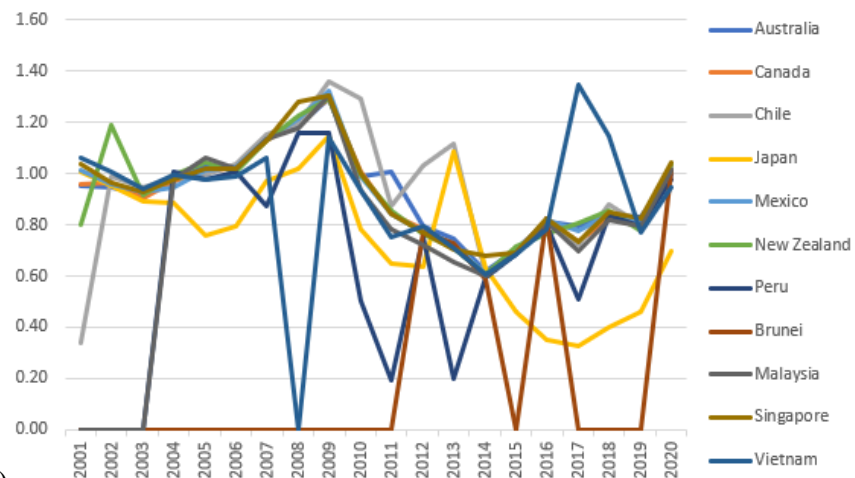
b)

Figure z. RCA of Malta Agriculture, Forestry, Fishing (a) and Manufacturing (b) Products in CPTPP Countries



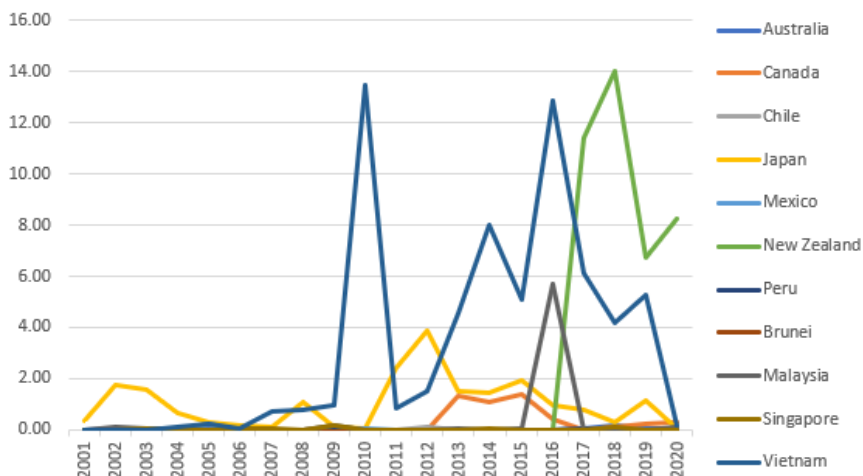
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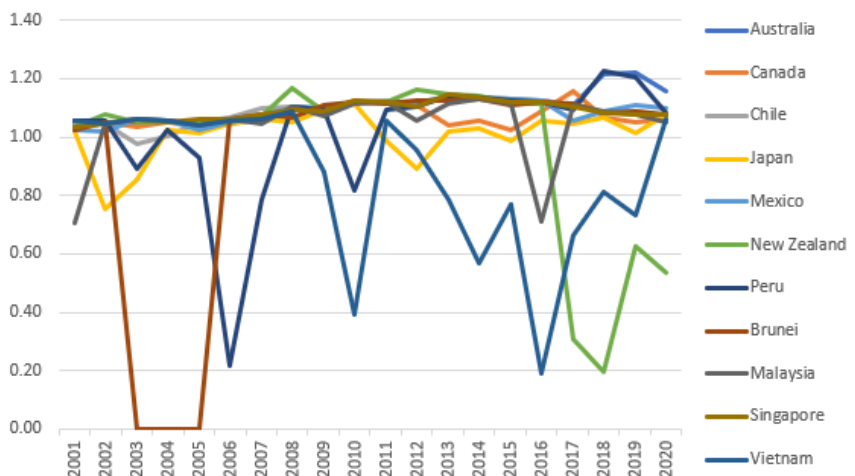
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Figure aa. RCA of Romania Agriculture, Forestry, Fishing (a) and Manufacturing (b) Products in CPTPP Countries



a)

Source: Own computation



b)