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## MORE COOPERATION, MORE BENEFIT?: AN ANALYSIS OF MODERN TRADE AGREEMENTS

*Evolving of free trade agreements creates not just a free, mutually beneficial trade between actors, but may results in elimination of non-tariff barriers. The European Union is by far and away the leader in liberalizing economic and monetary policies, while Canada disposes one of the most open and competitive markets in the world economy, and the United States is the biggest economy in nominal dollars and landing trading country in goods and services. This paper provides four scenarios through a game theoretic model in order to analyze whether players support or except each other in international trade by including the EU, Canada and the USA into the game. Specifically, the article examines that the US withdrawal from TTIP could be explained with the trade integrations impacts on each other.*

*A szabadkereskedelmi egyezmények megkötésével a létrejövő szabad, kölcsönösen előnyös cserén túl a nem vámjellegű akadályok is megszűnhetnek. Az Európai Unió fiskális és monetáris politikája közel sem olyan liberalizáló, mint például a kanadai, ami egyike a legnyitottabb és versenyen alapuló piacnak, vagy az Egyesült Államok, ami dollárban mérve a legnagyobb gazdaság és kereskedelmi ország áruk és szolgáltatások terén is. Tanulmányomban játékelméleti modellen keresztül négy forgatókönyvet vázolok fel azt vizsgálva, hogy a játékosok ((EU, Kanada és az USA) együttműködnek-e egymással nemzetközi kereskedelemben. Pontosabban, a cikk azt vizsgálja, hogy az Egyesült Államok távozása a TTIP-ből magyarázható-e a kereskedelem integrációjának egymásra gyakorolt hatásaival.*

### 1. INTRODUCTION

A key element that constitutes international trade between countries, regions and continents is regional trade agreement (RTA). Over the past years these agreements have changed significantly. One can be seen both, increasing in number and in depth and complexity. Globalization has highly contributed to progress of transformation and government policy decision making process. Understanding these alterations are necessary in order to eliminate transparency in wide bilateral and multilateral trading system.

Fundamental debate concerning trade agreements that freer trade is assumed to create a win-win situation for both parties or not, but answering this question is increasingly difficult, as the agreements

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have become more complex. To examine the economic context is the most relevant, but also considering political, and other effects of these treaties. Many studies deal with inter alia growth effects on Transatlantic Trade and Investment Partnership (TTIP), United States-Mexico-Canada Agreement (USMCA), Comprehensive Economic and Trade Agreement (CETA) by using specific methodology (as CGE modeling), but less examine all of the potential outcomes concerning participants' choices available. With the help of game theory, we give a comprehensive examination of the sort recommendation here in order to bridge an existing gap in a highly relevant issue like modern free trade agreements. The importance of these conventions, as well as its difficulty, is that go beyond the elimination of norms, rules, standards.

With the new measure of countries' profit is introduced, when they preserve their status quo position and interact. The second relates to the situation when a country could optimize its utility by choosing whether it engages in a free trade agreement with other countries, or not. The results in our examined cases show that a country yields higher profit, when it cooperated in free trade agreements. However positive the results are, a relatively lower growth rate as a result can be experienced. The evidences might be conclusive, but just in our cases. This has been identified at bilateral level, when policy makers aimed at making trade with those nations, regions, who are part of largest economies. New type free trade agreements could be an explanation for lower growth rate.

This article is organized as follows. After the introduction paper frames free trade agreements and examines their trends by placing regions in the literature. It is followed by analysis of economies' interaction with applied game theoretic model. Finally results are presented under the four different scenarios and last section concludes. The two main contribution factors for this are political and economic.

## **2. FRAMING FREE TRADE AGREEMENTS, AND OTHER ASPECTS**

In the current world of increasing relevance, the regional agreements and cooperation grown apart. Although, cooperation and integration are frequently used synonymously, one need to differentiate between them from a political and economic aspects. Cooperation is aiming at trade without explicit interest in moving beyond a free trade agreement, that includes low harmonization level of economic policies, norms, standards. By contrast, integration aims at a higher form of collaboration. In this case a country loses its independent trade policy, and can harmonize economic policies, norms with many different countries. [Dieter, 2004]

Transatlantic Trade and Investment Partnership (TTIP), United States-Mexico-Canada Agreement (USMCA), Comprehensive Economic and Trade Agreement (CETA) are exceptions to the free trade agreements are in this regard, because they supposed to create free trade areas by eliminating tariffs and non-tariff barriers between them. It includes the removal of services, key standards, norms, and regulations. These agreements are the so called "new generation" type of trade agreements [European Commission, 2017] beyond a trade liberalization, their scope are, inter alia, liberalization of public services, financial markets, cooperation in new rules creation, and protecting mutual investments.

General trend that modern trade agreements consist of eliminating tariff and nontariff barriers (free movement of capital flows), protecting intellectual property right (patent, copyright), operating investor-state dispute settlement (ISDS) and rule of origin regulations, harmonization of regulatory standards. When a government's economic policy is carried out concerning trade and welfare enhancing, it essentially creates winners and losers in the economy. This situation provides a context to investigate whether cooperation or competition brings greater economic benefits to players.

In recent academic works the main focus is on "trade cost", that are often identified as "iceberg transport cost function". It means part of the profit "melts" in transportation of delivered goods because of geographical distance [Samuelson, 1952]. From other view, the literature also reflects other trade cost that appears in a general cost-benefit analysis for trade agreements: these cause better market access, and reduces tariff by liberalization, but on the other side they are also characterized by restriction in political environment, or multinational companies pressing on prices, and so forth. However, one can be note that the gains may vary by inputs that are placed into an agreement. [Arokolakis, Costinot & Rodriguez-Clare, 2012]

Seating trade agreements is possible from two aspects. First, determines integration levels according to the typology by Bela Balassa that suggests the gradual deepening of collaboration between states in 5 stages: 1. free trade area, 2. customs union, 3. common market, 4. economic and monetary union, 5. political union. [Palánkai, Benczes, Kengyel, Kutasi, Nagy, 2011] Among definitions basic concept is free trade area, we suggest to OECD definition:

**Definition 1:** *a grouping of countries within which tariffs and non-tariff trade barriers between the members are generally abolished but with no common trade policy toward non-members.* [OECD, 1999]

It means, a free movement of goods and services with zero tariff rates, but set tariff by members on non-members is not necessarily desirable. [Ju & Krishna, 1996]. At this level, free trade agreements are fundamental.

A categorization divide economic agreements into three main categories: 1. partial scope agreement (PSA), 2. free trade agreement (FTA), 3. custom union (CU), where the least integrated agreement type is PSA, and the deepest is CU. [Baier, Bergstrand & Clance, 2017] Since the 1990s, governments policies toward international integrations, where FTAs have become much more relevant compared to other agreement types. They contain eliminating more non-tariff barriers on average, that CUs. [Dhingra, Freeman & Mavroeidi, 2018]

The World Trade Organization defines a regional trade agreements (RTAs):

**Definition 2.** *In the WTO, these refer to reciprocal trade agreements between two or more partners to liberalize tariffs and services. They include free trade areas and customs unions and economic integration agreements on services.* [WTO Glossary]

When it is successfully ratified, an interest desire of government policy is to get closer the countries' economy to a welfare optimum by reducing protectionism. [Rodrik, 2018] But it reaches only when a tariff is set at optimal level. [Zissimos, 2009] In addition a treaty able to manipulate term of trade that is a realistic motivation for countries to make agreements. [Grossmann, 2016] Although between term of trade and volume of trade, the latter is lighted better when policy makers care about trading issues. Trade volume impact on world market prices: in the beginning reducing import demand causes lower world market prices and improved terms of trade, but it requires an increased export supply with export subsidies, or credits. To achieve this, countries apply subsidies and credits. Export supply will subsist, but prices will lower, thus term of trade will worsen. [Rodrik, 2018]

### 3. TRADE AGREEMENT TRENDS IN THE ERA OF TTIP, USMCA, AND CETA

The "next-generation" international economic agreements have relatively little link with traditional trade agreements. If we go back to 1817, it may be seen, that free trade based on the comparative advantage framed by David Ricardo. This determined the assumption that free trade is

the optimal policy, and a free trade agreement is economically beneficial to countries. Later, trade liberalization, reduced import tariffs and other restrictions to the lowest level [Rodrik, 2011] and today, nations seek deep integrations, rather than shallow integration. [Lawrence, 1996]

Now the trend is not only a creation of more free trade agreements, but also toward deepening and comprehensive agreements. These designed to embed one economy in other to shape the economic framework within which governments, businesses, households operate and strengthen their position in the global economic context. [Haggart, Lauerate, Spence, 2017] Further they includes market access, elimination of technical barriers to trade, customs and trade facilitation, but sanitary measures, domestic regulation, financial, transport services, telecommunications, intellectual property, labour, electronic commerce and so on. Furthermore, it contains administrative and institutional provisions and protocols concerning conformity and manufacturing practices.

Economic growth is a very discussed topic since the start of the international trade. As part of its, free trade agreements (FTAs) dominated weight of economies in global economic environment. However, not all FTAs are able to shape global trade in significant manner. The reduction of trade barriers created a more stabile and transparent markets, where countries enhances its export activities to partner countries and that is why trade projects are welcomed. Although at the same time, they may carry damages in sense of politics and economy. Governments have altered their policies over the last 20 years, and turned toward creating free trade. With changing of treaties and appearance of "mega-regional" trade agreements its number have increased significantly. Comparison data, 79 regional trade agreements was in force in 2000, while this value increased to 294<sup>2</sup> in 4 January 2019. [RTA/IS database]

Comparing top economies by export and import of goods and services in last ten years, the key economies remaining in almost the same position: the leader is European Union followed by United States and Canada among examined three economies. The EU and the US economies together accounting for about 50 percent of global GDP and nearly 30 percent of world trade flows. Canada has less impact on global trade, notwithstanding its role is important, because trade overwhelmingly is still tent toward the USA and EU. The USA Canada's first trading partner is the USA and second is the EU that gives to country a vulnerability. [European Comission, 2017a] The trading system has been under pressure, since structural changes in world economy as BRICS countries' rising, or globalization. Further under a highly competitive market environment, it is crucial that economies secure their main trading partners. Given the United States, Europe and Canada' market size and structure, the diversity could be the key that open opportunities to preserve their role both each other economies and in world economy.

Global trade with fast economic growth spread around the world from 1990s. It is ten years since the global economic and financial crises that was a stop in international trade and world trade volume to GDP ratio. Before the crises, global trade expanded by around 7 percent a year that volume twice fast as the world economy. [Bank of Canada, 2017] After collapse, global trade decreased by 20 percent in volume. Initially recovering has started in 2009, but it could be seen sharply from 2010/2011.

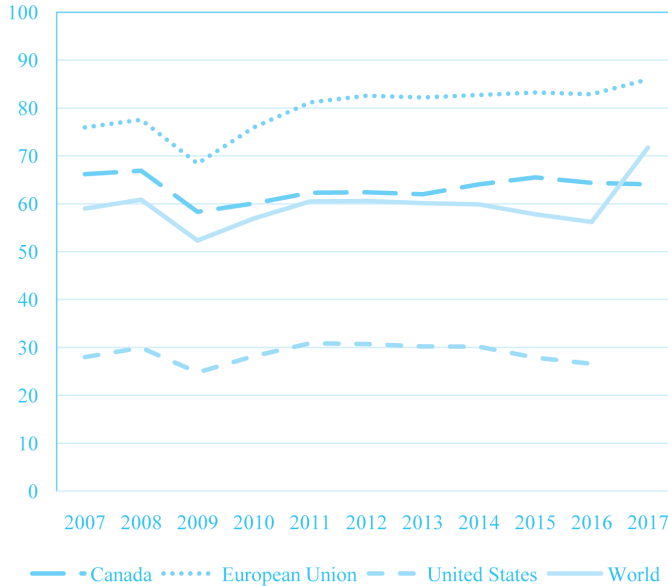
Although negative effects have gone out, it appears to trade volume to ratio has not recovered its dynamism and it is below the precrisis period. Regarding Canada, during the Great Recession

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<sup>2</sup> Cumulative number of physical Regional Trade Agreements in force. This number accountig for 467, if separating all the notifications on goods, servicies and accessions.

its exports plunged by about 20 percent. They rebounded quickly, but this process slowed down. United States followed the broader global pattern. Alone the European Union succeed to reach higher trade rate. Figure 1 illustrates trade performance to GDP ratio<sup>3</sup> from 2007-2017.

Chart 1. Trade to GDP ratio



Source: Author's elaboration based on WTO data

The United States suggested to abolish all tariffs on goods at the Doha round, continuing this aspects, the Bush, and Obama administration has emphasized the importance of trade. Trump has been broken the global trading idea, and moved toward protectionism. Moreover tariff application appears in auto industry, steel and aluminium, The European Union is the world's largest single market area. Among its members free trade was one of the EU's aims, parallel with an opening up toward world trade. Canada's economic policy claims trade as the most important tool that contributing economic development through the history. [Ritchie, 1997]

In this sence, the USA, Canada and EU have taken steps to negotiate trade agreements as TTIP, USMCA or CETA. Restriction of external trade does not necessarily mean gain for economic players, it might could appears only several sector as automotive industries, or electronic manufacture service. Although challenges and opportunities concerning trade continuing change after a government actor has move from trade scene.

<sup>3</sup> Trade to GDP ration here means the sum of exports and imports of goods and services measured as a share of gross domestic product. Aggregation Method is weighted average.

### 3.1. THE TRANSATLANTIC TRADE AND INVESTMENT PARTNERSHIP, TTIP

TTIP is set to become one of the largest free trade agreements with coverage of around 30 percent of worldwide trade and 50 percent of global GDP, if once fully ratified by parties. In 2018 President Trump has expressed willingness to reopen TTIP, but for now the agreement is still on ice. It is being formed to link the world's largest economies, the European Union and the United States. It would result approximately one-third of the global economic output. Combining these economies, a deeper cooperation and economic benefits are expected. If the negotiation processes are reached and the agreement comes into force, it strongly determines future global trend and investment. The gains arise from lower prices of goods, higher product variety, and higher productivity. [Felbermayr, 2016]

The regulatory changes may cause additional tariffs in some sectors (between 10 and 20 percent) opposed to classic agreements, where this value accounts for only 4 percent. Further growth impacts would account for around 0.5 percent GDP growth in the European Union economy<sup>4</sup> and it would be 0.4 percent for the United States. [CEPR, 2013] It shows, that the importance of TTIP claims to elimination of non-tariff barriers and adaptation of technical standards, rules rather than economic gains and it might go beyond of these features also. It is now the greatest obstacle for activist groups and business that may lose in this process. [Bacaria, 2015] [Kutasi, 2015]

Other effect relates to trade diversion and it will be created by the European Union itself. The integration has no internal trade barriers, thus a significant intra-EU trade operates within the region's frontiers. If the United States eliminate the tariff and non-tariff barriers, part of the EU trade will be transferred to the USA. [Felbermayr, 2013] Let us see an example. In the beginning EU countries trade each other, but if a member state starts to import from the United States, it will reduce the intra-EU trade, thus trade creation will have a deteriorative effect for the EU. Furthermore, if the difference between the before and after trade volume is relatively high, the USA will not be able to compensate the member state for the impacts created by the trade diversion.

### 3.2. THE COMPREHENSIVE ECONOMIC AND TRADE AGREEMENT, CETA

Partnership between Canada and the European Union is highly relevant as the EU is Canada's second-biggest trading partner after the USA. The European Union's ratio in Canada's import accounts for 11.13 percent, while export is 9.01 percent in January 2019. The CETA was signed in 2016 and approved in 2017 by the Government of Canada and the European Union. Even though Canada is heavily influenced by the United States, the country represents strong political and economic ties, and cooperative relationships with the European Union.

The agreement was recognized as a 'vehicle to create new prosperity' on both sides of the Atlantic Ocean. (Government of Canada & European Union, 2014) Both parties gain market access by liberalization, thereafter it enters into force. The European Union eliminates those custom duties of goods that originate from the EU, and Canada. The increased bilateral trade and investment flows contribute to economic growth and the region's external competitiveness

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<sup>4</sup> A study estimates its effects on growth, employment and investment by CGE model in case of Hungary. The results are shown by sectors and similar compared to impact on the European Union. The results are compared with previous results. For more information, see Publication Kutasi, Rezessy, Szijártó [2014].

comply with Europe 2020 strategy. [European Commission, 2017b] While it is a comprehensive and strongly liberalized free trade agreement, it is also highlighting standards.

The parties underlined the importance of their ability to reach legitimate policy scopes regarding public health, environment, safety, public morals and protection of cultural diversity. The main final negotiating result including the elimination of tariff for 99 percent that is the most comprehensive tariff reduction that the European Union has ever achieved. CETA even beyond tariff elimination, for example Canadian government procurement is open to foreign partners, or market access to ships has never been existed before CETA. Concerning intellectual property rights Canada has guaranteed to EU data protection, no discrimination relates to genetic drugs. Further standard element of the agreement is the ISDS. This mechanism was determined to make transparency, but preserves the states' ability to regulate and protects the Investment Canada Act (ICA).

### **3.3. THE UNITED STATES-MEXICO-CANADA AGREEMENT, USMCA (NAFTA 2.0)**

Under the Trump Administration, the United States has reached an agreement with Mexico and Canada that is modernized NAFTA into a 21st century trade agreement. The USMCA has signed in 2018 to support mutually beneficial trade and enhance competitiveness of regional exports in the region by free and fairer market access. [USTR, 2018] If successfully ratified by all countries, it will replace NAFTA. It is not drastically different from the old agreement, but some changes are placed concerning economic and trade policy.

One of the key components of new agreement relating automobiles: the agreement requires that 75 percent of vehicles be manufactured with North American content (while NAFTA subjects to rules of origin requirements of 62.5 percent content for motor vehicles). Furthermore, to the 2.6 million car, tariff is zero from Mexico and Canada. Although trade restrictions on agriculture are strict, the USA and Canada make a concession to move toward greater agriculture liberalization. [CRS, 2019] USMCA would maintain investor-state dispute settlement (ISDS) between Canada-Mexico, but it is not applicable to the USA and Canada. (Before it was worked as trilateral commitments.) NAFTA was the first agreement to deals with intellectual property right (IPR), and USMCA would retain these protections for these.

The agreement escalates e-commerce, cross-border data flows and restricts data localization. Under NAFTA, internet was in its early phase, therefore there was no need to regulation, but globalization changes world and now prohibition of custom duties of electronically-transmitted products is included in the USMCA. NAFTA includes trilateral commitments for government procurement of goods and services, but in USMCA only the USA and Mexico applies these standards, To Canada compulsory using of World Trade Organization Government Procurement Agreement (WTO GPA) that ensures transparency and fairness in competition process.

New provisions includes inter alia “achieve and maintain a market-determined exchange rate regime, refrain from competitive devaluation, through intervention in the foreign exchange market and strengthen underlying economic fundamentals, which reinforces the conditions for macroeconomic and exchange rate stability.” [USTR, 2018:ch33] Last momentum relates to withdrawal from the agreement. This is allowed, if a party enters into a trade agreement with another party, and it seems to be a non-market economy. [USTR, 2018]

Table 1: Key elements of modern agr

Sectors	TTIP	CETA	USMCA
Tariffs	EU: 97% of tariffs to 0, USA: 87.5% of tariffs deleted	Removing over 99% of tariff Autos: 100.000 duty free	2.6 million car for zero tariff
IPR Protection	Patents, trademarks, design are included	Pharmaceuticals protection, patent term restoration system, data protection (6+2 years)	Biologics: 10 years Copyright: 70 years
ISDS	Applicable to secure comprehensive investment protection for EU and the USA	Protects Investment Canada Act and EU innovations on investment, thus meeting interests.	USA-CAN: not applicable USA-MEX: disputes restricted
ROO	Product specific rules	Important sectors are strongly protected from products of a third country	Autos: 75% ROO
Government Procurement	Under WTO GPA, but not included sub-federal procurement in the USA	CAN-EU: open procurement markets, compatible with the WTO GPA, extended coverage to sub-federal procurement.	USA-MEX: can use CAN: uses WTO GPA

Source: Elaborated by author

#### 4. EXAMINING INTERACTION OF TRADE AGREEMENTS

Countries' optimal economic policy, henceforward the search for new markets to subsist in global trade competition. This strategy triggered both push and pull factors. The pull comes from the emerging countries, their rapid economic growth and market opportunities draw attention that developed countries' own interest to opening toward the rest of the world. From Canada's aspects, the country is under the United States' umbrella that means, the US hampering market access with its continuing political actions. Canada in this situation could dealing with the USA, - for example, the NAFTA, and the USMCA created better access to the US markets, but they are still protected strongly- and cooperating with other economies by allowing better border flow in goods, services, labor, capital, and other factors.

Even though the gravitational pull is powerful to Canada, past years' experience came from the US reflects the importance of building markets overseas, to have alternative trading partners to keep pressure on the USA in order to preserve their liberal trade. To the USA as one of the worlds of the biggest economic player, there is always the threats to apply protectionism toward its neighbor and other relevant countries. Behind this policy, stands security obstacles after 9/11, trade war with China in order to reduce the states' role in economy. Treaties created better access to the US markets, but progress is still slow. While the USA position itself as the strongest economic system for innovator companies, it is not as open as it shows itself. [Gold, 2017] Taking into China's role in world economy, a fast emerging county with non-market economic elements as state capitalism and government-controlled policy.

Furthermore enormous amount of capital and low-cost labour stream into sectors of economy. All of these factors capable to distort prices in global markets. In this situation, the USA



needs to cooperate such economies such Canada, or the European Union. Last, but not least, taking into account the European Union's position among great economic powers. Because its position is relative weak compared to the United States and China. For these reasons the agreements seems to be foremost more strategic for the EU, than economically profitable. If it comes into force, it will be the most relevant ratified agreement for both the European Union and the United States that amplifies their role and determines their future condition in global trade.

A strong economy as the European Union could be Canada's potential partner, managing the USA. The Canada-Europe deal serves this aim, although the two country's market approach is different. The EU regards its economy, as a Single Market over against Canada's more market-oriented approach concerning reconciling business interest within a negotiation. This approach arguable belongs not just to Canada, but to whole North America, reveals in basic elements of TTIP negotiations, that corresponding with CETA. It is a balance that restore the level of benefited players between the European Union and the United States, since the US benefits from trading by contracting NAFTA. To sum, it can be said, these transatlantic trade agreements designed to link, therefore the three deals interact with each other.

## 5. MIXED METHODOLOGY

In our research context, case studies refer to the agreements between the United States, the European Union and Canada. Case studies are introduced based on their characteristic and function in global world trade. With the game theory, it is a mixed method approach, which allows to answer the paper's questions both qualitative and quantitative perspective. Taking by these countries, the article investigates the modern trade agreement as a phenomenon within its political and economic context. The mixed methodology highlights the elimination of tariff barriers' unimportant role opposite non-tariff barriers. Although every country has an independent role in this study, the finding can converge and this independent role disappears. The results can integrate and make a general conclusion that forms the overall picture of the study. In this topic, most of the research has been implemented both qualitative and quantitative, less focus on a game theoretic approach.

This multiple case study method provides a widely understanding the modern trade agreements' practice. One of our interesting finding is the players' behavior that do not correspond to theoretical predictions relation rational choice theory. Further we can conclude that there is no exist only one answer in our cases for the main question. It resembles such a case as Bertrand's paradox, where one can experienced the absence of one answer for the presumed question. (Tissier, 1984)

To examine cooperative opportunities among the USA, Canada, and EU, beyond political factors it is necessary to understand reasons behind treaties from an economic perspective also. Previous studies have not focused on any cooperative or competitive strategies relating these three participants, thus the study combines the two strategies. The main question is whether the three economies should cooperate with each other, or should they just maintain their status quo position if they are committed to improve their profitability. There have been taken cooperative initiatives as the examined agreements that make easier analyses to us. Using game theoretical approach, we investigate cooperative opportunities that lie among the tree economies as much as competitive strategy. The opportunities are categorized as four cases model:

Table 2: Four cases model

<b>Case 1</b>	All the three economies remain their status quo position (Competition).
<b>Case 2</b>	Only the USA and EU cooperate (TTIP), while Canada stays out.
<b>Case 3</b>	Only EU and Canada cooperate (CETA), while the USA stays out.
<b>Case 4</b>	Only the USA and Canada cooperate (USMCA), while Canada stays out.

After formulating these cases, we considered nominal GDP constant 2010, as an analytical tool and collected data first, for the mean annual trade between the years 2007 to 2017 for these economies, and second we modified beforehand results with estimating growth determined by computable general equilibrium (CGE) model. This model is used to estimate an economy's reaction to changes in a government policy. Corresponding CGE outputs include assumptions made when draft alternatives. Estimating results (gains or losses) in GDP indicate the difference between the base and the established case. [Pelkmans, Lejour, Schrefler, Mustilli, Timini, 2014]

The mean annual GDP's are used to reflect the profit, that origins from the four different cases. The final results are inserted into a payoff matrix. We expect, it could shows the players optimal strategy in order to comparison.

### 5.1. GAME THEORY

Game theory both as a theory and a methodology tool to describe situations of conflict and cooperation among rational decision makers, who are the players. After evaluating outcomes, they make their choices based on that maximize their expected utility. The model framework that will be used for illustrate cooperative and competitive strategies between the European Union, the United States, and Canada in this paper can be described as a normal-form game.

**Definition 3.** An  $n$ -player game in normal form,  $n \geq 2$ , is a set  $[n]$  of players and a finite set of strategies  $S_i$  for each player  $i$ . We denote the set of all strategy profiles of players other than  $i$  by  $S_{-i}$ . Finally, for each  $i \leq n$  and  $s \in S$  we have an integer payoff or utility  $u_i s$ . [Daskalakis & Papadimitriou, 2005:2]

**Definition 4.** Rational players possessed a payoff function  $\pi$  in any decision making situation  $(.)$  over strategies is rational if they choose a strategy  $a \in A$  that maximizes their payoffs. That is,  $a^* \in A$  is chosen if and only if  $\pi(a^*) \geq \pi(a)$  for all  $a \in A$ . (Neumann & Morgenstern, 1944)

In this game, three basic elements are required and settled: players, laws of a game (strategies), and consequences of player's choices (payoff). [Kóczy, 2006]

Game theory is based on the assumption that players are absolutely rational when they make their strategic choices. [Neumann & Morgenstein, 2004] Rational behavior is more predictable compared to irrational behavior that narrows down the possibilities by excludes random actions.

Table 3: Payoff matrix that shows assumed profits (Profits in trillion US\$)

Players	$N = \{\text{USA, EU, Canada}\}$ ,
Strategies	$S_i = \{\text{Cooperate, Compete}\}$ Cooperate strategy, when a players forms a free trade agreement, while competitive strategy means, participants remain status quo position.
Payoff	$\pi = \{\text{Profit}\}$ Represents two countries trade with each other, expressed in US\$.

To set a game, it is necessary to set axioms. According to Neumann and Morgenstein [1944] utility theorem rational behaviour operates under axioms are then completeness, transitivity, continuity, and independence. An individual, who make a decision faced with probabilistic consequences of different choices will behave as the players are maximizing the expected value of some function. In future, it is defined over the possible outcomes at some specified point.

**Axiom 1.** Completeness: either  $M$  is preferred,  $L$  is preferred, or the individual is indifferent.  
 $L \leq M, M \leq L, L \sim M$

**Axiom 2.** Transitivity: assumes that preferences are consistent across any three options.  
 If  $L \leq M$  and  $M \leq N$ , then  $L \leq N$ , and similarly for  $\sim$ .

**Axiom 3.** Continuity: if  $L \leq M \leq N$ , then there exists a probability  $p \in [0,1]$ , such that  $pL + (1 - p) N \sim M$ .

**Axiom 4.** Independence: if  $L \leq M$ , then for any  $N$  and  $p \in [0,1]$ ,  $pL + (1 - p) N \leq pM + (1 - p) N$ .

In a game theoretic model, it is required to rational players select the best strategy among all alternatives in order to maximize their rewards (utilities, incomes, profits, subjective benefits) [Chen, 2008] that is the purpose of the game at the same time. The predicted strategies for solving a game are presented as a solution. Given these assumptions, we expect the three players seek greater benefit in their strategy. To construct a payoff matrix concerning these economies, we obtain the profit for each cases.

**Table 4: Three player's profit determination for four scenarios**

Case 1	Profit = The median of nominal GDP (Time period: 2007-2017, constant 2010 trillion US\$)
Case 2	Profit = [The median of nominal GDP (Time period: 2007-2017, constant 2010 trillion US\$)] * [1 + estimated GDP growth by CGE modeling] CGE estimation: EU: 0,5%, USA: 0,4%
Case 3	Profit = [The median of nominal GDP (Time period: 2007-2017, constant 2010 trillion US\$)] * [1 + estimated GDP growth by CGE modeling] CGE estimation: EU: 0,02%, Canada: 0,36
Case 4	Profit = [The median of nominal GDP (Time period: 2007-2017, constant 2010 trillion US\$)] * [1 + estimated GDP growth by CGE modeling] CGE estimation: USA: 0,00 %, Canada:0,02%

Source: World Bank Database, Felbermayr [2016], Burfisher, Lambert, Matheson [2019], European Comission [2017b]

## 6. RESULTS

In this section, we present our findings for four scenarios, where players choose a strategy in order to maximize their profits. The profits are calculated for all four cases, and have been constructed as a payoff matrix. It is shown in Table 2. from a fully competitive to partial cooperative solutions. Based on the results, the alliance between the United States and the European Union

brings the highest benefit in total profit. Regarding to the countries one by one, for all is better, if they engaged in some cooperative move. Despite of Canada's smaller total profit, the economy is able to cooperate that is more rewarding compared to status quo.

Table 5: Payoff matrix that shows assumed profits (Profits in trillion US \$)

	USA	Canada	EU	Total Profit
Case 1: USA vs. Canada vs. EU	$\pi = 15.54$	$\pi = 1.69$	$\pi = 17.31$	$\pi = 34.55$
Case 2: USA & EU vs. Canada	$\pi = \mathbf{16.16}$	$\pi = 1.69$	$\pi = \mathbf{18.17}$	$\pi = \mathbf{36.03}$
Case 3: EU & Canada vs. USA	$\pi = 15.54$	$\pi = \mathbf{1.75}$	$\pi = 17.34$	$\pi = 34.64$
Case 4: USA & Canada vs. EU	$\pi = 15.54$	$\pi = 1.73$	$\pi = 17.31$	$\pi = 34.58$

Although, results do not diverge in large extent from each other. This strengthens the fact that TTIP, CETA and USMCA do not seem to be profit-oriented trade agreements. In the background a more complex interacting process moves cooperation. We can regard to states' behaviour as a black box. It is not possible to know its internal operation, just can perceive the input and output factors and can analyze its behaviour. According to the theory of rational choice, an individual seeks after the utility maximization, firms its profit maximization, while states their power maximization. [Kiss, 2003] Today trends show players diverge from the equilibrium more and more and choose such a strategy that gives a greater benefit rather than the security situation. [Forgó, 2009]

The United States possesses a great power when engaging in a cooperative strategy and maintenance of this role may be implemented a competitive, rather than a cooperative environment. The reasons that is why the USA cooperate to Canada are on one hand it has a weak dominant role compared to the European Union, or the United States and the other hand, the countries are neighbors. For the EU, it seems to be desirable a great power in the world that explains its recourse to America.

Agreements could open the door to the world by giving opportunity each other's market access and from the profit aspects, cooperation is the best solution, if a country choose a strategy. From answering basic question from a political point of view, it can be explained Donald Trump's withdrawal from TTIP, but economically this fact has not been argufy.

## 7. CONCLUSION

Firstly, we introduced modern trade agreements. Our findings, the base objective of trade agreements that is tariff elimination has not changed. Conversely some clear historical characteristic relating trade agreements, stronger political and economic cooperation have appeared in recent years. After framing free trade agreements, we differentiate those from a past and modern perspective, thus now we are able to determine the most important components of modern trade agreements that are the followings: elimination of trade and non trade barriers, intellectual property right's protection, setting an investor-state dispute settlement and accession to government procurements. Secondly, we can conclude that since trade agreements no longer defined as a simply product trade across borders, it has been created a global value chain, thus rule of origin has acquired particular importance and belong to characteristics.

We chose actors on one hand by their relevance in international trade, on the other hand by their concluding trade agreements. This paper explored and explained why CETA and USMCA has entered into force, while TTIP has not yet by analyzing profits, and political factors of participant countries namely the United States, the European Union and Canada. The used methodology has compared possible outcomes that based on players' choices available. The transatlantic trade agreement between the EU and Canada, and the "one continent" agreement among Canada and the USA looks increasingly likely to materialize, but TTIP has not escaped yet. These mega-regions have the capability to may impact on trade by trade diversion and trade creation.

We focused on actual politics and opposed to our hypothetical finding to draw a conclusion relating players' choices. As in the game, none of the player intent to remain their status quo position, rather they shift toward trade agreements. Moreover, for cases in which cooperation is a choice between two parties, they are unambiguously committed to abolish tariffs, although the state power as important factor appears when a decision making.

Finally answering our fundamental question, interaction is possible, that allow countries to choose a cooperation scheme (it could be neglect) ensuring the most beneficial outcome, that shows a rational player's decision. Regarding TTIP, the power that is discussed above is one of the explanation for withdrawal, but timing of this negotiation also mattered a great deal. The United States' issue on traditional market access, especially on agriculture and automotive industry also could influence on the country's behaviour. To sum, transatlantic deal appears increasingly unlikely, but the two other trade deals and their implication has strongly seems to be implemented.

This game theoretic approach is a useful tool in order to illustrate situations, but less known that strategic decisions' result in optimal outcomes. We assume, but do not know. Without players' strategic behaviour integrated into this model, our findings may not be generalizable.

For future research, studies should consider these strategic interactions of players and illustrate clearly in a pattern.

Further it is highly possible that a more complex cooperative and competitive game theoretic model could be used for examines trade agreements impact on FDI, unemployment rare, or inflation with extended data collection. In addition could be consider environmental and sustainability issues.

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