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Transoceanic trade triangle of the US–EU–China: A game theoretical analysis on its present and future relations

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As part of global trade, the emergence of free trade agreements has resulted in the removal of tariff and non-tariff barriers over the past seventy years. The major trade actors (European Union, United States, and China) have become economic rivals, which make them compete in confrontational or cooperative ways for greater benefits and welfare. This paper discusses three free trade agreements between the US–EU–China: the Transatlantic Trade and Investment Partnership (TTIP), EU-China Comprehensive Agreement on Investment (CAI), and the Economic And Trade Agreement Between The Government Of The United States Of America And The Government Of The People's Republic Of China (ETA). The author's contribution is the creation of alternative scenarios to analyse the effects of these treaties on profit from a game theoretical approach. The results of this model suggest that cooperation generates greater economic benefits in each situation compared to competitive strategy. At the same time, players' welfare cannot be identified with profit in all cases.

Keywords: free trade agreements, international relations, trade policy

1. Introduction

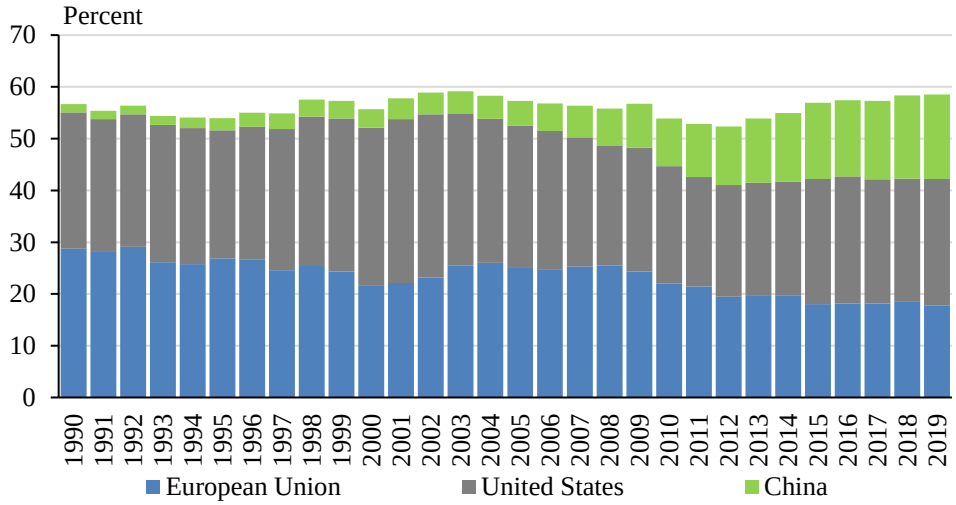
Free trade agreements are treaties between two or more economies aimed at the reduction or elimination of tariff and non-tariff barriers. Despite the fact that they are important creators of international trade, partly due to the lack of information, the literature barely deals with their practical operation and methodology. These are explained almost exclusively by WTO manuals. Data on the subject are mainly provided by the WTO, World Bank, ITC, OECD and UNCTAD databases. However, a comprehensive study of their content, characteristic features, and structure already appears in various analyses (Kutasi 2015, Acharya 2016).

The European Union, the United States, and China have become the world's most important trading centers in recent decades. This has also contributed to the negotiation of deeper, more comprehensive trade agreements between these economies. Among the collaborations, the *EU–China CAI* (EU-China Comprehensive Agreement on Investment) has already been signed. However, the agreement is currently suspended, and the *TTIP* (Transatlantic Trade and Investment Partnership) and the *US–China ETA* (Economic and Trade Agreement Between The Government Of The United States Of America And The Government Of The People's Republic Of China) are also suspended or blocked. At the beginning of the negotiations, the primary objective was the abolition of tariffs, but removing barriers in many fields was also aimed at. Despite opening up to each other, a number of tariff sanctions are currently applied against each other in some economic areas in the form of customs war. Harmonization of rights and norms differs in the three continents, which also makes it difficult to conclude

agreements. At the same time, there are strong motivations behind the initiatives: economic expansion, geopolitical power, geostrategic preferences, etc. Although the world is currently described as a multipolar center of power in foreign policy studies, the EU can only play a secondary role in this due to its disintegrated political system and significant internal economic disparities. Moreover, for the future, a US–China bipolar world order is clearly projected for the second third of the 21st century. In this geostrategic situation, the US is, for the time being, the main ally of the EU, which is why the EU is necessarily interested in closer cooperation, at least through conventions (Kutasi 2015).

The United States has the largest share in world GDP, accounting for 25 percent of total output, while the European Union and China account for 18 and 16 percent of total production[1] (Figure 1), respectively. In this context, the study provides a comparative analysis of the agreements listed above. The contributions are the comparison of political areas identified in these negotiations, and the description of possible outcomes on the export surplus of the United States, the European Union, and China.

Figure 1 Share of large economies in world GDP



Note: nominal data
Source: author's elaboration based on World Bank (2021)

The EU and the US depend on China in several goods and services, but the dependency is mutual. China seeks the high technologies to become self-sufficient. By overcoming obstacles, cooperation between these economies shall promote a higher level of economic growth.

Many studies deal with the effects of these agreements, but fewer examine the potential choices available for players and the consequences of their choices when they are committed to conclude a treaty. In this study, I introduce the strategic options and interpret them from a game theoretical perspective.

[1] Based on nominal data in 2019.

The main question is whether cooperation or competition brings greater benefit for players. The results in the examined cases show that cooperation yields higher profit compared to competition, and a relatively higher profit can be achieved with cooperative strategy. Although, I based this on the status of the conventions, I conclude that geostrategic or geopolitical interests are stronger than economic profit for the players.

The remainder of this paper is organized as follows. Section 2 gives a short summary of the three agreements. Section 3 introduces the related literature. Section 4 sets up the methodology. Section 5 presents the results. Finally, Section 6 concludes with a summary.

2. Transoceanic Trade Triangle Review

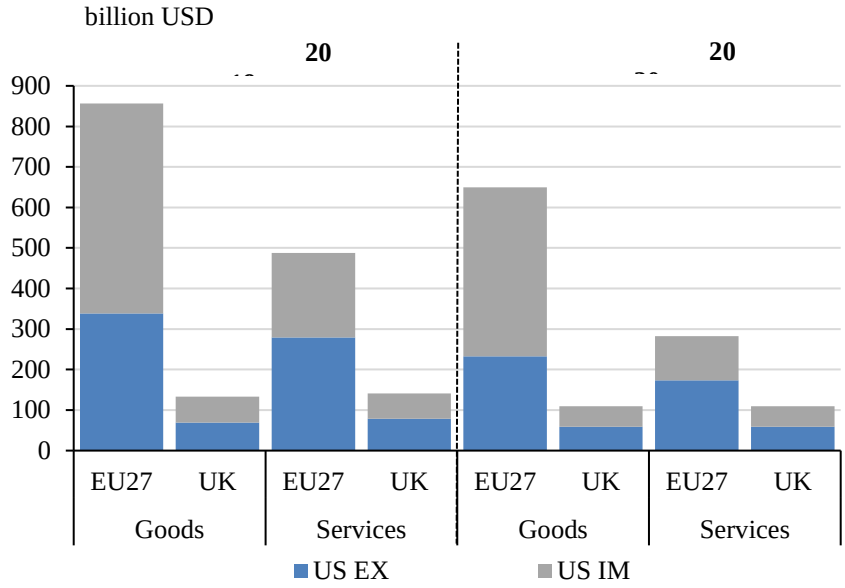
The transition from original free trade agreements to modern cooperation forms dates back to the 1990s. In the 2010s, however, trade negotiations reached another milestone. Evolution of deep and comprehensive trade agreements began, aiming not only at trade and investment potential, but also at a global harmonization of regulations (Kutasi et al. 2014),

2.1. EU–US Transatlantic Trade and Investment Partnership (TTIP)

TTTP (negotiated since July 2013) would have been one of the largest bilateral free trade agreements, covering around 30 percent of world trade and 50 percent of global output, once fully ratified by the two participants. President Trump expressed his willingness to reopen negotiations on the EU–US agreement in 2018, and the current Biden administration has not ruled it out, but so far no progress has been made on concluding the agreement. However, the treaty has been cast off, and the most recent research sees a great chance to renew the agreement, highlighting the linkage between trade policy and climate protection as a great opportunity for transatlantic trade relations. Successful cooperation in this area could be the value of international collaboration, tangible and thus spilling over into other economic and financial policy areas (such as rules for digital technologies, protection of data access, a sustainable finance architecture with standards for a green financial market, and fair taxation in the digital age, etc.) (AICGS 2021, Wilson Center 2021, WPR, 2021).

By bringing these economies together, the parties expect deeper cooperation and economic benefits. Once the negotiation process is completed and the agreement comes into force, it will strongly shape future global trends and foreign direct investments. The gains come from lower commodity prices, greater product variety, technology transfer, and higher productivity (Felbermayr et al. 2013). The European Union was the United States' largest trading partner in 2019, giving around one-fifth of total US trade. However, Brexit and the Covid-19 pandemic have altered the EU–US trade volume in 2020 compared to 2019 (Figure 2).

Figure 2 EU–US Trade volume



Note: seasonally adjusted data
Source: author's elaboration based on the US Bureau of Economic Analysis (2021)

Regulatory changes may lead to additional tariffs levied on goods traded in some sectors (between 10 and 20 percent), compared to classical negotiations where the average tariff level is only 4 percent. The additional growth effects would mean GDP growth of around 0.5 percent for the European Union's economy and 0.4 percent for the United States. This shows that the significance of TTIP relates more to the removal of non-tariff barriers (legislation, standards, licences, etc.) to economic benefits, and perhaps goes beyond these. This is now the biggest obstacle for activist groups and businesses who stand to lose in this process (CEPR 2013).

The other impact is related to trade diversion, and this may be created by the European Union itself. Given the lack of internal trade barriers within the integration, a significant intra-EU trade takes place within the region's borders. If the US removes tariff and non-tariff barriers, some EU trade likely to be diverted to the US. The explanation would be as following. Initially, EU countries trade with each other, but if a member state starts importing from the US, it reduces intra-EU trade, so trade creation becomes destructive for the EU. In addition, if the difference between the pre- and post-trade volumes is relatively large, the US will not be able to compensate the member states for the effects caused by trade diversion (Felbermayr et al. 2013).

The two parties waged a tariff war during the period 2017–2019. Under the Trump administration, the US began to impose protective tariffs on steel and aluminium export products from the EU in 2017. As a result, the EU announced its intention to impose countervailing tariffs to the full list of US products submitted to the WTO to reimburse the amount lost. From 2019, the US (due to prohibited subsidies) has applied additional tariffs, among other things, to aircraft parts and automotive products, which it has amended several times since then. In 2020, the EU levied digital taxes on several

large US technology firms. In response, the US envisaged raising car import tariffs. The most favoured nation (MFN) principle has been already applied to various product groups, but the parties are currently imposing high tariffs on each other's goods and services with the highest revenue (European Parliament 2015).

2.2. EU-China Comprehensive Agreement on Investment (CAI)

On 30 December 2020, the EU and China concluded the Comprehensive Agreement on Investment (CAI). By the cooperation, EU investors will get greater access to China's market. According to the agreement, China ensures fairer treatment for EU companies, which means that they can compete on a wide playing field in China.

The two states agreed on such policy areas as state-owned enterprises, transparency of subsidies, rules against forced technology transfer, sustainable development, including commitments on climate and forced labour, investment protection and investment dispute settlement. The agreement also allows foreign direct investment in production and manufacturing in China in case of a number of industries that were not or only to a limited extent possible at the time. In 2019, Chinese FDI in the EU was higher than the EU investment in China, especially in the field of transport, utilities and infrastructure (Figure 3).

Restrictions have been subsisted in only a few industries where China has a significant overcapacity. After the entry into force of the CAI, EU investors will not be required to disclose their technological secrets to their Chinese joint venture partners. The handling of technological and business information brought to the attention of the Chinese authorities during licensing procedures will be strictly regulated by the pact (European Commission 2021b).

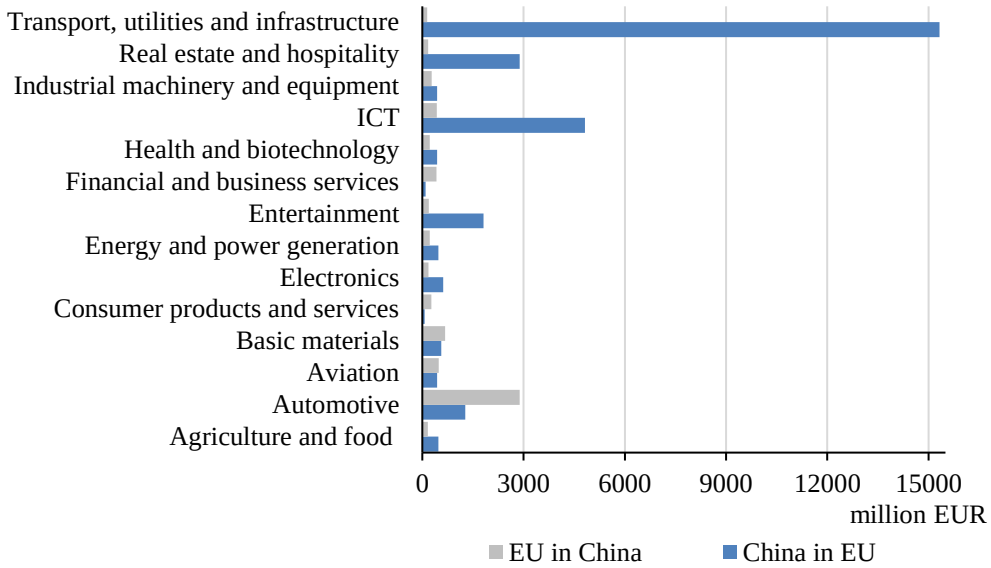
Various activists, NGOs and major economies (including the US) have also expressed concerns about the convention. Relevant economic issues that are common in debates are as follows:

- Norms and rules differ between the two economies in many fields. China follows a much more liberal principle, so the agreement could be a tool to bring the country closer to certain democratic and human rights norms and rules.
- The European Commission (2021b) has only recorded the fact of the agreement, the elaboration or entering into force of several policy areas is still unclear.
- It is expected that China will implement the International Labor Organisation's (ILO) provisions concerning prohibition of slavery, forced labour.
- Most European companies are distrustful of technology sharing. This is evidenced by the fact that, according to preliminary surveys, the willingness to invest in setting up EU–China joint ventures is low.

At the same time, according to the Commission, China has also made serious commitments in three important areas, namely, market access, ensuring equal competition, and sustainable development.

Overall, it may be that mutual investments start under the new conditions. The pact is expected to reach the final signing stage in 2022, pending several issues and conditions to be clarified between the parties.

Figure 3 Cash flow and capital stock of FDI in 2019, by sector



Note: nominal data
Source: author's elaboration based on Rhodium Group (2021)

2.3. Economic and Trade Agreement between the United States of America and China (ETA)

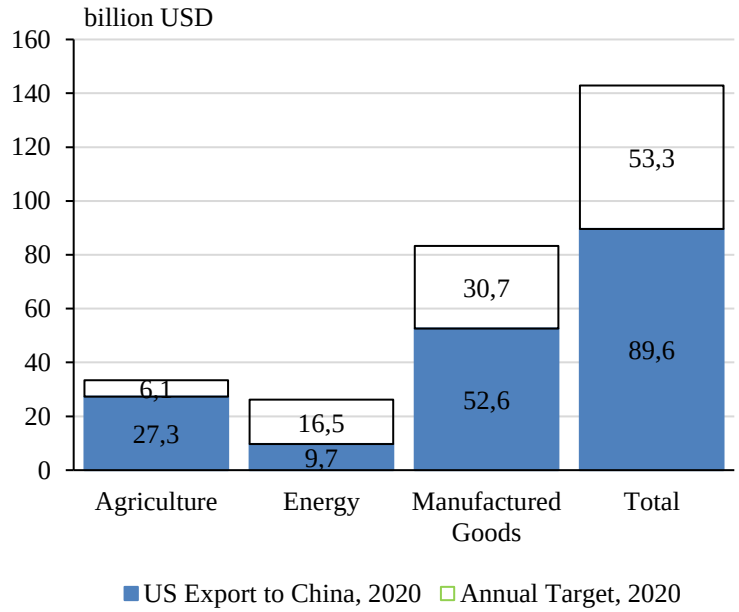
The United States and China signed the Economic and Trade Agreement on 15 January 2020. The pact aims to open Chinese markets to more American companies, enhancing agricultural and energy exports, and ensuring a higher level of protection for American technology, trade secrets, patterns, and rights. China has committed to purchasing an additional 285.8 billion USD worth of American goods and services by 2021 and is expected to eliminate or moderate several tariffs on American products. China's purchases in 2020 (first year since the agreement) were below its commitment levels in all sectors (Figure 4). US exports to China in 2020 were below the target, mainly because of the imposed retaliatory tariffs by China in response to President Trump. Partly, that is why the agreement preserves the tariffs placed by the Trump Administration (360 billion USD worth on Chinese goods) and maintains additional tariffs if Beijing does not meet the terms of the agreement in order to address overcapacity in China (NYT, 2021).

The ETA provides a variety of positive effects from the opening up of markets for pharmaceutical and energy industries, beef and poultry, biotechnology, banks and insurers. China has promised not to acquire sensitive technology through acquisitions. Both parties agree that they are not to devaluate their currencies to gain advantages in export markets.

Beside economic benefits, critics highlight that negative economic, geopolitical and social factors are surrounding the ETA:

- The treaty does not deal with cybersecurity (relating companies' handling data, cloud computing, China rejected demands that refrain from hacking American companies);
- Crucial industries like solar energy and steel in the United States are threatened by the cheap Chinese goods. American companies blame political decision-making for not solving this economic practice with the treaty (USTR 2021).

Figure 4 Trade commitments in phase I



Note: nominal data
Source: author's elaboration based on the US Census Bureau (2021)

3. Literature review

This section addresses key literature that deals with the impact assessment of international trade agreements. Cost-benefit theories have appeared several times in relation to states. Integration theories draw attention to trade creation and trade diversion (Palánkai 2011). In the economics of international organizations, states can establish collaborations as profit-maximizing individuals (Blahó 2004). Fratianni and Pattison (1982) and the functional approaches underline the marginal benefits and marginal costs of these agreements. Market theory analyses cartels and identifies their welfare-increasing, welfare-reducing effects at a national economic level. The realist school sees countries as individual competitors, which is a microeconomic approach, as states seek to maximize welfare in the international system.

3.1. The impact assessment of free trade agreements

Since the 1970s–80s, a comprehensive integration process has taken place in the world economy, encompassing micro- and macro-processes. That means that the corporate, national, regional and global integration processes in the international trading system happen in parallel and are intertwined (Blahó 2004).

The literature generally distinguishes between the regional economic integration levels according to the typology by Balassa (1961). In the case of a free trade area, tariffs and quotas within the zone are abolished, but customs duties and quotas are applied to outsiders (EFTA, AFTA, NAFTA). The customs union does not apply customs duties and quotas within the zone but defines a common external customs duty and foreign trade policy vis-à-vis the outsiders (EU–Turkey Customs Union). The common market liberalizes not only goods and services in the customs union but also the flow of capital and labour (MERCOSUR). In addition to the abolition of customs barriers, the single market includes the removal of non-tariff barriers (EC) (Palánkai 2011). The economic and monetary union also accomplishes the unification and coordination of economic and monetary policies (EMU). Political union means raising power and legislation to a supranational level where a "supranational authority" can make decisions.

With the appreciation of regional economic integrations, there has been an increasing emphasis on assessing the benefits and costs they bring. Customs union theories are the first to analyze the links between free trade and the international division of labour. Within this framework, Viner (1950) considers trade creation to be a positive effect of the customs union, and even trade diversion to be a negative outcome of the customs union. Meade (1955) already highlights the impacts of production and consumption. As a result of cheaper imports, savings become higher, which increases consumption. He calls such an increase in imports trade expansion, and a change in the opposite direction trade contraction. The transportation costs of trade are identified by Samuelson (1952) in the iceberg trade cost metaphor that means some of the profits melt as the geographical distance increases.

3.2. Applying game theory to international relations

Game theory as a potential methodological tool is commonly used in international trade to illustrate different situations. From the 1950s onwards, the situations observed in the international system began to be examined with game theory models. In addition to individuals, analyses also focus on the global level with states and nations. However, theories already differ in determining the benefits of interactions among economic players. The realist school (Morgenthau 1951, Kiss 2003, Szörényi 2009) rejects the interaction between states, which is justified by zero-sum games. The neorealist conception is already more lenient if there is a hegemonic power modeled by the prisoner dilemma. In this game, the parties are better off cheating because they can reap greater benefits. The neoliberal school emphasizes the importance of cooperation, modeled by the repeated prisoner dilemma. The game demonstrates the states' ability to cooperate in the long run (Keohane 2005).

Inter-state relations are most often illustrated in a game theoretical approach by the two-player prisoner's dilemma (conventional game). This describes the different trade policy perspectives of nations. In the game, cooperative behavior (concluding a trade agreement) would be more beneficial than if the parties did not collaborate. The outcome of the game, however, is that they both refuse cooperation because their individual interest is thus higher. This concept can also be applied to trade relations between states. There are cases where, although the parties previously promised to cooperate, in the end they do not conclude a trade agreement because their personal interest (maximization) overrides the agreement (Krugman 1991, Bagwell and Staiger 1999, 2002).

The prisoner's dilemma can be a one-shot game or a repeated game with the Nash-equilibrium (Keohane 1986, Krugman 1992, Axelrod 1997). Players' decision options are illustrated by the payoff matrix, which are sets of players' strategies in the same game. When determining the matrix, we assume that players prefer higher profits over fewer, and they are also affected by non-financial incentives in some cases (Kreps 2005). However, as game theory evolves, more and more complex methods are emerging for examining trade relations.

In the 2000s, evolutionary games appeared for purposes of analyzing trade cooperation. These games included a larger number of players, became less static, and do not rely on the rational behavior assumption against conventional game theory models (Gintis 2009). In this game type, the successful and inefficient strategies of nations are illustrated by numerous authors such as Elkins and Simmons (2005), Gintis (2009), Gilardi (2010), and Yukawa et al. (2014).

This paper proposes a two-player model in a conventional game rather than an evolutionary game to reduce the complexity of the structural models.

4. Methodology

Modeling trade relations necessarily consists of two different parts: a game that is played by all participants of a trade agreement, and the evaluation of results with the payoff matrix. To explore the opportunities that lie among the three chosen actors (US, EU, and China), it is necessary to view the interactions between them in the examined period.

TTIP, CAI, and ETA are actual cooperative approaches, but of these, there is still no agreement in force that has been taken by the economies. Therefore, research is focused on the export revenues and strategic decisions. Data has been collected for 2020, covering the annual export good revenues of each economy in order to obtain accurate results. This paper categorizes the interaction types as three scenarios:

Scenario 1: trade wars without agreements

Scenario 2: no trade wars with agreements

Scenario 3: no trade wars, agreements without tariffs

The results are inserted into a payoff matrix for comparison; thus, we are able to determine the winner situation of participants. However, we do not rule out the possibility of achieving different results by other methods.

4.1. Game theory

Game theory as a methodology describes situations of conflict and cooperation. A game necessarily consists of three elements: players, strategies, and payoffs.

Players are rational decision makers. *Rational players possessed a payoff function π 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 and Morgenstern, 1944).

Players make their choices based on optimization according to utility maximization problem. In the game, each player, when deciding what steps to take, must consider how others may respond to that action. Although the literature generally agrees that trade policies are aimed at maximizing economic profit, we often encounter situations where economic benefits are pushed into the background and replaced by other geopolitical or security policy interests (Laidi 2008, Dieter 2014, Kutasi 2015, Eichengreen et al. 2019).

The consequences of their choices are represented as a payoff matrix, which shows all the possible combination of outcomes according to the strategy chosen by players. Each player is assumed to know their own mind and to be able to identify the payoff of each strategy they choose (Mankiw and Taylor 2017).

The model framework that will be used for illustrating cooperative and competitive strategies between the United States, the European Union, and China in this paper can be described as a normal-form game. *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_s^i* (Daskalakis and Papadimitriou, 2005:2).

4.2. Model development

To construct a payoff matrix, we obtain the export revenue functions for each player according to the three scenarios.

Scenario 1: trade wars without agreements

$$\pi_i^{EX}=\left(p_i^{EX}-c_i^{EX}\right)*q_i^{EX} \text{ where } c_i^{EX}=t_i^{EX} \quad (1)$$

Scenario 2: no trade wars with agreements

$$\pi_i^{EX}=\left(p_i^{EX}-c_i^{EX}\right)*q_i^{EX} \text{ where } t_i^{EX}>0 \quad (2)$$

Scenario 3: no trade wars, agreements without tariffs

$$\pi_i^{EX}=\left(p_i^{EX}-c_i^{EX}\right)*q_i^{EX} \text{ where } t_i^{EX}=0 \quad (3)$$

Table 1 Notations

i	index (i = US, EU, China)
p_i^{EX}	export price of country i
q_i^{EX}	export quantity of country i
c_i^{EX}	export cost of country i
t_i	tariff rate paid by country i
π_i^{EX}	export profit of country i
∂	annual growth of export revenue
n	number of players
A	possible variable

After determining the payoff matrix, we obtain the minimum criteria for the economies to conclude an agreement in the context of rationality. For this, we are able to apply the superadditive function:

$$\pi\left(\bigcup_{i=1}^{n} A_i\right) \geq \sum_{i=1}^{n} \pi(A_i) \tag{4}$$

$$\text{Since, } \pi(US, EU, China) \geq \pi(US) + \pi(EU) + \pi(China), where \tag{5}$$

$$\pi(US, EU, China) = \sum_{i=1}^{3} \pi_i^{C,t=1} = 890.7 \cdot \partial, and \tag{6}$$

$$\pi(US) + \pi(EU) + \pi(China) = \sum_{i=1}^{3} \pi_i^{\bar{C},t=1} = 890.7 \cdot \partial \geq 754.4 \tag{7}$$

$$\partial = 1.1807$$

Considering the characteristic function of superadditive, at the point, where $\partial = 1.1807$, players decide about cooperation or competition. Less growth than this value will certainly lead to competition according to the set function.

5. Results

The profits are obtained for the United States, the European Union and China according to the scenarios in a payoff matrix.

5.1. Payoffs of alternative scenarios

The economies' export performance heavily depends on the tariffs imposed on goods. In this chapter, the study elaborates three alternative scenarios that examine how much revenue the parties could have expected if trade wars had ended, and tariffs had been eliminated.

To investigate the unexplored cooperation possibility between the European Union, the United States, and China, it is necessary to view all opportunity that may

arise from the current situation. There is still no comparative analysis that examines the elaborated cases, therefore I collected data for empirical evidence. My intention with the study has been to explore the best option of the three largest economic players. This study lists the competition and cooperation policies as three scenarios (first, when the parties wage a trade war without any agreements; second, when trade wars are taking place with agreements, which means that players increase tariffs in areas not covered by the trade agreement; third, when no trade wars happen and the economies conclude agreements; and finally, no trade wars, agreements are in effect, and trade occurs without tariffs). The data has been collected for the EU, US, and China for 2020 (USCB 2021). The final results are summarized in Table 2 for comparison and discussion.

Table 2 Payoff matrix

Scenarios	EU	US	China	Total
	Million USD			
Scenario 1 *trade wars without agreements*	611.5	314.2	800.1	1,114.3
Scenario 2 *no trade wars with agreements*	674.2	431.7	874.2	1,980.1
Scenario 3 *no trade wars, agreements without zero tariffs*	710.2	453.2	900.1	**2,063.5**

Note: In case of the EU, export good revenues contain the EU good export revenues to US and China. In case of US, export good revenues contain the US good export revenues to EU and China. In case of China, export good revenues contain the China good export revenues to EU and US.
Based on actual export in 2020.
In scenarios 3 and 4, revenues are adjusted by tariffs.
Source: author's calculation based on US Census Bureau (2021)

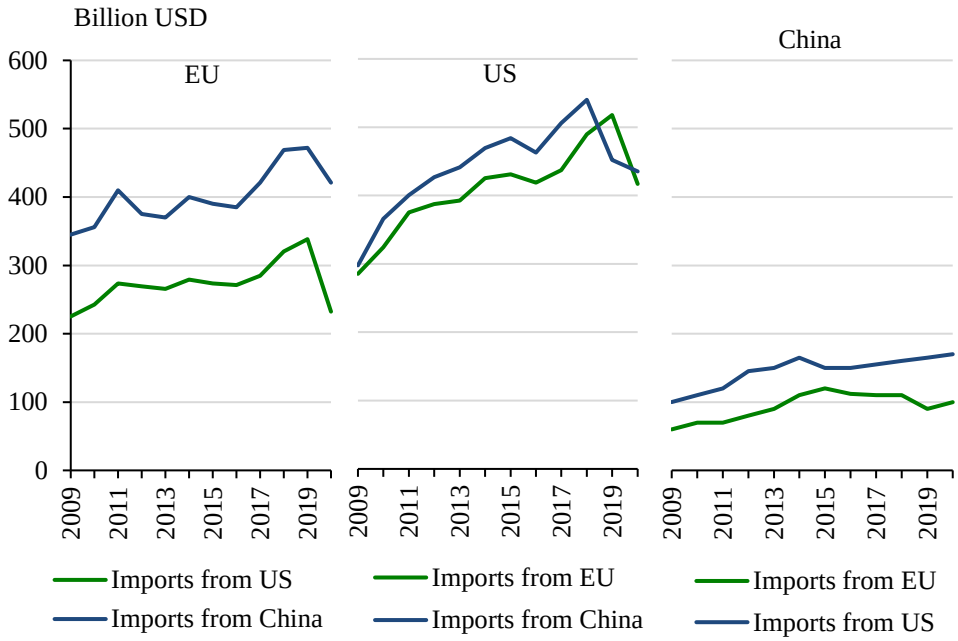
The difficulty of choices lies in determining the extent of interaction between participants. Competition results in a separate enforcement. Collusion is a kind of willingness to move in the other direction. Cooperation is adherence to the rules that result from commitment. Integration is a deepened form of commitment, where economic policies and norms are harmonized. Coordination results in the greatest dependence through joint, supranational governance (Blahó et al. 2004, Benczes 2014). The payments to the actors depend on the choice of strategies, i.e. the expected profits vary.

Our estimations support that in the cases in which cooperative strategy is applied, the revenues are higher compared to competitive situations. Microeconomics highlights the individual rationality (Mas-Colell et al. 1995), but the best decision for one player may not be necessarily the best option to the others, or for all the players. In our case, results suggest that both the individual and the group revenues are the highest when no trade wars occur and the tariff levels are eliminated between the actors.

All three economies are located in different continents, which strengthens their role in the world economy. From a geopolitical perspective, the EU and US are strongly dependent on Chinese import goods. This level of import exposure is no longer substitutable for other products. Although China is able to retain its leading export position, the market share may decline with the appearance of new technologies.

Finally, the country is forced to adapt new technologies and to access infrastructural development that preserves its competitive advantage. Thus, the rational behaviour is for the three big trade players to cooperate with each other and form treaties (Figure 5).

Figure 5 Trade triangle between the EU–US–China



Note: The US–China trade war has begun in 2018
Source: author's elaboration based on US Census Bureau (2021)

6. Conclusion

This study has provided an exploratory analysis of the three economies' trade trends and analyzed both competitive and cooperative strategies among the US, EU, and China using a game theoretic model.

The main question has been whether the parties should cooperate with each other, or whether they should just compete if they are committed to improving their current situation. However, the presented treaties are doubtful, and the parties have taken cooperative initiatives that allow us to analyze their behavior.

The base objective of free trade agreements is that they are concluded for the purpose of reciprocal reduction or elimination of tariffs (cooperative competition). This statement is in line with our findings. First, in the game, all the players seek to maximize their profits, and since cooperation ensures the most beneficial outcome, they are committed to concluding the agreements (the rational decision of players). At the same time, many factors (conflicting interests in the field of environment, laws, etc.) were introduced that have a strong impact on the success of the mentioned treaties. In comparison, parties seem to be more open towards forming such provisions in

agreements that elaborate on common dialogue and eliminate differences from each area. Taking into account only the scope of the treaties, these disparities seem to be even more significant. On the other hand, the majority of the provisions concerns non-economic areas, so benefits link mainly to geopolitical and social issues (geopolitical power and geostrategic role). The actors in the agreements make their strategic decision in the light of these, which could provide explanations for the current status of the TTIP, ETA, and CAI. It is highlighted that these findings may not be generalizable.

By creating a trading model, I have aimed to get closer to understanding reality and to show situations in which the exploitation of trading tools can be useful. For further research, a more sophisticated and complex model could be taken into account with data that covers expenditures and size of the economies. In addition, future research can be extended to include some environmental, political, or other economic variables.

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