UNIVERSITA' DEGLI STUDI DI PADOVA

DIPARTIMENTO DI SCIENZE ECONOMICHE ED AZIENDALI "M. FANNO"

DIPARTIMENTO DI *SCIENZE POLITICHE, GIURIDICHE E STUDI INTERNAZIONALI*

CORSO DI LAUREA IN ECONOMIA

PROVA FINALE

"Gravitational Models and GATT/WTO effects on trade: An Empirical Analysis"

RELATORE:

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MATRICOLA N. 1217240

ANNO ACCADEMICO 2022 – 2023

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ABSTRACT

Questa tesi ha come argomento principale il commercio internazionale, nello specifico si occupa del modello gravitazionale del commercio e degli effetti che il GATT e il WTO hanno avuto sul sistema commerciale multilaterale. La domanda di ricerca di questa tesi è capire se queste due organizzazioni siano state efficaci nel loro scopo e in che modo il modello gravitazionale sia stato utilizzato per compiere quest'analisi. Nel primo capitolo viene approfondita la storia del GATT e del WTO, vengono illustrati la loro struttura, le loro funzioni e i loro principi, e si conclude con un discorso approfondito sui vari "round" di negoziazione. Il secondo capitolo, dedicato al modello gravitazionale del commercio, mostra la sua storia, le sue estensioni statistiche e le tecniche di ottimizzazione adottate dagli esperti. Il terzo capitolo illustra vari "paper" e articoli nei quali gli studiosi, come Andrew Rose e Yoto Yotov, discutono sull'efficacia del GATT e del WTO. I primi risultati, elaborati da Andrew Rose, non mostravano alcun incremento del commercio dovuto al GATT/WTO. Gli studi successivi hanno corretto gli errori effettuati da Rose e migliorato il suo lavoro: come risultato hanno trovato che il GATT e il WTO producono effetti positivi sul commercio internazionale.

INTRODUCTION

In a world characterized by globalization, international trade plays a key role in determining economic growth and development, as well as employment opportunities, consumer benefits, investments and poverty reduction.

This thesis deals with the subject of international trade, in particular it aims to study in deep the gravity model of trade and the effects that WTO, along with its precursor GATT, have on the multilateral trading system.

Starting from the bibliography, I want to answer the research question on which my thesis is based on: investigating whether the GATT/WTO has been effective in favoring the growth of international trade and how the gravitational model has been used to accomplish this analysis.

To reply to this question, the thesis relies on studies conducted by experts of the field, Yoto V. Yotov, Andrew Rose and Michael Tomz, to name a few.

The first chapter starts with the analysis on the General Agreements on Tariffs and Trade and its successor, the World Trade Organization. The chapter examines their history, their structure and objectives, and the Rounds held by them. This analysis reconstructs which sectors have been affected and which sectors have been excluded by their liberalization process, the countries that thanks to them have reduced tariffs and China's 2001 accession to the WTO.

This chapter is grounded in various sources: "The History and Future of the World Trade Organization" (Craig Van Grasstek, 2013) and "Six Decades of Multilateral Trade Cooperation: What have we learnt?" (World Trade Report, 2007) provide a general framework on topics such as history and the nine rounds; "The Empirical Landscape of Trade Policy" (Bown C.P., Crowley M., 2013) instead, is used to better investigate the subject of countries and sectors impacted by WTO/GATT's activities. The WTO's website, "www.wto.org", was used to gather information on the remaining subjects, namely GATT/WTO's principles and objectives.

The second chapter describes the gravity model of international trade, summarizing its history, to then display its formula, the factors and variables that are omitted and the empirical results. A considerable element analyzed in this chapter is the change in the approach of the gravity model, shifting from OLS to PPML. Yoto V. Yotov's researches are the most important pieces of source for this chapter, especially "Gravity at Sixty: The Bijou of Trade" (Yoto V. Yotov, 2022), which provides a comprehensive view of the model.

"An Advanced Guide to Trade Policy Analysis: The Structural Gravity Model" (Yoto V. Yotov, Piermartini R., Monteiro J. A., Larch M., 2016) is another paper published by Yotov and co-published by the World Trade Organization and the United Nations Conference on Trade and Employment, which I consulted for this chapter.

The last chapter focuses on Andrew K. Rose, well-known professor and economist, and his article "Do We Really Know That the WTO Increases Trade?" (Rose A., 2004), on the effects of the membership to GATT/WTO on one country' trade flows.

Two additional papers from Rose have been investigated: "Which International Institutions Promote International Trade?" (Rose A., 2005) and "Do WTO members have more liberal trade policy?" (Rose A., 2004) to provide further context on Rose's position on the matter: GATT/WTO membership did not increase the volume of trade of a participant country, according to his studies.

In addition to that, this chapter analyzes the criticisms towards Rose's work, referring to the studies of other researchers, where they emphasize Rose's gaps, improve on its work in different ways and display their results.

The experts in question are the following: firstly, the chapter will cover Michael Tomz, Judith L. Goldstein and Douglas Rivers with a homonym article "Do We Really Know That the WTO Increases Trade? Comment." (Tomz M., Goldstein J. L., Rivers D., 2007), in which they include a new group of countries to the Rose's original pool of countries, all while using the same data and methods of Rose. The main finding of this study is that participation in GATT/WTO did actually increase global trade flows.

Then "The WTO promotes trade, strongly but unevenly" (Subramanian A., Wei S.J., 2007) is going to be investigated; in this article, which utilized the same data employed by Rose, they consider four types of asymmetries which were left aside in "Do We Really Know That the WTO Increases Trade?".

"In search of WTO trade effects: Preferential Trade Agreements promote trade strongly, but unevenly" (Eicher T., Henn C., 2011) analyzes the PTAs and their relation with trade.

"International Institutions and the Volatility of International Trade" (Mansfield E. D., Reinhardt E., 2008) focuses on similar subjects.

Finally, "Trade effects of WTO: They're real and they're spectacular" (Yoto V. Yotov, Monteiro J. A., Piermartini R., Larch M., 2019) concludes the chapter by presenting current and accurate data on this study.

CHAPTER 1- GATT AND WTO: HISTORY AND ROUNDS

1.1 History: from GATT to WTO

After the Second World War, the world was in ruins, as this conflict brought destruction, human suffering and death on an unprecedented scale, while also harming the world economy: the countries, which participated in this armed conflict, spent more money in this war than in any other wars put together, making this warfare the most expensive war in history. Additionally, nations had to withstand major economic payments due to the reconstruction and recovery of what the war destroyed. Inflation, debt, trade and balance of payments deficits and imbalances, high trade barriers and the depletion of gold and dollar supplies are some of the economic repercussions of the Second World War.[1]

To combat the economic depression and try to improve on the economy, the richest nations worldwide decided to avoid protectionism and to apply trade liberalization; with it and with freer trade, they would have achieved peace and economic growth. Furthermore, the US, under Harry S. Truman's presidency, wanted international economic relations and the world economy to be found on international institutions; so, in 1947-8, the United Nations Conference on Trade and Employment was held in Cuba. The topic of this conference was the expansion of production, exchange and consumption of goods.

The Havana Charter, the last act of the UN Conference on Trade and Employment, aimed to set rules on employment, commodity agreements and international investments; for this purpose, it provided for the founding of the International Trade Organization (ITO), arranging the basic rules for global trade. ITO was intended as the third international institution, alongside the World Bank and the International Monetary Fund (IMF); discussions about a third world economic pillar date back to the Bretton Woods Conference of 1944.[2]

This is when the General Agreements on Tariffs and Trade (GATT) arose: the GATT was established in 1947 with the Geneva Round, as a forerunner of the ITO, and it came into force on January 1st, 1948[3]. It was set up and intended only as a temporary agreement, meant to last for several years until the ITO would have become effective. GATT was a multi-national trade treaty, it provided a small forum focused on reducing, on a multilateral basis, obstacles to free trade. It became the pillar for international trade cooperation in 1950, when the USA, formally

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[1] IMF, Destruction and Reconstruction". Money Matters: An IMF Exhibit -- The Importance of Global Cooperation. Part 1 of 6. imf.org.

[2] Douglas A. Irwin, Petros C. Mavroidis, Sykes O. Alan, "The negotiation of GATT". The Genesis of GATT. Cambridge, Cambridge University Press, 2008, pp. 98-175.

[3] In alphabetical order, the 23 founding countries were Australia, Belgium, Brazil, Burma, Canada, Ceylon, Chile, China, Cuba, Czechoslovakia, France, India, Lebanon, Luxembourg, Netherlands, New Zealand, Norway, Pakistan, Southern Rhodesia, Syria, South Africa, United Kingdom and the United States.

withdrew from the ITO concept, with other nations following this decision. The reason behind this decision was the US' internal economic policy: the USA thought that the ITO would have hampered it. [4]

GATT, despite being intended as a brief stand-in, lasted for 47 years. During this time, it was used as a temporary international organization, substituting for the original functions of the ITO. GATT provided the framework for multilateral trade negotiations; it held a total of eight rounds of multilateral trade negotiations, which reduced tariffs in many sectors.[5]

It was finally replaced after the Marrakesh Agreement of 1994, with the World Trade Organization (WTO) taking its place as the main intergovernmental organization for global trade regulation.[6] Today the WTO still works for the regulation of global trade and economic cooperation; whereas the GATT only covered the trade in goods, the WTO also deals with the trade in services and intellectual property rights. This organization has 164 members, which account for 98% of world trade.[7] It sponsored only one single round in 2001, named the Doha Round, but it has been a very problematic round as it failed: it went on too long without significant results, until it was officially shut down in 2018. A more detailed study on this topic is present in the fourth paragraph of this thesis.[8]

The WTO also faces many challenges that the GATT did not encounter, for instance China's 2001 accession to the organization. Even though negotiations began in the 1980s, China became an official member of the WTO barely on December 11th, 2001, after the agreement of the Ministerial Conference, with some adjustments to the Chinese economy.[9] The admission of the Chinese country to the organization caused worldwide the "China shock", also known as the China trade shock: the increase of Chinese exports reduced jobs, in the manufacturing sector, of about 2.0 million just in the US.[10] Beyond that, there have been also controversies about the discrepancy between WTO's approach to trade liberalization and China's economic model as, until then, the WTO dealt with only market economies, whereas the Asian country was recognized as a non-market economy (NME).[11]

[4] Bruce W. Wilkinson, "General Agreement on Tariffs and Trade", The Canadian Encyclopedia, 2021; Van P., "The Law and Policy of the World Trade Organization". Cambridge University Press, 2005, pp. 79-80.

[5] WTO, "Understanding the WTO – the GATT Years: From Havana to Marrakesh"". wto.org

[6] WTO, "Marrakesh Agreement Establishing the World Trade Organization". wto.org

[7] WTO, "WTO in brief". wto.org

[8] Vangrasstek C., "The History and Future of the World Trade Organization". Cambridge University Press, 2013, pp. 43-73.

[9] WTO, "Accessions: China". wto.org, 2019.

[10] Feenstra C. Robert, Sasahara A., "The China Shock, Exports and U.S. Employment: a Global Input-Output Analysis". Review of International Economics, vol. 26, 2017.

[11] Trachtman J., "Is China a Non-Market Economy, and Why Does It Matter?". Fletcher School, Tufts University, 2017.

1.2 GATT/WTO: Structure, Functions and Principles

The WTO is composed by eight bodies, which are organized into a hierarchical system. The most important body of the WTO is the Ministerial Conference, responsible for decisions on all subject matters under any of the multilateral trade agreements. The Ministerial Conference meets every two years, with a total of twelve ministerial conferences gathered during the period 1996-2022. At the next level there is the General Council; this WTO body acts on the behalf of the Ministerial Conference and it is composed by ambassadors from all member countries, which meets in multiple occasions in the Geneva headquarters. The General Council, under different rules, also gathers as the Trade Policy Review Body and the Dispute Settlement Body, whose functions are given by their names, i.e. trade policy review and dispute settlement, respectively. In the level below there are the Services Council, the Goods Council and the Intellectual Property Council, which reports to the General Council; there are also various specialized committees, such as the Committee on T&D and T&E (Trade & Development and Trade & Environment). With the exception of plurilateral committees, Dispute Settlement panels and the Appellate Body, all WTO members can take part in all committees and councils.[12]

Regardless of some dissimilarities, GATT and the WTO share functions and principles, being one the precursor of the other. The functions of the WTO are cited in Article III of the Marrakesh Agreement of 1994[13], and are as follows:

-administering trade agreements, since the implementation of the multilaterally agreed rules is essential for the proper functioning of the WTO

-acting as a forum for trade negotiations, used to solve the trade issues between member countries

-settling trade disputes, because the enforcement of the rules is necessary in a system based on rules

-reviewing national trade policies, in order to enhance transparency and to provide a better comprehension of the member governments' domestic policies

-building the trade capacity of developing countries: supply to the least-developed countries technical assistance and training

-cooperating with other international organizations: the WTO does not act isolated from other international organizations, instead it cooperates with almost 200 international institutions[14]

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[12] WTO, "Understanding the WTO - WTO organization chart". wto.org; WTO, "WTO in brief". wto.org
[13] WTO, "Marrakesh Agreement Establishing the World Trade Organization". wto.org
[14] WTO, "What is the WTO?". wto.org; Sinha, A., "What are the functions and objectives of the WTO?". 2014

The pre-1994 GATT and the WTO are both guided by five fundamental principles

-non-discrimination

-reciprocity

-binding and enforceable commitments

-transparency

-safety valves

Non-discrimination is divided into two legs: non-discrimination at the border and non-discrimination behind the border. The first one is also known as the Most-Favored-Nation (MFN) clause and it is the first article of the GATT. MFN compels WTO's member governments to apply to all member governments the same conditions and advantages, in order to reduce discrimination. There are exceptions to the MFN clause, with developing countries, customs unions (CU) and free trade areas (FTA) receiving preferential treatment. The second leg is called the national treatment rule and it provides for equal treatment between domestically produced goods and imported goods.

Reciprocity is the second principle of the trading system. The reciprocity principle commands for a balance of concessions, that is when a country offers to reduce a trade barrier, the beneficiary country should reciprocate by offering to reduce one of its own trade barriers.

Binding and enforceable commitments is the third principle and it is used to regulate a member's bindings. The schedule of concessions, a legal instrument used to list the tariff commitments made by member states, settles ceiling bindings, thanks to which the countries cannot raise tariffs above bound levels without negotiations with its trading partners; if the countries do not reach any agreements, the dispute settlement procedures get activated.

With the transparency principle, the WTO plans to augment stability and predictability by making trade rules clearer, i.e., more transparent. WTO member countries are obliged to publish their trade restrictions in order to avoid the problem of imperfect information.

Lastly there are the "safety valves", which are known as the flexibility principle. Under specific circumstances, governments can impose trade restrictions as a means to:

-achieve noneconomic objectives

-accomplish and ensure fair competition

-economic reasons

National security, public health and the protection of industries are included in the noneconomic objectives, meanwhile fair competition is achieved with antidumping and countervailing duties.

Finally, member governments consider balance of payments problems and imbalances as "economic reasons", effective to enable the flexibility principle.[15]

1.3 The Eight GATT Rounds

Across its lifespan, the GATT held a total of eight rounds: Geneva, Annecy, Torquay, Geneva, Dillon, Kennedy, Tokyo, Uruguay; they were mainly used to lower trade barriers, and to encourage trade growth and economic cooperation.

The first ever GATT round was the Geneva Round, scheduled in the homonym city, and it is mainly famous for establishing the GATT. It lasted for seven months, during which the 23 participating countries discussed possible solutions regarding the trade obstacles and imbalances that were created with the aftermath of the Second World War, along with discussions about non-discrimination and the Most Favored Nation (MFN) treatment. The main outcome of this round is the creation of the GATT; another important results from the negotiations is tariffs reduction, to be more specific $10 billions of trade in tariff concessions, covering around 15000 tariff items (almost 40% of world trade). These tariffs reductions were agreed upon with the application of the MFN principle. In this conference the United States made the most generous tariff concessions out of all countries, due to its high level of tariff protection and its strong economic position, leading to great advantages for the rest of the members, especially the Western European countries.[16]

The second round was the Annecy Round, held by 33 countries in France in 1949. Like the previous round, the 5 months long negotiations focused on tariff reductions, and through them countries managed to reach the result of 5000 tariff concessions. The negotiation of tariff concessions did not happen between the original GATT members, instead they happened between the first 23 countries and the newly acceding members.[17]

The Torquay Round is the third one, arranged by 34 members in 1950 and ended in the following year. A total of 8700 tariff concessions were made, moreover the Contracting Parties decided to leave untouched the nearly all of the commitments made during the first two round. The 1948 tariff levels were cut by 25% as a consequence of this conference.

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[15] WTO, "Understanding the WTO - Principles of the trading system". wto.org; Hoekman B., "The WTO: Functions and Basic Principles", pp. 42-44.

[16] WTO, "World Trade Report – Six decades of multilateral trade cooperation: What have we learnt?". 2007. Pp. 180-181.

[17] WTO, "World Trade Report – Six decades of multilateral trade cooperation: What have we learnt?". 2007. P. 181.

In 1956 a second round in Geneva was gathered, with 22 countries participating. This round earned modest achievements, specifically $2.5 billions in tariff reduction. It was in this round that the Contracting Parties started to show interest in developing countries, setting up experts to study the challenges and the problems that these nations face to integrate in the world trading system.[18]

The fifth round was the Dillon Round, which lasted from 1960 through 1962. It was named after the man who proposed the talks, namely the U.S. Secretary of State, Douglas Dillon. The types of product discussed in this conference, unlike the previous rounds, were not just industrial goods, but also agricultural ones. The talks, occurred in Geneva between 45 countries, managed to reach 4400 tariff concessions worth $4.9 billions of trade and managed to yield the adoption by the European Economic Community (ECC) of a common external tariff (CET). Another result of these negotiations is the Arrangement on Cotton Textiles, allowing the negotiation of quota restrictions with cotton exporting nations; this was also a step forward for the inclusion of the developing countries in the world economy.

Then there has been the Kennedy Round in 1964, lasted for 3 years with a total of 48 participants. Named after U.S. President John Fitzgerald Kennedy, who proposed it, this round discussed about tariffs and anti-dumping. This was the first set of negotiations that included agriculture as a major negotiating matter and that carried out non-tariff negotiating measures (NTMs) talks. The tariff-related achievements of the Kennedy Round were the reduction of tariffs by 35%, worth $40 billions of world trade; there was also the decrease in tariffs for textile products, even though inferior, compared to the industrial ones. On top of that these negotiations accomplished a non-tariff achievement, that is the creation of the GATT Antidumping Code of 1967, which was used as a framework for negotiating dumping allegations.[19]

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[18] WTO, "World Trade Report – Six decades of multilateral trade cooperation: What have we learnt?". 2007. Pp. 181-182.
[19] WTO, "World Trade Report – Six decades of multilateral trade cooperation: What have we learnt?". 2007. Pp. 183-185.

Table 1. Tariff reductions of the Kennedy Round (Import weighted bound tariff averages of industrial products and change)

Trader	Pre-	Post-	Reduction	Imports(MFN)
	Kennedy Round rate		in %	Billion $(1964)
United States	9.2	5.9	-36	12
Japan	7.3	4.5	-39	5
EEC(6)	7.7	4.8	-37	16
United Kingdom	12.0	7.2	-40	7
TOTAL of above	**8.9**	**5.5**	**-38**	**41**

Source: WTO, "World Trade Report – Six decades of multilateral trade cooperation: What have we learnt?". 2007. P. 208.

The Tokyo Round (1973-1979), held by 99 countries, was the seventh round of GATT. The Tokyo Round was meant to be "the most comprehensive of all the seven rounds of negotiations held within the GATT since its founding in 1948": it dealt with bovine meat and dairy products for the first time. This round of the WTO addressed many economic subjects, for example tariffs, NTMs and "framework" agreements; it also dealt with tropical goods, especially cocoa, tea and coffee, The outcomes of the seventh round were tariffs reduction, with concessions reaching $19 billions worth of trade; average tariffs reduced by one-third to 6% for OECD manufactured imports; with the exceptions of safeguards, the creation of voluntary codes of conduct agreed for all non-tariff issues, in order to control the propagation of non-tariff barriers. Despite the overall great results, the negotiations did not meet the expectations of the developing countries: the results on NTMs were considered disappointing (it left untouched imports on a variety of goods, including agricultural, textiles and steel ones), moreover the effects resulting from the drop in tariffs were called moderate.[20]

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[20] WTO, "World Trade Report – Six decades of multilateral trade cooperation: What have we learnt?". 2007. Pp. 185-188.

Table 2. Tariff reductions of the Tokyo Round (Import weighted bound tariff averages of industrial products and change)

Trader	Pre-	Post-	Reduction	Imports(MFN)
	Tokyo Round rate		in %	Billion $(1977)
United States	6.3	4.3	-32	78
Japan	5.4	2.7	-50	32
EEC(9)	6.5	4.6	-29	62
TOTAL of above	**6.2**	**4.1**	**-34**	**172**

Source: WTO, "World Trade Report – Six decades of multilateral trade cooperation: What have we learnt?". 2007. P. 209.

Lastly, in 1986, the Uruguay Round took place as the final round of GATT. It launched in Punta del Este in 1986 and it concluded in Marrakesh in 1994 with a total of 117 participants, by the end of 1993. It is arguably the most ambitious and important round, since it established the WTO, retiring the GATT from its role of governing body for international trade. In addition to this, it sought to accomplish various goals, such as the reduction of agricultural subsidies and of restrictions on foreign investments, the establishment of opening trade in services like insurance and banking and of a code regarding intellectual property rights violations. Other topics discussed in the negotiations were tariffs, NTMs, textile, clothing, natural resource-based and tropical products, subsidies and countervailing measures, dispute settlements.   The meetings of this round resulted in large trade reductions in tariffs, with the average tariff reduced by one-third on average, the adoption of numerous important agreements, such as TRIMS (goods and investment), GATS (services) and TRIPS (intellectual property), plus the AoA (Agreement on Agriculture), which caused agricultural trade to be under the monitoring of the WTO. Despite the initial reluctance of developing countries, this round of negotiations brought great benefits to their economies, thanks to the Agreement of Textiles and Clothing. This arrangement boosted these sectors, considered valuable for these nations, and the increment in binding of tariffs went from 21% to 73% (measured by the number of bound product lines). Additionally, there is the creation of the dispute settlement body, the approval of Trade Policy Review Mechanism (TPRM) and finally the creation of the WTO, which came into force in the succeeding year, on January 1st, 1995.[21]

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[21] WTO, "World Trade Report – Six decades of multilateral trade cooperation: What have we learnt?". 2007. Pp. 190-197.

Table 3. Tariff reductions of the Uruguay (Import weighted bound tariff averages of industrial products and change)

Trader	Pre-	Post-	Reduction	Imports(MFN)
	Uruguay Round rate		in %	Billion $(1988)
United States	5.4	3.5	-35	297
Japan	3.9	1.7	-56	133
EU(12)	5.7	3.6	-37	197
TOTAL of above	**5.2**	**3.1**	**-39**	**627**

Source: WTO, "World Trade Report – Six decades of multilateral trade cooperation: What have we learnt?". 2007. P. 209.

The first four rounds used the "item-by-item" approach for tariffs negotiations: each country identified the products for which it was seeking to grant offer reductions, and then negotiations proceeded bilaterally between the importers and the main supplier of each product. Introduced with the Dillon Round, the "formula" approach became the main method for tariff negotiations during the Kennedy Round, as it was more inclusive and efficient; it consisted in a linear tariff reduction of a uniform percentage of large categories of products.[22]

After the retirement of the GATT, the WTO carried out only one single round: the Doha Round; an in-depth writing on this topic is in the fourth paragraph of the first chapter.

Overall, the eight GATT rounds carried off notable accomplishments: they significantly reduced tariffs and barriers from the high levels of the second post-war period to the relatively low levels of today, they assisted to the increase of trade liberalization, economic growth and international trade flows (this is questioned by Andrew Rose, which is discussed in the third chapter), and finally, thanks to their work, developing countries became more integrated in the global trading system, as opposed to the twentieth century.

On average, tariff levels for the biggest trading nations in 1947 were around 22%, and by 1999, after the Uruguay Round, they got reduced to 5%, thanks to the cooperation and collaboration obtained as a result of the rounds organized by the member states of the GATT/WTO.[23]

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[22] WTO, "World Trade Report – Six decades of multilateral trade cooperation: What have we learnt?". 2007. Pp. 179-198; Bown P. Chad, Crowley A. Meredith, The World Bank and CEPR, University of Cambridge, "The Empirical Landscape of Trade Policy". 2016, pp. 40-51.

[23] Bown P. Chad, Irwin A. Douglas, "The GATT's Starting Point: Tariff Levels circa 1947". December 2015, pp.1-3 and 28.

Table 4. GATT/WTO – 60 years of tariff reductions (MFN tariff reduction of industrial countries for industrial products (excl. petroleum))

Implementation Period	Round covered	Weighted tariff reduction	Weights based on MFN imports (year)
1948	Geneva (1947)	-26	1939
1950	Annecy (1949)	-3	1947
1952	Torquay (1950-51)	-4	1949
1956-58	Geneva (1955-56)	-3	1954
1962-64	Dillon Round (1961-62)	-4	1960
1968-72	Kennedy Round (1964-67)	-38	1964
1980-87	Tokyo Round (1973-79)	-33	1977(or 1976)
1995-99	Uruguay Round (1986-94)	-38	1988(or 1989)

Note: Tariff reductions for the first five rounds refer to the United States only. The calculation of average rates of reductions are weighted by MFN import values.

Source: WTO, "World Trade Report – Six decades of multilateral trade cooperation: What have we learnt?". 2007. P. 207.

1.4 The Doha Round

The Doha Round, also semi-officially known as the Doha Development Agenda, is the one and only Round promoted by the WTO. It was formally launched on 14 November 2001 by the Doha Ministerial Declaration; it was set in motion after the failed WTO Ministerial Conference, also known as the Seattle Ministerial, of 1999.

The main purpose of this Round was to increase international trade by lowering trade barriers worldwide and by revamping the trade rules. Being a "development round", another important purpose of this unlucky round was to assist poorer countries, with a particular focus on agriculture, in order to improve on their trade flows.

All WTO member governments participated in the Doha Development Agenda, where decisions were taken by the rule of unanimity. The negotiations were organized by the Trade Negotiations Committee (TNC) and other subsidiary negotiating groups. TNC was established by the Doha Declaration and it conducts its operations under the authority of the General Council of the WTO.[24]

A wide range of subjects was discussed in the various negotiations, such as agriculture, non-agricultural market access (NAMA), services, trade facilitation, rules, environment, intellectual property issues and dispute settlement. The rounds addressing agriculture issues, which began in 2000, aimed at improving the market access and lowering distortions, high tariffs and export

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[24] WTO, "the Doha Round". wto.org, 2015

subsidies, with a particular concern on the environment and on food security.[25] Negotiations focused on NAMA, instead, had as objective the reduction of tariffs, particularly in development countries.[26] The negotiations on the environment had two main components: environmental products with freer trade and environmental agreements; the discussions focused on the reduction and elimination of trade barriers to achieve higher market opening in environmental goods and services. The Negotiating Group on Rules dealt with subsidies and countervailing measures, anti-dumping and Regional Trade Agreements (RTAs). Other rounds addressed the issues of services' market access, the improvement of the Dispute Settlement Understanding and geographical indications, which is the only intellectual property subject to be confirmed to be a part of the Doha Round.[27]

Despite its vast ambition, the Doha Round faced many problems and encountered numerous obstacles, which hampered its development. First of all, disagreements between countries, in particular between developed and developing countries, slowed down the progression; on top of that, new countries kept joining the WTO, complexifying even more the discussion and creating even more deadlocks.[28]

Agriculture is considered one of the major causes of the failure of the Doha Round: agriculture is crucial for developing countries, as the majority of the population lives in rural areas. Developing countries displayed the numerous issues regarding the agriculture negotiations, in particular they highlighted their limited capacity to increase market access and the disparities of agricultural subsidies in developed countries; conversations about this topic created tedious and long stalemates since no agreements were reached.[29] As a way of stemming the problem, the extraordinary decision to eliminate agricultural export subsidies by developed countries was made by WTO members at the 2015 Nairobi Ministerial Conference with the adoption of the "Nairobi Package".[30]

Other minor, though not less important issues arisen with this round are the special and differential treatment, the access to patented medicines and the implementation issues.

S&D (Special and Differential) treatment was a special provision with a view to help developing countries; however, the division between the two groups of countries grew even

[25] WTO, "Briefing Notes – Agriculture". wto.org

[26] WTO, "Briefing Notes – Non-Agricultural Market Access (NAMA)". wto.org

[27] WTO, "Doha Round: What Are They Negotiating?". wto.org

[28] Pakpahan B., "Deadlock in the WTO: What Is Next?". wto.org; Baldwin R., "resolving the Conflict Leading to the Collapse of the Doha Round". CEPR, 2008; International Trade and Integration Division, ECLAC, "Concluding the Doha Round in 2010 is Imperative". cepal.org

[29] Hanrahan E. Charles, "Agriculture in the WTO Doha Round: The Framework Agreement and next steps". 2005; WTO, "Agriculture – Negotiations". wto.org

[30] WTO, "Ministerial Conference – Tenth WTO Ministerial Conference – Nairobi". wto.org

further.[31] Access to patented medicine is yet another problem: the participants of the Doha Round had to find an equilibrium between the demands for better healthcare in developing countries and the economic interests of the pharmaceutical industry of the developed countries.[32] Last but not least there is the issue of implementation, with developing countries struggling to apply the agreements reached due to a lack of technical assistance by their part.[33] Many attempts to restore this infamous round were made in 2008, 2010, 2011 and 2013; the members asked either to continue the negotiations or to conclude them once and for all.

After all these problems and many failed attempts to restore it, in 2015 the US government finally asked for the shutdown of the Doha Round, and by 2018 the Doha Round "finally died a merciful death", quoting a Financial Times article.[34]

Despite his issues, this round still carries some good things with its legacy, the most important being the Bali Package. With this trade agreement adopted on December 7th, 2013, global trade barriers have been lowered, as a means to assist developing country in facilitating trade.[35]

Other positive aspects that came out are the strengthen of WTO rules, the emphasis on capacity building and technical assistance and aid to the least developed countries.

There are debates about the overall benefits brought by the Doha Round: an example is the study conducted by the University of Michigan, which found out that global income could increase by $574 billions if all tariffs in agriculture, services and manufactures got reduced by 33% as a result of the round.[36] A study conducted by Kym Anderson, famous Australian economist, predicted that global welfare could increase by $300 billions per year,[37] while other studies called for more moderate outcomes.

The WTO must learn a very important lesson from the failure of the Doha Round: in future it will have to concentrate on smaller deals, to avoid entangling itself in an unsolvable situation; despite the Doha Round, the WTO still remains as of today the best institution for dealing with trade regulation.

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[31] Doha Round Briefing Series, "Special and Differential Treatment". November 2005; WTO, "Doha 4th Ministerial – Ministerial Declaration". wto.org

[32] Cullet P., "The Doha Declaration of the WTO and Access to Medicines".ielrc.org

[33] Verbiest J., Liang J., Sumulong L., "The Doha Round: Development Perspective". July 2022, pp. 1-2.

[34] Financial Times, "The Doha round finally dies a merciful death". Financial Times, Financial Times, 21 Dec. 2015.

[35] WTO, "Days 3, 4 and 5: Round-the-clock consultations produce "Bali Package". wto.org; Devarakonda R. K., "Asymmetries mark WTO's Bali Accord". December 2013.

[36] Brown K. Drusilla, Deardorff V. Alan, Stern M. Robert, "Computational Analysis of Multilateral Trade Liberalization in the Uruguay Round and Doha Development Round". University of Michigan, 2002, pp. 10-14.

[37] Anderson K., Martin W., "Agricultural Trade Reform and the Doha Development Agenda". The World Economy, vol. 28, no. 9, 2005, pp. 7-8.

CHAPTER 2: THE GRAVITATIONAL MODEL OF TRADE

2.1 History and Inspiration

In the year 1687, Sir Isaac Newton submitted the law of universal gravitation. Its equation, $F=G*(m1*m2)/r^2$, relates the gravitational constant G, the masses of the objects m1 and m2, and the distance between them r, to determine the gravitational force F.[38] This formula is the main prompt used to formulate the gravitational model of trade. Throughout the years there have been many researchers who have contributed to the formulation of this model.

Johann Heinrich von Thunen's works are the blueprints used to highlight the significance of the role of location in economic theories. The idea that geography plays a central part in these was taken up by other economists during the first half of the twentieth century, but it was not until 1954 that the concept of the model itself was suggested.[39]

Walter Isard, principal founder of the discipline of regional science, hinted at a relation between the geographical location and the potential trade amid nations in his article "Location Theory and Trade Theory: Short-Run Analysis"; he explicitly wanted to base this upcoming model on physical sciences.[40]

In 1962 Jan Tinbergen, Dutch economist and future Nobel prize winner, finally formalized the gravity equation in his article "Shaping the World Economy: Suggestions for an International Economic Policy".[41] In all fairness, Tinbergen is not actually the first economist to apply gravity to economics: Ernst Georg Ravenstein is. Ravenstein utilized the gravity equation in migration flows in the book "The Laws of Migration" of 1885, where he highlighted the fact that migration patterns are higher towards richer countries, but they decay when the distance from these nations increases.[42]

Back to the main topic, Tinbergen's equation, $T_{ij}=A*Y_i^a*Y_j^b/D^c_{ij}$, was used to explain international bilateral trade; furthermore, in his model there were analogies to Newton's formula: an equation where trade flows are directly proportional to the size (GDP) of a country and inversely proportional to the distance between them is quite similar to what Newton discovered two centuries earlier. After Tinbergen's equation there has been some

[38] Newton I. et al., "The Principia: The Mathematical Principles of Natural Philosophy". July 1687.
[39] Von Thunen J. H., "The Isolated State". 1826.
[40] Isard W., "Location Theory and Trade Theory: Short-Run Analysis". The Quarterly Journal of Economics, Vol. 68, No. 2, 1954.
[41] Tinbergen J., "Shaping the World Economy: Suggestions for an International Economic Policy". New York: The Twentieth Century Fund, 1962.
[42] Ravenstein E. G., "The Laws of Migration". 1885.

augmentations and refinements to the original gravity model, so that it could evolve and improve its applicability.

The first to apply these extensions was James Anderson in 1979. He proposed the "Armington assumption", which is the product differentiation by country-of-origin assumption and Constant Elasticity of Substitution (CES) expenditures. Anderson offered this theoretical economic foundation for the gravity equation, based on the demand side, incorporating new variables, like country-specific attributes and trade barriers. The econometric models developed by Anderson explained the presence of income variables in the gravity model and ultimately, as a result of his work, economic theory and empirical tests were finally linked.[43]

Jeffrey Bergstrand, professor and expert in finance, resumed this concept in 1985, but he focused on the supply side of economics, as opposed to Anderson. Bergstrand contributed to the gravity model by incorporating monopolistic competition frameworks and firm-level data, even though he kept using the existing price indexes.[44]

Another economist who contributed to the development of the gravity model is Eric Van Wincoop. In 2003, in cooperation with Anderson, he expanded on the gravitational model by adding the relative trade costs, in particular the transportation costs, which were exempt from the original equation. Van Wincoop overcame the problem of price indexes by granting a way to estimate gravity coefficients in a cross-section using country-specific effects.[45]

Afterwards, in 2008, Elhanan Helpman and other scholars promoted a model based on heterogeneous firms, correcting the problems of firm heterogeneity and zero-trade flows.[46]

In recent years there has been many other attempts to improve on the gravity model, in order to build a better framework that accounts different factors influencing international trade.

Costas Arkolakis in 2010 inserted the endogenous marketing costs inside the model, which demonstrated that the increasingly difficulty of getting to new customers was the cause of why the trade costs grew in the long run.[47]

Michael E. Waugh instead proposed the presence of trade costs differences between rich and poor countries back in 2010, which would explain the differences in total factor productivity and quality of life across nations.[48]

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[43] Anderson E. James, "A Theoretical Foundation for the Gravity Equation". American Economic Review, 1979.
[44] Bergstrand H. Jeffrey, "The Gravity Equation in International Trade: Some Microeconomic Foundations and Empirical Evidence". Review of Economics and Statistics, 1985.
[45] Anderson E. James, van Wincoop E., "Gravity with Gravitas: A Solution to the Border Puzzle". American Economic Review, 2003.
[46] Helpman E., et al., "Wages, Unemployment and Inequality with Heterogeneous Firms and Workers". 2008.
[47] Arkolakis C., "Market Penetration Costs and the New Consumers Margin in International Trade". Journal of Political Economy, 2010.
[48] Waugh M. E., "International Trade and Income Differences". American Economic Review, Vol. 100, No. 5, 2010.

Then there is Ana Cecilia Fieler who, in 2011, built a gravity model with non-homothetic preferences, to stem the fact that trade is responsive to income per capita and not to population.[49] Yoto V. Yotov is one of the greatest exponents of the gravity model of trade. His support towards the evolution of this model is astounding: to name a few examples, in 2010, along with Anderson, he expanded it to reduce the incidence of trade costs on producers and customers; then, in 2012, he and Olivero derived a dynamic gravity model; in 2020 he even proposed a gravity model with bilateral dynamics.[50]

As of 2022, the gravitational model of trade is sixty years old and it is still accepted by the majority of the economists as an accurate and reliable instrument of international trade, and it is even considered a "celebrity" by experts like Yotov, as it even made the front page news of the Financial Times (April 19, 2016).[51]

2.2 Formula and Omitted Factors

Mathematically, the basic equation, which is also the best known and most applied formula of the gravity model, is $T_{ij}=A*Y_i^a*Y_j^b/D_{ij}^c$. In this formula:

-T_{ij} represents the value of bilateral trade flows between country I and country j

-A is a constant

-Y_i and Y_j are respectively country i's GDP and country j's GDP (in some instances Y also refer to population)

- D_{ij} is the distance between the two countries (usually measured from capital city to capital city)

-a, b and c are exponents that can also be not equal to 1

In this basic form the gravity model explains that the volume of trade between two countries is positively related to their economic size and negatively related to their distance. Despite working pretty well from an empirical point of view, this simple version is often considered incomplete, lacking several important factors; these omitted points are elements are other elements that influence trade, just like distance and GDP do.

The most important one is culture: cultural affinity facilitates the trade of two countries, overcoming the problems of different languages, different religions, different politics and so

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[49] Fieler C. A., "Nonhomotheticity and Bilateral Trade: Evidence and a Quantitative Explanation". Vol. 79, No. 4, 2011.

[50] Yoto V. Yotov et al., "An Advanced Guide to Trade Policy Analysis: The Structural Gravity Model". 2016, pg. 11-17.

[51] Yoto V. Yotov, "Gravity at Sixty: The Bijou of Trade". Drexel University, 2022, pg. 1-14.

on. If two countries share cultural ties, it is more likely that they will share economic ties too, as a lot of transactional costs get cut. This factor could also be explained by a shared history between the countries, interconnecting them.

Another important factor is geography, even if its influence has become progressively less important in the last years due to the ever-increasing globalization, thanks to modern transportation networks, infrastructure and communication. Geographical factors influence trade, as nations with more harbors and airports do present bigger volumes of trade, compared to nations that are less equipped. Furthermore, countries that are comprised of deserts, mountain ranges or, in general, inconvenient geography, tend to have less transports, and so less trade.

The presence of borders also tends to have an impact on trade, as these frontiers increase the costs and time of trade, due to bureaucratic reasons. It is true though that commercial agreements increase trade as they decrease these legal issues. An example is the North American Free Trade Agreement (NAFTA), which is an agreement signed by the Unites States, Canada and Mexico in 1994, and lasted until 2020. It created a free trade zone between the three countries, eliminating all tariff barriers.[52] It is also true that trade is usually larger when two countries share a border.

Then there is the per capita income: countries with a higher income p.c. produce and sell more goods compared to the nations with lower incomes p.c., and so they generate more income and import more products.

It is also worth mentioning that multinational companies influence trade, as they trade a great diversity of goods in many countries, between their affiliated companies.[53]

2.3 OLS and PPML

Ordinary Least Squares (OLS) is a method used in statistics for estimating the unknown parameters in a linear regression model. Historically, OLS has been used as the standard gravity estimator. The first OLS estimation used was:

$\ln X_{ij,t} = \beta 0 + \beta \ln DIST_{ij} + \beta 2 CNTG_{ij} + \beta 3 LANG_{ij} + \beta 4 CLNY_{ij} + \beta 5 \ln Y_{i,t} + \beta 6 \ln E_{j,t} + \varepsilon_{ij,t}$, where:

- $\ln X_{ij,t}$ is the logarithm of nominal bilateral international trade flows

- $\beta 0$ is a constant

- $\ln DIST_{ij}$ is the logarithm of bilateral distance between the two countries

[52] International Trade Administration, "North American Free Trade Agreement (NAFTA)". July 2020.
[53] Capoani L., "Review of the Gravity Model: Origins and Critical Analysis of its Theoretical Development". 2023; Campbell L. Douglas, "History, culture and trade:a dynamic gravity approach". 2010; Head K., "Gravity for Beginners". 2000.

- $CNTG_{ij}$ is an indicator variable (it captures the presence of contiguous borders)

- $LANG_{ij}$ is a dummy variable for the presence of a common language between countries i and j

- $CLNY_{ij}$ is an indicator for the presence of colonial ties between the two countries

- $lnY_{i,t}$ is the logarithm of the value of exporter output

- $lnE_{j,t}$ is the logarithm of the value of importer expenditure

This estimation had the problem of not counting for the multilateral resistance terms, as suggested by Anderson and van Wincoop in their 2003 article[54], which led to the estimates of exporter output and importer expenditure to be statistically different.

To stem these problems, econometricians utilized another OLS estimation which accounted for the multilateral resistances:

$lnX_{ij,t} = \beta0 + \beta lnDIST_{ij} + \beta2CNTG_{ij} + \beta3LANG_{ij} + \beta4CLNY_{ij} + \beta5lnY_{i,t} + \beta6lnE_{j,t} + \beta7lnREM\_EXP_{i,t} + \beta8lnREM\_IMP_{j,t} + \varepsilon_{ij,t}$, where:

- $lnREM\_EXP_{i,t}$ is the logarithm of exporter output weighted averages of bilateral distance

- $lnREM\_IMP_{j,t}$ is the logarithm of importer expenditure weighted averages of bilateral distance

Nonetheless, this analysis still presented issues: this estimation only partially controlled for multilateral resistances, leading to results similar to those of the first examination.

Again, experts tried to correct the OLS estimation, modifying the original OLS equation to account for the multilateral resistances with a suitable set of importer-time and exporter-time fixed effects:

$lnX_{ij,t} = \pi_{i,t} + \chi_{j,t} + \beta lnDIST_{ij} + \beta2CNTG_{ij} + \beta3LANG_{ij} + \beta4CLNY_{ij} + \varepsilon_{ij,t}$, where:

- $\pi_{i,t}$ indicates the vector of exporter-time fixed effects. It absorbs the exporter value of output, plus other observable and unobservable exporter-specific characteristics.

- $\chi_{j,t}$ indicates the vector of importer-time fixed effects. It absorbs the importer value of expenditure, plus other observable and unobservable importer-specific characteristics.

However, even this method had two main problems. The first one is that, when there are observations in which there are zero values of the dependent variable ($X_{ij,t}$), the method cannot be used. The second one is the usage of OLS: it can lead to biases as it is not consistent.

The solution for this is the usage of a new method: the Poisson Pseudo Maximum Likelihood (PPML). It was introduced by Santos Silva and Tenreyro in the article "The Log of Gravity" and since then, it has been the main gravity estimator.[55] This estimator is based on the Poisson

[54] Anderson E. James, van Wincoop E., "Gravity with Gravitas: A Solution to the Border Puzzle". American Economic Review, 2003.
[55] Santos Silva J. M. C., Tenreyro S., "The Log of Gravity". 2006.

model (hence the name), which is often used for data counting. They proposed the estimation of the gravity model to be in its multiplicative form using PPML, which is

$$X_{ij,t} = \exp[\ \pi_{i,t} + \chi_{j,t} + \beta \ln DIST_{ij} + \beta2 CNTG_{ij} + \beta3 LANG_{ij} + \beta4 CLNY_{ij}\ ] \times \varepsilon_{ij,t}$$

PPML has the ability to deal for the heteroskedasticity and zero flows problems; thanks to those abilities, the main problems of OLS estimation, being the presence of biases and the zero trade flows problem, are eliminated. As a result, PPML estimates may be different from OLS estimates. The most notable differences, compared to OLS, are that PPML estimate of the effect of distance is significantly smaller, the estimate of common language remains significant but becomes smaller and the estimate of contiguous border becomes statistically significant. The transition from OLS to PPML is a step forward in the gravity model of trade, as PPML a valuable resource for econometricians.[56]

Beyond OLS and PPML, there are also other methods for gravity estimation, though less important. One of these is Gamma Pseudo-maximum Likelihood (GPML): this method was described in "The Log of Gravity". The model is estimated using the gamma distribution and a log-link. Another method is the "tetrads" method, proposed in "The erosion of colonial trade linkages after independence". This method is used to cancel importer and exporter fixed effects by taking the ratio of ratios, in order to allow studies only on bilateral trade costs.[57]

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[56] Yoto V. Yotov et al., "An Advanced Guide to Trade Policy Analysis: The Structural Gravity Model". 2016, pg.41-45.
[57] Head K., Mayer T., Ries J., "The erosion of colonial trade linkages after independence". Journal of International Economics, 2010.

CHAPTER 3: ANDREW ROSE: HIS CRITICISM AND HIS CRITICS

3.1 Andrew Rose: His Initial Criticism

"Do we really know that the WTO increases trade?" is the question pondered by Andrew Rose in 2004 and that sparked a long debate among scholars. In this highly discussed paper, Andrew Rose questioned himself if not only the WTO, but also the GATT and the Generalized System of Preferences (GSPs) were actually effective in their role. "Do we really know that the WTO increases trade?" was the first econometric study that used a gravity model on the effects of the multilateral trade system on global trade. In this paper Rose used a standard gravity model of bilateral merchandise trade, augmented with variables that affect trade, such as culture, geography and history. The equation is the following:

$Ln(X_{ijt}) = \beta 0 + \beta llnD_{ij} + \beta 2ln(Y_iY_j)_t + \beta 3ln(Y_iY_j/Pop_iPop_j)_t + \beta 4Lang_{ij} + \beta 5Cont_{ij} + \beta 6Landl_{ij} + \beta 7Island_{ij} + \beta 8ln(Area_iArea_j) + \beta 9ComCol_{ij} + \beta 10CurCol_{ijt} + \beta 11Colony_{ij} + \beta 12ComNat_{ij} + \beta 13CU_{ijt} + \beta 14FTA_{ijt} + \Sigma_t\phi_tT_t + \gamma 1Bothin_{ijt} + \gamma 2Onein_{ijt} + \gamma 3GSP_{ijt} + \varepsilon_{ijt}$, where:

-i and j denotes trading partners, t denotes time

- X_{ijt} represents the average value of real bilateral trade between i and j at the time t

-Y is real GDP

-Pop is population

-Lang is a binary dummy variable, it is 1 if I and j share a common language and it is 0 otherwise

-Cont is a binary variable, it is 1 if i and j share a land border and it is 0 otherwise

-Landl is the number of landlocked countries in the country pair

-Island is the number of island nations in the pair

-Area is the area of the country, measured in square kilometers

-ComCol is a binary variable, it is 1 if i and j were ever colonies after 1945 with the same colonizer, it is 0 otherwise

-CurCol is a binary variable, it is 1 if i is a colony of j at time t or vice versa

-Colony is a binary variable, it is 1 if i ever colonized j or vice versa

-ComNat is a binary variable, it is 1 if i and j remained part of the same nation during the sample

-CU is a binary variable, it is 1 if i and j share the same currency at time t

-FTA is a binary variable, it is 1 if i and j both belong to the same RTA

-T_t is the comprehensive set of time fixed effects

- β and φ are vectors of nuisance coefficients

-Bothin$_{ijt}$ is a binary variable, it is 1 if both i and j are GATT/WTO members at t

-GSP$_{ijt}$ is a binary variable, it is 1 if i was a GSP beneficiary of j or vice versa at t

-ε_{ij} is the error term

Specifically, $\gamma 1$ is the coefficient that measures the effect on international trade if both countries are GATT/WTO members, $\gamma 2$ measures the trade effect if only one country is a GATT/WTO member and $\gamma 3$ measures the effect of the GSP on trade. Rose estimated the gravity model using OLS.

Rose used the "Direction of Trade" (DoT) CD-ROM data set, which was developed by the IMF, covering over 50 years and 175 countries, for the bilateral merchandise trade. He also used other sources, for example the CIA's World Factbook, for the other variables.

After an extensive search, Rose found little evidence of the effectiveness of GATT/WTO membership on one country's trade patterns, since member countries had similar trade patterns to non-member countries. The biggest coefficient showed that a pair of GATT member countries traded just 16% more than a pair of non-member countries, which is not a lot, considering the importance that the organization should have on commerce; other results displayed even lower results. On the contrary, he observed that the GSPs are actually successful: they have a strong effect and are positively associated with an approximate doubling of trade.[58]

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[58] Rose A., "Do we really know that the WTO increases trade?". The American Economic Review, vol. 94(1), 2004, pp.98-114.

Table 5. Benchmark Results

	Default	No industrial countries	Post 1970	With country effects
Both in GATT/WTO	−0.04	−0.21	−0.08	0.15
	(0.05)	(0.07)	(0.07)	(0.05)
One in GATT/WTO	−0.06	−0.20	−0.09	0.05
	(0.05)	(0.06)	(0.07)	(0.04)
GSP	0.86	0.04	0.84	0.70
	(0.03)	(0.10)	(0.03)	(0.03)
Log distance	−1.12	−1.23	−1.22	−1.31
	(0.02)	(0.03)	(0.02)	(0.02)
Log product real GDP	0.92	0.96	0.95	0.16
	(0.01)	(0.02)	(0.01)	(0.05)
Log product real GDP p/c	0.32	0.20	0.32	0.54
	(0.01)	(0.02)	(0.02)	(0.05)
Regional FTA	1.20	1.50	1.10	0.94
	(0.11)	(0.15)	(0.12)	(0.13)
Currency union	1.12	1.00	1.23	1.19
	(0.12)	(0.15)	(0.15)	(0.12)
Common language	0.31	0.10	0.35	0.27
	(0.04)	(0.06)	(0.04)	(0.04)
Land border	0.53	0.72	0.69	0.28
	(0.11)	(0.12)	(0.12)	(0.11)
Number landlocked	−0.27	−0.28	−0.31	−1.54
	(0.03)	(0.05)	(0.03)	(0.32)
Number islands	0.04	−0.14	0.03	−0.87
	(0.04)	(0.06)	(0.04)	(0.19)
Log product land area	−0.10	−0.17	−0.10	0.38
	(0.01)	(0.01)	(0.01)	(0.03)
Common colonizer	0.58	0.73	0.52	0.60
	(0.07)	(0.07)	(0.07)	(0.06)
Currently colonized	1.08	—	1.12	0.72
	(0.23)		(0.41)	(0.26)
Ever colony	1.16	−0.42	1.28	1.27
	(0.12)	(0.57)	(0.12)	(0.11)
Common country	−0.02	—	−0.32	0.31
	(1.08)		(1.04)	(0.58)
Observations	234,597	114,615	183,328	234,597
R^2	0.65	0.47	0.65	0.70
RMSE	1.98	2.36	2.10	1.82

Source: Rose A., "Do we really know that the WTO increases trade?". The American Economic Review, vol. 94(1), 2004, p. 104.

3.2 Further Rose's papers

After his initial paper, Rose wrote two additional articles about the WTO and international institutions in general. The first one is "Do WTO members have more liberal trade policy?",

published in 2004. This paper used 68 measures of trade policy and liberalization to find out whether or not GATT/WTO membership was associated with more liberal trade policy; this study focused on a sample of 168 countries, covered in the Penn World Table mark 6, from 1950 to 1998. Rose compared measures of trade policy, firstly between GATT/WTO members and non-members, and then for countries before and after becoming members. He classified the indicators of trade policy in seven groups: openness, trade flows adjusted for country-characteristics, tariffs, non-tariff barriers, informal/qualitative measures, composite indices, measures based on price outcomes.

He found almost no measures of trade policy correlated with GATT/WTO membership: he thus concluded that there is little to no evidence that these two organizations had actually liberalized trade policy. There is one exception though: WTO members tend to have slightly more freedom using the Heritage Foundation's index.[59]

The other Rose's paper is "Which international institutions promote international trade?", 2005. In this study Rose analyzed the GATT, alongside with the WTO, the IMF and the Organisation for Economic Co-Operation and Development (OECD), as all of them had trade liberalization as part of their mandate.

The results arising from this study were rather surprising: OECD membership is consistently associated with a strong positive effect on trade, while comparable evidence is weaker for the GATT/WTO and especially the IMF.[60]

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[59] Rose A., "Do WTO members have more liberal trade policy?". Journal of International Economics, vol. 63(2), 2004, pp. 209-235.
[60] Rose A., "Which international institutions promote international trade?". Review of International Economics, vol. 13(4), 2005, pp. 682-698.

Table 6. Benchmark Results

	Default OLS	Fixed country-pair effects	Random country-pair effects
Both in GATT/WTO	−0.12	0.27	0.23
	(0.05)	(0.02)	(0.02)
One in GATT/WTO	−0.11	0.16	0.11
	(0.05)	(0.02)	(0.02)
Both in IMF	−0.54	−0.54	−0.47
	(0.10)	(0.04)	(0.04)
One in IMF	−0.30	−0.30	−0.25
	(0.09)	(0.04)	(0.04)
Both in OECD	0.44	0.91	1.20
	(0.08)	(0.04)	(0.03)
One in OECD	0.40	0.29	0.48
	(0.04)	(0.02)	(0.02)
Regional FTA	1.17	0.78	0.91
	(0.11)	(0.04)	(0.04)
GSP	0.66	0.18	0.28
	(0.03)	(0.01)	(0.01)
Log distance	−1.10		−1.28
	(0.02)		(0.03)
Log product real GDP	0.91	0.45	0.86
	(0.01)	(0.02)	(0.01)
Log product real GDP p/c	0.27	0.21	−0.03
	(0.02)	(0.02)	(0.01)
Currency union	1.08	0.58	0.54
	(0.12)	(0.05)	(0.05)
Common language	0.36		0.27
	(0.04)		(0.05)
Land border	0.58		0.73
	(0.11)		(0.13)
Number landlocked	−0.34		−0.57
	(0.03)		(0.03)
Number islands	0.05		0.14
	(0.04)		(0.04)
Log product land area	−0.10		−0.07
	(0.01)		(0.01)
Common colonizer	0.66		0.32
	(0.07)		(0.06)
Currently colonized	0.88	0.08	0.05
	(0.23)	(0.09)	(0.09)
Ever colony	1.07		1.90
	(0.12)		(0.17)
Common country	0.16		1.48
	(1.04)		(1.33)
GATT/WTO = 0	0.07	0.00	0.00
IMF = 0	0.00	0.00	0.00
OECD = 0	0.00	0.00	0.00
R^2	0.65	0.53	0.62

Source: Rose A., "Which international institutions promote international trade?". Review of International Economics, vol. 13(4), 2005, p. 687.

3.3 Tomz, Goldstein and Rivers' Criticism

In 2007, Michael Tomz, Judith L. Goldstein and Douglas Rivers published a paper called "Do We Really Know That the WTO Increases Trade? Comment.", which directly discusses the paper written by Rose 3 years earlier. In this article these scholars criticized Rose's work, as he made a few mistakes in his 2004 paper: the most important one is called the "identification mistake". Rose did not account that some countries "de jure" were not GATT/WTO participants, but "de facto" they were, and, because of that, they were grouped with countries that were outside the organizations. This set of participants had rights and obligations with the GATT/WTO but did not formally appear on the membership roster, and treating them as outsiders is what led to a bias in Rose's research. Contrarily Tomz et al. included the "nonmember participants", which can be divided in three categories: colonies, newly independent states and provisional members. Tomz and the other scholars included the colonies because the contracting parties applied the agreement to them (for example the Netherlands implemented it to its possessions). De facto participants were included because they were required to observe the arrangements of the GATT and to give MFN; they also participated in multilateral trade negotiations. Finally, the provisional members were included because they earned GATT rights and obligations when they acceded, even though these commitments only applied to the contracting parties that accepted them, and not to all of the contracting parties. Tomz, Goldstein and Rivers used the same data and methods as Rose plus the correct set of participants, shifting the focus to from formal membership to participation. The estimates found were nearly always positive, statistically significant and economically substantial: the GATT/WTO increased trade of both member and nonmember participants.

Table 7. Effect of GATT on Bilateral Trade

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Both participate in GATT							
Both formal members	−0.04 (0.05)	−0.17 (0.03)	0.17 (0.07)	0.54 (0.06)	0.48 (0.06)		
Formal member and nonmember participant			0.80 (0.14)	0.86 (0.12)	0.88 (0.09)		
Both nonmember participants			0.41 (0.07)	0.64 (0.06)	0.56 (0.06)	0.54 (0.06)	0.54 (0.06)
Only one participates in GATT							
Formal member	−0.06 (0.05)	−0.27 (0.04)	0.06 (0.07)	0.24 (0.06)	0.23 (0.06)	0.27 (0.05)	0.27 (0.05)
Nonmember participant			0.33 (0.09)	0.40 (0.08)	0.34 (0.07)		
Both invoke Article XXXV							−1.88 (0.62)
Only one invokes Article XXXV							−0.25 (0.14)
GSP	0.86 (0.03)	0.86 (0.03)	0.85 (0.03)	0.70 (0.03)	0.18 (0.03)	0.19 (0.03)	0.19 (0.03)
Log product real GDP	0.92 (0.01)	0.92 (0.01)	0.93 (0.01)	0.18 (0.05)	0.47 (0.05)	0.45 (0.05)	0.45 (0.05)
Log product real GDP per capita	0.32 (0.01)	0.32 (0.01)	0.31 (0.01)	0.52 (0.05)	0.21 (0.04)	0.22 (0.04)	0.22 (0.04)
Regional FTA	1.20 (0.11)	1.20 (0.11)	1.19 (0.11)	0.94 (0.13)	0.76 (0.07)	0.77 (0.07)	0.77 (0.07)
Currency union	1.12 (0.12)	1.15 (0.12)	1.11 (0.12)	1.17 (0.12)	0.61 (0.11)	0.61 (0.11)	0.61 (0.11)
Currently colonized	1.08 (0.23)	0.98 (0.23)	0.94 (0.23)	0.73 (0.26)	0.28 (0.16)	0.31 (0.15)	0.31 (0.15)
Log distance	−1.12 (0.02)	−1.12 (0.02)	−1.13 (0.02)	−1.31 (0.02)			
Common language	0.31 (0.04)	0.30 (0.04)	0.31 (0.04)	0.27 (0.04)			
Land border	0.53 (0.11)	0.51 (0.11)	0.52 (0.11)	0.28 (0.11)			
Number landlocked	−0.27 (0.03)	−0.27 (0.03)	−0.27 (0.03)	−1.53 (0.32)			
Number of islands	0.04 (0.04)	0.03 (0.04)	0.02 (0.04)	−1.03 (0.19)			
Log product land area	−0.10 (0.01)	−0.10 (0.01)	−0.09 (0.01)	0.37 (0.03)			
Common colonizer	0.58 (0.07)	0.56 (0.07)	0.52 (0.07)	0.60 (0.06)			
Ever in a colonial relationship	1.16 (0.12)	1.16 (0.12)	1.15 (0.12)	1.28 (0.11)			
Common country	−0.02 (1.08)	−0.03 (1.07)	−0.02 (1.07)	0.32 (0.58)			
Fixed effects	years	years	years	countries & years	dyads & years	dyads & years	dyads & years
Standard error of the regression	1.980	1.978	1.976	1.817	1.313	1.313	1.313
R^2	0.648	0.649	0.649	0.704	0.853	0.853	0.853

Source: Tomz M., Goldstein J. L., Rivers D., "Do We Really Know That the WTO Increases Trade? Comment.". The American Economic Review, vol. 97(5), 2007, p. 2012.

In addition to that, they also performed a series of sensitivity analyses and cross-sectional analyses, observing that the outcomes of GATT/WTO are nearly always positive (the exception

here is the effect of the last GATT round) across time and space, disproving once again Rose's work.[61]

3.4 Subramanian and Wei's Criticism

In the paper "The WTO promotes trade, strongly but unevenly", issued in 2007, Arvind Subramanian and Shang-Jin Wei wanted to correct Rose's mistakes by considering four asymmetries in the GATT/WTO system.

The first asymmetry is difference in trade flows between developed and developing countries. According to the theory, the trade of the developed nations should increase remarkably, since they were under GATT, while the trade of the developing members should not change very much, as they were exempted from the GATT obligations. The second asymmetry is the discrimination made by developed countries between imports from GATT/WTO members and non-members, as the developed participants were not obliged to extend the benefits of tariff concessions to non-members. The next asymmetry is the difference between liberalized and exempted sectors. Manufactured products, which are exported by developed countries, were more likely to be subject to liberalization, while products such as agriculture and clothing, exported mainly by developing countries, were not. The last asymmetry is the distinction between the new developing countries and the old developing countries members after the end of the Uruguay round, as this round addressed the problem of the exemption of the developing nations. Furthermore, from that moment the developing countries that wished to join the GATT/WTO had to participate in trade liberalization.

In order to take into consideration these asymmetries, Subramanian and Wei disaggregated by countries and by sectors; they also utilized the same data employed by Rose, while applying a theory-consistent specification to the gravity model. The finding of this work is that the GATT/WTO has helped to increase world imports substantially, possibly by about 120% of world trade, which is about US $ 8 trillion, just in the year 2000. However, this trade promoting role of these organizations has been uneven: the unevenness is related to the four asymmetries in the system. While the industrialized countries achieved great increases in their trade flows, the developing countries, in comparison, enjoyed less benefits by being GATT/WTO members, even though they still gained advantages, especially in the export category.[62]

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[61] Tomz M., Goldstein J. L., Rivers D., "Do We Really Know That the WTO Increases Trade? Comment.". The American Economic Review, vol. 97(5), 2007, pp. 2005-2018.
[62] Subramanian A., Wei S.J., "The WTO promotes trade, strongly but unevenly". Journal of International Economics, vol. 72(1), 2007, pp. 151-175.

Table 8. Core regression

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
a	Long distance	−1.259** (0.020)	−1.247** (0.019)	−0.969** (0.017)	−0.965** (0.017)	−0.961** (0.017)	−0.955** (0.017)	−0.956** (0.017)	−0.956** (0.017)
b	Common Language	0.302** (0.037)	0.283** (0.036)	0.153** (0.031)	0.143** (0.031)	0.140** (0.031)	0.141** (0.031)	0.143** (0.031)	0.142** (0.031)
c	Common border	0.103 (0.085)	0.131 (0.081)	0.015 (0.066)	0.024 (0.065)	0.021 (0.065)	0.019 (0.065)	0.02 (0.065)	0.019 (0.065)
d	Common colony	0.635** (0.057)	0.609** (0.056)	0.589** (0.050)	0.576** (0.050)	0.577** (0.050)	0.567** (0.050)	0.567** (0.050)	0.567** (0.050)
e	Current colony	0.608** (0.185)	0.628** (0.187)	0.749** (0.145)	0.757** (0.145)	0.771** (0.144)	0.777** (0.143)	0.774** (0.143)	0.762** (0.143)
f	Ever colony	1.351** (0.086)	1.331** (0.084)	1.172** (0.066)	1.164** (0.065)	1.167** (0.065)	1.168** (0.065)	1.166** (0.065)	1.168** (0.065)
g	Common country	0.236 (0.677)	0.153 (0.677)	−0.49 (0.543)	−0.519 (0.544)	−0.55 (0.546)	−0.539 (0.545)	−0.535 (0.544)	−0.522 (0.544)
h	Common currency	0.878** (0.106)	0.880** (0.105)	0.605** (0.082)	0.614** (0.082)	0.637** (0.082)	0.637** (0.081)	0.633** (0.081)	0.636** (0.082)
i	Free trade area	0.661** (0.097)	1.650** (0.105)	0.672** (0.060)	1.165** (0.073)				
j	FTA and both in WTO					1.212** (0.078)	1.204** (0.078)	1.208** (0.078)	1.210** (0.078)
k	FTA and at least one not in WTO					1.065** (0.107)	1.067** (0.107)	0.945** (0.113)	0.975** (0.113)
l	Industrial country importer granting GSP	0.234** (0.075)	2.149** (0.146)	−0.055 (0.059)	0.806** (0.096)				
m	Industrial country importer granting GSP and partner WTO member					0.841** (0.100)	0.815** (0.101)	0.823** (0.101)	0.828** (0.101)
n	Industrial country importer granting GSP and partner not WTO member					0.831** (0.115)	0.820** (0.115)	0.619** (0.132)	0.675** (0.134)
o	Importer WTO member	−0.252** (0.044)		0.056 (0.036)					
p	Industrial country importer WTO member (β_3)			1.865** (0.144)	1.010** (0.092)				
q	Developing country importer WTO member (β_4)			−0.313** (0.043)	0.017 (0.036)				
r	Industrial country importer and partner WTO member					1.082** (0.096)			
s	Industrial country importer WTO member, but not a partner (β_7)					0.905** (0.107)	0.872** (0.108)	0.679** (0.125)	0.701** (0.125)
t	Developing country importer and partner WTO members (β_8)					−0.024 (0.036)	−0.046 (0.036)	−0.043 (0.036)	−0.037 (0.036)
u	Developing country importer WTO member, but not partner (β_9)					0.103* (0.059)	0.09 (0.059)	−0.117 (0.094)	−0.073 (0.096)
v	Industrial country importer WTO member, partner industrial country and WTO member (β_5)						1.127** (0.097)	1.134** (0.097)	1.145** (0.097)
w	Industrial country importer WTO member, partner industrial country and WTO member (β_6)						0.972** (0.103)	0.980** (0.103)	0.988** (0.103)
x	Developing country importer not WTO members and partner also not WTO member (β_6)							−0.237** (0.090)	−15.751** (6.029)
y	Developing country importer not WTO members and partner also not WTO member, interacted with year ($\beta 10$*time)								0.008** (0.003)
	Time-varying importer and exporter fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Observations	76094	76094	55831	55831	55831	55831	55831	55831
	Sample	All imports	All Imports excluding values less than $500,000						
	R-squared	0.74	0.75	0.75	0.75	0.75	0.75	0.75	0.75
	Root mean square error	1.679	1.673	1.113	1.110	1.110	1.109	1.109	1.109
	F-test[1]		240	142,136,7.3	125	10.1,5.5	7.7,6.3,17,2.5	7.6,0.7,24,11	7.9,0.2,23,9.7
	Prob >F[1]		0.00	0.00,0.00,0	00000	0.00.0.02	0.0,0.0,0.0,0.1	0.0,0.4,0.0,0.0	0.0,0.7,0.0,0.0

Source: Subramanian A., Wei S.J., "The WTO promotes trade, strongly but unevenly". Journal of International Economics, vol. 72(1), 2007, pp. 162-163.

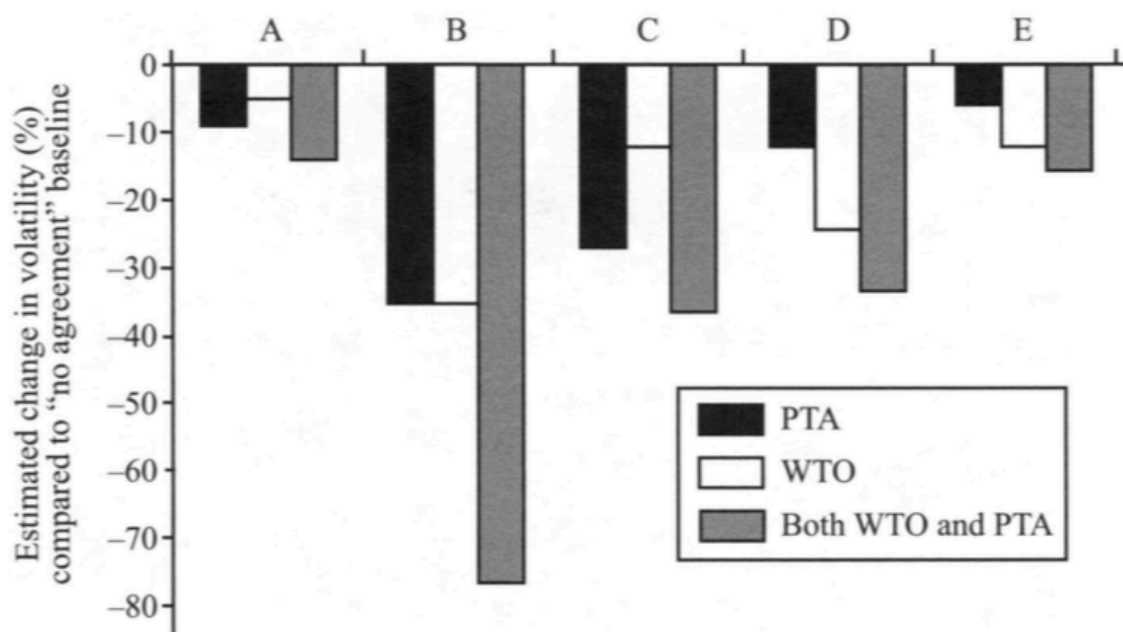## 3.5 Mansfield and Reinhardt's Criticism

The article written by Edward D. Mansfield and Eric Reinhardt in 2008 is "International Institutions and the Volatility of International Trade". In this paper the authors want to discover whether or not international institutions like the WTO and preferential trade agreements

(PTAs)[63] reduce the volatility in trade, as a country's economic output to terms of trade shock becomes weaker when said country is exposed to international markets. According to their theory, the WTO and PTAs should stabilize the stability of commerce in three different ways: firstly, by promoting transparency and convergence; secondly, by restraining their members from raising new tariffs; finally, by stimulating responses by private traders that reduce the volatileness. Furthermore, they also theorized that trade institutions, by reducing trade volatility, should increase the volume of foreign commerce, as firms and market actors prefer price stability. This indirect increment on trade would disprove once again Rose's papers.

In order to prove their hypotheses true, Mansfield and Reinhardt conducted large-scale and multivariate statistical tests, using four different measures of trade variability. For data, they utilized annual data on exports for all the 162 countries examined between 1951 and 2001.

After all these examinations, they presented systemic evidence that international institutions stabilize and reduce the volatility in international outcomes, especially export volatility, even up to one-third. These trade agreements succeed in this purpose by making trade policy and trade flows more predictable: they reduce the probability of new tariffs barriers. As a result of this situation, export levels also increase.[64]

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[63] Institutions with a bilateral/regional scope, that liberalize commerce, Free Trade Areas, Customs Unions, Common Markets and economic Unions.
[64] Mansfield E. D., Reinhardt E., "International Institutions and the Volatility of International Trade". International Organization, vol. 62(4), 2008, pp. 621-652.

Table 9. Estimated impact of trade institutions on trade volatility

Source: Mansfield E. D., Reinhardt E., "International Institutions and the Volatility of International Trade". International Organization, vol. 62(4), 2008, p. 640.

3.6 Eicher and Henn's Criticism

"In search of WTO trade effects: Preferential trade agreements promote trade strongly, but unevenly" is a paper written by Theo S. Eicher and Christian Henn in 2011. In this article they unified the previous studies about the effects of the WTO on trade, namely Rose (2004), Rose (2005), Tomz et al. (2007) and Subramanian and Wei (2007), using an approach that minimized omitted variable bias. This refined way of using the gravity equation controlled multilateral resistance, unobserved bilateral heterogeneity and individual PTA trade effects, id est sources of omitted variable bias.

The initial result that they found is that the effects on trade of the PTAs are strong, even though they are uneven across individual agreements: the effects on trade were higher for PTAs that consisted of developing countries than for industrialized nations that participated in the same agreement. Meanwhile the effects of the WTO were not statistically significant, even after they accounted for the "de facto participants"; the reason of why these results are different from the previous studies is attributable to omitted variable bias.

To further explore this topic, they extended the gravity model, to account for some specific effects that are exclusive to WTO members. The first of these additions extricates WTO and PTA trade effects and that inspects a possible regional dimension of WTO trade creation. The

second extension, instead, contains proxies for the terms-of-trade theory of the WTO. They based their data on a version of SW's unbalanced panel, adjusted to attribute a value of zero to GSP country-pairs (it represents a developed country exporting to a developed one).

With these two expansions they discovered positive and significant trade effects. To be more specific, with the first extension they found that with WTO membership trade increases just before PTA accession. With the second specification, instead, the main finding was that positive and significant trade effects are associated with countries that present greater incentives to bargain tariff reduction, during WTO accession negotiations.[65]

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[65] Eicher T., Henn C., "In search of WTO trade effects: Preferential trade agreements promote trade strongly, but unevenly". Journal of International Economics, vol. 83(2),2011, pp.137-153.

Table 10. WTO influence on PTA accession dynamics.

	Dependent variable: bilateral imports			
Regression #	30b	31b	30c	31c
Estimation method	MLR & CPFE	MLR & CPFE	First-differenced MLR	First-differenced MLR
N	55,831	55,831	40,925	40,925
Adj R^2	0.8373	0.8373	0.2773	0.2774
Impact of PTAs on trade flows for trading partners that are not WTO members (β_1)				
$PTA_{mx}, t-1$	0.112**	0.193	0.099***	0.179
	(0.046)	(0.151)	(0.037)	(0.139)
PTA_{mx}, t	0.360***	0.309*	0.289***	0.012
	(0.053)	(0.184)	(0.049)	(0.181)
$PTA_{mx}, [t+1, n)$	0.794***	1.118***	0.515***	0.403***
	(0.067)	(0.150)	(0.061)	(0.157)
Impact of WTO on trade flows for trading partners that do not share same PTA (β_3)				
WTO/GSP_{mxt}	−0.061	−0.060	0.077*	0.078*
	(0.048)	(0.048)	(0.040)	(0.040)
Impact of PTA membership on trade flows for trading partners that are also WTO members ($\beta_1 + \beta_2$)[a]				
$t-1$		0.106**		0.094**
		(0.045)		(0.037)
t		0.369***		0.313***
		(0.054)		(0.049)
$[t+1, n)$		0.771***		0.527***
		(0.065)		(0.060)
Impact of WTO membership on trade flows for trading partners that share the same PTA ($\beta_2 + \beta_3$)[a]				
$t-1$		−0.147		−0.006
		(0.159)		(0.140)
t		0.001		0.379**
		(0.189)		(0.177)
$[t+1, n)$		−0.407***		0.202
		(0.143)		(0.147)
WTO interactions with contemporaneous PTA dynamics (β_2)				
$WTO/GSP_{mx}*PTA_{mx}, t-1$		−0.087		−0.085
		(0.149)		(0.135)
$WTO/GSP_{mx}*PTA_{mx}, t$		0.060		0.301*
		(0.180)		(0.171)
$WTO/GSP_{mx}*PTA_{mx}, [t+1, n)$		−0.347***		0.124
		(0.134)		(0.141)

Source: Eicher T., Henn C., "In search of WTO trade effects: Preferential trade agreements promote trade strongly, but unevenly". Journal of International Economics, vol. 83(2),2011, p. 149.

Table 11. Using terms of trade theory to identify WTO trade effects: WTO induced trade gains by country-import rank in WTO accession year.

	Dependent variable: bilateral imports						
Regression #	34	35	36	37	38	39	40
Estimation method	MLR & CPFE	MLR & CPFE	MLR & CPFE	MLR & CPFE	MLR & CPFE	MLR & CPFE	MLR & CPFE
WTO dummy coding	Rose	Rose	Rose	Rose	Rose	Rose	Rose
WTO membership definition	De jure	De jure	De jure	De jure	De jure	De jure	De jure
N	55,831	55,831	55,831	55,831	55,831	55,831	55,831
Adj R^2	0.8383	0.8383	0.8383	0.8383	0.8383	0.8383	0.8383
WTO/GSP$_{mxt}$	−0.001 (0.053)	−0.017 (0.048)	−0.019 (0.046)	−0.018 (0.045)	−0.028 (0.043)	−0.014 (0.041)	−0.007 (0.040)
WTO/GSP$_{mxt}$ · imports_66%[a]	0.012 (0.058)						
WTO/GSP$_{mxt}$ · imports_70%[a]		0.051 (0.055)					
WTO/GSP$_{mxt}$ · imports_75%[a]			0.061 (0.055)				
WTO/GSP$_{mxt}$ · imports_80%[a]				0.067 (0.055)			
WTO/GSP$_{mxt}$ · imports_85%[a]					0.111** (0.056)		
WTO/GSP$_{mxt}$ · imports_90%[a]						0.121** (0.061)	
WTO/GSP$_{mxt}$ · imports_95%[a]							0.162** (0.074)
PTAs$_{mxt}$ (individual PTAs?)	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Composite of both WTO effects[b]	0.014 (0.044)	0.034 (0.047)	0.042 (0.048)	0.049 (.050)	0.084 (0.052)	0.107* (0.060)	0.155** (0.074)

Source: Eicher T., Henn C., "In search of WTO trade effects: Preferential trade agreements promote trade strongly, but unevenly". Journal of International Economics, vol. 83(2),2011, p. 151.

3.7 Current Data on the Subject

This last paragraph analyzes a quite recent paper, published by Yoto Yotov, Josè-Antonio Monteiro, Roberta Piermartini and Mario Larch in 2019.[66] The article in question is "Trade effects of WTO: They're real and they're spectacular". As the previous researches presented contrasting results about the effects of the WTO on trade, this academic paper aims once and for all to provide an ultimate answer on the topic.

It is no doubt that in the past fifty years international trade showed a remarkable increase, thanks to factors such as a deeper and wider multilateral trade system. The question asked by the authors though is if the WTO also had a prominent role in this expansion of trade, as the non-discriminatory nature of the agreements was not accounted by Rose (2004) and the following papers; furthermore, these accords also benefits members and non-members by providing transparency and predictability. The effect of GATT/WTO membership has been typically estimated utilizing empirical gravity models, where a dummy variable denoted whether both countries in a pair were members. Even though economic theory suggests that GATT/WTO

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[66] Yoto V. Yotov, Monteiro J.A., Piermartini R., Larch M., "Trade effects of WTO: They're real and they're spectacular". CEPR, 2019.

should increase trade, due to costs reduction and transparency, the articles that made use of the gravity model of trade neglected these positive effects.

Yotov et al. used the latest development in the empirical structural gravity literature, that is Yotov et al. (2016)[67]; this estimation, in addition to international trade flows, incorporates intra-national trade, thanks to which was possible to consider deviations from domestic sales toward international trade flows. In this literature, the dataset covered 178 countries during the period 1980-2016. The authors also made two contributions to the 2016 paper: firstly, they acquired unilateral estimates of the effects of GATT/WTO membership; with these, joining GATT/WTO led to an average of 72% increase in the international trade of member countries, relative to their domestic sales. The second contribution is the obtainment of positive and larger bilateral estimates of the effects of GATT/WTO membership on international trade between member countries; in this case, joining the GATT/WTO resulted in an increase of trade by 171% between member countries, on average. By combining these two variables simultaneously, Yotov and the other scholars drew an inference about the impact of GATT/WTO membership on trade between members and non-members.

The results of this study showed that these international organizations did in fact create trade. On average, trade between members incremented by 171%, while for trade between member and non-member countries it increased by 88%. This positive effect is mainly caused by the non-preferential nature of some GATT/WTO commitments, which was ignored by the previous studies that exploited the gravity model of trade.

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[67] Yoto V. Yotov, Monteiro J.A., Piermartini R., Larch M., "An advanced Guide to Trade Policy Analysis: The Structural Gravity Model". WTO & UNCTAD, 2016.

CONCLUSION

The purpose of this thesis is to understand whether or not the GATT and the WTO helped increasing the international trade, utilizing the gravity model of trade.

The first chapter showed how these international institutions came to be, how they are structured and the several rounds of negotiations that were held under their supervision. The second chapter displayed the history of the gravitational model of trade, its various extensions and the different methods used as estimators. Finally, thanks to the tools provided by the previous two sections, the third chapter illustrated the various articles that employed the gravity model to acknowledge if there have been any increments in trade flows as a consequence of the work of GATT/WTO.

Rose (2004) concluded that there was little evidence of the effectiveness of GATT/WTO membership on one country's trade patterns; the subsequent literature challenged this discovery and corrected Rose's gaps. Tomz et al. (2007), by including nonmember participants, found that GATT/WTO increased trade; Subramanian and Wei (2007), instead, by considering four asymmetries, stated that GATT/WTO promoted trade, but unevenly. Mansfield and Reinhardt (2008) discovered that international institutions, by reducing the volatility in trade, indirectly raise the volume of foreign commerce, and Eicher and Henn (2011) also found support for positive and significant trade effects, as a result of the WTO.

The answer to the research question of this thesis comes from the 2019 article "Trade effects of WTO: They're real and they're spectacular" by Yotov, Monteiro, Piermartini and Larch: by combining the correct set of variables, the GATT and the WTO do increase trade by large percentages, both for member and non-member countries, as a consequence of the non-preferential nature of some GATT/WTO commitments, ignored by the other scholars.[68]

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[68] Numero di parole utilizzate (frontespizio, indice, bibliografia esclusi): 9996

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