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Causes and consequences of international trade disputes

Samplonius - Raut, Shilpa

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Causes and consequences of international trade disputes
Evidence from the multilateral trade system, 1948-2016

Shilpa K. Raut -Samplonius

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Causes and consequences of international trade disputes Evidence from the multilateral trade system, 1948-2016

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the decision by the College of Deans.
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Definitions

These definitions are in line with World Trade Organization (WTO) sources.

Dispute Settlement Body (DSB): The DSB is the executive body of the Dispute Settlement Understanding (DSU). In full, it represents the WTO agreement that covers the Understanding on Rules and Procedures Governing the Settlement of Disputes. The DSB consists of all member governments, usually represented by ambassadors or equivalent.

Dispute: A dispute is a case of complaint, initiated after a member takes the decision to request a consultation at the DSB. It has a dispute settlement number and a respondent and is mentioned by evoking a specific legal agreement.

Complainant: Only a country member is allowed to complain, so a complainant is always a country. Complaints are cases that explicitly invoke General Agreement on Tariffs and Trade (GATT)/WTO laws that regulate dispute proceedings, name defendants, and allege the infringement of specific legal rights. Before initiating consultations, a member is obliged to exercise its judgement about whether action under the dispute settlement system would be fruitful, given that the aim of the dispute settlement mechanism is to secure a positive solution to the dispute (Article 3.7 of the DSB). By its express terms, Article 3.7 of the DSB entrusts members of the WTO with the self-regulating responsibility of exercising their own judgement in deciding whether it is fruitful to bring a case.

Respondent: A respondent is a member to which the request for consultations is addressed. Members are obliged to accord sympathetic consideration to, and afford adequate opportunity for, consultations (Article 4.2 of the DSB). Consultations typically take place in Geneva and are confidential (Article 4.6 of the DSB), and the (WTO) Secretariat is not involved. The consent of a respondent is necessary if any other member wants to join as a third party to a dispute. The role of the respondent is 'induced active', that is, it must be active after a complaining trade partner has induced it and must prepare documents and clarify its policy.

Third party: A WTO member that is neither a complainant nor a respondent may be interested in the matters being discussed by those parties. There are various reasons for such an interest; for example, it may have a trade interest and feel similarly aggrieved by the challenged measure; it may benefit from that measure; or it may be concerned about the challenge because it maintains a measure similar to that of the respondent. The member in question also may have an interest in being present at discussions on any mutually agreeable solution (MAGS) because such a solution may affect its interests.

Outcome: An outcome of a dispute at the GATT/WTO has two aspects: The first relates to the official ruling and the second relates to the consequence of the ruling (i.e., the ultimate policy result of a dispute, not the nature of a ruling per se). For this paper, outcome refers to the status of the cases assigned by the WTO related to the official ruling. The outcome relates to the status of the case as of April 2018.

List of Abbreviations

AB: Appellate Body	ECCAS: Economic Community of Central African States
ABRC: Appellate Body report circulated	EEC: European Economic Community
ACP: African, Caribbean and Pacific	EIA: Economic Integration Agreement
ACWL: Advisory Council on WTO Law	EU: European Union
AD: Anti-dumping	FDI: Foreign Direct Investment
AFPL: Authority for panel lapsed	FTA: Free Trade Agreement
AGOA: African Growth and Opportunities Act	GATS: General Agreement on Trade in Services
ATRG: Authorization to retaliate granted	GATT: General Agreement on Tariffs and Trade
ATRR: Authorization to retaliate requested (including 22.6 arbitration)	GDP: Gross domestic product
CVD: Countervailing duties	GDPo: GDP from output side
CPCWFNC: Compliance proceedings completed without finding of non-compliance (represents compliance)	GDPpc: Gross domestic product per capita
CPCWITHFNC: Compliance proceedings completed with finding(s) of non-compliance (represents non-compliance)	GNI: Gross National Income
CPO: Compliance proceedings ongoing	GPG: Global public good
Dispute LL: dispute between two low-income countries	Gologit: Generalized ordered logit
Dispute LM: dispute where complainant is a low-income country and respondent a middle- income country	GSP: Generalized system of preferences
Dispute LH: dispute where complainant is a low-income country and respondent a high- income country	GVC: Global value chain
Dispute ML: dispute where complainant is a middle- income country and respondent a low-income country	H: High-income
Dispute MM: dispute between two middle-income countries	IC: In consultations
Dispute MH: dispute where complainant is a middle- income country and respondent a high-income country	IIA: Independence of irrelevant alternatives
Dispute HL: dispute where complainant is a high- income country and respondent a low-income country	IMF: International Monetary Fund
Dispute HM: dispute where complainant is a high- income country and respondent a middle-income country	INBR: Implementation notified by respondent
Dispute HH : dispute between two high-income countries	IP: Intellectual Property
DSB: Dispute Settlement Body	L: Low-income countries
DSU: Dispute Settlement Understanding	LDCs: less-developed countries
DPI: Database of Political Institutions	LM: Lower-middle-income
	MAGS: Mutually agreed solution
	MASOIN: Mutually acceptable solution on implementation notified
	MFN: Most favoured nations
	Non-PTA: Non-preferential trade agreement
	OLS: Ordinary least square
	PC: Panel composed
	PENBYC: Panel established, but not yet composed
	PO: Proportional odds
	PPML: Poisson pseudo-maximum likelihood
	PRC: Panel report circulated

PRUA: Panel report under appeal
PTA: Preferential trade agreement
PWT: Penn World Tables
RANFAR: Report(s) adopted, no further action required
RAWRTBMIC: Report(s) adopted, with recommendation to bring measure(s) into conformity
RGDP: Real gross domestic product
RPT: Reasonable period of time (for a losing defendant country to implement recommendations of panel ruling)
RTA: Regional trade agreement

SOTWMASOL: Settled or terminated (withdrawn, mutually agreed solution)
SSA: Sub-Saharan Africa
TRIPS: Agreement on Trade-Related Aspects of Intellectual Property Rights
UK: United Kingdom
UM: Upper-middle-income
UN: United Nations
US: United States
W: Withdrawal/Withdrawn disputes
WPR: Working Party Report
WTO: World Trade Organization

Chapter 1

Introduction

Next in order to harmonies, rhythms will naturally follow, and they should be subject to the same rules, for we ought not to seek out complex systems of metre, or metres of every kind (Plato, The Republic, around 380 BC).

1.1 Background

The 1980s, in India: As a teenager, I dreamed of owning an Ambassador or a Fiat; the streets in India were full of them. Other car brands—used or new—from countries such as Germany or the United States (US) were rare, even in the commercial capital of India, because of high tariffs and licensing procedures applied to imported cars.

Around 2000, in the Netherlands: Dutch supermarkets amazed me—especially the uniformity of the vegetables. Cucumbers, for example, were equal in length, equally shiny, and identically straight. They were a stark contrast to the cucumbers I was familiar with—cucumbers in varied shades of green, white, and yellow, bent, with each single cucumber of a different diameter. The uniform Dutch cucumbers are the result of the European Union (EU) agricultural product standards for fresh-produce Category A.¹

Present day: During visits back to India, I carefully avoid buying ‘original branded goods’ that are available at ‘willing to pay’ prices, because these branded products belong to top firms from developed economies and are subject to seizure for being counterfeit or pirated.

Each of these situations represents some form of trade barrier, tariff, or other restriction that prevents international trade from being free and transparent.² Each also represents a potential trade dispute between bilateral trade partners. In 1948, to address such disputes and allow the free and transparent flow of international trade, 23 countries signed a treaty that established a multilateral trade agreement. It was known as the General Agreement on Tariffs and Trade (GATT).³ In 1995, the GATT was transformed into the World Trade Organization (WTO).

¹ Class 1 cucumbers must be ‘practically straight’ and bent by a gradient of no more than 1/10 (EEC Regulation No 1677/88). Another example is EU Regulation No 2257/94, stipulating all bananas must be ‘free of abnormal curvature’ and at least 14 cm in length. These rules were abolished in 2009.

² Relevant barriers in these cases include tariffs, product standardization, and intellectual property (IP) rights.

³ The 23 countries that engaged in the Geneva negotiations that led to the signing of the GATT in 1947 were officially called contracting parties, these were Australia, Belgium, Brazil, Burma (Myanmar), Canada, Ceylon (Sri Lanka), Chile, China, Cuba, Czechoslovakia (Czech Republic and Slovakia), France, India, Lebanon, Luxembourg, Netherlands, New Zealand, Norway, Pakistan, South Africa, Southern Rhodesia (Zimbabwe), Syria, the United Kingdom (UK), and the US. Only 18 of these countries were members during the year 1948. Chile joined in 1949. Lebanon, Syria, China did not join the GATT, but joined the WTO in 2001. Lebanon and Syria are in the accession process. Czechoslovakia joined in 1993 as two separate GATT members, Czech Republic and Slovakia (WTO, 2016a).

'Few, if any, international organisations have expanded as rapidly as the WTO, both in terms of membership and of the range of issues that it seeks to resolve'.⁴ Figure 1.1 shows the increase in the number of WTO members over the years. As of 2018, membership in the WTO includes 164 countries, with another 23 countries in the process of accession.⁵ Appendix 1.1 provides a list of all WTO members entitled to file trade disputes against trade partners. Under the terms of the agreement, if any member identifies a barrier erected by a trade-partner member, that member is entitled to file a dispute under the DSU of the WTO. This research examines to what extent WTO members have used the DSU and whether these disputes have had an impact on members' trade flows.

The WTO has by and large functioned outside the limelight until 2016. That has changed since Mr. Trump was sworn in as President of the United States in January 2017. Since then the media arena of international politics has not been devoid of news on the WTO. Mr. Trump has openly expressed his dissatisfaction about the WTO. In an interview in 2017, Mr. Trump threatened that the US would withdraw from the WTO "if they don't shape up." In another interview Mr. Trump claimed that "the WTO was set up to benefit everybody but us (...) We lose the lawsuits, almost all of the lawsuits in the WTO." In one of his tweets Mr. Trump lashed out to China by tweeting that "The WTO is BROKEN when the world's RICHEST countries claim to be developing countries to avoid WTO rules and get special treatment. NO more!!! Today I directed the U.S. Trade Representative to take action so that countries stop CHEATING the system at the expense of the USA!" It is not only the President, but also the top officials of the US administration have a similar opinion. For example, Mr. John Bolton, an experienced American diplomat and former advisor to Trump, is convinced that the WTO "fails to deter violators," while the rulings threaten the US' national sovereignty and ability to "strictly implement US trade laws" (Moore, 2019).

While the US has been explicit about its anti-WTO stance in the last few years, the other member countries of the WTO, the so-called "violators", have also been emphatically present in the WTO. As recently as April 2019, China, India and South-Africa, rallied by a number of other developing countries, unitedly opposed a joint US-EU proposal that would have allowed to call out and punish member countries that do not fulfil the WTO's notification requirements. This front referred to the joint proposal as not only unfair, failing to take into account the capacity constraints of developing countries, but also as reminiscent of colonial era rules (Kanth, 2019).

⁴ This is an opening statement of the foreword by Christopher Roberts as a chairperson of the WTO's Dispute Settlement Understanding (DSU) working group. Retrieved from <http://fedtrust.co.uk/wp-content/uploads/2014/12/FedT-DSU-DEC2002.pdf>.

⁵ The 22 countries that are in the process of accession are Algeria, Andorra, Azerbaijan, Bahamas, Belarus, Bhutan, Bosnia and Herzegovina, Comoros, Equatorial Guinea, Ethiopia, Iran, Iraq, Lebanese Republic, Libya, Sao Tomé and Príncipe, Serbia, Somalia, South Sudan, Sudan, Syrian Arab Republic, Timor-Leste, and Uzbekistan. Retrieved from https://www.wto.org/english/thewto_e/acc_e/acc_e.htm.

Furthermore, the US administration has blocked the appointment of judges on the Appellate Body, the supreme court of the WTO. As many as 119 WTO members in November 2019 urged to start the selection process for new AB members and to improve its functioning – but until now to no avail. In blocking the appointment of judges, the US is effectively hollowing out and bringing the WTO judicial system to a halt while, at the same time, the number of dispute initiations and pending cases in the AB have not been stagnant.

In light of these events, the current manuscript comes at an appropriate time to systematically and empirically evaluate the multilateral trade system's judicial track record. Taking a long-term perspective, our analysis starts with the origins of the GATT in 1948 and concludes in 2016, just shortly before the WTO entered turbulent times under President Trump.

1.2 Objectives

Although examination of trade disputes within the formal framework of economics is academically challenging, it is worthwhile, because GATT/WTO disputes represent a unique intersection of law, politics, and economics (Bown, 2009).⁶ A WTO dispute is a political decision; only governments can take legal action against bilateral partners for economic or trade reasons. The latest round of WTO trade negotiations—the Doha Development agenda that commenced on November 2001, with the aim of making major changes in the international trading system—has yet to be finalized. Therefore, it is imperative to understand the mechanisms of multidisciplinary dispute, in a multilateral institution, within the formal framework of economics. In that context, this research fills a gap between theory and policy and provides new empirical insights.

The record shows that over the years, use of the DSU has intensified: Whereas the GATT registered more than 130 formal disputes during its 48 years of existence, the WTO registered more than 500 cases in its first 22 years.⁷ Although some WTO members, such as the United States (US) and the European Union (EU), have used the DSU frequently, most members have not. Accordingly, this research aims to (1) explore the characteristics of bilateral pairs that were in dispute from 1948 to 2016 (the 'who' of the disputes), (2) investigate the determinants of the disputes (the 'why' of the disputes), (3) identify the determinants of the legal outcomes of the disputes (the 'what' outcomes in the legal context), and (4) examine the economic effects of the disputes in terms of trade flow (the 'what' outcomes in the economic context).

Given the lack of data corresponding to the multilateral-organisation period that started in 1948, the first step of this research was to compile a comprehensive data set on trade disputes during the GATT period (1948-1995) and during the WTO period, to 2016. The second step was to review relevant scientific literature on the determinants of the trade disputes, their legal outcomes, and their economic effects in terms of trade flow. The third step was to conduct an analysis that provides new empirical insights into the determinants of trade disputes at the WTO, the legal outcomes of the disputes, and the economic effects of the disputes in terms of trade flows.

⁶ For an economic theory underlying the GATT, please refer to Bagwell and Staiger (1998).

⁷ According to information available on the disputes as of December 2016, retrieved from https://www.wto.org/english/tratop_e/dispu_e/dispu_status_e.htm and <http://worldtradelaw.net>.

The remainder of this chapter introduces issues that are central to this research. Section 1.1 explains the main differences between the WTO and its predecessor, the GATT, with reference to dispute initiations. Section 1.2 introduces the newly compiled data set, and Section 1.3 outlines the research, using the empirical motivations that underlie each chapter.

Figure 1.1: Yearly count of GATT/WTO members

Source: WTO membership roster.

1.3 The GATT and the WTO

Most GATT/WTO studies focus exclusively on either GATT disputes or WTO disputes. However, to provide a total understanding of these multilateral trade disputes, it is necessary to consider both trade eras. It also is necessary to keep in mind that the WTO is a result of a culmination of experiences and negotiation rounds during the GATT period; the former cannot be understood without considering the latter. Although there are many differences between the GATT and the WTO, this chapter is limited to discussion of their key differences—that is, those of which members must be aware and which are potential sources of dispute.⁸ The rationale for this emphasis is that the DSU is key to maintaining the greater good of trade, with a minimum of barriers.⁹

The main purpose of the GATT was to strengthen international trade; GATT members were designated as contracting parties, and the agreement's scope was limited to trading in goods. The main purpose of the WTO is to govern the GATT and other international trade practices. The scope of the WTO is wider than that of the GATT; WTO rules include trade in services and trade-related aspects of intellectual property (IP) rights.

⁸ For a more detailed discussion of the differences between the GATT and the WTO, see Shukla (2000), Crowley (2003) and https://www.wto.org/english/thewto_e/whatis_e/tif_e/fact4_e.htm.

⁹ Every member country is entitled to use facilities of the DSU (Uruguay Round Agreement Article 1).

Table 1.1 summarizes the evolution of the GATT to the WTO. Column (1) displays the years in which negotiations took place; Column (2) shows the location of the negotiations; Column (3) shows the number of participating countries; and Column (4) identifies the individual negotiation rounds and the subjects that were covered. The table shows a continued increase in the number of negotiating countries after 1951; it also indicates that 1961 marked a widening of the scope from tariffs to other non-monetary measures.

Table 1.2 shows the agreements that are covered by the WTO as well as the scope of the DSU, which applies to all WTO agreements such that member countries can challenge breaches of any of the agreements.

During the GATT period, dispute-initiating members filed disputes with a permanent appellate body. This body was expected to review findings of dispute panels and settle disputes, but there was no permanent structure or framework. The method employed was diplomatic, and full consensus was required. The procedure was ad-hoc and had no fixed time path. Notably, the procedural power base was biased toward defendants, who could veto ratification procedures to avoid complying with panel findings.

One of the earliest references about the alleged bias in the GATT can be traced back to the title of the book “GATT and the Developing Nations: Is GATT a Rich Man's Club?” by Gal-Edd (1961).¹⁰ The use of GATT by mostly rich nations was acknowledged, and is evident from the measures to restrict their power that were included in the DSU procedures of the WTO. In a 1995 speech delivered on the eve of the WTO era, GATT Chair Dr. Zahran captured the essence of this change: ‘As we now move away from the GATT into the WTO, all partners have undertaken to comply with a strengthened rule-based system’.¹¹

When countries joined the WTO, they voluntarily agreed to contribute to the stability of the global economy by following rules that govern external and internal trade and fulfil the main functions of the WTO—that is, to maintain trade flow as smoothly, predictably, and freely as possible. Therefore, the WTO is vitally important and is a key player in global governance.¹² The WTO provides the facilities necessary to ensure global governance on trade matters. Any breach or deviation from GATT/WTO rules can be disputed under the DSU, making it the central pillar of the WTO. Given that a trade dispute is a vital instrument for ensuring the smooth flow of trade, a DSU dispute signals that one member—the complainant—has notified the WTO of a breach of a rule by another member—the respondent. The DSU helps rectify the breach with a panel ruling, making the DSU the heart of the WTO system. Dispute-initiating members play a vital role, because they regulate the world trade system by initiating procedures to remove obstacles to the flow of trade.

The WTO has a permanent structure with a permanent framework, with the WTO Secretariat serving as the institution’s backbone and memory. The Secretariat maintains a list of potential dispute panel members submitted by members and proposes panel nominations to the disputants. The course of the DSU procedure is automatic, with a stipulated time of 16 months

¹⁰ This book is enlisted in the seventh supplement of the compilation of the GATT-related publications by the GATT Secretariat (1955).

¹¹ WTO press release, retrieved from https://www.wto.org/english/news_e/pres95_e/pr036_e.htm.

¹² WTO press release, retrieved from https://www.wto.org/english/news_e/sppl_e/sppl12_e.htm.

if the dispute procedure runs its full course.¹³ Appendix 1.2 describes the dispute settlement procedure.

The WTO recognizes the importance of settling disputes in a timely manner, so the organisation can function effectively and maintain the rights and the obligations of members (Article 3.3 DSU). Procedural details are designed to attain efficiency, and a complainant can carry forward with a dispute even if the respondent does not agree (Articles 4.3 and 6.1 DSU). Moreover, the WTO considers an allowance for urgent cases, leaving them to the discretion of the dispute initiator of the cases (Article 4.9 and 12.8 DSU).

Under the GATT (1948–1994), respondents were able to block the formation of panels and threaten retaliation (Roberts, 2002; Pervez, 2015; Van Grasstek, 2013) suggesting that developed countries were at least in part responsible for the underrepresentation of developing countries in the GATT. Furthermore, when reports were adopted, positive consensus was applied, such that the losing party could block the adoption of a panel's report.¹⁴ The WTO tackled this issue by imposing the requirement of negative consensus.¹⁵ That is, during the three important stages of the dispute settlement process—establishment, adoption, and retaliation—the Dispute Settlement Body (DSB) must automatically decide to take action unless there is a consensus not to do so (Section 3.1 WTO). This addresses the complainant's right to retaliate and rejects the practice of defendants linking complainants to the resolution of other related issues. The requirement of negative consensus was designed to empower poorer complainants by removing the threat of retaliation. The expectation was that the number of trade disputes by lower-income members would rise under the WTO, because those members no longer feared retaliation from powerful trade partners.

In a dispute, the complainant must provide documents and information to prove the claim against the respondent.¹⁶ A WTO member that is not a principal disputant may join as a third party.¹⁷ Such third-party participation is not unique to the WTO, but there are few systematic records available with regard to third-party participation during the GATT period (Carmody, 1997).¹⁸ The third-party provision helps members contribute to dispute settlements while

¹³ The adjudicated case is expected to take not more than one year for a panel ruling and not exceed 16 months if the case is appealed (Article 20 DSU), retrieved from https://www.wto.org/english/res_e/booksp_e/gatt_ai_e/art20_e.pdf.

¹⁴ Section 6.5 of the DSU Training Module.

¹⁵ The DSB is the administrative body of the DSU and establishes panels. When it adopts the reports of panels and Appellate Body (AB) and authorises retaliation, the DSB must approve the decision unless there is a consensus against it (Articles 6.1, 16.4, 17.14 and 22.6 of the DSU). This special decision-making procedure is commonly referred to as 'negative' or 'reverse consensus' (Section 3.1).

¹⁶ The DSU does not include any express rules concerning the burden of proof in panel proceedings. In turn, the party invoking a provision in defence that is an exception to the allegedly violated obligation (i.e., the respondent) bears the burden of proof that the conditions set out in the exception are met. Such exceptions are, for example, Articles XX and XI:2(c)(i) of the GATT 1994.

¹⁷ Participation of third parties at the various stages of a dispute settlement proceeding, see the section on third parties in consultations, the section on third-parties before the panel, and the section on third participants at the appellate stage.

¹⁸ WTO, (2018d) A recent WTO publication on GATT dispute data provides a list of members that participated as third parties per dispute during the GATT.

they are in process.¹⁹ Although DSU proceedings are confidential, under Article 10.3, third parties are entitled to receive other parties' first written submissions to panels and to present their views orally to panels during initial substantive meetings.²⁰ Furthermore, although panel reports do not contain conclusions and recommendations for third-party members (Section 6.3 of the DSU Module),²¹ the inactive role of third parties may help them obtain information and get acquainted with procedures. The expectation is that third-party experiences will induce members to initiate disputes.

As the number of WTO members has increased, so has the formality of the DSU. However, it is difficult to know whether this rule-based system has provided poorer members of the WTO with more DSU access, because there is a lack of a data; the standard database of Horn and Mevroidis (2012), does not provide a complete set of data on disputes for 1948 to 2016 and therefore does not facilitate comparison between the GATT and WTO disputes. Accordingly, a new, more comprehensive data set on disputes is required.

¹⁹ To participate in the panel procedure, these members must have a substantial interest in the matter before the panel, and notify their interest to the DSB (Article 10.2 of the DSU). In practice, the DSB applies a 10-day deadline from the establishment of the panel for members to reserve their rights as third parties. Any member that invokes a systemic interest, in practice, is admitted to a panel procedure as a third party without any scrutiny whether the interest truly is 'substantial'. Third parties receive the parties' first written submissions to the panel and orally present their to the panel during the first substantive meeting (Article 10.3 of the DSU). Third parties have no rights beyond these although a panel can, and often does, extend the rights of participation of third parties in individual cases.

²⁰ Members may make use of their right to disclose their own submissions to the public (Article 18.2 of the DSU and paragraph 3 of the Working Procedures in Appendix 3 to the DSU). The reports of the panels and the AB also give a description of the proceeding, including the positions taken by the various participants. However, this does not give non-participants any opportunity to make a contribution to the dispute settlement proceeding while it is ongoing (i.e., before decisions are made). For that reason, there is a great deal of interest in the question of who can participate in dispute settlement proceedings (9.1 WTO module).

²¹ There is a difference between 'substantial trade interest', which is required for third parties in consultations, and 'substantial interest' before the panel. Most significant is the fact that it is possible to join consultations only with the respondent's acceptance (and, in the case of non-acceptance, there is no recourse to enforce participation). However, any member who invokes a systemic interest, in practice, is admitted to a panel procedure as a third party without any scrutiny whether the interest truly is 'substantial'. In practice, the DSB applies a 10-day deadline from the establishment of the panel for members to reserve their rights as third parties. At the meeting at which the panel is established, it is sufficient to do so orally. During the following 10 days, the substantial interest and the desire of members to participate as third parties must be notified to the DSB in writing through the WTO Secretariat (6.3 Module WTO).

Table 1.1: Landmarks in the journey from the GATT to the WTO

Year	Place/name	No. countries	Subjects covered
1947	Geneva	23	Tariffs
1949	Annecy (France)	13	Tariffs
1951	Torquay (UK)	38	Tariffs
1956	Geneva	26	Tariffs
1960–1961	Geneva Dillon Round	26	Tariffs
1964–1967	Geneva Kennedy Round	62	Tariffs and anti-dumping (AD) measures
1973–1979	Geneva Tokyo Round	102	Tariffs, non-tariff measures, ‘framework’ agreements
1986–1994	Geneva Uruguay Round	123	Tariffs, non-tariff measures, rules, services, intellectual property (IP), dispute settlement, textiles, agriculture, creation of WTO

Source: retrieved from https://www.wto.org/english/thewto_e/whatis_e/tif_e/fact4_e.htm.

Table 1.2: Coverage of the WTO²²

Agreements establishing WTO			
	Goods	Services	Intellectual Property
Basic principles	GATT	General Agreement on Trade in Services (GATS)	Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS)
Additional details	Other goods agreements and annexes	Services annexes (movement of natural persons, air transport, shipping, financial services, telecommunications)	
Market access commitments	Countries' schedule of commitments	Countries' schedule of commitments (and most-favoured nation [MFN] exemptions)	
Dispute settlement	Dispute settlement		
Transparency	Trade policy review		

Source: retrieved from https://www.wto.org/english/thewto_e/whatis_e/tif_e/agrm1_e.htm.

²² The coverage of the WTO is not static and may include later agreements. It does not include 'plurilateral' agreements not signed by all members, which relate to civil aircraft and government procurement.

1.4 Need for a novel data set

Horn and Mevroidis (2011) provide a standard data set that covers the WTO disputes.²³ They record minute details of legal stages for every initiated dispute, by providing extensive legal, procedural, and factual factors.²⁴ Their data set historically reconstructs the legal process of a given dispute. Moreover, it provides additional insights into the legal processes by meticulously providing the names of those responsible at various stages of the disputes. The database of GATT disputes also is available and accessible; it provides extensive information on 132 GATT cases.²⁵ Together, these two data sources provide a unique history of the process of the disputes²⁶ on a single WTO website; however, they are fragmented and do not allow full comparability because of a lack of uniformity of information provided. It is, therefore, both relevant and necessary to compile a new data set on GATT/WTO disputes.

In December 2018, the WTO published comprehensive data on GATT disputes.²⁷ This data is a rich source of disputes, of various intensities, among GATT members. However, it covers only the GATT period and includes not only formal disputes but also informal disputes with or without legal basis. In some cases, therefore, no formal GATT proceedings took place, or some disputes were subject to dispute settlement procedures other than those of the GATT.

The data set introduced in this research covers formal disputes that have (1) a legal basis, (2) formal registration in the DSU of the GATT/WTO, and (3) public accessibility as of December 2016. One of the advantages of the newly compiled data set is that it combines the GATT and WTO disputes in a similar format. It includes four major stages of dispute settlement proceedings: (1) date of consultations, (2) panel establishment, (3) adoption of the panel report, and (4) adoption of an Appellate Body (AB) report or date of withdrawal. It also includes the dates for the comparable phases for the GATT disputes. Moreover, given that an investigation of GATT/WTO disputes in the economic context calls for a data set that facilitates the use of existing economic data sets, the new data set is a bilateral database.²⁸ Although it is conventional to split cases into bilateral cases to study the effects of the disputes, the standard database does not provide for such division.

The new data set records the cases of multiple complainants into bilateral dispute cases. For example, on December 17 1993, nine members—Argentina, Brazil, Canada, Chile, Colombia,

²³ A dispute is a legal act that is entitled to follow the GATT/WTO settlement procedure. It does not involve requests for mediation. The formal definition of dispute will be discussed in Chapter 3.

²⁴ A settlement of the dispute, after a complainant initiates, passes through a complex set of steps involving a highly complicated procedure, requiring a thorough and careful examination of the information that demands good knowledge of WTO law. If a dispute runs its full course to a ruling, the entire time duration need not exceed 16 months if a case is appealed, and it may take three months less (12 months), if the case is not appealed.

²⁵ Openly accessible data on <http://www.worldtradelaw.net> displays a database originally compiled by Robert E. Hudec with 132 cases. Recent attempts of the WTO, along with Stanford University, to publish all GATT material digitally is another source of information about GATT disputes. All WTO disputes are available on https://www.wto.org/english/tratop_e/dispu_e/dispu_status_e.htm.

²⁶ Three GATT cases, coded as DSG97, DSG99, and DSG102 and related to job development tax credit, border tax adjustments and the UK–Temporary Import Charges respectively are not bilateral complaints. They are GATT examinations and do not have dispute-related data such as name of complainant. They are included in the database but are irrelevant to the dispute case analysis.

²⁷ WTO (2018d): New GATT data set.

²⁸ Key bilateral trade dimensions, for example, continents and income classifications of the dispute parties during the year of dispute can be easily merged.

El Salvador, Guatemala, Thailand, and Zimbabwe—requested consultation in the *US v Tobacco* case.²⁹ It is officially a single dispute case (one dispute number) against the US. However, the new data set records all nine members as separate complainants in nine bilateral claims under the same dispute number. These complainants, representing four different continents and three different income classifications, joined forces to make a case against the US.³⁰ This separate record enables examination of bilateral cases against one respondent (i.e., the US). For cases in which the EU has been one of the disputants, either as complainant or respondent, the cases are split bilaterally.³¹ The number of bilateral cases equals the number of countries that were members of the EU during the year of dispute initiation.³²

Furthermore, the new data set reports the formal legal outcomes of the disputes with dates as they were reported in official documents. In contrast to the WTO era, during the GATT period there were no distinctive phases in the dispute settlement procedure. Although the new data set retains the character of legal outcomes during the GATT and the WTO, it allows comparisons of final settlements, thus serving a study purpose that is more economic than legal. That is, it is a complement to existing data sets rather than a substitute for them. In summary, the newly compiled data set:

- Streamlines the GATT (1948–1995) and the WTO (1995–2016) data set into one format;
- Supplements information contained in the existing GATT data set;
- Facilitates comparison between GATT and WTO disputes;
- Provides a bilateral database, organized by complainant/respondent/year dispute cases;
- Interfaces easily with available economic and trade-related data because of its bilateral nature;
- Distinguishes various outcomes/statuses of dispute cases;
- Includes transitional cases during the period of 1990 to 1994;
- Provides a ‘one-stop’ database.

The new data set helps fulfil the aim of this research, which is to investigate the determinants of (1) trade disputes, (2) legal outcomes of trade disputes, and (3) economic effects of trade disputes in terms of trade flow for from 1948 to 2016. A user’s manual for the data set is provided separately in (the Appendix to) chapter 2. The next section outlines the remaining chapters.

²⁹ <http://www.worldtradelaw.net/databases/gattpanels.php>, BISD cite 41S/131, document DS44/R.

³⁰ They pleaded that measures implemented by the US affected the importation, internal sale, and use of tobacco.

³¹ Membership in the European Economic Community (EEC), as it was known during the days of GATT, has increased a number of times. The EEC was comprised of six members for the period from 1952–1972 and nine countries until 1981; EEC membership expanded to 10 and 12 members in the years 1986 and 1994, respectively. It reached 15 members at the onset of the WTO in 1995. During the WTO period, 1995–2016, the membership has expanded three times, totalling 25, 27, and 28 in the years 2004, 2012, and 2014, respectively.

³² Bilaterally split disputes give rise to a total of 4,761 bilateral disputes during the WTO period. The 132 cases, when split bilaterally but keeping the EU as one entity, total 177 disputes.

1.5 Outline of this thesis

The previous section introduced a new data set for GATT/WTO disputes. To gain new empirical insights based on this data set, the research is divided into four parts. The first part explores the typical characteristics of members in dispute; the second examines the general determinants of dispute initiation; the third investigates the general determinants of the legal outcomes of the dispute initiation; and the fourth ascertains the economic impact in terms of trade flow following dispute initiation.

Chapter 2 answers the question: What are the stylized features of bilateral pairs in a dispute? Decisions taken at the multilateral level to modify national trade policies toward free trade are directly relevant to the availability and consumption of products in daily life. The beginning of Chapter 1 recounts three representations of the DSU; with regard to the first, the rarity of imported cars in India was the result of the highly regulated import of cars via the licensing system, which led to two dispute initiations. The EU launched the dispute known as DS146 in 1998. In 1999, the US also filed a dispute (DS175) against India in the similar sector. With regard to cucumbers, there have not been any disputes launched against the EU by any of cucumber-producing WTO members, including China, where the shape, colour, size of cucumbers is natural.³³ For pirated goods and intellectual property (IP), there are 39 dispute cases recorded related to patent and IP laws, filed against a list of members that includes the EU, Denmark, Japan, China, and India.³⁴

Accordingly, Chapter 2 describes the stylized features of bilateral pairs that are in dispute. It should be noted that because the WTO is a member-driven organisation, the aspect of inclusiveness is essential to sustaining self-enforcement. This chapter uses descriptive statistics to present the features and the extent of participation of WTO members, according to various economic and political dimensions that characterize disputants. The newly compiled database allows income-status comparison of complainants and respondents to ascertain whether the WTO's intended dispute-resolution effect has occurred. As previously mentioned, low-income countries were underrepresented in the GATT; however, although the least-developed countries form 20% of the total membership of the WTO, there have been few complaints filed by any members of this group.³⁵ Furthermore, results show that trade-

³³ The product standards that the EU applies to cucumbers are a product of agricultural technology rather than natural course. They prevent cucumber producers around the world from getting their cucumbers on the shelves of EU supermarkets.

³⁴ In 2016, counterfeit and pirated goods amounted to as much as 3.3% of world trade, and up to 6.8% of EU imports from third countries (OECD/EUIPO, 2019 p3). Two related news items are: 1) 'So is Donald Trump really about to trigger that trade war with China (Section 301 of the Trade Act of 1974) to retaliate against China over its controversial intellectual property policies? (Shawn Donnan, August 7, 2017 Financial Times); 2) Section 301 of the Trade Act of 1974, a little-used provision, authorises the president to 'take all appropriate action...to obtain removal of any [trade] practice that is unjustified, unreasonable, or discriminatory, and that burdens or restricts U.S. commerce. US Trade Representative Robert Lighthizer has launched an investigation to determine whether China's policies toward intellectual property are in violation of Section 301'. (Irwin M. Stelzer, August 26, 2017, The Weekly Standard).

³⁵ The WTO does not have a list of least-developed country members; it recognizes the countries that are designated by the UN. At the time of writing, there are 48 countries recognized by the UN out of which 34 are WTO members: Angola, Bangladesh, Benin, Burkina Faso, Burundi, Cambodia, Central African Republic, Chad, Congo, Democratic Republic of the, Djibouti, Gambia, Guinea, Guinea Bissau, Haiti, Lao People's Democratic Republic, Lesotho, Madagascar, Malawi, Mali, Mauritania, Mozambique, Myanmar, Nepal, Niger, Rwanda,

promoting geographical and institutional similarities, such as trade agreements or colonial connections between bilateral pairs, do not characterize bilateral pairs in dispute.

Thus, the characteristics of bilateral disputants do not reflect the bilateral trade features of bilateral pairs that trade intensively. This leads to the next research step of formally analysing why these bilateral pairs engage in disputes. Chapter 3 asks: What are the determinants of disputes? To answer this question, the study focuses on one of the key issues that has emerged in WTO studies of factors that contribute to trade disputes. It is important to understand dispute initiations, because the WTO's main objectives are to provide security and predictability to the multilateral trading system (Article 3.2 DSU). Chapter 3 addresses issues that are fundamental to ensuring a comprehensive and sustainable self-enforcing mechanism of dispute, safeguarding trade transparency, and protecting the trade interests of WTO members. Accordingly, Chapter 3 identifies the factors that contribute to disputes and determines whether there has been a shift in the predictors of dispute since the GATT evolved into the WTO.

These disputes, in addition to being interdisciplinary, represent a multi-level interplay, because the origin of disputes is at the sectoral level (the government as complainant at the national level, and the DSU, the court of trade justice, at the international level). A literature review confirms this representation. There have been numerous determinants ascribed to the incidence of GATT/WTO disputes. Chapter 3 takes this complexity into account by considering several variables, including five dispute predictors—bilateral trade determinants, trade strength, tariffs, political factors, and legal factors—to provide a more complete picture of the 1948 to 2016 period. Results show that countries with higher gross domestic products (GDPs) are more likely to initiate disputes. They also show that the higher the GDPs of respondents, the greater the likelihood they are facing dispute. This is an indication of the working of the legal capacity mechanism. Does the dispute-initiation advantage of high-GDP members also give them an edge in the subsequent legal procedures of the dispute settlement? Chapter 4 investigates this question.

The specific research question formulated in Chapter 4 is: What are the determinants of a trade dispute's legal outcome? According to the DSU, members should use their judgement and self-regulating responsibility before initiating disputes (Article 3.7). This procedure entails submitting written requests that indicate the legal basis of disputes (Article 4.4) and clearly identifying respondent breaches. Dispute initiation is the first step in the long procedure of settlement that should take just over a year. Appendix 1.A2 describes the official procedure of dispute settlement. These rules cover the stages of the dispute settlement procedure from the consultation phase to the final phase of implementation (WTO, 2016c). The legal outcomes are the results of these DSU procedures.³⁶ Although disputes can be withdrawn, terminated, or solved mutually at any point, the DSU does not permit the use of other procedures for resolving trade disputes that are covered by Article 23.1.

Senegal, Sierra Leone, Solomon Islands, Tanzania, Togo, Uganda, Vanuatu, Yemen, Zambia (https://www.wto.org/english/thewto_e/whatis_e/tif_e/org7_e.htm).

³⁶ Special and differential treatment applies only to developing-country members.

One of the most frequent dispute outcomes is implementation notified by respondent (INBR).³⁷ This outcome implies that the defendant complies with the legal outcome of the dispute. Calculations of this research show that when this outcome is set against the income status of respondents compared to that of complainants, in 67% of cases with INBR outcomes, the incomes of respondents are either lower or similar to the incomes of complainants; respondents have higher incomes than complainants in only 21% of cases. This raises questions about why higher-income respondents have lower rates of INBR. Does the legal capacity advantage of dispute initiating members 'lubricate' the subsequent judicial process to achieve a favourable outcome?

With regard to the legal outcomes of the two previously mentioned dispute cases launched against India (DS146 and DS175) by the EU and the US, respectively, it is notable that the disputes favoured dispute-initiating members, and the cases achieved closure after implementation was notified by India in 2002. In this context, the EU and US are categorised as high-income countries, whereas India was categorised as a low-income country until 2007.³⁸ Findings of Chapter 4 suggest that the real GDPs per capita (GDPpc) of disputants do matter to legal outcomes. They imply that legal capacity is a form of power in the rule-oriented WTO that continues to play a role in the dispute-settlement procedure. However, do these dispute initiations also elicit favourable economic outcomes in terms of restored trade flow? That is the topic of Chapter 5.

Chapter 5 investigates the effects of trade disputes on trade flow. The importance of this investigation lies in the rationale of dispute initiation. Under the DSU, WTO members can challenge the WTO-inconsistent trade measures of other members; therefore, the entire procedure of the DSU revolves around the elimination of WTO-inconsistent trade measures, to restore trade flow between disputants. Chapter 5 shifts the focus from the cause to the effect of the disputes by examining the effect of trade disputes on trade. However, analysis of this shift poses problems of causality and endogeneity. By using a comprehensive database on the universe of aggregate bilateral trade that covers both the GATT and WTO eras, the chapter uses a state-of-the-art gravity equation to quantify the economic magnitude of disputes on international trade. The analysis is complemented by a detailed product-level analysis of the WTO era, providing a fine-grained view of how disputes have affected international trade in recent decades. To the best of the author's knowledge, this is the first study to incorporate all dispute data from both the GATT and WTO eras and to comprehensively shed light on the trade effects of disputes in the multilateral system. Results show overall that the effect of disputes on trade flow is statistically significant and negative. Moreover, product-level analysis of the WTO era does not show any significant effect of disputes on product-level trade.

³⁷ Of 17 distinct phases of the outcomes identified in the DSU, more than 25% of bilaterally split disputes are in the initial phase of consultation. Given the nature of this phase, it is omitted here. In 19%, respondents complied with the panel ruling according to INBR; 16% were mutually solved; 8% were asked to bring the measure into conformity; and 5% withdrew. The WTO views this as positive. These disputes are in an initial phase either because satisfactory settlements were found but not reported or because the complainants decided for other reasons not to pursue the matters further. This shows that consultations are often an effective means of dispute resolution in the WTO and that the instruments of adjudication and enforcement in the dispute settlement system are by not always necessary (Module 6.2, WTO 2018h).

³⁸ Except the two EU members, Romania and Bulgaria, that are categorised as upper-middle-income (UM) members.

Finally, Chapter 6 draws on the main findings and conclusions of previous chapters to conclude that the transformation from the GATT to the rule-oriented WTO has not resulted in any significant change in favour of lower-income members. Wealthier members are still more likely than poorer members to initiate disputes, be dragged into disputes, and achieve favourable legal outcomes. Furthermore, the statistical irrelevancy of disputes to the increase in bilateral trade flow creates doubts about the economic utility of disputes. Findings suggest that to remain relevant, the WTO must adapt to changing times. Modernization of systems, digitization of procedures, and inclusivity of members are keys to a self-sustaining WTO. Chapter 6 concludes with a brief outlook on future research possibilities with regard to WTO disputes and the WTO.

Table 1.A1: Dispute settlement process and time schedule

Phases	Time schedule
Consultation, mediation	60 days
Panel set-up request and panelists appointed	45 days
Final report to parties*	7 months
Final panel report to WTO members	6 weeks
DSB adopts report (if no appeal)	60 days
	Total = 1 year (without appeal)
Appeals reports	60–90 days
DSB adopts appeal's report	31 days
	Total = 1 year and 3 months (with appeal)
* Stages from panel set-up until final report:	
1. Receipt of first written submissions of parties	3–6 weeks
(a) complainant	2–3 weeks
(b) respondent	
2. First substantive meeting with parties, third-party sessions	1–2 weeks
3. Receipt of written rebuttals of parties	2–3 weeks
4. Second substantive meeting with parties	1–2 weeks
5. Issuance of descriptive part of report to parties	2–4 weeks
6. Receipt of comments by parties on descriptive part of report	2 weeks
7. Issuance of interim report, including findings and conclusions, to parties	2–4 weeks
8. Deadline for parties to request review of part(s) of report	1 week
9. Period of review by panel, including possible additional meeting with parties	2 weeks
10. Issuance of report to disputing parties	2 weeks
11. Circulation of final report to members	3 weeks
These are approximate periods for each stage of the dispute settlement procedure. Information provided on the WTO flow chart of the DS process in Figure 6.1, WTO (2016c).	

Chapter 2

GATT/WTO dispute initiators

...there is a further good in the law; viz. that if a man has a quarrel with another he will satisfy his resentment then and there, and not proceed to more dangerous lengths (Plato, The Republic, around 380 B.C.).

2.1 Introduction

The previous chapter explains the need for new data on disputes to allow comparison of GATT and WTO disputes. It also explains the differences between the dispute settlement procedures of the GATT and those of its successor, the WTO, with the latter formalizing its dispute procedures to reduce member power plays and lower the dispute threshold, such that less powerful members can initiate disputes (Bown 2004).

Accordingly, this chapter answers the question of whether the intended effect of the formalization of the WTO has been effective in terms of the number of disputes initiated by WTO members, compared to GATT members. It describes the stylized features of dispute initiators by using a newly compiled data set with special reference to a few selected economic and political dimensions of the dispute initiators of the GATT/WTO. Text Box 2.1 contains two examples of dispute initiations.

Figure 2.1 shows that over time, the self-enforcing nature of the GATT/WTO agreements has become more evident. Figure 2.1 depicts disputes for four different years: 1948, 1994, 1995, and 2016. The origin of the arrow shows the complainant and the side arrow indicates the respondent.³⁹ The number at the arrow side shows the number of disputes in each continent. The type of line differentiates the targeted members from different continents. The figures show that over the years, there has been an increase in the absolute number of disputes. In 1948, there was only one cross-continent dispute; North American and Asian members filed one dispute each against their trade partner in the same region. The shaded circles show the number of disputes within same regions. There is a notable upsurge in the number of disputes after the onset of the WTO in 1995. Figure 2.1 also shows not only that the number of disputes increased, but also that disputes have dispersed across WTO members and continents. This dispersion across members is key, because it demonstrates the WTO's increased accessibility to its members, which could be a consequence of the GATT's transformation to the WTO and the accompanying formalization of the DSU. It shows that member accessibility is essential to the WTO's success and sustainability (Baldwin & Nakatomi, 2015).

Text Box 2.2 summarizes a few of the crucial differences between the GATT and the WTO. The increase in number of disputes shows that disputes continue to be members' instrument of choice for safeguarding their trade interests. This highlights the role of the dispute initiator: It

³⁹ As the legend in Figure 2.1 shows, the curved line is used for disputes targeted at members in Africa, solid lines for Asian members, dot dash line for Australia, dashed lines for South American members, thick dotted line for European members and thin dot lines for North America.

is the most active trade-defending role a member can play.⁴⁰ After all, countries join the WTO because it is an organisation that has trade and trade-related policies at its centre (Bown & Hoekman, 2007).

There is ample literature on the participation of the WTO members in the DSU (Bown, 2004; Busch & Reinhardt, 2003; Horn, Johannesson, & Mavroidis, 2011; Horn, Mavroidis, & Nordström, 1999). The WTO also issues annual reports, and Leitner and Lester (2007, 2012) publish regular statistical analyses. To date, however, it remains unclear to what extent member participation has increased under the WTO and whether more low-income members are initiating disputes. One reason for this lack of clarity may be that most studies and reports analyse members according to their development status rather than making a clear distinction between low and high incomes.⁴¹

This chapter differs from previous studies in three ways. First, it extends the period of investigation (1948–2016) to allow comparability between the GATT and WTO periods. Second, it deviates from previous literature on the participation of members in the DSU by employing a World Bank (WB) analytical income classification that allows consideration of the changes in income status of members over the years.⁴² Finally, it uses rich, self-compiled data arranged in a complainant/respondent/year/dispute quadruplet.⁴³

The remainder of this chapter is structured as follows: Section 2.1 describes the self-compiled data set on disputes initiated during the GATT and the WTO periods from 1948 to 2016; Section 2.1 describes a few selected dimensions of the stylized features, such as economic integration and the political system; Section 2.3 presents the stylized features of the disputes data; and Section 2.4 discusses results and presents conclusions.

⁴⁰ A member may participate in the DSB in various roles, for example, as a complainant, respondent, third party, panel member, or AB member. It should be noted that the dispute initiation is just the first step. It is the settlement of the dispute that matters to a dispute initiating country. A dispute can be settled in several ways, Chapter 4 addresses this issue in detail; all GATT disputes for which panel reports were adopted are considered as settled and otherwise. In the WTO, a dispute is considered settled when a respondent has complied with a panel ruling or when a dispute has a MAGS. The role of respondents is reactive, because they must defend themselves after facing complaint. The role of third parties is an induced active role, because members that are interested in participating as third parties must provide evidence of substantial interest in cases, but this role does not involve complicated procedures or substantial costs.

⁴¹ The WTO does not have its own definition; the United Nations (UN) publishes the development status of countries. Strictly speaking, the term ‘developing countries’ includes not only low-income countries but also high-income countries such as Brunei and upper-middle-income countries such as Brazil. This chapter does not focus on the definition of developing countries, as such, but on countries’ classifications as low-income and lower-middle-income. This is an advantage in that a country’s income classification is objective, whereas countries’ self-reported claims regarding their development status may be (geo)politically motivated. Periodical reports by Leitner & Lester account for disputes from 1995 onwards and do not assess participation in terms of income status.

⁴² For example, until 2007, India was classified as a low-income country, after which it graduated to the status of lower-middle-income country. Brazil, classified as upper-middle-income for most of the period, changed to lower-middle-income during 2003–2005.

⁴³ Data arranged by complainant–respondent helps analysis the by member-pairs, because trade relations and trade flows are bilateral.

Text Box 2.1: A dispute by Sri Lanka

Coconut is one of the major plantation crops in Sri Lanka and accounts for approximately 12% of all agricultural produce there. With a total land area under cultivation of approximately 395,000 hectares, equivalent to about 2,500 million nuts per year, coconut is clearly a product of commercial importance for this island. This is the most important reason why Sri Lanka showed interest in reserving its rights as a third party when, on 27 November 1995, the Philippines requested consultations with Brazil with respect to a countervailing duty imposed by Brazil on the Philippines' exports of desiccated coconut.

The Philippines claimed that the Brazilian duty was inconsistent with WTO and GATT rules (DS 22). Subsequently, on 23 February 1996, Sri Lanka filed a similar but separate complaint against Brazil by requesting consultations with Brazil concerning imposition of countervailing duties on Sri Lanka's export of desiccated coconut and coconut milk powder. Sri Lanka alleged that those measures were inconsistent with GATT Articles I, II, and VI and Article 13(a) of the Agriculture Agreement (DS 30).

At the DSB, every dispute is treated as a separate case, and the ruling of one case does not automatically apply to the other party. The settlement of the DSB is binding on WTO members, though it is of a self-enforcing nature. In this light, the decision of Sri Lanka to file a separate complaint could be considered rational. These two dispute cases are unique, because they have been filed by developing-country members.

With regard to the outcomes of these two cases, the case filed by Sri Lanka (DS 30) at the WTO has a current official status of 'in consultation,' implying it is still in the first phase. However, the dispute case of the Philippines is resolved (DS22); its status is that the panel report(s) has been adopted and no further action is required.

Source: DS22 and DS30 WTO (2016a; 2018j) and Sri Lanka export development board (2018).

Text Box 2.2: The GATT and the WTO

The GATT was created in 1948. The main purpose was to strengthen international trade, and the scope was to trade in goods. It had a permanent appellate body to review findings and settle disputes, but there was no permanent structure or framework. The nature of the procedure was ad-hoc, without any fixed time path. The method employed was diplomatic, and consensus was required. The power base was more biased towards the defendant who could veto the ratification procedure and thus avoid complying with the findings.

The main purpose of the WTO, established in 1995, was to govern the GATT and international trade practices. It has a permanent structure with a permanent framework, with the Secretariat serving as an institutional backbone and memory. The Secretariat maintains a list of potential panel members and proposes panel nominations to the parties of the dispute. Its scope is wider than trade in goods; it includes trade in services and trade-related aspects of intellectual property rights. The nature of the procedure is automatic with a stipulated time of 16 months, if the dispute procedure runs its full course. It employs a negative consensus requirement, such that respondents can no longer block the implementation of panel findings. It is based on a rule whereby the complainant has a right to retaliate if the respondent fails to comply with the report findings within a reasonable period of time. It rejects the practice of respondents linking complainants to the resolution of other related issues.

When comparing the WTO with the GATT, it is important to keep in mind that the WTO today represents an evolutionary process that began under the GATT in 1948.

Source: WTO (2016b)

Figure 2.1: Disputes spread over the continents

2.2 Data and dimensions

This chapter ascertains the effect of the formalization of the DSU procedure in terms of dispute initiations by poorer members of the WTO, compared to the GATT. It also provides the stylized features of bilateral pairs in a dispute, using a few selected political and economic dimensions during the period of 1948 to 2016. It uses a newly compiled data set that facilitates the comparison between GATT and WTO disputes. This section discusses the data and the dimensions used to describe features of bilateral pairs.

2.2.1 Dispute data

Disputes under the GATT date from 1 January 1948 to 31 December 1994. The 132 GATT cases recorded online include those during the transitional period from the GATT to the WTO and are openly accessible.⁴⁴ Splitting the EU into bilateral cases results in 735 bilateral GATT disputes.

Disputes under the WTO date from 1 January 1995 to 31 December 2016.⁴⁵ The data set for the WTO covers all 518 disputes initiated through official filings of requests for consultations at the WTO. The 518 cases, when split bilaterally, with the EU as one entity, total 548 disputes. Splitting the EU into bilateral dispute cases results in 4,024 bilateral WTO disputes. Table 2.1 summarizes the total number of disputes.

The data used in this chapter are part of the self-compiled database. The new data set bilaterally splits all disputes; however, the descriptive analysis considers not only the bilateral pairs but also the uniquely initiated disputes, because the EU files disputes as one economic entity and defends them as one respondent.⁴⁶ That is, the EU cases at the DSU are not considered to be cases of multiple disputants. The unit of analysis in this chapter, therefore, is economic entity. Practically, it means that participation of members at the DSU of the GATT and the WTO is determined at the member-pair level, except for the EU, because the EU files and defends as one economic entity. The data are compiled at the member-pair level, so that when the analysis considers dimensions such as contiguity and political system, the data at

⁴⁴ Robert E. Hudec is considered to be the founding father of international economic law. He was the first to compile data on GATT disputes, which are publicly and available on <http://www.worldtradelaw.net> and the WTO website (compilation date for the database is not cited on either site). The three GATT cases coded as DSG97, DSG99, and DSG102, job development tax credit, border tax adjustments and UK–Temporary import charges are GATT examinations rather than bilateral complaints and thus do not have dispute-related data. They are included in the database for completeness but are irrelevant to dispute case analysis.

⁴⁵ Using the two-fold arguments about the consistency of the source and emphasizing on a cleaner break from the GATT to the WTO era, Maggi and Staiger (2013) choose to exclude cases that occurred during the transitional period from 1990 to 1995 (DS3, DS16, DS52, DS101, DS106, DS185, DS228, DS271), because they are addressed in DS41, DS27, DS65, DS132, DS126, DS187, DS230, and DS270, respectively. Case DS152, which is the same as DS16, and DS27 is considered for a reason that is not known.

⁴⁶ This also helps give an ‘unbiased’ picture of the income status of disputants. Most EU members are classified as high-income members. Greece, which joined the EU in 1981, was classified as an upper-middle-income member until 1995. At present, there are only two countries, Bulgaria and Romania, that joined the EU in 2007, that are classified as upper-middle-income countries by the WB.

member-pair level becomes useful. Therefore, the EU disputes are split into bilateral pairs, resulting in 4,759 disputes.⁴⁷

Table 2.1: Number of dispute records

Era	Period	Recorded disputes	Bilateral cases (EU as one entity)	Bilateral cases (individual EU countries)
GATT	01/01/1948-31/12/1994	132	177	735
WTO	01/01/1995-31/12/2016	518	548	4,024
Total		650	725	4,759

2.2.2 Dimensions

This chapter uses a few selected dimensions to provide insight into the income status of dispute initiators under the WTO compared to the GATT.

The rationale for using income status and other geopolitical dimensions is the standard gravity model of bilateral trade.⁴⁸ The dimensions in the gravity model vary from economic factors to geopolitical factors (Head & Mayer, 2013). There is a positive relationship between GDP and rule of law (Kaufmann, Kraay, & Mastruzzi, 2011). It is common in WTO literature to use GDP or other derived dimensions such as GDPpc as a proxy for the legal capacity of a country (Bown, 2005; Horn et. al., 1999).

The skewed use of the DSU by high-income members has been ascribed to their high export intensity (Horn et.al., 1999). Table 2.A1 displays the skewness of the data on the merchandise export share and the GDPpc of the dispute initiators in the data.⁴⁹ This chapter uses the WB classification of countries into four income categories (see Table 2.2).⁵⁰ Although this

⁴⁷ However, depending on the availability of data for some disputants, for example for Hong Kong, the number decreases to 4,730. Another reason for the smaller sample is limited availability of the data during the GATT period.

⁴⁸ It essentially explains (the natural logarithm of) trade with (the logs of) the distance between the countries and their joint income. This basic model is often augmented in literature with some extra conditioning dimensions that affect trade. These dimensions account for as many extraneous factors as possible, for example, historical connection or country location (Head & Mayer, 2013).

⁴⁹ Data source: GDPpc by Maddison (<http://www.ggd.net/maddison/maddison-project/data.htm>) and the merchandise export share, PWT (9.0) (<http://www.rug.nl/ggdeveloping/country/productivity/pwt>).

⁵⁰ This classification line is adjusted yearly; for example, for the year 2013, all countries with per capita income $\leq$ US\$1,045 were labelled as low-income (L), those with per capita income between US \$1,046 and US \$4,125 and US \$4,126 and US \$12,745 were classified as lower-middle-income (LM) and upper-middle-income (UM), respectively, whereas all with per capita income $>$ US\$12,745 were classified as high-income (H). The WB provides classifications for the years 1987 to 2012. For years prior to 1987, the classification of 1987 is taken as the reference year, whereas for the years 2013 to 2016, the year 2012 is taken as the reference year. Every year, the WB publishes categorisation of the countries by gross national income (GNI) per capita. The analytical classification of the WB (GNI per capita in US\$, Atlas methodology) provides information from the year 1987. During this period, some countries moved up in income classification. For each country, it is not possible to allocate more than one income status, so the final income status of the countries as of 1994 for the GATT cases and as of 2014 for the WTO cases is taken. Members with L status that complained under the GATT: Cuba, Malawi, Nicaragua, Pakistan, and Zimbabwe; and under the WTO: Bangladesh, Honduras India, Indonesia, Nicaragua Pakistan, and Sri Lanka.

classification is based on income, it indicates more than just a numerical cut-off line.⁵¹ This chapter also uses an income classification based on deciles of income. The deciles sort the data into ten equal parts, with a higher place in the decile ranking denoting higher income.

The chapter also classifies members according to continent;⁵² members are divided as they appear in the World Atlas.⁵³ Further, given that complainants may be contiguous or non-contiguous to respondents and that disputing members may have historical connections through colonization, these factors are captured by the dyadic dimensions of contiguity and colonization, respectively (Mayer & Zignago, 2011).

The chapter also considers the extent of economic agreement between bilateral pairs. During the GATT period, there were 124 notified regional trade agreements (RTAs). Following the establishment of the WTO, the number of notifications increased to 400 (RTA-IS, 2016).⁵⁴ The use of a tariff rate can be justified on the grounds that most 20th century regional and multilateral agreements focused on tariffs and other border measures (Richard Baldwin, 2014). Furthermore, the use of tariff rates is the most fruitful result of the Uruguay Round, in which members agreed to cut the tariff rate and 'bind' custom duty rates to levels that are difficult to raise (WTO, 2005).⁵⁵ The bilateral data set on an economic integration agreement is drawn from the publicly accessible work of Bergstrand (2017), and data on tariff rates are drawn from the World Bank Economic Indicators (2017).⁵⁶

The rationale for examining political dimensions is rooted in the theory of structure of trade protection that links the political contributions of lobbyists to trade policy (Grossman & Helpman, 2007). It is also a recognition that because national governments are the only entities allowed to file disputes at the WTO, an internal dimension, such as the political system, is essential to characterizing dispute initiators. A political system represents the extent of influence of the citizens on the election of the head of the state; it captures the relationship between the executive and legislative branches of government and the competitiveness of elections of political actors (Cruz, Keefer, & Scartascini, 2016).

Another political dimension relates to form of democracy. The plurality form of democracy indicates a system of majority-based election. Because this form of democracy is more susceptible to majority mass opinion, it is more subject to the disproportional influence of

⁵¹ Another relevant justification for using the GDP is the positive but statistically non-significant relationship between the relative contribution of non-tariff measures to the overall level of protection and the level of GDPpc (WTO, 2012).

⁵² There could have been other criterion for the classification based on regional proximity such as the Middle East or a free trade zone such as the North American Free Trade Agreement (NAFTA). However, extent of cooperation and economic integration differs, and to provide an overview of the distribution of the disputes across the continents, the geographical location serves the purpose.

⁵³ Geographically, North America includes Central American countries. The number in brackets show the number of countries in each of the continents as published December 2014: Africa (54) Asia (44), Australia Oceania (14), Europe (47), North America (23), and South America (12) of which 42, 33, 8, 42, 22, 12 countries are WTO members, respectively (<http://www.worldatlas.com/cntycont.htm>).

⁵⁴ (WTO, 2016d) Regional trade agreement information system (RTA-IS) of the WTO. <https://rtais.wto.org/>, last accessed October 2017.

⁵⁵ Tariff is the duty charged on imports, and the most visible indicator of protectionism is tariff data. Import tariffs in developed countries tend to be lower than in developing countries (WTO, 2005b, chapter 6).

⁵⁶ Data on tariffs during the GATT is limited; the earliest year with records of simple mean tariff of all products is 1988. Source of ranking Economic Integration Agreements (EIA): <https://www3.nd.edu/~jbergstr/>.

local constituencies than the system of proportional representation (Persson & Tabellini, 2004). The political data in this chapter is drawn from the Database of Political Institutions (DPI) (Cruz, Keefer & Scartascini, 2016). Table 2.2 explains the dimensions used. Sources of all dimensions and variables are included in List of Data Sources, following References.

Table 2.2: Dimensions and definitions

Dimension	Definition/explanation
Income classification	Four country income categories according to the WB classification: low-income (L), lower middle-income (LM), upper middle-income (UM), and high-income (H) Deciles: 10th, 20th, 30th, 40th, 50th, 60th, 70th, 80th, 90th, and 100th percentiles. Considering the ten categories, the chapter chooses to restrict in most cases to the WB's four categories.
Continent	Complainants and respondents divided into six continents: Africa, Asia, Europe, North America, Oceania, and South America.
Contiguity	Denotes whether the complainant and the respondent are adjacent countries: 0 = non-contiguous and 1 = contiguous.
Colonization	Denotes whether the complainant and the respondent have ever had colonial relationships, 0 = no and 1 = yes
Political system	Indicates election mode through which power of a leader is constitutionally sanctioned: direct/electoral college = 0, by assembly = 1, by parliament = 2
Plurality	Type of democracy: plurality = 1, non-plurality = 0
Economic integration agreement	Ranking level of economic integration: 0 = no agreement, 1 = non-reciprocal preferential trade agreement, 2 = preferential trade agreement, 3 = free trade agreement, 4 = customs union, 5 = common market
Tariff	Applied tariff is simple mean of all products (%). The chapter compares the tariff rate of a complainant with that of its respondent. It assumes the value of 2 when a complainant has a higher tariff rate than the respondent, 0 when it is equal, and 1 when the complainant has a lower tariff rate than the respondent.

2.3 Results

The purpose of this descriptive research is to ascertain the participation status of members under the WTO (1995–2016) compared to the GATT (1948–1994). This section presents graphs and tables that illustrate the extent of participation.

2.3.1 Number of participants and extent of participation

Table 2.3 shows the number of GATT/WTO members that have participated in disputes, either as complainants or respondents, during the period under consideration. Columns (1) to (4) show member participation during the GATT period, and Columns (5) to (8) show member participation during the WTO. The rows specify whether their roles were as respondents or non-respondents. This gives rise to four quadrants: Q1 shows non-complainants and respondents, that is, induced active members; Q2 shows most active members; Q3 shows complainants and non-respondents, that is, dispute-initiating members alone; and Q4 shows non-complainant and non-respondent members, that is, most passive members. Figures in parentheses indicate the number and percentage under the GATT; Q2 shows there are 34 countries that are the most active countries under the WTO (23 under the GATT); and Q4 indicates that as of December 2016, most WTO members—97 of 164 (59%)—have not participated in disputes either as complainants or respondents. It also shows that the number of passive members is fewer than under the GATT, in which 64.8% were passive members.

Table 2.3: Participant quadrants

(1) GATT	(2) Complainants	(3) Non- complainants	(4) Total countries
Respondents	Q2: 23 (17.9%)	Q1: 7 (5.3%)	30
Non- respondents	Q3: 15 (11.7%)	Q4: 83 (64.8%)	98
Total	38	90	128
(5) WTO	(6) Complainants	(7) Non- complainants	(8) Total countries
Respondents	Q2: 34 (20.7%)	Q1: 20 (12.2%)	54
Non- respondents	Q3: 13 (7.9%)	Q4: 97 (59.1%)	110
Total	47	117	164

Source: Author's calculations. Notes: Unit of measurement is number of members.

Table 2.4: Most active participants

(1) GATT/WTO member	(2) Total GATT cases as complainants	(3) Total GATT cases as respondents	(4) Total WTO cases as complainants	(5) Total WTO cases as respondents	(6) Total WTO cases as third parties
US	42	38	114	130	140
EU (formerly EC)	19	28	97	84	166
Canada	15	13	35	20	120
Brazil	7	2	31	16	112
Mexico	3	0	24	14	82
India	1	1	23	24	128
Japan	2	4	23	15	171
Argentina	1	0	20	22	60
Korea, Republic of	0	4	17	16	113
China	N.A.	N.A.	15	39	140
Thailand	1	1	13	4	73
Indonesia	0	0	10	14	21
Chile	5	0	10	13	45
Guatemala	3	0	9	2	37
Russia	N.A.	N.A.	6	7	37

Source: Author's calculations. Unit of measurement is number of dispute cases.

Table 2.4 lists the 15 most frequent dispute initiators in Table 2.3, Q2. Columns (1) and (2) show the participation of members under the GATT. Columns (4), (5), and (6) depict the participation of the active members under the WTO as complainants, respondents, and third parties, respectively. This table indicates that the four GATT frontrunners—US, EU, Canada, and Brazil—continue to maintain their active roles under the WTO. Moreover, these frequent users of the DSU as disputants also participate actively as third parties.

Table 2.5: Income of participants under the GATT and the WTO

(1) Income classification	(2) GATT	(3) WTO excl. third- party participation	(4) WTO incl. third- party participation
H	26 (20.3)	33 (20.1)	42 (25.6)
UM	12 (9.3)	18 (10.9)	28 (17)
LM	4 (3.1)	15 (9.1)	24 (14.6)
L	3 (2.3)	1 (0.6)	8 (4.8)
L + LM	7 (5.4)	16 (9.7)	32 (19.4)
Total no. members participating	45 (35)	67 (40.8)	102 (62)
Total no. members	128 (100)	164(100)	164 (100)

Source: Author's calculations. Notes: Unit of measurement is number of members; % in parentheses. L=Low-income, LM=lower middle-income, UM=Upper-middle-income, and H=High-income.

2.3.2 Nature of participation and income status

The WTO recognizes the additional role of third parties.⁵⁷ The possibility of members participating as third parties has enhanced the participation of all members. Table 2.5 depicts number of countries according to income status and nature of participation for all members under the GATT and under the WTO. It demonstrates widespread third-party participation, not only by low-income members but also by members from other income categories

Table 2.6 answers the question, 'Who complained against whom?' It considers the incomes statuses of complainants and respondents. Column (1) shows the income status of complainants and Columns (2), (3), (4), and (5) indicate the low-income (L), lower middle-income (LM), upper middle-income (UM), and high-income (H) income statuses of respondents, respectively. The first part of Table 2.6 provides information related to the GATT, and the second part provides information related to the WTO.

Under the GATT, 51% (90 of 177) of total disputes were between H members. That percentage decreased to 36% (195 of 548) under the WTO; L and M members accounted for 3% of the disputes against high-income members under the GATT; that share increased to 11% under the WTO. Under the GATT, L members initiated just 19.2% (34 of 177) of disputes; that percentage increases to 36.5% (200 of 548) under the WTO. Under the GATT, H members faced 92% of total disputes—162 disputes in total, of which L members initiated 20% (33 of 162). That percentage remains the same under the WTO (65 out of 325). Under the GATT, L members faced just 3.4% (6 of 177) of total disputes. Under the WTO, the number increased to 101 cases of 548 (18%). The total percentage of disputes initiated by L members shows a marginal increase from 19.2% (34 of 177) to 19.3 % (106 of 548). Nevertheless, with regard to disputes filed by UM members, 18% have been against L members.

⁵⁷ There are some GATT disputes—for example, in 1992 when US imposed countervailing duties on imports of fresh and chilled Atlantic salmon from Norway—in which the European Economic Community (EEC) reserved its right to present its views to the panel as an interested third party.

Table 2.6: Who complained against whom, by income status

Panel A: Table GATT		Income of respondent GATT			
(1)	(2)	(3)	(4)	(5)	(6)
Income of complainant GATT	H	UM	LM	L	Total
H	90 (51)	8 (5)	2 (1)	3 (2)	103 (58)
UM	39 (22)	1 (1)	0	0	40 (23)
LM	29 (16)	0	0	0	29 (16)
L	4 (3)	0	0	1 (0.5)	5 (3)
L + LM	33 (19)	0	0	1(0.5)	34 (19)
Total	162 (92)	9 (5)	2 (1)	4 (2)	177 (100)
Panel B: Table WTO		Income of respondent WTO			
(1)	(2)	(3)	(4)	(5)	(6)
Income of complainant WTO	H	UM	LM	L	Total
H	195 (36)	67 (12)	38 (7)	20 (3,6)	320 (58)
UM	65 (11,8)	31 (5,6)	25 (4,6)	1	122 (22)
LM	48 (8.7)	17 (3)	11 (2)	2(0.3)	78 (14)
L	17 (3)	7 (1,2)	3 (5)	1(.18)	28 (5)
L + LM	55 (11.7)	24 (4.2)	14 (7)	3 (0.5)	106 (19)
Total	325 (59)	122 (22)	77 (14)	24 (4.3)	548 (100)

Source: Author's calculations. Notes: Unit of measurement is number of members; % in parentheses. L=Low-income, LM=lower middle-income, UM=Upper-middle-income, and H= High-income.

Table 2.6.1 more clearly illustrates the contrast. It provides similar information, but classifies disputants in terms of decile rankings of income. It shows that although the lowest 30% of members by income hardly are active as complainants, the disputes they have filed are against members of the highest 20% of income. Members in the lowest 20% income category have not faced any disputes.

Table 2.6.1 Who complained against whom by income deciles

GDP decile ranking of complainant (column)/respondent (row)	3	4	5	6	7	8	9	10	Total
1	0	0	0	0	0	0	0	1	1
2	0	0	0	0	0	0	0	1	1
3	0	0	0	0	0	0	5	30	35
4	0	0	2	0	2	4	11	35	54
5	1	2	4	8	9	27	44	175	270
6	0	2	5	6	10	31	54	146	254
7	1	1	8	4	8	26	43	190	281
8	4	3	17	11	21	58	92	484	690
9	7	7	28	18	34	92	111	501	798
10	19	19	95		121	343	395	1,082	2,148
Total	32	34	159	121	205	581	755	2,645	4,532

Source: Author's calculations. Notes: Unit of measurement is number of dispute cases.

2.3.3 Continent, contiguity, and colonial relationship of disputants

The numbers of countries that are members of the WTO differ by continent. All countries in North America are members of the WTO, and only one country is categorised as low-income country, that is, Haiti. The continent of Asia has six low-income countries that are WTO members and the continent of Africa has 25 low-income WTO members.⁵⁸

Figure 2.2 shows that numbers of active GATT/WTO members differ by continent. The most active continent is South America, with 66% of members having participated actively in the DSU. It also shows that 62% of European WTO members were active under the GATT and that the participation of Asian members has increased from 31% under the GATT to 40% under the WTO.

Table 2.7 shows complainants and respondents by continent. Column (1) shows continent; Columns (2) and (3) show total number of complainants and respondents under the GATT, and Columns (4) and (5) provide the same information for the WTO. The table shows that the North American share of disputes has almost doubled under the WTO, but African members have yet to find their way. The share of Asian dispute initiators has increased during the WTO, compared to the GATT era, and the number of respondents on the African continent is growing.⁵⁹

Figure 2.2: Number of GATT/WTO members per continent and active members

⁵⁸ Asian L countries: Afghanistan, Bangladesh, Cambodia, Laos, Myanmar and Nepal. African L countries: Angola, Benin, Burkina Faso, Burundi, Central African Republic, Chad, Congo Democratic Republic, Djibouti, Gambia, Guinea, Guinea-Bissau, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mozambique, Nigeria, Rwanda, Senegal, Sierra Leone, Tanzania, Togo, and Uganda

⁵⁹ African respondents: Egypt, South Africa, and Morocco.

Table 2.7: DSU participatory role per continent

(1) Continent	(2) GATT Complainants	(3) GATT Respondents	(4) WTO Complainants	(5) WTO Respondents
Africa	3 (1.7)	0	0	10 (1.8)
Asia	8 (4)	15 (8.5)	132 (24)	139 (24)
Oceania	5 (2.8)	2 (1)	119 (21.7)	15 (2.7)
Europe	43 (24)	93 (53)	200 (36)	132 (24)
North America	70 (39.5)	65 (37)	22 (4)	185 (33)
South America	48 (27)	2 (1)	75 (13.6)	67 (12)
Total	177 (100)	177 (100)	548 (100)	548 (100)

Source: Author's calculations. Notes: Unit of measurement is number of members; % in parentheses.

Table 2.8: Contiguity of bilateral disputants, 1948–2016

Complainant's income classification	GATT			WTO		
	Non-contiguous	Contiguous	Total	Non-contiguous	Contiguous	Total
L	27 (96%)	1	28	134 (99%)	1	135
LM	106 (99%)	1	107	458(98%)	7	465
UM	125 (98%)	2	127	676(95%)	32	708
H	452 (94%)	21	473	2,616(97%)	71	2,687
Total	710 (97%)	25	735	3,884(97%)	111	3,995

Source: Author's calculations. Notes: Unit of measurement is number of bilateral disputant pairs; % in parentheses. L=Low-income, LM=lower middle-income, UM=Upper-middle-income, and H= High-income.

Table 2.8 draws attention to the high number of disputes between non-contiguous bilateral pairs in relation to total disputes. During the GATT period, 96.5% (710 of 735) of bilateral disputes occurred between non-contiguous members. During the WTO period, 97.2% (3,884 of 3,995) of bilateral disputes occurred between non-contiguous members. Table 2.8 also shows that irrespective of income status of complainants, there is a high percentage of non-contiguity between disputants.

Figure 2.3: Colonial connection between disputants

Figure 2.3 shows that, irrespective of era and income level, complainants have, in most cases, no colonial connections with their respondents.

2.3.4 Economic integration and tariffs

Figure 2.4 is a collection of pie charts that exhibits the extent of economic integration between disputants. Figure A shows percentages for all disputants; it illustrates that 73% of bilateral pairs that have been disputants during the period under study have no economic agreement. Figures B to E show the extent of economic integration between disputants according to income status; they show that the percentage of disputants with no economic agreement decreases from 97% to 69% as the income classification of the disputants moves from low (Figure B) to high (Figure E). Irrespective of income classification, the majority of disputes are between WTO members that do not have economic agreements.

One of the major impacts of economic agreements is on tariffs. Figure 2.5 shows whether the level of simple weighted average tariff of complainants, compared to their respondents, is higher, lower, or equal. It shows that under the GATT, 89.2% of low-income members that initiated disputes had higher tariffs than those of their respondents; this percentage diminishes as the income category of initiators moves toward high. Under the WTO, the percentage of disputes against lower-tariff members increases among all income categories of complainants; it is as high as 97.7% for low-income members and as low as 36.1% for high-income members. However, when comparing tariff rates under the GATT with those under the WTO, it should be noted that data is limited.

Figure 2.4: Economic integration of disputants

Figure 2.5: Tariffs of complainants compared to tariffs of respondents

2.3.5 Political dimensions of disputants

According to the DPI, the form in which the president (or leader) is directly elected is the most non-democratic. Figure 2.6 shows that for non-high-income members, having presidential political systems has contributed to most of the disputes. During the GATT era, high-income complainants are characterized by having parliamentary systems. With the advent of the WTO era, the share of low-income complainants with parliamentary systems increased to 73% of total dispute initiations by low-income members.

A non-plurality form of democracy indicates an absence of the influence of public opinion and pressure on the elected constituencies. Figure 2.7 shows that, during the GATT, dispute-initiating low-income members had a non-plurality form of democracy. Irrespective of income status, most WTO cases are filed by members that have plurality forms of democracy. However, the percentage of complainants with a plurality form of democracy diminishes as the income category moves toward high income, from 97% for low-income complainants to 64% for high-income complainants.

In summary, these tables and figures in this section characterize disputants during the GATT and the WTO, according to various dimensions. Table 2.9 provides an overview of the main findings.

Figure 2.6: Political systems of complainants

Figure 2.7: Plurality form (democracy) of complainants

Table 2.9: Summary of main findings from tables and figures

Figure/ table	Description: Main result	Result GATT: 1948–1994	Result WTO: 1995–2016
Table 2.3	Active participation rate (Q2 = active members total members)	17.9% (23 of 128 members)	20.7% (34 of 164 members)
Table 2.3	Inactive rate (Q4 = non-active members/total members)	64.8% (83 of 128 members)	59.1 % (97 of 164 members)
Table 2.4	Most active participants	First four frontrunner countries: US, EU, Canada, Brazil	Same as under the GATT
Table 2.5	Income status and general participation of L members	5.4% (7 of 128 members)	9.7% (16 of 164 members)
Table 2.5	Total members participating (including WTO third parties)	34% (44 of 128 members)	62% (102 of 164 members)
Table 2.6	Who complained against whom: L dispute initiators	19.2% (34 of 177 bilateral disputes)	36.5% (200 of 548 bilateral disputes)
Table 2.7	Who complained against whom: L members as respondents	3.4% (6 of 177 bilateral disputes with EU one entity)	18% (101 of 548 bilateral disputes)
Figure 2.2	Continents and active members	Asian member participation: 31%	Asian member participation: 40%
Table 2.7	Continents and complainants	3 African complainants	No African complainants
Table 2.8	Contiguity and disputant pairs	97% non-contiguous bilateral disputants	Same as GATT
Figure 2.3	Colonial connection and disputant pairs	Majority of disputants have no colonial connection.	Same as GATT
Figure 2.4	Economic integration and disputant pairs	No economic agreement between disputants irrespective of the income classification of the complainant	Same as GATT
Figure 2.5	Tariff rates and disputant pairs	H complainants raise disputes against members with equal tariffs.	H complainants raise disputes against members with higher tariffs.
Figure 2.6	Political system and complainants	Complainants tend to be L members with a presidential political system.	Complainants tend to be L and H members with a parliamentary system
Figure 2.7	Plurality and complainants	Complainants tend to be L members with a non-plurality form of democracy.	Most complainants have a plurality form of democracy.

2.4 Discussion and conclusions

Given that the WTO is a member-driven organisation, it is fundamental to assess the extent of inclusiveness of WTO members in the DSU process. This chapter addresses the extent of participation of WTO members compared to GATT members, with reference to the income status of members as disputants from 1948 to 2016. The database consists of 725 initiated disputes, comprising 4,759 bilateral pairs. The chapter uses descriptive techniques to present stylized features of dispute data that helps ascertain the extent of participation of low-income members.

The following observations arise from the descriptive analysis:

- There was a marginal increase in the number of disputes filed by low-income members under the WTO, as compared to the GATT, but disputes with low-income members have increased sharply under the WTO.
- Under the WTO, African countries have not initiated disputes .
- There is widespread use of the third-party role by low-income members under the WTO.
- Almost all bilateral disputes are between ‘distant’ members in terms of contiguity, colonial connection, and economic agreements.

The concluding remarks of minutes of a public forum session of the WTO in 2011 state that, ‘Developing countries should be encouraged to use the WTO dispute settlement mechanism...to ensure the continued good functioning of the system and to make it more effective and operational for them.’⁶⁰ This point had been recognized more than a decade earlier, and the Advisory Council on WTO Law (ACWL) was established in 2001 to address the problem. The Council’s mission is to provide developing countries (developing countries) and less developed countries with the legal capacity to take full advantage of the opportunities offered by the WTO. In 2008, Hoekman, Bank, and Horn noted that the ACWL should have increased the participation of developing-country members, implying that the results were otherwise. Moreover, developing-country members’ various capacity constraints may result in them bringing fewer cases brought to the DSB (Hoekman, Bank, & Horn, 2008). In 2009, Busch, Reinhardt, and Shaffer conducted a study of WTO members to determine whether members had relied on the services of the ACWL for legal representation. They concluded that developing-country members face two problems—one at home and the other in Geneva. The problem at home arises from a lack of support from the home capital or a lack of coordination between ministries in the home capital, and the problem at Geneva arises from lack of experience, expertise, personnel, and legal knowledge.

According to Bown and Hoekman (2007):

Developing countries are rarely challenged in formal WTO litigation for failing to live up to WTO commitments and obligations. The weak incentives for trading partners to enforce commitments reduce the relevance of the WTO for

⁶⁰ WTO, (2011). The session 26 with a theme of dispelling the myths of developing country participation in dispute settlement mechanism was organized by Development Division, WTO and Advisory Centre on WTO Law (ACWL), Retrieved from: https://www.wto.org/english/forums_e/public_forum11_e/session26_summ_e.doc. Last retrieved 27 September 2019.

*trade constituencies in all countries, but especially those in developing economies.*⁶¹

The increase in disputes against low-income members, from 3.4% under the GATT to 18% during the WTO (Table 2.6), questions this observation. The increase could be the result of the post-2001 export spurt. The use of various protective measures by developing economies gives trade partners an opportunity to file disputes against them. These disputes may provide low-income members with the impetus to remove anti-WTO trade obstacles.

According to Shaffer (2009), the experience of more than a decade of observation and time to improve the knowledge, capacity and skills should have been enough and that the strength of the argument related to the experience gets weaker as the time passes. Third-party involvement in disputes was intended to allow members without WTO experience to practice DSB procedures and learn by observing, such that ‘third-party countries today’ could actively participate as ‘complainant countries tomorrow.’ The explicit and official role of third parties⁶² in the dispute process provides new opportunities for participation. It should be noted however, that for a member to join a dispute as a third party, the respondent must officially accept the member.

Third parties receive the parties’ first written submissions and present their views orally to the panel during the first substantive meeting (Article 10.3 of the DSB)⁶³. Third parties have no rights beyond these, although panels can extend the rights of participation of third parties in individual cases. This may suggest the need to re-examine and redefine the role of these parties, which may involve providing them with additional rights that would allow them to receive benefits from panel rulings.⁶⁴ Some developing-country members may decide not to participate to save their scarce resources; as for whether they are active or passive, members that are in the same income bracket face the same trade barriers abroad (Bermann & Mavroidis, 2007). Results show there is a significant increase in the number of active members under the WTO, especially after including third-party members. However, when third parties are not accounted for, there is only a marginal increase in the participation of low-income members.⁶⁵

⁶¹ Brazil, Cuba, and Jamaica (all LM) and India (L) were challenged during the GATT.

⁶² A few cases in which the respondent was alleged to have offered excessive import protection relative to liberalization gains being extended to the complainant have also been extended to third-country exporters, which is consistent with a functioning principle of equity embodied in the MFN rule (Bown, 2009)

⁶³ WTO, (2018k) In the event of non-acceptance, there is no recourse to enforce participation. Panel stage of the dispute: source https://www.wto.org/english/tratop_e/dispu_e/disp_settlement_cbt_e/c6s3p1_e.htm.

⁶⁴ There is a difference between ‘substantial trade interest’ that is required for third parties in consultations and ‘substantial interest’ before the panel. Notably, it is possible to join consultations only with the respondent’s acceptance (and, in the case of non-acceptance, there is no recourse to enforce participation). However, any member that invokes a systemic interest, in practice, is admitted to a panel procedure as a third party without any scrutiny of whether the interest is truly ‘substantial’ (WTO, 2018k).

⁶⁵ As shown in Table 5, the income status and role under the GATT (1948–1994) and the WTO (1995–2016) (previous section), increases from 35% under the GATT to 41% under the WTO. From 1995 to 2014, 5% of disputes were initiated by seven L-status members (Bangladesh, Honduras India, Indonesia, Pakistan, Sri Lanka, Nicaragua); LM-status members accounted for 14% of initiated disputes. During the GATT, L and LM members together launched 17% of the total 153 bilateral disputes; those with L status that initiated disputes included Cuba, Malawi, Nicaragua, Pakistan, and Zimbabwe.

According to Laker (2014, p. 244):

...the low levels of participation of the African members in the dispute settlement system is strongly influenced by 'the cost in time and staying power,' a 'mind-set reluctance to litigate' against major trading partners, 'disputable trade measures' and, sustained, cumulative diligent professional engagement...

The absence of African countries as complainants to the WTO contrasts with their presence under the GATT. Under the GATT, three African countries—Malawi, South Africa, and Zimbabwe—filed disputes.⁶⁶ In a survey by Laker (2014) of African resident representatives in Geneva, 55% of survey respondents mentioned they had no legal capacity, and only 10 of Africa's resident representatives (44%) had legal capacity. Another reason for the absence of African members as complainants may be the pact between the US and Africa. Although the African Growth and Opportunities Act (AGOA) reports there have been a few disputes between the US and African members, the records are not openly accessible.⁶⁷

Of the 44 African members, 18 have participated as third parties in disputes. The expectation that the third-party role would function as a stepping-stone to build expertise and capacity has not substantially induced these members to initiate disputes under the WTO. Lack of experience, expertise, and skills is not necessarily a valid argument for the absence at the DSU; the conclusion that the experience of a developing-country member as a complainant or as a respondent may increase the likelihood of complaining again (Davis & Bermeo, 2009) has an exception.⁶⁸

According to Head and Mayer (2013), 'Typically, contiguity...has about half the effects of colonial links...."non-traditional" determinants of economic exchange turn out to be crucial factors in trade patterns. Policy variables such as RTAs have large estimated effects'.⁶⁹ Contrary to factors explaining trade patterns, the results of this chapter show that most bilateral disputants are non-contiguous, have no economic agreement between them, and no colonial connection. This implies that 'institutional distance' between bilateral pairs matters. This is one of the chapter's most striking observations, given that bilateral trade determinants are expected to contribute to bilateral trade disputes. The role of distance is notable, even though many other factors appear to be relevant to dispute initiation. The observation calls for deeper investigation and leads to the topic of the next chapter, that is, formal analysis of the predictors of disputes in the GATT and WTO eras.

⁶⁶ All after the post-independence era; Malawi-US in 1967, South Africa-Canada in 1985, and Zimbabwe, as one of nine complainants against the US in 1994.

⁶⁷ <https://agoa.info>. The AGOA is a US Trade Act enacted on 18 May 2000 as Public Law 106 of the 200th Congress. The AGOA has since been renewed to 2025. On December 2016, it was extended to 37 Sub-Saharan African (SSA) countries, to 1,800 tariff line products in addition to 4,600 duty-free products under the US generalized system of preferences program (GSP) program. It includes import-sensitive products such as apparel, footwear, watches, handbags, and luggage (USAID).

⁶⁸ Egypt, South Africa, and Morocco have experience as respondents.

⁶⁹ Head and Mayer (2013) use this term to refer to all factors other than traditional gravity factors (i.e., GDP of exporter and the importer, and distance between them).

Appendix Chapter 2

This section provides a description of the variables in the database. Though it is conventional to split the disputes into bilateral disputes for the analysis, the standard database of Horn and Mevroidis (2011) and WTO records do not provide such an overview. Therefore, whenever there is a joint dispute filed by a multiple number of countries, we have split disputes into bilateral cases carrying the same dispute number. In the event of multiple complainants or multiple respondents, each complainant or each respondent is taken as a separate case. This creates multiple numbers of bilateral cases for each multi-complainant and multi-respondent initiation of a dispute. This is done taking into account that the trade analysis is primarily a bilateral trade analysis, and the split structure is more convenient empirical analyses.

The same applies to the dispute cases filed by or filed against the EU, which implies that the dispute cases by and against the EU increase by the number of EU members in a given year. The number of member countries the European Economic Community (EEC) increased during the realm of the GATT. The EEC was comprised of six members for the period from 1952 - 1972, nine countries until 1981, and reached a number of ten and 12 members for the period of 1986 and 1994, respectively, and included 15 countries at the beginning of the WTO in 1995⁷⁰. During the covered period of the WTO era, i.e., 1995-2016, the European Union experienced an increase in its membership three times, making the total number of its members 25, 27, and 28 in the years 2004, 2012, and 2014, respectively.

Additionally, the convention also dictates that multiple filings for the same case are to be taken as one initiation (Maggi, Staiger 2013; Davis, Bermeo 2009). For example, the dispute cases DS 16, DS 27, and DS 152⁷¹ are separate filings, however, they are taken into account as one initiation because they are by the same plaintiffs against the same respondents and about the same topic. These three cases are related to the imports of bananas into a European Community area. This dataset registers all of these complaints as a separate initiation of the dispute cases⁷². It may be decided to use these 'multiple filings' in an analysis as one legal litigation as the dataset includes this on the grounds that each separate filing is a dispute.

The database contains the chronologically ordered disputes brought in at the GATT and WTO. The first spreadsheet contains all of the GATT dispute cases, 132 in total (739 bilateral cases). The second contains all of the WTO disputes, totalling 4,028 bilateral cases. The second spreadsheet contains a total of 4,028 WTO bilateral cases. Each spreadsheet begins with a dispute number, the complainant country, and the respondent. Table 2.A1 provides a description of the variables. Column 1 refers to the column in the database, Column 2 provides the variable name, and Column 3 explains the variable.

⁷⁰ The dispute dataset shows the EU member countries with a prefix EEC. This is to distinguish from the European member countries, which complained or were complained against individually.

⁷¹ Maggi and Staiger(2013) exclude eight cases from their analysis for this reason. They exclude DS3, DS16, DS52, DS101, DS106, DS185, DS228, and DS271 as they are handled in DS41, DS27, DS65, DS132, DS126, DS187, DS230, and DS270, respectively; the case DS 152 which is the same as DS16; and DS27 is taken into account for a reason that is not known.

⁷² The official status of DS16 is that it is still in consultation, and DS27 has official status as it is a mutually agreed solution. This raises a question it is mutually agreed why there was a need for DS 158 by the same complainant countries for the same product.

Table 2.A1: Description of variables in the GATT/WTO dispute database

Column	Title	Explanation
A	iso_o	ISO 3166-1 alpha-3 – three-letter country code of the complainant country.
B	complainant	Complainant country: The country, which initiated the process by requesting consultation (Note 1)
C	iso_d	ISO 3166-1 alpha-3 – three-letter country code of the respondent country.
D	respondent	Respondent country: The country against which the Complainant country has initiated the process by requesting a consultation (Note 2)
E	year	Year during which the dispute is initiated
F	disputeNumber	For the WTO cases the official number with the DS code. For the GATT cases, codes assigned chronologically based on the WTO system but with the prefix GATT. The Dispute Settlement number: DSNo: as it appears in the official document and website of the WTO. (Note 3)
G	dateRequestConsultation	The data on which the complainant country has declared the intention to discuss matter officially by consultation request
H	dateCurrentStatus	The official status of the dispute; it is the most recent date that informs about the outcome of the dispute. The current status refers to legal stage as of April 2018
I	dateRequestPanel	The date on which the complainant country asks the DSU to establish the panel
J	dateDSBEstablishment	The date on which the DSB to establish the panel
K	datePanelEstablished	The date on which the panel is established
L	datePanelComposed	The date on which the panel is composed
M	datePanelReport	The date on which the panel issues the report
N	dateABReport	The date on which the AB issues its report, in case the dispute is referred to the AB
O	dateArbitratorReport	The date on which the Arbitrators report is issued
P	dateAdoption	The date on which the panel report is adopted
Q	dateAdoption2	The date on which the AB report is adopted
R	dateAdoption3	The date on which the panel is established
S	dateImplementation	The date on which the implementation is notified
T	dateJoinComplainant	The date on which the complainant country has acceded to the GATT/ WTO
U	dateJoinRespondent	The date on which the respondent country has acceded to the GATT/ WTO
V	product	The main cited product in dispute (Note 4)
W	hs	The hs code of the product in dispute. (Note 5)
X	sector	The sector to which the product is related; primary, secondary, tertiary or quaternary (note 6)
Y	referenceOtherDispute	The reference to the other disputes in the WTO cited by the dispute cases (note 7).
Z	currentStatus	The status of the dispute/ the outcome of the dispute as of the date. (Note 8)
AA	disputeSettled	Whether the dispute can be considered as settled Yes/ No (Note 9)
AB	AgreTOD1	First Agreement cited. Agreement topic cited in the original document
AC	AgreArt1	The articles of the first agreement cited. Agreements Art as cited in request for consultation
AD	AgreTOD2	2. Agreement topic cited in the original document
AE	AgreArt2	2. Agreements Art as cited in request for consultation
AG	AgreTOD3	3. Agreement topic cited in the original document
AH	AgreArt3	3. Agreements Art as cited in request for consultation
AI	AgreTOD4	4. Agreement topic cited in the original document
AJ	AgreArt4	4. Agreements Art as cited in request for consultation
AK	AgreTOD5	5. Agreement topic cited in the original document
AL	AgreArt5	5. Agreements Art as cited in request for consultation
AM	AgreTOD6	6. Agreement topic cited in the original document
AN	AgreArt6	6. Agreements Art as cited in request for consultation

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AO	AgreSum1	1.Agreement cited in summary (PDF)
AP	ArtSum1	1.Art as cited in summary
AQ	AgreSum2	2.Agreement cited in summary (PDF) 2
AR	ArtSum2	2.Art as cited in summary2
AS	AgreSum3	3.Agreement cited in summary (PDF) 3
AT	ArtSum3	3.Art as cited in summary3
AU	ToAgre	Total number of cited originally Agreements
AV	TArtO	Total number of cited originally Articles
AW	thirdPartyCountries	The member countries which have requested to participate in the dispute as a Third-party countries
AX	numberThirdParties	Total number of countries that are third parties in the dispute case
AY	numberReservedThirdParties	Total number of countries that have reserved rights as third parties in the dispute case
AZ	keywordsPanel	Key words of the Panel Report
BA	keyFindingAB	Key finding Appellate Body
BB	KeyFindArbR	Key finding Arbitrator's Report(check the spelling in excel)
BC	defendentComplied	Whether the dispute can be considered as settled Yes/ No
BD	keyCauseCurrentStatus	Key of cause current status
BE	shortTitle	Short title as appeared on the WTO website per dispute case
BF	shortCaseDescription	Short case description
BG	sourceWTO	Official document source: WTO dispute
BH	sourcePDF	Official document source: PDF summary

Notes: The Complainant (CC) is the country that initiated the process by requesting a consultation. When there are multiple countries as complainants, the dispute number remains the same, and this column lists all of the complainants. For the EU, it lists all of the countries that were part of the EU during the year of dispute initiation. Table 2 in an earlier section provides an overview of the years and EU members (Column B).

The Respondent country (RC) is the country against which the Complainant country has initiated the process by requesting a consultation. For the EU, it lists all of the countries that were part of the EU during the year of dispute initiation (Column D). The Dispute Settlement number (DSNo) is the number that is taken as it appears in the official document and website of the WTO. For the WTO cases, it is the official number with the DS code. For the GATT cases, it is the codes assigned chronologically based on the WTO system but with the prefix GATT. The Dispute Settlement number (DSNo) is as it appears in the official document and website of the WTO (Column F). Product: This column mentions the product that is central to the dispute settlement. If there is a particular tariff or a measure that is a matter of enquiry, then the concerned product is considered as the product (Column V). In most of the cases, the disputes concern multiple numbers of products at HS6 levels.

HS: The six digit HS code is used because it is internationally standardized. Furthermore, it does not involve any country specific codes. The information provided with respect to the HS classification of the products under dispute is taken from Horn and Mevroidis documents. For the GATT disputes, it is taken from the WWW HS.org at a six-digit level as updated in February 2014. When such information is not available, the data reports the sign NA (not available) in Column W. Sector: This column mentions the sector to which the product belongs, i.e., Primary, Secondary, Tertiary, and Quaternary. The Quaternary includes the measures that cover a general policy and the issues related to Intellectual property rights and knowledge based issues (Column X).

ReferenceOtherDispute: This column shows a dispute case number that is referred by the other countries while filing a DS or a DS that is referred to in a DS process. The reference to the concerned cases in other disputes shows some connection with the other dispute cases. (Column Y). CurrentStatus: current status indicates the legal/ procedural phase at which the dispute finds itself. The date of the current status is as of April 2018. The main source of it is the WTO site; this applies to the current status of all disputes. This specific abbreviation list is shown in Table 4. The WTO website combines the dispute settled by Settled, Withdrawn, mutually agreed solution (SOTMAG) into one category. This data set splits into W or MAGS whereby W stands for Withdrawn and MAGS stands for mutually agreed solutions. (Column Z). The abbreviations are alphabetically listed in the following Table 4. Dispute settled: indicates whether the dispute is still ongoing. It indicates whether a dispute is settled which is denoted by 'Yes' or 'No'. For the GATT countries, this implies that, if the report is adopted, it is

considered as 'Yes' and if the report is unadopted it is filled in as 'No'. For a status other than these two, it is decided case wise to determine whether it is settled or not (Column AA). There are three peculiar cases related to the basic observations of bilateral pairs. These consist of three extra observations that involve countries that were non-GATT/WTO members when they were involved in trade disputes. The first is about GATT dispute Number 25. Uruguay filed a dispute in 1961 against the fourteen GATT member countries⁷³ and one non-member, i.e., Switzerland. Switzerland enjoyed a special status and joined the GATT as late as in 1966 and, therefore, does not form any dyad before the year 1966. However, given that this complaint was filed against it, this country is added to this year. The second case is related to Hong Kong. During the GATT period, there were two cases filed by Hong Kong, viz: GATTDS 50 and GATTDS 65 in 1979 and 1982, respectively, under the colonial period of Great Britain. The first case, GATT 50, is against Norway which does not cause any problem of a bad merge as the complainant is Great Britain. However, the case GATT 65, is when Great Britain complained on behalf of Hong Kong against the EU. However, Great Britain being a member of the EU gives rise to the second exceptional case. The third case is the WTO dispute DS 469 that Denmark filed in 2013 on behalf of the Faroe Islands that are neither an EU member⁷⁴ nor a WTO member. It is an independent territory under Denmark rule which is an EU member, giving rise to third case exceptional case. These cases are added to the basic member matrix data set. The number of dispute observations consists of 4768 bilateral disputes of which 735 are GATT disputes and 4023 are WTO bilateral disputes. Multiple numbers of disputes involve the same complainant and the same respondent in a given year. For example, the EU filed four cases in 1998 against India; this gives rise to a total of 60 bilateral cases as the number of EU members in 1998 was 15⁷⁵. There are 1017 such cases that are unique observations only to the DS number.

⁷³ Austria, Belgium, Canada, Czechoslovakia, Denmark, Finland, France, Federal Republic of Germany, Italy, Japan, the Netherlands, Norway, Sweden, Switzerland, and the United States of America.

⁷⁴ It is explicitly asserted by treaties of the European Union that the Faroe Islands are not part of the European Union. The Faroes are not grouped with the EU. When Denmark joined the European Economic Community, now the European Union, in 1973, the Faroes had the option to remain outside. Like other fisheries dependent communities, the Faroese have not found it in their interest to become subject to the Common Fisheries Policy. As a result, the Faroes are regarded as a third country in the context of the EU.

⁷⁵ These disputes do not have bilateral pair and year specific unicity. These cases are specific for a given year and have unique DS numbers just like all of the other cases. A list of such cases is provided in the data guide description. In 1998, while there are a total of only 15 entries for each of the members of the EU for the year 1998 with India, this multiple number of complaints increases the number of cases fourfold to 60.

Figure 2.A1: Truncated normal distribution curve of dispute initiators with
Panel A as GDPpc and Panel B as share of merchandise exports

Panel A

Panel B

Chapter 3

Revisiting the determinants of trade disputes

Whether this power which is possessed by the superior state can exist or be exercised without justice or only with justice (Plato, The Republic, around 380 BC).

3.1 Introduction

Descriptive analysis in the previous chapter showed that institutional distance matters. It showed that trade disputants did not have an economic agreement, were non-contiguous, and had no colonial connection.⁷⁶ These results are surprising, given that the presence of economic agreements, contiguity, and colonial connections are important non-traditional factors that explain patterns of bilateral trade (Head & Mayer, 2013a). Furthermore, even though Sattler and Bernauer (2011) conclude that more trade does not mean more disputes, the intuitive expectation is that the presence of bilateral trade, rather than the absence, accounts for bilateral trade disputes. Bilateral trade between any two countries is largely explained by the gravity model, which accounts for the income of the exporter and importer and the distance between them. Therefore, under the assumption that the gravity model explains trade disputes, this chapter carries out a formal statistical analysis to identify the predictors of GATT/WTO disputes from 1948 to 2016.

A literature review reveals there is no consensus on the determinants of GATT/WTO disputes. Literature on dispute determinants shows several explanations for dispute incidence at the GATT/WTO, ranging from export diversity (Horn et al., 1999) to re-election year and the swing state industry in the US (Conconi et al., 2017). However, although these studies use explanatory factors based on established models such as terms of trade (Bown, 2002), gravity (Sattler & Bernauer, 2011), and tariff overhead (Kuenzel, 2015), they are limited, because they lack uniformity in terms of standard theoretical and empirical frameworks.⁷⁷ As a result, literature provides an eclectic mix of variables and fails to present an overall picture. Moreover, to the author's best knowledge, disputes at the GATT/WTO have been investigated only minimally from the point of view of the gravity model of bilateral trade,⁷⁸ even though this model has exceptional stability and great power to explain bilateral trade (WTO & UNCTAD, 2012; Head & Mayer, 2013). Accordingly, this study is the first to apply the gravity model to the new comprehensive data set (see Chapter 1) on disputes, to provide insights into the economic determinants of trade disputes. It asks the question: What are the economic determinants of the GATT/WTO dispute incidence from 1948 to 2016?

⁷⁶ Chapter 2, Figure 2.4, Table 2.8 and Figure 2.3, respectively.

⁷⁷ Sattler and Bernauer (2011) use trade, sum of imports and exports, as proxies for distance. They conclude that trade has a dispute-enabling effect.

⁷⁸ Although, for example, by Martin, Mayer, and Thoenig (2008) used theory of gravity for theoretical and empirical analysis and for the relationship between military conflict and trade.

This time frame is advantageous for examining the effect of transformation from the GATT to the WTO. The rule orientation of the WTO was expected to discourage the power plays that occurred under the GATT and give more power to developing-country members under the WTO (Lacarte-Muro & Gappah, 2000).⁷⁹ Given the trade objectives of the GATT/WTO and their functions as forums for the settlement of trade disputes between members, an increase in the number of disputes by lower-income members would be anticipated.⁸⁰ However, as the previous chapter (Table 2.6.1) shows, the number of disputes initiated by lower-income members has increased only marginally.⁸¹ Accordingly, an intriguing question is: Do the determinants of disputes differ according to their initiation under the GATT or under the WTO?

The remainder of this chapter is organised as follows: Section 3.2 reviews relevant literature and identifies factors related to trade disputes; Section 3.3 outlines the methodology and explains the probit and conditional logit models; Section 3.4 presents probit and logit results; and Section 3.5 discusses the results and presents conclusions.

3.2 Literature

There is a large and growing body of literature that suggests variables that determine dispute incidence at the GATT/WTO, including: export diversity (Horn et al., 1999), democracy (Reinhardt, 2000), market access (Bown, 2005), legal capacity (Guzman & Simmons, 2005), endured protectionism by trade partner (Götz & Rudolf, 2007), trade structure (Francois et al., 2008), previous initiations (Davis & Bermeo, 2009), preponderance effect (Sattler & Bernauer, 2011), plaintiff winning coalition (Bobick & Smith, 2013), leadership and support coalition (Rosendorff & Smith, 2013), tariff overhang (Kuenzel, 2015), number of years away from election (Pervez, 2014), plurality rule (Betz, 2017), re-election year and swing state industry (Conconi et al., 2017), article-specific and disputant-specific learning (Maggi & Staiger, 2017), and affirmative anti-dumping (Feinberg & Reynolds, 2018). Appendix Table 3.A1 presents an overview of studies related to the determinants of GATT/WTO disputes.

Although scholars have indicated the importance of these variables to predicting trade disputes, results have been interpreted mostly in terms of support for either a legal capacity effect or a power effect. Low-income members often do not have enough resources to identify trade-partner violations. Moreover, even if they do identify violations, they may not have sufficient resources to carry out formal proceedings. This argument forms the essence of the capacity hypothesis. In contrast, the power hypothesis implies that despite the identification of trade violations, affected members fail to file disputes, because they fear retaliation from more powerful trade partners. This argument is an alternative to the legal capacity hypothesis for explaining the underrepresentation of low-income members at the DSU.

⁷⁹ WTO (2018l) Less-developing country members form 20% of the total members of the WTO. Developing countries are, according to the OECD's definition, all countries excluding H countries. Refer to Footnote 37 for a list of countries https://www.wto.org/english/thewto_e/whatis_e/tif_e/org7_e.htm

⁸⁰ WTO (2018m) To expand the production of and trade in goods and services', <https://www.wto.org/> Accessed 2018 March.

⁸¹ With the increase in exports and imports of intermediate goods, Developing members registered an average growth of 15.5% and 14%, respectively, from 2000 to 2012.

Literature also suggests that whether GDP supports or refutes the legal capacity hypothesis depends on what the GDP variables represent and the way the results are interpreted. Bown (2005) takes the GDP of exporters as a proxy for their capacity to absorb legal costs; he explains that a positive GDP and the significance of market access and exporter's share in the respondent market are evidence of the power mechanism at work. Davis and Bermeo (2009) support the legal capacity hypothesis, by connecting it to the emerged significance of previous experience. Reinhardt (2000) interprets negative GDP in terms of power. Guzman and Simmons (2005) find that retaliatory power has no significant effect on defendant selection in WTO disputes; they explain negative GDP in favour of the legal capacity hypothesis.

In acknowledgment of the importance of legal expertise, the ACWL was established in 2001 to mitigate or reduce the difficulties faced by poorer members. Studies do not offer conclusive evidence on the effect of the ACWL on the dispute initiations by lower-income members. Davis and Bermeo (2009) note that for the years 2001 to 2003, ACWL members were more likely to file disputes, whereas Bown and McCulloch (2010) conclude that the ACWL has not been able to overcome all problems, resulting in fewer disputes than possible.

A review of literature identifies two main conceptual issues. The first pertains to the definition of trade disputes and the second to the definition of legal capacity. The first discussion focuses on whether trade disputes at the GATT/WTO represent real disputes. The importance of this issue relates to the possibility of selection bias, because only disputes filed at the WTO can be considered. Horn et al. (1999) identifies this as a problem, because the number of informal bilateral consultations is not known; the assumption is that the data are unbiased. In this context, Francois, Horn, and Kaunitz (2008) note that requests for consultations under the DSU could be 'packages' of conflicts, made up of several dimensions. Referring to this discussion, Guzman and Simmons (2005) pose the question: 'Is the problem of selection bias important, and is it likely to affect the claims we are making in our paper?' Although they admit they cannot rule out such an effect, they conclude it is unlikely to be present.

The second issue in the literature pertains to the operational definition of legal capacity. Horn et al. (1999) observe the lack of data on legal capacity of national trade administrations, and their observation remains applicable to date;⁸² they take the number of representatives at the WTO as a proxy for legal capacity.⁸³ However, Francois et al. (2008) point out that WTO representatives in Geneva are highly educated, competitively selected, trained bureaucrats who may not be typical of the legal expertise of a country. Guzman and Simmons (2005) include other proxies such as the number of embassies abroad. Besson and Mehdi (2004) use the gap in the number of representatives between developing-country members and L-developed country members as a measure of legal capacity. Busch, Reinhardt, and Shaffer (2009) propose the (much-desired) construction of an index of legal capacity by considering, among other things, experience in handling the general WTO matters. However, such an index

⁸² Many other studies, such as that of Horn et al. (1999) have used number staff working at Geneva or number of embassies, but they fail to show expected results at significance. Availability of reliable data is another issue related to legal expertise.

⁸³ Simple developing-country member count of number of delegates listed in the WTO phone directory. Horn et al. (1999, p15) note, 'While there seem to be some correlation between GNP/capita and the propensity to file complaints, this crude proxy for legal capacity does not yield any significant coefficient at the 95%'.

is not available for all years. Overall, literature shows that none of the variables used as proxies for legal capacity have shown noteworthy or consistent results, with the exception of GDP.⁸⁴

In this vast pool of knowledge and insights, there is an opening for some generality and the development of a standard approach to predicting disputes that have occurred. Accordingly, this chapter is not limited to any specific agreement invoked, type of member, or sector. In terms of data and methods, it deviates from previous studies, taking an approach that reflects the work of Sattler and Bernauer (2011).

3.3 Estimation and data

3.3.1 Estimation models in literature

Various scholars from different perspectives have attempted to investigate the determinants of disputes and predict the probability of dispute occurrence. Models and estimation techniques are chosen according to definitions of dependent variables. Because WTO disputes are relatively rare within the set of all potential bilateral pairs, researchers have used logit regression (Bobick & Smith; Kuenzel, 2015; Rosendorff & Smith, 2013) or a negative binomial model (Davis & Bermeo, 2009; Sattler & Bernauer, 2011). Rosendorff and Smith (2018) use the rare-event logit model; although they acknowledge the significant role of the EU as a complainant, they omit such cases.⁸⁵

Bown (2005) uses a standard ordered probit model in which the dependent variable is the ordered choice of an exporter. An exporting member has three choices: (1) file a complaint, (2) do not file a complaint, or (3) join the complaint as a third party. Given that Bown assumes that the decision to file is an ordered choice, he implicitly assumes that if a member decides not to file a complaint, another member that is also suffering from a similar breach by the same trade partner has identified a breach. Further, he implicitly assumes that the other member has the resources to file—and will file—a complaint within the desired time frame of a potential complainant. Moreover, he assumes the complainant has resorted to the DSU article to allow the potential complainant to join as a third party.⁸⁶ Finally, he acknowledges that the joining of a member as a third party is subject to the approval of the respondent.⁸⁷

⁸⁴ Studies have provided evidence that GDP and enforcement of contracts through legal systems relate positively (Magee, 2010). Kaufman Kraay and Mastruzzi (2011) shows that the GDP is strongly and positively associated with rule of law.

⁸⁵ With a share of 19.2% of total complaints (95 of 488) during the WTO and 82 (16.8%) cases as respondent, the EU has emerged as the second-largest player in the DSU after the US. During the GATT, the percentage of complaints by the EU is 14% (19/132). Excluding the EU makes complaints more rare. The EU takes a pragmatic approach to cases involving the EU by creating a pseudo-nation EU. With regard to economic indicators such as population and GDP, Rosendorff and Smith (2018) treat the EU as the sum of its constituent members. In their analyses, they exclude all dyads in which an EU member is the complainant. However, because individual EU states are defendants, they include directed dyads that include EU members.

⁸⁶ By choosing Article XXIII: 1, the complainant can prevent the involvement in the consultations of third parties. This option may be attractive for a complainant that intends to work toward a MAGS with the respondent without interference from other members (WTO, 2018n). Moreover, joining as a third party requires the respondent's consent.

⁸⁷ WTO (2018o). In the case of non-acceptance, there is no recourse to enforce participation. Article 10.2 of the DSU states that a member that has 'a substantial interest in a matter before a panel' is eligible. This is different

Bown discusses an alternative method, the multinomial logit, in which choices do not need to be ordered. However, he chooses the standard ordered probit model to deal with the assumption of independence of irrelevant alternatives (IIA) of the logit model.

Reinhardt (2000) uses a bivariate probit model to investigate the point at which the US decides to file a complaint at the WTO and when complaints filed under Section 301 are a subset of complaints filed by the US.⁸⁸

Sattler and Bernauer (2011) use a zero-inflated negative binomial model to deal with the problem of zeros in time-series cross-sectional analysis. Given that this involves an estimation of the possibility of a dispute, it accounts for variation in disputes filed by bilateral trade partners that have a positive possibility of dispute. The authors also apply the cross-sectional model with the dependent variable, defined as the yearly disputes for a given bilateral pair.⁸⁹ The binomial distribution is useful when the probability for each observation is an independent observation. Although each request for consultation is a unique initiation of a dispute, initiation of a dispute may depend on other disputes. A dispute at the WTO may not be independent, because some disputes succeed previous disputes and could be reactions to other disputes with other members.⁹⁰

Given the binary nature of the dependent variable, this chapter chooses to use the probit model.⁹¹ However, given its limitations in considering member-pair fixed effects and the advantage of insight into the robustness of time-invariant determinants of trade disputes at the WTO, it supplements the probit model with the conditional logit method.⁹² Because the probit model estimates time-fixed effects, it considers the unobserved year-specific characteristics that the model does not take into account. An example of a year-specific effect

from qualifying for third-party participation in consultations, which must be approved by the respondent for consultations, under DSU Article 4.11. A complainant can choose one of the two legal bases for GATT 1994 and the covered dispute agreements under Articles XXII or XXIII: 1. Practically, the main difference between these two options is the possibility of other WTO members joining as third parties (which is possible only when consultation is pursuant to Article XXII of GATT 1994 or XXII: 1 of GATS), https://www.wto.org/english/docs_e/legal_e/28-dsu_e.htm#10, last accessed October 4, 2019.

⁸⁸ Section 301 of the Trade Act of 1974 provides the US with the authority to enforce trade agreements, resolve trade disputes, and open foreign markets to US goods and services. Section 301 is simply a process that requires the US government to identify countries that deny adequate protection for IP rights and rely on the 'normal' Section 301 for any potential enforcement actions that may be taken to address the IP rights problem (Dunn & Fennell, 2004). Because the decision to file a GATT/WTO complaint depends on the simultaneous choice of whether to initiate a Section 301 investigation, the errors of equations of the two processes will be correlated, leading to potential bias in the results if estimated separately. Reinhardt estimates a bivariate probit model with two dependent variables. Although these processes are mutually exclusive, they are negatively correlated (Reinhardt, 2000).

⁸⁹ For the cross section, the authors use 1995–2003 averages for the explanatory variables and the cumulated number of disputes in a dyad during that period.

⁹⁰ DS22 Philippines against Brazil and DS30 Sri Lanka against Brazil over desiccated coconuts or Guatemala against the EU in banana cases DS16, DS27, and DS158

⁹¹ The probit model estimates the parameters by iteration method. Iteration is stopped and converged if the difference between two successive log likelihoods is very small. Small cell percentage in any category cannot converge easily in iterations. In this case, the exact logistic regression model may be used. Fixed-effect specification in xtprobit leads to biased results. Problems that occur are (1) estimating N incidental parameters and (2) inconsistency (Williams, 2015).

⁹² Conditional logit is a specialized type of logit, equivalent to a log-linear model, where main effect of the binary dependent variable is represented in term of the covariates.

is the pro-cyclical trend of applied tariffs in developing-country members (Lake & Linask, 2016). The conditional logit allows consideration of the bilateral-pair fixed effect that accounts for unobserved characteristics between bilateral pairs, such as war, military interventions, and common population composition.

3.3.2 Gravity estimation model

In its search for general determinants of all of bilateral trade disputes from 1948 to 2016, this chapter uses the principle of gravity for trade, which states that bilateral trade is proportional to the size of an economy and is inversely proportional to distance (Head & Mayer, 2013). Theoretical support for applying the gravity equation to the bilateral trade disputes can be found in Head and Mayer's (2013:19) assertion that 'micro-foundations for the gravity equation for trade is that they can be applied to a range of other bilateral flows and interactions'. The application of gravity estimation to a trade dispute is justifiable, because a dispute initiation at the DSU is primarily a bilateral trade dispute involving any two WTO members that must follow a set of rules and procedures that entail time-bound interactions.

Moreover, empirics show a relationship between trade and trade disputes Figure 3.1 plots a log of bilateral trade on the X-axis as well as the annual number of bilateral disputes between bilateral pairs from 1948 to 2016.⁹³ It shows a direct relationship between trade and trade disputes. Given that trade is a function of the GDP of the bilateral trade partners and the distance between them, it is imperative to use the gravity equation. Furthermore, in empirical literature on international trade, the gravity equation functions as a workhorse; this chapter follows suit.

The probit estimation of bilateral trade dispute model is:

$$Prob[Dispute_{ijt}] = \frac{Y_{it}\beta_1 Y_{jt}\beta_2 Z_{ijt}\beta_3}{D_{ij}\beta_4} \quad (3.1)$$

The conditional logit estimation is:

$$xtLogit[Dispute_{ijt}] = \frac{Y_{it}\beta_1 Y_{jt}\beta_2 Z_{ijt}\beta_3}{D_{ij}\beta_4} \quad (3.2)$$

where $Dispute_{ijt}$, is a function of real GDP of the complainant and the respondent in year t ; Y is a proxy for the respective member's economic size (GDP); D_{ij} is the physical distance between i and j ; and Z_{ijt} represents a range of variables that control for the location of the member and other standard variables used in literature for bilateral trade determinants.

⁹³ Where trade is sum of exports and imports in US\$ between a bilateral pair for a given year from 1948 to 2016 (source PWT 9.0).

Figure 3.1: Bilateral trade and trade disputes, 1948–2016

3.3.3 Data

This chapter estimates the predictive power of bilateral trade determinants on trade. The panel data set has 239 countries, of which 164 are WTO members. It contains observations from 1948, the year of establishment of the GATT, to 2016. The panel is arranged by bilateral pair and year. The maximum number of bilateral pairs is $239 \times 238 \times 68 = 3,754,212$.⁹⁴ Of these bilateral pairs, there is a maximum number of $164 \times 163 \times 68 = 1,764,312$ potential disputes possible. Data on countries' participation status in the GATT/WTO are drawn from Tomz, Goldstein, and Rivers (2007) and have been updated using the WTO website⁹⁵.

The dependent variable is binary, defined as the probability of the incidence of trade disputes for a given year for bilateral trade pairs that are GATT/WTO members from 1948 to 2016. A request by a WTO member at the DSU for a consultation with another WTO member is considered an initiation of a trade dispute. For all years under consideration, the chapter assumes that a GATT/WTO member makes one of two choices: $i \in \{0, 1\}$, where 0 = no dispute, or 1 = dispute. Table 3.1 provides the frequency distribution of the dependent variable.

This chapter draws additional data for the independent variables from various sources. Table 3.A2 provides descriptive statistics of these variables in the data set and Table 3.A3 provides the correlation matrix of the variables in the data set. Bilateral trade data on imports and exports (in US\$ millions, 2005) are from IMF (2014).⁹⁶ Imports will be used for the primary

⁹⁴ This number (3,754,212) is smaller than the total number of observations in the data set (3,924,858), because a bilateral pair can have a multiple number of disputes in a given year. For more information, refer to the Chapter 2 on construction of data and observations.

⁹⁵ (WTO, 2018i) GATT/ WTO Members: https://www.wto.org/english/thewto_e/whatis_e/tif_e/org6_e.htm.

⁹⁶ For imports: costs insurance and freight (c.i.f.) and for exports: free on board (f.o.b.)

analysis and exports for robustness checks. Data on GDP are from the Penn World Table (PWT 9.0). The GDP used is the real GDP variable based on the GDP from the output side in year t for a complainant/respondent at constant 2011 national prices (in US\$ millions 2011).⁹⁷ Population data are obtained from PWT 9.0. Several dyadic variables are taken from CEPII (2008); they include simple geodesic distance (in kilometres), whether a bilateral pair shares a common language, whether they share a border, whether they had colonial relations, and whether a country is landlocked. Data on countries' participation statuses are from Tomz et al. (2007). An update of countries that acceded to the WTO as formal members comes from WTO (2018i). Data on the extent of economic integration is taken from Bergstrand's database on Economic Integration Agreements (2017). Data on the legal origins of countries is taken from LaPorta et al. (2007), and data on political variables, such as plurality and proportional representation, is taken from Cruz, Keefer, & Scartascini, (2016)⁹⁸. The variable of observable protection is based on the application of a scale developed by Bown (2009: p 80). Data on tariff rates are taken from the World Bank Indicators (2014)⁹⁹, and data on dispute initiation year are part of the self-compiled database based on WTO (2016a).

Table 3.1: Frequency of dependent variable

Dispute	GATT/WTO members	Non-GATT/WTO members	Total
0	3,316,093	598,788	3,914,881
1	9,977	0	9,977
Total	3,326,070	598,788	3,924,858

3.4 Results

This chapter identifies the general determinants of trade disputes at the GATT/WTO from 1948 to 2016, using new data. The dependent variable is a dichotomous variable that measures the probability of a dispute between a bilateral pair. To obtain the general effect of dispute incidence and gravity variables from 1948 to 2016, the chapter uses both probit and logit methods. Probit results display robust standard errors (clustered by member pairs) with year fixed effects. Logit results consider the year fixed effects and the bilateral-pair fixed effects.

Subsection 3.4.1 addresses basic gravity variables and geographic and institutional variables. Subsection 3.4.2 considers trade agreements and their heterogeneity. Subsection 3.4.3 divides the full sample size into two periods, the GATT and the WTO, to investigate their differences in determinants according to income differences of GATT/WTO members. Finally, Section 3.4.4 describes the sensitivity tests applied to check the robustness of results.

⁹⁷ PWT 9.0 provides the real GDP measure (RGDP), which equals GDPo (GDP from output side) in 2005; information on its growth rate is taken from the national accounts of each country, thereby making it specific to the country.

⁹⁸ The database on political institutions (DPI) as compiled and revised by Cruz, Keefer & Scartascini (2016).

⁹⁹ <https://data.worldbank.org/indicator/TM.TAX.MRCH.SM.AR.ZS>.

3.4.1 Benchmark regression results

Table 3.2 presents benchmark regression results. The regression results in Column (1) represent the preferred specification; they suggest it is not only the GDPs of complainants but also the GDPs of respondents that have a significant positive effect on dispute initiations by GATT/WTO members. A positive coefficient for the GDPs of complainants and respondents indicates that in bilateral pairs, richer members not only are more likely to initiate disputes but also are more likely to be confronted with trade disputes. The significant positive relationship between GDP and dispute incidence is consistent with previous studies, such as those of François et al. (2008), Sattler and Bernauer (2011), and Rosendorff and Smith (2018) (who interpreted results in support of a power hypothesis).¹⁰⁰

Surprisingly, the distance between bilateral pairs also shows a significant positive effect on dispute initiation. For example, a bilateral pair such as US–Australia is more likely to be engaged in a dispute than a bilateral pair such as US–Guatemala or US–Nicaragua. This result, demonstrating that distance has a statistically significant influence on dispute initiation, contrasts with the earlier finding of Sattler and Bernauer (2011). It is noteworthy that those authors equate log of trade to distance and conclude that trade is dispute-enabling, and more trade does not mean more disputes.¹⁰¹

Adding a set of geographical and institutional variables to the basic gravity equation determines whether the positive significance of the distance implies that lack of social, cultural, and legal proximity also contribute positively to dispute incidence. Rodrik, Subramanian & Trebbi (2004) were the first to systematically integrate income with geographical and institutional factors;¹⁰² by following their integration strategy in one equation and recognizing the importance of ‘non-traditional’ bilateral determinants, this research justifies the addition of these sets of variables to the basic gravity equation. These variables include whether members of bilateral pairs: (1) share common borders, (2) are landlocked (either or both), (3) were formerly the same countries, (4) had colonial relationships, (5) had the same colonizers, (6) have a common lingua franca, and (7) have common legal origins.

Column (3) of Table 3.2 shows that, irrespective of the addition of the geographical and institutional variables, results of GDP and distance hold; the variable of being landlocked is significantly negative, which implies that bilateral pairs such as Norway–Paraguay (one landlocked) or Nepal–Bolivia (both landlocked) are less likely to be in trade dispute. Examples of contiguous landlocked bilateral pairs include Nepal–Lao PDR and Zimbabwe–Botswana. Examples of distant landlocked bilateral pairs include Bolivia–Zimbabwe and Kazakhstan–Paraguay.

¹⁰⁰ Reinhardt (1999) uses GDP t-1 and lower income in a year before obtaining a negative sign for 1975–1999 with 235 observations. Guzman and Simmons (2005) also obtain a negative sign for GDP of complainant, but their dependent variable is GDP of defendant. The focus variables are: trade structure (François et al. 2008); preponderance effect (Sattler and Bernauer, 2011); and leadership and support Coalition (Rosendorff and Smith 2018).

¹⁰¹ Rosendorff and Smith (2018) use it as a control in one of their equations, where they obtain a negative sign. The main explanatory variables are ‘dispute onset’ and ‘changes in leaders and support coalitions’.

¹⁰² The scholars used this for the first time in their working paper; their approach of combining geographical variables with institutional variables is based on Rodrik, Subramaniam, and Trebbi (2002).

The variable of common legal origin is a new GATT/WTO dispute determinant. It shows a significant positive effect on incidence of trade disputes between bilateral pairs. This implies that bilateral pairs such as Japan–Korea, Ukraine–Russia, Turkey–Egypt, and UK–US are more likely to be in dispute because of their common legal origins than, for example, Saudi Arabia–Paraguay.

Although the variable of colonial relationship shows a positive significant effect on dispute incidence, having a common colonizer shows a negative significant effect on initiation of disputes between bilateral pairs.¹⁰³ This implies that bilateral pairs with common colonizers, such as India–New Zealand, are less likely to be in dispute than India–Brazil.

The variables contiguity, same country, and common lingua franca show a positive insignificant effect on incidence of trade disputes between bilateral pairs. Literature shows that geographical and institutional variables common to bilateral trade literature have been used sparingly in examining DSU disputes. Bobick and Smith (2013) use contiguity and colonial connection; they find non-significant positive and significant negative relationships, respectively. Davis and Bermeo (2009) use English language as a control variable and find it insignificant for developing-country members. Column (4) of Table 3.2 displays the full specification of the model with conditional logit. It is partly blank because of the time-invariant nature of the regressors in the logit; it shows that bilateral-pair fixed effects strengthen the coefficients of the GDPs of both complainants and respondents.

3.4.2 Trade agreements

One of the direct policy-relevant variables that has a large estimated effect on bilateral trade is trade agreement (Head & Mayer, 2013a). During the period of the GATT from 1948 to 1994, the organisation received 124 notifications of RTAs that cover trade. Since the inception of the WTO in 1995, over 400 additional arrangements covering trade in goods or services have been notified (WTO, 2018).¹⁰⁴

One of the striking results shown in Table 3.3 is the difference in signs for the coefficients of trade agreements across the probit and the logit specifications. Column (4) shows that considering year fixed effects, trade agreements are likely to contribute significantly positively to dispute initiation between bilateral pairs. For example, pairs such as EU–Canada and US–Vietnam are distant from one another and have economic agreements; they are more likely to have trade disputes than pairs such as Paraguay–Taiwan or Argentina–Taiwan that are distant but have no economic agreements. Column (5) shows exactly the opposite result: The presence of a trade agreement has a significantly negative sign. This implies that, given the year and bilateral pair fixed effects, the pairs of Argentina–Peru, Argentina–US, and Taipei–New Zealand, all of which have trade agreements, are less likely to be in dispute than Australia–Canada, Bangladesh–US, or Turkey–South-Africa, all of which do not have any trade agreements.

¹⁰³ Most prominent colonizers, such as the UK and France, are as of now parts of one economic entity, the EU. Although there have been a few complaints by former colonies, such as India, Brazil, and Peru, they have been addressed to the EU rather than a member of the EU.

¹⁰⁴ WTO, (2018p). Retrieved from https://www.wto.org/english/tratop_e/region_e/regfac_e.htm

Table 3.2: Gravity model with geographic and institutional variables

	(1) probit	(2) probit	(3) probit	(4) xtlogit
Log GDP complainant	0.251*** (0.01)		0.246*** (0.01)	1.647*** (0.13)
Log GDP respondent	0.309*** (0.01)		0.302*** (0.01)	2.242*** (0.13)
Log distance	0.209*** (0.02)		0.213*** (0.02)	
Contiguity		0.242* (0.11)	0.053 (0.11)	
<i>Members in pair landlocked</i>				
– One		-0.294*** (0.04)	-0.007 (0.05)	
– Both		-1.241*** (0.14)	-0.557*** (0.15)	
Formerly same country		-0.207 (0.14)	0.171 (0.23)	
Colonial relationship		0.753*** (0.09)	0.305*** (0.09)	
Common colonizer		-1.102*** (0.09)	-0.795*** (0.12)	
Common lingua franca		-0.214*** (0.05)	0.008 (0.07)	
Common legal origin		0.129*** (0.03)	0.123** (0.04)	
Constant	-11.615*** (0.43)	-3.537*** (0.10)	-11.599*** (0.45)	
No. observations	1,451,636	3,446,688	1,451,636	63,231
Pseudo R ²	.337	.153	.343	.434
Bilateral pair FE	NO	NO	NO	YES
Year FE	YES	YES	YES	YES

Notes: Probit and xtlogit regressions in which the dependant variable equals 1 if the complainant and respondent are in dispute; standard errors clustered by member-pair in parentheses; *p < 0.10, **p < 0.05, ***p < 0.01; parameter estimates of fixed effects omitted for brevity.

In this context, it should be noted that ‘The trade agreements alone do not account for the heterogeneity in terms of institutional design and legal enforceability and the results show that these heterogeneity is relevant for international trade’ (Kohl, Brakman, & Garretsen, 2016). The preferential trade agreements (PTAs) create strong but uneven trade across individual agreements (Eicher & Henn, 2011). Deeper integration agreements yield stronger trade-promoting effects (Kohl, Brakman, & Garretsen, 2016). This calls for considering the heterogeneity of trade agreements. Accordingly, this research adds extent of economic cooperation to trade dispute literature as a new variable. It is a step toward gradually reducing the trade distance from no-agreement to non-reciprocal PTA, two-way PTA, free trade

agreement (FTA), customs union, common market, and economic union. Columns (6) and (7) of Table 3.3 show that not every phase of economic integration makes a similar contribution to the incidence of trade disputes. Neither the absence of economic integration nor the presence of full economic integration (i.e., first and final phases) has any effect on trade disputes at the GATT/WTO.¹⁰⁵ Examples of bilateral pairs with no economic integration are Sweden–South Africa and Ethiopia–Cyprus. Examples of economic union are members of the EU such as France–Netherlands and members of the Economic Community of Central African States (ECCAS), such as Gabon–Congo.

Probit estimates in Column (6) show that, after considering year fixed effects, the non-reciprocal PTA, common markets, and free trade agreements (FTAs) are likely to contribute positively to trade dispute incidence, whereas PTAs and customs unions are less likely to contribute.¹⁰⁶ Logit estimates in Column (7) show consistently negative signs for all extents of economic agreements except non-reciprocal PTAs. Examples of bilateral pairs with non-reciprocal PTAs are Philippines–Turkey, Sri Lanka–Czech Republic, Saudi Arabia–Austria, Uzbekistan–France, and Indonesia–USA.

Results imply that bilateral pairs with PTAs such as Uruguay–Peru, Guatemala–Costa Rica, Bolivia–Switzerland and Djibouti–Seychelles are less likely to be in dispute. Moreover, pairs with FTAs are less likely to engage in WTO disputes. For example, Guatemala–Costa Rica, Israel–US, Kuwait–Oman, and UK–Jordan are less likely to be in trade disputes. Furthermore, pairs that have common market, such as Norway–Germany, Lithuania–Italy, and Hungary–Puerto Rico are less likely to be in trade disputes. Logit results displayed in Column (7) support the findings of Kuenzel (2015), Bown (2005), and Guzman and Simmons (2005), all of whom have used the PTA variable. However, it should be noted that estimates shown in Table 3.3 cover a range of trade agreements, rather than just PTAs or customs unions.

3.4.3 *The GATT and the WTO*

The Uruguay Round of negotiations brought important modifications and elaborations to the GATT system. Experts agree that because the WTO is more rule-oriented, it should discourage the power plays that held the upper hand during the GATT (Besson & Mehdi, 2004; Bown, 2005; Cottier, 2015). A more rules-based dispute settlement system was intended to benefit developing-country members in particular, because they previously lacked leverage to operate effectively under the former power-based system of the GATT (Bown, 2005). However, the question arises: Has the change to the WTO simply been a change of names, rather than a benefit to developing-country members? To explore whether the rule-based system does in fact favour developing-country members, this research adds an extra variable to capture the income differences between bilateral pairs. This variable is based on terciles of

¹⁰⁵ An example of two WTO members with no agreement is Paraguay–Taipei. The economic union comprises, for example, all of the countries of the EU.

¹⁰⁶ A tangential but interesting study by Vidigal (2018) investigates the reasons for resorting to the DSU rather than the FTA adjudication courts and ascribes it to the more comprehensive nature of DSU law, together with the more attractive possibility of retaliation as the result of community pressure in the DSU rather than the FTA adjudications.

GDP; a three-fold divide of the WTO members gives rise to nine pairs that combine high-, middle-, and low-income members.

Table 3.4 summarizes the results. It displays only variables that are significant at 1%. The negative sign indicates the sign of the coefficient; absence of sign indicates a positive sign. (Table 3.A9 presents complete results.) Columns (1) to (3) show probit results. Column (1) shows the full specification for the full 1948 to 2016 period; Column (2) indicates results for the GATT period; and Column (3) denotes results for the WTO period. Columns (1) to (3) show that, after taking year fixed effects into account, the GDPs of complainants and respondents are significantly positive not only during the GATT era but also during the WTO era. As Column (3) shows, distance is significantly positive only during the WTO. Column (3) also indicates a significantly positive contribution of common legal origin during the WTO. The tercile differences between bilateral pairs do not show any significant differences that favour low-income members as dispute initiators during the WTO, compared to the GATT.¹⁰⁷

Columns (4) to (6) show conditional logit results after considering year and bilateral pair fixed effect. The GDPs of complainants are significantly positive for both the GATT era and the WTO era, whereas the GDPs of respondents are significantly positive only for the WTO era. The tercile differences between bilateral pairs do not show any significant differences that favour low-income members as dispute initiation during the WTO, compared to the GATT.

There do not appear to be any previous studies that have systematically investigated the differences between the predictors of GATT disputes and WTO disputes. However, Davis and Bermeo (2009) used a dummy variable for the period of 1975 to 2000 to conclude that the WTO period does not influence the filing behaviours of developing-country members relative to the GATT. Results of this research tend to support their observation, but they do not support Bown's conclusion, which is that 'developing countries are learning from their earlier failures and have changed their dispute initiation pattern so that they now initiate disputes where they have greater power in making retaliatory trade policy threats against the defendant' (Bown, 2004:25).¹⁰⁸

¹⁰⁷ A further estimate divides members into two median halves; the results are similar.

¹⁰⁸ The sample covers 64 bilateral trade disputes involving import liberalisations, of which 37 are GATT and 27 WTO disputes in which developing-country members were the defendants during the period 1978 to 1998. The economic resolution of these disputes is measured through trade liberalisation gains.

Table 3.3: Trade agreements and the extent of economic agreement

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	probit	xtlogit	probit	probit	xtlogit	probit	xtlogit
Log GDP com	0.251*** (0.01)	1.647*** (0.13)		0.269*** (0.01)	1.617*** (0.13)	0.281*** (0.01)	1.804*** (0.13)
Log GDP resp	0.309*** (0.01)	2.242*** (0.13)		0.293*** (0.01)	2.321*** (0.14)	0.293*** (0.01)	2.204*** (0.14)
Log distance	0.209*** (0.02)			0.287*** (0.02)		0.219*** (0.02)	
TA			0.666*** (0.03)	0.449*** (0.04)	-0.248*** (0.06)		
<i>TA type</i>							
– NRPTA						0.563*** (0.05)	0.403*** (0.07)
– PTA						-0.891*** (0.13)	-3.373*** (0.27)
– FTA						0.292*** (0.07)	-0.667*** (0.09)
– CU						-0.641* (0.25)	-3.435*** (0.71)
– CM						0.521*** (0.10)	-1.658*** (0.16)
– EU						0.000 (.)	-19.737 (875.37)
Constant	-11.615*** (0.43)		-3.632*** (0.09)	-12.336*** (0.44)		-11.883*** (0.44)	
Obs.	1,451,636	63,231	3,924,858	1,451,636	63,231	1,448,062	63,231
Pseudo R ²	.337	.434	.151	.351	.435	.362	.446
Bilateral pair	NO	YES	NO	NO	YES	NO	YES
FE							
Year FE	YES	YES	YES	YES	YES	YES	YES

Notes: Probit and xtlogit regressions in which the dependant variable = 1 if the complainant and respondent are in dispute; standard errors clustered by member-pair in parentheses; *p < 0.10, **p < 0.05, ***p < 0.01; parameter estimates of fixed effects omitted for brevity.

Table 3.4: Summary of gravity model & tercile differences during GATT and WTO

	(1)	(2)	(3)	(4)	(5)	(6)
	Full period	GATT	WTO	Full period	GATT	WTO
	probit			logit		
log GDP com	*	*	*	*	*	*
log GDP resp	*	*	*	*		*
log distance	*		*			
<i>Members in pair landlocked</i>						
Both	(-)*		(-)*			
Common colonizer	(-)*		(-)*			
Common legal origin	*		*			
Extent of trade agreements						
Non-reciprocal PTA	*		*	*	*	*
PTA	(-)*		(-)*	(-)*		(-)*
FTA			*	*	*	*
Customs union				(-)*		
Common market	*		*	(-)*		(-)*
Economic union						
<i>Tercile differences:</i>						
<i>GDP com–resp</i>						
– Dispute LL						
– Dispute LM	(-)*					
– Dispute LH	(-)*		(-)*			
– Dispute ML						
– Dispute MM						
– Dispute MH						
– Dispute HL	(-)*		(-)*			
– Dispute HM	(-)*		(-)*			
– Dispute HH						

3.4.4 Sensitivity analysis

Literature has demonstrated that several factors determine trade disputes. Accordingly, in this research, some of these factors are estimated separately by adding to the basic gravity Equations 1.1a and 1.1b as the independent variables. These variables are divided into four sets: tariff, trade strength, human capacity, and political factors. Trade strength includes factors such as an export diversity index, log of current account balance, and foreign direct investment (FDI) as a percentage of the GDP. Human capacity includes variables such as GDPpc and human development indexes for complainants and respondents. The tariff set of variables includes differences in the average most-favoured nation (MFN) tariffs of complainants and respondents. Political factors include plurality and proportional forms of government. The addition of these variables does not change the basic results of the gravity variables. Appendix 3 presents these results: Table 3.A4: Gravity and tariffs, Table 3.A5: Gravity and trade strength, Table 3.A6: Gravity and absolute difference in GDP, Table 3.A7: Gravity and human capacity, Table 3.A8: Gravity and political factors, and Table 3.A9: Gravity and the tercile income difference during the GATT and the WTO.

3.5 Discussion and conclusion

This chapter examines the yearly data set of dispute initiations spanning 1948 to 2016. It represents one of the first attempts to investigate general predictors of all disputes for both the GATT and the WTO. The use of the basic gravity equation is significant in that past empirical efforts have emphasized other variables, such as export diversity, leadership change, trade structure, experience, and tariff overhang. However, given the specificity of previous studies and the institutional transformation from the GATT to the WTO, it is imperative to examine the general predictors of all disputes to compare the GATT and the WTO. Furthermore, use of the probit model with its year fixed effect and the conditional logit—that allows for bilateral fixed-pair effects, in addition to year fixed effects—provide insight into the robustness of time-variant general predictors.

This chapter makes an important contribution by using a set of gravity variables that have not often been part of the analysis of the variables that influence dispute incidence at the GATT/WTO.¹⁰⁹ It finds that basic gravity variables appear to be key to explaining the likelihood of a bilateral pair's decision to initiate a dispute under the DSU. The positive sign of the complainant's GDP can be interpreted as an indication of the importance of power in terms of market size or legal capacity. The positive sign of the respondent's GDP shows the working of the legal capacity mechanism. Lower-income members have scarce resources; given that they need to make choices about where to spend them, they initiate disputes with members from which they can gain the most.

According to Guzman and Simmons (2005: p592), 'If the problem is a deficit in the ability to initiate legal action, there are measures the international community can take to address this situation'. The international community used such measures when it established the ACWL in 2001 to mitigate the difficulties the faced by poorer members. However, as the preceding literature review shows, studies do not offer a conclusive answer to the effect of the ACWL on dispute initiations by the lower-income members.

According to Sattler and Bernauer (2011: p21), 'It is, arguably, much easier to reduce legal capacity differences than to reduce power differences'. This study finds that the transformation to the WTO has not brought much change to poorer members in terms of their participation as dispute initiators. Rather, the significance of respondents' GDP under the WTO, and common legal origin, shows the importance of legal capacity and indicates that power in the form of legal capacity has gained importance during the era of the WTO. For example, in the case of *US v Upland Cotton*, Benin and Chad, two of the least-developed-country members, were involved in proceedings as third parties.¹¹⁰ The panel stated, 'In accordance with Article 24.1 of the DSU, particular consideration was given to the special

¹⁰⁹ Some studies that do not include gravity variables are those of Bown (2005), Conconi (2017), Davis and Bermeo (2009), Götz and Rudolf (2007), Guzman and Simmons (2005), Horn et al. (1999), and Reinhardt (2000).

¹¹⁰ This case refers to WTO Dispute DS267, with complainant Brazil against the US.

situation of this Member' (WTO, 2007 p.31).¹¹¹ Despite such facilities and considerations, however, there has been no dispute filed by Benin or Chad.¹¹²

Landlocked countries are policy-locked countries that have more restrictive trade policies than coastal countries (Borchert, Gootiiz, Grover, & Mattoo, 2012). They also have higher trade costs. Given such restrictions, more complaints against landlocked countries might be expected. However, landlocked countries are in most cases poorer countries that trade less (Rose, 2004; WTO & UNCTAD, 2012).¹¹³ Nonetheless, their lesser trade does not mean that trade is of less importance to them. For example, from 2013 to 2015, Chad's trade as a percentage of GDP was 32%. In comparison, it was 22.4% for India, 20% for China, and 13.9% for the US for 2014 to 2016.

One of the most striking results from Chapter 2 is that institutional distance between bilateral pairs matters. Formal analysis carried out in this chapter shows that institutional factors, such as colonial connection and common legal origin, reduce distance and contribute to dispute initiation. Geographical distance also contributes positively. Therefore, both institutional proximity and geographical distance that contribute to trade dispute incidence; factors that contribute to trade also contribute to trade disputes.

What is the consequence of poorer members that face constraints not initiating disputes? Note that dispute initiation is not a goal; it is an instrument to achieve the objectives of the WTO. Every WTO member contributes to the WTO, with a minimum of 0.015% for members whose share in total member trade is less than 0.015%.¹¹⁴

It is in this context that the purpose and act of dispute initiation can be considered a new global public good (GPG). The concept, introduced by Kaul (2001a: p20), owes its existence to the 'different nature international policy agenda that are cross cutting that requires increased policy harmonization and cooperation behind national borders'. Kaul (2001b) considers the international trade regime to be a GPG even though that it differ in its extent of publicness.¹¹⁵ Accordingly, dispute initiations that are aimed at attaining policy harmonization and cooperation among WTO members could be considered GPGs. However, results from this chapter suggest that dispute initiation shows characteristics of an economic good rather than a public good. It is scarcity that creates value for members that have the ability and willingness to bear the costs of the DSU. Figure 3.2 plots the log of the real GDP of the dispute initiators versus annual disputes and cumulative disputes. It clearly shows the positive contribution of GDP to disputes filed from 1948 to 2016.

¹¹¹ Reference for dispute 267 is WTO (2018q), and WTO (2007) for the panel report.

¹¹² WTO (2018r). DSU 24.1: 'At all stages of the determination of the causes of a dispute and of dispute settlement procedures involving a least-developed member country, consideration shall be given to the special situation of least-developed country'.

¹¹³ A few exceptions are landlocked countries in Europe such as Austria, Switzerland, the Czech Republic, Slovakia, and Hungary.

¹¹⁴ Members' contributes to the WTO and AB budgets can be found at WTO (2018s): https://www.wto.org/english/thewto_e/secret_e/contrib_e.htm.

¹¹⁵ Although they rank high in terms of inclusiveness (indicated by number of people and countries they affect), they are regarded as lacking publicness of decision-making. However, in their case, ownership is not defined by excludability or clearly established property rights (Kaul, 2001a).

Figure 3.2: Real GDP vs. annual and cumulative disputes

In summary, results of this chapter show that key bilateral trade determinants matter for trade disputes. Furthermore, the effects of transition to the WTO are not evident for low-income members in terms of increased numbers of dispute initiations. Results tend to support the importance of legal capacity, which seems to have gained more power during the WTO, such that it can be regarded as a new form of power.

There are clear implications for policy makers. On one hand, findings show it is bilateral trade that matters; in seeking to promote the participation of developing-country members at the DSU, it is important to pay more attention to trade promotion and policies to help increase trade. On the other hand, they show the influence of the legal capacity mechanism. Given the ever-increasing complexities of WTO law, it may be desirable for the ACWL to play a more active role; currently, it comes into play only after a member decides to initiate a dispute and chooses to use ACWL services. Digitization of the DSU would make it unnecessary for members to be physically present in Geneva during initial phases of disputes, which could stimulate poorer members to initiate disputes.

Despite this chapter's contributions, it has limitations. The pseudo-regression coefficient shows there is more to explain; the omission of a number of observations as the result of group invariability in the logit regressions calls for caution when interpreting results, even though the regressions account for both year and pair fixed effects. With regard to probit results, although the number of observations is large, it does not account for pair fixed effects. Moreover, in the conditional logit model, the original coefficient estimates were retained, because fixed effects were not estimated, and it was pointless to set them to zero to calculate marginal effects.

Future researchers could examine member-specific trade policy factors that might be relevant. For example, it would be interesting to investigate the impact of a re-election year and swing industry factors after the addition of gravity variables in the study by Conconi et.al (2017) on the pattern of US dispute initiation.

Furthermore, whereas trade is inversely related to distance, results show that trade disputes are positively related to distance. They also show that the contribution of distance to dispute initiation is not the result of lack of institutional similarities; this calls for extra investigation, to provide more insight into trade disputes and trade. Researchers also could examine the uneven impact of the extent of economic agreement on dispute initiation, given that that NR-PTAs have shown a consistently positive sign.¹¹⁶

Considering the significance of the GDP to dispute initiation, the question arises of whether the power advantage of GDP percolates through subsequent DSU processes that determine the outcome of disputes. This is the topic of the next chapter.

¹¹⁶ Examples of non-reciprocal PTAs are the African, Caribbean and Pacific Group (ACP)–EC partnership agreement, the Caribbean Basin Initiative, and the Andean Trade Preference Act. A non-reciprocal PTA usually provides unilateral tariff reductions by developed countries to developing or least-developed countries. When interpreting the results with non-reciprocal PTA, note that most disputes between bilateral pairs with non-reciprocal PTAs involve the EU, the second-highest complainant and respondent at the DSU. The non-reciprocal PTA pairs in disputes have been India–EU (2000), EU–Hongkong (1984), EU–Colombia (2012), and EU–Peru (1991).

Appendix Chapter 3

Table 3.A1: Overview of studies on the determinants of trade disputes

Study	Explanatory variable	Dependent variable	Period	Sample	Method
Horn et al (1999)	Export intensity (US\$1,000) with legal capacity	Probability of complaints filed	1995–1998	146 cases, 113 members	Binomial probability
Reinhardt (2000)	Democracies, GATT1989, WTO, agriculture	US dispute to GATT/WTO probability of litigation and under section 301	1975–1999	235	Bivariate probit
Bown (2005)	Market access: Log of exporter's real value of exports to respondent's disputed market in t-1	Exporters choice to become complainants to join disputes as complainants	1995–2000	89 complainants, 54 unique disputes	Standard ordered probit model
Guzman & Simmons (2005)	Legal capacity GDP, repeat filing embassies	Determinants of defendants' selection	1995–2004	303	Ordinary least squares
Götz & Rudolf (2007)	Endured protectionism by trade partner	Probability of dispute in food sector	1995-2007	53	Bernoulli trials with probability by logistic distribution
Francois et al. (2008)	GDP exporter, trade structure	Number of bilateral disputes	1995–2006	192720	Zero-inflated negative binomial
Davis & Bermeo (2009)	Previous initiations	Developing country trade dispute initiation	1975–2003	1314	Negative binomial regression
Sattler & Bernauer (2011)	Trade, preponderance effect	Determinants of litigation in the WTO	1995–2003	9928	Cross-sectional negative binomial
Bobick & Smith (2013)	Plaintiff winning coalition	Onset of WTO disputes	1995–2009	219	Rare event logit

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Rosendorff & Smith (2018)	Leadership and support coalition	WTO dispute onset	1995–2008	167728	Logit model
Kuenzel (2015)	Tariff overhang	Incidence of WTO disputes, WTO dispute (1: Yes, 0: No)	1995–2011	49740	Logit regression
Pervez (2014)	Number of years a member is away from election	Dispute initiation over anti-dumping (AD)		213 AD duties that resulted in 87 WTO disputes	Discrete time hazard model (survival model)
Betz (2017)	Plurality rule	Dispute initiation	1975–2010	456	Negative binomial
Conconi et al (2017)	Re-election year, swing state industry	US dispute initiation	1995–2014	580	Linear probability probit, negative binomial
Feinberg & Reynolds (2018)	Affirmative AD	Dispute initiation over an AD	1995–2011	210 and 974	Probit regression

Table 3.A2: Descriptive statistics of variables in the dataset

Variable	Obs	Mean	Std. Dev.	Min	Max
Dispute	3,924,858	.002542	.0503542	0	1
Log GDP origin	2,246,482	1.030.407	2.312.953	2.092.768	1.665.754
Log GDP respondent	2,246,482	1.030.407	2.312.953	2.092.768	1.665.754
Log distance	3,446,688	8.828.632	.7771146	2.349.362	9.901.043
Contiguity	3,446,688	.0123318	.110362	0	1
<i>Landlocked</i>					
One	3,446,688	.2709801	.4444659	0	1
Both	3,446,688	.0252242	.1568055	0	1
Formerly same country	3,446,688	.0080277	.0892371	0	1
Colonial relationship	3,446,688	.0096493	.0977556	0	1
Common colonizer	3,446,688	.1178331	.3224105	0	1
Common lingua franca	3,446,688	.1751682	.3801109	0	1
Common legal origin	3,924,858	.2578672	.4374606	0	1
Trade agreement	3,924,858	.0589504	.2355319	0	1
<i>TA type</i>					
– Non-reciprocal PTA	3,924,858	.0338438	.1808269	0	1
– PTA	3,924,858	.011098	.1047608	0	1
– FTA	3,924,858	.0083845	.0911823	0	1
– Customs union	3,924,858	.0028205	.0530333	0	1
– Common market	3,924,858	.0018931	.0434681	0	1
– Economic union	3,924,858	.0009106	.0301625	0	1
Export diversity index	1,954,932	3.636.218	1.269.733	.960971	643.775
Abs. diff. GDPpc	1,467,806	8.827.582	1.479.349	-6.238.325	123.809
Human capital index origin	1,872,346	2.032.653	.7088947	1.007.038	3.734.285
Human capital index respondent	1,872,346	2.032.653	.7088947	1.007.038	3.734.285
Log GDP absolute diff.	1,467,806	1.127.561	215.951	-2.272.761	1.665.753
Log abs. diff. simple tariffs	353,628	1.682.197	1.133.516	-460.517	4.611.848
Log simple avg. tariff complainant	693,532	2.090.395	.6063578	-.967584	4.736.286
Log simple avg. tariff respondent	693,532	2.090.395	.6063578	-.967584	4.736.286
Log avg. price exports received origin	2,246,482	-1.041.918	.6634922	-4.820.873	.333312
Log avg. price imports paid by origin	2,246,482	-1.043.092	.6532107	-4.127.654	.5340554
Plurality complainant	1,230,936	.6701469	.4701598	0	1
Proportional representation complainant	1,124,550	.5974603	.4904097	0	1

Table 3.A3: Correlation matrix of bilateral trade variables

	1	2	3	4	5	6	7	8	9	10
2	0.0787* 0.0000	1								
3	0.0920* 0.0000	0.0324* 0.0000	1							
4	0.0051* 0.0000	-0.0125* 0.0000	-0.0125* 0.0000	1						
5	0.0054* 0.0000	0.0428* 0.0000	0.0428* 0.0000	-0.3177* 0.0000	1					
6	-0.0182* 0.0000	-0.1042* 0.0000	-0.1042* 0.0000	-0.0731* 0.0000	0.0427* 0.0000	1				
7	-0.0032* 0.0000	-0.0246* 0.0000	-0.0279* 0.0000	-0.2483* 0.0000	0.2705* 0.0000	0.0148* 0.0000	1			
8	0.0310* 0.0000	0.0894* 0.0000	0.0894* 0.0000	-0.0529* 0.0000	0.0855* 0.0000	-0.0320* 0.0000	0.0324* 0.0000	1		
9	-0.0192* 0.0000	-0.1765* 0.0000	-0.1765* 0.0000	-0.0345* 0.0000	0.0402* 0.0000	-0.0472* 0.0000	0.1286* 0.0000	-0.0361* 0.0000	1	
10	-0.0095* 0.0000	-0.1261* 0.0000	-0.1261* 0.0000	-0.0753* 0.0000	0.0793* 0.0000	-0.0543* 0.0000	0.1262* 0.0000	0.1151* 0.0000	0.4216* 0.0000	1

- 1 Dispute
- 2 Log GDP origin
- 3 Log GDP respondent
- 4 Log distance
- 5 Contiguity
- 6 Landlocked
- 7 Formerly same country
- 8 Colonial relationship
- 9 Common colonizer
- 10 Common lingua franca

This section of Appendix 3 provides an overview of results after adding various sets of variables to the basic gravity equations.

Table 3.A4: Gravity and tariffs

	(1) probit	(2) xtlogit	(3) probit	(4) xtlogit	(5) probit	(6) xtlogit
Log GDP com	0.251*** (0.01)	1.647*** (0.13)			0.219*** (0.01)	0.584* (0.23)
Log GDP res	0.309*** (0.01)	2.242*** (0.13)			0.298*** (0.01)	3.486*** (0.20)
Log distance	0.209*** (0.02)				0.155*** (0.02)	
Log abs. diff. simple MFN tariffs			-0.058*** (0.01)	-0.071** (0.03)	-0.011 (0.01)	-0.048 (0.03)
Log simple avg. tariff com			-0.231*** (0.02)	0.259* (0.11)	-0.319*** (0.03)	0.243* (0.12)
Log simple avg. tariff res			-0.507*** (0.02)	0.391** (0.13)	-0.507*** (0.02)	0.998*** (0.14)
Log avg. price exports received by com			1.076*** (0.14)	8.134*** (0.68)	1.532*** (0.20)	7.930*** (0.78)
Log avg. price imports paid by com			3.453*** (0.18)	9.150*** (0.84)	0.100 (0.29)	10.263*** (0.88)
Constant	-11.615*** (0.43)		2.921*** (0.19)		-6.758*** (0.41)	
Obs.	1,451,636	63,231	304,331	19,754	290,520	19,712
Pseudo R ²	.337	.434	.143	.14	.309	.158
Bilateral pair FE	NO	YES	NO	YES	NO	YES
Year FE	YES	YES	YES	YES	YES	YES

Notes: Probit and xtlogit regressions in which the dependant variable equals 1 if the complainant and respondent are in a dispute; standard errors clustered by member-pair in parentheses; *p < 0.10, **p < 0.05, ***p < 0.01; parameter estimates of fixed effects omitted for brevity.

Table 3.A5: Gravity and trade strength

	(1) probit	(2) xtlogit	(3) probit	(4) xtlogit	(5) probit	(6) xtlogit
Log GDP com	0.251*** (0.01)	1.647*** (0.13)			0.175*** (0.01)	2.335*** (0.24)
Log GDP res	0.309*** (0.01)	2.242*** (0.13)			0.351*** (0.01)	2.566*** (0.23)
Log distance	0.209*** (0.02)				0.315*** (0.03)	
FDI (% of GDP) complainant			-0.002 (0.00)	0.004 (0.00)	0.001 (0.00)	0.004 (0.00)
Share of merchandise exports complainant			0.351*** (0.04)	0.885** (0.33)	0.599*** (0.04)	1.090** (0.33)
Export diversity index complainant			-0.395*** (0.02)	-0.889*** (0.10)	-0.280*** (0.02)	-0.868*** (0.10)
Current account balance (as % of GDP)			0.006*** (0.00)	0.008 (0.00)	0.004* (0.00)	0.007 (0.00)
Constant	-11.615*** (0.43)		-2.583*** (0.21)		-11.891*** (0.41)	
Obs.	1,451,636	63,231	670,173	28,697	640,877	28,697
Pseudo R ²	.337	.434	.127	.404	.346	.413
Bilateral pair FE	NO	YES	NO	YES	NO	YES
Year FE	YES	YES	YES	YES	YES	YES

Notes: Probit and xtlogit regressions in which the dependant variable equals 1 if the complainant and respondent are in a dispute; standard errors clustered by member-pair in parentheses; *p < 0.10, **p < 0.05, ***p < 0.01; parameter estimates of fixed effects omitted for brevity.

Table 3.A6: Gravity and absolute difference in GDP

	(1) probit	(2) xtlogit	(3) probit	(4) xtlogit	(5) probit	(6) xtlogit
Log GDP com	0.251*** (0.01)	1.647*** (0.13)			0.252*** (0.01)	1.527*** (0.13)
Log GDP res	0.309*** (0.01)	2.242*** (0.13)			0.310*** (0.01)	2.065*** (0.14)
Log distance	0.209*** (0.02)				0.209*** (0.02)	
Abs. diff. in GDP			0.275*** (0.01)	0.510*** (0.05)	-0.004 (0.01)	0.272*** (0.05)
Constant	-11.615*** (0.43)		-6.687*** (0.33)		-11.611*** (0.43)	
Obs.	1,451,636	63,231	1,467,806	63,231	1,451,636	63,231
Pseudo R ²	.337	.434	.2	.427	.337	.435
Bilateral pair FE	NO	YES	NO	YES	NO	YES
Year FE	YES	YES	YES	YES	YES	YES

Notes: Probit and xtlogit regressions in which the dependant variable equals 1 if the complainant and respondent are in a dispute; standard errors clustered by member-pair in parentheses; *p < 0.10, **p < 0.05, ***p < 0.01; parameter estimates of fixed effects omitted for brevity.

Table 3.A7: Gravity and human capacity

	(1) probit	(2) xtlogit	(3) probit	(4) xtlogit	(5) probit	(6) xtlogit
Log GDP com	0.251*** (0.01)	1.647*** (0.13)			0.198*** (0.01)	1.642*** (0.13)
Log GDP res	0.309*** (0.01)	2.242*** (0.13)			0.242*** (0.01)	2.245*** (0.13)
Log distance	0.209*** (0.02)				0.268*** (0.02)	
Log abs. diff. GDPpc			0.017 (0.01)	0.025 (0.03)	-0.004 (0.01)	0.001 (0.03)
Human capital index com			0.526*** (0.03)	0.487* (0.25)	0.384*** (0.03)	0.120 (0.25)
Human capital index res			0.734*** (0.03)	0.621* (0.25)	0.563*** (0.03)	0.007 (0.26)
Constant	-11.615*** (0.43)		-6.174*** (0.31)		-12.723*** (0.44)	
Obs.	1,451,636	63,231	993,162	63,186	993,162	63,186
Pseudo R ²	.337	.434	.233	.424	.356	.434
Bilateral pair FE	NO	YES	NO	YES	NO	YES
Year FE	YES	YES	YES	YES	YES	YES

Notes: Probit and xtlogit regressions in which the dependant variable equals 1 if the complainant and respondent are in a dispute; standard errors clustered by member-pair in parentheses; *p < 0.10, **p < 0.05, ***p < 0.01; parameter estimates of fixed effects omitted for brevity.

Table 3.A8: Gravity and political factors

	(1) probit	(2) xtlogit	(3) probit	(4) xtlogit	(5) probit	(6) xtlogit
Log GDP com	0.251*** (0.01)	1.647*** (0.13)			0.258*** (0.01)	1.143*** (0.16)
Log GDP res	0.309*** (0.01)	2.242*** (0.13)			0.323*** (0.01)	2.511*** (0.15)
Log distance	0.209*** (0.02)				0.226*** (0.02)	
Plurality com			0.129*** (0.03)	-0.084 (0.11)	-0.094* (0.04)	0.039 (0.13)
Proportional representation com			0.386*** (0.04)	-0.640 (0.41)	0.285*** (0.05)	-0.666 (0.41)
Constant	-11.615*** (0.43)		-3.426*** (0.10)		-12.118*** (0.29)	
Obs.	1,451,636	63,231	1,120,266	39,457	748,574	37,003
Pseudo R ²	.337	.434	.0418	.286	.306	.31
Bilateral pair FE	No	YES	No	YES	No	YES
Year FE	YES	YES	YES	YES	YES	YES

Notes: Probit and xtlogit regressions in which the dependant variable equals 1 if the complainant and respondent are in a dispute; standard errors clustered by member-pair in parentheses; *p < 0.10, **p < 0.05, ***p < 0.01; parameter estimates of fixed effects omitted for brevity.

Table 3.A9: Gravity and other variables under the GATT and under the WTO

	(1)	(2)	(3)	(4)	(5)	(6)
	Full Sample	GATT probit	WTO	Full Sample	GATT xtlogit	WTO
Log GDP com	0.132*** (0.02)	0.280*** (0.07)	0.113*** (0.02)	0.506 (0.39)	86.386*** (20.27)	-0.333 (0.44)
Log GDP resp	0.262*** (0.02)	0.299*** (0.05)	0.246*** (0.01)	3.200*** (0.32)	-9.226 (9.11)	4.389*** (0.38)
Log distance	0.333*** (0.03)	0.257** (0.09)	0.339*** (0.03)			
Contiguity	0.107 (0.14)	-0.145 (0.31)	0.121 (0.14)			
<i>Landlocked</i>						
– One	-0.117 (0.06)	-0.334 (0.24)	-0.112 (0.06)			
– Both	-1.356*** (0.32)	0.000 (.)	-1.343*** (0.32)			
Formerly same country	0.440 (0.26)	0.000 (.)	0.452 (0.27)			
Colonial relationship	0.201 (0.12)	0.351 (0.23)	0.185 (0.12)			
Common colonizer	-0.113 (0.18)	0.000 (.)	-0.122 (0.18)			
Common lingua franca	-0.135 (0.09)	-0.330 (0.24)	-0.133 (0.09)			
Common legal origin	0.331*** (0.06)	0.489*** (0.14)	0.333*** (0.06)			
Trade agreement	0.577*** (0.05)	0.254 (0.17)	0.596*** (0.05)	-0.159 (0.13)	0.000 (.)	-0.293* (0.13)
Abs. diff. GDPpc	-0.005 (0.02)	-0.130** (0.05)	0.004 (0.02)	0.121 (0.06)	1.595 (0.83)	0.193* (0.08)
Human capital index com	0.176** (0.06)	-0.004 (0.13)	0.197*** (0.06)	3.780*** (0.61)	8.605 (40.42)	3.043*** (0.67)
Human capital index res	0.403*** (0.05)	0.195 (0.14)	0.418*** (0.05)	-1.784** (0.59)	-31.824 (27.03)	-2.561*** (0.68)
Log GDP abs. diff.	-0.028 (0.02)	0.068 (0.05)		0.437*** (0.10)		
Log abs. diff. simple tariffs	-0.031* (0.01)	-0.036 (0.03)	-0.030* (0.01)	-0.072* (0.03)	2.490** (0.78)	0.030 (0.04)
Log simple avg. tariff com	-0.174*** (0.05)	-0.420*** (0.08)	-0.138* (0.05)	-0.112 (0.15)	-41.943*** (11.03)	-0.171 (0.17)
Log simple avg. tariff res	-0.193*** (0.04)	-0.403*** (0.08)	-0.162*** (0.05)	0.751*** (0.20)	-23.817*** (4.96)	0.979*** (0.23)

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Log avg. price exports for com	0.073 (0.32)	2.486* (1.05)	-0.424 (0.34)	6.465*** (1.03)	-43.046 (24.92)	6.082*** (1.17)
Log avg. price imports paid by com	2.013*** (0.42)	1.935 (1.37)	2.011*** (0.43)	6.695*** (1.24)	-16.735 (41.72)	6.290*** (1.39)
Export diversity index	-0.275*** (0.04)	0.177 (0.10)	-0.312*** (0.04)	-0.448** (0.16)	-22.374* (9.28)	-0.420* (0.17)
Plurality com	0.041 (0.05)	-0.272 (0.19)	0.045 (0.05)	0.739** (0.28)	-1.735 (86.71)	0.807* (0.32)
Proportional representation com	0.265*** (0.06)	-0.197 (0.16)	0.286*** (0.06)	-0.933 (1.06)	0.000 (.)	-3.342* (1.55)
Constant	-8.436*** (0.66)	-7.297*** (1.70)	-8.898*** (0.65)			
Obs.	149,166	6,348	142,515	13,153	432	9,876
Pseudo R ²	.343	.416	.343	.214	.78	.124
Bilateral pair FE	NO	NO	NO	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES

Notes: Probit and xtlogit regressions in which the dependant variable equals 1 if the complainant and respondent are in a dispute; standard errors clustered by member-pair in parentheses; *p < 0.10, **p < 0.05, ***p < 0.01; parameter estimates of fixed effects omitted for brevity.

Chapter 4

Dispute outcome and disputant income

So far am I from agreeing with Thrasymachus that justice is the interest of the stronger (Plato, The Republic, around 380 B.C.).

4.1 Introduction

Chapter 2 illustrates the descriptive features of bilateral disputants. It uses several dimensions such as contiguity, common legal origin, and trade agreements to characterize bilateral pairs in disputes. Results of descriptive analysis suggest that non-traditional bilateral trade determinants that contribute positively to bilateral trade may not contribute positively to trade dispute initiations.

Therefore, Chapter 3 carries out a formal statistical analysis using a gravity-inspired approach to study the determinants of dispute initiations. The positive significance of the main gravity factors—GDPs of main disputants, distance—indicates the importance of basic bilateral trade determinants to dispute initiation. Results imply that richer members are not only more likely to initiate more disputes but also more likely to be confronted with disputes. This is evidence of a working legal-capacity mechanism whereby poorer members, which must allocate their resources wisely, file disputes against richer trade partners only when they can expect positive economic effects in terms of trade or market share.

However, it should be noted that this intended positive effect in terms of trade/market share is possible only when a respondent (mutually) agrees to retract a disputed measure or when a respondent ‘loses’ the dispute and adheres to the panel ruling;¹¹⁷ if a ‘losing’ respondent fails to adhere to a panel ruling, the dispute-initiating member may be authorised to retaliate. Accordingly, the research question addressed in this chapter is whether the incomes of disputants influence the outcome of dispute at the GATT/WTO. This is of importance because poorer members have little market power to threaten richer trade partners with retaliation, even if the WTO authorises them to retaliate.

Therefore, for poorer dispute-initiating members that are initiating disputes with richer members, the outcomes of disputes remain dependent on the DSU; if panels rule in their favour, their hopes for eliciting compliance from richer trade partners are based not on their own retaliatory power, but on their capacity to endure time-consuming, complicated dispute procedures. The WTO has become an increasingly complex legal system (Shaffer, 2009) that provides uniform procedures and a set of rules for dealing with disputes, irrespective of the incomes of dispute-initiating members.¹¹⁸ The shift from the power-based GATT to a more

¹¹⁷ Either by a panel or a ruling by an AB, if the AB’s report favours the complainant.

¹¹⁸ Articles 1 to 27 of the DSU cover various aspects of dispute settlement, in which Article 12 delineates detailed panel procedures; Developing members enjoy special and differential treatment comprising five distinct rights: political, preferential market access, additional levels of import restriction, export of subsidies otherwise

rule-based WTO was expected to benefit weaker members (Nottage, 2009). However, scarce resources may influence the quality of the latter’s legal argumentation (Hoekman, Horn, & Mevroidis, 2009).

Accordingly, the empirical motivation for this chapter, depicted in Figure 4.1, draws on literature to take GDPpc as a proxy for the scarce legal resources.¹¹⁹ The x-axis shows the log of GDPpc, and the y-axis illustrates binary variable compliance as an outcome between bilateral pairs. Figure 4.1 shows that dispute-initiating members with higher GDPpcs are more able to elicit compliance. This occurs despite Special Article 24 of the dispute settlement procedure that attends to the special needs of the least-developed members. This basic empirical depiction provides motivation for using the GDPpc as one of the explanatory variable to determine the outcomes of disputes.

Figure 4.1: Complainant’s GDP per capita and compliance

Previous studies are almost unanimous in observing that low-income members suffer from problems that are reflected in unfavourable outcomes for them under the DSU (Besson & Mehdi, 2004; Busch and Reinhardt, 2007; Horn and Mevroidis, 2008; Reynolds, 2007). However, most of these studies address deal the early settlement of disputes or panel rulings, rather than compliance, and early settlements or mutually agreed solutions (MAGS) do not always imply desirable outcomes for complainants.

prohibited, flexibility in the application of a range of non-tariff or ‘behind-the-border’ rules (Keck & Low, 2004). Additionally, they are entitled to the help of the ACWL and to longer reasonable periods of time (RPTs) Article 21.2 of the WTO, WTO (2018t).

¹¹⁹ Refer to Chapter 3, Section 3.2 for discussion of GDP-related variables and legal capacity.

For example, with regard to two dispute cases initiated by Vietnam against the US, Figure 4.2 provides time lines of the advancement of these disputes (DS404 and DS429). Closer examination of the progression of these two dispute cases provides insights into the need to consider compliance that involves implementation of panel rulings. In both cases, panels were established, and the panel rulings favoured Vietnam. Subsequently, in both cases, the US requested a reasonable period of time (RPT) to comply with the suggestions of the panel. The implication is that the US would implement measures, with the outcome to be compliance at the end of the RPT, that is, INBR by the US. However, the disputants informed notified a MAGS, which is surprising given that for DS404, the RPT had expired almost four years earlier, and for DS429, the RPT expiration date fell just a month short. This raises questions with regard to the nature of MAGS; because dispute details are not always made public, it remains unknown whether the outcomes of the MAGS were also beneficial to Vietnam.¹²⁰

Notably, these two examples are not exceptional. For example, for DS406 (Indonesia–USA) and the multi-complainant DS158 (Guatemala, Honduras, Mexico, Panama, US) against the EU also shows a similar recourse. Moreover, of the 87 cases in which members have asked permission to retaliate, only 12 are lesser-income members.¹²¹ Accordingly, this research recommends an emphasis on compliance, on the grounds that it involves adhering to panel rulings and carrying out the reforms suggested by panel rulings, the contents of which are open to the public.

The remainder of this chapter is organised as follows: Section 4.2 provides a literature review; Section 4.3 presents stylized features, methodology, and results; and Section 4.4 discusses main findings and provides conclusions.

120 WTO (2018u). Article 21.5; Article 3.7 is not prescriptive of the content of a MAGS except for the condition that it must be consistent with the covered agreements. The only express limitation referred to in Article 3.7 is that “a Member shall exercise its judgment as to whether action under these procedures would be fruitful” (WTO: accessed March 2018). It also is not subject to public dissemination. The US forms the largest export market for Vietnam, but not vice versa; the potential retaliation capacity of Vietnam cannot be considered to be high. (Source: WTO module: 6.7 Implementation by the “losing” Member Article 21.5 and 3.7. See https://www.wto.org/english/tratop_e/dispu_e/disp_settlement_cbt_e/c6s7p2_e.htm and https://www.wto.org/english/docs_e/legal_e/28-dsu_e.htm.)

121 Of which three countries belonged to L and LM income classifications, and nine belonged to the UM income classification, as of December 2016

Figure 4.2: Time line of disputes between Vietnam and the US

4.2 Literature

Literature shows that previous studies draw approximately similar conclusions with regard to the income statuses of main dispute participants and dispute outcomes. Besson and Mehdi (2004) conclude that high success rates of richer complainants have increased since 1995, and it is legal capacity and representation, rather than power, that matter to favourable outcomes for developing-country members. Similarly, Busch and Reinhardt (2007) conclude that lower-income members are still less likely to get what they want when filing disputes, irrespective of their market size.¹²² Reynolds (2007) draws a similar conclusion, that is, that legal capacity measured in terms of sparse numbers of representatives at the WTO is a handicap to members that are opposed better-endowed, developed members.

Horn and Mevroidis (2008) observe a spectrum of winning claims in terms of percentages, in which the US and the EU are at the top and developing-country members are at the bottom. Beshkar & Majbouri (2015) emphasizes that this divergence in winnings depending on income may arise from prohibitive costs of litigation. He predicts that likelihood of settlement is more subject to the costs faced by the respondents than the costs faced by complainants, assuming that smaller members face higher costs.

Meagher (2015) has been closely involved with the ACWL, which was founded to provide legal assistance to developing-country members to overcome their lack of legal capacity, experience, and financial constraints. He notes that the DSU system serves to reinforce the tendency of divergence, given both the incentives to litigate and developing-country members' lack of capacity to push for early settlements. Bown (2004) concludes that the dispute settlement procedure fails to erase the impact of economic dependence between developing and developed members.

Busch and Reinhardt (2003: p732) contradict these findings, concluding that rich dispute initiators do not have a 'special advantage over a poor but equal-sized complainant in securing compliance from a defendant'. They stress the importance of early settlement in the shadow of the law and note that the legal capacity indicated by GDPpc is of less importance once parties resolve to litigate rather than settle.

Another contradictory result is Hoekman et al.'s (2008) conclusion that the share of claims 'won' is broadly similar across industrialized and developing-country members despite differences in 'capacity' and 'administrative sophistication' that presumably exist across the groups. The reason for this deviation in findings can be explained by their dependent variable; they count the number of legal claims per provision made by complainants and use the share of claims upheld by panels as the dependent variable. For example, in DS404, Vietnam evoked four agreements with more than 20 claims under these agreements.¹²³

Busch and Reinhardt (2000: p 162) define the outcome as 'the ultimate policy result of a dispute, rather than the nature of a ruling per se'. Additionally, they define compliance as

¹²² They conclude that WTO reforms have not made developing-country complainants significantly more likely to persuade defendants to liberalise disputed policies.

¹²³ The legal claims in this case are: AD (Article VI of GATT 1994): Articles 1, 2.1. 2.4. 2.4.2, 5.8, 6.8, 6.109, 9.1, 9.3, 9.4, 11, 11.1, 11.2, 11.3, 18.1,18.3, and 18.4; Annex II GATT 1994: Articles I, II, VI:1, VI:2(a), and VI:2; and agreements establishing the WTO: Article XVI:4, and Protocol of Accession: Part I, para.1.2.

‘whether the defendant liberalized the disputed trade policy practices, conceding to some or all the complainant's demands’. They operationalize the level of concessions with regard to contested trade measures and conclude that per capita income has an effect on concessions and early settlements. They describe early settlements as democracies’ need for privacy, because, unlike panel rulings, these settlements are not subject to Article 21.5 or compliance reviews; democratic-country members prefer early settlements, because their content is not publicly accessible.

Bown (2005) suggests that compliance also may be a function of credible threats that complainants will retaliate through DSU-sanctioned withdrawal of concessions. Maggi and Staiger (2013) postulate a theoretical model that generates predictions of how outcomes of WTO disputes depend on the contracting environment and how they correlate with optimal contract forms. They theorize that transformation from liability to property rules implies a lower rate of early and post-ruling settlements.¹²⁴ Their empirical results show that the only control variable that is consistently significant is the variable that indicates whether a respondent is a developing country.

Williams (2006) concludes that, while less-developed-country members often face several capacity constraints, having WTO representation in Geneva, being in Geneva, and being active are keys to successful outcomes. Cottier (2015) draws a similar conclusion, asserting that a key role of the WTO is to serve as a forum for trade negotiations and negotiating within the WTO. This also implies being able to influence agendas outcomes and contribute actively to the development of global common law, something that poor members are not able to do.

Gray and Potter (2014) provide estimates of the probability of dispute settlement associated with diplomatic gifts. They measure the number and value of gifts by foreign officials to highly-placed US officials. They conclude that number of gifts is positively associated with the settlement of disputes shortly before final WTO rulings.¹²⁵ Busch and Reinhardt (2000) also stress the role of diplomacy when they note that interactions facilitated by diplomacy contribute to dispute settlement during either the consultation stage or the panel proceedings prior to rulings. Maggi and Staiger (2017) propose a dispute-resolution theory related to explaining a pattern of dispute resolution and test it empirically to prove that patterns of rulings are consistent with article-specific leaning and with disputant-specific learning. Yildirim, Tyson Chatagnier, Poletti, and De Bièvre (2018) systematically assess the way in which different patterns of integration into the global value chain (GVC) affect the amount of time it takes to comply with WTO panel rulings. Their results suggest that the amount of time for compliance is less when GVCs are highly integrated.

A few of these studies define the dependent variable as an ordered outcome. Reinhardt (2000) uses level of concessions, and Busch and Reinhardt (2003) use level of concessions and compliance. They account for each stage of dispute settlement from consultation to decision by the AB, coding outcomes and defining levels as substantial, partial, or concessions made with regard to contested trade measures. They also account for dropped disputes, in

¹²⁴ The WTO represents, in general, the transformation to the property rules.

¹²⁵ Value of gifts has the opposite effect; it increases the probability of a ruling and decreases the probability of a settlement, because high numbers of low-value gifts are associated with hierarchically lower officers doing ‘mundane’ work of forging settlements and low numbers of high value gifts are associated with heads of states (Gray & Potter, 2014).

consultations or during panel deliberations in advance of rulings or initial AB reports, and determine whether they substantially favour the complainant or the defendant or whether the results are mixed. However, their use of a concession scale and its link to compliance is far from clear; for example, they code the outcome of DS13, which was mutually solved in 1997, as a full concession. The contents of mutual solutions are not known and therefore, it is not clear why this case is coded as such or whether it is included as a complied case. They acknowledge the time-bound nature of WTO outcomes and recommend considering them in future studies. Therefore, the categorisation of changed legal outcomes is not obvious according to their classification.

In line with Lee (2011), who notes the vastness and complexity of information on the WTO website for assessing the compliance status of disputes, this chapter proceeds to develop a categorisation method that accounts for implied compliance with dispute outcomes. This level of compliance is linked directly to the status of disputes and can be adapted as cases progress.

Table 4.A1 presents a concise summary of literature. In its organisation and objective, this chapter reflects the paper of Busch and Reinhardt (2003). Figure 4.3 shows the contribution of this current research to literature with respect to previous studies. The left-side diagrams show the phases of outcomes addressed by the studies, and the right-side sections depict authors, data coverage, and period. As Figure 4.3 shows, this chapter deals with compliance, which is part of the phase of post-panel ruling. A scale of compliance, the development of which is described in the following section, allows the determination of various outcomes to be interpreted in terms of compliance; therefore, it includes all variations of outcomes. Furthermore, this chapter provides wider coverage of dispute cases than previous studies. By examining the outcomes of all dispute cases during the GATT and the WTO until 2016, it determines whether the shift from a power-based GATT to a rule-based WTO has been advantageous with regard to compliance. This matter is of particular interest, because the binding nature of WTO panel rulings contrasts sharply with the non-binding nature of GATT outcomes.

Figure 4.3: Position of this chapter in literature

4.3 Data, methodology and results

This chapter investigates the outcomes of GATT and WTO disputes in light of the incomes of dispute-initiating members. With a total number of 132 dispute initiations during the GATT period (1948 to 1994) and 518 initiations during the WTO (1995 to 2016), the data set provides an ample range of variation in legal outcomes.¹²⁶

The outcome of dispute is the phase that initiated disputes reached as of April 2018. This allows analysis to include the outcomes of disputes 16 months after they were initiated in December 2016. Note that officially, this length of time is sufficient for reaching a panel ruling (see Table 1.A2 for details). For example, the two cases initiated in December 2016, DS517 and DS518, have had time to take their procedural course and have reached the panel phase.

¹²⁶ Outcomes of the GATT and WTO disputes Accessible at GATT Reports - WorldTradeLaw.net and WTO (2016a).

4.3.1 Defining dependent variables

The choice of the main dependent variable is guided by two assumptions: first, that there is a keen interest in compliance—because the ultimate aim of a dispute-initiating member is the removal of the perceived anti-WTO rule—and second, that it helps members to remain as close as possible to the official notified status of disputes at the WTO.

However, literature shows that researchers have used different ways to define outcomes of dispute at the GATT/WTO. When developing a scale for the main dependent variable of compliance, it is necessary to account for the complexity of the procedure and the procedural outcome. Therefore, the dependent variables are defined in several ways and then further categorised as dichotomous or polytomous variables, according to the procedural phases of dispute outcomes. There are two reasons to consider various definitions: First, it makes the development process of the compliance scale transparent, and second, it allows checking of the sensitivity of the results with alternatively defined sets of dependent variables.

Whereas GATT outcomes can be classified into three categories—adopted reports, unadopted reports, and other categories—WTO outcomes vary from early settlement to retaliation, comprising a minimum of 17 distinctive phases of outcome. The 17 WTO procedural phases fall into five distinct phase categories. At any given time, these categories are mutually exclusive. As in Chapter 3, in this chapter, ‘request for consultation’ is considered to be an official initiation of a dispute. This first category of ‘in-consultation’ may take 60 days. After that, if there is no MAGS or withdrawal (W), a dispute-initiating member may request the establishment of a panel. The second category consists of procedures related to the panel ruling, which may end following the adoption of a panel report.

The third category relates to the actions of respondents. In cases of favourable outcomes for complainants, respondents may have to go through a compliance phase. However, the disputants may not agree and may appeal against the panel ruling. This is the fourth category, which includes an advanced phase related to appeals and retaliation. An outcome of a W or a MAGS can take place at any phase of a dispute; it can be preceded by a panel ruling, as occurred in the Vietnam–US dispute. This outcome of W or MAGS is the fifth category.

Table 4.A2 provides a compact table that bundles the procedural steps into two main outcomes to make the definitions of various dependent variables more transparent. Table 4.1 shows the simplified WTO procedure that explains the derivation of the dependent variables. Column (1) shows the five phases and the procedural steps that a WTO dispute has reached. Columns (2) to (4) show the defining of the dichotomous dependent variables; Column (2) defines dispute settlements as ‘yes’ or ‘no’. The phases such as ‘in-consultation’ and ‘authority for panel lapsed’ are not considered to be settled disputes, even if the disputes are stuck at this phase for several years. Column (3) defines panel rulings. It assigns a value of ‘yes’ to all cases in which there has been a phase beyond panel and there has been a ruling, irrespective of whether the dispute is settled. Column (4) defines compliance; all cases in which there has not been compliance are labelled ‘no’ and the remainder are labelled ‘yes’.

Column (5) shows the definition of the main dependent variable, which is a polytomous variable with four levels.¹²⁷ It strictly defines compliance, keeping in mind that compliance is

¹²⁷ There are too few observations to define a compliance scale with more than four levels.

measured as a result of a legal stage that a dispute has reached. Practically, it implies an implicit or explicit willingness of a respondent derived through the phase that a dispute has reached as of April 2018. The dependent variable of compliance scales the outcomes of disputes from non-compliance, in-process, and MAGS, to compliance. Note that the compliance scale does not necessarily follow the procedural time path of DSU procedures. This is because non-compliance is, by default, a result of a panel ruling.

Categorisation of MAGS poses another challenge. This categorisation presupposes that a MAGS is a less-desired outcome for a dispute-initiating member, because there is no ultimately desirable compliance, and it can take place during any phase of dispute. Text Box 4.1 provides information about why W cases are not categorised as cases of compliance.

Column (6) presents the categorization of the alternative dependent variable, ‘compliance2’. It represents a less-strict definition with three levels. It categorises MAGS and Ws as complied cases. Whereas one extreme end of the scale, non-compliance, is easy to define and remains the same in both definitions of a polytomous dependent variable, the categorisation of GATT-adopted reports differs.

These levels are assumed ordered.¹²⁸ Outcomes that are currently non-compliant are expected to reach compliance at a certain time in the future, given that compliance is the ultimately desirable dispute outcome. However, the difference between levels is not consistent. The step between in-process and non-compliant may be smaller than the step between non-compliance and MAGS.¹²⁹ The difference between non-compliance and compliance could be even bigger, because this is the stage at which the retaliation threats of complainants must be proven. Small, developing-country members may not have the power and capacity to retaliate even if the DSU grants them that authority. The variable of compliance is measured on an ordinal scale, but the ordinal scale is a crude measurement of an interval/ratio scale. The dependent variable of compliance may be a rough measure of the enforcement power of the DSU or the retaliation capacity of a complainant.

For all procedural outcomes of WTO disputes it is important to note the following:

- All compliant and non-compliant outcomes have panel rulings.
- Not all disputes are settled via panel ruling; some are solved mutually.
- Not-settled disputes may have an initial-stage status for years.
- Not-settled disputes may have panel rulings and be in advanced stages with the AB.

¹²⁸ Busch and Reinhardt (2003) provide three examples of categorisation of outcomes into level of concessions: DS13 (1997) = MAGS/W as full concession, DS26: no concession, and DS27: partial concession. Further, DS26 in 2009 = MAGS on implementations and DS27 in 2012 = MAGS/W. They are all categorised on a compliance scale at Level 2.

¹²⁹ This research differs from the assertion of (Hofmann & Kim, 2013: p 6) that ‘compliance may be brought about during any part of the compliance stage through mutually agreed solutions (MAGS) among the dispute participants. That is, the disputing parties can agree at any step during the compliance proceedings to extend the reasonable period of time for the implementation of dispute panel or Appellate Body (AB) report recommendations or to lower the degree of change that satisfies the complainant that compliance is indeed established or restored’.

Table 4.2 shows the frequency of the dependent variables. It shows that the main dependent variable of compliance has a higher mean than compliance2. This is because the definition of compliance is stricter than the definition of compliance2, and compliance2 has only three levels, whereas compliance has four.

The mean of a binomial variable (DiSe) is smaller than that of a panel ruling, which implies that not all disputes that have had panel rulings have been settled. That is, after the panel rulings, they have been appealed to the AB.

Table 4.1: WTO dispute phases and definition of dependent variables

(1)	(2)	(3) Dichotomous variable	(4)	(5) Polytomous variable	(6)
Status of disputes April 2018	Dispute settled	Panel ruling	Compliance dichotomous	Compliance order (strict)	Alternatively defined Compliance order (loose)
GATT outcomes					
Adopted	Yes	Yes	No	In-process	Compliance
Other e.g., award WPR, follow up, award decision	No	Yes	No	In-process	Uncertain
Unadopted	No	Yes	No	No	No
WTO outcomes					
Start phase					
In consultations (IC)	No	No	No	In-process	In-process
Panel composed (PC)	No	No	No	In-process	In-process
Panel established but not yet composed (PENBYC)	No	No	No	In-process	In-process
Authority for panel lapsed (AFPL)	No	No	No	In-process	Compliance
Advanced phase AB					
Appellate body report circulated (ABRC)	No	Yes	No	In-process	In-process
Authority to retaliate granted (ATRG)	No	Yes	No	Non- compliance	Non- compliance
Authority to retaliate requested(ATRR)	No	Yes	No	Non- compliance	Non- compliance
Panel Report Circulated (PRC)	No	Yes	No	In-Process	In-process
Panel report under appeal (PRUA)	No	Yes	No	Non- compliance	Non- compliance
Compliance proceedings completed with finding(s) of non- compliance (CPCWITHNC)	No	Yes	No	Non- compliance	Non- compliance

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(1)	(2)	(3) Dichotomous variable	(4)	(5) Polytomous variable	(6)
Status of disputes April 2018	Dispute settled	Panel ruling	Compliance dichotomous	Compliance order (strict)	Alternatively defined Compliance order (loose)
<i>In progress of compliance</i>					
Compliance proceedings completed without finding(s) of non- compliance CPCWFNC	Yes	Yes	Yes	Compliance	Compliance
Compliance process ongoing (CPO)	No	Yes	No	Compliance	Compliance
Report(s) adopted, with recommendation to bring measure(s) into conformity (RAWRTBMIC)	Yes	Yes	No	Not required	Compliance
Implementation notified by respondent (INBR)	No	Yes	Yes	Compliance	Compliance
Mutually acceptable solution on implementation notified (MASOIN)	Yes	Yes	Yes	Not required	Compliance
<i>No action required</i>					
Report(s) adopted, no further action required (RANFAR)	Yes	Yes	Yes	Yes	Compliance
Mutually agreed solutions (MAGS)	Yes	No*	No	Not required	Compliance
Withdrawn (W)	Yes	No*	No	Not required	Compliance

*There may be a panel ruling; a case can be withdrawn or mutually solved at any stage even after a panel ruling.

Table 4.2: Frequency of dependent variables

Dependent variable	Code	No. of disputes	% of disputes	Total
Panel A: Dichotomous				
1: Dispute settled				
Yes	0	2,733	59.26	4,612
No	1	1,879	40.74	
2: Panel Ruling				
Yes	0	2,598	56.33	4,612
No	1	2,014	43.67	
3: Comply				
Yes	0	3,176	68.86	4,612
No	1	1,436	31.14	
Panel B: Polychotomous				
1: Compliance				
Non-compliance	0	395	8.56	4,612
In-process	1	1,967	42.65	
Mutual solutions	2	1,31	28.40	
Compliance	3	940	20.38	
2: Compliance2 (alternative)				
Non-compliance	0	2,116	44.99	4,612
In-process	1	184	3.99	
Compliance	2	2,312	50.12	

Text Box 4.1: Withdrawal: Does it have a compliant nature?

There are a few dispute cases that have two common components: (1) respondent and (2) outcome. The cases are against China, that is, DS358, DS359, DS373, and DS378 initiated by the US, Mexico, and Canada respectively, with a W outcome.

1. On 2 February 2007, the US requested consultations with China (DS358) concerning measures granting refunds, reductions, or exemptions from taxes and other payments owed to the Government by enterprises in China.

2. On 26 February 2007, Mexico requested consultations with China concerning measures granting refunds, reductions, or exemptions from taxes and other payments owed to the Government by enterprises in China. At its meeting on 31 August 2007, the DSB established a single panel for both these disputes, WT/DS359. Australia, Canada, Chile, the EC, Japan, Chinese Taipei, and Turkey reserved their third-party rights. Subsequently, Argentina, Colombia, and Egypt reserved their third-party rights.

3. On 19 December 2007, China and the US informed the DSB they had reached an agreement in relation to this dispute, in the form of a Memorandum of Understanding. On 7 February 2008, China and Mexico informed the DSB they had reached an agreement in relation to this dispute, in the form of a Memorandum of Understanding.

4. On 3 March 2008, the US requested consultations with China (DS373) with respect to certain measures pertaining to financial information services and service suppliers. On 4 December 2008, China and the US informed the DSB they had reached an agreement in relation to this dispute in the form of a Memorandum of Understanding.

5. On 20 June 2008, Canada requested consultations (DS378) with China with respect to measures affecting financial information services and foreign financial information service suppliers in China. On 2 July 2008, the US requested to join the consultations. On 4 December 2008, China and Canada informed the DSB they had reached an agreement in relation to this dispute in the form of a Memorandum of Understanding.

The striking feature of these outcomes is that they are not MAGS; they have a W outcome status. Although the WTO makes no distinctions between these two, the compiled data set makes use of this distinction. There is a Memorandum of Understanding that has instigated the complainants to withdraw the initiated disputes. The status of the challenged measures is not known; therefore, W is not categorised as compliance but as a separate outcome.

Source: WTO (2016a)

4.3.2 Data: independent variables

The choice of independent variables in this research is based on literature discussed in Section 4.2 as well as the and results of Chapter 3. These variables can be roughly divided into two sets. The first relates to the variables that are specific to the disputants such as GDP, GDPpc, and geographical and institutional variables (such as the presence of trade agreements between bilateral pairs or common legal origin).¹³⁰ The use of the GDPpc as a proxy for the legal capacity (i.e., the main explanatory variable) is based not only on literature (Busch and Reinhardt, 2007; Horn et al., 1999; Reynolds 2007) but also on its strong association with the rule of law and human capital development (Barro, 2003; Bingham, 2007). Section 3.3 discusses these variables.¹³¹

The second set of variables represents dispute-specific characteristics, such as number of third parties, GATT rounds, and observable protection. These are drawn from the previously discussed self-compiled database. Number of third parties is the number of members that have joined disputes as third parties. The GATT round is a year-specific variable; it is derived from Table 1.1 of Chapter 1. Observable protection is based on the nature of agreements evoked by complainants while initiating disputes; it uses a scale based on Bown's (2009)¹³² assigned value of 0 for disputes with measures such as, subsidies, domestic measures, and export restrictions that have low protectionist content take the value of 0; disputes that involves border measures and customs take the value of 1, and strong, obvious protectionist measures, such as AD and safeguards take the value of 2.

Table 4.3 provides descriptive statistics for all variables. It shows that the minimum values of GDPs and GDPpcs for respondents are higher than the minimum values for complainants, which indicates the tendency to target richer, more resourceful trade partners. Table 4.A3 presents the correlation matrix.

¹³⁰ In literature, GDP is a proxy for market power or retaliatory power rather than legal capacity (e.g., de Carvalho & Canesin, 2018).

¹³¹ The EU is the second-most-active member in the DSU. Using GDPpc also accounts for EU-country members such as Cyprus, Portugal, Bulgaria, Latvia, and Greece that have smaller GDPs than most Asian countries. For example, China and India rank in the first five nations with the highest GDP, but their GDPpc rankings are lower.

¹³² Bown (2009) categorises observability of alleged policy cause of lost market access into five levels: obvious (AD, countervailing duties [CVDs]), high (safeguards), medium (border measures, custom valuation); low (subsidies, domestic measures, export restrictions) and others.

Table 4.3: Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Comply	4,612	.3993929	.4898267	0	1
panelRuling	4,612	.4366869	.496029	0	1
DiSe	4,612	.4074154	.4914066	0	1
compliance	4,612	1.606.028	.9043561	0	3
compliance2	4,612	1.042.498	.9790331	0	2
Log distance	4,612	8.907.594	.518101	5.322.198	9.880.192
Log GDP complainant	4,437	13.42835	1.844.834	7.33021	16.61828
Log GDP respondent	4,437	13.9143	1.838.389	8.41425	16.65754
Log ΔGDP	1,893	1.438.546	1.700.903	7.042.621	1.654.414
Log GDPpc complainant	4,437	1.000.146	.7492364	6.083.113	113.252
Log GDPpc respondent	4,131	1.013.472	.7098122	7.683.415	1.148.697
Log ΔGDPpc	4,436	9.338.168	1.095.474	1.914.161	1.110.861
Common legal origin	4,612	.2784042	.448262	0	1
Deciles income respondent	4,437	894.005	162.765	2	10
Deciles income complainant	4,437	8.672.076	1.721.861	1	10
Diff. in deciles	4,436	1.888.864	1.806.428	0	9
Terciles income respondent	4,437	1.861.844	.8015863	1	3
Terciles income complainant	4,437	1.880.775	.7763888	1	3
Δ tercile ranking	4,436	-.0187106	1.180.588	-2	2
GATT rounds	4,612	2.821.119	.4811392	0	3
Observable protection	4,612	1.311.795	.8553654	0	3
Members in pair landlocked	4,612	.1433218	.3529054	0	2
Common lingua franca	4,612	.1125325	.3160548	0	1
Contiguity	4,612	.0288378	.1673687	0	1
Colony	4,612	.0849957	.2789055	0	1
Common colonizer	4,612	.0034692	.0588041	0	1
Extent of trade agreements	4,612	.4143539	.8947144	0	5
Number of third party members	2,149	1.070.405	8.786.888	0	62
Plurality	4,319	.5890252	.4920676	0	1

4.3.3 Estimation model: logit and generalized ordered logit

The first step is to carry out logit analysis for the dichotomous variables. The advantage of using this step is that helps provide odds ratios. The regression, including complainants, respondents, and year fixed effects, is carried out with and without control variables. The results of logit are presented in odds ratios. There is a direct relationship between logit coefficients and odds ratios. The exponentiated value of the coefficient results in the odds ratio for explanatory variables. The explanatory variable predicts in which of the two groups of binary dependent variables' the 'outcome' falls. The logit regression is carried out for each of the three dichotomous variables.

The estimated logit model is:

$$\text{Logit}[X_{ijt}] = Y_{it}\beta_1 Y_{jt}\beta_2 Z_{ijt}\beta_3 / Ydif_{ijt}\beta_4, \quad (4.1)$$

where X is the outcome of a $Dispute_{ijt}$, that is specified to be a function of real GDPpc of the complainant; the respondent in year t is a proxy for the respective member's economic and legal capacity (GDPpc); $Ydif_{ijt}$ is the difference in GDPpc between i and j in a given year t ; and

Z_{ijt} represents a range of variables that control for the institutional factors between a bilateral pair and other standard variables that are used in literature as bilateral trade determinants.

The next step is to carry out a generalized ordered logit model (gologit) analysis for the polytomous variables. The most important reason for using a gologit is that it allows the relaxing of parallel assumptions and is thus less restrictive than an ordered logit (Williams, 2006).¹³³ The main variable is a polytomous variable with four levels of compliance: 0, 1, 2, and 3. The baseline of the gologit specification is taken into account for both dependent variables (compliance and compliance2) to examine whether GDP-related variables obtain a similar result. The baseline specification has four regressions according to GDP-based independent variables: log of absolute GDP, log of GDPpc, deciles, and percentiles of GDP. The next step is the step-wise addition of control variables (such as basic gravity variables and trade agreements), as well as political and dispute-specific variables (such as number of third-party members) to the baseline equation. Finally, the sample is sliced into various sub-samples to carry out robustness checks.

The gologit model for the polytomous variables can be written as:¹³⁴

$$P(Y_i > J) = g(X\beta_j) = \frac{\exp(\alpha_j + X_i \beta_j)}{1 + \{\exp(\alpha_j + X_i \beta_j)\}}, J = 1, 2, \dots, M - 1, \quad (4.2)$$

where M = number of categories of the ordinal dependent variable. Equation 4.2 determines the probabilities that Y will take on each of the values $1, \dots, M$, where M is the number of categories of the ordinal dependent variable. The dependent variable compliance has three values ($M = 3$). These values are 0, 1, and 2, where 0 = uncertain outcome, 1 = non-compliance, and 2 = compliance. When the number of categories is greater than 2 ($M > 2$), the gologit model becomes equivalent to a series of binary logistic regression in which categories of the dependent variable are combined. When $M = 3$, then for $J = 0$, category 0 is contrasted with categories 1 and 2. For $J = 1$, the contrast is between categories 0 and 1 versus 2. Table 4.A4 provides a detailed explanation of these models.

4.4 Results

This chapter answers the question of whether the incomes of disputants influence the outcomes of disputes at the GATT/WTO. This subsection presents the results of logit and gologit analysis.

4.4.1 Results of binary dependent variables

Table 4.4 provides results of binary dependent variables in terms of odds ratios of a logit regression. The explanatory variables thus predict into which of the two groups of binary

¹³³ This estimates the two models separately, as per the Brant test. If the assumption is met, all coefficients other than the constant should be same for each logistic equation, such that they are parallel and implying that only the intercept will be different.

¹³⁴ Some well-known models are special cases of the gologit model. When number of categories (M) = 2, the gologit model is equivalent to the logistic regression model. The parallel line model fitted by ordered logit is also a special case of gologit.

dependent variables a 'dispute outcome' falls. It is a compacted table; the complete table is available upon request.¹³⁵

Columns (1) to (2) provide odds ratios of the binary variable 'dispute settled', which assumes a value of 1 if the dispute is settled and 0 otherwise. Column (1) shows the first baseline equation with GDP of disputants and absolute difference between GDP. Given that GDPpc is a more appropriate measure of legal capacity, Column (3) specifies the second baseline equation with GDPpc.

Columns (5) to (8) show odds ratios for the binary variable of compliance, which assumes a value of 1 if there has been compliance and 0 otherwise. It presents the results after the addition of various sets of variables (such as bilateral trade determinants and dispute characteristics) to the baseline equations.

Results show:

- In Column (2), the odds of disputes being settled decrease with an increase in absolute GDP difference between disputants.
- In Column (4), the odds of disputes being settled increase with an increase in GDPpc of respondents.
- The correctly classified percentage of cases has a minimum value of 75%.

Results of Columns (6) and (8) show that, after the addition of geographical and institutional variables, GDP and GDPpc do not play any roles in significantly reducing or increasing odds.¹³⁶ This result is in line with Busch and Reinhardt (2006), who use GDPs of complainants and respondents and obtain a positive insignificant coefficient for panel ruling.¹³⁷

¹³⁵ The full results include an addition of an extra binary dependent variable, 'panel ruling'.

¹³⁶ Given the objective of this chapter, complainants and respondents are divided into GDP deciles. Results are similar and are available on request.

¹³⁷ They obtain a negative significant result for respondent GDP for an early settlement at 10%.

Table 4.4: Results of dichotomous dependent variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable:	Dispute Settled				Compliance			
Log GDP complainant	2.823 (0.92)	-2.488 (-0.18)			-14.998*** (-6.82)	13.856 (0.82)		
Log GDP respondent	-0.438 (-0.38)	1.544 (0.25)			5.100*** (3.36)	3.378 (0.66)		
Log ΔGDP	0.056 (0.27)	-0.584* (-2.03)			0.116 (0.67)	0.326 (1.35)		
Log GDPpc complainant			-1.231 (-1.71)	0.467 (0.23)			-2.286** (-2.63)	1.724 (0.63)
Log GDPpc respondent			-2.343** (-3.24)	5.826** (2.94)			-0.438 (-0.52)	-4.589 (-1.85)
Log ΔGDPpc			0.078 (1.56)	0.174 (1.71)			0.040 (0.77)	0.067 (0.57)
Constant	-28.933 (-0.74)	-14.229 (-0.06)	37.089*** (3.30)	-55.754 (-1.80)	165.709*** (4.42)	-231.989 (-0.95)	22.083 (1.89)	11.452 (0.29)
Obs.	1,317	377	4,111	1,640	1,273	374	3,913	1,668
Chi ²	2.042.857	2.351.762	1.134.954	4.320.315	491.290	.	654.876	442.191
Pseudo R ²	0.374	0.672	0.396	0.558	0.414	0.577	0.294	0.506
% correctly classified	79.57%	80.42%	90.5%	89.57%	81.46%	94.12%	80.04%	85.55%
Controls	NO	YES	NO	YES	NO	YES	NO	YES
<i>Fixed effects:</i>								
Complainant	YES	YES	YES	YES	YES	YES	YES	YES
Respondent	YES	YES	YES	YES	YES	YES	YES	YES
Year	YES	YES	YES	YES	YES	YES	YES	YES

Notes: Odds ratios of logit regressions in which dependent variable equals 1 if the dispute is settled; Columns (1) to (4), and if there has been compliance, Columns (5) to (8); exponentiated coefficients; t statistics in parentheses; *p < 0.10, **p < 0.05, ***p < 0.01; odds of outcome do not vary across subjects when constant term is considered; constant estimates baseline odds; 2, 4, 6, and 8 show results after addition of geographic and institutional factors of distance, contiguity, being landlocked, ever in colony, common colonizer, common legal origin, presence of trade agreement; also includes plurality, however, odds of common colonizer and GATT rounds not displayed because of 0 odds ratios.

4.4.2 Results of polytomous dependent variables

Following the logit regression for binary outcomes, results of the main dependent variable of compliance are presented. Compliance is used as an ordered variable with four levels. Columns (1) to (4) of Table 4.5 show the basic results of the main dependent variable of compliance. To determine whether the different GDP-related variables produce comparable results, results include four different specifications of GDP-based variables: GDP, GDPpc, terciles of GDP, and deciles of GDP.

Considering the enormous scale of output that gologit regression delivers, this section attempts to provide results in as compactly as possible, without compromising the essence of the results. For each regression, there are $(4 - 1) = 3$ regression coefficients. Moreover, statistical significance of the explanatory variables differs per level of outcome. The results focus on the gologit as a model to help explore the determinative direction of GDPpc on outcomes of disputes.

The gologit coefficients can be interpreted in the same way as the coefficients from binary logit models. Positive coefficients indicate that higher values on covariates make higher values on the dependent variable more likely.

Column (1) shows that GDP of complainant is positive in all three levels of compliance, implying that higher values of complainants' GDP make outcomes in higher categories than current categories more likely. That is, richer complainants are likely to push cases forward toward compliance. Given that respondent GDP is negative for all three categories, higher GDPs of respondents makes outcomes in the non-compliant category more likely. Absolute difference in GDP also shows negative signs for all three levels, implying that the greater the differences between complainants and respondents in terms of GDP, the more likely outcomes will be in the non-compliant category.

Column (2) presents results of preferred baseline specifications. These relate to Chapter 3's finding that GDPpc is a better indicator of human development and legal capacity. Results show that baseline specifications with GDPpc are more congruent with the results of Columns (3) and (4). Results in Columns (2) and (4), show it is not only GDPs of complainants but also absolute differences in GDPs that move disputes toward compliance. For brevity, results are compacted.¹³⁸ These results support the positive inclination of complainant GDP to compliance.

Table 4.6 shows the gologit output after the step-wise addition of variables to the baseline equation. Column (1) indicates the baseline results for ready reference. Column (2) shows results after adding bilateral trade determinants such as contiguity, colonial relationship, same colonizer, and common legal origin. Column (3) shows results after adding extent of trade agreement; Column (4) shows results after adding the political variable of plurality; and Column (5) accounts for dispute-specific variables such as number of third-party members, evoked agreements in a dispute, and GATT rounds.

¹³⁸ Full results of this variable and of the alternatively defined variable, compliance2, which has three levels, are available on request (also see Table 4.7).

Results show that GDPpc of complainants remains positive and significant in most regressions across the three levels of compliance. However, after the addition of dispute characteristics, it shows a mixed picture (Column 6). The most consistent result of this sub-section is the negative GDPpcs of respondents and the positive sign of differences between GDPpcs. The negative sign of GDPpcs of respondents in categories shows inclination to non-compliance. The positive sign of differences between GDPpcs indicates that the greater the differences between complainants and respondents, the more likely disputes will end in higher categories (i.e., toward compliance). This result supports baseline results.

Table 4.5: Results of gologit polytomous variable

	(1)	(2)	(3)	(4)
Non-compliant				
Log GDP complainant	0.210 (1.62)			
Log GDP respondent	-0.014 (-0.36)			
Log ΔGDP	-0.174* (-2.11)			
Log GDPpc complainant		0.642*** (10.35)		
Log GDPpc respondent		-0.643*** (-7.58)		
Log ΔGDPpc		0.245*** (9.35)		
Decile income complainant				0.242*** (5.68)
Constant	2.061 (1.67)	1.339*** (8.34)	2.336*** (13.80)	-0.196 (-0.33)
In-process				
Log GDP complainant	0.182 (1.64)			
Log GDP respondent	-0.014 (-0.36)			
Log ΔGDP	-0.174* (-2.11)			
Log GDPpc complainant		0.254*** (6.33)		
Log GDPpc respondent		0.230*** (4.83)		
Log ΔGDPpc		0.245*** (9.35)		
Tercile income respondent			0.095* (2.46)	
Decile income complainant				-0.089*** (-3.57)
Decile income respondent				-0.049* (-2.13)
Constant	-0.046 (-0.08)	-0.925*** (-9.36)	-0.154 (-1.79)	1.290** (3.22)

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	Mutually agreed			
Log GDP complainant	0.616*** (5.41)			
Log GDP respondent	-0.014 (-0.36)			
Log ΔGDP	-0.174* (-2.11)			
Log GDPpc complainant		0.525*** (10.49)		
Log GDPpc respondent		-0.054 (-0.98)		
Log ΔGDPpc		0.245*** (9.35)		
Difference in tercile income			0.068*** (4.61)	
Decile income complainant				0.319*** (8.66)
Decile income respondent				0.360*** (10.59)
Constant	-7.886*** (-11.22)	-1.967*** (-15.65)	-1.778*** (-17.97)	-7.968*** (-12.67)
No. observations	1,893	4,436	4,436	4,436
Pseudo R ²	0.027	0.022	0.004	0.022

Notes: Standard errors clustered by member-pair in parentheses; *p < 0.10, **p < 0.05, ***p < 0.01; significant results of preferred baseline specification with GDPpc highlighted in table.

Table 4.6: Control variable to baseline equation (gologit)

	(1)	(2)	(3)	(4)	(5)
Non-compliance					
Log GDPpc complainant	0.642*** (10.35)	0.673*** (10.84)	0.614*** (8.81)	0.680*** (10.76)	0.447* (2.43)
Log GDPpc respondent	-0.643*** (-7.58)	-0.689*** (-7.70)	-0.679*** (-7.30)	-0.740*** (-9.27)	-1.323*** (-5.05)
Log ΔGDPpc	0.245*** (9.35)	0.262*** (9.43)	0.323*** (7.85)	0.226*** (8.60)	0.217*** (5.18)
Constant	0.300 (0.26)	-0.786 (-0.49)	0.322 (0.26)	0.892 (0.79)	3.992 (1.22)
In-process					
Log GDPpc complainant	0.254*** (6.33)	0.304*** (6.97)	0.318*** (6.28)	0.276*** (6.54)	-0.218** (-2.87)
Log GDPpc respondent	0.230*** (4.83)	0.254*** (5.28)	0.205*** (4.26)	0.183*** (3.81)	0.026 (0.23)
Log ΔGDPpc	0.245*** (9.35)	0.262*** (9.43)	0.218*** (7.05)	0.226*** (8.60)	0.217*** (5.18)
Constant	-7.152*** (-9.35)	-10.487*** (-9.60)	-7.346*** (-8.99)	-6.899*** (-8.74)	-5.043*** (-3.64)
Mutually agreed					
Log GDPpc complainant	0.525*** (10.49)	0.676*** (10.84)	0.133* (2.00)	0.686*** (12.70)	0.103 (1.46)
Log GDPpc respondent	-0.054 (-0.98)	0.001 (0.01)	0.076 (1.35)	-0.112* (-1.99)	-0.628*** (-8.34)
Log ΔGDPpc	0.245*** (9.35)	0.262*** (9.43)	0.363*** (8.41)	0.226*** (8.60)	0.217*** (5.18)
Constant	-8.372*** (-9.62)	-16.722*** (-11.93)	-6.554*** (-6.56)	-9.486*** (-10.46)	-2.382 (-1.91)
No. observations	4,436	4,436	4,436	4,281	2,017
Chi ²	382.768	712.655	467.396	458.659	878.971
Pseudo R ²	0.030	0.040	0.046	0.037	0.069
Controls	NO	YES	YES	YES	YES

Notes: Standard errors clustered by member-pair in parentheses; *p < 0.10, **p < 0.05, ***p < 0.01; Columns (2) to (5) show results after including increasing number of controls; Column (2) includes geographical and institutional factors, such as distance, contiguity, common legal origin; Column (3) presents results after inclusion of presence of RTA; Column (4) includes additional political variable of plurality; Column (5) includes dispute-related variables such as GATT rounds, agreements evoked, and number of third parties.

4.4.3 Sensitivity analysis: Alternatively defined dependent variable

This section presents results using the alternatively defined dependent variable *compliance2*, as is defined in Column (6) Table 4.1, which has three categories. The same regression as in Table 4.6 is done. Table 4.7 shows a positive sign and significance at 1% for GDPpcs of complainants; complainants with higher GDPs are more likely to have outcomes in categories that are higher than their current category of uncertainty.¹³⁹ Columns 1, (2), (4) show similar results as before for the dispute-initiating members. Columns (5) and (6) show a negative sign of respondent GDP at various levels of significance, indicating that higher GDP values of respondents increase their likelihood of staying in their current category of non-compliance or moving down to an outcome of uncertainty.¹⁴⁰

Table 4.8 presents results after the data are sliced into sub-samples, using various criteria to check whether the results of the baseline equation hold. Column (1) shows the baseline results for ready reference; Column (2) accounts for disputes that have the EU/US as respondents; Column (3) includes disputes with the EU/US as complainants; Column (4) shows disputes between bilateral pairs without any economic agreements; and Column (5) shows bilateral pairs that have advanced economic agreements such as FTAs. Finally, Columns (6) and (7) show results for the sub-sample of the respective GATT and WTO time periods. An important observation is that the GDPpcs of complainants shows a positive sign across all levels of compliance. The same applies to absolute differences in GDPpcs. Respondents during both eras of the GATT and the WTO show negative signs and are more likely to stay in their current category of non-compliance. The GDPpcs of complainants and differences in the absolute GDPpcs are stronger in the WTO era.¹⁴¹

¹³⁹ Positive coefficients indicate that higher values of the explanatory variable make it more likely that respondents are in a higher category of Y than their current category; negative coefficients indicate that higher values of the explanatory variable increase the likelihood of their being in the current or lower categories (ordered logit; Williams, 2006, 2016). When interpreting results for each panel, the current category of Y, as well as the lower-coded categories, serve as the reference group. Effects of the predictors, which meet the proportional odds (PO) assumption, can be interpreted in the same way as those in the PO model. Effects of explanatory variables that violate the PO assumption (i.e., being beyond a particular category versus at or below that category), must be interpreted separately at each comparison and need more attention (Liu & Koirala, 2012).

¹⁴⁰ The same model (Model 1) is also respecified using GDPpc instead of GDP. Results show the statistical significance of GDPpc of the respondents and the Herfindahl index of complainants. The GATT rounds and number of third parties also remain significant in this specification.

¹⁴¹ This research performs the regression with an alternatively defined dependent variable. It confirms only the result related to the respondent for the GATT during the non-compliance phase. Results are available upon request.

Table 4.7: Sensitivity results of alternatively defined compliance (gologit)

	(1)	(2)	(3)	(4)	(5)	(6)
Non-compliance						
Log GDPpc com.	0.136** (3.23)	0.195*** (4.43)	-0.027 (-0.54)	0.215*** (4.97)	-0.273*** (-3.55)	-0.182 (-1.83)
Log GDPpc resp.	0.070 (1.50)	0.070 (1.46)	0.174*** (3.60)	0.035 (0.74)	-0.562*** (-6.90)	-0.526*** (-6.17)
Log ΔGDPpc	-0.041 (-1.44)	-0.040 (-1.36)	0.008 (0.29)	-0.034 (-1.20)	0.087 (1.83)	0.081 (1.54)
Constant	-1.478 (-1.89)	-9.065*** (-7.74)	-1.193 (-1.52)	-2.317** (-2.93)	48.068 (.)	25.607 (.)
Mutually agreed						
Log GDPpc com.	0.069 (1.63)	0.124** (2.79)	-0.027 (-0.54)	0.215*** (4.97)	-0.273*** (-3.55)	0.031 (0.32)
Log GDPpc resp.	0.022 (0.47)	0.012 (0.24)	-0.003 (-0.06)	0.035 (0.74)	-0.484*** (-5.92)	-0.526*** (-6.17)
Log ΔGDPpc	-0.009 (-0.32)	-0.007 (-0.25)	0.008 (0.29)	-0.012 (-0.42)	0.087 (1.83)	0.026 (0.51)
Constant	-0.749 (-0.95)	-8.202*** (-6.98)	0.375 (0.48)	-2.763*** (-3.48)	47.371*** (122.66)	28.404*** (35.58)
Obs.	4,436,000	4,436,000	4,436,000	4,281,000	2,017,000	1,941,000
Chi 2	57.389	2.764.215	132.555	159.563	884.222.523	245.321.166
Pseudo R2	0.005	0.028	0.018	0.025	0.090	0.192
Controls	NO	YES	YES	YES	YES	YES

Notes: Robust standard errors clustered by member-pair in parentheses; *p < 0.10, **p < 0.05, ***p < 0.01; Columns (2) to (5) show results after including increasing number of controls; Column (2) includes geographical and institutional factors, such as distance, contiguity, common legal origin; Column (3) presents results after inclusion of presence of RTA; Column (4) includes additional political variable of plurality; Column (5) includes dispute-related variables such as GATT rounds, agreements evoked, and number of third parties.

Table 4.8: Sensitivity results, sub-samples (gologit)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Non-compliance							
Log GDPpc com.	0.642*** (10.35)	0.581*** (8.30)	0.539*** (5.16)	0.166 (1.00)	0.642*** (10.35)	0.850*** (5.65)	0.194 (1.28)
Log GDPpc resp.	-0.643*** (-7.58)	0.335* (2.09)	-0.715*** (-5.95)	-0.751*** (-6.73)	-0.643*** (-7.58)	-1.567*** (-4.77)	-1.138*** (-6.12)
Log DGDpcc	0.245*** (9.35)	0.276*** (7.35)	0.236*** (6.39)	0.314*** (6.65)	0.245*** (9.35)	-0.043 (-0.46)	0.130*** (4.68)
Constant	0.300 (0.26)	-9.674*** (-5.89)	2.027 (1.18)	5.706** (2.60)	0.300 (0.26)	8.300* (2.34)	12.097*** (4.91)
In process							
Log GDPpc com.	0.254*** (6.33)	0.214*** (4.46)	0.324*** (4.76)	0.557*** (6.59)	0.254*** (6.33)		0.099* (2.25)
Log GDPpc resp.	0.230*** (4.83)	0.541*** (4.49)	0.247*** (4.07)	0.227*** (4.32)	0.230*** (4.83)		0.254*** (5.17)
Log DGDpcc	0.245*** (9.35)	0.276*** (7.35)	0.236*** (6.39)	0.242*** (6.74)	0.245*** (9.35)		0.130*** (4.68)
Constant	-7.152*** (-9.35)	-10.383*** (-8.11)	-8.052*** (-7.92)	-10.242*** (-8.93)	-7.152*** (-9.35)		-4.418*** (-5.50)
Mutually agreed							
Log GDPpc com.	0.525*** (10.49)	0.465*** (7.13)	0.443*** (6.02)	0.254** (2.93)	0.525*** (10.49)		0.429*** (8.34)
Log GDPpc resp.	-0.054 (-0.98)	1.580*** (7.76)	-0.041 (-0.61)	0.101 (1.72)	-0.054 (-0.98)		-0.072 (-1.32)
Log DGDpcc	0.245*** (9.35)	0.276*** (7.35)	0.236*** (6.39)	0.398*** (8.45)	0.245*** (9.35)		0.130*** (4.68)
Constant	-8.372*** (-9.62)	-25.307*** (-11.57)	-7.584*** (-7.06)	-8.375*** (-6.76)	-8.372*** (-9.62)		-5.924*** (-6.72)
Obs.	4.436	2.856	2.555	3.184	4.436	665	3.771
Chi ²	382.768	222.053	203.884	244.614	382.768	63.039	207.465
Pseudo R ²	0.030	0.033	0.026	0.030	0.030	0.093	0.021
Controls	NO	YES	YES	YES	YES	YES	YES

Notes: Robust standard errors clustered by member-pair in parentheses; *p < 0.10, **p < 0.05, ***p < 0.01.

4.5 Discussion and conclusion

This chapter investigates whether the incomes of disputants determine the outcomes of disputes at the GATT/WTO. It considers geographical, political, and dispute characteristics as control variables. It presents results in two steps: results of binary dependent variables and results of polytomous dependent variables. Furthermore, it uses an alternatively defined dependent variable and sub-samples to check the robustness of the main results.

The research question is answered affirmatively. Economic determinants such as differences in absolute GDP and GDPpc are significant for both dichotomous and polytomous dependent variables. Results reflect Busch and Reinhardt's (2003) ordered probit results for compliance, which show no significant results for either GDP or GDPpc.¹⁴² There may be various reasons for this result, such as sample size or definition of the dependent variable.¹⁴³

Results obtained explain the outcomes of disputes initiated by Vietnam (Chapter 1). Pro-complainant rulings in both cases—DS404 and DS429—have not resulted in compliance by the US. Although Vietnam and the US have an FTA, the cases attracted third parties, and Vietnam is not strong enough in terms of legal capacity and retaliatory power to elicit US compliance.¹⁴⁴

A comparison of the power of income to determine the outcomes of GATT disputes and WTO disputes is not straightforward. Respondents during both eras show negative signs, implying they are more likely to stay in their current category of non-compliance. Therefore, changes in the WTO are not reflected in advantageous outcomes to poorer dispute-initiating members of the WTO compared to the GATT. Given the lack of conformity of GATT procedures with WTO procedures, the results compare only the first phase of the compliance scale. During the GATT, panel establishment was ad-hoc, and panel members were high-profile diplomats or technocrats.¹⁴⁵ More than 95% of bilateral disputes under the GATT have a status of adopted or unadopted, implying that all recorded disputes have been subject to some kind procedure of panel formation, discussions, and negotiations—diplomatic or otherwise.¹⁴⁶ Percentages of formal cases that did not go through the 'panel process' under the GATT, therefore, is zero. However, GATT reports that recommend bringing measures into conformity could be considered to be panel rulings that do not imply respondent compliance. This aspect of the non-binding nature of GATT outcomes restricts the comparability of GATT and WTO compliance.¹⁴⁷

If the concept of GPG discussed in Section 3.5 is extended, a result or consequence of a GPG also could be a GPG. That is, legal outcomes—as a result of dispute initiation—could be GPGs,

¹⁴² However, for levels of concession, Busch and Reinhardt (2003) show that complainant GDP is positively significant at 10% and respondents' per capita income is negatively significant at 10%.

¹⁴³ Section 2 and Table 4.A.1 provide more details on this topic.

¹⁴⁴ Vietnam's income designation during the years of dispute initiation is LM.

¹⁴⁵ Panel members are selected by the Secretariat from the list provided by members.

¹⁴⁶ Of 129 cases, three are related to trade policy reports, which are not included because there are no members that can be identified as complainants.

¹⁴⁷ A specific procedural form was prescribed for third-party intervention. The content of third-party rights at the time extended from submission of written statements and memoranda to participation in oral hearings (Antoniadis, 2002).

because legal outcomes of compliance contribute to policy harmonization of WTO members. However, results show that compliance also shows characteristics of being an economic good.

Figure 3.7 in Chapter 3 shows a positive relationship between real GDP and annual and cumulative disputes. Results obtained in this chapter show that GDPs of complainants continue to play roles in outcomes. Figure 4.4 reinforces the results obtained in this chapter. Figure A shows that GDPpcs of complainants and differences in the GDPpcs are directly related to compliance, whereas Figure B shows that GDPpcs of respondents are inversely related to compliance. Figure C combines the first two figures, showing these conflicting tendencies. Obviously, such a tendency is undesirable in a rule-based multilateral institution such as the WTO.

What does it imply when the results show that the members with higher GDPs and GDPpcs are able to elicit compliance? The WTO procedures were designed to empower complainants such that irrespective of their economic power, they could dispute richer members. Therefore, DSU outcomes represent the sanctity that is essential to the trustworthiness and sustainability of the multilateral institution; the suggestion that outcomes are predetermined is undesirable. The lack of legal resources available to poorer members becomes painfully apparent when disputes are pushed toward the compliance process. Apparently, the rule-based WTO system has not been able to eliminate the need for legal resources; it even may have strengthened it. It has not led to automated facilitation of the compliance process, which is a situation that calls for reforms to the monitoring of the process. As noted by Peters (2003), the binding nature of panel rulings is weakened by the lack of a central enforcement system at the WTO, making compliance a WTO weak spot. Results of this research also call for an expansion of the role of the ACWL: 'The ACWL provides, on demand, legal advice, assistance in WTO dispute settlement proceedings, and training on WTO law, to its developing country Members and to the least-developed countries' (ACWL, 2016). Currently, the ACWL has a passive role that becomes active only after less-developed country members voluntarily approach it.

Figure 4.4: GDPpc of disputants and compliance

Despite the contributions of this chapter, there are a few limitations. Although gologit is useful, because it is less restrictive in terms of assumptions and results are more parsimonious and interpretable than those of (for example) multinomial logit, its major drawback is that it is less intuitive in terms of interpretation than (for example) ordered logit. Moreover, there are several ways in which gologit results can be presented and interpreted (Williams, 2016).¹⁴⁸ A large amount of result output produced by gologit is challenging in terms of finding a compromise between details and the big picture. As previously noted in section 4.3.3 the categories for the observed variable are defined into a limited number of categories. The idea is that the unobserved continuous variable y^* that is collapsed into the limited number of categories for the observed variable y is a challenge. This is especially true for the 28% (148 of 518) disputes that are still in the IC phase. Can these disputes be considered solved? Or were they simply gestures of threat?

Another limitation is that this chapter focuses on the power represented by GDPpc, rather than on other variables such as dispute-specific characteristics. Results of dispute-specific characteristics, such as third-party participation, support the results of Bown (2005), who finds that a key role of third parties is that their presence contributes to panel processes.¹⁴⁹ This opens up a new area of investigation of the possible association between non-compliance and the role of third parties. It also opens another research avenue related to the impact of MAGSs on poorer members. For them, MAGS outcomes may be their most favourable solution, given their lack of retaliatory power. Furthermore, results show that in contrast to panel ruling and compliance, GDP of complainants shows an inverse relationship with settled disputes. It would be interesting to know whether this implies that disputes are used as threats by higher-GDP members. Further in-depth research into the magnitudes of coefficients could address this question. It also shows the need for panel data that accounts for outcomes per year for the same dispute; such data would provide insight into changes in outcomes.

Having clarified the role of resourceful members in initiation of disputes and their legal outcomes, the next step of this research is to investigate the economic outcomes of disputes. The next chapter investigates the effect of disputes on trade flows, given that restoration of trade flow is the purpose of trade disputes.

¹⁴⁸ For example, the effect of the independent variable on dependent variables depends on the value of y . The effects of an explanatory variable are not the same across the categories, K-1 cumulative logits of the model. (Williams, 2010)

¹⁴⁹ The reason may be that the effect of Article 10, which allows a third party to accrue benefits if it perceives it is also affected by the measure in dispute. Participation as a third party is considered fruitful without incurring expenses that main parties should bear (John & Pelc 2013). Being a third party in a dispute is an accessible, 'free-rider' option for a resource-restrained country (Bown, 2005).

Appendix Chapter 4

Table 4.A1: Overview of studies on outcomes of trade disputes

Study	Explanatory variable	Dependent variable	Period covered	Sample size
Reinhardt (2000)	Bandwagon, countersuit, democracy, GDP ratio	Determinants of concessions	1948–1993	233
Busch & Reinhardt (2003)	GDPpc, panel ruling, GDP, multilateral, panel established, mixed ruling, ruling for defendant	Pre-panel phase, early settlement/concessions/compliance /defendant's level of concessions (ordered): None, partial, full compliance	1980–2004	380 disputes/154 WTO (level of concessions)/41 coded cases (compliance)
Busch & Reinhardt (2006)	Third parties, GDP, No. complainants, trade, US/EU dispute	Early settlement, ruling issued, pro-complainant ruling	1995–2002	120 cases /202
Reynolds (2007)	GDPpc, defendant and GDPpc, GDP Ratio, trade importance to defendant	Pending dispute and an alternative venue or alternative DSU case as resolved/determinants of abandoning a dispute	1995–2004	324/107 pending cases
Hoekman et al. (2008)	Developing- and developed-country members	Distribution of number of legal claims, WTO case law on Art. 6.2 DSU	1995–2006	144 cases -2,369 claims
Lee (2011)	Respondent	Compliance to TRIPS	1995–2011	29 disputes with a TRIPS violation WTO

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Maggi & Staiger (2013)	Developing-country respondent, property liability rule	Early settlement withdrawal	1948–1989/1995–2006	348 disputes/916 claims
Gray & Potter (2014)	Gift size, value	Three categories: dropped cases, early settlement, and cases that went to litigation	1995–2011	Cases with US involvement in any role: 1535/317
Beshkar & Majbouri (2015)	Respondent high cost/complainant high cost	Determinants of early settlements/settlement likelihood	1995–2011	427 cases/308 disputes under allegation of direct breach
Maggi & Staiger (2017)	Article-specific leaning with disputant-specific learning	Ruling	1995–2009	73 adopted panel ruling-directed dispute dyads, 140 articles
Yildirim et al. (2018)	Time until compliance	Import dependence, intermediate import dependence, and foreign exports	1995–2010	124 cases, panel or AB issued explicit, legally-binding injunction

Table 4.A2: Categorization of legal outcome variables

Reference Table 4.1	Dependent variable	Outcomes of GATT/WTO disputes 1948–2016:					
		Dispute settled		Dispute not settled			
		Disputes mutually solved/ withdrawn	Report adopted with no further action; mutual solution implementation	Advanced phase: dispute with panel ruling		Disputes in phases before panel ruling	
		Panel ruling irrelevant	Panel ruling	Compliant	Non- compliant	In-process after panel ruling	
(2)	Dispute settled	Yes		No			
(3)	Panel ruling	No	Yes	Yes	Yes	Yes	No
(4)	Compliance	No	Yes	Yes	No	No	No
(5)	Polytomous compliance main variable	Compliance not required	Compliance not required	Compliant	Non- compliant	In-process	
(6)	Alternative polytomous Compliance	Compliant		Non-compliant		In-process	

Table 4.A3: Correlation matrix

	1	2	3	4	5	6	7	8	9	10	11
2	0.2726* 0.0000	1									
3	-0.0321* 0.0293	-0.0484* 0.0010	1								
4	0.0993* 0.0000	0.1905* 0.0000	-0.0792* 0.0000	1							
5	0.1161* 0.0000	-0.0274 0.0684	-0.1910* 0.0000	-0.1392* 0.0000	1						
6	-0.0068 0.6601	-0.1274* 0.0000	-0.0740* 0.0000	0.0006 0.9693	-0.1289* 0.0000	1					
7	0.0412* 0.0061	0.0424* 0.0048	-0.0124 0.4084	0.1075* 0.0000	-0.1925* 0.0000	-0.1513* 0.0000	1				
8	0.0990* 0.0000	-0.0137 0.3535	-0.0265 0.0723	0.0162 0.2728	0.1277* 0.0000	-0.0621* 0.0001	0.1700* 0.0000	1			
9	-0.0851* 0.0000	-0.1454* 0.0000	0.0202 0.1709	-0.0505* 0.0006	-0.0631* 0.0000	-0.0051 0.7438	0.0591* 0.0001	-0.1000* 0.0000	1		
10	-0.1197* 0.0000	-0.0180 0.2222	0.1303* 0.0000	-0.3447* 0.0000	-0.1822* 0.0000	0.0933* 0.0000	0.2022* 0.0000	0.0584* 0.0001	0.1230* 0.0000	1	
11	-0.2038* 0.0000	-0.1245* 0.0000	0.0540* 0.0122	-0.0572* 0.0079	-0.1729* 0.0000	0.0466* 0.0339	0.0410 0.0655	0.0848* 0.0001	0.0946* 0.0000	0.0794* 0.0002	1

- 1 Compliance
- 2 Compliance2
- 3 Common legal origin
- 4 Log distance
- 5 Log GDPpc complainant
- 6 Log GDPpc respondent
- 7 Log GDP per capita difference
- 8 GATTrounds
- 9 Observable protection
- 10 Extent of trade agreements
- 11 Number of third-party members

Text Box A4: Generalized ordered logit model (gologit)

In Chapter 4, the dependent variable is compliance. It has four levels: 0, 1, 2, and 3, representing uncertain outcome, non-compliance, MAGS, and compliance, respectively. These are assumed to be ordered. The outcomes that are currently uncertain are expected to reach toward compliance at a certain point of time in future, compliance being the ultimately desirable outcome. However, the difference between levels is not consistent. The step between uncertain and mutual settlements may be larger than the step between mutual agreements and compliance. The difference between non-compliance and compliance might be even bigger, because this is the stage at which the retaliation threat of complainants must be proven. Small, developing-country members may not have the power and capacity to retaliate even if the DSU grants them the authority. The variable of compliance is measured on an ordinal scale, but the ordinal scale represents a crude measurement of an interval/ratio scale. The dependent variable of compliance may be a rough measure of the enforcement power of the DSU or the retaliation capacity of the complainant.

A post-estimation Brant test provides evidence that the parallel regression assumption has been violated. Accordingly, the option of a gologit is used (Williams 2006).¹⁵⁰

In the ordered logit model, the observed ordinal variable, Y , is the compliance. This compliance is a function of another variable, Y^* , that is not measured. This Y^* is a latent, continuous, unmeasured variable, the values of which determine the value of the observed ordinal variable y .

The continuous variable Y^* has various thresholds points, denoted by k . The values of the observed variable Y depend on whether a threshold is crossed. If the number of levels for a dependent variable is three (i.e., $M = 3$), there will be two cut-off points, one from uncertainty to non-compliance and another from non-compliance to compliance.

In the ordered logit, the dependent variable Y is the collapsed version of Y^* , where Y^* may take an infinite range of values that are collapsed into three categories of Y : uncertainty, non-compliance, and compliance ¹⁵¹.

In the population, the continuous Y^* is equal to $\beta_k X_{ki}$:

$$Y^*_i = \sum_{k=0}^K (\beta_k X_{ki} + \varepsilon_i) = Z_i + \varepsilon_i. \quad (4.3)$$

The ordered logit part of the estimates above is:

$$Z_i = \sum_{k=0}^K (\beta_k X_{ki}) = E(Y^*_i). \quad (4.4)$$

¹⁵⁰ This estimates the two models separately, as per the Brant test. If the assumption is met, all coefficients other than the constant should be same for each logistic equation, that is, parallel, implying only the intercept will be different.

¹⁵¹ The random disturbance term ε has a standard logistic distribution mean and variance of 3.29, given that the relevant variables may be left out or may not have been measured perfectly (Williams 2015).

Because of the presence of a random disturbance term, the unmeasured continuous latent variable Y^* can have values that are either lower or higher than Z . Because of this random term, Z is not a perfect measure of Y^* , which may lead to incorrect classification of some cases. For example, some cases that were classified as uncertain actually may fall within non-compliance. The knowledge of distribution error terms helps to estimate the probability of the error.

The K number of β s and $M-1$ k s are the estimated parameters. The corresponding sample estimates:

$$Z_i = \sum_{k=0}^K (\beta_k X_{ki}). \quad (4.5)$$

Next, the $M-1$ cut-off terms are used to estimate the probability that Y will take a particular value.

This paper uses three levels of values in which:

$$\Pr(y=0) = \frac{1}{1 + \exp(Z_i - k_0)}. \quad (4.6)$$

$$\Pr(y=1) = \frac{1}{1 + \exp(Z_i - k_1)} - \frac{1}{1 + \exp(Z_i - k_0)}. \quad (4.7)$$

$$\Pr(y=2) = 1 - \frac{1}{1 + \exp(Z_i - k_1)}. \quad (4.8)$$

However, this holds true only when the assumption of parallel lines is met. A post-estimation Brant test shows that the parallel regression assumption has been violated. The test provides details of the variables that do not meet the assumption. Therefore, the option of gologit is used.¹⁵² The autofit model keeps all coefficients that are not significantly different constrained as equal and allows only unequal coefficients to vary.

In line with Busch & Reinhardt (2006) the gologit model can be written as:¹⁵³

$$P(Y_i > j) = g(X_i \beta_j) = \frac{\exp(\alpha_j + X_i \beta_j)}{1 + \{\exp(\alpha_j + X_i \beta_j)\}}, j = 1, 2, \dots, M - 1, \quad (4.9)$$

where M = number of categories of the ordinal dependent variable. This equation determines that the probabilities that Y will take on each of the values $1, \dots, M$ are equal to:

$$P(Y_i = 1) = 1 - g(X_i \beta_1); \quad (4.10)$$

$$P(Y_i = j) = g(X_i \beta_{j-1}) - g(X_i \beta_j) \quad j = 2, \dots, M - 1; \quad (4.11)$$

$$P(Y_i = M) = g(X_i \beta_{M-1}), \quad (4.12)$$

¹⁵² This estimates the two models separately, as per the Brant test. If the assumption is met, all coefficients other than the constant should be same for each logistic equation, that is, parallel, implying only the intercept will be different.

¹⁵³ Some well-known models are special cases of the gologit model. When $M = 2$, the gologit model is equivalent to the logistic regression model. The parallel line model fitted by ordered logit is also a special case of gologit.

where M is the number of categories of the ordinal dependent variable. The dependent variable of compliance has three values ($M = 3$). These values are 0, 1, and 2, where 0 = uncertain outcome, 1 = non-compliance, and 2 = compliant. When the number of categories is greater than 2 ($M > 2$), the gologit model becomes equivalent to a series of binary logistic regressions in which categories of the dependent variable are combined.

When $M = 3$:

For $J = 0$, category 0 contrasts with categories 1 and 2.

For $J = 1$, the contrast is between categories 0 and 1 versus 2.

The gologit model relaxes the proportional odds (PO) assumption. If one of the predictors violates the assumption, its effect can be estimated freely across various levels of the dependent variable. It can be specified as:

$$\text{logit} [\pi Y > j | x_1, x_2, \dots, x_j]; \quad (4.13)$$

$$= \ln([\pi Y > j | x_1, x_2, \dots, x_j] / ([\pi Y \leq j | x_1, x_2, \dots, x_j])); \quad (4.14)$$

$$= \alpha_j + \beta_{1j} X_1 + \beta_{2j} X_2 + \dots + \beta_{pj} X_p, \quad (4.15)$$

where α_j = the intercept or cut points, and $\beta_{1j}, \beta_{2j}, \dots, \beta_{pj}$ are logit coefficients. The gologit estimates the odds of being beyond a certain category relative to being at or below that category (Williams 2006).¹⁵⁴ A positive logit coefficient generally indicates that a unit under consideration is more likely to be in a higher category than a lower category of the outcome variable.

¹⁵⁴ All effects of the independent variables can vary across each of the cut points. If some of these effects are found to be stable, they can be constrained to be equal as in the PO model; the gologit model refers to the case in which at least one of the coefficients for a predictor varies across categories (Liu & Koirala, 2012).

Chapter 5

GATT/WTO disputes and their effect on international trade¹⁵⁵

What a wonderful calculation! And how enormous is the distance which separates the just from the unjust in regard to pleasure and pain! (Plato, The Republic, around 380 B.C.).

5.1 Introduction

Results of Chapter 2 show that the transformation of the GATT to the WTO has led to only a marginal increase in the participation of least-developed country members in dispute settlement proceedings. Results of Chapter 3 show that national income levels of disputing members are partly responsible for this, suggesting that bilateral trade could be of importance for dispute initiation. Results also show that poorer members tend to channel their limited resources toward disputes with trade partners that have large, wealthy export markets, rather than small, poor markets.

However, given that dispute initiation is only the first step in the rule-oriented dispute settlement procedure, Chapter 4 investigates the legal outcomes of these disputes in terms of settlement. A dispute settlement at the WTO is possible when there is either a MAGS, or compliance by the respondent subsequent to a panel ruling in favour of a complainant. Compliance with panel rulings by respondents is not merely a matter of legal/procedural recourse; results from Chapter 4 show there is a power play in terms of resources and legal capacity. The greater the power of a dispute-initiating member, the greater the likelihood that member will obtain compliance from a respondent. This implies that dispute initiations and favourable outcomes leading to compliance by respondents may not be attainable for poorer, less-developed members of the multilateral trade system.

This chapter shifts the focus from studying the determinants of trade dispute initiation and settlement to investigating the consequences of GATT/WTO disputes on disputants' international trade flows. Using a comprehensive database on the universe of aggregate bilateral trade covering both the GATT and WTO eras, it applies a state-of-the-art gravity equation to quantify the economic magnitude of disputes on international trade. It complements this analysis with a detailed product-level analysis of the WTO era, providing a fine-grained view of how disputes have affected international trade in recent decades. To the best of the authors' knowledge, it is the first study to incorporate all dispute data from both the GATT and WTO eras and shed a comprehensive light on the trade effects of disputes in the multilateral system.

¹⁵⁵ This chapter is co-authored with Tristan Kohl.

The remainder of the chapter is structured as follows: Section 2 reviews empirical literature on the trade effects of multilateral disputes on trade; Section 3 presents the underlying methodology and data; Section 4 presents results; and Section 5 discusses the main findings and presents conclusions.

5.2 Literature

For over a decade, literature on the GATT/WTO and their economic outcomes has evolved in two related, relatively complementary streams. Rose's (2004) seminal work on the effect of GATT/WTO membership on trade has instigated a considerable amount of research that identifies the conditions under which membership in the multilateral trade system has/has not brought about more trade for participating members.

Although Rose (2004) finds essentially no evidence that the GATT/WTO generates more trade for members compared to non-members, Subramanian and Wei (2007) use the same data to illustrate the opposite, according to the extent to which members are industrialized and their sectoral composition. However, Tomz, Goldstein, and Rivers (2007) show that Rose's (2004) GATT/WTO membership data do not correctly account for informal participation in the GATT by many developing countries; when such participation is accounted for, Rose's main findings are reversed. Literature's further scrutiny of the importance of country asymmetries, intensive and extensive margins of trade, and various estimation techniques, has led to the current consensus that GATT/WTO membership, in principle, has a favourable outcome for members' trade (see Kohl 2017 for a survey).

Bown (2004) was the first to examine how WTO members' participation in the DSB affects disputing nations' international trade. For a sample of disputes between 1973 and 1998, he finds that a 1% increase in a complainant's share of the respondent's imports is associated with a 2% to 3% increase in trade liberalisation following a dispute. That is, if complainants successfully litigate, their exports to members found to be in violation with multilateral trade rules increase. However, Bown notes that the extent to which defendants implement trade reforms depends on disputing members' capacities to retaliate .

Using actual trade data, Bechtel and Sattler (2015) examine how disputes affect sectoral exports from complainants and third-party members to respondents. They conclude that sector-specific exports from complainants to respondents increase in the aftermath of disputes. However, Hofmann and Kim (2013) find that trade outcomes vary depending on whether cases have been settled by consultations or by undergoing the entire formal arbitration process. The former does not lead to an improvement in trade flows, whereas the latter causes a decline in disputants' bilateral trade. More recently, Chaudoin et al. (2016) use product-level data on WTO disputes spanning 1992 to 2010 to show there is no singular factor that sufficiently explains the diverse dispute-induced trade effects. They find that on average, there is no statistically significant relationship between dispute resolutions and trade flow.

Accordingly, there is no clear consensus on the trade effects of WTO disputes. Moreover, literature seems to focus mostly on how dispute resolutions affect trade, rather than on how disputes affect members' trade while disputes are ongoing (and regardless of legal outcomes). The first contribution of this chapter is to provide new empirical evidence to this discussion, showing that on average, disputes bring negative effects to disputants' bilateral trade.

Moreover, to the best of the authors' knowledge, there is no literature that sheds light on the trade effects of GATT disputes. This is a non-trivial matter, given the fundamental redesign of the DSB in the Uruguay Round, including the subjecting of members to a binding, legal outcome they can no longer veto. Therefore, the second contribution of this chapter is to shed light on the trade outcomes of GATT-era disputes and systematically compare them to WTO-era estimates, using a state-of-the-art gravity equation of international trade.

5.3 Methodology

5.3.1 Data

This chapter approaches the question of how GATT/WTO disputes affect disputants' bilateral trade flows from two complementary angles, involving both aggregate and product-level trade data.

Analysis of whether disputes stem from product- and sector-specific trade restrictions that affect product-level trade requires a panel of bilateral, product-specific trade flows to gauge the effect of disputes on international trade.

Although the use of product-level data ensures the most detailed identification of disputes' effect on international trade, such an approach has several potential drawbacks. First, on a practical level, bilateral product-level trade data are not available for the world economy prior to 1995. Therefore, it is impossible to estimate the product-level consequences of disputes on GATT members' trade flows. However, even if such data were available, estimating the envisioned model would be very challenging, given the number of observations.

Second, it is possible that disputes cause uncertainty about partners' bilateral trade policies that extend beyond limited sets of products and lead to broader macroeconomic and geopolitical consequences. This seems particularly plausible if multiple products are simultaneously involved in a particular dispute. However, only 14% of WTO disputes are based on singular products; 50% involve between two and 10 products, and about 75% cover up to 50 products (see Table 5.A1 for further data). Accordingly, it is unlikely that disputes have trade outcomes at the aggregate level, regardless of any potential product-level effects.

Third, Conconi et al. (2017) find that trade disputes are not necessarily filed at the times they are economically applicable; in the case of the US, bilateral issues that could serve as the potential for dispute are shelved and expedited only when politically convenient. This implies there is no association between particular product-level related changes in trade flows and the timing of initiations of related trade disputes. However, if geopolitical uncertainty is linked to the timing of trade disputes, it may be more feasible to detect such tensions at a broader macroeconomic, aggregate level than by using product-level data.

Given the main objective of this chapter—and more broadly of this dissertation—the chapter compares the economic outcomes of the GATT and the WTO. Therefore, the main analyses focus on GATT and WTO outcomes using aggregate bilateral trade data.

Analysis begins with aggregate, country-level trade data used in previous chapters and obtained from the International Monetary Fund (IMF) Direction of Trade Statistics, which

yields real aggregate import data for 239 importers by 239 exporters. This is the most comprehensive database available, spanning 1948 to 2016, and enabling literature's first study of the impact of disputes on GATT and WTO members' trade throughout the entire existence of the multilateral trade system.

To explore product-level results for the WTO era, this analysis relies on CEPII's BACI product-level data set for 1995 to 2014, covering 210 importers by 210 exporters by 5,822 products at the HS6-digit level and totaling close to 123 million observations.

Data drawn from Tomz et al. (2007) account for both formal members and informal participants in the GATT and rely on the WTO's online membership roster to identify current WTO members. Data on GATT/WTO disputes and trade agreements are as described in Chapter 3. Complementary data on the HS6-digit products involved in WTO disputes are taken from Bown and Reynolds (2015).

5.3.2 Estimation

Estimation of a state-of-the-art gravity model is as follows:

$$\ln(M_{odt}) = \beta_0 + \beta_1 \text{BothIn}_{odt} + \beta_2 \text{OneIn}_{odt} + \beta_3 \text{TA}_{odt} + \beta_4 \text{DISPUTE}_{odt} + \varphi_{ot} + \varphi_{dt} + \varphi_{od} + \varepsilon_{odt}, \quad (5.1)$$

where M_{odt} depicts bilateral aggregate imports in destination (respondent) d from origin o (complainant) in year t ; BothIn_{odt} and OneIn_{odt} are binary indicators for whether both or one of the members in member-pair od are GATT/WTO members in year t and 0 otherwise; TA_{odt} is a binary variable equal to unity for member-pairs sharing a trade agreement (TA) in year t and 0 otherwise; and DISPUTE_{odt} is a binary variable equal to unity when a member-pair observes an official trade dispute (as explained in Chapter 3).

The origin-year (φ_{ot}) and destination-year (φ_{dt}) fixed effects capture time-varying multilateral resistance terms, as discussed in Baier and Bergstrand (2007). This includes the GDPs of complainants and respondents. Moreover, the origin-destination (complainant/respondent) fixed (φ_{od}) controls for relevant time-invariant variables, such as geographic distance between the bilateral pair in kilometers, colonial ties, and any other pair-specific determinants that may affect a member-pair's trade policy and willingness to engage in trade disputes. This is akin to the pair fixed effect introduced by Baier and Bergstrand (2007) that controls for pair-specific determinants of trade policy variables such as trade agreements and, by extension, GATT/WTO membership and trade disputes. This approach controls for possible endogeneity bias (i.e., the effect of trade on disputes).

All robust standard errors are clustered by member-pair. Main results are obtained by estimating with ordinary least squares (OLS). The robustness of the findings is explored by means of Poisson pseudo-maximum likelihood (PPML) estimation.

For the product-level analysis, equation (5.1) is estimated with the addition of an HS6-level product-level dimension p in the DISPUTE_{odtp} variable. Fixed effects are modified in different ways to allow for variation in the product dimension.

5.4 Results

With regard to the effect of disputes on international trade flows, Table 5.1, Column (1) presents regression results for the GATT era. It shows a positive but statistically insignificant effect on formal and informal GATT participation on international trade in the GATT era. However, having a trade agreement fosters trade by about 36%.¹⁵⁶ The main variable of interest—the binary variable that is unity if member-pairs have a GATT/WTO dispute in a given year and 0 otherwise—shows a negative and statistically significant effect of disputes on members' trade (at the 95% confidence level). That is, disputes decreased members' trade by approximately -10.4%. A test of the GATT/WTO membership and dispute parameter estimates for size equivalence (i.e., that their sum equals zero) is rejected ($p = 0.0218$), suggesting that disputes hindered members' trade in the GATT era more than they benefited from participating in the multilateral system.

With regard to results for the WTO era, Column (2) shows there is a statistically significant and negative effect of disputes on member's trade (although somewhat smaller at about -5.2%). Interestingly, the effect of WTO membership is now positive and significant, whereas the gains of participating in other trade agreements are small and negative. In contrast to findings for the GATT era, the joint effects of WTO membership and having a trade dispute are now positive, that is, disputes harm members' trade, but this effect does not exceed the positive effect of participating in the multilateral trade system ($p = 0.0086$).

In the long run, and including both institutional eras, what is the overall effect of disputes on GATT/WTO members' trade? Column (3) reveals positive effects of GATT/WTO membership (8.8%) and being in a trade agreement (27.9%) and a negative impact of disputes (-16%). These findings suggest that the negative effect of disputes far outweighs the positive gains of participating in the multilateral trade system.

However, Column (3) omits a periodic control that acknowledges an institutional difference between the GATT and WTO eras. Therefore, Column (4) introduces a WTO-era interaction term. For GATT/WTO membership, the interaction term confirms that the trade-promoting effects of multilateralism are ascribed to the WTO era (32.6%), whereas the trade-decreasing effect of disputes apply to both eras (-8% and -10.4%, respectively; the test of equality with a p -value of 0.7479 is not rejected). Taken together, these Column (4) findings suggest that the gains of GATT/WTO participation outweigh the negative impact of disputes (p -value for the test of equality of relevant parameters = 0.0249), but the economic loss associated with disputes is sizeable at about 10% of members' bilateral trade.

¹⁵⁶ $(e^{0.304} - 1) * 100 \approx 35.5269$.

Table 5.1: Effect of disputes in GATT and WTO eras

	(1) GATT	(2) WTO	(3) GATT & WTO	(4) GATT & WTO
Both in GATT/WTO	0.0165 (0.0403)	0.181*** (0.0447)	0.0847** (0.0336)	-0.0302 (0.0426)
Both in GATT/WTO x post-1994				0.282*** (0.0613)
Trade agreement	0.304*** (0.0287)	-0.0535*** (0.0170)	0.245*** (0.0181)	0.246*** (0.0181)
Dispute	-0.110** (0.0481)	-0.0537*** (0.0201)	-0.175*** (0.0275)	-0.0835** (0.0420)
Dispute x post-1994				-0.110** (-2.36)
Constant	14.78*** (0.0250)	14.24*** (0.0290)	14.44*** (0.0213)	14.40*** (0.0221)
No. observations	380,107	523,012	906,118	906,118
R ²	0.882	0.892	0.866	0.866
p-value	0.0218	0.0086	0.0376	0.0249

Notes: Standard errors clustered by member-pair in parentheses; *p < 0.10, **p < 0.05, ***p < 0.01; all regressions include importer-year, exporter-year and importer-exporter fixed effects; parameters for 'both in GATT/WTO' could not be estimated due to collinearity with fixed effects; p-value refers to the p-value of the two-sided test of equivalence of the parameter estimates for 'both in WTO and 'dispute'.

In addition to this finding of the generally negative impact of disputes on trade, results also establish considerable variation in the number of disputes in which members are involved. About 60% of member-pairs are involved in only one dispute in any given year; 20% face two disputes; and about 16% are involved in three disputes at the same time. However, the distribution has a long tail, with a small fraction of about 5% of member-pairs involved simultaneously in up to 16 disputes (see Table 5.A2, Panel A for supporting data).

Table 5.2 shows results of controlling for number of disputes instead of a simple dispute dummy variable. The parameter estimates for GATT/WTO membership and participation in trade agreements are as previously discussed for the GATT (Column 1), WTO (Column 2) and both eras (Column 3). The new result is the number of disputes, which is consistently negative and statistically significant at the 99% level. These negative estimates indicate that additional trade disputes have the undesirable effect of further diminishing disputing members' trade by about 5% of member's bilateral trade per additional dispute.

Table 5.2: Number of disputes

	(1) GATT	(2) WTO	(3) GATT & WTO
Both in GATT/WTO	0.0164 (0.0403)	0.181*** (0.0447)	0.0833** (0.0336)
Trade agreement	0.304*** (0.0287)	-0.0541*** (0.0171)	0.245*** (0.0181)
Number of disputes	-0.0606** (0.0294)	-0.0204*** (0.00743)	-0.0499*** (0.0119)
Constant	14.78*** (0.0250)	14.24*** (0.0290)	14.44*** (0.0214)
No. observations	380,107	523,012	906,118
R ²	0.882	0.892	0.866

Notes: Standard errors clustered by member-pairs in parentheses; *p < 0.10, **p < 0.05, ***p < 0.01; all regressions include importer-year, exporter-year, and importer-exporter fixed effects; parameters for 'both in GATT/WTO' could not be estimated because of collinearity with fixed effects.

The data also reveal considerable heterogeneity in the duration of any given dispute. Table 5.A2, Panel B shows that members can be embroiled in disputes for up to 35 years, with an average dispute length of 11 years. Table 5.3 therefore considers the effect of dispute length for the aforementioned time periods. Although Column (1) shows that dispute length under the GATT has no significant effect on trade, Column (2) shows there is a marginally negative effect in the WTO era, as does Column (3) in the full sample. These results imply that the longer trade disputes drag on, the greater their detrimental effect on trade; they decrease members' bilateral trade by 1.4% per added year.¹⁵⁷

¹⁵⁷ In results not reported here, there are regressions with lagged dispute dummies up to and including lags for 15 years (recall that the mean dispute length is 11 years and about 70% of disputes last less than 15 years, as shown in Table 5.A2, Panel B.) Overall, parameter estimates of the lagged dispute dummies are negative and up to two-thirds of these lags are statistically significant, depending on whether they relate to the GATT era, the WTO era, or both eras.

Table 5.3: Dispute length

	(1) GATT	(2) WTO	(3) GATT & WTO
Both in GATT/WTO	0.0163 (0.0403)	0.181*** (0.0447)	0.0845** (0.0336)
Trade agreement	0.305*** (0.0287)	-0.0539*** (0.0171)	0.245*** (0.0181)
Dispute length	-0.00547 (0.00534)	-0.00604*** (0.00199)	-0.0138*** (0.00261)
Constant	14.78*** (0.0250)	14.24*** (0.0290)	14.44*** (0.0213)
No. observations	380,107	523,012	906,118
R ²	0.882	0.892	0.866

Notes: Standard errors clustered by member-pairs in parentheses; *p < 0.10, **p < 0.05, ***p < 0.01; all regressions include importer-year, exporter-year, and importer-exporter fixed effects; parameters for 'both in GATT/WTO' could not be estimated because of collinearity with fixed effects.

This chapter also considers whether the detrimental effect of disputes is subject to variation across member pairs, depending on their level of development. It repeats the baseline regressions from Table 5.1, but interacts the dispute dummy with a variable accounting for the 'direction' of the complaint; that is, 'dispute HM' implies a high-income complainant and medium-income respondent, 'dispute LH' implies a low-income complainant and high-income respondent, and so on. Table 5.4 presents results for the GATT, the WTO, and both eras.

It shows that in general, dispute-induced trade effects are statistically insignificant. In Columns (1) to (3), statistically meaningful cases tend to be either positive (disputes between high-income members), negative (disputes with medium- and high-income members), or mixed (disputes involving low- and high-income members). Interestingly, the trade effects of low-income members filing disputes against high-income members were negative under GATT, but positive under the WTO. Surprisingly, however, trade among high-income members seems to be stimulated by disputes.

Table 5.4: Disputes and member asymmetries

	(1) GATT	(2) WTO	(3) GATT & WTO
Both in GATT/WTO	0.0183 (0.0402)	0.181*** (0.0447)	0.0893*** (0.0335)
Trade agreement	0.307*** (0.0286)	-0.0517*** (0.0171)	0.253*** (0.0181)
Dispute HH	0.163** (0.0780)	0.0224 (0.0307)	0.131*** (0.0450)
Dispute HM	-0.439*** (0.145)	-0.0228 (0.0325)	-0.231*** (0.0546)
Dispute HL	0 (.)	0.0818 (0.0590)	-0.217** (0.0853)
Dispute MH	-0.588*** (0.0733)	-0.210*** (0.0360)	-0.449*** (0.0460)
Dispute MM	-0.365 (0.245)	0.0165 (0.0572)	-0.110 (0.0804)
Dispute ML	0 (.)	-0.414 (0.299)	-0.312 (0.192)
Dispute LH	-0.834*** (0.300)	0.334*** (0.0952)	-0.380*** (0.108)
Dispute LM	0 (.)	0.259 (0.197)	-0.136 (0.260)
Dispute LL	0 (.)	0.0308 (0.0894)	-0.191 (0.127)
Constant	14.77*** (0.0250)	14.24*** (0.0290)	14.43*** (0.0213)
No. observations	380,107	523,012	906,118
R ²	0.882	0.892	0.866

Notes: Standard errors clustered by member-pair in parentheses; *p < 0.10, **p < 0.05, ***p < 0.01; all regressions include importer-year, exporter-year, and importer-exporter fixed effects; parameters for 'one in GATT/WTO' could not be estimated because of collinearity with fixed effects.

5.4.1 Sensitivity analysis: zero trade flows

This research has established a generally detrimental effect of disputes, number of disputes, and dispute length on members' international trade flows, but a possible drawback of the results is that they have so far relied on estimation with OLS. However, a well-known feature of international trade data is the prevalence of 'zero' trade flows, which introduces estimation bias in log-linear specifications of the gravity equation. The conventional solution to this problem is to estimate the model in levels using PPML estimation (see, e.g., Santos Silva & Tenreyro, 2006). Therefore, Table 5.5 revisits the main results for the combined GATT and WTO eras (Column 3 in previous tables) with PPML.

Column (1) confirms the negative impact of disputes on members' trade; Column (2) finds that number of disputes negatively affects trade, but the effect is not statistically significant; Column (3) confirms previous findings for dispute length; and Column (4) reveals findings that somewhat at odds with OLS results. Specifically, there is no longer a positive effect of disputes among high-income members. There is evidence of trade-promoting effects for disputes initiated by low-income members. This is partly because PPML (in contrast to OLS) correctly accounts for zero trade flows that pertain mostly to developing-country members, thereby resolving a measurement issue in the estimation procedure.

Table 5.5: Revisiting main results with PPML

	(1) GATT & WTO	(2) GATT & WTO	(3) GATT & WTO	(4) GATT & WTO
One in GATT/WTO	-0.0262*** (0.00812)	-0.0260*** (0.00809)	-0.0255*** (0.00807)	-0.0252*** (0.00823)
Trade agreement	0.0965*** (0.00585)	0.0969*** (0.00584)	0.0957*** (0.00586)	0.0972*** (0.00589)
Dispute	-0.0148** (0.00647)			
Number of disputes		-0.00124 (0.00137)		
Dispute length			-0.00113*** (0.000397)	
Dispute HH				-0.0246*** (0.00846)
Dispute HM				0.0381*** (0.0137)
Dispute HL				-0.00405 (0.0314)
Dispute MH				-0.0697*** (0.0128)
Dispute MM				0.0141 (0.0415)
Dispute ML				-0.412*** (0.0787)
Dispute LH				0.130** (0.0508)
Dispute LM				0.282 (0.196)
Dispute LL				0.346*** (0.0826)
No. observations	1,648,030	1,648,030	1,648,030	1,648,030
R ²	0.997	0.997	0.997	0.997

Notes: Standard errors clustered by member-pair in parentheses; *p < 0.10, **p < 0.05, ***p < 0.01; all regressions include importer-year, exporter-year, and importer-exporter fixed effects; parameters for 'both in GATT/WTO' could not be estimated because of collinearity with fixed effects.

Table 5.6: Product-level results

	(1) WTO	(2) WTO
Both in GATT/WTO	-0.0829*** (0.0251)	-0.0655** (0.0259)
Trade agreement	-0.0123** (0.00607)	-0.0124** (0.00631)
Dispute	0.0551 (0.0696)	-0.0508 (0.0611)
Constant	3.735*** (0.0205)	3.721*** (0.0211)
No. observations	122,640,994	122,640,994
R ²	0.198	0.323
Importer-year FE	Yes	Yes
Exporter-year FE	Yes	Yes
Importer-exporter FE	Yes	Yes
Product (HS6) FE	No	Yes

Notes: Standard errors clustered by member-pair in parentheses; *p < 0.10, **p < 0.05, ***p < 0.01; all regressions include importer-year, exporter-year, and importer-exporter fixed effects.

5.4.2 Sensitivity analysis: product-level data

So far, analysis has focused on trade data aggregated at the member-pair-year level. A potential issue with the econometric identification is that disputes typically do not include all products traded by member-pairs, but pertain only to a specific set of products. As previously discussed it is possible that product-specific disputes should be observed only at the product level. However, Table 5.6 shows there are no dispute-induced trade effects on product-level trade for the WTO era.¹⁵⁸

5.5 Discussion and conclusion

The main purpose of this chapter is to provide a comprehensive view of how disputes in the multilateral trade system affect disputants' bilateral trade flows for both the GATT and WTO eras, a novelty in this literature that has focused entirely on WTO-era disputes.

This chapter's overall finding is that trade outcomes for GATT and WTO-era disputes are statistically significant and negative, that is, disputes depress the bilateral trade flows of disputing members. It also shows that the trade gains of GATT/WTO membership are partially

¹⁵⁸ These findings come with two caveats. First, the large number of observations and high dimensionality of the data made it unfeasible to estimate a gravity equation with importer-product-year, exporter-product-year, and importer-exporter-product fixed effects, even though econometrically, this would be the preferred approach. The 'settled-for' approach is importer-year, exporter-year, importer-exporter, and product fixed effects. Second, given the large number of observations, none of these regressions could be estimated with PPML.

offset by the negative trade effects of DSB litigation. These results are indicative the sizeable economic costs associated with dispute procedures (Bechtel and Sattler 2015).

Analyses also show that the trade costs of litigation increase with number of simultaneous disputes per member-pair and with length of disputes. Results generally are robust to estimation with PPML with a host of fixed effects, in line with most recent empirical literature on the gravity equation of international trade.

Although results of previous chapters show that less-developing-country members' participation as dispute initiators has increased only marginally—and that they are unable to command compliance from richer trade partners—the results of this chapter are more encouraging for them. The positive trade effects for disputes induced by low-income members may reflect their increased abilities to engage with and participate in the rules-based multilateral trade system. However, further research is needed to uncover the exact mechanisms at play, determine the circumstances in which benefits and learning occurs, and identify the specific resources needed to support low-income members' sustainable inclusion in the WTO. Future research also could explore the intensive and extensive margins of trade during and following disputes and consider potential variation in these outcomes subject to disputes' legal outcomes.

Product-level analysis of the WTO era does not provide any significant findings for disputes' effects on product-level trade, suggesting that trade disputes have broad-scale, macroeconomic effects that go beyond the narrow dimension of a particular product. Until now, the role of global value chains (GVCs) in GATT/WTO disputes has not been explored in the literature. However, increasing production fragmentation in the world economy implies that disputes introduce disruptions that may very well have knock-on effects on GVC trade. Given the current climate of trade wars between the world's major economies, understanding the integral role of trade disputes in GVCs is a timely topic for deeper analysis.

Appendix Chapter 5

Table 5.A1: Number of products in WTO disputes

Number of products	Number of disputes	%	Cumulative
1	45	13.9	13.9
2–5	85	26.2	40.1
6–10	50	15.4	55.6
11–50	75	23.1	78.7
51–100	14	4.3	83.0
101–200	20	6.2	89.2
201–500	14	4.3	93.5
501–1000	14	4.3	97.8
1000+	7	2.2	100.0
Total	324	100.0	

Notes: Number of HS6 products in WTO disputes, 1995–2011; authors' calculations based on Bown and Reynolds (2015).

Table 5.A2: Distribution of (a) number of disputes and (b) dispute length

Panel A				Panel B			
Number of disputes	Frequency	Percent	Cumulative	Dispute length	Frequency	Percent	Cumulative
1	5,701	57.14	57.14	1	197	1.99	1.99
2	1,910	19.14	76.29	2	564	5.69	7.67
3	1,619	16.23	92.51	3	963	9.71	17.38
4	220	2.21	94.72	4	668	6.74	24.12
5	140	1.4	96.12	5	765	7.71	31.83
6	29	0.29	96.41	6	594	5.99	37.82
7	56	0.56	96.97	7	455	4.59	42.41
8	114	1.14	98.12	8	328	3.31	45.72
9	82	0.82	98.94	9	351	3.54	49.26
10	76	0.76	99.7	10	470	4.74	54
13	15	0.15	99.85	11	374	3.77	57.77
16	15	0.15	100	12	312	3.15	60.92
				13	234	2.36	63.28
				14	448	4.52	67.79
				15	45	0.45	68.25
				16	432	4.36	72.6
				17	306	3.09	75.69
				18	486	4.9	80.59
				19	950	9.58	90.17
				20	60	0.61	90.77
				21	567	5.72	96.49
				30	58	0.58	97.08
				33	29	0.29	97.37
				35	261	2.63	100
Total	9,977	100		Total	9,977	100	

Notes: Number of disputes counts the number of active disputes per member-pair-year; dispute length is the duration of a given dispute in years.

Chapter 6

Conclusion

Our global institutional arrangements—the basic ground rules that govern our world economy—are human-made. They don't exist naturally, nor are they God-given. We make these rules, those of the WTO (World Trade Organization) for instance, which fill tens of thousands of pages. These words have been strung together by human beings and are also interpreted and enforced by human beings (Pogge, 2005).

This research investigates GATT/WTO disputes from 1948 to 2016, covering 68 years of the multilateral period. It discusses characteristics of disputants, determinants of disputes, and legal outcomes and economic effects of disputes. Disputes under the WTO are legal acts for economic reasons, and it is challenging to unravel their causes and effects. Disputes occur at the intersection of politics, law, and economics and interplay at multiple levels; although disputes originate at the sectoral level in domestic economies, the governments that initiate them are at the national level, and panel rulings are administered at the multilateral level.

Given the timespan of this research, it was necessary to compile a comprehensive bilateral database on disputes to facilitate the use of other existing economic databases for the research. Accordingly, an act of consultation of request at the DSU was chosen as the unit of dispute. Empirically, this research bridges a gap between theory and policy by providing new insights on disputants' characteristics, determinants of disputes, determinants of legal outcomes, and the economic effects of the trade disputes in terms of trade flows.

Chapter 2 explores various characteristics of disputant countries. Results show that although there was only a marginal increase in the number of complaints by lower-income members under the WTO compared to the GATT, disputes against lower-income members increased sharply under the WTO. African countries did not initiate disputes under the WTO, and low-income members participated in the DSU mainly as third parties. Moreover, descriptive analysis shows that almost all bilateral disputes are between members that are 'distant' in terms of contiguity, colonial connection, and having economic agreements. Contrary to the factors that explain trade patterns, the results of Chapter 2 show that most bilateral disputants are non-contiguous, have no economic agreements, and no colonial connections, implying that 'institutional distance' between bilateral pairs matters. This finding leads to Chapter 3, which formal analyses the predictors of GATT/WTO dispute incidence from 1948 to 2016.

Bilateral trade between any two countries is largely explained by a model that accounts for the incomes of exporters and importers and the distance between them. Therefore, Chapter 3 presumes that trade disputes can be explained by these explanatory variables. The chapter makes an important contribution by using a set of 'gravity' variables that have not often been included in analysis of dispute incidence at the GATT/WTO. Using probit and logit models with incidence of dispute initiation as the dependent variable, it finds that basic gravity variables explain the likelihood of disputes under the DSU. Results suggest that for complainants, power derived from market size and/or legal capacity is important. They also show evidence of the

legal capacity mechanism for respondent countries; because lower-income members do not have sufficient resources, they must make choices about where to spend them. Considering the significance of the member size to dispute initiation, Chapter 3 questions whether the power advantage of GDP percolates through subsequent DSU processes that determine dispute outcomes.

Accordingly, Chapter 4 investigates whether the legal outcomes of disputes also reflect income and differences in income status. It uses factual information on dispute outcomes—such as the presence of panel rulings, whether a dispute is settled, and dispute compliance—to construct dependent variables related to the dispute outcomes. It constructs two types of dependent variables: dichotomous and polytomous. Dichotomous variables take two values, 0 or 1, and the polytomous dependent variable of compliance has four levels. Logit is used for the dichotomous variables, and gologit is used for the polytomous variable. Results show that economic determinants, such as differences in absolute GDP and GDP per capita, are significant for both dichotomous and polytomous models. They also show that respondent compliance with panel rulings is not solely a matter of legal-procedural recourse; power plays occur in terms of resources, that is, legal capacity. The stronger the power of a dispute-initiating member, the greater the likelihood the member will achieve compliance by a respondent.

Following this clarification, that is, that resources of members affect both dispute initiation and legal outcomes, Chapter 5 investigates the economic outcome of disputes in terms of trade flows. It examines the effect of disputes on trade flows of GATT/WTO disputants, to provide a comprehensive view of how disputes in the multilateral trade system affect disputants' bilateral trade flows. Inclusion of the GATT era in this analysis is a novelty in literature that so far has focused on WTO-era disputes. The analysis provides estimates according to the state-of-the-art gravity equation. Overall, results show that trade outcomes for both GATT- and WTO-era disputes are statistically significant and negative. Product-level analysis for the WTO era finds no significant evidence that disputes affect product-level trade.

However, results do show that disputes initiated by low-income members lead to positive results in terms of increased trade flows following the dispute. True to the spirit of the WTO and its DSU procedures, they indicate that although low-income members may have little power in terms of legal or economic capacity to threaten their trade partners, their dispute initiations are effective in terms of increasing trade flow.

If the WTO did not exist, it would have to be invented...but the system's accomplishments over the past two decades are no guarantee of its future success...the WTO will continue to be an essential pillar of global economic governance (Azevêdo, September 28, 2015).

Results of this research show that these human-made global institutional arrangements, in which all members have ratified rules and procedures after years of deliberations, have failed to serve the majority of members. Trade disputes represent a GPG, in they provide benefits to all members of society, including consumers, even though disputes occur at the multilateral level. However, the results are disturbing: Disputes and their outcomes show characteristics of economic, rather than global, public benefit. Analysis of disputes in this human-made multilateral institution show that they follow economic laws that disadvantage poorer members. It implies that some members are excluded from DSU procedures; if the WTO, in

any form, seeks to be member-driven and self-sustaining, the DSU must be redesigned to include and be accessible to all members.

The key to maintaining a self-sustaining multilateral organisation is modernization. Digital filing of disputes would remove the need for members to be present physically in Geneva for dispute initiation; use of blockchain mechanisms could enhance the effectiveness of this process,¹⁵⁹ given that the DSU procedure is rule-based and involves systemic flow. Blockchain-based settlements could speed up the initial processes of dispute settlement. Although incorporating well-defined DSU processes into the algorithms of flow charts calls for precise economic data on affected trade transactions and legal GATT/WTO articles, as well as information and communication technology programming skills, it could reduce panel deliberation and decision-making time.

Decision making at the WTO has been characterized as an impossible trinity of consensus, universal rules, and strict enforcement (Baldwin, 2010:4). The WTO's need to modernize recently surfaced painfully when the US administration blocked¹⁶⁰ the reappointment of AB members in 2018.¹⁶¹ The AB was established under Article 17 of the DSU, with the authority to uphold, modify, or reverse panel rulings, subject to the approval of the DSB. Members may need reminding that these rules are 'human-made', and the greater good of 'free trade' is more important than maintaining ground rules that inhibit rather than facilitate it.

Moreover, the AB has been dominated by lawyers and legal experts. Appeals are limited to issues of law covered by panel reports and legal interpretations developed by panels (WTO, 2018h). The role of economics in the DSU is limited to providing evidence: 'ACWL does not have economists to provide technical economic consulting services', that is, 'without economic expertise and insight, it can provide no information on the size of the economic benefit to pursuing a case' (Sandhu, 2016:159).¹⁶² Bown (2008:10) previously raised the possibility of the role of economists in the DSU when he analyzed various ways to incorporate the services of economists into the DSU and bring a 'way of thinking particularly suited to efficiently processing and assessing the information at the core of DSU adjudication'. Bodies such as the ACWL represent good initiatives by richer members, but the ACWL does not play an active role; it renders its services only after being approached by lower-income members and therefore may not be effective for them. The DSU's current framework provides many possibilities for it to be more inclusive, for example, by providing more opportunities to third-party members or using mediation instead of DSU procedures.

The systemic threat to the WTO stems from political rather than economic factors, such as regionalism and RTAs (Baldwin, 2010). Results from Chapter 5 show that RTAs have a generally

¹⁵⁹ There is no standard definition of blockchain. Blockchain is a digital platform that stores and verifies the entire history of transactions between users across the network (Kakavand, Kost De Sevres, & Chilton, 2017: 6).

¹⁶⁰ This makes clear that the WTO judicial appointment process has become progressively *more* politicized over the past two decades, with the United States playing the leading role in such politicization. Candidates for the Appellate Body have come under increasingly close scrutiny and frequently are blocked if their previous writings appear problematic to the more powerful member states (Elsig, Pollack & Shaffer, June 2016, Washington Post).

¹⁶¹ WTO (2018v). An AB is a permanent body of experts consisting of seven members for four years to be extended for a maximum of another four years as part-time duties for the experts. Disputants can appeal to an AB panel. A panel ruling can be appealed to AB only, and only if the AB constitutes a quorum of three members. Source: https://www.wto.org/english/tratop_e/dispu_e/dsu_e.htm

¹⁶² However, the ACWL has the possibility of the Technical Expertise Trust Fund.

positive influence on trade; because they are non-multilateral, they provide more flexibility. Although international trade and commerce has changed radically since the establishment of the WTO in 1995 (by introducing features such as e-commerce and e-payments), related issues such as cloud services, cybersecurity, privacy rights, and the recycling industry are not reflected in WTO agreements.¹⁶³ In its efforts to shift its power base to a rule-oriented institution, the WTO's complex system of complex laws, rules, and procedures has become detrimental, and legal capacity has become an instrument of power. This rule-oriented system needs to become flexible enough to meet the changing demands of the times.

Present day: Having grown up in a protectionist country, and having studied the necessity of import substitution and the impact of GATT on the basic fibre of a developing economy, I admire the visionary spirit of representatives of 23 countries, whose efforts led to the founding of the GATT in 1948 for the greater good of free trade. If the number of trade dispute cases is indicative, the DSU has become increasingly important to the administration of 'trade justice,' smoothing trade through fewer, more transparent barriers. The institution has withstood the test of time. Now, however, technological advancements are changing the face of international trade; shifts in economic power and a plethora of RTAs are demanding a multilateral trade institution that caters to all members. Accordingly, future research on trade disputes must be multi-disciplinary; it must account for various aspects of trade and technology and identify their impacts on the DSU. It must keep the DSU's rules economy-oriented and true to the objectives of trade. There is demand for such a multilateral trade institution; from an economics perspective, that demand should soon generate supply.

The results of this research are based on a numerical analysis and by definition these are far from being normative. This does not imply that the implication of these results are not normative. The Trump administration has left deep scars on this multilateral institution. Irrespective of personal opinions about the leadership of Mr. Trump, it is hard to ignore the essence of his message. Our results show the necessity for the DSB to "shape up", as Mr. Trump puts it, but not for the same reasons. The results of the lawsuits show bias, though not against the US. The crisis in the AB highlight the severe need to reform the DSB so that no one country should be able to block any kind of appointments or procedures. The WTO needs to consider assigning members' development status in other ways than through self-declaration. There is enough data to consider assigning the status of developing countries at the sectoral level. Special and differential treatment for developing countries needs to be sufficiently specified to cater to their economic needs. The results from this manuscript highlight the necessity of the reforms, but for different reasons and to different ends than argued for by the US administration. Recent events like Brexit and the US' undermining of the AB indicate a movement toward waning multilateralism rather than globalization. This may not necessarily be a worrying matter, but my experience suggests otherwise.

¹⁶³ Such as infrastructure-as-a-service, platform-as-a-service, software-as-a-service or, storage, database, information, process, application, integration, security, management, testing-as-a-service.

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Data sources

Data description	Source
Country-level bilateral trade data	IMF Direction of Trade Statistics
Distance, contiguity, continent, colonial connection	Mayer and Zigano (2011)
Export diversity index	https://wits.worldbank.org/wits/wits/witshelp/Content/Utilities/e1.trade_indicators.htm
Formal and informal participants of GATT	Tomz et al. (2007)
GATT disputes	http://www.worldtradelaw.net/databases/gattpanels.php
GATT members and accession dates	https://www.wto.org/english/thewto_e/gattmember_e.htm
GDP, human capital index	Feenstra et al. (2015)
GDP per capita	https://www.rug.nl/ggdevelopingcountry/historicaldevelopment/maddison/releases/maddison-project-database-2018
Legal origin	La Porta et al. (2008)
Political database	Cruz et al. (2016)
Product-level bilateral trade data	http://www.cepii.fr/CEPII/en/bdd_modele/presentation.asp?id=1
Product-level data on products in WTO disputes	Bown & Reynolds (2015)
Tariff rate, applied, simple mean, all products in (%)	https://data.worldbank.org/indicator/TM.TAX.MRCH.SM.AR.ZS Indicator code: TM.TAX.MRCH.SM.AR.ZS
Trade agreements	https://www3.nd.edu/~jbergstr/
WTO disputes	https://www.wto.org/english/tratop_e/dispu_e/dispu_status_e.htm
WTO members and observers	https://www.wto.org/english/thewto_e/whatis_e/tif_e/org6_e.htm

Samenvatting (in Dutch)

Dit proefschrift onderzoekt internationale handelsgeschillen onder het multilaterale handelssysteem, beter bekend als de General Agreement on Tariffs and Trade (GATT, 1948-1994) en de Wereldhandelsorganisatie (WTO, 1995-heden). De belangrijkste bijdrage van dit proefschrift is dat het een nieuwe, uitgebreide database presenteert die alle handelsgeschillen onder de GATT en WTO voor de periode 1948-2016 omvat. Dit onderzoek overbrugt op empirische basis de kloof tussen theorie en beleid door nieuwe inzichten te verschaffen over de kenmerken van de GATT/WTO-leden met een handelsgeschil, de determinanten van deze handelsgeschillen, welke factoren bijdragen tot de juridische uitkomsten van deze geschillen, en de mate waarin deze geschillen de internationale handel beïnvloeden.

Hoofdstuk 2 onderzoekt verschillende kenmerken van landen die in een handelsgeschil verwickeld zijn en constateert dat, hoewel er slechts een marginale toename was van het aantal klachten door leden met een lager inkomen onder de WTO in vergelijking met de GATT, de geschillen tegen leden met een lager inkomen sterk toenamen onder de WTO. Afrikaanse landen begonnen geen geschillen onder de WTO, en leden met lage inkomens namen voornamelijk als derde partij deel aan de Dispute Settlement Understanding (DSU). In tegenstelling tot de factoren die handelspatronen verklaren, laten de resultaten van hoofdstuk 2 zien dat de meeste landen in bilaterale geschillen geen geografische grenzen delen, geen economische overeenkomsten hebben en geen gemeenschappelijke koloniale banden hebben, hetgeen impliceert dat 'institutionele afstand' een rol speelt in de vraag welke landen betrokken zijn in handelsgeschillen, en met welke landen deze geschillen zijn.

Hoofdstuk 3 onderzoekt de empirische voorspellers van GATT/WTO-geschillenincidentie van 1948 tot 2016, waarbij wordt vastgesteld dat variabelen die gemeenschappelijk zijn voor het zwaartekracht model van internationale handel - zoals afstand en BBP - de kans van geschillen onder de DSU verklaren. De resultaten suggereren dat voor verzoekers macht, afgeleid van marktomvang en/of juridische capaciteit, belangrijk is. We vinden ook bewijs van de werking van het juridische capaciteitsmechanisme voor verwerende landen; omdat leden met een lager inkomen niet over voldoende middelen beschikken, moeten ze keuzes maken over waar ze die aan uitgeven. Gezien het belang van de grootte van het lid voor het starten van geschillen, vragen we ons af of het machtsvoordeel van het BBP doorwerkt in latere DSU-processen die de uitkomst van geschillen bepalen.

Daaraan gerelateerd wordt in hoofdstuk 4 daarom onderzocht of de juridische uitkomsten van geschillen ook een afspiegeling zijn van inkomen en verschillen in inkomensstatus. We zien dat economische determinanten, zoals verschillen in het absolute BBP en het BBP per capita significant zijn bij het voorspellen van juridische resultaten in GATT/WTO-geschillen. Onze resultaten laten ook zien dat de naleving door verweerders van uitspraken van het panel niet alleen een juridische kwestie is; er vindt een machtsspel plaats in termen van de rechtsbevoegdheid van de twistende partijen. Hoe sterker de macht van een lid dat een geschil indient, hoe groter de kans dat het lid de inwilliging door een verwerende partij zal bereiken.

Na vastgesteld te hebben dat de middelen van leden zowel de totstandkoming van geschillen als de juridische resultaten beïnvloeden, wordt in hoofdstuk 5 de economische uitkomst

onderzocht van geschillen in termen van handelsstromen op productniveau. Het onderzoekt het effect van geschillen op handelsstromen van GATT/WTO-geschilpartijen. Het opnemen van het GATT-tijdperk in deze analyse is een noviteit in de literatuur die tot dusver alleen gericht was op geschillen uit het WTO-tijdperk. Met behulp van een structureel zwaartekrachtmodel laten de resultaten zien dat de handelsresultaten voor zowel geschillen in het GATT- als WTO-tijdperk statistisch zowel significant als negatief zijn. Analyse op productniveau voor het WTO-tijdperk levert geen significant bewijs op dat geschillen de handel op productniveau beïnvloeden. Geschillen die zijn geïnitieerd door leden met een laag inkomen, bevorderen echter hun handel na geschillen.

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Guru is verily the representative of the divine trinity, Guru the creator of knowledge: ।।

Guru the sustainer of intelligence, Guru the destroyer of the weeds of ignorance: ।।

To such Guru I obeisance: ।। (Indian ancient verse)

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