DETERMINANTS OF ANTIDUMPING POLICY: INTERESTS, INTERACTIONS, AND INSTITUTIONS

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ABSTRACT

The development of antidumping (hereinafter "AD") policy has been the most frequently used method of contingent protection in the past twenty years. In this study, we conducted an empirical analysis employing a panel dataset of World Trade Organization (hereinafter "WTO") members from 1995 to 2018 to explore the determinants of AD policy based on the theoretical framework of the three Is (interests, interactions, and institutions) of the international political economy. We found that AD policymaking was a product of the interplay of interests, interactions, and institutions. Regarding interests, we found that the demands of interest groups and political pressure from export-oriented industries counterbalanced AD protection. Regarding interactions, the more WTO members disputing petitions, the stronger the motivation on the part of target countries to retaliate by initiating AD investigations. Regarding institutions, more democratic countries

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with WTO membership tended to initiate more AD investigations. These findings have implications for industries, national governments, and the WTO in improving the fairness and legitimacy of the global trade governance system.

KEYWORDS: *antidumping, three Is theory, interests, interactions, institutions, international political economy*

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I. INTRODUCTION

In the multilateral trading system, three main methods of contingent protection have been legalized by the World Trade Organization (hereinafter "WTO"): antidumping (hereinafter "AD") investigations, countervailing measures, and safeguard measures.[1] Among these, the most frequently used is AD investigations, which try to determine whether goods being imported into a country are being sold at below the market price in the producer country (i.e., being "dumped"). Since the establishment of the WTO in 1995, AD investigations have accounted for more than 86% of the total number of initiations, with countervailing and safeguard measures coming a distant second (8%) and third (5%), respectively.[2]

A substantial body of political economic literature has explored the factors underlying the AD protective mechanism. As shown in Table 1, some researchers have demonstrated the effects of micro-level factors, such as industry size, the degree of concentration, and capital intensity, on the AD decision-making process. However, others have examined the effects on AD protection of macroeconomic factors, including GDP growth rate, exchange rates, import penetration, and trade balance. In addition to these various micro/macroeconomic factors, several studies have explored strategic

[1] PETROS C. MAVROIDIS ET AL., THE LAW AND ECONOMICS OF CONTINGENT PROTECTION IN THE WTO 288-89, 291, 465 (2008).
[2] *Safeguard Initiations: By Reporting Member*, WORLD TRADE ORGANIZATION [hereinafter WTO], https://www.wto.org/english/tratop_e/safeg_e/SG-InitiationsByRepMember.pdf.

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factors; for example, retaliation threat has been identified as significant in AD policymaking. Moreover, AD may serve as a "safety valve" for governments to gain political support from domestic protectionist pressures when a country faces trade liberalization reforms such as reduction of tariffs or proliferation of regional trade agreements. Other factors, such as industry, the type of economy in the target country, and the membership of China in the WTO, may also affect AD policy.

Most prior studies have limited the scope of their research to a few developed economies, especially the United States (hereinafter "US") and the European Union (hereinafter "EU").[3] More recently, some studies have focused on developing countries.[4] These studies have limitations in generalizing their empirical findings from a global perspective. Another difficulty is that most studies have narrowly focused on only one factor related to AD protection. One exception was Kim *et al.* (2007),[5] who employed the theoretical framework of Frieden *et al.* (1995)[6] in their study on the international political economy (hereinafter "IPE") and examined the determinants of American AD decisions from four perspectives: the international political perspective, international economic perspective, domestic statist perspective, and domestic societal perspective. However, the empirical study of Kim *et al*. (2007)[7] was based on a US dataset from 1947 to 1999 and thus it is now outdated.

In recent years, Frieden *et al.* (2017) have updated their analysis to a new theoretical framework involving three Is (interests, interactions, and institutions),[8] providing an opportunity to fill existing research gaps.

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[3] *See, e.g.*, Bruce A. Blonigen, *U.S. Antidumping Filings and the Threat of Retaliation*, CARIBBEAN TRADE REFERENCE CTR. 2 (2000), http://ctrc.sice.oas.org/geograph/antidumping/bloni.pdf; Michael R. Czinkota & Masaaki Kotabe, *A Marketing Perspective of the U.S. International Trade Commission's Antidumping Actions—An Empirical Inquiry*, 32(2) J. WORLD BUS. 169 (1997); Robert M. Feinberg, *U.S. Antidumping Enforcement and Macroeconomic Indicators Revisited: Do Petitioners Learn?*, 141(4) REV. WORLD ECON. 612 (2005); Robert M. Feinberg & Barry T. Hirsch, *Industry Rent Seeking and the Filing of 'Unfair Trade' Complaints*, 7(3) INT'L J. INDUS. ORG. 325 (1989); Eun-mi Kim, *The Political Influence of the U.S. AD*, 10(3) J. KOR. RSCH. SOC'Y. FOR CUSTOMS 417 (2009); Eunmi M. Kim & Minho H. Kim, *Determinants of US Antidumping Decisions: Four Perspectives of International Trade Policymaking*, 14(12) APPLIED ECON. LETTERS 893 (2007); Michael M. Knetter & Thomas J. Prusa, *Macroeconomic Factors and Antidumping Filings: Evidence from Four Countries*, 61(1) J. INT'L ECON. 1 (2003); Faten Sabry, *An Analysis of the Decision to File, the Dumping Estimates, and the Outcome of Antidumping Petitions*, 14(2) INT'L TRADE J. 109 (2000).

[4] *See, e.g.*, Chad P. Bown & Patricia Tovar, *Trade Liberalization, Antidumping, and Safeguards: Evidence from India's Tariff Reform*, 96(1) J. DEV. ECON. 115 (2011); Michael O. Moore & Maurizio Zanardi, *Does Antidumping Use Contribute to Trade Liberalization in Developing Countries?*, 42(2) CAN. J. ECON. 469 (2009); Ka Zeng, *The Political Economy of Developing Country Antidumping Investigations Against China*, 37(2) INT'L INTERACTIONS 190 (2011).

[5] *See, e.g.*, Kim & Kim, *supra* note 3.

[6] JEFFRY A. FRIEDEN & DAVID A. LAKE, INTERNATIONAL POLITICAL ECONOMY: PERSPECTIVES ON GLOBAL POWER AND WEALTH 8-9 (4th ed. 2003).

[7] Kim & Kim, *supra* note 3, at 894.

[8] JEFFRY A. FRIEDEN ET AL., INTERNATIONAL POLITICAL ECONOMY: PERSPECTIVES ON GLOBAL

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Therefore, to explain the determinants of AD policy from the perspective of the three Is, in this study, we conducted a regression analysis employing a panel dataset of WTO members from 1995 to 2018. We demonstrate that a country's AD policy is determined by the interplay of interests, interactions, and institutions.

The rest of this study proceeds as follows. Section II explains the three Is theoretical framework and develops our research hypotheses concerning AD policymaking. Section III presents our research design, introducing our empirical model, variables, data, and sample selection process. Section IV shows the results of the empirical analysis and robustness checks. Section V concludes and suggests several implications of this study.

TABLE 1: A Summary of the Political Economy Literature on the Determinants of AD

Factors	Variables	Relationships	Literature
Micro-Level Factors	industry size	+	Finger *et al.* (1982); Eymann *et al.* (1996)[9]
	the degree of concentration	+/-	Tharakan *et al.* (1994); Czinkota *et al.* (1997); Sabry (2000)[10]
	capital intensity	+	Feinberg *et al.* (1989); Niels *et al.* (2006); Niels *et al.* (2004)[11]

POWER AND WEALTH 5 (6th ed. 2017).

[9] *See, e.g.*, J. M. Finger et al., *The Political Economy of Administered Protection*, 72(3) AM. ECON. REV. 452, 458 (1982); Angelika Eymann & Ludger Schuknecht, *Antidumping Policy in the European Community: Political Discretion or Technical Determination*, 8(2) ECON. & POL. 111, 126 (1996).

[10] *See, e.g.*, P.K.M. Tharakan & J. Waelbroeck, *Antidumping and Countervailing Duty Decisions in the EC and in the U.S.: An Experiment in Comparative Political Economy*, 38(1) EUR. ECON. REV. 171, 180 (1994); Czinkota & Kotabe, *supra* note 3, at 180; Sabry, *supra* note 3, at 128.

[11] *See, e.g.*, Robert M. Feinberg, *Exchange Rates and "Unfair Trade"*, 71(4) REV. ECON. & STAT. 704, 707 (1989); Gunnar Niels & Adriaan ten Kate, *Antidumping Policy in Developing Countries: Safety Valve or Obstacle to Free Trade?*, 22(3) EUR. J. POL. ECON. 618, 624 (2006); Gunnar Niels & Adriaan ten Kate, *Anti-Dumping Protection in a Liberalising Country: Mexico's Anti-Dumping Policy and Practice*, 27(7) WORLD ECON. 967, 975 (2004).

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Macro-Level Factors	GDP growth rate	-/×	Knetter *et al.* (2003); Blonigen (2005); Feinberg (2004); Irwin (2005)[12]
	exchange rates	+/-	Feinberg (1989); Irwin (2005); Knetter *et al.* (2003); Niels *et al.* (2006); Feinberg (2005)[13]
	import penetration	+/×	Blonigen (2006); Blonigen and Bown (2003); Irwin (2005)[14]
	trade balance	-	Coughlin *et al.* (1989); Aggarwal (2004)[15]
Strategic Factors	retaliation threat	+/-	Blonigen (2000); Bown (2005); Blonigen and Prusa (2003); Aggarwal (2004); Prusa *et al.* (2002); Feinberg *et al.* (2006, 2018); Busch, Raciborski *et al.* (2008)[16]

[12] *See, e.g.*, Knetter & Prusa, *supra* note 3, at 10; Bruce A. Blonigen, *The Effects of NAFTA on Antidumping and Countervailing Duty Activity*, 19(3) WORLD BANK ECON. REV. 407, 417 (2005); Robert M. Feinberg, *U.S. Antidumping Enforcement and Macroeconomic Indicators: What Do Petitioners Expect, and Are They Correct?* 11 (Am. U. Dep't of Econ. Working Paper Series No. 2004-17, 2004); Douglas A. Irwin, *The Rise of US Anti-Dumping Activity in Historical Perspective*, 28(5) WORLD ECON. 651, 662 (2005).

[13] *See, e.g.*, Feinberg, *supra* note 11, at 706; Irwin, *supra* note 12, at 663; Knetter & Prusa, *supra* note 3, at 11; Niels & Kate, *supra* note 11, at 627; Feinberg, *supra* note 3, at 618.

[14] *See, e.g.*, Bruce A. Blonigen, *Working the System: Firm Learning and the Antidumping Process*, 22(3) EUR. J. POL. ECON. 715, 728 (2006); Bruce A. Blonigen & Chad P. Bown, *Antidumping and Retaliation Threats*, 60(2) J. INT'L ECON. 249, 251 (2003); Irwin, *supra* note 12, at 662.

[15] *See, e.g.*, Cletus C. Coughlin et al., *The Determinants of Escape Clause Petitions*, 71(2) REV. ECON. & STAT. 341, 346 (1989); Aradhna Aggarwal, *Macro Economic Determinants of Antidumping: A Comparative Analysis of Developed and Developing Countries*, 32(6) WORLD DEV. 1043, 1051 (2004).

[16] *See, e.g.*, Blonigen, *supra* note 3, at 25; Chad P. Bown, *Trade Remedies and World Trade Organization Dispute Settlement: Why Are So Few Challenged?*, 34(2) J. LEGAL STUD. 515, 543 (2005); Bruce A. Blonigen & Thomas J. Prusa, *Antidumping*, *in* HANDBOOK OF INTERNATIONAL TRADE 251, 259 (E. Kwan Choi & James Harrigan eds., 2003); Aggarwal, *supra* note 15, at 1050; Thomas J. Prusa & Susan Skeath, *The Economic and Strategic Motives for Antidumping Filings*, 138(3) WELTWIRTSCHAFTLICHES ARCHIV 389, 409 (2002); Robert M. Feinberg & Kara M.

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Trade Liberalization Factors	tariff rates	-/×	Aggarwal (2004); Feinberg *et al.* (2007); Moore *et al.* (2011)[17]
	regional trade agreements	-	Prusa *et al.* (2010); Ahn *et al.* (2011); Silberberger *et al.* (2018)[18]
Other Factors	steel industry	+	Hansen *et al.* (1995); Kim (2009); Wruuck (2015)[19]
	the type of economy	+	Busch, Reinhardt *et al.* (2008); Wruuck (2015)[20]
	the membership of China in the WTO	+	Kim (2009)[21]

NOTES: 1. "+" and "-" denote a significantly positive/negative relationship between the variables and AD protection. 2. "×" denotes that the variable is not a statistically significant determinant of AD protection.

Reynolds, *The Spread of Antidumping Regimes and the Role of Retaliation in Filings*, 72(4) S. ECON. J. 877, 885 (2006); Robert M. Feinberg & Kara M. Reynolds, *How Do Countries Respond to Anti-Dumping Filings? Dispute Settlement and Retaliatory Anti-Dumping*, 41(5) WORLD ECON. 1251, 1260 (2018); Marc L. Busch et al., *Does the Rule of Law Matter? The WTO and US Antidumping Investigations*, CITESEERX 31 (May 2, 2007), https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=b5d20ad24a8758bef03890d6d4f065ce99994dd8.

[17] *See, e.g.*, Aggarwal, *supra* note 15, at 1050; Robert M. Feinberg & Kara M. Reynolds, *Tariff Liberalisation and Increased Administrative Protection: Is There a* Quid Pro Quo*?*, 30(6) WORLD ECON. 948, 959 (2007); Michael O. Moore & Maurizio Zanardi, *Trade Liberalization and Antidumping: Is There a Substitution Effect?*, 15(4) REV. DEV. ECON. 601, 611 (2011).

[18] *See, e.g.*, Thomas J. Prusa & Robert Teh, *Protection Reduction and Diversion: PTAs and the Incidence of Antidumping Disputes* 9 (NBER Working Paper Series No. 16276, Aug. 2010); Dukgeun Ahn & Wonkyu Shin, *Analysis of Anti-Dumping Use in Free Trade Agreements*, 45(2) J. WORLD TRADE 431, 454 (2011); Magdalene Silberberger & Frederik Stender, *False Friends? Empirical Evidence on Trade Policy Substitution in Regional Trade Agreements*, 41(8) WORLD ECON. 2175, 2184 (2018).

[19] Wendy L. Hansen & Kee Ok Park, *Nation-State and Pluralistic Decision Making in Trade Policy: The Case of the International Trade Administration*, 39(2) INT'L STUD. Q. 181, 198 (1995); Kim, *supra* note 3, at 429; PATRICIA WRUUCK, THE POLITICAL ECONOMY OF ANTI-DUMPING PROTECTION: A STRATEGIC ANALYSIS 115 (2015).

[20] Busch, *supra* note 16, at 42; WRUUCK, *supra* note 19, at 6.

[21] Kim, *supra* note 3, at 429.

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II. THEORY AND HYPOTHESIS DEVELOPMENT

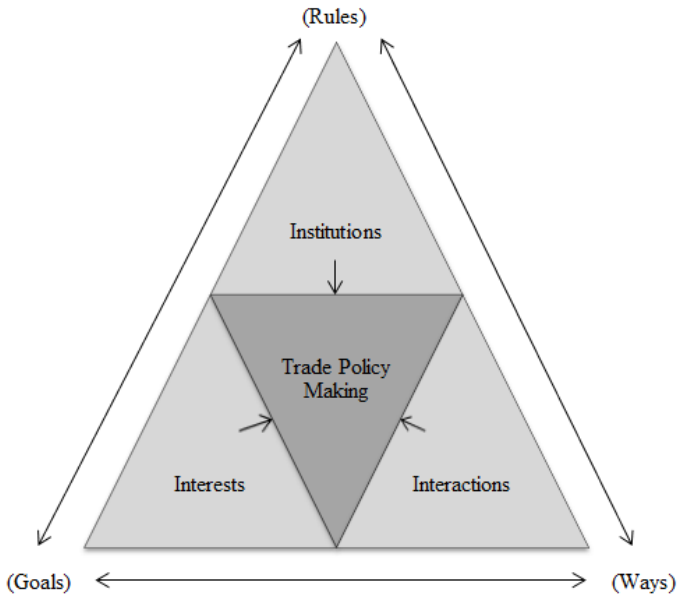


FIGURE 1: The Three Is Theoretical Framework of International Political Economy
SOURCE: Compiled by the authors based on Frieden *et al.* (2017), pp. 4-8.[22]

A. Interests

The political economy of trade is rife with debates among various actors who have interests in supporting or opposing protectionist measures. It is not feasible to include all of these actors in our explanation of trade policymaking; therefore, we focus on the key actors. Based on the two leading theories in international trade, that is, Stolper-Samuelson (hereinafter "S-S") theorem and the Ricardo-Viner (hereinafter "R-V") model,[23] this study includes laborers and industries as the principal actors, examining the effects of their interests on AD policy.

Regarding the interests of laborers, the S-S theorem indicates that laborers in capital-abundant countries (i.e., those with high capital/labor ratios) stand to lose from free trade; thus, they tend to support protectionist

[22] FRIEDEN ET AL., *supra* note 8, at 4-8.
[23] JEFFRY A. FRIEDEN ET AL., WORLD POLITICS: INTERESTS, INTERACTIONS, INSTITUTIONS 309-10 (4th ed. 2019).

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policies. On the other hand, laborers in labor-abundant countries (i.e., those with low capital/labor ratios) stand to benefit from free trade; thus, they tend to oppose protectionist policies.[24] Hence, we hypothesize as follows:

Hypothesis 1: All else being equal, the higher the capital/labor ratio, the more AD investigations are initiated.

Regarding the interests of industries, the AD literature suggests that either negative trade balance[25] or import penetration[26] can serve as proxies for pressure to increase imports to domestic industries, since more rigorous foreign competition threatens their interests. However, this study distinguishes two branches of domestic importing industries: import-competing industries and import-dependent industries. The rationale behind this is that different classes of goods have different effects on import industries, according to the R-V model.[27] Specifically, the import of final goods goes against the interests of import-competing industries, triggering them to seek protection from the government. However, the import of intermediate goods is in accordance with the interests of import-dependent industries, whose production costs would increase with more enforcement of AD policy.[28] Taken together, these arguments suggest the following two hypotheses:

Hypothesis 2: All else being equal, the more final goods are imported, the more AD investigations are initiated.

Hypothesis 3: All else being equal, the more intermediate goods are imported, the fewer AD investigations are initiated.

Unlike those of import-competing/dependent industries, export-oriented industries have an interest in trade openness since they rely on international markets to sell their products. Thus, they can act as a political force to counteract protectionism for fear of retaliatory measures by trading partners.[29] Thus, we hypothesize as follows:

Hypothesis 4: All else being equal, the more goods are exported, the fewer AD investigations are initiated.

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[24] GIANCARLO GANDOLFO, INTERNATIONAL TRADE THEORY AND POLICY 85 (2d ed. 2014).
[25] Aggarwal, *supra* note 15, at 1050; Hansen & Park, *supra* note 19, at 188.
[26] *See, e.g.*, Mustapha Sadni Jallab et al., *Antidumping Procedures and Macroeconomic Factors: A Comparison Between the United States and the European Union*, 6(3) GLOB. ECON. J. 1 (2006).
[27] FRIEDEN ET AL., *supra* note 23, at 310-11.
[28] Sébastien Miroudot et al., *Trade in Intermediate Goods and Services*, OECD iLIBRARY 2 (2009), https://www.oecd-ilibrary.org/docserver/5kmlcxtdlk8r-en.pdf?expires=1675708801&id=id&accname=guest&checksum=B8FF7B9084D938D6ED6CED3A805E924B.
[29] WRUUCK, *supra* note 19, at 86.

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B. Interactions

Frieden *et al.* (2019) clarified "strategic interaction in international trade" as follows: "when governments make national trade policies, they take into account what other governments are likely to do in response."[30] That is, national governments are engaged in strategic interactions that affect trade policymaking. Numerous empirical studies have explored the strategic considerations of AD policy, finding that retaliation matters not only at the domestic level of the AD process, but also at the international level.

At the domestic level, the retaliation factor affects the domestic industry's choice of a target country in filing an AD petition. Empirically, Blonigen (2000) argued that US petitioners were less likely to file for AD investigations against countries where the expected profit loss from retaliation was high.[31] At the international level, the threat of retaliation affects interactions between target countries and investigating countries. Prusa *et al.* (2002) and Feinberg *et al.* (2006) found that countries tended to file AD investigations against trade partners that had previously filed AD suits against them.[32] However, Blonigen and Prusa (2003) and Busch, Raciborski *et al.* (2008) argued that the threat of retaliation discouraged government agencies from imposing AD measures.[33] More recently, Feinberg *et al.* (2018) further revealed that retaliation is less likely for larger target countries or those with closer trade relationships, but more likely in times of difficult economic conditions.[34] Presumably, if country X has been targeted in the past by country Y, country X is more likely to target country Y as an act of retaliation. On the other hand, the fact country Y has already targeted X also serves as a signal that it will not hesitate to respond to being targeted with additional duties if country X decides to target country Y. In other words, the impact of previous duties has an ambiguous effect, since it might elicit filings as an act of revenge but also discourages filings due to the threat of likely retaliation that will ensue. Hence, we hypothesize as follows:

Hypothesis 5: All else being equal, the number of AD investigations initiated increases or decreases depending on the number of AD investigations filed against a country.

Moreover, the investigating country must take into consideration the possibility that the target country may also retaliate by filing a complaint with the WTO's Dispute Settlement Body.[35] Hence, we hypothesize as follows:

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[30] FRIEDEN ET AL., *supra* note 23, at 319.
[31] Blonigen, *supra* note 3, at 21.
[32] Prusa & Skeath, *supra* note 16, at 411; Feinberg & Reynolds, *supra* note 16, at 889.
[33] Blonigen & Prusa, *supra* note 16, at 390; Busch et al., *supra* note 16, at 31.
[34] Feinberg & Reynolds, *supra* note 16, at 1261.
[35] *Id.* at 1263.

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Hypothesis 6: All else being equal, the number of AD investigations initiated increases or decreases depending on the number of WTO disputes filed against a country.

C. Institutions

Institutions, both domestic and international, set the rules that structure international policymaking. The relationship between democratic institutions and trade liberalization is a classic question in IPE research, one that has been subject to considerable scholarly and political debate.[36] Some have argued that the level of democratization and trade liberalization go hand in hand. Based on the median voter theorem of Mayer (1984),[37] Milner *et al.* (2005) found that trade liberalization in developing countries reduced the prices of imported products bought by laborers, who, in turn, were pro-trade; over time, institutional changes toward democracy made policymakers in labor-rich countries prefer trade liberalization. In effect, democracy shifted the identity of the median voter towards the laborer.[38] In addition, based on the Grossman-Helpman model, Mitra *et al.* (2002) provided empirical evidence that democratization induced greater trade openness, since politicians in more democratic institutions placed more weight on welfare.[39] However, Rosendorff *et al.* (2001) held that more democratic institutions were associated with more frequent use of flexibility provisions in international agreements such as escape clauses in the WTO.[40] Avsar (2014) provided empirical evidence for this argument and found that increases in democratization were associated with more AD investigations, possibly because of easier access to government for domestic industries.[41] In light of these arguments, we hypothesize as follows:

Hypothesis 7: All else being equal, the number of AD investigations initiated increases or decreases depending on the level of democratization.

Regarding international institutions, as noted by Bown (2008),[42] entry into the WTO when it was established in 1995 resulted in a set of multilateral rules that were binding for all members. The Agreement on Implementation of Article VI of the General Agreement on Tariffs and Trade 1994

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[36] Barry Eichengreen & David Leblang, *Democracy and Globalization*, 20(3) ECON. & POL. 289, 301 (2008).
[37] *See generally* Wolfgang Mayer, *Endogenous Tariff Formation*, 74(5) AM. ECON. REV. 970 (1984).
[38] *See generally* Helen V. Milner & Keiko Kubota, *Why the Move to Free Trade? Democracy and Trade Policy in the Developing Countries*, 59(1) INT'L ORG. 157 (2005).
[39] *See generally* Devashish Mitra et al., *"Protection for Sale" in a Developing Country: Democracy vs. Dictatorship*, 84(3) REV. ECON. & STAT. 497 (2002).
[40] B. Peter Rosendorff & Helen V. Milner, *The Optimal Design of International Trade Institutions: Uncertainty and Escape*, 55(4) INT'L ORG. 829, 844 (2001).
[41] Veysel Avsar, *Partisanship and Antidumping*, 38 ECON. MODELLING 190, 192 (2014).
[42] Chad P. Bown, *The WTO and Antidumping in Developing Countries*, 20(2) ECON. & POL. 255, 263 (2008).

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(hereinafter "the AD Agreement"), as a part of the Single Undertaking, authorized WTO members to establish domestic AD laws and to implement AD trade restrictions. The AD Agreement did impose some evidentiary requirements for a government to substantiate the existence of dumping, injury, and causality; however, Article 17.6 in the AD Agreement implied that WTO dispute settlement should show deference to domestic authorities in AD investigations.[43] Even though the paralysis of the Appellate Body resulted in a structural crisis in the dispute settlement mechanism, WTO members have not stopped launching new AD investigations.[44] Thus it can be seen that the international institutions do affect the use of AD investigations by members. Moreover, the empirical analysis of Kucik *et al.* (2008) and Avsar (2014) found an association between WTO membership and more AD investigations.[45] Thus, we hypothesize as follows:

Hypothesis 8: All else being equal, countries that are WTO members initiate more AD investigations.

III. RESEARCH DESIGN

A. Research Model

Since previous theoretical and empirical studies have found that each element of the three Is analysis framework can explain the determinants of AD, we first tested the model from each of the three perspectives separately and then tested the explanatory power of each element when other elements are held constant by combining all three elements in a full model. Our models are as follows:

Model (1). From the Perspective of Interests

$adini_{it}= f(imfinalt_{it-1}, imintert_{it-1}, extrade_{it-1}, lnkl_{it-1}, gdpgrowd_{it-1}, militaryr_{t-1}, worldgdpg_{t-1})$

Model (2). From the Perspective of Interactions

$adini_{it}= f(disputetar_{it-1}, adtar_{it-1}, gdpgrowd_{it-1}, militaryr_{t-1}, worldgdpg_{t-1})$

Model (3). From the Perspective of Institutions

$adini_{it}= f(demo_{it-1}, wtom_{it-1}, gdpgrowd_{it-1}, militaryr_{t-1}, worldgdpg_{t-1})$

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[43] Chad P. Bown, *Trump Ended WTO Dispute Settlement. Trade Remedies Are Needed to Fix It.*, 21(3) WORLD TRADE REV. 312, 322-23 (2022).

[44] Since the establishment of the WTO in 1995, as of 2019, all members have initiated a total of 5,952 Anti-Dumping [hereinafter AD] investigations, an average of 238 per year. The use of AD investigations has continued even after the paralysis of the Appellate Body since December 2019. WTO members initiated 355 and 182 AD investigations in 2020 and 2021, respectively. *See Anti-Dumping Initiations by Reporting Member 01/01/1995-30/06/2022*, WTO (June 30, 2022), https://www.wto.org/english/tratop_e/adp_e/AD_InitiationsByRepMem.pdf.

[45] Jeffery Kucik & Eric Reinhardt, *Does Flexibility Promote Cooperation? An Application to the Global Trade Regime*, 62(3) INT'L ORG. 477, 499 (2008); Avsar, *supra* note 41, at 192.

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Model (4). Full Model

$adini_{it} = f(imfinalt_{it-1}, imintert_{it-1}, extrade_{it-1}, lnkl_{it-1}, disputetar_{it-1}, adtar_{it-1}, demo_{it-1}, wtom_{it-1}, gdpgrowd_{it-1}, militaryr_{t-1}, worldgdpg_{t-1})$

where the dependent variable $adini_{it}$ is the number of AD initiations of country i in year t based on the rationale that the mere initiation of an AD investigation can lead to about a 20% decrease in imports even when the final AD determination is not affirmative.[46]

Note that in all models, each regressor is lagged one year from the year for which the number of AD initiations is calculated. The first reason for this one-year lag for the variables is that it helps to attenuate potential problems with endogeneity. The second reason is that investigative authorities shall make initiating decisions based on data gathered during the period of investigation (hereinafter "POI"). Although the AD Agreement does not regulate any specific POI, the common practice of WTO members is to follow the recommendation of the Committee on Anti-Dumping Practices. In general, the POI for determining the dumping margin is one year before the initiation of an AD investigation and the POI for determining injury is at least three years ahead.[47] Following the protocol of previous studies such as Aggarwal (2004) and Meng *et al.* (2016)[48] and as a matter of practice, we therefore implement the regressors with a one-year lag.

B. Variable Definitions

The theoretical and empirical literature on trade policymaking and AD helps identify independent variables that can serve as proxies for interests, interactions, and institutions.

Regarding the perspective of interests, this study uses the logged value of the ratio of capital to labor (*lnkl*) to represent the interests of laborers. To measure the interests of import-competing industries and import-dependent industries, we use the ratio of imports of final goods (*imfinal*) and intermediate goods (*iminter*) to total trade, respectively. Moreover, the ratio of exports to total trade (*extrade*) is used as a proxy for the interests of export-oriented industries. Regarding the perspective of interactions, we use the number of AD initiations against a country (*adtar*) and the number of WTO disputes filed against a country (*disputetar*) as proxies for determinants of the strategic interactions related to AD policy. Regarding the perspective of institutions, we use the level of democratization (*demo*) as a proxy for institutional determinants of AD policy at the domestic level. In addition,

[46] Thomas J. Prusa, *On the Spread and Impact of Anti-Dumping*, 34(3) CAN. J. ECON. 591, 603 (2001).

[47] JUDITH CZAKO ET AL., A HANDBOOK ON ANTI-DUMPING INVESTIGATIONS 36 (2003).

[48] Aggarwal, *supra* note 15, at 1048; Ning Meng et al., *Differences in the Determinants and Targeting of Antidumping: China and India Compared*, 48(43) APPLIED ECON. 4083, 4093 (2016).

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WTO membership (*wtom*) is used as a proxy for the political institutions embodied in international trade organizations.

Apart from the above independent variables, we also include various control variables to account for other potential reasons for initiating an AD investigation, such as domestic factors related to the macroeconomic environment, international factors related to the economic environment, and international factors related to the political environment. As previously mentioned, numerous empirical studies found that countries undergoing domestic economic recessions tended to file more AD investigations. Therefore, following the measuring method of Wruuck (2015),[49] we use deviations in the GDP growth rate from the average growth of a country (*gdpgrowd*) as a proxy for the domestic macroeconomic environment. This measure is distinct from those that use simple annual growth values for the annual GDP growth rate and has the advantage of capturing deviations from trends. For example, a growth rate of 5% that would be hailed in the US would cause political pressure in China. The international economic environment can also have a powerful influence on a country's trade policy.[50] For example, the global economic crisis in the 1930s drove many countries to look inward and adopt a protectionist stance (Frieden *et al.*, 2019).[51] Thus, this study controls for the annual GDP growth rate of the world economy (*worldgdpg*).

In addition, a country's trade policy is structured in the global geostrategic and diplomatic environment within which it operates.[52] Kim (2009) argued that international tension is directly related to AD policy in her empirical study of AD in the US; she found that as military expenditure increased, more American AD investigations tended to be filed.[53] Similar to the measure used in Kim (2009),[54] we use the ratio of total global military expenditure to world GDP (*militaryr*) as a proxy for the international political environment.

C. Sample Selection and Data

For empirical testing of our hypotheses, we collected panel data for forty-four countries initiating AD investigations from 1995 to 2018 (twenty-four years). Among these forty-four countries, thirty-four of them are original WTO Members and ten are non-original WTO Members. The sample is limited to forty-four countries during this specific period to ensure adherence to our theoretical rationale and because of data availability. The

[49] WRUUCK, *supra* note 19, at 105.
[50] Kim & Kim, *supra* note 3, at 894.
[51] FRIEDEN ET AL., *supra* note 23, at 319.
[52] FRIEDEN & LAKE, *supra* note 6, at 8.
[53] Kim, *supra* note 3, at 428-29.
[54] *Id.* at 423.

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period prior to establishment of the WTO is essentially different from the period after it in the sense that multilateral rules applied to fewer countries and under the jurisdiction of the General Agreement on Tariffs and Trade, dispute settlement procedures were not compulsory. Focusing on the post-1995 period also ensures a sufficiently large and heterogeneous sample that is subject to binding rules. Specifically, focusing on WTO members facilitates data collection since these members are required to submit semi-annual reports of their AD actions, whereas data is not readily available for non-members. The forty-four countries included in our sample reported on their AD initiations as required during the study period, while the remaining members did not submit reports or submitted incomplete reports. Thus, we believe the sample can provide useful information about the determinants of AD policy. Table 2 shows the composition and description of our sample.

TABLE 2: Composition and Description of Samples

Member	Year to Join the WTO	Member	Year to Join the WTO
Argentina	1995	Korea	1995
Australia	1995	Malaysia	1995
Brazil	1995	Mexico	1995
Canada	1995	Morocco	1995
Chile	1995	New Zealand	1995
China	2001	Nicaragua	1995
Chinese Taipei	2002	Pakistan	1995
Colombia	1995	Panama	1997
Costa Rica	1995	Paraguay	1995
Dominican Republic	1997	Peru	1995
Ecuador	1996	Philippines	1995
Egypt	1995	Russian Federation	2012

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El Salvador	1995	Saudi Arabia	2005
European Union	1995	South Africa	1995
Guatemala	1995	Thailand	1995
Honduras	1995	Trinidad and Tobago	1995
India	1995	Turkey	1995
Indonesia	1995	Ukraine	2008
Israel	1995	United States	1995
Jamaica	1995	Uruguay	1995
Japan	1995	Venezuela	1995
Jordan	2000	Viet Nam	2007

SOURCE: WTO (2019)[55]

For the number of AD initiations and AD investigations filed by or against a country, data was obtained from the WTO Statistics on Antidumping database, which includes data for sixty-two reporting members; however, the numbers for the reporting customs union members were dropped to avoid duplicates. Moreover, this database provides data for 106 targeted countries of AD investigations, the reports of which we matched with the forty-four reporting members included in the sample for the dependent variable. The data for the *disputetar* variable was collected from the WTO Dispute Settlement Activity database (2019).[56] Since the WTO provides a table that contains a complete list of the dates of key stages in all disputes, we use it to count the number of WTO disputes filed against a country in each year.

For the data on the ratio of imports of final goods and intermediate goods to total trade, we utilized the Bilateral Trade Database by Industry and End-use Category of Organization for Economic Co-operation and Development, which categorizes goods based on the United Nation's Broad Economic

[55] *Members and Observers*, WTO, https://www.wto.org/english/thewto_e/whatis_e/tif_e/org6_e.htm (last visited Sept. 15, 2022).

[56] *Dispute Settlement Activity – Some Figures (choose "For a Complete List of the Dates of Key Stages in All Disputes, by Dispute")*, WTO, https://www.wto.org/english/tratop_e/dispu_e/dispustats_e.htm#more_numbers (last visited Oct. 25, 2019).

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Categories classification. For the ratio of exports to total trade, we collected data from the World Development Indicators of the World Bank.

The original data for the capital/labor ratio was obtained from the Penn World Table,[57] which provides information on relative levels of input, output, productivity, and income, covering 182 countries from 1950 to 2017. Following the method of calculation of the capital/labor ratio in Carbaugh (2022),[58] we divided the capital stock at current Purchasing Power Parities by the number of persons engaged and then logged this variable to make its distribution appear more symmetrical.

For the level of democratization, we used the political rights index in the Freedom in the World database, which has assessed the condition of political rights and civil liberties in 195 countries since 1973. Each country is assigned a political rights rating ranging from 1 to 7, with 1 indicating the greatest degree of democratization and 7 being the smallest degree of democratization. For ease of analysis, we reversed the scores by subtracting each score from 8 and then taking the absolute value such that higher scores represented a higher degree of democratization.

Deviation in the GDP growth rate from the average growth rate was calculated with the following equation:

$$gdpgrowd_{it} = gdpgrow_{it} - \frac{\sum_{t=1995}^{2018} gdpgrow_{it}}{24}$$

where $gdpgrow_{it}$ is the annual GDP growth rate of country i in year t, with data collected from the World Development Indicators of the World Bank. The data on the annual growth rate of the world GDP was obtained from the same database. For the military variable, we divided total global military expenditure by global GDP, using data collected from the World Bank. Table 3 provides the descriptive statistics of our sample.

[57] Robert C. Feenstra et al., *The Next Generation of the Penn World Table*, 105(10) AM. ECON. REV. 3150, 3150 (2015).

[58] ROBERT J. CARBAUGH, INTERNATIONAL ECONOMICS 438 (18th ed. 2022).

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TABLE 3: Descriptive Statistics

Variable	Measurement	Mean	Standard Deviation	Min	Max
Dependent Variable	$adini_{it}$	5.39	10.19	0	81
Variables of Interest	$imfinalt_{it-1}$	5.96	3.32	0.24	20.02
	$imintert_{it-1}$	23.04	8.24	0.65	56.07
	$extrade_{it-1}$	48.49	6.37	29.27	68.65
	$lnkl_{it-1}$	11.37	0.90	8.12	13.21
Variables of Interaction	$disputetar_{it-1}$	0.44	1.22	0	12
	$adtar_{it-1}$	4.77	9.80	0	93
Variables of Institution	$demo_{it-1}$	5.08	1.84	1	7
	$wtom_{it-1}$	0.93	0.26	0	1
Control Variables	$gdpgrowd_{it-1}$	0.03	3.13	-17.65	15.79
	$militaryr_{t-1}$	2.31	0.10	2.16	2.59
	$worldgdpg_{t-1}$	2.97	1.25	-1.69	4.39

IV. EMPIRICAL RESULTS AND ROBUSTNESS CHECKS

A. Test for Multicollinearity

To examine whether there is a problem of multicollinearity, first, the pairwise correlation coefficients between the variables are presented in Table 4. According to the rule of thumb, multicollinearity is a serious problem when the absolute value of the correlation coefficient exceeds 0.8 while Table 4 shows the highest absolute value of the correlation coefficient is 0.489.

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TABLE 4: Correlation Matrix of the Variables

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) *adini*	1.000											
(2) $imftnal_{it-1}$	-0.300	1.000										
(3) $iminterr_{it-1}$	-0.026	-0.086	1.000									
(4) $extrade_{it-1}$	-0.014	-0.468	-0.381	1.000								
(5) $lnkl_{it-1}$	0.057	0.014	-0.340	0.321	1.000							
(6) $disputetar_{it-1}$	0.489	-0.094	-0.130	-0.016	0.196	1.000						
(7) $adtar_{it-1}$	0.235	-0.345	0.221	0.206	0.015	0.270	1.000					
(8) $demo_{it-1}$	0.178	0.198	-0.239	-0.026	0.353	0.148	-0.218	1.000				
(9) $wtom_{it-1}$	0.110	0.099	0.085	-0.182	0.086	0.101	-0.074	0.313	1.000			
(10) $gdpgrowd_{it-1}$	0.023	-0.033	0.022	0.014	-0.038	0.016	-0.002	0.008	-0.025	1.000		
(11) $militaryr_{t-1}$	-0.074	-0.025	0.026	0.030	0.037	-0.057	-0.055	0.012	0.048	0.006	1.000	
(12) $worldgdpg_{t-1}$	0.007	-0.054	-0.002	0.023	-0.072	0.033	-0.027	0.006	-0.057	0.397	-0.378	1.000

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To further test whether there is a problem of multicollinearity, the variance inflation factor (hereinafter "VIF") and tolerance (hereinafter "TOL." TOL=1/VIF) of them are estimated in Table 5. According to the rule of thumb, multicollinearity is a serious problem if the VIF of a variable exceeds 10 and the mean VIF is significantly greater than 1. If the tolerance is 0, there is a perfect multicollinearity problem. Table 5 shows that there is no severe multicollinearity problem in the variables.

TABLE 5: Variance Inflation Factor and Tolerance

Variable	VIF	1/VIF
$extrade_{it-1}$	1.95	0.51
$imintert_{it-1}$	1.64	0.61
$adtar_{it-1}$	1.53	0.65
$worldgdpg_{t-1}$	1.50	0.67
$wtom_{it-1}$	1.20	0.83
$imfinalt_{it-1}$	1.46	0.69
$lnkl_{it-1}$	1.45	0.69
$demo_{it-1}$	1.44	0.70
$disputetar_{it-1}$	1.34	0.75
$gdpgrowd_{it-1}$	1.26	0.79
$militaryr_{t-1}$	1.25	0.80
Mean VIF	1.46	

B. Empirical Results

The dependent variable, the number of AD initiations, is a non-negative discrete variable. Therefore, linear regression analysis is not recommended, as it will not provide appropriate results.[59] A Poisson or negative binomial (hereinafter "NB") regression model is widely used for such data.[60] However, the former imposes a strict restriction requiring that the mean value

[59] JEFFERY M. WOOLDRIDGE, ECONOMETRIC ANALYSIS OF CROSS SECTION AND PANEL DATA 472 (2010).
[60] *See generally* WILLIAM H. GREENE, ECONOMETRIC ANALYSIS (5th ed. 2002).

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and variances of the dependent variable should be identical; otherwise overdispersion occurs. In our model, we find that the variance of the dependent variable (103.86) is more than nineteen times its mean (5.39), so the Poisson regression is not an adequate approach. In such cases, a common alternative is the NB model.[61] To decide whether to employ mixed, random, or fixed-effects NB models, we conduct the following two-step tests. First, we run an NB panel regression with mixed effects and find that the results of the likelihood ratio test indicate that we should strongly reject the mixed-effects NB model. Next, we employ Hausman (1978)'s specification test[62] to decide whether a random-effects or fixed-effects model specification is more appropriate. The result of the Hausman test indicates that we should strongly reject the null hypothesis in which the estimated coefficients between the two estimators are not statistically different (H_0: difference in coefficients not systematic), suggesting that we should instead use a fixed-effects NB model estimator.

Table 6 reports the empirical results of our baseline estimates. Column (1) contains the estimation results of the determinants of AD policymaking based on the perspective of interests. It shows that the coefficient of $extrade_{it-1}$ is negative and significant at the 1% level, indicating that with increases in the ratio of exports to total trade, there tend to be fewer AD initiations due to the political interests and pressures from export-oriented industries. In line with our expectations in Hypothesis 4, the estimation results are consistent with that in the full model in column (4), which also considers the effects of interactions and institutions.

However, coefficients for the variables that represent the interests of laborers, import-competing industries, and import-dependent industries are not statistically significant, refuting our Hypotheses 1-3. A possible explanation for the lack of significance of $lnkl_{it-1}$ is as follows: although laborers have strong interests in AD policymaking, they also have collective action problems and an incentive to free ride. Their very numbers make it difficult for them to lobby policymakers for their desired policies, so their voice is often ignored in the policymaking process. The non-significant sign of $imfinalt_{it-1}$ may be explained as follows: import-competing industries are made up of firms that produce final goods and depend on domestic supply chains. Compared to firms in highly productive, export-oriented industries,[63] these firms tend to be less productive and lack the ability to offshore their production to countries with lower manufacturing costs. Therefore, their

[61] Jerry A. Hausman et al., *Econometric Models for Count Data with an Application to the Patents-R&D Relationship*, 52(4) ECONOMETRICA 909, 921 (1984).

[62] *See generally* Jerry A. Hausman, *Specification Tests in Econometrics*, 46(6) ECONOMETRICA 1251 (1978).

[63] Soo Yeon Kim & Gabriele Spilker, *Global Value Chains and the Political Economy of WTO Disputes*, 14(2) REV. INT'L ORGS. 239, 259 (2019).

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interest requirements may not be satisfied by AD policymakers under some circumstances. Finally, firms in import-dependent industries, including processing firms or retailers, are typically diverse, so their interests in AD policymaking can vary widely. This makes it more difficult for them to organize effectively or engage in joint efforts toward political mobilization against imposed AD measures. Moreover, when import prices increase due to protectionist measures, these firms have the flexibility to adjust their business strategies rather than lobbying policymakers for assistance.[64] These possible causes may explain the non-significant sign of $imintert_{it-1}$.

Column (2) of Table 6 reports the estimation results from the perspective of interactions. The coefficients of both $disputetar_{it-1}$ and $adtar_{it-1}$ are positive, while only the former is statistically significant at the 1% level, indicating that more AD retaliatory responses may be triggered in situations where the number of WTO disputes filed against a country increases rather than a mere increase in the number of initiations of AD investigations. In line with our expectations in Hypothesis 6, the results are consistent in the full model in column (4). However, the results refute Hypothesis 5. A plausible explanation for this may be that a successful WTO dispute filed by a foreign country can result in forceful implementation and elimination of measures inconsistent with WTO regulations, creating a bigger threat and stronger motivation to retaliate against the targeting country.

TABLE 6: Estimation Results of Fixed-Effects Negative Binomial Regression Models

	Interest (1)	Interaction (2)	Institution (3)	Three Is (4)
Constant	5.6358***	3.0035**	2.0539	5.1349**
	[1.7466]	[1.2880]	[4.7124]	[2.1202]
$imfinalt_{it-1}$	-0.0288			-0.0382
	[0.0466]			[0.0530]
$imintert_{it-1}$	-0.0034			0.0052
	[0.0151]			[0.0149]
$extrade_{it-1}$	-0.0480***			-0.0383*
	[0.0157]			[0.0209]

[64] Jappe Eckhardt, *Firm Lobbying and EU Trade Policymaking: Reflections on the Anti-Dumping Case Against Chinese and Vietnamese Shoes (2005-2011)*, 45(5) J. WORLD TRADE 965, 969 (2011).

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$lnkl_{it-1}$	0.0229			-0.1098
	[0.0895]			[0.1188]
$disputetar_{it-1}$		0.0990***		0.0598**
		[0.0239]		[0.0295]
$adtar_{it-1}$		0.0059		0.0105
		[0.0112]		[0.0154]
$demo_{it-1}$			0.1553	0.1717**
			[0.0960]	[0.0851]
$wtom_{it-1}$			1.0657	0.8512***
			[4.3019]	[0.2411]
$gdpgrowd_{it-1}$	0.0256**	0.0333***	0.0396***	0.0236
	[0.0118]	[0.0129]	[0.0139]	[0.0176]
$militaryr_{t-1}$	-1.1517***	-1.0932**	-1.3981***	-1.3164***
	[0.4357]	[0.4723]	[0.3978]	[0.4401]
$worldgdpg_{t-1}$	-0.0553**	-0.0611**	-0.0698**	-0.0553*
	[0.0269]	[0.0300]	[0.0341]	[0.0320]
Observations	923	920	989	856

NOTES: 1. Bootstrap standard errors in brackets. 2. * p<0.1, ** p<0.05, *** p<0.01.

Column (3) of Table 6 displays the estimation results for institutions in AD policymaking. The coefficients of both $demo_{it-1}$ and $wtom_{it-1}$ are positive, but not significant. However, in column (4), which contains the estimation results of the full model based on the three Is theory in AD policymaking, the coefficients of these two variables are positive and statistically significant, in line with our expectations in Hypotheses 7 and 8. The degree of democratization has positive impacts on the number of AD initiations at the 5% significance level, indicating that AD, acting as a flexibility mechanism, allows policy discretion for political leaders to protect special interest groups in more democratic countries.

The coefficient of $wtom_{it-1}$ is positive at the 1% significance level, in line with the expectation that countries tend to initiate more AD investigations if they are WTO members. The estimation results of the full model in column (4) suggest that interests, interactions, and institutions all influence AD initiations independently. For example, when a country is faced by multiple

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WTO dispute complaints, it may be motivated by retaliation to initiate an AD investigation without fear of constraints emanating from interests and institutions.

To explore the determinants of AD further, we divide our research sample into low-middle-income and high-income country groups, referring to Aggarwal (2004).[65] Based on the classification of the World Bank (2020),[66] countries may be assigned into four groups: low-income, lower-middle-income, upper-middle-income, and high-income economies. To match our sample, we merged the second and third groups into low-middle-income countries (there are no low-income countries in our sample). As shown in column (1) of Table 7, for both low-middle-income and high-income countries, the ratio of exports to total trade has a negative impact on countries' use of AD, with significance levels of 1% and 10%, respectively. The results reveal that the interests of export-oriented industries in relation to trade liberalization can deter initiations of AD investigations.

In column (2) of Table 7, the signs of the coefficients of $disputetar_{it-1}$ (the number of WTO disputes filed against a country) are shown to be positive for both low-middle-income and high-income country groups, but the coefficient is statistically significant only for the former at the 5% level. The logic behind this is that WTO dispute petitions can pose a threat to low-middle-income countries and motivate them to launch retaliatory AD investigations. The results coincide with the reality that the proliferation of AD initiations in recent years has spread from a few traditionally high-income AD users to more low-middle-income AD users. Specifically, thirty low-middle-income countries in our sample together accounted for 49% of the initiation of global AD investigations in the early days (from 1995 to 1997) of the establishment of the WTO; however, their share increased to 63% in later years. Moreover, the total number of AD initiations for low-middle-income countries from 1998 to 2018 was more than ten times that of the first three years of the establishment of the WTO. Apparently, low-middle-income countries (such as India, Brazil, and Argentina) are joining the community of frequent AD policy users. Aggarwal (2004) argued that the increasing use of AD protection to counter credible threats by these countries can help strengthen their retaliatory capacity and discourage AD investigations against them.[67] In addition, it may also make them take initiative in their strategic interactions with other countries. On the other hand, retaliatory AD activity can be a costly trade policy from a global perspective since it may also lead to the backsliding of trade liberalization.

The results in column (3) of Table 7 show that variables representing

[65] Aggarwal, *supra* note 15, at 1045.
[66] *The World by Income and Region*, THE WORLD BANK, https://datatopics.worldbank.org/world-development-indicators/the-world-by-income-and-region.html (last visited Dec. 12, 2020).
[67] Aggarwal, *supra* note 15, at 1048.

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both domestic and international institutions (i.e., the level of democratization ($demo_{it-1}$) and WTO membership ($wtom_{it-1}$) have strongly significant and positive effects on initiations of AD investigations for high-income countries at the 1% level. Regarding domestic institutions, the results are in line with the flexibility theory proposed by Rosendorff *et al.* (2001),[68] suggesting that having more democratic institutions is associated with more frequent use of flexibility-enhancing provisions. In the WTO AD Agreement, ambiguous provisions allow political leaders broad discretion in legal interpretations and practical applications. In democratic institutions, which tend to be found in high-income countries, it is easier for protection-seeking interested parties to lobby policymakers to take protectionist measures such as initiating AD investigations. To alleviate pressure from these domestic constituencies, political leaders are more likely to use AD investigations as the measure of choice. Regarding international institutions, the estimate of the WTO membership variable ($wtom_{it-1}$) is only positive and significant for the high-income country group at the 1% level in column (3). However, in our model specification in column (4), the estimates for both groups are positive and significant at the 1% level, revealing the triggering effect of the binding and multilateral rules on members' AD initiations after their 1995 accession to the WTO. Moreover, the results in our full model reveal that in low-middle-income countries, AD initiations appear to be largely motivated by the international institution factor; however, the interest and institutional factors are major influences in high-income countries in terms of AD use, more so than retaliatory interaction factors.

[68] Rosendorff & Milner, *supra* note 40, at 844.

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TABLE 7: Estimation Results of Fixed-Effects Negative Binomial Regression Models: Low-Middle-Income Countries vs High-Income Countries

	Interest (1)		Interaction (2)		Institution (3)		Three Is (4)	
	Low-Middle-	High-Income	Low-Middle-	High-Income	Low-Middle-	High-Income	Low-Middle-	High-Income
Constant	4.3208*	16.6954***	1.4739	6.5953***	0.8212	-11.7852***	3.4967	3.0028
	[2.5277]	[6.3894]	[1.2728]	[1.7420]	[3.7757]	[2.6725]	[2.9112]	[4.1464]
$imfinalt_{it-1}$	-0.0702	0.0302					-0.0353	-0.0299
	[0.0718]	[0.0786]					[0.0631]	[0.1089]
$iminterit_{it-1}$	0.0102	-0.0244					0.0224	-0.0133
	[0.0165]	[0.0586]					[0.0215]	[0.0313]
$extrade_{it-1}$	-0.0384***	-0.0728*					-0.0233	-0.0684**
	[0.0147]	[0.0379]					[0.0192]	[0.0336]
$lnkl_{it-1}$	-0.0091	-0.5146					-0.1498	-0.6325***
	[0.1663]	[0.4639]					[0.2134]	[0.2392]
$disputetar_{it-1}$			0.0889**	0.0823			0.0346	0.0482
			[0.0395]	[0.0556]			[0.0403]	[0.0499]
$adtar_{it-1}$			0.0094	-0.0175			0.0134	-0.0194
			[0.0168]	[0.0138]			[0.0164]	[0.0274]
$demo_{it-1}$					0.1073	0.5266***	0.1182	0.3972***
					[0.1185]	[0.1728]	[0.1035]	[0.1306]
$wtom_{it-1}$					0.9733	14.9420***	0.8419***	13.4590***
					[3.3954]	[1.3263]	[0.2519]	[0.9328]
$gdpgrowd_{it-1}$	0.0128	0.0516	0.0262**	0.0666	0.0271	0.0952*	0.0138	0.0303
	[0.0132]	[0.0579]	[0.0111]	[0.0462]	[0.0178]	[0.0508]	[0.0186]	[0.0631]
$militaryr_{t-1}$	-0.789	-2.2055*	-0.5344	-2.2734***	-0.7813	-2.3566***	-0.8789	-2.6137***
	[0.4951]	[1.2034]	[0.4523]	[0.6593]	[0.5140]	[0.8317]	[0.5590]	[0.9442]
$worldgdpg_{t-1}$	-0.0487	-0.0891	-0.0429	-0.0974*	-0.0502	-0.1193**	-0.0379	-0.0869
	[0.0393]	[0.0668]	[0.0362]	[0.0518]	[0.0389]	[0.0502]	[0.0367]	[0.0633]
Observations	635	288	644	276	690	299	590	266

NOTES: 1. Bootstrap standard errors in brackets. 2. * p<0.1, ** p<0.05, *** p<0.01.

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C. Endogeneity Issues

Following Moore *et al.* (2011) and Meng *et al.* (2016)'s study,[69] we have used a one-year lag for each explanatory variable, which could help to attenuate the potential endogeneity problem to some extent. However, the problem of reverse causality is also one of the causes of endogeneity. For example, it may be argued that Hypothesis 6 is established on the premise that bringing a case to the WTO may incentivize the AD-user country to initiate AD investigations against the target. However, it can be otherwise thought that the AD-user is more subject to WTO respondents because the user country invokes more AD investigations.[70] That is, *disputetar* (the number of WTO disputes filed against a country) and *adini* (the number of AD investigations initiated by a country) may affect each other. To further address this concern, we employed Hilbe (2011)'s two-stage instrumental variables approach to attenuate the endogeneity problem related to the reverse causality in negative binomial regression model.[71] We suppose that *disputetar* is endogenous, and we selected *l.disputetar* (the one-year lagged *disputetar*) as an instrumental variable (*IV*) to test whether the use of one-year lag actually alleviates the endogeneity problem.

As shown in Table 8, at the first stage, the instrument is a significant predictor of the endogenous predictor. Next, we obtained the residual from an ordinary least squares (OLS) regression. At the second stage, we employed a NB regression model of our choice, including the endogenous predictor and the residual obtained at stage 1, but excluding the instrument. The results showed that the sign and significance of the coefficient of *disputetar* are basically the same as the baseline estimation results.

[69] Moore & Zanardi, *supra* note 17, at 605; Meng et al., *supra* note 48, at 4093.
[70] An anonymous reviewer, correspondence on file with the authors.
[71] JOSEPH M. HILBE, NEGATIVE BINOMIAL REGRESSION 416-21 (2d ed. 2011).

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TABLE 8: Results of the Two-Stage Instrumental Variables Approach

Variable	Stage 1	Stage 2
	disputetar	*adini*
IV	0.2363***	
	[0.0326]	
disputetar		0.2440*
		[0.1346]
Other Explanatory and Control Variables	Yes	Yes
Observations	826	826

NOTES: 1. Standard errors in brackets. 2. * p<0.1, ** p<0.05, *** p<0.01.

D. Robustness Checks

We conducted a series of tests to check the robustness of our regression results. First, we considered the possible influence of omitted variables such as the growth rate of the industrial value addition of country *i* in year *t-1* ($valueaddg_{it-1}$), which can affect the estimation results. The World Bank (2019) defines the value addition as "the net output of a sector after adding up all outputs and subtracting intermediate inputs."[72] The rationale for controlling this variable is to measure the levels of domestic activity[73] or the competitiveness of domestic industries.[74] A decrease in the growth rate of the industrial value addition may indicate less competitive industrial products, which could motivate domestic industries to petition for more AD protection. Therefore, this variable is expected to be negatively related to the number of AD initiations. Data for this variable was collected from the World Development Indicators of the World Bank. The estimation results shown in column (1) of Table 9 suggest that the coefficient of this variable is not statistically significant and makes little difference to the sign and significance of the coefficients of the main variables in the baseline regression model.

[72] *DataBank: Metadata Glossary*, THE WORLD BANK, https://databank.worldbank.org/metadataglossary/jobs/series/NV.IND.TOTL.KD.ZG (last visited Jan. 15, 2023).
[73] Aggarwal, *supra* note 15, at 1047.
[74] Meng et al., *supra* note 48, at 4086.

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Further, we conducted analyses using alternative measures for several variables to examine whether the baseline estimation results hinge on a particular operationalization. We replaced the variables representing the interests of import-competing industries ($imfinalt_{it-1}$), import-dependent industries ($imintert_{it-1}$), and export-oriented industries ($extrade_{it-1}$) with $imfinalgdp_{it-1}$ (the ratio of imports of final goods to GDP in country *i* in year *t-1*), $imintergdp_{it-1}$ (the ratio of imports of intermediate goods to GDP in country *i* in year *t-1*), and exd_{it-1} (the ratio of exports to GDP in country *i* in year *t-1*), respectively. The rationale behind this is that these three alternative measures represent the interests and political pressures of different industries when it comes to AD initiations. We reran the regression model and found that the results shown in column (2) of Table 9 are basically the same as the baseline estimation results.

Finally, we conducted an analysis using alternative samples to reduce the risk that the estimation results were driven by extreme values. It is noteworthy that, among the top three AD initiators, that is, India (919), the US (694), and the EU (510), India accounts for 43.3% of AD investigations initiated between 1995 and 2018. Therefore, India was excluded from the sample for a robustness check. The re-estimated results in column (3) of Table 9 show minimal difference in the signs and statistical significance of all main variables when compared with the baseline regression results.

TABLE 9. Results of Robustness Checks

Baseline Regression Model		Model Re-Specification (1)	Alternative Measures (2)		Alternative Sample (3)
Constant	5.1349**	4.9617**	Constant	3.2997**	5.0867**
	[2.1202]	[1.9915]		[1.6107]	[2.1587]
$imfinalt_{it-1}$	-0.0382	-0.0327	$imfinalgdp_{it-1}$	-0.1121	-0.0324
	[0.0530]	[0.0529]		[0.0970]	[0.0506]
$imintert_{it-1}$	0.0052	0.0042	$imintergdp_{it-1}$	0.0189	0.0015
	[0.0149]	[0.0148]		[0.0191]	[0.0153]
$extrade_{it-1}$	-0.0383*	-0.0379*	exd_{it-1}	-0.0187*	-0.0395**
	[0.0209]	[0.0204]		[0.0101]	[0.0183]
$lnkl_{it-1}$	-0.1098	-0.1109	$lnkl_{it-1}$	-0.0414	-0.1226
	[0.1188]	[0.1150]		[0.1344]	[0.1511]

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$disputetar_{it-1}$	0.0598**	0.0624*	$disputetar_{it-1}$	0.0545*	0.0721***
	[0.0295]	[0.0322]		[0.0295]	[0.0273]
$adtar_{it-1}$	0.0105	0.0099	$adtar_{it-1}$	0.0047	0.0101
	[0.0154]	[0.0148]		[0.0090]	[0.0109]
$demo_{it-1}$	0.1717**	0.1770**	$demo_{it-1}$	0.1622*	0.1630*
	[0.0851]	[0.0833]		[0.0931]	[0.0953]
$wtom_{it-1}$	0.8512***	0.8992***	$wtom_{it-1}$	0.9853***	0.8324***
	[0.2411]	[0.2582]		[0.2171]	[0.2187]
$gdpgrowd_{it-1}$	0.0236	-0.0137	$gdpgrowd_{it-1}$	0.0273*	0.0227
	[0.0176]	[0.0367]		[0.0147]	[0.0174]
$militaryr_{t-1}$	-1.3164***	-1.3092***	$militaryr_{t-1}$	-1.4647***	-1.1788**
	[0.4401]	[0.4462]		[0.5465]	[0.5537]
$worldgdpg_{t-1}$	-0.0553*	-0.0598	$worldgdpg_{t-1}$	-0.0534*	-0.0462
	[0.0320]	[0.0375]		[0.0304]	[0.0315]
$valueaddg_{it-1}$		0.0283			
		[0.0224]			
Observations	856	840	Observations	846	833

NOTES: 1. Bootstrap standard errors in brackets. 2. * p<0.1, ** p<0.05, *** p<0.01.

V. CONCLUSIONS AND IMPLICATIONS

This study examines the determinants of AD initiations based on the three Is theory of the IPE. The empirical results are generally consistent with our theoretical expectations that the determinants of AD policymaking include an interplay of interests, interactions, and institutions, as proposed by Frieden *et al.* (2017).[75] Regarding interests, we find that an increase in the ratio of exports to total trade reduces the number of AD initiations due to the interest demands and political pressures from export-oriented industries. Regarding interactions, a country tends to initiate more AD investigations if it has more WTO disputes filed against it. Regarding institutions, more democratic WTO members initiate more AD investigations in response to domestic interest groups. In addition, the patterns of AD between low-

[75] *See generally* FRIEDEN ET AL., *supra* note 8.

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middle-income and high-income countries differ in that international institutional factors constitute major concerns for the former, while interest and institutional factors constitute major concerns for the latter. Our research conclusion still holds after a series of robustness checks.

The empirical results of this study carry significant theoretical and practical implications. Theoretically, by focusing on a specific trade policy (i.e., AD policy), this research provides novel insights into how actors pursue their interests, states interact with other states, and institutions affect interests and structure interactions. In this way, this study expands our understanding of the determinants of AD based on a coherent and comprehensive theoretical framework including the three Is of Frieden *et al.* (2017):[76] interests, interactions, and institutions. This novel approach has practical implications for industries, national governments, and the WTO.

For industries, the negative relationship between the ratio of exports to total trade and the number of AD initiations indicates that export-oriented industries can serve as a counterbalance to protectionist sentiment. Therefore, they can take collective action to mobilize against AD use in the political arena to defend their interests on the one hand and help to secure trade liberalization on the other hand.

For national governments, at the domestic level, policymakers should refrain from over-responding to political mobilization by actors with protectionist interests. Engaging in trade protection activities like initiating AD investigations is not the only answer to reduce the impact of free trade. Instead, governments can arrange compensation for actors who lose from free trade. For example, some countries such as the US, Canada, and Korea provide Trade Adjustment Assistance to firms, workers, and farmers harmed by free trade. Since free trade brings overall gains for the national economy, this redistribution through compensation can move all actors toward the Pareto frontier and increase the welfare of all. At the international level, the positive relationship between the number of WTO disputes filed against a country and its AD initiations suggests that negative strategic interactions between countries induce them to use AD investigations as a means of retaliation, which increases trade conflicts. To curtail retaliation in strategic interactions, a few countries can sign trade agreements, which may reduce the possibility of trade wars among partner countries.

For the WTO, the positive relationship between WTO membership and the number of AD initiations verifies our hypothesis that international trade institutions legalize the use of AD by these members. Ambiguous AD rules allow a greater flexibility in more democratic countries, where political leaders may abuse their discretionary privileges to satisfy the requirements of special interest groups. Therefore, it is desirable that the WTO revise the

[76] *Id.* at 5.

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ambiguous provisions in the WTO AD Agreement. However, given the long and arduous multilateral trade negotiations during the ongoing Doha Round, this seems to be an unrealistic expectation. A more legally practical and politically feasible option is to revise the flexibility provisions in regional trade agreements through negotiations. In this process of political bargaining, developing countries, usually low-middle-income countries, should take the initiative in reshaping world trade rules to promote formation of a fairer and more legitimate global trade governance system.

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