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**The Political Economy of WTO Dispute Settlement:  
Toward a Synthesis of International Regime Theories**

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## **Abstract**

This paper analyzes the explanatory power of mainstream international regime theories from the international political economy (IPE) literature—neoliberalism, realism, and cognitivism—through formal econometric techniques. I use a data set based on 162 dispute settlement cases since the inception of the World Trade Organization and find that the probability of a Dispute Settlement Panel (DSP) forming depends on the share of exports for a target country as a share of its total exports as well as relative gaps in military expenditures (as a share of GDP). These results are highly robust to different model specifications and control variable choice. Though the cognitivist variable does not yield significant results, this paper represents a positive first step toward more widespread application and confirmation of regime theories through empirical testing.

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## I. Introduction

Disagreements over the formulation, implementation, and regulation of external trade policy have increased dramatically in recent years, extending beyond the industry or factor cleavages predicted by standard trade models.<sup>1</sup> Joining these interest groups have been ordinary citizens concerned about environmental degradation, unsatisfactory labor conditions and increasing incidences of illegal child labor, and the plight of developing countries. As a result, recent trends in international trade have spawned a cottage industry of pundits and commentators defending both sides of the free trade debate.<sup>2</sup> The most noteworthy manifestations of this renewed interest in trade have been massive protests against the *status quo* of international financial and commercial relations. For example, Marxists, non-governmental organizations (NGOs), and environmental activists continually fill city streets during World Trade Organization (WTO) ministerial or International Monetary Fund (IMF)/World Bank meetings often decrying the presence of these international institutions as much as the pattern of exchange that they promote.

Mainstream academic theories about international regimes and institutions posit that the regularized behavior they promote reduces uncertainty, transforms zero-sum games into repeated versions with infinite time horizons, and lengthens the shadow of the future (or, equivalently, reduces actors' discounting of future periods of strategic interaction). In essence, the consensus among most international political economy (IPE)

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<sup>1</sup> See James E. Alt and Michael Gilligan, 'The Political Economy of Trading States: Factor Specificity, Collective Action Problems, and Domestic Political Institutions,' in Jeffrey A. Frieden and David A. Lake, *International Political Economy: Perspectives on Global Power and Wealth*. Boston: Bedford/St. Martin's, 2000, pp. 327-342.

<sup>2</sup> Such activity often has led to vociferous responses from the economics community, particularly from free trade defenders Jagdish Bhagwati and Paul Krugman. See Paul Krugman, *Pop Internationalism*. Cambridge: The MIT Press, 1996.

scholars is that regimes help mitigate the problems associated with achieving ‘cooperation under anarchy.’

Before proceeding further, a discussion of regime definition is in order. In this paper, I start with Krasner’s (1983) now widely accepted version, which casts regimes as:

implicit or explicit principles, norms, rules, and decision-making procedures around which actors’ expectations converge in a given area of international relations. Principles are beliefs of fact, causation, and rectitude. Norms are standards of behavior defined in terms of rights and obligations. Rules are specific prescriptions for action. Decision-making procedures are prevailing practices for making and implementing collective choice

and consider it to be an inadequate interpretation of institutional patterns of behavior.<sup>3</sup>

This definition, like most other generalizations about regime dynamics, fails to capture parallel patterns of dissent and discord. In other words, although regimes are designed and maintained in order to facilitate the realization of state goals in an environment of conflicting preferences, cooperation or resort to regime mediation is not always observed. In order to explore further the duality of regime effects, I focus here on the political-economic determinants of intra-regime conflict and collaboration.

## **II. Purpose**

The purpose of this paper is to twofold. The primary objective is to determine the effects (magnitude and significance) of well-known regime theory variables on the probability of cooperative outcomes in international trade disputes. In other words, what characteristics of countries embroiled in conflict best explain state behavior during the period of disagreement? What determines whether a trade dispute is resolved bilaterally or through the rules and standards of a multilateral trade regime? The second, yet no less important, objective is to test these theories within the context of the WTO, perhaps the

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<sup>3</sup> Stephen D. Krasner (ed.), *International Regimes*. Ithaca: Cornell University Press, 1983, p. 1.

most important international trade regime today. What features of WTO member countries best explain variation in the successful use of WTO dispute settlement mechanisms? Taken together, the aim of this research agenda is to analyze WTO dispute settlement dynamics within the context of a regime theory synthesis, the results of which should shed light on whether the WTO dispute settlement mechanism is serving the national interest of states as defined by regime theory.

These research questions are derived from two important motivating sources. Recent theoretical publications have offered initial hypotheses regarding the persistence of conflict within international regime structures and the potential for a grand synthesis of the major paradigms in regime theory.<sup>4</sup> While much important qualitative work has been completed in this domain, these attempts (to my knowledge) have not included more rigorous applications to data. Moreover, theory building on international regimes, especially within the tradition of political science, tends to focus on the definitions of and demand for regimes. This paper departs from previous contributions first by avoiding the long-standing debate on the benefits of regimes and institutions; I assume regimes to be collective and existence goods for international trade negotiators. Second, I embrace an approach of examining specific regime dynamics over time and across countries using econometric modeling. Hence, this paper represents a first cut at bridging the methodological gap dividing economists and political scientists through the employment of both economic and political variables in the econometric model.<sup>5</sup>

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<sup>4</sup> See Andreas Hasenclever, Peter Mayer and Volker Rittberger, 'Integrating Theories of International Regimes,' *Review of International Studies*, Volume 26, Number 1, January 2000 for a notable example.

<sup>5</sup> Economists have in large part been engaged in model building, while political scientists prefer small-*n* case studies and qualitative theorizing.

In essence, this particular research question embodies but one of many in the array of collective action/policy coordination puzzles that confront and confound researchers and policy-makers. Political economy analyses of multilateral regimes naturally focus on those variables that increase the probability of cooperative outcomes. Yet, serious empirical investigations of the viability and robustness of these predictions are often missing. The choice of a conflict versus cooperation approach is a direct response to Hasenclever, Mayer, and Rittberger (2001) and Keeley (1990), though neither suggests the functional form analyzed in subsequent sections. Unfortunately, given the dearth of similar research, it will be impossible to compare my findings with other hypotheses or model specifications.

I find that the neoliberal and realist paradigms (associated with export volume and relative military expenditures, respectively) are significant determinants of state behavior within a regime-based framework, interpreting the establishment and use of a Dispute Settlement Panel (DSP) as a commitment to multilateral cooperation. From the model estimates, it is clear that these ‘schools’ of international regime theory contain robust explanatory power with respect to observed behavior in the WTO. Specifically, there is significant evidence supporting the claim that the neoliberal and realist paradigms are useful heuristic devices when analyzing patterns of trade cooperation and conflict.

The paper is organized as follows. Section III presents a survey of the relevant literature from the perspectives of economics and political science. Section IV briefly outlines the WTO dispute settlement procedure. Section V details the data set and construction of the model variables. Section VI presents the results of the model.



estimation. Section VII concludes. An Appendix contains summary statistics on the data set and all regression output.

### **III. Literature Review**

The existing literature on international regimes, though well established in the political science community, has garnered attention from international trade theorists only since the advent of regional and global trade institutions. Moreover, since the amount of data required to empirically test a country within the WTO (or any similar regime) has just become available, such analyses have yet to be conducted. On the other hand, political scientists have explored the nature of regime-based interaction, especially in the wake of Krasner (1983). These differing approaches and traditions are examined in this section through a review of the relevant literature, which will provide the necessary context for empirically testing international regime theories.

#### **Economics**

Most of the research conducted within the economics community focuses on the theoretical implications of international trade negotiations within the WTO. Trade theorists, however, have only recently begun to address the questions of institutional design as well as the benefits of multilateralism and the dispute settlement mechanism. Maggi (1999) suggests a model in which the WTO dispute settlement procedure allows for third-party information gathering and multilateral enforcement mechanisms. In short, the WTO extends the domain of trade negotiations beyond strictly bilateral dimensions, yielding positive benefits in terms of transparency and reputational effects for offending countries engendered by exposing details about the complaint. Ludema (2000) finds that

sanctions authorized by the Dispute Settlement Body (DSB) reduce trade policy cooperation relative to an environment without the DSB. Although these findings seem rather pessimistic, the game-theoretic model used ignores completely the information gathering and preference aggregating functions of the mechanism. Bagwell and Staiger (1998) observe that the principles of the General Agreement on Tariffs and Trade (GATT), which underlie the WTO's system, assist governments in their effort to implement efficient trade agreements through reciprocity and nondiscrimination. Rosendorff (2000) portrays the dispute settlement procedure as a mechanism for reducing rigidity and increasing stability in trade policy. Moreover, he finds that a wider variety of countries are willing to sign an agreement through a dispute settlement procedure than without. Sevilla (1998) most resembles this paper's focus, yet differs in its analysis of GATT versus WTO dispute settlement procedure effectiveness. Importantly, she finds that variation in institutional design significantly affects state behavior in trade negotiations. Finally, Anne O. Krueger's (1997) volume casting the WTO as an international organization includes an early review of the dispute settlement procedure by legal scholar John Jackson suggesting that the dispute settlement procedure is a theoretically sound means of reducing the risk premium on international trade.

## **International Political Economy/Political Science**

### **Neoliberal Theories**

The dominant paradigm in international regime theory has been termed neoliberal because of its emphasis on systemic convergence of interests.<sup>6</sup> Not surprisingly, the neoliberal approach is biased toward explanations of cooperation or the conditions under

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<sup>6</sup> The international relations (IR) conception of neoliberalism is similarly a systemic view of cooperation among states due to shared economic interests.

which cooperation may arise. Theories from this perspective borrow heavily from microeconomic concepts of information asymmetries, transaction costs, and game theoretic behavior. Keohane (1984), for example, underscores the demand for regimes arising from these microeconomic deficiencies. As is well known, many trade dispute scenarios in the absence of formal or informal institutions can be reduced to a game of one-shot Prisoner's Dilemma in which the suboptimal outcome of 'mutual defection' is a Nash equilibrium of the normal form game. Regimes, argue neoliberal theorists, transform international economic relations into the equivalent of dynamic games with infinite time horizons. With sufficiently low discount rates on future stages of play, the cooperative solution may emerge from strategies of Tit-for-Tat (player selects counterpart's previous strategy in the next stage) or Grim Trigger (both players choose the cooperative strategy until one player defects; then second player defects for the remainder of play).<sup>7</sup> Briefly stated, regimes raise the costs associated with non-compliance in any particular situation, and, consequently, make cooperation more likely.<sup>8</sup>

Other prominent ideas from the neoliberal paradigm include Ruggie's (1983) exposition of 'embedded liberalism.' Because of the often-disproportionate distributional effects of trade policy for various factors of production—namely those that control the use and flows of income to capital and labor—regimes allow governments to adopt trade policies as long as they simultaneously provide social safety nets. Embedded liberalism effectively reflects a particular government's commitment to remunerating dislocated or disadvantaged sectors facing competitive pressures under free trade.

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<sup>7</sup> See Robert Gibbons, *Game Theory for Applied Economists*. Princeton: Princeton University Press, 1992, p. 91 and Kenneth A. Oye (ed.), *Cooperation Under Anarchy*. Princeton: Princeton University Press, 1986, pp. 50-51.

At the heart of these and other neoliberal theories is the proposition that trade matters to states in terms of both real income and increased consumption sets to the extent that sustaining mutually beneficial patterns of trade will impel disputants to reduce or eliminate the potential for conflict. Moreover, there is an implicit assumption in neoliberal thought that states behave according to axioms of economic rationality. In other words, Country X will prefer higher levels of income made possible through trade and, through instrumental reasoning, elects the proper trade policy for achieving these and other self-interested goals. It is important to note that the neoliberal 'ontology' assumes that states are primarily concerned with absolute gains from trade, thereby framing economic transactions in a positive-sum game framework. Consequently, countries have a vested interest in preserving regime structures once they are formed, ensuring that at some level those structures are robust to shifts in wealth or capabilities within the international system.

### **Realist Theories**

Realist theories of regimes share the same fundamental assumptions of rationality and self-interested behavior that have characterized the neoliberal paradigm. The point of departure lies in the underlying motivation for regime formation and the probability that regimes will survive shocks to distributions of economic or military power. Specifically, relative gains often matter and cause regime dynamics to break down or disappear all together. According to this logic, states only will support and maintain regimes as long as it is in their immediate interest to do so. Furthermore, without the presence of a dominant hegemon to coerce acceptance and enforce the 'rules of the game'

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<sup>8</sup> Andreas Hasenclever, Peter Mayer, and Volker Rittberger, *Theories of International Regimes*, Cambridge: Cambridge University Press, 1997, p.35.

as well as to 'tax' potential free riders, regimes will cease to function or demand attention.<sup>9</sup> Thus, realist states heavily discount future stages of play in the international trade game. In a self-help environment, countries are concerned about the distributions of goods, technology, and arms among both allies and adversaries that result from relatively free patterns of trade.

Grieco (1993) acknowledges the appeal of the neoliberal viewpoint, including its common use of 2x2 Prisoner's Dilemma (PD) games as structural models and its faith in iterated reciprocal strategies based on Axelrod's (1984) seminal study. Yet, he concludes that '*conditional cooperation* among states may evolve in the face of international anarchy and mixed interests through strategies of reciprocity, extended time horizons, and reduced verification and sanctioning costs [emphasis added].'<sup>10</sup> The thrust of his argument is that regimes cannot *guarantee* the emergence of cooperation. At the end of the day, regimes fail to allay the fear of distributional advantages accruing to political or economic adversaries. Grieco thus demonstrates the fundamental difference between his interpretation and the neoliberal case through the following neoliberal and realist utility functions, respectively:

$$U_i = V_i; U_i = V_i - k(W_j - V_i) \quad (1)$$

where  $U_i$  = utility of state  $i$ ;  $V_i$  = payoff to state  $i$ ,  $W_j$  = payoff to state  $j \neq i$ , and  $k$  = coefficient of sensitivity

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<sup>9</sup> See Robert Gilpin, *War and Change in World Politics*. Cambridge: Cambridge University Press, 1981 and John J. Mearsheimer, 'The False Promise of International Institutions,' *International Security*, Volume 19, Number 3, Winter 1994/95.

<sup>10</sup> David A. Baldwin (ed.), *Neorealism and Neoliberalism: The Contemporary Debate*. New York: Columbia University Press, 1993, p. 122.

The coefficient of sensitivity  $k$  in Equation 1 measures a state's responsiveness to relative gains, or the difference in payoffs accruing to the two states.<sup>11</sup> Grieco claims that  $k$  may vary from state to state and from system to system, but the coefficient will always remain greater than zero. In other words, for a state operating under realist assumptions, relative gains will *always* matter. Even exchanges with allies are affected by the  $k$  coefficient; 'gaps in pay offs favoring partners will always detract from a state's utility to some degree.'<sup>12</sup>

How well does Grieco's position, and by extension that of realist regime theory, depict the reality of interstate efforts toward cooperation? If his argument that states always are mindful of relative gains is valid, then cooperation is extremely unlikely or even impossible with political and economic rivals or when trade agreements entail uneven distributions. Nevertheless, cooperative behavior among allies and adversaries is an observable phenomenon. In fact, turning Grieco's criticism of conditional cooperation on its head, the value of  $k$  is similarly dependent on a set of conditions: the number of actors,  $N$ , engaged in international trade and the payoff structure described by the appropriate game theoretic framework. Stated otherwise, calculations of relative gains will be most significant and influential when trade approximates a zero-sum game of Deadlock and as  $N \rightarrow 2$ .<sup>13</sup> Apart from the height of the Cold War era, it is difficult to identify a period that reflects these conditions of extreme bipolarity and irreconcilable trading positions. As a result, the conditions that elevate relative gains considerations appear to be extreme, limiting cases that fail to capture the common experience of states.

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<sup>11</sup>  $k$  is assumed to be zero whenever  $(W_j - V_j) \leq 0$ . This makes intuitive sense, since the restriction implies the absence of any positive relative gains accruing to the second state.

<sup>12</sup> *Ibid*, p. 129.

In a multipolar world marked by malleable interests and opportunities for accommodation, most situations will fall somewhere here along a continuum running from complete cooperation (Harmony) to intractable conflict (Deadlock).

### **Cognitivist Theories**

A third branch of international regime theory abandons the assumption of explicitly rational decision-making according to exogenously given preferences. The cognitive or constructivist paradigm focuses on the role of uncertainty in the international economic system and the potential for knowledge and information to shape the way in which states interact. Hasenclever, Mayer, and Rittberger (2000) divide this approach into weak and strong variants. The former refers to processes of learning among state actors, bounded rationality, and other cognitive limitations. For example, knowledge about a high technology product imported from Japan or a new agricultural chemical introduced on American farms may be unavailable or indecipherable to those charged with resolving disputes. Thus, weak cognitivists stress the ‘demand on the part of decision-makers for reliable issue-specific knowledge.’<sup>14</sup> Studies of so-called epistemic communities have shed light on this phenomenon and the role of information in the complex process of policy coordination.<sup>15</sup> Strong cognitivist theories, on the other hand, are less explanatory theories than approaches to analyzing interstate behavior. Wendt (1992) is a notable example. Among other arguments, Wendt avers that ‘through practice agents are continually producing and reproducing identities and interests, continuously

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<sup>13</sup> See Duncan Snidal, ‘Relative Gains and the Pattern of International Cooperation,’ in Baldwin (1993).

<sup>14</sup> Hasenclever, Mayer, and Rittberger (2000), p. 10.

<sup>15</sup> A prominent example is Peter M. Haas, ‘Do Regimes Matter? Epistemic Communities and Mediterranean Pollution Control,’ *International Organization*, Volume 43, 1989.

choosing now the preferences [they] will have later.’<sup>16</sup> In a sense, international affairs are characterized by a constant state of flux among chosen identities and interests, thereby denying the rationalist assumptions of neoliberalism and realism.

One major deficiency in the cognitivist approach is its general lack of predictive power. Such explanations, by nature, tend to abstract from the nuances of reality. Where they fall short as forecasting tools, however, cognitivist ideas portraying institutions as organic social constructions are particularly useful explanatory variables. This paper in part attempts to extract predictive power from the cognitivist paradigm by applying its central themes to specific institutional features of the WTO.

### **The Possibility of Theoretical Synthesis**

Hasenclever, Mayer, and Rittberger (2000) accentuate the compatibility of neoliberal and realist regime theories based on the common underlying assumption of rationality. Following Keohane (1984), I take rationality to imply

that actors have consistent, ordered preferences, and that they calculate costs and benefits of alternative courses of action in order to maximize their utility in view of those preferences.<sup>17</sup>

Indeed, the attractiveness of Keohane’s argument in *After Hegemony* lies the use of traditionally realist theoretical assumptions in a primarily neoliberal argument. This congruity should be neither controversial nor surprising. For, if both theories presume that states value either increased trade flows or political security, then there must be a

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<sup>16</sup> Alexander Wendt, ‘Anarchy is what States Make of it: The Social Construction of Power Politics,’ *International Organization*, Volume 46, Number 2, Spring 1992, p. 411.

<sup>17</sup> Robert O. Keohane, *After Hegemony: Cooperation and Discord in the World Political Economy*. Princeton: Princeton University Press, 1984, p. 27.



method of expressing these values as preferences associated with state behavior.<sup>18</sup> Thus, an empirical test including measures of these preferences should have the potential to reveal the joint significance of neoliberal and realist theories.

Cognitivist theories, on the other hand, are not grounded in explicit assumptions of rationality. In fact, the strong version represents a rejection of rationality in favor of social construction. Often borrowing from sociological theories, arguments from this perspective deny that preferences are *exogenously* given according to the vagaries of international trade, exchange flows, or arms sales. Cognitivist theories by definition attempt to uncover the *endogenous* determinants of state behavior—those conditions and distributions of knowledge that shape and, in turn, are shaped by international actors.

Given this sufficient basis for a synthesis of neoliberal, realist, and weak cognitivist regime theories, I proceed to the empirical portion of the paper.

#### **IV. Dispute Settlement in the WTO<sup>19</sup>**

First, it will be helpful to review the fundamentals of dispute settlement procedures in the WTO. As part of the Uruguay Round of trade negotiations under the GATT, rules and procedures for handling dispute resolution within the WTO framework were conceived in the Understanding on Rules and Procedures Governing the Settlement of Disputes. One of the highlights of the revised system was a method of preventing any one Member from disrupting dispute resolution. Whereas under the GATT, states could

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<sup>18</sup> One potential criticism, however, may be that construing states as unitary rational actors with well-ordered preferences is wholly inappropriate. For the purposes of this paper, we assume this to be a sufficient characterization despite the validity of bureaucratic politics models.

<sup>19</sup> This section is largely based on a summary in Konstantinos Adamantopoulos (ed.), *An Anatomy of the World Trade Organization*. London: Klumer Law International, 1997.

unilaterally block complaints, the WTO Dispute Settlement mechanism requires a consensus among disputant(s) and target in order to block the formation of a panel.

A dispute may never reach panel review for several reasons. First, for a case of special importance such as the US-Japanese car import dispute (DS6) or the EU-US conflict over the use of the hormones estradiol and testosterone in the cattle industry (DS26), the Director-General may become personally involved in dispute resolution, bypassing the panel process entirely. If neither the Director-General nor the disputants themselves can reach an agreement, the matter then becomes eligible for DSP intervention. Alternatively, the economic significance of a disagreement may not be sufficient for the establishment of a DSP.

If a DSP convenes, its membership (ranging from three to five individuals) will investigate the details of the case and present a formal analysis with suggestions for the proper course of conflict resolution. In order to facilitate the investigation, the panel may convoke an Expert Review Group. These bodies are analogous to epistemic communities in that their members are qualified experts in the field of inquiry relevant to the case. The ERG is solely an advisory organization and its reports are distributed to the disputants and to the DSP for review and comments.

Panel decisions quite often fail to satisfy both parties. When disagreement persists, the case may be brought before an appellate body, the decision of which is final and binding (provided the DSB elects to adopt the report). Figure 1 in the Appendix depicts the various stages of dispute settlement according to these provisions. Nodes without subsequent panels are either secondary options from the preceding panel or possibly intermediary steps between panels.

These factors, however, only suggest explanations for institutional solutions to conflict as a function of the DSB bureaucratic process, whereas this paper seeks to identify theoretical factors that might also induce states to submit to the decisions of supranational arbiters.

**V. Data and Hypotheses**

Theories of regime-based trade policy examined in Section III may be summarized according to the explanatory variables outlined in Chart 1. This section describes how these theories are translated into falsifiable hypotheses with the use of economic data. The variables outlined below, though borrowed from regime theory, are not associated with or based on any previous econometric modeling. I therefore devote significant discussion to the rationale behind each variable construction and place those specifications within the context of the regime theories they are intended to represent. Appropriate summary statistics are documented in Tables 1 and 2 of the Appendix and are discussed in the concluding section.

**CHART 1 - MAINSTREAM REGIME THEORY EXPLANATORY VARIABLES**

<i>Neoliberal</i>	<i>Realist</i>	<i>Cognitivist</i>
Constellations of Interest (usually trade flows)	Power	Knowledge or Information

## Case Selection

Of the 254 cases registered with the WTO Dispute Settlement Body at the time of writing, only 75 (30%) have prompted the formation of a DSP. The data set includes 162 of the total cases from DS1 to DS202, since no subsequent cases were examined by a DSP. Of those, 56 (35%) are identified as panel cases, excluding observations for which data was unavailable or that were extensions of previous cases. Moreover, for cases in which more than one country is listed as a disputant, the first country to register the complaint is listed as the disputant. As the Appendix summary statistics exhibit, a disproportionate number of cases involve either the EU or the US. Potential bias is avoided by constructing an EU-US dummy, which is described below.

## Dependent Variable

The intensity of conflict in a WTO dispute and its effect on state behavior are difficult concepts to capture, both in qualitative and quantitative terms. A few potential candidates for the dependent variable are: the monetary value of sanctions imposed in a settlement package, the length (in days) of a dispute as recorded by the DSB, or the probability that any potential trade conflict is formally brought to the attention of the WTO. Yet, because monetary sanctions have been imposed in only three cases to date<sup>20</sup>; the length of a dispute may be a function more of bureaucratic inefficiency than inherent conflict; and calculating the probability measure requires knowledge of undocumented disagreements, these formulations are ruled out. Though not a perfect proxy for conflict intensity, I have chosen the probability that a case will appear before a DSP as the

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<sup>20</sup> Rodney D. Ludema, 'Optimal International Trade Agreements and Dispute Settlement Procedures,' *European Journal of Political Economy*, July 2000.

dependent variable, expressed as the dummy  $P_n$ .<sup>21</sup> The primary benefit of this formulation, however, is that it captures disputants' willingness to pursue resolution through the formal apparatuses of the WTO and thus the extent to which conflict matters in a trade issue area or requires third party review and consultation.

As discussed in Section IV, bureaucratic or organizational factors may affect the probability that a case garners the attention of a DSP. Nevertheless, more nuanced explanations derived from regime theory also should underlie this probability function. The models estimated in the following section are designed to test the significance of standard IPE theories as determinants of DSP formation.

## **Independent Variables**

### **Bilateral Exports as a Share of Total Export Volume**

At the heart of neoclassical trade theory is the Ricardian notion of specialization and trade according to comparative advantage augmented with the Heckscher-Ohlin and Stolper-Samuelson models. Although patterns of trade may emerge among countries regardless of factor endowments or within (rather than across) industries, standard trade theory posits economic gains for exporters and (under certain restrictions) welfare gains for consumers. Trade increases income and consumption sets, thereby releasing populations from the strictures of producing and purchasing all goods domestically.

Consequently, one would expect that countries, especially those that have opted to abide by the trade rules and standards of the WTO have a common interest in maintaining high volumes of trade as predicted by neoliberal theories. Simply stated, when a country is a significant stakeholder in trade and faces the possibility of suspended trade relations on account of a burgeoning dispute, it will attempt to maximize its utility function by

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<sup>21</sup> The dummy takes the values 1 if a panel is established and 0 if not.

reducing the intensity of conflict. From a game-theoretic standpoint, the dispute settlement procedure effectively casts a longer shadow of the future onto current stages of play.

The neoliberal variable  $T_n$  is constructed as  $\frac{EX_{i \rightarrow j}}{EX_i}$ , where the numerator is the volume of exports from the target country to the disputant (in millions of constant US dollars) as a share of the target's total exports.<sup>22</sup> All data are taken from the IMF Direction of Trade Statistics (1995-2000), which are published on a quarterly basis.<sup>23</sup> As a result, the values used are those for the quarter in which the dispute was lodged with the DSB. Based on neoliberal and standard international trade theory, I hypothesize the following with respect to the trade flows variable:

**HYPOTHESIS 1:** *Greater values for bilateral exports as a share of total exports for a target country increase the probability that a DSP will be established.*

### **Military Expenditures**

Realist regime theory invariably focuses on the role of power relations among states. These paradigms define international economic relations in terms of fungible capabilities and resources, i.e. assets available to a state that are easily transferable into political clout. As Grieco's simple model indicates, relative power considerations may translate into stalled or severed economic relations.

Data with respect to relative gains on a significant scale and across a wide variety of countries is impossible to obtain. Hence, I construct a proxy for the realist paradigm

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<sup>22</sup> One could argue that a more precise indicator for the neoliberal variable would be the importance of trade in the disputed sector or industry for the target country measured as the sector-specific share of total exports. Due to data limitations, the total volume of exports to the disputant country is a sufficient alternative.

that makes use of military expenditure as a percentage of GDP for the countries in the data set. In order to capture the spirit of relative gains considerations, I use  $M_n =$

$$\left| 1 - \frac{MIL_j / GDP_j}{MIL_i / GDP_i} \right|$$

in order to capture differences in relative military expenditures from

equality. This construction, according to realist theory, is related to (though not perfectly correlated with) the probability of a DSP forming due to the tendency of military rivals to eschew regime-based solutions to trade disputes.<sup>24</sup> Data for this variable are derived from the Stockholm International Peace Research Institute's (2001) Yearbook of World Armaments and Disarmament.<sup>25</sup>

Thus, a model of dispute settlement should take into account considerations of power balances using this proxy of military expenditures. In keeping with realist predictions about regime-based interactions, I claim:

**HYPOTHESIS 2:** *Greater differences in relative military expenditure between the countries involved in a dispute increase the probability that a DSP will be established.*

### **Cognitive Dummy**

Representing knowledge in the spirit of cognitivist theory and as a quantitative regressor is a nearly impossible task. I therefore make use of the dummy variable,  $C_n$ , which takes a value of 1 if the disputed product comes from a high-technology sector

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<sup>23</sup> Data for the EU-15 are neither averages nor aggregates across Member States. The DTS Yearbooks have published figures for the European Union from 1995 to the present.

<sup>24</sup> Though this is the primary variable construction used, we also include model specifications with expenditure shares countries entered as individual variables.

<sup>25</sup> Like the DTS formulation, the SIPRIS Yearbook calculates data on military expenditures for the EU-15, though not as shares of GDP. Therefore, the EU figures are divided by EU GDP, taken as an aggregate across Member States according to World Development Indicators (1999).

(e.g. computer equipment or satellite navigation systems), chemical or pharmaceutical sectors, or agricultural sectors and 0 otherwise. The rationale for this specification with respect to the first two categories is straightforward.<sup>26</sup> It is highly probable that trade disputes in those sectors will require some amount of specialized knowledge in the process of the investigation—knowledge that will not necessarily be contained in the general information sets of DSP members. Hence if unique knowledge and information are important elements in a case, weak cognitive theory suggests that the disputants would seek the counsel of an ERG. For example, in agricultural disputes concerning the safety of food engineered with biotechnological science, an ERG may provide the external, relatively unbiased analysis necessary to reach a scientific consensus.

To be sure,  $C_n$  is not a perfect portrayal of the cognitivist paradigm at work. A more plausible formulation would account for the actual presence of an ERG. Since the formation of an ERG is dependent on the establishment of a DSP, endogeneity problems prevent the use of such an indicator. A more direct test of the cognitive paradigm alone might take the form of a model testing the hypothesis that the presence of an ERG expedites the panel deliberation process and publication of the DSP's official report. Nevertheless, use of  $C_n$  in the probability model leads to the following hypothesis:

**HYPOTHESIS 3:** *Cases in which scientific or technical knowledge is integral to the dispute resolution or in which agricultural interests are at stake increase the probability that a DSP will be established.*

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<sup>26</sup> I include agricultural cases because of the high incidence of intense conflict in this sector. Aside from the now infamous European banana regime dispute (beginning with DS27) and the beef hormones case, work experience at the US Department of Agriculture Food Safety and Inspection Service (FSIS) suggests that other agricultural cases might have similar ramifications for the dispute settlement procedure. Indeed, one of the primary roles of the FSIS and the Under Secretary overseeing the administration is coordination with international regimes, including the World Health Organization and



### Relative Per Capita GDP Ratios

The first control variable makes use of data on per capita GDP for the countries involved in each dispute. Figures are taken from World Development Indicators (1999).

Constructed as  $\left|1 - \frac{GDP_j}{GDP_i}\right|$ , the variable  $Y_n$  captures the notion that imbalances in

economic size will impact the decision of a country or countries to enter into a formal dispute settlement scheme. Presumably, disparities in economic size between countries translate into calculations of the dispute's relative economic importance, at least with respect to the wealthier country.<sup>27</sup> Countries with higher income levels may find it less worthwhile to engage in the formal mechanisms of the dispute settlement process with developing countries, especially if the disputants can agree to side payments or other concessions. For example, it is unlikely that a case involving the Slovak Republic and the US would appear before a DSP, since the 'senior partner' (the US) would prefer to settle the matter outside of the WTO framework given the large number of concurrent pending cases.

Accordingly, I posit the following hypothesis:

**HYPOTHESIS 4:** *Greater disparities in GDP levels between disputant and target increase the probability that a DSP will be established.*

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Codex Alimentarius Commission, and other countries to resolve trade disputes in accordance with WTO rules and standards.

## **EU-US Dummy**

The European Union is listed as party to a dispute in 67 cases (41%) and the United States in 91 cases (56%); 28 cases (17%) include both major players. Indeed, one criticism of this data set may imply that the inclusion of these cases automatically biases the results toward these observations. Consequently, either country's presence may be of interest as a control variable and may explain a significant portion of the variation in panel formation. In various specifications of the regression model, I include the dummies  $EU_n$  and  $US_n$ .

In order to remain consistent with previous hypotheses, it seems likely that *the joint presence of the EU and US in a dispute case should reduce the probability of a DSP forming*. Intuitively, the EU and US have much to lose economically from prolonged conflict and are seldom conscious of military competitiveness, which, when considered together, should yield more frequent submissions to a panel. Thus, I postulate:

**HYPOTHESIS 5:** *The presence of the EU or the US as parties to a dispute increases the probability that a DSP will be established.*

## **Democratic Index**

The final control variable,  $D_n$ , measures the relationship between the degree of political freedom and respect for democratic principles in disputing countries and the use of DSPs. Commitment to civil liberties is ostensibly, though not necessarily, linked to transparent political processes and faith in political institutions as intermediaries in society. Consequently, one may expect to find that more democratic countries submit their case to DSPs than do more authoritarian regimes. Undoubtedly, any index of

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<sup>27</sup> This is assumed to be true irrespective of economic interdependence through trade. In any event, it is unlikely that non-neighboring states with significant per capita GDP disparities will have large

democratic freedom will be subject to the particular questions deemed important by the organization conducting the survey.

The index used in this analysis is taken from the 2001-2002 version of the Freedom House Global Survey of Freedom. The data included are indices measuring the status of political rights and civil liberties in a particular country ranging from 1 (most identifiable with democratic ideals) to 7 (least identifiable with democratic ideals). In each model,  $D_n$  for a given country is always calculated as the average of the political rights and civil liberties indices. However, some model specifications include  $D_n$  as the average index values for the two countries combined. EU values were obtained by averaging individual  $D_n$  values for the 15 Member States.<sup>28</sup> Briefly stated, I claim:

**HYPOTHESIS 6:** *The presence of relatively more democratic countries as parties to a dispute increases the probability that a DSP will be established.*

## VI. Model Estimation

The baseline model estimates in this section were obtained through an ordinary least squares (OLS) estimation of the linear probability model given by:

$$P_n = \alpha_0 + \alpha_1 * T_n + \alpha_2 * M_n + \alpha_3 * C_n + \varepsilon_n \quad (2)$$

where the  $\varepsilon_n$  are serially uncorrelated error terms with mean zero. The LPM invariably entails heteroskedasticity in the error terms, which is corrected using White's technique. Estimation of this simple model yielded the conclusion that trade flows and relative military expenditures are significantly correlated with the probability of DSP formation.

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bilateral trade balances.

<sup>28</sup> Index values from 1995 to 2000 are constant for all 15 countries, with most assigned the ideal value of 1 for both indicators. Inclusion of Italy causes the average value to increase slightly to 1.2.

Tables 3 and 4 present the regression output, with significance determined at the 5% level. While the cognitive dummy  $C_n$  was not significant in this specification, the positive sign does fit with the prediction of Hypothesis 3. The signs and significance of  $T_n$  and  $M_n$  are consistent with Hypotheses 1 and 2, respectively. Interpretations of LPM estimates differ slightly from traditional OLS techniques; coefficient estimates represent the probability increase or decrease of observing a dependent variable ‘win’ (in this case,  $P_n = 1$ ) for a unit change in the independent variable. Therefore, I conclude from this model that a unit increase in export shares for a target country increases the probability of a DSP forming by 31%, while a unit increase in relative military expenditure gaps decreases the same probability by approximately 7%. Note the  $R^2$  for this estimation is rather low at 0.04. Nonetheless,  $R^2$  is a somewhat dubious measure of goodness of fit in LPM estimations.<sup>29</sup>

Included in Table 1 are four additional specifications of the model, each retaining the three regime theory indicators and adding different combinations of the control variables from the preceding section. Model 2 replaces  $M_n$  with the simple ratio of military expenditures (disputant relative to target). This indicator is also significant and has virtually the same effect. Nonetheless, I retain  $M_n$  in all subsequent estimations. Model 3 adds the EU and US dummies, which are both highly insignificant. Model 4 includes the democratic indices and obtains similar insignificant results. Finally Model 5 controls for  $Y_n$  and, again, the baseline results are unchanged. Thus, Model 1 results for  $T_n$  and  $M_n$  are generally robust to different functional forms; that is they remain significant and retain their original signs.

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<sup>29</sup> Values between 0.2 and 0.6 are typically regarded as strong indicators of explanatory power.

Table 2 presents two additional models that make use of non-standard representations of Hypotheses 4 and 6. As expected,  $T_n$  and  $M_n$  remain significant, while the null hypotheses that the control variables are zero are not rejected. Interestingly, however, the highest  $R^2$  (0.06) is obtained in non-standard Model 2.

Finally, I revisit the three primary hypotheses and the implications of these findings for international regime theory.

## VII. Conclusion

Clearly, the preceding econometric analysis lends support to a synthesis of neoliberal and realist regime theories as determinants of state behavior in the WTO. Given that coefficients on both  $T_n$  and  $M_n$  were consistently significant, one could interpret this fact as evidence of their joint theoretical utility. If we accept the rationalist premises of neoliberalism and realism, then this result is not entirely surprising. For, the estimations undertaken were based on data that directly captures the economic and political interests of the countries involved—interests that appear to affect the way in which they conduct negotiations and dispute settlement.

Glancing at the summary statistics, we can conclude the following about country characteristics in the WTO dispute settlement process and the role of this mechanism in achieving state goals from a rationalist perspective. Export shares for targeted countries tend to be non-trivial; the mean value for the  $T_n$  variable is nearly 15%. With such high trade volumes at stake, the significance of  $T_n$  seems even more natural. Interestingly, most countries accounted for in DSB cases are exceptionally democratic. The mean values for both disputants and targets are slightly above the ideal value of 1. Certainly,

this is affected by the disproportionate number of cases involving the EU and US; but, it may also point to the fact that the WTO and other multilateral regimes tend, on average, to attract more democratic states.

What might explain the uniform insignificance of the cognitive variable? As noted in Section IV, the cognitive variable is certainly an imperfect proxy for the role of epistemic communities or technical information gathering institutions. Moreover, the results may have been biased by the inclusion of agricultural cases in variable construction, which, had they been left out, would have prohibitively reduced the variance of  $C_n$ . The insignificance of  $C_n$  of course does not invalidate the cognitivist research agenda. To be sure, with improvements in science and technology has come serious disagreement about the validity of conflicting evidence for and against various forms of technology in consumer-based economies. Additional steps should be taken to codify and capture the essence of the cognitivist approach for future empirical analyses.

Other fruitful extensions of this research might include consideration of regional trade regimes or additional multilateral institutions whose missions are located at the nexus of international politics and economics. Building upon Sevilla (1998), one could test these hypotheses against the combined GATT/WTO data set used in that paper. As these considerations are beyond the scope of this paper, I leave their exploration to the reader.

The implications of this paper are clear. Hasenclever, Mayer, and Rittberger's call for a theoretical synthesis indeed has merit and should be pursued further with other data sets and samples. Hopefully, this will lead to a revival of international regime theory and spawn more research programs that make use of traditionally economic tools.

More important for policy purposes, though, my findings seem to indicate that the institutional design of the embattled WTO in fact conforms to the interests of states as defined by standard regime theory. To wit, the dispute settlement mechanism embedded in its framework maintains an ideal amount of flexibility for states seeking to resolve trade conflict issues. For countries with high stakes in trade, DSPs tend to be established in order to expedite the settlement process. For countries concerned about relative gains, establishment of DSP becomes a less likely outcome, reflecting a general disdain for regime-based solutions. Consequently, the next logical question that social activists, commentators, and trade theorists should attempt to answer is not whether to abolish the WTO but how to strengthen further its role in reducing conflict in the international political economy.

## Appendix

### **FIGURE 1** – THE WORLD TRADE ORGANIZATION DISPUTE SETTLEMENT PROCEDURE

*Source:* Adamantopoulos (ed.), *Anatomy of the World Trade Organization*, 1997.

Figure not available.



**TABLE 1 – SUMMARY STATISTICS FOR DISPUTE SETTLEMENT DATA SET**

Source: World Trade Organization, 2002

[http://www.wto.org/english/tratop\\_e/dispu\\_e/dispu\\_e.htm](http://www.wto.org/english/tratop_e/dispu_e/dispu_e.htm).

Total number of observations: 162

CATEGORY	NUMBER OF OBSERVATIONS	PERCENTAGE OF TOTAL
<i>Panel cases</i>	56	35%
<i>United States (US) cases</i>	91	56%
<i>European Union (EU) cases</i>	67	41%
<i>US and EU cases</i>	28	17%
<i>Developing Country cases</i>	79	49%
<i>Technical or Agricultural cases</i>	54	33%

**TABLE 2 – SUMMARY STATISTICS FOR SELECTED INDEPENDENT VARIABLES**

(ALL VALUES IN MILLIONS OF US DOLLARS, EXCEPT FOR DEMOCRATIC INDEXES)

SERIES	MEAN ( $\mu$ )	MEDIAN	MAXIMUM	MINIMUM	STANDARD DEVIATION ( $\sigma$ )
$T_n$	0.15	0.09	0.88	0.00019	0.17
$M_n$	0.72	0.43	8.4	0	1
$D_n$ ( <i>disputant</i> )	1.66	1.2	7	1	1.15
$D_n$ ( <i>target</i> )	1.89	1.2	6	1	1.11
$Y_n$	21931.9	26517	44987.6	380.07	11453.1

**TABLE 3 – REGRESSION OUTPUT (STANDARD CASE)***Dependent variable: Dummy variable ( $P_n$ ): 1 if DSP established, 0 otherwise*

Model Number	(1)	(2)	(3)	(4)	(5)
Observations	162	162	162	162	162
Countries	48	48	48	48	48
<i>Constant</i>	0.31 (5.20)	0.34 (5.27)	0.32 (3.89)	0.29 (2.58)	0.31 (5.20)
$T_n$	0.51 (2.41)	0.53 (2.45)	0.52 (2.46)	0.65 (3.11)	0.54 (2.55)
$M_n$	-0.07 (-2.78)		-0.08 (-3.14)	-0.06 (-2.55)	-0.07 (-2.74)
$C_n$	0.03 (0.40)	0.04 (0.46)	0.02 (0.30)	0.04 (0.47)	0.03 (0.43)
$Mil_c/Mil_t$		-0.06 (-2.74)			
$Y_n$					-0.001 (-0.50)
$EU_n$			-0.06 (-0.79)		
$US_n$			0.04 (0.56)		
$D_n$ (disputant)				0.04 (1.25)	
$D_n$ (target)				-0.03 (-0.89)	
$R^2$	0.04	0.04	0.04	0.05	0.04

Note: White-corrected  $t$ -statistics given in parentheses. All regressions are OLS estimates of a linear probability model.

**TABLE 4** – REGRESSION OUTPUT (NON-STANDARD CASE)*Dependent variable: Dummy variable ( $P_n$ ): 1 if DSP established, 0 otherwise*

Model Number	(1)	(2)
Observations	162	162
Countries	48	48
<i>Constant</i>	0.28 (2.72)	0.32 (3.01)
$T_n$	0.53 (2.45)	0.66 (3.09)
$M_n$	-0.07 (-2.72)	-0.06 (-2.34)
$C_n$	0.05 (0.56)	0.02 (0.22)
$Y_n$ ( <i>disputant</i> )		$-4.64 \times 10^{-6}$ (-1.27)
$Y_n$ ( <i>target</i> )		$3.95 \times 10^{-6}$ (1.34)
$D_n$ ( <i>average</i> )	0.01 (0.21)	
$R^2$	0.04	0.06

Note: White-corrected  $t$ -statistics given in parentheses. All regressions are OLS estimates of a linear probability model.

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