

Why Democracies Cooperate More:
Electoral Control and International Trade Agreements.

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Introduction

Over the past fifty years, barriers to international trade have decreased substantially. While the decline in protectionism since World War II has stemmed partly from unilateral changes in trade policy by countries, it also has been an outgrowth of agreements among countries to liberalize commerce. The purpose of this paper is to analyze the conditions under which states have concluded such agreements and, more generally, to explore the factors affecting interstate economic cooperation. Here, we argue that the prospect of states cooperating on commercial issues depends heavily on their political regime types: as states become more democratic, they are increasingly likely to conclude trade agreements.

Our focus differs from most of the existing literature on economic cooperation. Many studies have attributed variations in cooperation to international factors, especially the global distribution of capabilities (e.g., Krasner 1976; Milner 1992). Some effort also has been made to link these variations to institutional differences among democracies (e.g., Milner 1997; Reinhardt 1996). However, there is a remarkable dearth of research addressing whether differences across regime types influence patterns of economic cooperation. Furthermore, the few studies that have been conducted on this topic pertain only indirectly to international trade agreements (Remmer 1998; Verdier 1998).¹ We seek to fill this important gap in the literature by conducting one of the first studies that directly examines the effects of regime type on the establishment of commercial agreements.

¹ Comparative economic studies have investigated the effect of regime type on economic outcomes (e.g. Barro (1999) on growth, Rodrik (1999) on wages or Persson et al (1999) on government size and tax rates).

Our analysis emphasizes how international cooperation in trade is affected by the control that voters exert over political leaders, a factor that varies starkly between democracies and autocracies. Fundamental to all democracies is the regular occurrence of fair and competitive elections (Dahl 1971, 1-5; Schumpeter 1976, 269). As Schumpeter (1976) points out, such elections vest the public with control over government leaders that is absent in nondemocratic polities. Free and fair elections have the greatest influence on the behavior of democratic leaders if voters care about the policy choices made by leaders. Of course, voters do not display much interest in many policy issues, but economic policy and performance are typically of great concern (e.g., Fiorina 1981; Kiewiet 1983; Lewis-Beck 1988).² Voters also seem to care about foreign policy, which recent research has shown to be influenced in important ways by electoral constraints (Buono de Mesquita and Siverson 1995; Fearon 1994). Hence, there is ample reason to expect that, in democracies, trade policy will be affected by electoral constraints. By contrast, elections occurring in an autocratic regime are not free and fair, so they vest the populace with little control over public officials and place few (if any) constraints on the autocrat's foreign economic policy.

Elections, however, are not the only domestic constraints faced by leaders. Regardless of a state's regime type, all political leaders must satisfy certain influential domestic groups, some of whom may have an interest in commercial protection. Political leaders, especially if motivated by rent-seeking, may therefore keep various trade barriers in place (Grossman and Helpman 1994).

² . A number of formal models demonstrate how and why such electoral control might operate. See, for example, Barro 1973; Ferejohn 1986; Fearon 1997.

In any political regime, then, leaders may be torn between policies that enhance their electoral prospects and those that meet the demands of special interest groups.

In what follows, we model the optimal foreign economic strategy of political leaders operating in different regime types when such leaders must set trade policy unilaterally and when they can set it cooperatively. We make two claims. First, the more important elections are for deciding the fate of governments, the lower are the levels of trade barriers that governments will adopt unilaterally. This follows directly from the effect that elections have in holding the government accountable to society at large. Second, and of greater significance, as the fate of a government becomes more dependent on elections, it becomes increasingly willing to cooperate with other countries on commercial issues. Hence, the probability of a country concluding an international trade agreement rises as its domestic institutions grow more democratic.

These results arise because of the information that commercial agreements convey to voters. We show that trade agreements can enhance the welfare of both voters and leaders. Voters prefer lower trade barriers but cannot directly control trade policy. Since trade barriers create rents for interest groups, government office-holders may seek to raise barriers to extract these rents. Voters can threaten to remove the incumbent if the government's rent-seeking becomes excessive, but they face an informational problem. Voters cannot distinguish between adverse economic shocks and the extractive policies of their leaders. In a democracy, voters may, as a result of this informational problem, remove a leader from office during economic downturns, even if that leader has not been engaged in excessive rent-seeking.

Leaders therefore would like to find a way to indicate credibly to voters that poor economic performance is not the result of predation. One way to do so is by entering into a trade agreement with another country. An agreement is both a commitment to a less protectionist policy and a device to convey credibly to the voters that a less protectionist policy has been adopted. In comparison, autocrats have less reason to worry about reelection, and hence less need to solve this informational problem by concluding commercial agreements. International cooperation can thus help democratic leaders increase their chances of reelection, thereby providing a reason for them to pursue such agreements.

Since our model demonstrates that leaders have greater incentives to conclude trade agreements as elections grow in importance, we expect the probability of signing an agreement to rise as countries become increasingly democratic. To test this hypothesis, we examine whether the regime types of states have influenced their propensity to form and expand preferential trading arrangements (PTAs) during the period since World War II. Consistent with our model, we find that democratic countries are about twice as likely to form a PTA as autocratic countries, and that pairs of democracies are roughly four times as likely to do so as autocratic pairs. These results provide strong evidence that democracies are more commercially cooperative than other countries.

The Model

At the outset, we present a formal model that derives three central propositions. We begin by specifying the nature of the underlying economy, the structure of the polity, and the nature of the international bargaining environment. Then we compare two international situations. The first is characterized by a unilateral trade barrier setting game in which countries

are unable to cooperate, and the second is a game where countries may be able to cooperate over time in setting their trade barriers.

The Economy

Consider two countries that are identical, except for their regime type and their endowments. We refer to one country as “home” and the other as “foreign.” Each country produces and consumes three goods labeled x , m , and z . Consumers’ utility in any period is assumed to be additively separable: $U(x, m) = u(x) + u(m) + z$, where z is the numeraire good, and the units are chosen such that the price of a unit of z is 1. We assume that home’s endowment of x is given as $\mathbf{a} > \frac{1}{2}$ while foreign’s endowment of x is $1 - \mathbf{a}$. World output is therefore fixed at unity for each good. Similarly, home's endowment of m is $1 - \mathbf{a}$, while foreign's endowment is \mathbf{a} . Since preferences are identical, home will export good x and will import good m .

Each country has a single policy instrument at its disposal; it can set trade barriers on its imported good. Home can apply the specific tariff t on the imports of good m .³ If the price abroad of good m is p_m , then the local price is $p_m + t$ where t is home’s (nonprohibitive) trade barrier. Similarly, if the price of x at home is p_x , then the price of x abroad is $p_x + \mathbf{t}$ where \mathbf{t} is the (nonprohibitive) trade barrier level applied by foreign.

Utility maximization yields the demand functions: $x = u'^{-1}(p_x)$ and $x^* = u'^{-1}(p_x + \mathbf{t})$, $m = u'^{-1}(p_m + t)$ and $m^* = u'^{-1}(p_m)$. Market clearing implies that local and foreign demand must sum to unity for each good: $u'^{-1}(p_x) + u'^{-1}(p_x + \mathbf{t}) = 1$ and $u'^{-1}(p_m + t) + u'^{-1}(p_m) = 1$. Solving for the equilibrium prices yields $p_m(t)$ and $p_x(\mathbf{t})$. It is evident that $\frac{\partial p_x(\mathbf{t})}{\partial \mathbf{t}} < 0$ and $\frac{\partial p_m(t)}{\partial t} < 0$, while $\frac{\partial(p_x(\mathbf{t}) + \mathbf{t})}{\partial \mathbf{t}} > 0$ and $\frac{\partial(p_m(t) + t)}{\partial t} > 0$.

³. In the model we use specific tariffs as our particular trade policy. But our theory is about any type of trade barrier. Since any trade barrier can be expressed in terms of an equivalent tariff, this seems reasonable.

Home's equilibrium consumption of good x and m can be expressed as $x(\mathbf{t}) = u'^{-1}(p_x(\mathbf{t}))$ and $m(\mathbf{t}) = u'^{-1}(p_m(\mathbf{t}) + t)$, with

$$x' > 0 \text{ and } m' < 0. \quad (1)$$

As foreign trade barriers rise, less is exported, lowering the domestic price and raising home's consumption of x . As home trade barriers rise, the local price rises, lowering domestic consumption of m . The level of (single-period) utility associated with the consumption of x and m for consumers is given by $U(x(\mathbf{t}), m(\mathbf{t}))$.

Lemma 1: $U_t < 0$, while $U_{\mathbf{t}} > 0$.

Consumers' utility declines with home trade barriers, t , which raise the domestic price of the imported good. However, higher trade barriers abroad, \mathbf{t} , mean that home's export firms are unable to sell as much of their good abroad, and this increases the supply of the export good at home. Hence, the home price of the export good falls when the foreign country applies trade barriers. Consumers benefit from decreases in home tariffs and increases in foreign ones. (The proof of this and the following results is in the appendix.)

Consumers' utility is derived from their consumption, financed by their ownership of the numeraire good z ; they derive no income from ownership of goods x and m . One might think of the owners of the x and m firms as of infinitesimal mass among the population. They will, of course, exercise political influence beyond their numbers via the rents they provide to the executive.

The Polity: Voters and the Executive

In each country, there are two agents: the voters who are consumers and the executive. Voters wish to maximize the discounted sum of their single period utilities, $\sum_{s=0}^{\infty} d^s q_s U(t_s, \mathbf{t}_s)$,

where t_s is the level of trade barriers chosen by the executive in period s , \mathbf{d} is the discount rate, and \mathbf{q}_s is an exogenous shock to the entire economy, which is identically and independently distributed (iid) each period over support $(0, \bar{\mathbf{q}})$. The utility of voters in any period is a function of both the level of trade barriers chosen and the magnitude of the economic shock. Let the (single-period) utility function of consumers after they experience the shock be:

$$V_s = \mathbf{q}_s U(t_s, \mathbf{t}_s). \quad (2)$$

The executive in our model extracts rents from interest groups in exchange for trade barriers that shield these groups from foreign economic competition.⁴ The rents, G , that the government obtains are an increasing function of home trade barriers (indicating increasing political support from the import-competing sector) and a decreasing function of the foreign country's trade barriers (indicating decreased support from home's export sector). That is, the government's one-period utility function is:

$$G(t, \mathbf{t}) = G_m(t) + G_x(\mathbf{t})$$

where $G_{mt} > 0$,⁵ and $G_{xt} < 0$.⁶ We assume that the executive wishes to maximize the sum of the discounted rents, $\sum_{s=0}^{\infty} \mathbf{d}^s G(t_s, \mathbf{t}_s)$.

The sequence of moves in our game is such that the executives choose trade policies and then the voters hold an election (in each country) in each period. This one-shot game (a policy followed by an election) is repeated *ad infinitum*.⁷

⁴ . Social or consumer welfare does not enter the government's objective function, making our claims harder to establish.

⁵ . Tariff revenue can either be thought of as accruing to the government, i.e. $G_m(t) = T(t) + g_m(t)$, where $g_m(t)$ are the rents paid by the domestic import-competing firms, or simply dissipated. The results are unaffected.

⁶ . This is a very general formulation of political behavior, broadly consistent with the central models of the political economy of tariff formation (e.g. Grossman and Helpman 1994; Mayer and Li 1994; Hillman 1982), in which political support rises with the welfare of organized lobbies.

⁷ . The owners of firms are assumed to be of infinitesimal mass; their vote is of no consequence. Instead, firms here exercise political influence via the exchange of rents for policy.

In any period, the executive's choice of a positive level of trade barriers will have two effects. It reduces the voters' utilities (by raising prices), but it redistributes income towards import-competing firms. These firms give a portion of the rents they derive from protection to the executive as either campaign contributions, lobbying expenditures, or as outright bribes. Hence, the executive uses trade barriers to extract rents from society at large. But leaders know that after setting commercial policy, voters choose whether or not to reelect them. Thus, their optimal policy choice in this period must reflect their expectations about the voters' behavior in the election that follows.

The Structure of Information

The executive must commit to a trade policy in each period before some exogenous shock to the economy occurs. Once the level of trade barriers is chosen and implemented, voters remain unaware of this level. They only observe the realized value of their aggregate welfare, V_s . They do not observe the magnitude of the shock (q_s) or the level of trade barriers chosen by the executive of either country (t_s or \mathbf{t}_s). As such, voters face a signal extraction problem: they do not know whether any reduction in welfare was caused by an exogenous shock to the economy or by excessive rent-seeking on the part of the executive. They can base their reelection decision only on the information available to them.

This implies that voters may reject executives for events that are beyond the executives' control. Executives may pick the optimal policies from the voters' point of view, but the economy may experience an adverse shock, thereby degrading voters' welfare and prompting them to reject the executive. The executive thus faces some prospect of being ousted from office in every electoral period.

The Election

An election is a determination by the voters about whether the executive should remain in office. All regime types have an election. What differs across regimes is the degree to which it affects the executive's fate. The more democratic a country is, the more important are elections in determining whether the incumbent leader retains office.

At the end of each period, consumers examine their pocketbooks (by observing V_s) and decide whether or not to reelect the chief executive. We model an election as a lottery in which the probability of winning is a function of the welfare of the electorate in the current period. Voters follow a simple rule: the higher is their current welfare, the greater is the probability that they vote for reelection in this period. That is, the probability of retaining the incumbent executive depends positively on consumers' shock-adjusted welfare; or, $\Pr(\text{reelection}_s) = F(V_s)$ with $F' > 0$.⁸ Suppressing the time subscript, we define the leader's expected probability of reelection to be a function of the choice of foreign and home tariff levels and the expected value of the exogenous shock:

$$\Phi(t, \mathbf{t}) = E_q \Pr(\text{reelection}) \quad (3)$$

where E is the expectations operator. Then, recalling equation (2), $\Phi_t > 0$ and $\Phi_t < 0$ since, from Lemma 1, $F' > 0$, $U_t > 0$, and $U_t < 0$.⁹

This means that, as tariffs at home rise, the incumbent's probability of reelection falls. As tariffs rise abroad, the home incumbent's probability of reelection increases. And since the voters are unable to distinguish between an executive who is highly extractive and an executive who attempts to promote social welfare but is unfortunate enough to hold office during an adverse shock to the economy, the executive may fail to win reelection even if she does not engage in excessive rent-seeking.

⁸ Alternatively, a model with probabilistic voting (Coughlin 1992) would yield a similar behavioral rule.

⁹ We will also assume that $h(t, \mathbf{t}) \leq \frac{G(t, \mathbf{t})}{-G_t(t, \mathbf{t})} U_t(t, \mathbf{t}) \forall (t, \mathbf{t})$ where $h(\cdot)$ is the hazard rate of $\Phi(\cdot)$.

Political Regime Type

In the voting stage, individuals participate in an election to decide whether the executive's tenure should be extended. If the outcome of this election is binding, the regime is a “pure democracy.” If, on the other hand, the executive retains office irrespective of the voters’ decision, the regime is a “pure autocracy.”

We allow a continuum of possibilities for the role of elections: the degree to which the election binds the executive ranges from low to high. That is, the actual probability that the executive keeps office is a weighted average of the probability in a pure democracy and the certainty of keeping office in a pure autocracy. Thus, the actual probability of keeping office in any period s is:

$$\sigma \Pr(\text{reelection}_s) + (1 - \sigma)$$

where $\sigma \in [0, 1]$.

The variable, σ , indicates a country’s regime type and takes on higher values in more democratic polities. In a pure democracy, $\sigma = 1$. Only the choice made by voting public determines whether a leader retains office. In a pure autocracy, by contrast, $\sigma = 0$. The incumbent executive keeps office irrespective of the electorate’s sentiments. Let any type of leader’s probability of reelection be a function of the degree of democracy present and the shock-adjusted value of the consumers’ current welfare, or let $p(t, \mathbf{t}, \mathbf{q}, \sigma) = \sigma \Pr(\text{reelection}) + (1 - \sigma)$. Then, recalling equation (3), we have the leader’s expectation of reelection, or $E_q p(t, \mathbf{t}, \mathbf{q}, \sigma) = \sigma \Phi(t, \mathbf{t}) + (1 - \sigma)$.

The Executive’s Optimal Level of Trade Barriers

In a “noncooperative” international trading system, each country picks its own trade policies without being able to coordinate with other countries. Each executive will choose a level

of trade barriers that balances the threat of rejection at the polls with the gains from rent-seeking, taking the behavior of the foreign country as given.

In any period, s , once the executive has chosen the level of trade barriers, t_s , (and the foreign government has chosen \mathbf{t}_s) she accrues $G(t_s, \mathbf{t}_s)$. Then the value to the executive of choosing barriers, t_s , in s is:

$$\Gamma_s = G(t_s, \mathbf{t}_s) + dE[p(t_s, \mathbf{t}_s, \mathbf{q}_s, \mathbf{s})\Gamma_{s+1}]. \quad (4)$$

The executive makes her choice of the current period's tariff, t_s , taking the future play of the game as given. The decision taken today affects today's level of rent-seeking and the probability of reelection, but does not affect the level of extraction undertaken tomorrow (because the shocks are iid). We can then suppress the time subscripts where they are obvious from the context.

Maximization takes place each period; the executive solves:

$$\frac{\partial \Gamma_s}{\partial t} = G_t + d\mathbf{s}\Phi_t \Gamma_{s+1} = 0 \quad (5)$$

for the optimal t in any period. From equation (4) we have, in equilibrium:

$$\Gamma_{s+1} = \frac{G(t, \mathbf{t})}{1 - d(\mathbf{s}\Phi(t, \mathbf{t}) + (1 - \mathbf{s}))} \quad (6)$$

Substituting equation (6) into equation (5), we have that the optimal tariff for the executive, $t^N(\mathbf{s})$, satisfies:

$$G_t(1 - d(\mathbf{s}\Phi + (1 - \mathbf{s}))) + d\mathbf{s}\Phi_t G = 0.$$

The separability of the both the executive's and the voter's objective functions in the two trade barriers means that home's and foreign's best responses are not functions of the other's trade barriers. Instead, their best responses are dominant strategies. The Nash equilibrium to the tariff setting game is therefore the pair $(t^N(\mathbf{s}), t^N(\mathbf{s}^*))$, where $t^N(\mathbf{s}^*)$ satisfies

$G_t^*(1 - \mathbf{d}(\mathbf{s}^* \Phi^* + (1 - \mathbf{s}^*))) + \mathbf{d}\mathbf{s}^* \Phi_t^* G^* = 0$ for the foreign country and $t^N(\mathbf{s})$ as above for the home country.

Unilateral Trade Policy

In the “noncooperative” version of this game, each country sets its own trade barriers taking the other country’s barriers as given. What happens to the executive’s Nash equilibrium level of trade barriers as her own country becomes more democratic (i.e., as elections become more significant)? We show that as the degree of democracy rises, the home executive will prefer lower trade barriers. That is, heightened democracy leads to greater unilateral trade liberalization.

Lemma 2: *Greater democracy leads to more unilateral liberalization, i.e. $\frac{dt^N}{d\mathbf{s}} < 0$.*

As the home country becomes more democratic (i.e., as σ rises), the home executive’s optimal level of trade barriers falls (i.e., t^N decreases).

Elections and Unfair Punishment of the Executive

In equilibrium, the expected probability (in any future period) that the executive is not returned to office is $1 - (\mathbf{s}\Phi(t^N, \mathbf{t}^N) + (1 - \mathbf{s}))$. That is, in any period there is a nontrivial probability that the executive, even if she is behaving optimally with respect to consumers, finds herself rejected from office by the voters. The present discounted value of the executive’s income stream from imposing trade barriers is:

$$\Gamma(t^N(\mathbf{s}), \mathbf{t}^N(\mathbf{s}^*)) = \frac{G(t^N(\mathbf{s}), \mathbf{t}^N(\mathbf{s}^*))}{1 - \mathbf{d}(\mathbf{s}\Phi(t^N(\mathbf{s}), \mathbf{t}^N(\mathbf{s}^*)) + (1 - \mathbf{s}))}$$

Notice that the denominator’s discount factor, \mathbf{d} , is effectively reduced by the probability of reelection, i.e., by $\mathbf{s}\Phi(t^N, \mathbf{t}^N) + (1 - \mathbf{s})$. It has been suggested that a key distinction between democracies and autocracies is that democratic leaders are less patient (i.e., have a lower discount

factors) and are only concerned about the next election, whereas autocratic leaders have a longer time horizon (e.g., Haggard and Kaufman: 1995: 152). Our model formalizes this intuition by incorporating the role of elections into leaders' decision-making. If the election is substantively important, the effect of the election is, in equilibrium, to lower the discount factor that leaders use to calculate their future (expected) stream of rents. The leader's effective discount rate is shown to be lower the more democratic is a state.

Cooperation and Trade Agreements

Having described the “noncooperative” version of this game, we now turn to examine whether leaders and voters can be made better off in a “cooperative” game where countries can negotiate over their trade barriers. First we describe the conditions under which such cooperation can be sustained. Then we show how the utility of leaders and voters is affected by such trade agreements, and how regime type affects this.

In this game leaders can make reciprocal concessions with other countries to lower trade barriers. A trade agreement has the following characteristics. First, it reduces trade barriers among participants and it stipulates the how high these barriers are permitted to be. Second, a commercial agreement is public and therefore provides information that voters can use to more closely monitor the executive. In particular, monitors of the trade agreement (such as an independent agency like the World Trade Organization [WTO] or even the participating governments themselves) can announce, just before each election, whether the executive in each country is in compliance with the agreement.¹⁰

¹⁰ . The WTO does indeed issue such reports on all member countries periodically. Its publicly-issued Trade Policy Reviews of member countries are an important aspect of monitoring.

By making an agreement then, the executive trades some of her policy-setting discretion for the greater certainty that she will never be rejected (unfairly) from office. The trade agreement acts like an alarm that sounds whenever a country raises its trade barriers beyond the negotiated level. If voters hear this alarm then they can discipline the executive in the upcoming election. Interestingly, the executive (who is the potential violator) likes the alarm too because with it, there is much less chance of being (mistakenly) punished by voters when no rules were broken. As for the voters, lower tariffs at home are always preferred. While lower tariffs abroad actually worsen voter welfare at home, *ceteris paribus*, we can always find a pair of tariffs no larger than the non-cooperative pair that yields utility to the voters that is at least as good as under the non-cooperation. The agreement thus benefits both executives and voters.

We formalize this intuition in the following way. Assume that two countries have the option to cooperate and make a trade agreement that lowers barriers for each. What are the gains for the voters and executives in both countries from an agreement that commits each executive to a cooperative level of trade barriers (t^C, t^C) , which are lower than the Nash noncooperative level of trade barriers, $t^N(\mathbf{s})$ and $t^N(\mathbf{s}^*)$?

First, we must ask whether the executive benefits from such an agreement. It might seem that she would not. After all, without the agreement, she can extract rents from her domestic constituents up to the Nash level of trade barriers. Why would she ever relinquish this ability to earn rents? We show that she will do so because it can increase her probability of retaining office.

If the home executive sets barriers at or below the negotiated level, $t \leq t^C$, then the players or institutions monitoring the trade agreement inform the voters that the executive has complied. If, however, the executive raises barriers above the negotiated level, $t > t^C$, the institution sounds the violation alarm. The voters now adopt a new voting rule: they reelect the executive if she is in compliance with the agreement and they reject her if a violation is identified. We assume that information about whether the executive has violated the commercial agreement

is conveyed to voters accurately. Hence, the new voting rule renders the voters' strategy conditional on the executive complying with the trade barriers specified in the agreement.

The executive can comply with the agreement and be re-elected for sure and earn in present-discounted terms: $\frac{1}{1-d} G(t^C, t^C)$; the executive can sign the agreement, defect in any

period, and play non-cooperatively thereafter, earning

$G(t^N(\mathbf{s}), t^C) + \frac{dG(t^N(\mathbf{s}), t^N(\mathbf{s}^*))}{1-d(\mathbf{s}\Phi(t^N(\mathbf{s}), t^N(\mathbf{s}^*)) + (1-\mathbf{s}))}$; or the executive can earn

$\frac{G(t^N(\mathbf{s}), t^N(\mathbf{s}^*))}{1-d(\mathbf{s}\Phi(t^N(\mathbf{s}), t^N(\mathbf{s}^*)) + (1-\mathbf{s}))}$ from refusing to sign the agreement at all.¹¹

The value of cooperation over non-cooperation is

$$\Delta_1(t^C, t^C, \mathbf{s}, \mathbf{s}^*) = \frac{1}{1-d} G(t^C, t^C) - \frac{G(t^N(\mathbf{s}), t^N(\mathbf{s}^*))}{1-d\mathbf{s}\Phi(t^N(\mathbf{s}), t^N(\mathbf{s}^*)) + (1-\mathbf{s})}.$$

If this difference is positive, the executive gains more from cooperating than she does from maintaining high trade barriers over the long run. However, there may be benefits from defecting from an agreement, which we can write as

$$\Delta_2(t^C, t^C, \mathbf{s}) = G(t^N(\mathbf{s}), t^C) - G(t^C, t^C).$$

A grim trigger strategy will support cooperative behavior by the executive whenever

$$\Delta_1(t^C, t^C, \mathbf{s}, \mathbf{s}^*) > \Delta_2(t^C, t^C, \mathbf{s}). \quad (7)$$

We show (below) that for any regime type at home and abroad and for any discount factor, there is a pair of cooperative tariffs lower than the Nash tariffs such that this no-defect condition (equation 7) is satisfied.

¹¹ We are using the standard grim trigger approach here: if an executive defects in any period, reversion to the non-cooperative Nash action in every period occurs. Notice that the separability of the executive's objective function establishes that the optimal defection in any period in the face of cooperation abroad is the same as the Nash action. Notice too that it is always better to sign and defect than simply never to sign.

PROPOSITION 1: *For any regime type at home and abroad, there exists an international trade agreement that is at least as good as the non-cooperative game to the voters and satisfies equation (7). That is for any $\mathbf{s}, \mathbf{s}^*, \mathbf{d} \in (0, 1)$, there exists a pair $(t^c, \mathbf{t}^c) \in [0, t^N(\mathbf{s})] \times [0, t^N(\mathbf{s}^*)]$ such that $\Delta_1(t^c, \mathbf{t}^c, \mathbf{s}, \mathbf{s}^*) > \Delta_2(t^c, \mathbf{t}^c, \mathbf{s})$ and $U(t^c, \mathbf{t}^c) \geq U(t^N(\mathbf{s}), \mathbf{t}^N(\mathbf{s}^*))$.*

In a world where voters cannot distinguish between a reduction in welfare stemming from an adverse economic shock, on the one hand, and excessive government rent-seeking, on the other, executives and voters will both gain from international trade agreements that provide information about executive behavior. Hence, for any type of political regime (and any discount factor), cooperation is Pareto optimal for both the executives and the voters.

Moreover, we can further show that the incentive to defect falls relative to the gains from cooperation as the regime becomes more democratic. That is, an increase in democracy makes executives more likely to seek such international trade agreements. If we define $\Delta(t^c, \mathbf{t}^c, \mathbf{s}, \mathbf{s}^*) = \Delta_1(t^c, \mathbf{t}^c, \mathbf{s}, \mathbf{s}^*) - \Delta_2(t^c, \mathbf{t}^c, \mathbf{s})$ then proposition 2 establishes that this difference, Δ , rises with the level of democracy (at home).

PROPOSITION 2: *Given any cooperative pair of trade barriers, the gains for the home executive from cooperation increase with the degree of democracy at home. That is,*

$$\frac{d}{d\mathbf{s}} \Delta(t^c, \mathbf{t}^c, \mathbf{s}, \mathbf{s}^*) > 0.$$

Thus, we have our central result: the gains to a leader from signing a trade agreement rise as countries grow increasingly democratic. As such, the more democratic the polity, the greater is the likelihood that the country is a signatory to a trade agreement. Furthermore, as a country becomes more democratic, under the noncooperative Nash equilibrium, the executive is able to extract less and suffers a higher risk of removal from office. Under the trade agreement, the executive extracts less still, but now there is no risk of removal from office. Hence, the more

democratic a country, the more acute this trade-off for the executive becomes, and the more useful the agreement becomes to lock in the gains from elective office.

It Takes Two to Tango: How does Regime Type at Home affect the Foreign Country's Willingness to Cooperate?

For any agreement to be signed, both countries must gain. How do both countries' gains change when the home country becomes more democratic? From the preceding proposition (proposition 2), we know that the home executive's gains from cooperation (relative to the gains from defection) rise due to any increase in democracy at home. The home government becomes more willing to cooperate.

What happens to the foreign executive's gains as home becomes more democratic? We know that home grows increasingly inclined to unilaterally liberalize (by Lemma 2). Hence, the foreign executive has less to gain from cooperating. The executive must give up her higher trade barriers for only a small reduction from the home country, which will have already significantly liberalized of its own accord. So home's willingness to sign an agreement has risen, while the foreign country's has fallen. What is the overall effect on the gains from cooperating for both players when home becomes more democratic?

Let us assume that the likelihood of an agreement is an increasing function of the sum of the gains from cooperation in each country, i.e. $L = L(\Delta(t^c, t^c, \mathbf{s}, \mathbf{s}^*) + \Delta^*(t^c, t^c, \mathbf{s}, \mathbf{s}^*))$, with $L' > 0$. Then for discount factors that lie above a certain point, \bar{d} , an increase in the home executive's willingness to sign an agreement will outweigh the reduction in the foreign government's willingness, so that the likelihood of the international agreement rises when home becomes more democratic. This allows us to show that the home executive's gains from cooperation rise overall with an increase in democracy at home and abroad. But this is only true when the discount factor is high enough.

PROPOSITION 3: *For a high enough discount rate ($\mathbf{d} \geq \bar{\mathbf{d}}$), the likelihood of agreement rises as either country becomes more democratic. That is, for any cooperative agreement (t^C, \mathbf{t}^C) ,*

$$\frac{\partial}{\partial \mathbf{s}} L(\Delta(t^C, \mathbf{t}^C, \mathbf{s}, \mathbf{s}^*) + \Delta^*(t^C, \mathbf{t}^C, \mathbf{s}, \mathbf{s}^*)) > 0 \text{ and}$$

$$\frac{\partial}{\partial \mathbf{s}^*} L(\Delta(t^C, \mathbf{t}^C, \mathbf{s}, \mathbf{s}^*) + \Delta^*(t^C, \mathbf{t}^C, \mathbf{s}, \mathbf{s}^*)) > 0.$$

Thus, given any pair of cooperative trade barrier levels, the effect of an increase in democracy in either country will raise the likelihood of cooperation. This implies that the more democratic a country is, the greater the likelihood that it will sign trade agreements, and the greater the likelihood that others will sign as well. The probability that countries are party to a trade agreement is increasing in both of their levels of democracy. Thus an increase in democracy on the part of either country is expected to have the same positive impact on the probability of signing a trade agreement.

The Empirical Evidence

The preceding analysis generates the proposition that a country is increasingly likely to conclude a cooperative trade agreement as it becomes more democratic. This analysis also indicates that the probability of two countries signing such an agreement is greatest if both of them are democratic and is lowest if both are autocratic. In the remainder of this paper, we conduct some preliminary statistical tests of these propositions.

To this end, we focus on explaining agreements that establish or expand PTAs, a group of institutions that includes customs unions, common markets, free trade areas, and other commercial agreements. Central to all such arrangements are reductions in reciprocal trade

barriers among participants. In fact, Article XXIV of the General Agreement on Tariffs and Trade (GATT) stipulates that any PTA notified to this body must largely abolish barriers to commerce within the preferential grouping (Anderson and Blackhurst 1993; Bhagwati 1993, 27; de Melo and Panagariya 1993). Besides liberalizing trade among members, most of the empirical research on recent PTAs indicates that they have yielded more trade creation than trade diversion, strongly suggesting that these institutions have promoted members' economic welfare (Krueger 1999, 120-21).

Since our model addresses the effects of regime type on the decision to enter agreements that liberalize commerce between participants, we test it by analyzing the formation and expansion of PTAs. Agreements to form or expand trade cooperation among selected states do not constitute the entire universe of trade agreements to which this model could be applied. However, PTAs comprise a substantial portion of the commercial agreements concluded since World War II – which is the period analyzed here. Furthermore, comprehensive data on other such agreements are not available for many countries included in our sample.

Our empirical analysis centers on estimating the following model of PTA formation:

$$\begin{aligned}
 PTA_{ij} = & \beta_0 + \beta_1 REG_i + \beta_2 REG_j + \beta_3 GDP_i + \beta_4 GDP_j + \beta_5 \Delta GDP_i + \beta_6 \Delta GDP_j \\
 & + \beta_7 TRADE_{ij} + \beta_8 DISPUTE_{ij} + \beta_9 COL_{ij} + \beta_{10} ALLY_{ij} + \beta_{11} DISTANCE_{ij} + \beta_{12} GATT_{ij} + \\
 & \beta_{13} HEGEMONY + e_{ij}.
 \end{aligned} \tag{8}$$

The dependent variable is the log of the odds that a pair of states, i and j , enters a PTA in year $s + 1$, where we observe 1 if this occurs and 0 otherwise. We code i and j as entering a PTA if they – either by themselves or in combination with other countries – form a new preferential arrangement

or if one state joins a PTA to which the other is already a member. The PTAs included in our analysis are drawn primarily from those notified to the GATT (World Trade Organization 1995); but they include other arrangements too, since there is no reason to believe that our model should apply only to commercial agreements concluded among parties to the GATT.¹²

To measure each state's regime type, we rely on a widely-used index constructed by Gurr et al. (1989) and Jagers and Gurr (1995). This index combines data on five factors that help to capture the institutional differences between democracies and autocracies emphasized above: the competitiveness of the process for selecting a country's chief executive, the openness of this process, the extent to which institutional constraints limit a chief executive's decision-making authority, the competitiveness of political participation within a country, and the degree to which binding rules govern political participation within it. Following Gurr et al. (1989) and Jagers and Gurr (1995), these data are used to create an 11-point index of each state's democratic characteristics (*DEMOC*) and an 11-point index of its autocratic characteristics (*AUTOC*). The difference between these indices, $REG = DEMOC - AUTOC$, yields a summary measure of regime

¹² . In addition to the PTAs listed by the WTO – which are limited to arrangements formed by its members and members of the GATT – we include the PTAs listed in Hartland-Thunberg (1980). We also include the Council on Mutual Economic Assistance (CMEA), the Southern African Customs Union, the Economic Community of West African States (ECOWAS), the Southern African Development Coordination Conference, and the Eastern and Southern African Preferential Trade Area, each of which has been as a PTA (for example, de Melo and Panagariya 1993; Foroutan 1993, 246-51; Hanlon 1986; Kisanga 1991; Orimalade and Ubogu 1984; and Pomfret 1988).

Each PTA is coded as starting in the year it enters into force. (Note that we do not consider agreements strengthening or superceding an existing PTA to be new preferential arrangements.) The original members of every PTA are coded as joining it in this year. A state that enters an existing PTA is coded as having formed a preferential arrangement with each member of the arrangement in the year of its accession. In a few cases, the year when a PTA enters into force or the year a state joins an existing PTA is not available. Then, we rely on the year when the negotiations leading to the arrangement's formation or expansion were completed. The GATT/WTO only lists PTAs whose members are parties to the GATT and only does so when these agreements are officially notified to it. Thus, for some PTAs, the date when states enter the preferential arrangement that is given by the WTO differs from the date furnished by the other sources listed above. In these cases, we use the earliest date. For a further explanation of how we code the formation of PTAs, see Mansfield (1998).

type that takes on values ranging from -10 for a highly autocratic state to 10 for a highly democratic country.

There are three principle reasons to rely on this measure in the following analysis. First, our formal model treats regime type as a continuous variable, with the competitiveness of elections ranging from perfectly competitive to completely uncompetitive. As noted above, the index developed by Jagers and Gurr is also continuous, unlike some other measures of regime type (e.g., Alvarez et al. 1996). Second, Jagers and Gurr's index emphasizes a number of institutional dimensions of regime type that we have stressed. The ability of voters to choose their chief executive – which is central to our model – is expected to rise as the process for selecting the executive becomes more competitive, that process becomes more open, and political participation becomes increasingly competitive. Jagers and Gurr's index captures each of these three institutional elements, whereas various alternative measures do not (e.g. Gastil 1980, 1990). Third, their index covers more countries during the period since World War II than any other measure of regime type with which we are familiar (e.g., Alvarez et al. 1996; Bollen 1980; Gasiorowski 1996; Gastil 1980, 1990).

In equation (8), REG_i is the value of Jagers and Gurr's measure for state i in year s , REG_j is the value of this measure for state j in s , and which state in each pair is i and which one is j is randomly determined. Recall that our model indicates that the probability of concluding a trade agreement rises as the participants become more democratic. Hence, we expect both β_1 and β_2 to be positive and no systematic difference to exist between them.

Besides states' regime types, other factors are likely to influence the formation of PTAs

and it is important to account for their effects as well. The size of a country's domestic market is one such factor. States having larger home markets tend to depend less on trade and therefore may have less reason to conclude agreements that expand their access to foreign markets than economically smaller states. To address this possibility, we include GDP_i and GDP_j in equation (8). These variables are the gross domestic products (GDPs) of states i and j in year s . Furthermore, economic conditions may affect the probability that countries sign trade agreements. Some observers, for example, have argued that downturns in the business cycle may stimulate the formation of cooperative agreements (e.g., Mattli 1999). As a result, we analyze the effects of ΔGDP_i and ΔGDP_j , which are the changes in the GDP of i and j from year $s - 1$ to s , and are used here as rough measures of the business cycle in each state.¹³

Various scholars have suggested that the amount of economic exchange conducted by a group of states affects the likelihood that they will establish a PTA. This may occur because rising economic intercourse within the group fosters the growth of coalitions that have an interest in developing institutional mechanisms to promote greater economic integration and to avert the breakdown of economic relations among the group's members (Nye 1988, 239). It may also occur if increasing trade flows heighten the susceptibility of private traders to opportunistic behavior by foreign governments, prompting firms to press for the establishment of PTAs to reduce the ability of governments to engage in such behavior (Yarbrough and Yarbrough 1992).

¹³ . Data on GDP and the change in GDP are taken from Summers and Heston (1991) and Maddison (1995). Note that while we measure the change in GDP from $s-1$ to s , we also estimated equation (8) after measuring both ΔGDP_i and ΔGDP_j from s to $s+1$. These two sets of results were very similar.

We therefore include $TRADE_{ij}$, which is the flow of exports from i to j in year s , in equation (8).¹⁴

The nature of political relations between i and j is also likely to affect their willingness to form a PTA. It is widely recognized, for example, that various countries have established trade agreements with their former colonies, partly to maintain political influence over colonial possessions once they become independent states (Grilli 1993; Pomfret 1988, 163). In addition, Cold War dynamics affected international economic relations during the period analyzed here and may have contributed to the establishment of PTAs since World War II. To control for such dynamics – and security relations, more generally – we analyze the effects of political-military alliances and military disputes on PTAs.

Countries may be more likely to enter PTAs with their allies than with other states. Trade liberalization yields efficiency gains that enhance the political-military capacity of participants and alliances help to internalize these security externalities (Gowa 1994). Since PTAs liberalize commerce among members, alliance politics may influence the likelihood that states will establish such an agreement. It is also important to take account of military disputes, the occurrence of which obviously might discourage participants from forming a commercial agreement. We therefore include $DISPUTE_{ij}$, COL_{ij} , and $ALLY_{ij}$. The first of these variables equals 1 if i and j are embroiled in a military dispute in s and 0 otherwise. The second variable equals 1 if i and j had a colonial relationship (ending after World War II) in s and 0 otherwise. The third variable equals 1

¹⁴ . Data on trade flows are taken from the International Monetary Fund's Direction of Trade (Washington, DC: International Monetary Fund, various years). Note that these data and those on GDP are expressed in U.S. dollars and in real terms; they are deflated using the United States wholesale price index and producer price index.

if i and j are allies in s and 0 otherwise.¹⁵

The geographical distance between states is another factor that is likely to influence whether they enter a PTA. One reason why states form PTAs is to guarantee and expand access to the markets of their key trade partners (Whalley 1998). Frequently, a country's primary commercial partners are located in relatively close proximity to it, since as the distance between states increases, so do transportation costs and various other impediments to commerce (Frankel, Stein, and Wei 1998). To account for the effects of geographical proximity on the establishment and expansion of commercial agreements, we include $DISTANCE_{ij}$ in equation (8).¹⁶ We mentioned earlier that many of the PTAs in our sample were formed under the auspices of the GATT. To analyze whether GATT members have been more likely to establish trade agreements than other states, we include $GATT_{ij}$. This variable equals 1 if both i and j are parties to the GATT in s and 0 otherwise.

The factors just described pertain to conditions within countries and relations between them, but systemic conditions may affect the formation of PTAs as well. Particularly important in this regard is the influence of hegemony. Since various studies have concluded that waning hegemony tends to stimulate the proliferation of PTAs (Bhagwati 1993; Gilpin 1987; Krugman 1993; Mansfield 1998), we analyze $HEGEMONY$, which is the percentage of global trade accounted for by the state that conducts the greatest amount of commerce in a given year.¹⁷

¹⁵ . Data on military disputes are taken from Jones, Bremer, and Singer (1996); those on former colonial relations are taken from Kurian (1992); and those on alliances are taken from Small and Singer (1969) and the Correlates of War Project (1993).

¹⁶ . Data on distance are taken from Oneal and Russett (1999).

¹⁷ . This measure of hegemony has been used repeatedly in studies of the international political economy

Finally e_{ij} is a stochastic error term.

Since comprehensive data on both PTAs and the independent variables described above are only available for the period after World War II, we focus on this era. More specifically, our sample includes all pairs of countries for which complete data on the variables in equation (8) are available for at least part of the period from 1951 to 1992.¹⁸ To estimate this model, we pool the available data across time and country-pairs and then conduct a logistic regression. Following Beck, Katz, and Tucker (Beck and Katz 1997; Beck and Tucker 1996), we account for any temporal dependence in the data by including a natural spline function (with three knots) of the number of years that have elapsed (as of year s) since each pair of states, i and j , last formed a PTA. To conserve space, however, we do not present the estimates of this function below.¹⁹ In addition, the tests of statistical significance reported below are based on Huber standard errors, which account for the grouped nature of the data (in the present case, by country pairs). Recent research indicates that they are superior to logit standard errors in time-series cross-section models with a binary dependent variable (Beck and Katz 1997; Beck and Tucker 1996).

The Statistical Results

(Krasner 1976; Lake 1988; Mansfield and Busch 1995; Mansfield 1998; McKeown 1991). Note that global trade is defined as the sum of total global exports and total global imports and that, for each year analyzed below, the United States is the state having the highest percentage of global trade. Data used to construct this variable are taken from the International Monetary Fund, International Financial Statistics (Washington, DC: International Monetary Fund, various years).

¹⁸ . Only those countries listed by Singer and Small (1994) as members of the international system are included in our sample.

¹⁹ . Note that the base of the spline function and each of the three knots are statistically significant in all of the following analyses.

Our results are reported in the first column of Table 1. Consistent with the propositions derived from our formal model, the estimates of REG_i and REG_j are both positive and statistically significant, indicating that the likelihood of a trade agreement rises as each state becomes more democratic. Moreover, the effects of regime type on the commercial cooperation do not vary between states i and j . Indeed, there is no statistically significant difference between the estimates of REG_i and REG_j ($\Pi^2 = 0.26$; $p = 0.61$).

Furthermore, the effects of regime type on PTA formation are quantitatively large, as well as statistically significant. Table 2 shows the predicted probability that a pair of states enters into a trade agreement with each other if both states are highly democratic (i.e., $REG_i = REG_j = 10$), if one is highly democratic and the other is highly autocratic (i.e., $REG_i = 10$ and $REG_j = -10$), and if both are highly autocratic (i.e., $REG_i = REG_j = -10$).²⁰ Since the modal pair of states in our sample is not involved in a military dispute, did not have a colonial relationship, and is not made up of either allies or parties to the GATT, we set $DISPUTE_{ij}$, COL_{ij} , $ALLY_{ij}$, and $GATT_{ij}$ equal to zero to compute these probabilities. The remaining variables in equation (8) are evaluated at their means. Clearly, the values in Table 2 are small, which is not surprising given the rarity of PTA formation. Nonetheless, these results indicate that, on average, the probability of a democracy entering a trade agreement is roughly double the probability of an autocracy doing so. Pairs of democracies are about twice as likely to form a PTA as pairs composed of a democracy and an autocracy. The latter pairs, in turn, are about twice as likely to engage in commercial cooperation

²⁰ . Note that in evaluating the probability of a PTA between a democracy and an autocracy, our decision to consider the case where state i is the democracy and state j is the autocracy is entirely arbitrary. The predicted probability under these conditions (which is .0028) is virtually identical to the predicted probability (which is .0027) when i is the autocracy and j is the democracy.

as autocratic pairs.

Turning to the remaining variables, there is evidence that the economic size of countries affects their propensity to enter PTAs. The estimates of GDP_i and GDP_j are negative and statistically significant, indicating that the likelihood of a country joining a commercial agreement increases as the size its home market declines. As expected, political relations between states also influence the likelihood that they will join a cooperative agreement. That the estimates of COL_{ij} , $ALLY_{ij}$, and $GATT_{ij}$ are positive and statistically significant indicates that states having had a prior colonial relationship, political-military allies, and parties to the GATT are especially likely to enter a PTA. Furthermore, trade agreements tend to form between states located in close proximity to each other and during periods of waning hegemony, since the estimates of $DISTANCE_{ij}$ and $HEGEMONY$ are negative and significant.

Equally noteworthy is that the business cycle, trade flows, and military disputes have relatively little influence on whether states join the same PTA. The positive estimates of ΔGDP_i and ΔGDP_j imply that economic expansion increases the prospects that states will accede to a commercial agreement, whereas the negative estimates of $TRADE_{ij}$ and $DISPUTE_{ij}$ suggest that heightened trade flows and military disputes discourage the establishment of PTAs. None of these estimates, however, is statistically significant.

In addition to estimating the effects of regime type on PTA formation, it is important to assess the robustness of our results. To this end, we begin by dropping ΔGDP_i , ΔGDP_j , $TRADE_{ij}$, and $DISPUTE_{ij}$ – the variables that are not statistically significant based on our initial findings. As shown in the second, third, and fourth columns of Table 1, doing so has little bearing on the

remaining estimates.

We also address whether our results depend on the use of Jagers and Gurr's (1995) index of regime type. As noted earlier, there are important reasons to rely on this measure, given our objectives. However, another measure of regime type that taps the domestic institutions emphasized in our model has been developed by Alvarez et al. (1996). They code states in which "some government offices are filled as a consequence of contested elections" as democratic and all other states as autocratic (Alvarez et al. 1996, 4). The data in Alvarez et al. cover fewer countries and years than are included in our initial analyses and their dichotomous measure is not as well suited to our model as is Jagers and Gurr's continuous index. But the stress they place on whether or not elections are contested in coding a state's regime type is consistent with our model.

To further assess the robustness of our results, we therefore redefine REG_i and REG_j as dummy variables that equal 1 if Alvarez et al. code states i and j , respectively, as democratic in year s and 0 otherwise. The parameters in equation (8) are then estimated again. Like the findings presented in Table 1, the estimates of both REG_i and REG_j are positive and statistically significant.²¹ Furthermore, there continues to be no evidence of a significant difference between these estimates. Equally important is that the quantitative effects of regime type generated using Alvarez et al.'s data are much the same as those generated using Jagers and Gurr's data. Based on Alvarez et al.'s measure of regime type, for example, a democracy is roughly three-quarters more likely to enter a PTA than an autocracy; and democratic pairs are about three times as likely

²¹ . More specifically, the estimate of REG_i is .509, the estimate of REG_j is .580, and both estimates are statistically significant at the .001 level.

to join a trade agreement as autocratic pairs. Thus, our findings are quite robust with respect to the data used to measure regime type.

Next, we include a number of additional factors in equation (8) that might influence the formation of PTAs. First, there is reason to expect pairs of states that belong to the same PTA to have less incentive to enter (another) one than pairs that are not already party to the same arrangement. We therefore include a variable indicating whether i and j are already members of a common PTA in s . Second, it is widely argued that, due to strategic interaction among countries competing in international markets and for other reasons, PTAs tend to form in reaction to one another (de Melo and Panagariya 1993, 5-6; Fernández 1997; Mansfield 1998; Oye 1992; Pomfret 1988). This implies that states are especially likely to establish a commercial agreement soon after the creation of other agreements. As such, we include in equation (8) the number of PTAs formed in a given year. In addition, we estimate equation (8) using conditional logistic regression – a technique that is equivalent to including pair-specific fixed effects in the model – to account for any heterogeneity in our data (Greene 1993, chap. 16). Regardless of whether we include the two variables just described separately or together and regardless of whether equation (8) is estimated using conditional logistic regression, the estimates of REG_i and REG_j remain positive and statistically significant.²² These findings continue to indicate the robustness of our earlier

²² . Note that estimating our model using conditional logistic regression (which is equivalent to including pair-specific fixed effects in the model) leads to the omission of roughly 85 percent of the observations in our data, since most country-pairs included in the analysis did not form a PTA during the period since World War II. Nonetheless, when equation (8) is estimated with pair-specific fixed effects, the estimate of REG_i is .028, the estimate of REG_j is .023, and both estimates are statistically significant at the .001 level. Of course, factors that are specific to time might also affect the formation of PTAs. A common way of addressing these factors is to include year-specific fixed effects, but these effects are perfectly correlated with *HEGEMONY*, which takes on a different value in each year we examine.

results.

Finally, it is clear that the formation of a PTA is a rare event. King and Zeng (1999) have recently argued that using logistic regression to estimate the probability of rare events can yield biased results. They have developed methods to correct such biases and we use these methods to generate another set of estimates of the parameters in equation (8). The resulting estimates and standard errors are very similar to those in Table 1, demonstrating that our earlier findings do not suffer from a rare events bias.²³

In sum, then, the results of our statistical analysis strongly support the propositions developed earlier. During the period since World War II, more democratic states have displayed a greater propensity to enter trade agreements than less democratic states, even after controlling for a host of other economic and political factors. Furthermore, the probability of a pair of countries forming a commercial agreement is highest if both countries are democratic and is lowest if both are autocratic.

Conclusion

We have argued that the regime types of states strongly affect their propensity to cooperate on economic issues. We developed this argument using a formal model of trade relations emphasizing the electoral constraints faced by political leaders. This model assumes that democratic and autocratic leaders both desire to maximize their rents from trade barriers, but that both may lose office if their rent-seeking becomes excessive. In democracies, however, voters

²³ . This result is not unexpected, since King and Zeng (1999, 23) point out that the influence of their methods will be most pronounced when the number of observations being analyzed is less than a few thousand. Our sample is obviously much larger than that size.

have greater impact on leaders than in autocracies, since the electorate can turn leaders out of office if they are too extractive.

The problem faced by voters and leaders is that voters cannot judge exactly what trade policy a leader has chosen. And domestic executives cannot credibly commit to accurately divulging this information. Hence, when exogenous shocks adversely influence the economy, executives may be voted out of office not because they were extractive, but rather because voters assume that they were engaged in predation. The prospect of losing elections due to factors that the incumbent executive cannot control vests her with a strong incentive to conclude trade agreements. Since autocratic leaders face weaker electoral constraints, they have fewer incentives to give up policy autonomy and sign trade agreements, making them less likely than more democratic countries to be involved in commercial cooperation. Surprisingly, this result holds even though democratic executives discount the future more heavily than their autocratic counterparts.

In our model, international agreements serve a domestic purpose. They allow executives to commit themselves credibly to actions that voters would otherwise find incredible. They convey information to the voters about the behavior of their leaders, thus allowing voters to better judge their leaders. The information provided by trade agreements benefits all of the players in our analysis: home and foreign voters, as well as executives in both countries. This is an aspect that few, if any, scholars have discussed concerning the role of international institutions. International cooperation and the institutions created to monitor it can thus generate domestic

benefits for leaders, making them more likely to seek such cooperative agreements in the first place.

Our empirical findings strongly support the two central hypotheses stemming from the formal model. Since World War II, more democratic countries have displayed a greater likelihood of concluding trade agreement than their less democratic counterparts, even when holding constant numerous other political and economic influences. In the same vein, pairs of democratic countries are about twice as likely to form a PTA as pairs composed of a democracy and an autocracy and roughly four times as likely to form such cooperative agreements as autocratic pairs. In sum, we find considerable evidence that democracy promotes commercial cooperation.

Our study also throws light on other hypotheses about international cooperation. First, functionalist theories argue that high levels of trade between countries should promote cooperation. But our data suggest that the magnitude of trade flows does not have much impact on the probability of signing a trade agreement, and what impact it does have is negative. Second, and rather surprisingly, being involved in a military dispute does not have much effect either. Third, various studies have concluded that involvement in international institutions can improve the ability of states to cooperate (e.g., Keohane 1984; Russett, Oneal, and Davis 1998). Our analysis shows that the GATT has done apparently done this. Fourth, our data support claims that international political factors affect cooperation. Alliances, a history of colonial relations and the waning of American hegemony all foster cooperation in trade. However, even when we control for all of these potential influences, domestic politics still matters for cooperation.

Scholars of international relations have displayed a longstanding interest in the sources of international economic cooperation. Most of the research on this topic has been cast at the international level. Less attention has been paid to the domestic influences on economic cooperation. Our results highlight the drawbacks of ignoring these influences. Besides systemic factors, the regime types of states strongly condition their likelihood of forging a trade agreement. In commercial matters, democracies are more cooperative than other states because of the domestic political benefits generated by cooperative agreements.

APPENDIX

Lemma 1: $U_t < 0$, while $U_t > 0$.

Proof: $U_t = u_{\mathbf{c}} \mathbf{c} < 0$ since marginal utility is positive and imports decline with the tariff (from equation 1) in the text. Similarly, $U_t = u_{\mathbf{c}} \mathbf{c} > 0$ since domestic consumption of the export good rises when foreign's tariff rises.

Lemma 2: More democracy leads to more unilateral liberalization, i.e. $\frac{dt^N}{ds} < 0$.

Proof: Equation (5) in the text, evaluated at the Nash Equilibrium (and dropping the time subscript) takes the form $\Gamma_t = G_t + \mathbf{d}\mathbf{s}\Phi_t\Gamma = 0$. Totally differentiating this first order condition we

have $d\Gamma_t = \frac{\partial}{\partial t}\Gamma_t dt + \frac{\partial}{\partial \mathbf{s}}\Gamma_t d\mathbf{s} + \frac{\partial}{\partial \mathbf{s}^*}\Gamma_t d\mathbf{s}^* = 0$. From the separability of the objective functions,

$\frac{\partial}{\partial \mathbf{s}^*}\Gamma_t = 0$. Hence rearranging, we have $\frac{dt}{d\mathbf{s}} = -\frac{\Gamma_{ts}}{\Gamma_{tt}}$. Partially differentiating equation (6) we have

$$\Gamma_s = \frac{-Gd(1-\Phi)}{(1-\mathbf{d}(\mathbf{s}\Phi + (1-\mathbf{s})))^2}. \quad (\text{A1})$$

Then $\Gamma_{ts} = \mathbf{d}\Phi_t \left(\frac{G}{1-\mathbf{d}(\mathbf{s}\Phi + (1-\mathbf{s}))} - \mathbf{s} \frac{Gd(1-\Phi)}{(1-\mathbf{d}(\mathbf{s}\Phi + (1-\mathbf{s})))^2} \right) = \frac{\Phi_t dG(1-\mathbf{d})}{(1-\mathbf{d}(\mathbf{s}\Phi + (1-\mathbf{s})))^2} < 0$ since

$\Phi_t < 0$ and $G > 0$ and $\mathbf{d}, \mathbf{s}, \Phi \in (0, 1)$. From the second order condition, $\Gamma_{tt} < 0$. Hence

$$\frac{dt}{d\mathbf{s}} = -\frac{\Gamma_{ts}}{\Gamma_{tt}} < 0.$$

PROPOSITION 1: For any $\mathbf{s}, \mathbf{s}^* \in (0, 1)$, there exists a pair $(t^C, t^C) \in [0, t^N(\mathbf{s})] \times [0, t^N(\mathbf{s}^*)]$ such that $\Delta(t^C, t^C, \mathbf{s}, \mathbf{s}^*) > 0$ and $U(t^C, t^C) \geq U(t^N(\mathbf{s}), t^N(\mathbf{s}^*))$.

Proof: By construction: For any σ, σ^* , consider the pair $(t^C, t^C) = (t^N(\mathbf{s}), t^N(\mathbf{s}^*))$. Clearly,

$$\Delta_1(t^N, t^N, \mathbf{s}, \mathbf{s}^*) = \frac{1}{1-\mathbf{d}} G(t^N(\mathbf{s}), t^N(\mathbf{s}^*)) - \frac{G(t^N(\mathbf{s}), t^N(\mathbf{s}^*))}{1-\mathbf{d}(\mathbf{s}\Phi(t^N(\mathbf{s}), t^N(\mathbf{s}^*)) + (1-\mathbf{s}))} > 0 \text{ and}$$

$\Delta_2(t^N, t^N, \mathbf{s}, \mathbf{s}^*) = 0$. Therefore $\Delta(t^C, t^C, \mathbf{s}, \mathbf{s}^*) > 0$. Also $U(t^C, t^C) \geq U(t^N(\mathbf{s}), t^N(\mathbf{s}^*))$. That is, for any regime, cooperation is Pareto optimal for both the executive and voters.

PROPOSITION 2: Given any cooperative pair of trade barriers, the gains for the home executive from cooperation increase with the level of democracy at home. That is,

$$\frac{d}{ds} \Delta(t^C, t^C, \mathbf{s}, \mathbf{s}^*) > 0.$$

Proof: $\frac{d}{ds} \Delta(t^c, t^c, \mathbf{s}, \mathbf{s}^*) \Big|_{(t^N(\mathbf{s}), t^N(\mathbf{s}^*))} = -\frac{\partial}{\partial \mathbf{s}} \Gamma$ by the envelope theorem. Then from equation

$$(A1), -\frac{\partial}{\partial \mathbf{s}} \Gamma = \frac{dG(1-\Phi)}{(1-d(\mathbf{s}\Phi + (1-\mathbf{s})))^2} > 0 \text{ since } \Phi \in (0,1).$$

Definition: Define $\bar{d} = \frac{-G_t^*}{\mathbf{s}^*(G^*\Phi_t^* - \Phi^*G_t^*) - G_t^*(1-\mathbf{s}^*)}$.

Lemma 3: $\bar{d} \in (0,1)$.

Proof: $G_t^* < 0$ from the definition of G , so the numerator is positive. In the denominator, $G^*\Phi_t^* - \Phi^*G_t^* > 0$ since $G^*, \Phi^* > 0$ by definition, $\Phi_t^* > 0$ since the probability of reelection rises with voters' utility and utility rises when the other country's tariff rises (Lemma 1). Finally, $G_t^* < 0$ since government rents decline with tariffs abroad. Then the denominator is positive, and $\bar{d} > 0$. A sufficient condition for $\bar{d} \leq 1$ is $h^*(t, \mathbf{t}) \leq \frac{G^*(t, \mathbf{t})}{-G_t^*(t, \mathbf{t})} U_t^*(t, \mathbf{t}) \forall (t, \mathbf{t})$ where $h^*(\cdot)$ is the

hazard rate of $\Phi^*(\cdot)$, $h^* = \frac{1-\Phi^*}{F^*}$.

PROPOSITION 3: For a high enough discount rate ($d > \bar{d}$), the likelihood of agreement rises as either country becomes more democratic. That is, for any cooperative agreement (t^c, t^c) , $\frac{\partial}{\partial \mathbf{s}} L(\Delta(t^c, t^c, \mathbf{s}, \mathbf{s}^*) + \Delta^*(t^c, t^c, \mathbf{s}, \mathbf{s}^*)) > 0$ and $\frac{\partial}{\partial \mathbf{s}^*} L(\Delta(t^c, t^c, \mathbf{s}, \mathbf{s}^*) + \Delta^*(t^c, t^c, \mathbf{s}, \mathbf{s}^*)) > 0$ for any $d > \bar{d}$.

Proof: $\frac{\partial}{\partial \mathbf{s}} L(\Delta(t^c, t^c, \mathbf{s}, \mathbf{s}^*) + \Delta^*(t^c, t^c, \mathbf{s}, \mathbf{s}^*)) = -L'(\Gamma_s + G_t t_s + \Gamma_s^*)$ by the envelope theorem.

Now

$$\Gamma_s + G_t t_s + \Gamma_s^* = \frac{-dG(1-\Phi)}{(1-d(\mathbf{s}\Phi + (1-\mathbf{s})))^2} + G_t t_s + t_s \frac{G_t^*(1-d(\mathbf{s}^*\Phi^* + (1-\mathbf{s}^*))) + G^* d \mathbf{s}^* \Phi_t^*}{(1-d(\mathbf{s}^*\Phi^* + (1-\mathbf{s}^*)))^2}.$$

The denominators are positive, as are the first two terms; a sufficient condition for the result is

$G_t^*(1-d(\mathbf{s}^*\Phi^* + (1-\mathbf{s}^*))) + G^* d \mathbf{s}^* \Phi_t^* > 0$. That is if $d > \frac{-G_t^*}{\mathbf{s}^*(G^*\Phi_t^* - \Phi^*G_t^*) - G_t^*(1-\mathbf{s}^*)} = \bar{d}$. The

proof with respect to σ^* is similar.

Table 1 — Effects on PTA Formation of Regime Type, GDP, the Change in GDP, Trade, Military Disputes, Colonial Relations, Alliances, Distance, the GATT, and Hegemony, 1951-1992.

<u>Variable</u>	<u>(1)</u>	<u>(2)</u>	<u>(3)</u>	<u>(4)</u>
Intercept	8.122** (12.99)	8.027** (12.75)	7.585** (13.15)	8.023** (12.72)
REG _i	0.038** (8.89)	0.038** (8.80)	0.035** (8.84)	0.038** (8.93)
REG _j	0.035** (8.47)	0.035** (8.40)	0.032** (8.15)	0.035** (8.51)
GDP _i	-4.84×10^{-10} ** (-3.29)	-3.29×10^{-10} ** (-3.47)	-7.75×10^{-10} ** (-4.26)	-4.89×10^{-10} ** (-3.34)
GDP _j	-3.84×10^{-10} * (-2.39)	-2.26×10^{-10} * (-2.16)	-6.94×10^{-10} ** (-4.17)	-3.88×10^{-10} * (-2.43)
ÄGDP _i	4.72×10^{-9} (1.28)		6.41×10^{-9} (1.55)	4.63×10^{-9} (1.26)
ÄGDP _j	4.85×10^{-9} (1.71)		6.88×10^{-9} * (2.04)	4.77×10^{-9} (1.69)
TRADE _{ij}	-1.21×10^{-7} (-1.53)	-1.23×10^{-7} (-1.56)		-1.18×10^{-7} (-1.52)
DISPUTE _{ij}	-0.740 (-1.91)	-0.734 (-1.89)	-0.620 (-1.64)	
COL _{ij}	1.338** (8.74)	1.327** (8.73)	1.356** (8.62)	1.324** (8.45)
ALLY _{ij}	0.665** (9.70)	0.663** (9.69)	0.645** (9.34)	0.673** (9.73)
DISTANCE _{ij}	-0.731** (-17.51)	-0.730** (-17.47)	-0.681** (-20.20)	-0.717** (-16.62)
GATT _{ij}	0.391**	0.389**	0.376**	0.396**

	(6.05)	(6.03)	(5.79)	(6.12)
HEGEMONY	-53.75** (-14.92)	-53.07** (-14.73)	-52.29** (-14.68)	-53.84** (-14.93)
χ^2	1915.28**	1906.12**	1866.84**	1911.48**
Log Likelihood	-7146.54	-7147.73	-7173.51	-7149.97

Note: These parameters are estimated using logistic regression, after including a natural spline function with three knots. Figures in parentheses are asymptotic z-statistics computed using Huber standard errors. In each model, $N = 223,568$.

** $p \leq .001$; * $p \leq .05$. Two-tailed tests are conducted for all estimates.

Table 2 – Predicted Probability of a PTA’s Formation, Based on the Estimates in Table 1.

<u>Regime Types of i and j</u>	<u>Predicted Probability of a PTA</u>
Two Democracies	.0057
One Democracy and One Autocracy	.0028
Two Autocracies	.0013

Note: To compute these predicted probabilities, we use the estimates in the first column of Table 1. We assume that i and j are not involved in a military dispute, do not have a prior colonial relationship, and are not allies or parties to the GATT (that is, $DISPUTE_{ij} = COL_{ij} = ALLY_{ij} = GATT_{ij} = 0$). All remaining variables are evaluated at their means.

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