

Reactions and Reciprocity

TARIFFS AND TRADE LIBERALIZATION FROM 1815 TO 1914

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If one country lowers its tariffs, other countries might follow suit by liberalizing or defend their market by raising tariffs or do nothing at all. The question of a state's reaction to the tariff policy of another has been undertheorized, although it plays an important, implicit role in debates between theories. To understand these reactions, the author proposes a model of trade policy and tariff reciprocity that encompasses variables from both the domestic and international levels of analysis in a way that is compatible with several different theories. Two major testable propositions follow from the analysis. First, two countries' tariffs will move in opposite directions without trade agreements. Second, two countries' tariffs will move in the same direction when they have signed a trade agreement. These hypotheses find substantial support in both quantitative and qualitative tests against the period from 1815 to 1914, when there was substantial variation in countries' willingness to sign reciprocal tariff agreements.

A state's reaction to the policy of another state is an important, implicit part of many theories. In trade policy, one state's liberalization may be reciprocated by another, or foreign exporters may take advantage of the expanded market without their nation offering anything in return. A coercive trade policy, such as Section 301 of U.S. trade law, may force other countries to open their markets or may lead to retaliation that effectively closes foreign markets. These trade policy questions parallel problems in other areas of international relations, such as whether a conciliatory foreign policy leads to international cooperation or acts as an inducement for foreign aggression.

Although they play an important role in many theories, few study these reactions directly. Instead, most research focuses on the systemic-level outcome, whether it be an open trade regime, a regional trading area, or a trade war. Such a focus overlooks the process through which the outcome occurs. In hegemonic stability theory, for instance, an open trade regime might stem from the leadership of a single state despite the free

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riding of others, or international openness might depend on cooperation by a group of states.

Different analytical perspectives yield a variety of implicit hypotheses on reactions. Liberals expect openness by one state to lead to openness by others, thanks to self-enforcing cooperation or international institutions (i.e., Axelrod 1984; Keohane 1984). A breakdown of cooperation would also mean that each state reacts in kind to the other, trading defection for defection. In contrast, mercantilists are likely to argue that powerful states use their market power to coerce other states to open their markets even while keeping their own market closed. A state imposing an optimal tariff will also induce openness from small countries (Conybeare 1987; Johnson 1953). Unilateral openness by one state merely leads to free riding by others (Lake 1988).

Some approaches largely ignore the reactions of one state to another. Those who examine the domestic political foundations of trade policy generally assume that each state chooses its tariff in a political vacuum, unaffected by the choices of others (see Baldwin 1985; Caves 1976; Hillman 1982; Magee, Brock, and Young 1989; Marvel and Ray 1987; Pincus 1975; Schonhardt-Bailey 1991a, 1991b; Wellisz and Wilson 1986). However, even in purely domestic theories, countries respond to international market conditions such as increased import penetration and global expansions or contractions of trade (Gourevitch 1986; Rogowski 1989). If similar states respond in similar ways to the same external change, two states' trade policies will be positively related, without any international cooperation explicitly linking them.

To clarify the problem of these reactions, the major goal of this study is to develop a theory that predicts whether two countries' trade policies will be positively correlated, negatively correlated, or unrelated. If international-level variables are important, then presumably some predictable relationship exists between two countries' policies. If we find little relationship between the policy in two different countries, then the "policy in a vacuum" focus of most domestic-level theories is the best foundation for further theory building.

I find that we should expect different kinds of reactions depending on whether two countries have signed a trade agreement. Where a trade agreement is in effect, the policy changes in the two countries will move in the same direction. The reasons for this are similar to those in the literature on international cooperation. Without a trade agreement, however, domestic politics leads to a negative relationship between two states' policies.

In addition to helping clarify the problem of reactions, the study of these trade agreements is substantively important. Although producer lobbying normally determines the general tariff of a country, the general tariff is rarely applicable. Most goods enter under a conventional tariff, established by commercial conventions and extended to a greater or lesser extent by most-favored-nation (MFN) clauses. Such agreements, and not unilateral tariff legislation determined by lobbyists and legislators, have dominated tariff policy in manufactured goods.¹

1. One important exception is when the executive's negotiations are constrained by the anticipated problems of ratification by the legislature. American steel policies in the General Agreement on Trade and Tariffs (GATT) Tokyo Round are a good example of the problems.

If the typical domestic-level theory were to explore commercial agreements, it would have to argue that consumers and exporters in two countries simultaneously demanded commercial agreements. This is an unsatisfactory solution. It is at odds with the explanation given for nonnegotiated tariffs, which claims that concentrated producer interests can obtain protection at the cost of diffuse consumers and exporters. Where concentrated consumers exist, such as steel consumers in the automobile industry, purely domestic-level theories must claim that these consumers lobby unsuccessfully for low tariffs but successfully for the reciprocal lowering of steel barriers.

As a result, understanding states' reactions to one another requires looking not only at domestic politics but at international-level concerns as well. The sources of trade agreements must be found in foreign policy makers, for they are the people who negotiate them. Yet, these foreign policy makers face important political constraints at home, so I also model domestic politics from the executive's standpoint. This allows us to examine the same decision maker at both levels of analysis because the executive must respond to both international concerns and domestic political pressures (cf. Putnam 1988; Evans, Jacobson, and Putnam 1993).

I shall present a domestic-level theory of tariffs in one country. I make two major simplifications. First, the model uses a reduced-form representation of the economy and of interest group lobbying decisions (as in Hillman 1982; Hillman, Van Long, and Moser 1995; cf. Baldwin and Lage 1971; Grossman and Helpman 1995; Mayer 1981). This also means that I abstract from domestic political institutions such as legislatures, assuming that the foreign economic policy maker faces a similar political support problem across different political systems. I also use a reduced-form model of producers' incomes, ignoring economic variables such as demand, supply, and price.

Then I extend the model to two countries, deriving the hypotheses on reactions that are central to the study. I test these hypotheses quantitatively against France in the period from 1870 to 1914 and then qualitatively against Britain in the period from 1815 to 1840. These historical cases provide variation in the presence or absence of trade agreements not found in the contemporary period.

DOMESTIC INSTITUTIONS, POLITICAL SUPPORT, AND THE TARIFF

This section presents a political support model of tariff making in a single country. The model's point of departure is the Stigler-Peltzman theory of political support (Stigler 1971; Peltzman 1976), which Arye L. Hillman (1982) first applied to tariffs. Political support models assume that a single policy maker in each country seeks to maximize political support, such as votes and campaign contributions. To do this, a politician redistributes income from exporters to import-competers (or vice versa) until the import-competers' marginal gratitude exceeds the exporters' marginal resentment. The major advantage of a political support model over lobbying and party politics models (i.e., Magee, Brock, and Young 1989) is its analytic simplicity. In a two-country model, a political support assumption also has the advantage of being fairly institution free, allowing for countries with different political systems.

Of course, such simplifications have a cost. A growing literature argues that domestic ratification institutions play an important role in trade policies (Bailey, Goldstein, and Weingast 1997; Lohmann and O'Halloran 1994; Milner and Rosendorff 1996, 1997; O'Halloran 1994). For instance, Milner and Rosendorff (1997) argue that differences between legislative and executive preferences play a critical role in explaining both tariffs (chosen by the legislature) and trade agreements (negotiated by the executive with foreigners, subject to ratification).

This kind of two-level theory is of limited usefulness across nations because countries vary widely in terms of whether their legislature and executive have systematically different preferences.² One branch of government often chooses the other. In a parliamentary system, for instance, the legislature chooses the executive, presumably selecting an executive with preferences near its own.³ In many dictatorships and monarchies, the executive chooses the legislature. Even when chosen independently, the legislature may lack ratification power, as in the French Second Empire. Finally, even when they do have ratification power, some legislatures have preferences such that they will ratify everything that the executive might negotiate. For these reasons, making any assumptions at all about the divergent preferences of an executive and legislature is likely to do violence to many cases and be irrelevant for many others.

Whatever the roles of the legislature and executive, most systems have some actor seeking to maximize political support at the national level. This actor could be a prime minister maximizing his party's seats in the legislature, a president seeking popular election and/or the support of public opinion, or a dictator trying to maintain backing for his position among many different groups. Consequently, I use the political support assumption as a first approximation to the domestic politics that lie behind the interacting trade policies of several countries. The evidence suggests that this assumption yields useful results.

A political support model also captures an important part of 19th-century political rhetoric. Because the model assumes that politicians equilibrate the marginal support from different groups, it implies that they balance the welfare of one group against the welfare of others. In the 19th century, many policy makers discussed trade policy in the language of balancing. A good example is the following statement of French Foreign Minister Jules Roche in 1891 (cited in Smith 1980, 212 fn):

For us, the words protection and free trade have no magical powers which allow us to dispense with the study of the facts themselves. . . . We have resigned ourselves in advance to attaining, in many cases, only compromise solutions, happy if we succeed . . . in holding a balance among the diverse interests for which we are responsible.

Interestingly, Roche was considered a free trader. His contemporary, German Chancellor Leo von Caprivi, had a similar view, stating that for him, commercial policy was

2. Existing theories of two-level games rely heavily on analogies with the U.S. case. A theory that does not closely follow contemporary American institutions is useful for the 19th century, which saw many important semidemocratic countries such as prereform England, Wilhelmine Germany, and the French Second Empire.

3. For a two-level model examining when parliamentary parties might choose a government with preferences differing from their own, see Pahre (1997).

“the means by which to mediate between interest groups with competence, circumspection, and patriotism” (cited in Weitowitz 1978, 148).

To see how political support captures several different kinds of domestic institutions, consider three important mid-19th-century examples. They differ both in the role that political support played in the policy-making process and in whether commercial treaties required ratification by a legislature independent of the executive who negotiated them. In the French Second Empire, institutions are well captured by the political support assumption. Napoleon III sought a direct relation with the people of France and professed a concern with the welfare of each social class (Marx [1895] 1964). Although he did not have to contest elections personally after being elected emperor, he did seek political support from all classes to maintain himself in power. Ratification of trade treaties was irrelevant because the Constitution of 1851 followed Restoration and Orleans precedents by giving the executive sole control over these treaties (Thompson 1983).

The institutions of the French Third Republic are much more distant from a political support assumption. Local constituencies and interest groups, rather than national-level parties, dominated electoral considerations (Smith 1980; Verdier 1994). Most prime ministers were chosen by a coalition of legislative parties, and trade treaties required legislative assent. Here, the political support model captures the electoral concerns of the government of the day but not the important coalition formation and ratification process in the legislature.

Great Britain before the Reform Act of 1832 falls between these two French cases (see Beer 1966). Weak parties contested elections at the national level, but constituency concerns were also very important. Prime ministers sought not 51% of the Commons but supermajorities that would be resistant to losses in by-elections.⁴ Trade treaties required legislative ratification, but this was usually superfluous because the prime minister’s own party easily controlled a majority subject to party discipline (Beer 1966).

As this review suggests, institutions vary substantially in the countries whose tariffs I will examine. However, the political support assumption approximates political systems in which national leaders explicitly maximize popular support or the probability of election. It differs from the common claim that domestic politics is zero sum, with parties or groups trying to assemble a winning coalition to distribute income away from a rival coalition (Riker 1962). Instead of politicians balancing interests against one another, as I assume, this distributive approach suggests that an executive is likely to side with one interest or the other, with the winner taking all. To the extent that the balancing model is consistent with the evidence, however, the coalitional argument is less plausible. The choice of models is an empirical question, addressed below.

4. If politicians seek an electoral majority of 51% and no more, the results here would not necessarily follow for any politician already guaranteed such a majority. However, with multiple issues, it is reasonable to assume that politicians maximize political support (or the probability of election) when making policy on a single issue such as trade policy. See Magee, Brock, and Young (1989) and Mayer and Li (1994) for a fuller discussion.

A POLITICAL SUPPORT MODEL OF DOMESTIC PRICES AND THE TARIFF

Unlike other political support models, I begin with the conflict between two groups of producers and the interrelationship of tariffs in two (or more) countries. For simplicity, I assume that each individual either gains or loses from foreign trade and that politicians can identify the members of each group. For convenience, I call these groups exporters and import-competers, respectively. Exporters receive a price for a basket of their export goods, p_E , and import-competers receive a price for their goods, p_I . Income for these two groups (Y_E, Y_I) is a function of relative prices ($p \equiv p_I/p_E$), with $\partial Y_E/\partial p < 0$ and $\partial Y_I/\partial p > 0$.

If policy makers maximized national income ($Y = Y_E + Y_I$) the equilibrium would be at $\partial Y_E/\partial p + \partial Y_I/\partial p = 0$. Under standard assumptions, this describes the free-trade equilibrium for a small country. The economics of this equilibrium, such as the production and demand functions, are ignored here. These simplifications come at the cost of not providing a full general equilibrium model of tariffs and tariff making, yet this cost is acceptable because existing general equilibrium models of tariff cooperation (i.e., Grossman and Helpman 1995) do not yield testable hypotheses. Although a more complex model of the economy and of political institutions would be desirable, these complications may be unnecessary if this simple model accounts for the evidence.

I capture the political support maximization problem in a reduced-form model in which each group provides political support out of its assets, and politicians can receive support from either or both groups.⁵ The greater a group's income, the more political support (M) it provides.⁶ Thus, $M = M(Y_E, Y_I)$, with $\partial M/\partial Y_E > 0$, $\partial M/\partial Y_I > 0$, and diminishing marginal political contributions $\partial^2 M/\partial Y_E^2 < 0$, $\partial^2 M/\partial Y_I^2 < 0$. Equilibrium occurs at $(\partial M/\partial Y_E)(\partial Y_E/\partial p) + (\partial M/\partial Y_I)(\partial Y_I/\partial p) = 0$. This does not normally describe the same equilibrium as the income-maximizing case, implying that national income is less than it could be.

To study policy, I need to model tariffs (and tariff equivalents) and not just relative prices. Tariffs make domestic relative prices ($p_d \equiv p_d/p_{dE}$) diverge from world relative prices ($p_w \equiv p_w/p_{wE}$), which I assume are exogenous.⁷ With an ad valorem tariff (t) on the import-competing goods, $p_d = p_w(1 + t)$. Now $Y_I(p_d)$, $\partial Y_I/\partial p_d > 0$, and $Y_E(p_d)$, $\partial Y_E/\partial p_d < 0$. The political support function remains the same, taking the

5. This assumption contrasts with Magee, Brock, and Young's (1989) specialization theorems but is empirically more accurate (Austen-Smith 1991). My reduced-form equations do not explicitly model each interest group's decision problem; for the general rent-seeking problem, see Becker (1983).

6. This assumption is consistent with some more explicit representations of interest group activity. To see this, consider interest group responses to changes in income (following Austen-Smith 1981). Capitalists and workers will see their marginal utility of income decrease as their income increases, but the marginal utility of income increases as income decreases. An increase in income, by reducing the marginal utility of economic activity, makes it worthwhile to shift into political activity at the margin. Thus, political activity is an increasing function of income.

7. Tariffs also have revenue effects, but I will make the standard assumption that tariff revenue is redistributed domestically in an income-neutral way. Thus, it remains true that import-competer income is a positive function of the tariff, but exporter income will be a negative function of the tariff. Left unanswered in this approach is the question why governments use second-best tariffs instead of some first-best means of redistribution, such as direct taxes and subsidies. For some possible answers, see Lindbeck (1985).

form $M = M [Y_E(p_d), Y_I(p_d)]$. The political support maximizing tariff still occurs where $(\partial M / \partial Y_E)(\partial Y_E / \partial p_d) + (\partial M / \partial Y_I)(\partial Y_I / \partial p_d) = 0$. This describes the equilibrium unilateral tariff.

Although it is determined unilaterally, external factors such as changes in world prices clearly affect this tariff. By using the implicit function rule and taking the partial derivatives of the equilibrium conditions [$F = (\partial M / \partial Y_E)(\partial Y_E / \partial p_d) + (\partial M / \partial Y_I)(\partial Y_I / \partial p_d) = 0$], we can find that

$$\frac{dt}{dp_w} = -\frac{1+t}{p_w} = -\frac{(1+t)^2}{p_d} < 0. \tag{1}$$

If world prices increase, the policy maker will reduce tariffs ($dt/dp_w < 0$). Increasing p_w disturbs the prior equilibrium, increasing import-competers' income and decreasing the income of exporters. The politician reduces the harm to exporters by skimming some of this windfall gain away from import-competers. The reverse is also true, of course: if the price of their products on world markets (p_w) falls, import-competers will receive compensatory protection. In other words,

Hypothesis 1: Decreasing world prices (i.e., increasing terms of trade) lead to increased protection, and increasing world prices (decreasing terms of trade) lead to decreased protection (see also Hillman 1982; Magee, Brock, and Young 1989, 18).

This hypothesis captures the well-known tendency for industries in recession (and not those benefiting from price increases) to receive protection.⁸

Hypothesis 1 rests on the balancing logic of a political support model. Politicians respond to changing prices by balancing the added support they receive from those who benefit against the support they might gain by redistributing income toward those otherwise harmed. Improving terms of trade harm import-competers and help exporters, so politicians use tariffs to redirect some of exporters' gains toward the import-competing sector.

The logic of the political support model stands in marked contrast to some approaches to political economy, where winning groups themselves decide policy. In the tradition begun by Riker (1962), for instance, a winning coalition chooses a policy that represents the maximum demand consistent with the internal cohesion of the coalition. Most varieties of Marxism or interest group pluralism also use a demand-based theory in which the winners take all (i.e., Caves 1976; Baldwin 1985; Pincus 1975; Rogowski 1989).

8. The result parallels Hillman (1982), with a minor change. Hillman's approach requires the assumption that industries care not only about their final domestic price but also care whether that price comes through global market change or political intervention. Thus, actors must determine whether domestic price changes have external economic causes or internal political causes. I think that this is unlikely and assume that firms are motivated by profits from whatever source.

TARIFFS IN TWO COUNTRIES

The balancing logic of the model also yields interesting results in a two-country model, which allows me to derive hypotheses on reactions. In a two-country model, the tariff in one country is now of interest to exporters in the other country.⁹ A higher tariff in B lowers the income that A's exporters receive for their exports. Because exporter income in A is a function of tariffs in B, the problem faced by A and B is the following:

$$M_A = M_A [Y_{EA} (p_{dA}, t_B); Y_{IA} (p_{dA})]$$

$$M_B = M_B [Y_{EB} (p_{dB}, t_A); Y_{IB} (p_{dB})]. \tag{2}$$

The domestic price ratios p_{dA} and p_{dB} depend on each country's tariff and world prices; that is, $p_{dA} = (1 + t_A)p_w$.

In equilibrium, $(\partial M_A / \partial Y_{EA})(\partial Y_{EA} / \partial p_{dA}) + (\partial M_A / \partial Y_{IA})(\partial Y_{IA} / \partial p_{dA}) = 0$ and $(\partial M_B / \partial Y_{EB})(\partial Y_{EB} / \partial p_{dB}) + (\partial M_B / \partial Y_{IB})(\partial Y_{IB} / \partial p_{dB}) = 0$. Using the implicit function rule to find the reactions of A to a change in B's tariffs,

$$\frac{dt_A}{dt_B} = \frac{\frac{\partial M_A}{\partial Y_{EA}} \frac{\partial^2 Y_{EA}}{\partial p_{dA} \partial t_B} + \frac{\partial Y_{EA}}{\partial p_{dA}} \frac{\partial^2 M_A}{\partial Y_{EA}^2} \frac{\partial Y_{EA}}{\partial t_B} + \frac{\partial Y_{IA}}{\partial p_{dA}} \frac{\partial^2 M_A}{\partial Y_{EA} \partial Y_{IA}} \frac{\partial Y_{EA}}{\partial t_B}}{p_w \left[\frac{\partial M_A}{\partial Y_{EA}} \frac{\partial^2 Y_{EA}}{\partial p_{dA}^2} + \left(\frac{\partial Y_{EA}}{\partial p_{dA}} \right)^2 \frac{\partial^2 M_A}{\partial Y_{EA}^2} + 2 \frac{\partial Y_{EA}}{\partial p_{dA}} \frac{\partial^2 M_A}{\partial Y_{EA} \partial Y_{IA}} \frac{\partial Y_{IA}}{\partial p_{dA}} + \frac{\partial M_A}{\partial Y_{IA}} \frac{\partial^2 Y_{IA}}{\partial p_{dA}^2} + \left(\frac{\partial Y_{IA}}{\partial p_{dA}} \right)^2 \frac{\partial^2 M_A}{\partial Y_{IA}^2} \right]} < 0. \tag{3}$$

Subject to some presumptions, the derivative in equation (3) is always negative. Besides those assumptions already made, this claim requires the standard assumption that $\partial^2 M_A / \partial Y_{EA} \partial Y_{IA} = \partial^2 M_A / \partial Y_{IA} \partial Y_{EA} > 0$, that $\partial^2 Y_{EA} / \partial p_{dA}^2, \partial^2 Y_{IA} / \partial p_{dA}^2 < 0$ (price changes have a diminishing marginal effect on incomes), and that $\partial^2 Y_{EA} / \partial p_{dA} \partial t_B = \partial^2 Y_{EA} / \partial t_B \partial p_{dA} < 0$. This last assumption is the most problematic, assuming that an increase in foreign tariffs reduces the effect of domestic tariffs on exporter incomes. It implies that as p_{dA} increases, domestic goods become more expensive for exporters, reducing the effects of foreign tariffs on their real incomes by diminishing marginal returns.

In a full, general equilibrium model of the economy, these partial derivatives might have ambiguous signs, such that dt_A/dt_B could be positive or negative. The assumptions in the reduced-form approach here are useful to the extent that they make accurate predictions, especially if a general equilibrium approach produces only ambiguous results.

9. This assumes that international markets are not perfectly competitive, for there is implicitly some effect on exporters of restricted access to a given country's market. Exporters do not find new buyers without cost.

With these assumptions, equation (3) shows that any increase in B's tariff will be met with a decrease in A's tariff:

Hypothesis 2: Increasing protection in one country reduces protection in the other country, and vice versa.

This means that two countries' trade policies will be negatively correlated.¹⁰

This result will surprise those who think of tariff wars and automatically reciprocated tariff concessions, but the balancing logic is straightforward. Raising B's tariff affects politics in A. The foreign tariff hurts A's exporters, which disturbs the political equilibrium in A. In the previous equilibrium, the marginal political support from both domestic groups was equal. Now that A's exporters have less income, they give less support. Politicians in A can gain more support at the margin by lowering A's tariff until the increased political support from exporters equals the cost in lost political support from import-competers. Thus, A responds to B's protectionism by liberalizing.

The question of such reactions rarely arises in winner-takes-all theories of tariffs. Nonetheless, the result that $dt_A/dt_B < 0$ stands in marked contrast to their implicit logic. They would suggest that a reduction in B's tariffs should make A's exporters wealthier, and these resources should make the export interest more powerful than before (see Rogowski 1989). As exporters grow more powerful, they presumably demand tariff reductions, and they should be increasingly successful.¹¹

Equation (3) also describes those cases in which the negative correlation of hypothesis 2 does not follow:

Remark 1: A does not react to changes in B's tariff if $\partial Y_{EA}/\partial t_B = 0$.

When $\partial Y_{EA}/\partial t_B = 0$, the numerator of (3) is equal to zero. When exporter incomes in one country are unaffected by tariffs in the other country, these countries' trade policies will be unrelated. The simple two-country model in this section can in principle explain both negative reactions between two states' trade policies and the lack of any reaction at all. The next section will describe conditions under which positive reactions may occur.

RECIPROCAL TARIFF LIBERALIZATION

The previous section examined the single-play Nash equilibrium, in which each player chooses his or her best response to the other's strategy. In this single-play or

10. This negative correlation assumes that exogenous shocks disturbing a prior equilibrium will affect only one country, inducing a differently signed reaction in the other. If the same shock hits both countries simultaneously, the net effect on each will be unclear. Using control variables for any such shocks is a good way to minimize this problem in empirical work.

11. This logical implication remains implicit because few push the theory to this conclusion. Even so, it is hard to imagine a domestic-level theorist arguing the reverse—that increasing wealth makes an interest group less powerful and less likely to obtain policy in its interest.

myopic equilibrium, each country's reactions to the other reduce change: liberalization breeds protection, and vice versa. However, A and B can obtain joint political gains from mutual tariff reductions if they select their tariffs together. Of course, neither A nor B will agree to any outcome other than the Nash equilibrium unless they can guarantee themselves at least the same level of political support as in the Nash equilibrium. It is also necessary that the discounted benefits from cooperation are greater than the one-time benefits from cheating followed by the discounted utility from the noncooperative outcome (after the other country retaliates).

Here, I assume that both countries place a sufficiently high value on future payoffs such that it is always rational for both to cooperate; this assumption is common for many game-theoretic purposes (see, e.g., Kreps et al. 1981; Fudenberg and Maskin 1986). In what follows, I assume grim trigger enforcement, by which any deviation from the cooperation equilibrium is punished by permanent reversion to the single-play Nash equilibrium. This assumption means that I look only at those cases in which the "shadow of the future" (Axelrod 1984) is great enough for cooperation to occur. My empirical tests look only at how states' reactions to one another depend on the presence or absence of trade treaties, leaving the discount factors that explain the presence or absence of cooperation outside the model.

To find acceptable tariff changes that retain constant utility for A, I first differentiate (2) totally: $dM_A|_{dp_w = 0} = (\partial M_A/\partial Y_{EA})(\partial Y_{EA}/\partial p_{dA})dp_{dA} + (\partial M_A/\partial Y_{EA})(\partial Y_{EA}/\partial t_A)dt_A + (\partial M_A/\partial Y_{IA})(\partial Y_{IA}/\partial p_{dA})dp_{dA}$. Where $dM_A = 0$, A's total political support remains unchanged; the calculus extends easily to welfare-improving changes, where $dM_A > 0$, and to jointly improving changes, where $dM_A > 0$ and $dM_B > 0$. A can maintain its equilibrium level of political support (\hat{M}_A) under the following condition:

$$\frac{dt_A}{dt_B} \Big|_{M_A = \hat{M}_A, dp_w = 0} = \frac{-\frac{\partial M_A}{\partial Y_{EA}} \frac{\partial Y_{EA}}{\partial t_B}}{P_w \left(\frac{\partial M_A}{\partial Y_{EA}} \frac{\partial Y_{EA}}{\partial p_{dA}} + \frac{\partial M_A}{\partial Y_{IA}} \frac{\partial Y_{IA}}{\partial p_{dA}} \right)} \tag{4}$$

The numerator is unambiguously positive, so $dt_A/dt_B > 0$ iff $(\partial M_A/\partial Y_{EA})(\partial Y_{EA}/\partial t_A) + (\partial M_A/\partial Y_{IA})(\partial Y_{IA}/\partial t_A) > 0$. This condition holds wherever the reciprocitarian tariff is less than the unilateral tariff (i.e., $t_A < \hat{t}_A$), for it implies that increases in the tariff would increase A's political support. The same is true for $t_B < \hat{t}_B$. In this region, then, these countries can agree on simultaneous tariff reductions ($dt_A < 0$ and $dt_B < 0$) that do not decrease M_A and M_B from their equilibrium levels.¹² We may by analogy find those regions where simultaneous tariff reductions raise the utility of both. In short,

12. For positive tariffs, simultaneous tariff increases ($dt_A > 0$ and $dt_B > 0$) are ruled out because they would move both countries into the region where the denominator in (4) is negative. If we consider unilateral $\hat{t}_A < 0$ such that $t_A > \hat{t}_A$ would raise income, then a reciprocal reduction of the absolute value of negative tariffs is possible. An example would be a Euro-American agreement to limit wheat export subsidies. In short, reciprocal liberalization is possible, but reciprocal protection is not.

Remark 2: Unless $\partial Y_{EA}/\partial t_B = 0$ or $\partial Y_{IB}/\partial t_A = 0$ (see remark 1), two countries can always sign a reciprocity treaty reducing tariffs, but not one increasing tariffs.

This result shows the domestic political foundations of reciprocity treaties. Although unilateral tariff reductions are impossible, reciprocity is not. The other country's concessions bequeath an economic gain to the government: an economic gain with concrete beneficiaries and a political gain that unilateral tariff reductions alone cannot yield (cf. Oye 1992). This gain more than offsets the lost support from import-competers.¹³ In this way, these treaties allow the executive to take advantage of the economic gains from trade.

Again, history suggests that the model captures some important causal processes. Political gains from reciprocity make it a useful policy tool in the hands of politicians trying to broaden their political base. This was one reason Leo von Caprivi made commercial agreements a centerpiece of his economic policy, although many of his supporters were protectionists (see Weitowitz 1978). One of Caprivi's goals as chancellor was to reintegrate labor into the Wilhelmine Reich because Bismarck's *Sozialistengesetz* clearly had not stemmed the growth of trade unions or the proscribed Socialist Party. Lowering grain tariffs through trade treaties might regain worker loyalty by reducing the cost of living for the typical would-be unionist. Others in his coalition agreed, and agreements with Austria-Hungary and Italy passed the Reichstag with ease in 1891, even gaining the support of many agriculturalists.

Reciprocal liberalization affects the validity of hypothesis 2. A tariff agreement can counteract tariff increases stemming from terms of trade effects or from changes in the other country's level of protection. In particular,

Hypothesis 3: When two countries sign a tariff agreement, their tariffs will be positively correlated. (Thus, hypothesis 2 does not apply.)

This proposition describes what happens when the two countries move from the Cournot-Nash equilibrium of proposition 1 to the cooperative equilibrium of reciprocal tariff concessions. Because each country makes tariff concessions to the other, changes in tariffs will be positively correlated. Hypothesis 2's predicted negative correlation no longer occurs because the treaty lowers both tariffs simultaneously, making them positively correlated.

The same positive correlation occurs when the treaty is no longer in effect:

Hypothesis 4: When a trade treaty lapses or is denounced, the signatories' tariffs will be positively correlated.

When the treaty lapses, both countries return to the Cournot-Nash equilibrium from the cooperative equilibrium, reversing the previous tariff concessions. These mutual increases in tariffs will also be positively correlated with one another.

13. Richardson (1993) finds an analogous result for endogenously determined protection in a free-trade area (FTA), where the members of an FTA chooses a lower equilibrium tariff than they would have chosen independently.

Finally, we should also expect a positive correlation in the period between the signing and denouncing of a treaty:

Hypothesis 5: When two countries have a trade treaty in effect between them, their tariffs will be positively correlated.

Whereas hypotheses 3 and 4 describe changes between the Nash and cooperative equilibria, hypothesis 5 describes the comparative statics of the cooperative equilibrium. It stems less from the formal logic of the theory than from the mechanics of real trade treaties. First, most treaties make tariff concessions over time, such as 5 or 10 years. As a result, signatories' tariffs will be positively correlated during the phase-in period. Even after the phase-in period, the MFN clauses in these treaties require future reductions as the result of new treaties signed with third parties. As signatories negotiate these third-party treaties, these continual tariff reductions will ensure that changes in the signatories' tariffs remain positively correlated.

In sum, signatories' tariffs will be positively related at the time they sign the treaty, throughout the term of the treaty, and when they denounce the treaty. Given the benefits of mutual liberalization, then, it remains only to ask what explains variations in trade treaties. Because equation (4) describes the condition for a state maintaining its utility in a trade treaty and such treaties are always possible, variations in utility cannot explain the presence or absence of trade treaties.¹⁴ This leaves the grim trigger enforcement as a source of variation, which requires that states value the future sufficiently. In short,

Remark 3: Variations in discount factors explain variations in trade agreements.

This is an unfortunate result in that countries' discount factors are unobservable. Without being able to trace variation in trade treaties to observables, I focus solely on the reaction of one state to another, given the presence or absence of such a treaty. Testing the relevant propositions will occupy the rest of this study.

RECIPROCITY AND REACTIONS: QUANTITATIVE RESEARCH DESIGN

This section and the next test the core propositions from the model. Because terms of trade data are mostly lacking for the 19th century, I will not test hypothesis 1, which states that governments use tariffs to counteract changes in a country's terms of trade. Instead, I will focus on hypotheses 2, 3, 4, and 5, which speak directly to the problem of reactions and are the central findings of the theory. Together, these hypotheses state that two countries' tariffs will be negatively correlated without a tariff treaty, positively

14. One exception to this claim is that changes in the signs of some of the partial derivatives in equation (3) might lead to variation in the presence or absence of trade agreements if they sometimes make $dt_A/dt_B > 0$.

correlated otherwise. Testing these hypotheses requires finding a historical period with variation in this treaty variable. If we are interested in the largest traders, this immediately rules out the post-1945 period: because of the General Agreement on Trade and Tariffs (GATT), the system lacks variation in the treaty variable. The presence or absence of treaties varies more from 1920 to 1938, but the period is so short that looking at enough countries quickly consumes all the degrees of freedom.

For these reasons, I will test the theory against the period from 1815 to 1914. I begin with a quantitative test against French tariffs in the latter half of this period. France provides the most variation in the presence or absence of trade agreements among major countries. France negotiated a series of reciprocal trade treaties, beginning with the Cobden-Chevalier treaty of 1860. Most of these expired in the 1880s and 1890s, at a time when the Third Republic was considering a series of tariff reforms. France and several major partners (Italy, Belgium, Switzerland) then went some years without trade treaties before signing new treaties toward the century's end. Great Britain, in contrast, did not denounce trade agreements or engage in trade wars during this period.¹⁵

A secondary criterion was data availability, which poses problems for some countries for some portion of the period. France is also a good subject because trade and tariff data are available for it and many of its trading partners. German trade policy would provide more variation in trade agreements than Britain and less variation than France but at a cost of 20 years of data.

The available data allow two possible measures of protection. The first measure is the average tariff, defined as customs revenue as a percentage of import volume; the second measure is openness or import volume as a percentage of gross domestic product (GDP) (or gross national product [GNP] or net national product [NNP], depending on available country data). Openness is only an indirect measure of protection. Many economic variables will also affect it, such as transportation costs or a country's marginal propensity to import. The average tariff, although seemingly a more direct measure, is a very poor measure when real protection is sufficiently high. Prohibitive tariffs will appear to have an average tariff of zero. For some range of nonprohibitive tariffs, increases in the actual tariff will lower the average tariff measure because increasing a near-prohibitive tariff on a good reduces revenue as even less of the good is imported. Domestic producers receive protection, affecting the openness measure, but tariff increases reduce revenue.¹⁶ Moreover, the average tariff measure does not capture nontariff barriers because they entailed no customs revenue. Yet, protective state monopolies, navigation restrictions, and import quotas and prohibitions were important for many countries in this period.

15. The only exception to this is that Britain refused to renew treaties with Belgium and Germany in the 1890s without eliminating a clause that prohibited imperial preference. All three countries continued to observe the treaties nonetheless. Even with 52 years of French data, there is no treaty variation for the Netherlands and the United Kingdom, nor is there variation in the Franco-Swedish treaty variable in those 32 years for which there are data on Germany.

16. This argument was important in British debates at mid-century (Irwin 1989).

For these reasons, I will use the openness measure whenever it is available and will only use the average tariff measure for countries that the tariff histories identify as having had low tariffs and few quotas.¹⁷ Openness weights prohibitions and import quotas fairly because it depends on both actual imports and nonimports. Moreover, this openness measure generally decreases when a country passes a tariff that historians describe as protective and increases when a country passes a “liberal” tariff.

The model also assumes that revenue needs do not play an important role in tariff making. In contrast, the conventional wisdom is that tariffs were strongly influenced by a government’s fiscal dependence on customs revenue. The government could lower tariffs once it had developed other sources of revenue, such as an income tax, but not before (see Stein 1984; Nye 1990). If this is true, tariff rates will be higher when customs revenue is a significant portion of all government revenue; when customs revenue is a smaller share of all revenue, revenue concerns do not stand in the way of liberalization, and we should expect lower tariffs. In other words, customs’ share of all revenues should be negatively correlated with openness because high reliance on tariff revenue precludes greater openness.

We can look at the revenue problem with some simple correlations for France ($N = 46$ for all the correlations here, covering the period from 1868 to 1913). French average tariffs and revenue concerns are highly correlated ($p = .893$). It is plausible that the causal arrow might point in either direction: the government may depend heavily on tariff revenue, so it chooses high tariffs, or, because tariffs are high, the government will rely heavily on revenue from them. If the former, then the theory here errs by excluding revenue concerns; if the latter, then the government’s dependence on tariff revenue is endogenous, determined by whether France chooses high tariffs for domestic political reasons.

Other evidence suggests that the causal relationship runs from tariffs to revenue, contrary to the conventional claim. First, average French tariffs are nearly unrelated to openness ($p = -.070$). None of the obvious explanations for this pattern support the revenue explanation for tariffs. Tariffs and openness are presumably unrelated in this way because France relied heavily on nontariff protection such as import quotas and prohibitions in much of the century. However, French openness is weakly positively correlated with government reliance on tariffs ($p = .248$). From a revenue standpoint, this suggests that increasing international trade represents an attractive revenue source for governments. Revenue concerns are not an obstacle to liberalization but follow from the choice to liberalize.

This positive correlation is also consistent with the balancing logic of the political model here, without any need to consider revenue needs independently. As openness increases, the government raises tariffs to shift some gains away from the export sector toward the import-competing sector. Consistent with this claim, both openness and

17. We would be indifferent about the two measures if they were strongly negatively correlated. The measures for Italy in this period have a correlation of $-.46$, but only $-.21$ for Sweden. They are nearly uncorrelated in France ($-.07$) and positively correlated in the United Kingdom (.19 from 1868 to 1913, although $-.89$ over the years from 1830 to 1913). The low-tariff countries for which average tariff, but not openness, is available are Belgium and the Netherlands; the excluded high-tariff countries include Austria-Hungary and Russia.

reliance on customs generally increase throughout that part of the century for which we have data. This suggests that the conventional wisdom has stated the problem incorrectly. It is not true that an absence of other revenue sources inhibited liberalization, at least for France.¹⁸ Instead, it appears that greater openness encouraged France to tax international trade more heavily, thereby reaping additional revenue that would be partly paid by foreign producers. Excluding revenue concerns from the model is not only a reasonable simplification but also substantively preferable.¹⁹

REACTIONS AND RECIPROCITY: QUANTITATIVE TESTS

To see the effect of trade treaties on reactions, I also need a measure of trade treaties. I coded two countries as having a trade treaty if they had a treaty in effect that granted one either reciprocal tariff concessions or MFN treatment in tariffs; treaties granting reciprocity in shipping (third-country trade, port duties, etc.) are coded as zero because relevant data on reexports and third-country imports are lacking. An interactive variable, equal to foreign openness when a treaty is in effect and zero otherwise (i.e., interact = treaty * openness), captures hypotheses 3, 4, and 5. Except for Italy, most countries' treaties took effect in January and expired in December, so coding a year as treaty or no treaty was rarely problematic.

Hypotheses 3, 4, and 5 predict a positive relationship between French and foreign openness but for different reasons. The quantitative test cannot distinguish between the two propositions, which make different causal claims about the same observed correlation.²⁰

I estimate the following equation:

$$\text{French openness} = \text{constant} + \underset{(-)}{\beta_1} \text{foreign openness} + \underset{(+)}{\beta_2} \text{interactive term} + \dots \quad (5)$$

When there is no treaty, French openness depends solely on foreign openness, and a negative relationship is predicted. With a treaty, the net effect of foreign openness (openness + interact) on French openness is positive. I use an *F* test to see if this sum is significantly different from zero.

18. Similar analyses for other European countries yield mixed results.

19. Models that include the effects of revenue on tariffs in a one-country model yield only intuitive results, such as a higher tariff when politicians want to give tariff revenue to import-competers (Van Long and Vousden 1991). When I included revenue concerns as a control variable in the regressions reported later, I obtained both rightly signed and wrongly signed estimates for it, none of which were statistically significant. Including it did not affect the other estimates, except for the Swedish interactive variable, which often was not statistically significant when French revenue concerns were included.

20. Although I tried tests distinguishing the three hypotheses, the estimated coefficients were not sufficiently different to warrant reporting.

For some countries, in some equations, only average tariff data are available. This reverses the signs on the foreign and interactive variables because low tariffs are associated with high openness. For these countries, I estimate the following equation:

$$\text{French openness} = \text{constant} + \underset{(+)}{\beta_1} \text{foreign tariffs} + \underset{(-)}{\beta_2} \text{interactive term} + \dots \quad (6)$$

Because bilateral trade data are unavailable, these equations do not capture the effect of trade treaties on bilateral trade but on aggregate trade. Although I am forced to use aggregate data because they are the only data available, this has a substantive advantage. Measuring aggregate trade captures the effects of each treaty on third-party trade. Because nearly all 19th-century treaties in Europe included MFN clauses, these third-party effects will include the extent to which French concessions to Britain can affect French imports from Italy or Germany as well.

Initial tests of the model found two statistical problems. First, the residuals were positively correlated with most of the variables; for instance, the higher the openness or foreign GDP, the larger the residuals. Second, tests for serial correlation generally yielded Durbin-Watson statistics indicating positive serial correlation.²¹

To correct for these problems, I estimated these equations using logarithmic transformations (for heteroskedacity), lagged variables (for serial correlation), and both. Each solved one problem but not the other. Using first differences for all variables eliminated both, and I report these results here. (First differences are also algebraically equivalent to a one-period lag model.) First differences have the added advantage of capturing the reaction problem directly because they measure only changes from year to year. The results also include control variables that were found to have some effects: the GDPs of the included countries and time (year). Although the year was never statistically significant, its estimate was consistent across most specifications, and including it improves the estimates of the theoretical variables.

I report results with and without Germany in Table 1; including Germany comes at the cost of 20 years of data, two degrees of freedom, and the loss of the Franco-Swedish "no-treaty" period. The Netherlands and United Kingdom had treaties with France throughout the period from 1860 to 1913, as did Germany for all years in which trade data existed (1882-1913), so only the interactive variable is relevant in these cases.

I also report results with and without the two countries for which average tariffs and not openness are available (Belgium and the Netherlands). These not only provide additional tests but improve the efficiency of most other estimates. Using average tariffs for some countries also has the inadvertent advantage of helping rule out exogenous shocks (such as declining transportation costs) that might raise everyone's openness simultaneously, leading to a spurious positive correlation among openness.

The estimates are overwhelmingly rightly signed across all model specifications (27 of 36 variables for which the theory makes predictions). The statistical significance of the estimates varies considerably, from $p < .005$ to not significant at all. Even

21. The data are available on the Web at <http://www-personal.umich.edu/~pahre/jcr1998.html>.

TABLE 1
Effects on French Openness

Predict		French Openness		
Constant		26.765 (24.381)	14.156 (21.779)	-8.467 (33.436)
FRNGDP		-.0004*** (.0001)	-.0003** (.0001)	-.0001 (.0001)
UK		.004 (.004)	.002 (.003)	.005 (.004)
UKINTER	+	.281†† (.148)	.111 (.144)	.036 (.256)
ITL		.0004 (.0002)	.0002 (.0002)	.0002 (.0002)
ITLO	-	.295 (.194)	.240 (.174)	.016 (.196)
ITLOINTER	+	-.035 (.053)	-.017 (.050)	-.026 (.070)
SWD		.001 (.002)	.003 (.002)	.002 (.002)
SWDO	-	-.157† (.112)	-.107 (.098)	NA
SWDOINTER	+	.069 (.069)	.082† (.061)	.007 (.053)
BLGT	+		-.577 (1.140)	-.048 (1.756)
BLGTINTER	-		-1.751††† (.656)	-.741 (1.133)
NTHTINTER	-		-.069†† (.039)	-.015 (.047)
GMYO				-.0001 (.0002)
GMYOINTER	+			.162 (.133)
Year		-.014 (.013)	-.008 (.012)	.004 (.018)
<i>N</i> (years)		52 (1862-1913)	51 (1863-1913)	32 (1882-1913)
Adjusted <i>R</i> ²		.088	.326	.375
<i>F</i>		1.49	2.86	2.33
All INTER = 0				
(<i>F</i> test)		1.84, <i>p</i> < .20	2.20, <i>p</i> < .10	.65
BLGT +				
BLGTINTER = 0				
(<i>F</i> test)			7.52, <i>p</i> < .01	.52
SWDO +				
SWDOINTER = 0				
(<i>F</i> test)		.47, <i>p</i> < .25	.15	NA

NOTE: All variables are first differences except year. For definitions of variables, see the appendix. NA = not applicable.

p* < .05, two-tailed. *p* < .01, two-tailed. †*p* < .10, one-tailed. ††*p* < .05, one-tailed. †††*p* < .01, one-tailed.

so, those estimates that do not cross conventional levels of significance are usually consistent across specifications.

However, the 20 years of data lost by including Germany (in the final columns in Tables 1 and 2) greatly reduce both the *F* values and *t* ratios in the model. Apparently, the model fits the 1860s and 1870s better than subsequent periods. This is not too worrisome because these early decades exhibit greater variation in the trade treaty variable, which is the central theoretical variable.

Belgium and Sweden are of particular interest because of the variation in the treaty variable. The interactive variable for both is significant at nearly the .10 level; because the *t* ratio often narrowly misses the threshold, this significance is not always evident in the table. The coefficients on Swedish openness (SWDO) are similar across

specifications and always significant at the .17 level or better, whereas the estimates for Belgian tariffs (BLGT) vary greatly.

I also show results from testing two implications of the theory (see Tables 1 and 2). First, I ask whether the data show that these trade treaties taken as a whole significantly affect French openness by testing to see whether all interactive variables are jointly different from zero. (Because the Italian coefficient is wrongly signed, I exclude it from these tests.) This suggests that even if some rightly signed interactive terms are not significant at conventional levels, these terms may be significant as a group. Second, the theory predicts that the effect of a country's interactive variable in treaty years should be greater than the effect of the openness variable. Equivalently for rightly signed estimates, the sum of these two coefficients should be different from zero. Although the results support the theory, the levels of statistical significance are only in the .25 to .10 range.

Among the control variables, foreign GDPs have consistently positive effects on French openness. This is presumably true because France liberalizes to take advantage of larger potential export markets. The negative coefficient for France's GDP reflects the fact that France's GDP is the denominator in the ratio that defines openness (trade/GDP). Because the theory does not predict the signs on GDP and year, I use two-tailed tests for significance. French openness decreases gradually over this time, as captured by year, although this is never statistically significant at the .10 level.²² Examining the residuals suggests that there may be a statistically insignificant upswing from the 1880s on.

The theory is consistently wrong only for Italy. This may be because Franco-Italian commercial relations in this period were turbulent, and treaties were unrati- fied (1877), denounced (1887), or renegotiated under coercion. Moreover, each country intentionally changed its tariff code to the other's disadvantage before negotiating a treaty to increase its bargaining position.²³ Under the reasonable assumption that market actors anticipated some of this turbulence, this makes the measure of openness used here subject to much more error here than in the other countries. Excluding Italy yields better estimates of all the other variables, as reported in Table 2, and better summary statistics such as F and R^2 .

QUALITATIVE TESTS

Although the quantitative results are consistent with the theory, a cautious interpretation is appropriate. First, tariffs are generally sticky, in that most countries rewrite their tariff code only every 10 or 20 years. Because the quantitative tests look at annual changes, they include a lot of noise. Second, we should expect that private importers and exporters would rationally anticipate commercial treaties, treaty expirations, and trade wars, confounding the analysis. As discussed above, this may be a problem for

22. Tests to see whether institutional changes from the Second Empire to the Third Republic drove this result did not yield any useful results.

23. Franco-Italian treaties also tended to start and end in midyear, but using different coding rules in such cases does not affect the results.

TABLE 2
Effects on French Openness, Excluding Italy

Predict		French Openness		
Constant		16.900 (24.099)	6.626 (20.814)	-9.709 (30.341)
FRNGDP		-.0003** (.0001)	-.0003*** (.0001)	-.0001 (.0001)
UK		.005 (.004)	.002 (.003)	.004 (.003)
UKINTER	+	.319†† (.145)	.113 (.140)	.054 (.167)
SWD		.002 (.002)	.004** (.002)	.002 (.002)
SWDO	-	-.140 (.109)	-.084 (.093)	NA
SWDOINTER	+	.065 (.066)	.071 (.057)	.007 (.047)
BLGT	+		-.667 (1.090)	.083 (1.412)
BLGTINTER	-		-1.758††† (.637)	-1.048 (.840)
NTHTINTER	-		-.072†† (.035)	-.034 (.032)
GMYO				-.0001 (.0002)
GMYOINTER	+			.211†† (.095)
Year		-.009 (.013)	-.004 (.011)	.005 (.016)
N (years)		52 (1862-1913)	51 (1863-1913)	32 (1882-1913)
Adjusted R ²		.067	.341	.449
F		1.52	3.58	3.30
All INTER = 0		F = 2.42, p = .10	F = 2.49, p < .10	F = 1.49, p < .25
BLGT + BLGTINTER = 0		NA	F = 9.07, p < .005	F = 1.02
SWDO + SWDOINTER = 0		F = 1.06	F = .04	NA

NOTE: For definitions of variables, see the appendix. NA = not applicable.

p < .05, two-tailed. *p < .01, two-tailed. ††p < .05, one-tailed. †††p < .01, one-tailed.

Franco-Italian trade. Third, omitted variables, such as changes in trade patterns due to changes in transportation costs, may be affecting the relationship between countries' levels of openness without reflecting any policy changes.

An alternative test of the theory looks only at legislated tariff changes (which include administrative tariff changes and changes by executive decree). This test recognizes the stickiness of tariffs and looks at government behavior independent of traders' expectations. This has the added advantage of allowing a test of the theory for the first half of the century from 1815 to 1914, for which import data are mostly unavailable. Finally, commercial treaties were the exception and not the rule in the first half of the century, allowing a fuller test of the more counterintuitive hypothesis 2.

For this qualitative test, I examine legislated changes in European and U.S. tariffs between 1815 and 1840. Given the limitations of the evidence here, I looked at non-British tariffs as if they were responses solely to changes in British tariffs. This approach has some plausibility because Britain was by far the largest trading nation, the largest single trading partner of most countries, and the nation most likely to affect others.²⁴ Although I have tried to be complete in collecting evidence from a sizable

24. These claims are central to hegemonic stability theory, for instance. For an analysis of British hegemony in this period, see Pahre (1999, chaps. 5-8).

secondary literature (see Haight 1941; Henderson 1939; Smith 1980; Williams 1972), the list of tariff changes is probably not exhaustive.

I treat British tariffs as exogenous (for recent explanations of its policy, see Schonhardt-Bailey 1996). Britain raised its tariffs in this period and imposed the famous Corn Law in 1815. British policy changed in the early 1820s under William Huskisson's leadership at the Board of Trade. We can date the change in British tariffs precisely to 1821 and 1822, when British tariffs hit a peak of 64% (Imlah 1958). British imports and exports also hit lows in these years. Because Britain did not have reciprocal tariff treaties with most of its trading partners, we expect their tariffs to move in the opposite direction, that is, to be more liberal from 1815 to about 1821 and more protectionist thereafter.

As hypothesis 2 predicts, the tariffs of most European countries moved in a direction opposite to Britain's. Counting as many cases against the hypothesis as possible, 67% of tariffs in each period are correctly predicted (4 of 6 from 1815 to 1821 and 6 of 9 in the 1820s).²⁵ The null hypothesis should be 50% because we have periods of both tariff increases and decreases for a constant set of countries. The probability of predicting 10 of 15 tariffs correctly by chance is only 15.1%. Using a more favorable interpretation of the evidence, the model correctly predicts 12 of 15 cases, or 80% (6 of 8 from 1815 to 1821 and 6 of 7 in the 1820s). The chance of predicting this many correctly is only 1.8%.

Moreover, spurious correlation is apparently not a problem. A spurious correlation would be likely if some excluded variable caused the tariffs of all countries to move in the same direction. A good candidate is postwar deflation, which increased the real protection that specific duties afforded goods; alternative theories might expect countries to reduce these "overly high" duties or convert them to ad valorem rates in new tariff legislation. What makes spurious correlation an unlikely problem is that hypothesis 2 expects non-British tariffs to move in the opposite direction from British tariffs. Anything that might explain the common movement of non-British tariffs could not explain the opposing movement of British tariffs that underlies the hypothesis. Thus, any rival explanation of tariff legislation in this period would have one more anomaly in each period than the theory here (namely, Britain itself).

Another way to rule out spurious correlation is to look for evidence of the theory's causal relations at work. One way of checking for this causality is to see whether countries protect themselves against exactly those goods exported by the British juggernaut once the switch to free trade unleashes it. Because the British market is opening, those who export to Britain benefit the most. This leads foreign countries to redistribute some of these gains toward those who are hurt the most. These are mostly producers who compete with British imports because Britain ultimately has to obtain foreign currency for its greater imports by increasing its export earnings.

We generally find the legislated tariff changes targeted against Britain in exactly this way (examples are from Williams 1972). Austria introduced new and virtually prohibitive duties on woolens and cotton in 1824, as part of a general policy of

25. Because I suspect that the table is not exhaustive, I do not count "no evidence" as a falsification. If the table were exhaustive, then a failure to react in the predicted direction—such as Prussia before 1830—should count as a falsification.

TABLE 3
Changes in Legislated Tariffs

	Tariffs, 1815 to 1821		Tariffs, 1822 to 1840	
	Prediction	Pattern	Prediction	Pattern
Austria	Lower	Unknown	Higher	Higher, 1824; Lower, 1836
France	Lower	Higher, 1819, 1821	Higher	Higher, 1822, 1826
The Netherlands	Lower	Lower, 1816, 1818, 1819, 1821	Higher	Higher, 1822
Portugal	Not Lower ^a	Unknown	Higher after 1836 ^a	Higher
Prussia	Lower	Lower, 1818, 1821	Higher	Higher from 1830s (<i>Zollverein</i>)
Russia	Lower	Lower, 1819	Higher	Lower, 1830s
Sweden	Lower	Lower?, 1817	Higher	Higher, 1823, 1831; Lower, 1826
Sicily	Lower	Lower	Higher	Higher, 1823, 1827
Turkey	Lower	Lower?	Higher	Unknown
United States	Lower	Higher, 1816, 1818	Higher	Higher, 1824, 1828
Correctly predicted	6 of 8, 75%; 4 of 6, 67%, ignoring questionable cases		6 of 7, 87%, in 1820s; 6 of 9, 67%, in 1820s and 1830s, counting mixed cases as anomalies	

NOTE: *Legislated* does not necessarily mean passed by a legislature. Many countries changed tariffs through administrative agencies; details vary by country. *Unknown* means that I have been unable to find evidence of a legislated change in tariffs. Question marks indicate that the sources used terms such as "seemed to lower tariffs."

a. Britain and Portugal had a reciprocal trade treaty in effect from 1810 to 1836.

protecting Austrian manufactures from British competition. Sicily switched to extreme protection by increasing duties on textiles and iron, both exported by Britain, in 1823 and 1827. Sweden's 1823 tariff introduced new exclusions on British manufacturers of silk, wool, cotton, iron, steel, and copper. These details help rule out alternative causal mechanisms and omitted variables in the above quantitative analysis.

Although also consistent with the theory, the liberalization of many countries in response to British protectionism before 1821 is more surprising. The predictions of the model are especially interesting for Prussia, which saw widespread distress in both agriculture and industry after the Napoleonic Wars. Some problems were directly attributable to Britain: the Corn Law hurt Prussian grain exports, the Navigation Acts harmed the merchant marine, and British textile dumping hit industry. Even so, Prussia did not retaliate—indeed, it liberalized.

Still more evidence for the theory comes from Portugal, the only country to have tariff treaties with Britain across the 1821 to 1822 divide. As we would expect from hypothesis 3, Portugal does not follow the pattern of other countries. Yet, when Portugal withdrew from these treaties in 1836, its tariffs moved in the predicted upward direction in 1837 and 1841. These acts increased duties on textiles, earthenware, and hardware, all goods exported by Britain.

France is an important anomaly. When the theory expects liberalization, we observe import prohibitions and high tariffs in textiles, iron and steel, and many metal goods. Although French tariff increases in the 1820s are in the predicted direction, this confirmation of the hypothesis really should not be given much credence.²⁶ Still, the evidence for the theory is otherwise very good.

IMPLICATIONS

The core of this study has been foundational, proposing a model that can deal with variables at both the international and domestic levels of analysis to analyze reactions. The model yields some useful results, which seem to work for countries large and small across two long periods. Using two different operationalizations of tariffs (openness vs. legislated changes) adds to the plausibility of the hypotheses.

Whatever its support in the 19th century, one might wonder what the theory in this article tells us about the politics of trade policy today. A direct test is impossible because the major trading countries have had trade treaties with each other since the GATT (1947). Instead of a direct test, I will conclude with some implications of the theory for contemporary trade treaties at the global and regional levels.

Many supporters of free trade today argue that multilateral trade negotiations in the framework of the GATT (now the World Trade Organization [WTO]) are essential for

26. My suspicion is that France does not follow the predictions of the model for idiosyncratic political reasons: after 20 years of economic warfare with Britain and military defeat, protecting the French market from British goods was a matter of nationalism and not income redistribution. The tariffs of the United States, like France, show continuity where the theory expects discontinuity. Lingering hostility from the war between 1812 and 1815 is less plausible for the United States than for France.

staving off protectionist pressures in the industrialized world. One difficulty with evaluating this argument is the counterfactual claim that protectionism is likely if the international system lacks a GATT or WTO to restrain it.

One way to evaluate this claim is to look at historical periods lacking such tariff treaties, as I did in the previous section. The evidence suggests that trade treaties do play an important role in supporting a liberal trading order. However, the theory suggests that a world without trade treaties would be more complicated than many WTO supporters suggest. Although some countries would turn to protection, the political response of others would be to compensate their harmed exporters by liberalizing further. In short, the theory highlights a fallacy of composition: we should expect a breakdown of the liberal trading system but not the end of free trade in each individual nation, and we should predict continued free trade in some nations.

The theory also helps us understand some particular features of the GATT/WTO system, such as what Jagdish Bhagwati (1990) calls "GATT-speak." Tariff agreements are always politically rational, and total political support increases under them. Still, they come at the cost of reduced political support from import-competers. This cost is the reason they are called concessions, contrary to economic rationality. The correspondence between the model and this stylization of the politics behind these GATT/WTO norms adds credibility to the causal logic captured by the model.

As this suggests, the theory provides a useful foundation for further research. First, this approach brings both protection and reciprocity treaties within a single model. Domestic-level theories in particular usually focus on only one of these two aspects of trade policy. To the extent that they are unable to explain the commercial agreements that determine the conventional tariffs of most countries, these theories do not really address tariff levels at all. In contrast, the model of domestic politics here illuminates a world in which foreign policy executives sign reciprocity treaties, such as the contemporary period.

APPENDIX

List of Variables

- BLGT.** Belgian average tariffs, customs revenue as a percentage of import volume.
BLGTINTER. Equal to zero if there is no Franco-Belgian tariff treaty, equal to BLGT otherwise.
FRN. French NNP.
FRNO. French imports as a percentage of NNP.
FRNGDP. French GDP.
GMV. German NNP.
GMVO. German imports as a percentage of NNP.
GMVOINTER. Equal to zero if there is no Franco-German tariff treaty, equal to GMVO otherwise.
ITL. Italian GDP.
ITLO. Italian imports as a percentage of GDP.
-

(continued)

APPENDIX Continued

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- ITLOINTER.** Equal to zero if there is no Franco-Italian tariff treaty, equal to ITLO otherwise.
- NTHT.** Dutch average tariffs, customs revenue as a percentage of import volume.
- NTHTINTER.** Equal to zero if there is no Franco-Dutch tariff treaty, equal to NTHT otherwise. Because NTHTINTER = NTHT throughout this period, the estimated models drop NTHT.
- SWD.** Swedish GDP.
- SWDO.** Swedish imports as a percentage of GDP.
- SWDOINTER.** Equal to zero if there is no Franco-Swedish tariff treaty, equal to SWDO otherwise.
- UK.** U.K. GDP.
- UKO.** U.K. imports as a percentage of GDP.
- UKOINTER.** Equal to zero if there is no Anglo-French tariff treaty, equal to UKO otherwise. Because UKO = UKOINTER throughout this period, the estimated models drop UKO.
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Economic data are taken from Imlah (1958) and Mitchell (1975) in millions of the local currency; treaty data are taken from Haight (1941) and Smith (1980).

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