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Retaliation, Liberalization, and Trade Wars:
The Political Economy of Nonstrategic Trade Policy

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Abstract

In this paper, we examine the dynamic process behind protection,
retaliation, and trade wars. Consistent with empirical evidence on the
development of trade policies, we model policy decisions as an outcome of
political contests within two trading nations, rather than as an outcome
of a strategic game between two governments. Uncertainty about the
incidence and success of retaliation yields a dynamic political
equilibrium in which one country imposes a tariff that increases gradually
over time. Eventually, the cost of the tariff to the other country's
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Under Section 301 of the Tariff and Trade Act of 1974 and Super 301 of the Omnibus Trade and Competitiveness Act of 1988, the U.S. government has demonstrated increased willingness to threaten retaliation against protected foreign markets. In 1992 alone, the United States—through the use of countervailing duties, antidumping actions, and other sanctions—threatened to retaliate against the European Community, Korea, and Japan in an attempt to improve its access to their markets.[1] In some cases, these threats have been successful. The threat to impose 200-percent duties on European white wine and other agricultural products generated significant pressure within the European Community to accept a compromise on reductions in agricultural subsidies. Similarly, threats against Korean exports of semiconductors led the Korean government to further open its domestic markets to foreign competition. However, retaliation is not always successful and in some cases has degenerated into a trade war.[2]

What generates the decision to retaliate, and when does retaliation bring about liberalization? Traditionally, this question has been addressed in the context of a strategic game between governments. In the game-theoretic approach to trade policy, a government retaliates, liberalizes, or follows a mixed strategy to maximize its own country's welfare.[3] However, as Stigler (1971), Peltzman (1976), and others have argued, governments seldom pursue policies designed to maximize social welfare. Rather, governments maximize their political support and, in doing so, implement policies that reflect the interests of the most

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[1] See Finger (1991) for a description of the retaliatory action the United States can take to improve its access to foreign markets.

[2] The Smoot-Hawley tariff of 1930 is an extreme example of retaliation and counterretaliation between the United States and its trading partners nearly halting world trade.

[3] See Richardson (1990) for a broad survey of the recent literature on strategic trade policy.

powerful and vocal self-interest groups. Indeed, although the case for strategic trade policy is appealing, the United States has rarely acted in this manner (Dixit 1987). The decision to retaliate against foreign nations is, arguably, as much an outcome of an endogenous political process as is the decision to implement tariffs and other trade policies.[4] The decision to retaliate, or the decision to liberalize in response to a threat of retaliation, is not determined by the exogenous objectives of the governments but, rather, is determined by the relative powers of competing interests within two countries.[5]

This paper examines the dynamic political process behind the decision to retaliate and the response to such threats of retaliation. We model the process of protectionism, liberalization, and retaliation as an interaction between the foreign political market for protection and the home country's decision to retaliate against that protection. In every period in which foreign protection rises, the benefits to the foreign import-competing firm increase, but the probability of retaliation is higher. The higher the probability of retaliation, the lower is the expected profit of the foreign exporting firm and the more this firm will lobby against trade barriers. This lobbying counteracts the pro-protection forces.

Like the development of foreign protection, the home country's decision to retaliate is based on the political interaction between its own import-competing and exporting firms. In every period, the home

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[4] For a survey of the literature on the political economy of trade protection, see Hillman (1989) or Quibria (1989).

[5] The majority of the literature concerning the political economy of protection is silent on the causes of trade liberalizations. Notable exceptions are Hillman and Moser (1993), who model trade liberalizations as agreements between two countries that trade market access, Grossman and Helpman (1993) who examine the development of trade policies in a two stage game between special interests and governments, and Cassing, McKeown, and Ochs (1986), who explain tariff cycles as changes in the political demands of import-competing interests and exporting interests at various stages of the business cycle. In contrast to this literature, we examine the dynamic political interaction between special interest groups, which can lead to gradual increases in protection, retaliation, and episodes of liberalization or trade wars.

country's import-competing firm lobbies for retaliation because retaliation may lead to a trade war and a domestic market insulated from foreign competition. However, the exporting firm will oppose retaliation until the foreign tariff is relatively high or the probability of a trade war is low.

An interesting result of the model is that it helps to explain gradual increases in protection and periodic episodes of liberalization. If foreign protection rises to such an extent that it induces a threat of retaliation from a nation with a substantial export market, foreign exporting interests will devote tremendous resources lobbying for free trade. This increased lobbying effort can generate an episode of liberalization. If uncertainty about the potential for retaliation remains, protection can subsequently rise until another credible threat of retaliation is made and the process is repeated. This behavior concords with the well-known observation that while protectionist policies are implemented on an industry basis and tend to increase gradually over time, trade liberalizations are usually implemented at discrete points of time and tend to reduce protection across many industries at once. Such liberalizations are often followed by subsequent protectionist pressures that may partially or completely reverse the original liberalization.[6]

This paper is organized as follows. In Section I, we set the background for the model and describe the industry structure and the behavior of firms. In Section II, we describe an electoral contest in the home country that determines the decision to retaliate, given the level of the foreign tariff and uncertainty about the success of retaliation. The dynamic political process that determines the foreign tariff is described in Section III. We conclude in Section IV with some implications of the model.

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[6] For example, see Marvel and Ray (1983) and Ray (1987).

I. Industry Structure and the Behavior of Firms

Consider trade between two countries (home and foreign) and two
industries. In each country there is an exporting firm and
import-competing firm. The home country exporting firm sends its entire
production to the foreign market and competes in that market with the
foreign import-competing firm. Likewise, the foreign exporting firm sends
its entire production to the home market and competes in that market with
the home country import-competing firm. In every period, firms make
production decisions and can observe how the market reacts to those
decisions before the beginning of the next period. Because all market
interactions take place within each period, for simplicity we exclude time
subscripts.

The goods produced by the home country exporting firm and the foreign
country import-competing firm are imperfect substitutes in consumption.[7]
In the foreign country, the demand for home country exports and
domestically produced goods are

$$P_x = a - \frac{b}{M} X + \gamma_x P_x^* \tag{1}$$
and
$$P_x^* = a - \frac{b}{M} X^* + \gamma_x P_x \tag{2}$$

where X (X^*) is the quantity of the home (foreign)-produced good supplied
to the foreign market, P_x (P_x^*) is the price of the home (foreign)-
produced good in the foreign market, and M is the size of the foreign
market. γ_x represents the substitutability in consumption between the two
goods ($0 \leq \gamma_x < 1$). The larger is γ_x, the greater will be the fall in
foreign demand for the home-country export good when the price of the
foreign-produced good decreases.[8] The parameters a and b are positive.

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[7] This market structure is similar to the one used by Hillman and Ursprung
(1988). They analyze the political choice between tariffs and voluntary
export restraints.

[8] For a discussion of the form of the utility function underlying these
demand functions, see Harris (1985).

The goods produced by the home country import-competing firm and the foreign country export firm are also imperfect substitutes in consumption. In the home country, the demand for domestically produced goods and foreign exports are

$$P_y = a - \frac{b}{N} Y + \gamma_y P_y^* \tag{3}$$

and

$$P_y^* = a - \frac{b}{N} Y^* + \gamma_y P_y \tag{4}$$

where Y (Y^*) is the quantity of the home (foreign)-produced good supplied to the home market, P_y (P_y^*) is the price of the home (foreign)-produced good in the home market, and N is the size of the home market. γ_y represents the substitutability in consumption between the two goods ($0 \leq \gamma_y < 1$).

Assume that there is no possibility for entry into an industry and that all firms have no costs of production.[9] Each firm within an industry selects an output level to maximize its profit, given the output level of its competitor. The home firm exporting to the foreign country faces a specific tariff, t_x^*, while the foreign firm exporting to the home country faces a specific tariff, t_y.

The Nash equilibrium profit function of the home exporting firm is

$$\Pi_x(\beta_x^*) = \frac{M[(1 + \gamma_x)a^2](1 - \beta_x^*)^2}{b(1 - \gamma_x)(2 + \gamma_x^2)} \tag{5}$$

and the profit function of the foreign import-competing firm is

$$\Pi_x^*(\beta_x^*) = \frac{M[(1 + \gamma_x)a^2](1 + \frac{\gamma_x \beta_x^*}{2})^2}{b(1 - \gamma_x)(2 + \gamma_x^2)} \tag{6}$$

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[9] This assumption is made for simplicity. The results from the model still hold if one assumes constant nonzero costs of production.

where $\beta^*_x = t^*_x / \bar{t}^*_x$ is the foreign tariff as a proportion of the prohibitive tariff, $\bar{t}^*_x$.[10]

In the other industry, the profit function of the home import-competing firm is

$$\Pi_y(\beta_y) = \frac{N[(1 + \gamma_y)a^2](1 + \frac{\gamma_y \beta_y}{2})^2}{b(1 - \gamma_y)(2 + \gamma_y)^2} \tag{7}$$

and the profit function of the foreign exporting firm is

$$\Pi^*_y(\beta_y) = \frac{N[(1 + \gamma_y)a^2](1 - \beta_y)^2}{b(1 - \gamma_y)(2 + \gamma_y)^2} \tag{8}$$

where β_y is the home tariff as a proportion of the prohibitive tariff.

As displayed in Figure 1, the profit of the foreign import-competing firm is increasing in the foreign tariff, β^*_x, and the profit of the home exporting firm is decreasing in β^*_x. Both profit functions are strictly convex. An increase in the foreign tariff entices foreign consumers to substitute away from the imported good toward their own domestically produced good. This substitution increases the output and profit levels of the foreign import-competing firm at the expense of the home exporting firm. The larger is γ_x, the greater will be the substitution toward the foreign-produced good and the larger will be the impact of an increased tariff on profit (i.e., $\delta^2 \Pi^*_x / \delta\beta^*_x \delta\gamma_x > 0$ and $\delta^2 \Pi_x / \delta\beta^*_x \delta\gamma_x < 0$).

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[10]The prohibitive foreign tariff (i.e., the tariff that makes it unprofitable for the home exporting firm to supply any quantity to the foreign market) is $\bar{t}^*_x = (2 - \gamma_x)a / 2(1 - \gamma_x)$, while the prohibitive home tariff is $\bar{t}_y = (2 - \gamma_y)a / 2(1 - \gamma_y)$.

II. The Electoral Contest in the Home Country and the Decision to Retaliate

Initially, assume that trade between the two countries is free of tariffs, but then the foreign country decides to impose a tariff on the home country's exports to the foreign market. How will the home country respond to foreign tariffs on its exports?

Because a foreign tariff reduces the access of the home exporting firm to the foreign market, the home country decides whether to retaliate. Both the level of the foreign tariff and the decision to retaliate are determined by electoral contests within the two countries.[11] Decisions to lobby for or against a tariff are made under uncertainty about whether the tariff will incite retaliation and whether the retaliation will be successful. In this section, we consider the political choice within the home country to retaliate in response to a foreign tariff. This is followed by an analysis of the determination of the foreign tariff itself.

The decision by the home country to retaliate is determined by an electoral contest between two political parties.[12] To distinguish the political parties, assume that one party (the protectionist party) is predisposed toward retaliation while the other party (the liberal trade party) is predisposed toward a policy of no retaliation. This means that if the two parties adopt different policies, the protectionist party will propose retaliation and the liberal trade party will propose a policy of no retaliation. However, just because the liberal trade party has a predisposition for no retaliation, this does not mean it will exclude retaliation as a platform. It may adopt the platform of the protectionist party if that is the policy which will maximize its political support.

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[11]The only policy instrument available to the politicians is a specific tariff. Issues relating to the choice of the policy instrument are not considered in this paper.

[12]The essential feature here is that the decision to retaliate is the outcome of the political process in the home country and is not generated by a strategic game between the home government and the foreign government. See Riezman (1982) for an analysis of the use of retaliation in a strategic game.

The aim of each political party is to maximize its probability of election, which is determined by the campaign contributions received from the home country firms.[13] The political parties have a discrete policy choice between retaliation (R) and no retaliation (NR) *given* the foreign tariff, β_x^*. Retaliation involves setting a prohibitive tariff ($\beta_y = 1$), which is removed if the foreign country liberalizes.[14] The decision not to retaliate leaves the home tariff unchanged ($\beta_y = 0$)

As we show below, retaliation can lead to one of two outcomes. Either the foreign country liberalizes, which reestablishes free trade (i.e., $\beta_x^* = 0$ and $\beta_y = 0$), or the foreign country counterretaliates which leads to a trade war and autarky (i.e., $\beta_x^* = 1$ and $\beta_y = 1$). The outcome of retaliation is unknown. Assume that the home firms believe the probability of successful retaliation is α ($0 \leq \alpha \leq 1$). If the home country retaliates, the expected profit of the home import-competing firm is

$$\text{E}\Pi_y^R = \frac{N[(1 + \gamma_y)a^2]}{b(1 - \gamma_y)(2 + \gamma_y)^2}[1 + (1 - \alpha)\gamma_y(1 + \frac{\gamma_y}{4})] \tag{9}$$

and the expected profit of the home exporting firm is

$$\text{E}\Pi_x^R = \frac{\alpha M[(1 + \gamma_x)a^2]}{b(1 - \gamma_x)(2 + \gamma_x)^2} . \tag{10}$$

[13]The mechanism by which electoral success is determined in this paper is similar to the one used by Hillman and Ursprung (1988). An alternative mechanism by which success in the electoral contest could be determined is majority voting. See Mayer (1984) and Mayer and Riezman (1987) for applications of the majority voting rule to the determination of tariffs.

[14]Given that the aim of retaliation is to encourage the foreign country to liberalize, a political party will not propose a retaliatory tariff below the prohibitive tariff. The proof of this proposition is available from the authors on request.

If the home country does not retaliate, the profits of the two firms
are

$$\Pi_y^{NR} = \frac{N[(1 + \gamma_y)a^2]}{b(1 - \gamma_y)(2 + \gamma_y)^2} \qquad (11)$$

and

$$\Pi_x^{NR} = \frac{M[(1 + \gamma_x)a^2](1 - \beta_x^*)^2}{b(1 - \gamma_x)(2 + \gamma_x)^2} . \qquad (12)$$

Assuming risk neutrality, the home import-competing firm will prefer
a policy of retaliation independently of the level of β_x^* (i.e., $E\Pi_y^R > \Pi_y^{NR}$
for all β_x^*). However, the home exporting firm will have a larger expected
profit under retaliation only if β_x^* is greater than $[1 - (\alpha)^{1/2}]$. In the
case in which the interests of the firms are opposed, the decision to
retaliate will be the outcome of an electoral contest. Assuming that the
parties propose different policies, the profits of the firms will depend
on the outcome of the election, and they will contribute to the campaign
of one of the two political parties. The probability that the liberal
trade party wins the election is given by

$$\theta = \frac{L_x}{L_x + L_y} \qquad (13)$$

where L_x is the campaign contribution of the home exporting firm to the
liberal trade party and L_y is the campaign contribution of the home
import-competing firm to the protectionist party.[15]

The import-competing firm will select L_y to maximize

$$E\Pi_y = \theta\Pi_y^{NR} + (1 - \theta)E\Pi_y^R - L_y . \qquad (14)$$

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[15]Foreign interests cannot directly influence the outcome of the contest by
contributing to the campaigns of the home political parties. Hillman and
Ursprung (1988) develop a model in which foreign firms contribute to the
political party pre-disposed to a liberal trade policy and hence influence
the choice of policy instrument.

Setting $\delta E\Pi_y / \delta L_y$ equal to zero yields a campaign contribution, given L_x, of

$$L_y = -L_x + [L_x(E\Pi_y^R - \Pi_y^{NR})]^{1/2} \ . \tag{15}$$

Similarly, the home exporting firm's reaction function is

$$L_x = -L_y + [L_y(\Pi_x^{NR} - E\Pi_x^R)]^{1/2} \ . \tag{16}$$

Solving for the Nash equilibrium levels of L_y and L_x, given these policy decisions, yields

$$L_y(NR,R) = \frac{\Delta E\Pi_x \, \Delta E\Pi_y^2}{(\Delta E\Pi_x + \Delta E\Pi_y)^2} \tag{17}$$

and

$$L_x(NR,R) = \frac{\Delta E\Pi_y \, \Delta E\Pi_x^2}{(\Delta E\Pi_x + \Delta E\Pi_y)^2} \tag{18}$$

where $\Delta E\Pi_y = E\Pi_y^R - \Pi_y^{NR}$ and $\Delta E\Pi_x = \Pi_x^{NR} - E\Pi_x^R$.

PROPOSITION 1: *Given the policy choice between retaliation and no retaliation, the political equilibrium will be one in which the home political parties propose the same policy. This policy will depend on the level of the foreign tariff.*

PROOF:

Consider separately the cases in which the interests of the home firms coincide and diverge.

(Case A) $\beta_x^* > 1 - (\alpha)^{1/2}$.

In this case, both the import-competing firm and the exporting firm prefer a policy of retaliation. This policy will be proposed by both

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parties.

(Case B) $\beta_x^* < 1 - (\alpha)^{1/2}$.

In this case, the import-competing firm prefers a policy of retaliation, while the exporting firm prefers a policy of no retaliation. The policy will be decided by the outcome of the electoral contest described above. To demonstrate that the political equilibrium involves both parties advocating the same policy, we initially assume that they propose different policies and show that this cannot be an equilibrium. If the parties propose different policies, the odds of the protectionist party being successful in the contest are given by

$$S(NR,R) = \frac{1-\theta}{\theta} = \frac{L_y(NR,R)}{L_x(NR,R)} = \frac{\Delta E\Pi_y}{\Delta E\Pi_x} = \frac{NB(1 - \alpha)\gamma_y(1 + \frac{\gamma_y}{4})}{MA[(1 - \beta_x^*)^2 - \alpha]} \qquad (19)$$

where $A = (1 - \gamma_y)(1 + \gamma_x)(2 + \gamma_y)^2$ and $B = (1 - \gamma_x)(1 + \gamma_y)(2 + \gamma_x)^2$.

Solving for $S(NR,R) = 1$ gives a critical tariff, b_x^*:

$$b_x^* = 1 - [\alpha + (1 - \alpha)\frac{NB\gamma_y(1 + \frac{\gamma_y}{4})}{MA}] \qquad (20)$$

If $\beta_x^* > b_x^*$, the odds of the protectionist party winning the election are greater than 1-to-1; if $\beta_x^* < b_x^*$, the liberal trade party has a greater chance of electoral success. Because the aim of the political parties is to select a policy to maximize their political support, an outcome in which the parties propose different policies cannot be a political equilibrium. They will both propose the same platform to maximize their political support. For example, if $\beta_x > b_x^*$, and the liberal trade party chooses a platform of no retaliation, the party will have less than a 1-to-1 chance of electoral success. However, if the liberal trade party chooses the same policy as the protectionist party, firms will be indifferent between the parties, and the liberal party will have an equal

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chance of electoral success.[16] Consequently, the liberal trade party will alter its policy to match that of the protectionist party (i.e., it will advocate retaliation). Likewise, if $\beta_x < b_x^*$, the protectionist party will increase its chances in the election by altering its retaliation policy to one of no retaliation. So, there are two possible outcomes:[17]

$$\beta_x > 1 - [\alpha + (1 - \alpha)\frac{NB\gamma_y(1 + \frac{\gamma_y}{4})}{MA}] \qquad \text{(Retaliation)}.$$

$$\beta_x < 1 - [\alpha + (1 - \alpha)\frac{NB\gamma_y(1 + \frac{\gamma_y}{4})}{MA}] \qquad \text{(No retaliation)}.$$

III. The Electoral Contest in the Foreign Country and the Dynamic Tariff Equilibrium

The level of the foreign tariff is determined by an electoral contest between a foreign protectionist party and a foreign liberal trade party. The liberal trade party selects a level of the foreign tariff, β_{x0}^*, to maximize its probability of election, while the protectionist party selects the tariff level, β_{x1}^*. It is assumed that the liberal trade party has a predisposition for lower tariffs, so $\beta_{x0}^* \leq \beta_{x1}^*$. The probability that the liberal trade party wins the election is

$$\theta^* = \frac{L_y^*}{L_y^* + L_x^*} \qquad (21)$$

where L_y^* is the campaign contribution of the foreign exporting firm to the liberal trade party and L_x^* is the campaign contribution of the foreign

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[16]S(R,NR) is defined only if the parties adopt different policies. If both parties propose the same policy, them $\Delta E\Pi_x = \Delta E\Pi_y = 0$, which implies that S is not defined.

[17]The probability that $\beta_x^* - b_x^*$ lies in a set of measure zero, so this outcome is ignored.

import-competing firm to the protectionist party. The liberal trade party selects a tariff to maximize θ^*, while the protectionist party proposes a tariff to maximize $(1 - \theta^*)$.

While the foreign firms are aware that a tariff may generate a retaliatory response, they are uncertain of the tolerance level of the home country.[18] As shown above, the home country will only retaliate if the foreign tariff exceeds the critical tariff, b_x^*. Formally,

$$\beta_y = 1 \quad \text{if } \beta_x^* \geq b_x^*, \tag{22}$$

$$\beta_y = 0 \quad \text{if } \beta_x^* < b_x^*. \tag{23}$$

The foreign firms do not know b_x^* and assume that it has the following cumulative probability density:

$$F(b_x^*) = b_x^{*2} \qquad b_x^* \in [0,1]. \tag{24}$$

Consequently, for a given foreign tariff level, β_x^*, the foreign exporting firm believes that the probability of retaliation is β_x^{*2}. If the home country retaliates, the foreign exporting firm is excluded from the home market and earns zero profit. In the event retaliation is avoided, the foreign exporting firm faces a zero tariff and earns profit of $\Pi_y^*(0)$. Consequently, the expected profit of the foreign exporting firm for a given tariff, β_x^*, is

$$E\Pi_y^*(\beta_x^*) = (1 - \beta_x^{*2})\Pi_y^*(0) = \frac{N[a^2(1 + \gamma_y)](1 - \beta_x^{*2})}{b(1 - \gamma_y)(2 + \gamma_y)^2} \tag{25}$$

The potential for retaliation yields a direct relationship between the foreign tariff and the expected profit of the foreign exporting firm.

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[18]The actual imposition of a retaliatory tariff need not occur. All that is required is the credible announcement that retaliation will occur. Depending on the consequent actions of the foreign country, the imposition of a retaliatory tariff may not occur.

As depicted in Figure 2, the expected profit of this firm is a decreasing concave function of the tariff. Furthermore, the larger is the substitutability between foreign and home country products, γ_y, the more valuable is access to the home market for the foreign exporting firm and, hence, the larger will be the rate of decline of its expected profit as the foreign tariff increases (i.e., $\delta^2 E\Pi_y^* / \delta\beta_x^* \delta\gamma_y < 0$). On the other hand, the profit of the foreign import-competing firm is increasing in the tariff.

Because the profit of foreign import-competing and export firms depend on the foreign tariff, the firms contribute to the campaigns of the two political parties. For given policy pronouncements of protectionist and liberal trade parties, the campaign contributions of the foreign import-competing firm and foreign exporting firm are

$$L_x^*(\beta_{x0}^*, \beta_{x1}^*) = \frac{\Delta E\Pi_y^* \, \Delta\Pi_x^{*2}}{(\Delta\Pi_x^* + \Delta E\Pi_y^*)^2} \tag{26}$$

and

$$L_y^*(\beta_{x0}^*, \beta_{x1}^*) = \frac{\Delta\Pi_x^* \, \Delta E\Pi_y^{*2}}{(\Delta\Pi_x^* + \Delta E\Pi_y^*)^2} \tag{27}$$

where $\Delta\Pi_x^* = \Pi_x^*(\beta_{x1}^*) - \Pi_x^*(\beta_{x0}^*)$ and $\Delta E\Pi_y^* = E\Pi_y^*(\beta_{x0}^*) - E\Pi_y^*(\beta_{x1}^*)$.

Define $S^*(\beta_{x0}^*, \beta_{x1}^*)$ as the odds that the protectionist party wins the election:[19]

$$S^*(\beta_{x0}^*, \beta_{x1}^*) = \frac{L_x^*(\beta_{x0}^*, \beta_{x1}^*)}{L_y^*(\beta_{x0}^*, \beta_{x1}^*)} = \frac{\Delta\Pi_x^*}{\Delta E\Pi_y^*} . \tag{28}$$

The protectionist party will select its proposed tariff, β_{x1}^*, to

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[19] $S^*(\beta_{x0}^*, \beta_{x1}^*)$ is defined only if $\beta_{x0}^* \neq \beta_{x1}^*$ (which, in this model, implies $\beta_{x0}^* < \beta_{x1}^*$). If $\beta_{x0}^* = \beta_{x1}^*$, then $\Delta\Pi_x^* = \Delta E\Pi_y^* = 0$, and S^* is not defined.

maximize its odds of electoral success, *given* the proposed tariff of the liberal trade party, β^*_{x0}. Likewise, the liberal trade party will select its proposed tariff, β^*_{x0}, *given* the proposed tariff of the protectionist party, β^*_{x1}, to maximize its chance of political success. The political equilibrium will occur when neither party finds it in its interests to alter its tariff policy.

The foreign tariff consistent with the political equilibrium in this model is not static. The equilibrium tariff changes from one period to the next, depending on the home country's retaliation response in the previous period. If the previous tariff was less than the critical tariff, b^*_x, there is no retaliation, and some information is gained about the home country's tolerance level of the foreign tariff. If, on the other hand, the home country retaliates, the foreign political balance changes as the foreign exporting firm now observes with certainty that its profit will be zero if the present tariff level stays the same or increases.

A. *Equilibrium in the First Period*

PROPOSITION 2: *In the first period, the foreign political equilibrium will be a Hotelling's equilibrium, in which the tariffs selected by the foreign political parties converge.*

PROOF:

Assume that the parties announce different tariffs $(\beta^*_{x1} > \beta^*_{x0})$. Is it in the interests of the two parties to increase or decrease their tariffs?

The protectionist party will select its proposed tariff, β^*_{x1}, to maximize S^*, while the liberal trade party will select its proposed tariff, β^*_{x0}, to minimize S^*, where

$$S^*(\beta^*_{x0}, \beta^*_{x1}) = \frac{MA[4\gamma_x + \gamma_x^2(\beta^*_{x1} + \beta^*_{x0})]}{4NB(\beta^*_{x1} + \beta^*_{x0})} \quad . \tag{29}$$

It is easy to show that

$$\frac{\delta S^*}{\delta \beta^*_{x1}} = \frac{\delta S^*}{\delta \beta^*_{x0}} = \frac{-MA\gamma_x}{NB(\beta^*_{x1} + \beta^*_{x0})^2} < 0 \quad . \tag{30}$$

Consequently, the protectionist party will increase its probability of election by decreasing its proposed tariff towards the liberal party's proposed tariff for any proposed tariff, β^*_{x1}, which is greater than the liberal party's proposed tariff, β^*_{x0}. Likewise, the liberal trade party, will find that it is in its own best interests to increase its proposed tariff, β^*_{x0}, toward β^*_{x1} for any β^*_{x0} less than β^*_{x1}. As a result, the tariffs announced by the two parties converge and, hence, the equilibrium will be a Hotelling's equilibrium.

PROPOSITION 3: *Among the set of all common tariff policies, the only common tariff that is consistent with political equilibrium is* $\bar{\beta}^*_x$, *such that* $\delta\Pi^*_x / \delta\beta^*_x = |\delta E\Pi^*_y / \delta\beta^*_x|$.

PROOF:

If both parties propose the same tariff, $(\beta^*_{x0} = \beta^*_{x1} = \hat{\beta}^*_x)$ then foreign firms will be indifferent between the two parties and both parties will have an equal chance of electoral success. However, proposing the same tariff will only be an equilibrium if neither party can gain political support by deviating from the common tariff.

In order for a party to gain political support and increase its probability of election, it must be able to deviate from the common tariff, $\hat{\beta}^*_x$, and improve its odds of election above 1-to-1. We know from Proposition 2 that if it is in the interests of either party to deviate, the deviation will be only a small amount (i.e., if $S^*(\hat{\beta}^*_x, \hat{\beta}^*_x + \epsilon) > 1$ for any positive ϵ, it will be so for ϵ close to zero). However, if any party alters its original tariff from β^*_x to $\hat{\beta}^*_x + \epsilon$, this will result in a difference in the profits of the foreign firms under the alternative policies. This difference will generate campaign contributions. In the case of the protectionist party, the only way for it to generate more contributions than the liberal trade party is if the marginal increase in

the profit of the import-competing firm is greater than the marginal fall in the expected profit of the exporting firm from an increase in the tariff, $\delta \Pi_x^* / \delta \beta_x^* > |\delta E \Pi_y^* / \delta \beta_x^*|$. But this cannot be an equilibrium because the liberal trade party would then want to change its policy to match that of the protectionist party. Consequently, a common tariff in which the marginal increase in profit of the import-competing firm is greater than the marginal decrease in the profit of export firm from an increase in the tariff, $\delta \Pi_x^* / \delta \beta_x^* > |\delta E \Pi_y^* / \delta \beta|$, cannot be an internal equilibrium. Similarly, if $\delta \Pi_x^* / \delta \beta_x^* < |\delta E \Pi_y^* / \delta \beta_x^*|$, the liberal trade party will have an incentive to change its proposed tariff at the margin and, hence, this also cannot be an internal equilibrium. Only if $\delta \Pi_x^* / \delta \beta_x^* = |\delta E \Pi_y^* / \delta \beta_x^*|$, then neither party has an incentive to deviate from the common tariff.

Solving for the equilibrium tariff gives

$$\tilde{\beta}_x^* = \frac{2 M \gamma_x A}{4NB - M\gamma_x^2 A} .$$ (31)

The tariff equilibrium is depicted in Figure 3.[20] The size of the equilibrium tariff depends on the substitutability of the home and foreign-produced goods in the two markets (γ_x and γ_y), as well as on the market sizes (M and N). The higher the degree of substitutability between home-country exports and foreign import-competing products, γ_x, the greater will be the gain to the foreign import-competing firm from an increase in the tariff. This substitutability increases the willingness of the firm to contribute to the protectionist party, resulting in a larger equilibrium tariff. On the other hand, the larger is the degree of substitutability between home country import-competing products and foreign exports, γ_y, the greater is the expected loss to the foreign exporting firm from an increase in the tariff. As the foreign exporting firm stands to lose more from retaliation, increases in the tariff are

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[20]For $\tilde{\beta}_x^*$ to be an internal tariff, it must be the case that
$4NB > 2MA\gamma_x + MA\gamma_x^2$.

strongly opposed through larger contributions to the liberal trade party.
This acts to reduce the equilibrium tariff. Market size also plays an
important role in determining the size of the equilibrium tariff. The
larger is the foreign market (M), the more valuable is the tariff to the
foreign import-competing firm. This increases the equilibrium tariff.
However, the larger is the home market (N), the greater is the loss to the
foreign exporting firm if it is denied market access through retaliation.
This, in turn, decreases the equilibrium tariff.

B. *Equilibrium in the Second Period*

After imposition of the tariff by the foreign country, the home
country will decide to retaliate, or not to retaliate, depending on the
relative size of foreign tariff, $\tilde{\beta}_x^*$, and the home-country critical tariff
b_x^*. In either case, the initial political equilibrium in the foreign
country will no longer be the initial tariff. The two cases will be
analyzed in turn.

(B.1) *Home country does not retaliate* $(\tilde{\beta}_x^* < b_x^*)$.

The fact that the home country does not retaliate yields information
about the critical tariff. The foreign firms realize that the critical
tariff, b_x^*, lies above the current tariff, $\tilde{\beta}_x^*$. This realization alters
their belief about the probability of retaliation. It is now known that
$b_x^* \in [\tilde{\beta}_x^*, 1]$. The probability of retaliation becomes
$(\beta_x^* - \tilde{\beta}_x^*)^2 / (1 - \tilde{\beta}_x^*)^2$, which is between 0 and 1 for $\beta_x^* \in [\tilde{\beta}_x^*, 1]$ and
strictly increasing in β_x^*.

The expected profit of the foreign exporting firm becomes

$$E\Pi_y^{*'}(\beta_x^*) = \Pi_y(0) \qquad \text{for } \beta_x^* \leq \tilde{\beta}_x^* \qquad (32)$$

and

$$E\Pi_y^{*'}(\beta_x^*) = [1 - \frac{(\beta_x^* - \tilde{\beta}_x^*)^2}{(1 - \tilde{\beta}_x^*)^2}]\Pi_y^*(0) \qquad \text{for } \beta_x^* > \tilde{\beta}_x^* \qquad (33)$$

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The revised expected profit function is displayed in Figure 3. The equilibrium tariff is no longer the original tariff, $\tilde{\beta}_x^*$. At $\tilde{\beta}_x^*$, we find $\delta\Pi_x^* / \delta\beta_x^* > |\delta E\Pi_y^* / \delta\beta_x^*|$, indicating that any increase in the tariff will raise the profit of the foreign import-competing firm by more than it decreases the expected profit of the foreign exporting firm. Consequently, if the protectionist party increases its proposed tariff, β_{x1}^*, above $\tilde{\beta}_x^*$, the party will increase its probability of election. As the protectionist party increases its tariff, the liberal trade party will follow. A new internal equilibrium $(\tilde{\beta}_x^*)$ will be established at the point $\delta\Pi_x^* / \delta\beta_x^* = |\delta E\Pi_y^{*\prime} / \delta\beta_x^*|$. Solving gives $\tilde{\beta}_x^* = C\tilde{\beta}_x^*$, where

$$
C = \frac{4NB\tilde{\beta}_x^* + 2MA\gamma_x(1 - \tilde{\beta}_x^*)^2}{4NB\tilde{\beta}_x^* - MA\gamma_x^2\,\tilde{\beta}_x^*(1 - \tilde{\beta}_x^*)^2}
\tag{34}
$$

If $\tilde{\beta}_x^*$ is strictly an internal tariff, then $C \in [1,2]$. The political process will generate a less than proportionate increase in the tariff. This less than proportionate increase in the tariff will continue so long as there is no retaliation.

(B.2) *Home country retaliates* $(\tilde{\beta}_x^* \geq b_x^*)$.

If the home country retaliates, the foreign country faces the following trade-off:

$$
\beta_y = 1 \text{ if } \beta_x^* > 0.
\tag{35}
$$

$$
\beta_y = 0 \text{ if } \beta_x^* = 0.
\tag{36}
$$

Consequently, the foreign exporting firm knows that its profit will be zero if the tariff does not fall and will be positive if the foreign country liberalizes and removes its tariff:

$$
\Pi_y^*(\beta_x^*) = 0 \text{ for all } \beta_x^* > 0.
\tag{37}
$$

$$
\Pi_y^*(\beta_x^*) = \Pi_y^*(0) \text{ if } \beta_x^* = 0.
\tag{38}
$$

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PROPOSITION 4: *If the home country retaliates, the foreign political equilibrium will be one in which the political parties will announce a common tariff. This common tariff will either permit free trade or generate a trade war and totally prohibit trade.*

PROOF:

As before, the protectionist party and the liberal trade party will announce their proposed tariffs β_{x1}^* and β_{x0}^*, respectively, to maximize (minimize) S^*, where

$$
S^*(\beta_{x0}^*, \beta_{x1}^*) = \frac{\Pi_x^*(\beta_{x1}^*) - \Pi_x^*(\beta_{x0}^*)}{\Pi_y^*(\beta_{x0}^*) - \Pi_y^*(\beta_{x1}^*)} = \frac{\Delta\Pi_x^*}{\Delta\Pi_y^*}. \tag{39}
$$

Suppose that the parties announce different tariffs $(\beta_{x1}^* > \beta_{x0}^*)$. Is it in the interests of the two parties to increase or decrease their announced tariffs?

If both parties announce different, but greater than zero, tariff policies $(\beta_{x1}^* > \beta_{x0}^* > 0)$, the profit of the foreign exporting firm will be zero in either case because of the prohibitive retaliatory tariffs (i.e., $\Pi_y^*(\beta_{x0}^*) - \Pi_y^*(\beta_{x1}^*) = 0$). Hence, the liberal trade party will not elicit any campaign contributions. But because the protectionist party's proposed tariff is positive and greater than the liberal trade party's tariff $(\beta_{x1}^* > \beta_{x0}^*)$, the protectionist party will attract all the campaign contributions from the foreign import-competing firm. Consequently, for any policies announced by the parties which are both greater than zero $(\beta_{x1}^* \neq \beta_{x0}^* > 0)$, the protectionist party will always win the election. The only way in which the liberal trade party can elicit campaign contributions is to set its proposed tariff equal to zero $(\beta_{x0}^* = 0)$, which yield positive profit for the export firm. This generates the result that if the protectionist party proposes a positive tariff, the liberal trade party will only propose a zero tariff and opt for complete free trade (i.e., $\beta_{x0}^* = 0$ for any β_{x1}^*).

However, is it the case that protectionist party will propose a trade

war if the liberal party opts for free trade?. If the liberal trade party sets its proposed tariff equal to zero ($\beta_{x0}^* = 0$), then the odds of the protectionist party winning the election are

$$S^*(0,\beta_{x1}) = \frac{\Pi_x^*(\beta_{x1}) - \Pi_x^*(0)}{\Pi_y^*(0)} . \qquad (40)$$

By maximizing S^* (and, hence, its chance of election) the protectionist trade party will opt for a trade war and set its tariff to the prohibitive one ($\beta_{x1}^* = 1$). Consequently, if the liberal trade party opts for free trade, the protectionist party will propose a trade war.

If the protectionist party proposes a trade war and the liberal trade party opts for free trade, then odds that the protectionist party will win the election are:

$$S^*(0,1) = \frac{\Pi_x^*(1) - \Pi_x^*(0)}{\Pi_y^*(0) - \Pi_y^*(1)} = \frac{MA\gamma_x(1 + \frac{\gamma_x}{4})}{NB} . \qquad (41)$$

A political equilibrium will only be generated if neither party has an incentive to change its policy. The equilibrium, however, will only occur if both parties propose the same policy and each has a 50-percent chance of winning the election. There are only two possible outcomes; the liberal trade party changes its proposed policy and opts for a trade war, or the protectionist party proposes free trade,

If $S^*(0,1) > 1$, the liberal trade party has less than 50-percent chance of electoral success. It will alter its policy to match that of the protectionist party and opt for a trade war (i.e., $\beta_{x0}^* = 1$). On the other hand, if $S^*(0,1) < 1$, the protectionist party will increase its chance in the election by changing its original policy and propose free trade(i.e., $\beta_{x1}^* = 0$). The two possible equilibrium tariffs are[21]

$$\beta_{x1}^* = \beta_{x0}^* = 1 \text{ if } MA\gamma_x(1 + \frac{\gamma_x}{4}) > NB \quad \text{(Trade war)}.$$

$$\beta_{x1}^* = \beta_{x0}^* = 0 \text{ if } MA\gamma_x(1 + \frac{\gamma_x}{4}) < NB \quad \text{(Liberalization)}.$$

An interesting result is that retaliation will not always a move a country toward liberalization. It can have the perverse effect of inciting a trade war that pushes the countries toward autarky. For retaliation to achieve liberalization, it must be the case that

$$\frac{M}{N} < \frac{B}{A\gamma_x(1 + \frac{\gamma_x}{4})} \tag{42}$$

which depends on the substitutability of the commodities in the two markets and the relative market sizes. Both the size of the foreign market (M) and the substitutability of the foreign good for the home good (γ_x) increase the value of a closed market for the foreign import-competing firm. Consequently, the larger are these parameters, the greater is the likelihood of a trade war. On the other hand, the larger is the size of the home country's market (N) and the substitution parameter (γ_y), the more valuable is trade for the foreign exporting firm, and the greater is the likelihood of a liberalization.

IV. Some Implications of the Model

One result of the model is that it provides an alternative political rationale for tariff cycles. We often observe periods of gradually increasing protection followed by trade liberalizations, which are, in turn, reversed by further periods of increasing protection. Without altering the structure of the economy or the composition of coalitions, we find that protection may yield a retaliatory response and can generate a dynamic tariff equilibrium and episodes of trade liberalization. Uncertainty about the reaction of a trading partner to protection generates a political outcome in which the tariff increases over time at a decreasing rate until it is reversed by an episode of trade

liberalization. If the uncertainty concerning the incidence and the outcome of retaliation remains--because of changes in the characteristics of the home and foreign markets, for example--the tariff cycle will perpetuate. Of course, retaliation can also degenerate into a trade war, which is also an outcome of the model.

Another important finding is the positive role that large nations can play in maintaining an open world trading system. Despite the potential for free trade to maximize a country's aggregate welfare, incentives facing political parties lead them to design polices to gain the support of pro-protection interest groups. Without the discipline from trading partners, the political balance within a country will remain in favor of pro-protection interest groups, and policies inhibiting trade will remain. This model predicts, however, that trading partners, through the threat of retaliation, can alter the political balance in such a country and encourage liberalization. Such action is not without its potential costs. Retaliation may have the perverse effect of causing a trade war, which will further reduce access to foreign markets.

We show that there is an important role for nations with large markets, such as the United States, in maintaining a liberal world trading system. Because exporters have a great interest in maintaining access to a large market, big countries have the greatest power to encourage other countries to liberalize. This is consistent with the observations of Baldwin (1989), Keohane (1984), and Lipson (1982), who note that the trend toward a more liberalized trading environment since World War II may have been the result of the coercive hegemonic power of the United States. While it appears from recent experience that the United States is large enough to act as a hegemonic power in world trade, its relative size in the world market is diminishing. The absence of a single large country may partly explain the emergence of trading blocs. Large members because of their size, have the power to discipline smaller countries that attempt to cheat on trade agreements. However, in broader trading agreements, such as the General Agreement on Tariffs and Trade (GATT), a liberalized trading environment is more difficult to maintain because there is no single large country. This concords with recent experience in the Uruguay Round of the GATT.

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Figure 1

Profit Functions of the Home Exporting Firm (Π_x)
and the Foreign Import-Competing Firm (Π_x^*)
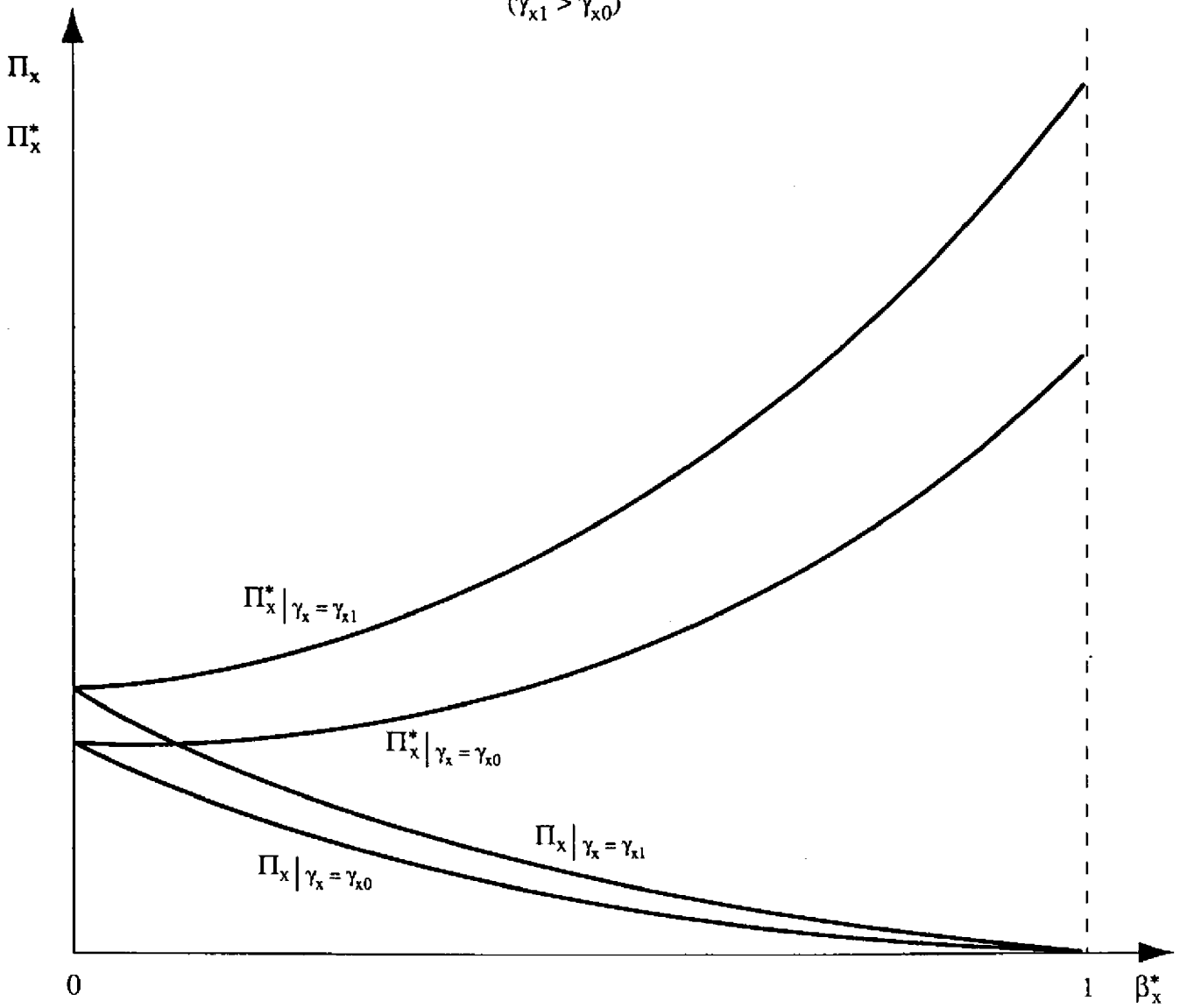
$(\gamma_{x1} > \gamma_{x0})$

Figure 2

Profit and Expected Profit Functions of the
Foreign Import-Competing Firm (Π_x^*) and Foreign Exporting Firm ($E\Pi_y^*$)

$$(\gamma_{x1} > \gamma_{x0},\ \gamma_{y1} > \gamma_{y0})$$
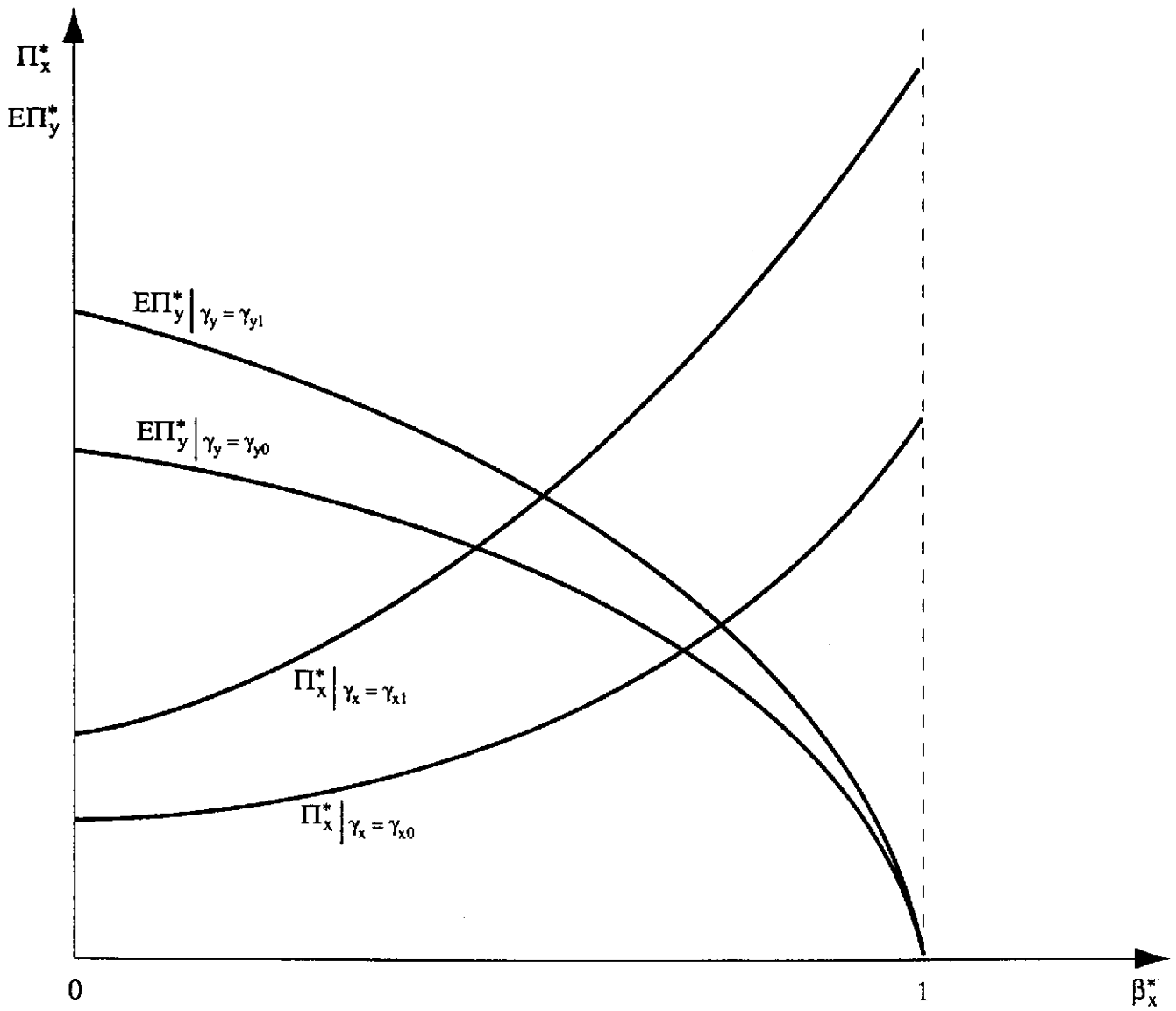
Figure 3

Dynamic Tariff Equilibrium in the Foreign Country
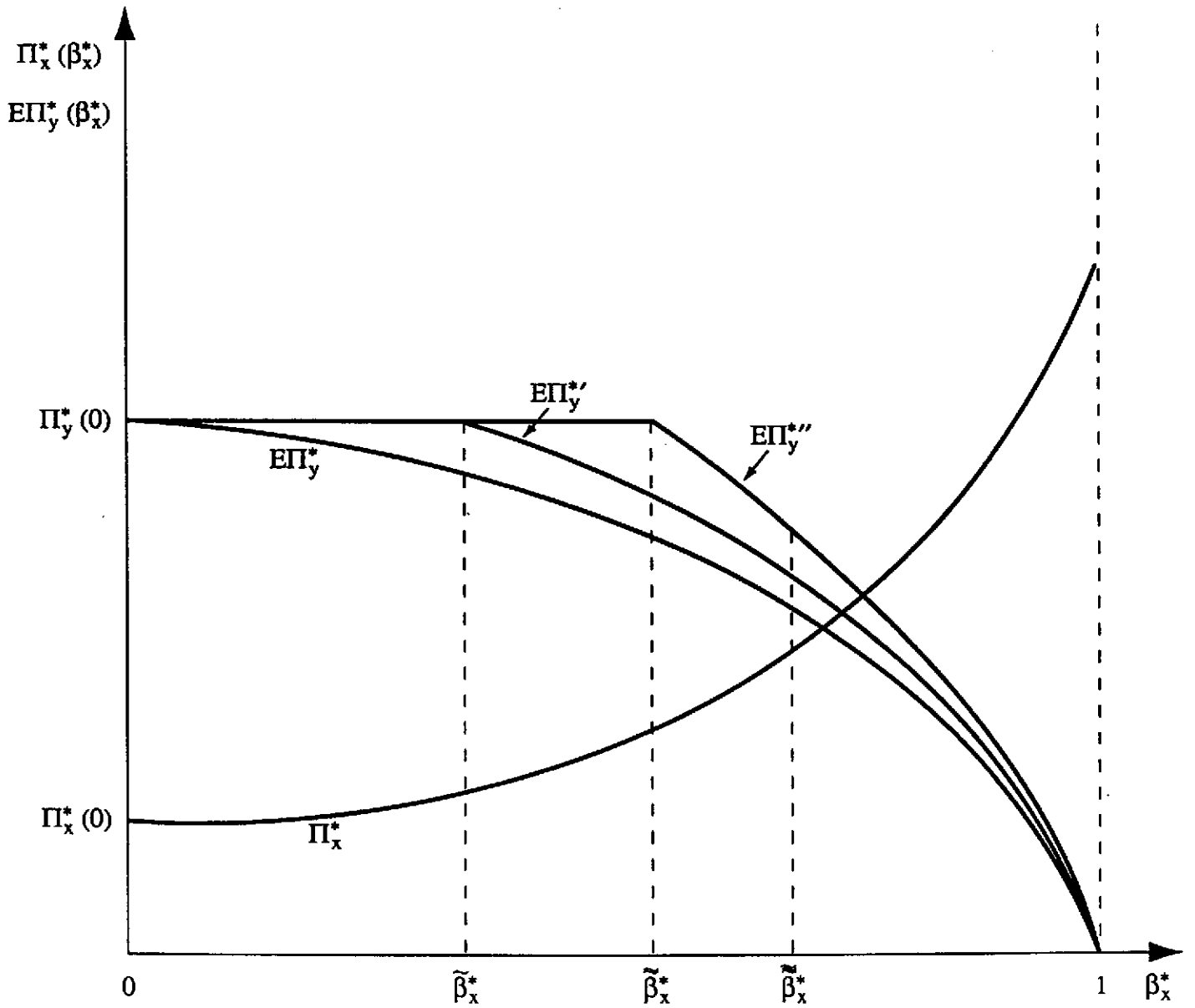
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