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"The Theory of Trade Policy and Trade Agreements: A Critique"

by

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Abstract: During the past half century, multilateral trade liberalization has reduced tariffs to historically low levels. The Received Theory of multilateral trade agreements, based solely on terms-of-trade externalities between national governments, offers an explanation that has become the conventional wisdom among international trade theorists. But it displays two puzzles that cast doubt on its practical relevance: the Terms-of-Trade Puzzle and the Anti-Trade-Bias Puzzle. This paper examines the consistency of the implications of the Received Theory with actual trade policy. The basic conclusion is that the theory is inconsistent with reality. Furthermore, it is the role of terms-of-trade externalities — the central component of the Received Theory — that is the *sole* cause of this inconsistency.

Outline:

The Theory of Trade Policy and Trade Agreements: A Critique

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A PROMINENT TWENTIETH-CENTURY ACCOMPLISHMENT of international trade theory was its theory of international trade policy and trade agreements. Building on Harry Johnson's classic paper (1953/54), scores of contributions developed and elaborated what can be called the "Received Theory". The deservedly influential work of Bagwell and Staiger (1999, 2002) may justly be seen as triumphantly completing the research agenda implied by Johnson nearly half a century earlier. The multilateral trade liberalization of the previous half century may well be the most successful deliberate exercise of economic policy in human history, so one could argue that understanding it is the most important task of applied economic theory.

A second strand[1] of the Received Theory, emphasizing political economy, emerged in the 1980s. Grossman and Helpman (2002) expound its most widely used component. The current state of the Received Theory is therefore conveniently described in two recent books by Bagwell and Staiger (2002) and Grossman and Helpman (2002).

However, two prominent puzzles draw into serious question the relation to reality of this theory. This paper examines the Received Theory to address these puzzles. In the process of doing so, a third puzzle emerges, and is also addressed. The basic result of this critique is that the Received Theory is dramatically inconsistent with reality. Thus, despite a half-century of work, we still lack a satisfactory framework for analyzing history's most significant example of deliberate economic policymaking.

I.   Introduction: Two Puzzles

The central premise of the Received Theory is that trade agreements arise *solely* because countries with market power are concerned, to at least *some* degree, with the fact that trade barriers, imposed for *whatever* reason, can move the terms of trade in their favor, shifting real income there from the rest of the world.

As pointed out in Ethier (2004), this is inconsistent with actual multilateral trade agreements, which do **not** prevent countries from trying to influence their terms of trade. I refer to this discrepancy as the *Terms-of-Trade Puzzle*.

Nothing in the GATT prevents a country from implementing export taxes. In their schedules of negotiated concessions, countries have bound their import taxes: They have *not*, with very rare exception, bound export taxes. If the EU, for example, were to decide, for *whatever* reason, to impose aggressively a set of export taxes that could improve its terms of trade, its outstanding multilateral trade obligations would *not* prevent it from doing so.

The more sophisticated and realistic contributions to the Received Theory — notably Bagwell and Staiger (1999, 2002) — do not assume that governments care only about

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[1] See Hillman (1982, 1990), Hillman, Long, and Moser (1995), and Hillman and Moser (1996). Surveys of the literature on the political economy of trade policy may be found in Hillman (1989), Magee (1994), Nelson (1988) and Rodrik (1995).

aggregate social welfare, but allow them to be concerned with any number of internal or political-economy objectives that relate to the domestic relative price of imports in terms of exports. This price can be manipulated unilaterally with trade policy, but, if a country has market power, such manipulation will impact the terms of trade, creating an international externality that shifts part of the cost of the policy onto the rest of the world. Dealing with this terms-of-trade externality is the *sole* reason for trade agreements in these models.[2]

A fascinating feature of the Terms-of-Trade Puzzle is that it has been consistently ignored in the international-trade-theory literature. For over four decades, successive GATT rounds have produced trade agreements that do not prevent terms-of-trade manipulation while trade theorists have produced theories of trade agreements in which such prevention is the sole object. More often than not, these theories have been based on two-good models in which an import tariff is completely equivalent to an export tax. Thus the GATT has been analyzed in a context in which the actual GATT would be completely meaningless! As far as I can tell, over these four decades no one has ever noted, addressed, or even expressed concern about this problem.

The Terms-of-Trade Puzzle is especially transparent in a two-good framework where Lerner symmetry guarantees that any policy goal pursued by controlling one commodity price can be completely undone by a change in the other commodity price, *provided* that the policy goal is influenced only by changes in relative prices.[3] But, the puzzle is not ameliorated in any degree whatsoever in a higher dimensional context.

Trade agreements typically involve countries binding import tariffs on thousands of goods. These necessarily have real effects: A country is constrained in its ability to attempt to influence the international relative price of one bound import in terms of another bound import. But they are not constrained in their ability to attempt to influence their terms of trade. Industrial countries (the active participants in the four decades of GATT rounds that reduced tariffs to historically low levels) have typically not bound *any* export taxes at all. Thus their trade agreements leave them free to attempt to manipulate (through export taxes) the international relative price of *any* export in terms of *any* import and, therefore, *any* index of their terms of trade. But, by and large, they refrain from doing so. Thus to assert, as does the

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[2]Although the Received Theory assigns the central role to terms-of-trade considerations, they are ignored virtually without exception by trade lawyers and policymakers. See Regan (2004) for an argument that neither the public rhetoric of trade, nor the specific provisions of trade agreements, nor the full range of policy behavior of countries, is well explained by terms-of-trade considerations.

[3]See Ethier (2004) for a case where trade policy goals depend on more than just relative commodity prices.

Received Theory, that the *sole* purpose of such agreements is to prevent such manipulation appears ludicrous.

Large countries will negotiate *only* trade agreements that constrain terms-of-trade manipulation. Trade agreements that do not do this would, *for no reason*, surrender the use of trade policy for domestic objectives. In reality we observe exactly the opposite. Countries negotiate trade agreements that do *not* prevent terms-of-trade manipulation, and *do not* negotiate multilateral agreements that would prevent it.

To summarize, there are two sides to the Terms-of-Trade Puzzle:

(i) Actual trade agreements do not prevent countries from manipulating their terms of trade with export taxes; (ii) Countries nevertheless do not, by and large, implement such taxes.

Both aspects are inconsistent with the Received Theory, built on the presumption that countries would be induced to so manipulate their terms of trade if allowed to do so, and that trade agreements exist *solely* to prevent this.

A second puzzle was emphasized by Rodrik in his survey (1995, p 1476-7): "why is trade policy systematically used to transfer resources to import-competing sectors and factors rather than to export-oriented sectors and factors?" He concludes, "[o]n this puzzle we get very little help from the literature." Indeed, Levy (1999, p 346-7) argues "that in a symmetric version of the Grossman and Helpman [1994, 2002] model, export subsidies exceed import tariffs in sectors with lobbies. ... Thus, this approach to modeling political economy may explain trade promotion rather than trade protection!" I call this the *Anti-Trade-Bias Puzzle*.

In sharp contrast to the Terms-of-Trade Puzzle, the Anti-Trade-Bias Puzzle has been widely recognized. But it has not been successfully addressed. Papers typically either ignore the problem or eliminate it by arbitrarily constraining the ability of the government to adopt export-promotion policies. One approach is simply to assume, in a political-economy model, that import-competing sectors organize politically while export sectors do not. This is convenient but arbitrary. Another approach rules out export subsidies by pointing to countervailing-duty laws, whose existence are not explained. I confess to having done this myself (in Ethier (2004)). This accords well with reality but the countervailing-duty laws are themselves essential components of the policy that is to be explained.

These two puzzles are not just puzzling with respect to the trade-theory literature: They're puzzling in relation to each other as well. A natural response to the Terms-of-Trade Puzzle would be to deny the practical importance of the terms-of-trade externalities upon which the

Received Theory has been erected. But the Received Theory can offer a ready potential explanation of the Anti-Trade-Bias Puzzle: terms-of-trade externalities!

Ethier (2004) argued that a theory of trade agreements based on political externalities not operating through price changes could resolve the Terms-of-Trade Puzzle. That paper assumed away terms-of-trade externalities. Here I confront the puzzles directly by using a microeconomic model in which countries affect each other only through price changes, as assumed by the Received Theory. I now explicitly allow export subsidies in order to address the Anti-Trade-Bias Puzzle.

The paper proceeds as follows. The next section describes an economic model, and the following section adds a model of lobbying. The latter is a version of the familiar model of Grossman and Helpman (1994, 2002), simplified as useful for my own purposes or for clarity. In a two-country context, this can in fact deliver trade agreements that do not necessarily constrain export taxes: With sufficiently important political externalities, countries *choose* not to tax exports. But then a third puzzle necessarily emerges. Parameter values simply determine which puzzle the model exhibits: It's inconsistent with reality in any case. To test whether this is due to the key component of the Received Theory, terms-of-trade effects, I then assume away the latter. When this is done, so that political externalities *completely* dominate terms-of-trade externalities (*i.e.*, the latter are ignored by all agents), the emasculated Received Theory finally becomes consistent with reality. The concluding section concludes.

II.   The Model: Economics

Assume two countries (*H*ome and *F*oreign), two factors (*K*apital and *L*abor), and three traded goods (*0*, *1*, and *2*). Good *0* is a numeráire good, produced by labor alone. Goods *1* and *2* are produced by capital and labor, with capital specific to each of these sectors. *H* imports good *1* and exports good *2*.

Ownership of each specific factor is distributed uniformly over a fraction α_i of the population (labor force), with each individual owning some of one of the specific factors. Normalize so that $L = 1 = \alpha_1 + \alpha_2$. Choose units so that a unit of good *0* is produced by a unit of labor. Thus, assuming good *0* is actually produced, the wage $w = 1$.

Each individual in each country has preferences that can be summarized by the utility function $U = c_0 + u_1(c_1) + u_2(c_2)$ where c_i denotes consumption of good i. This implies individual demand functions $d_i = d_i(Q_i)$, $i = 1, 2$, where Q_i denotes the relative price of good i in terms of good 0. Residual income is all spent on the numeráire good 0. I assume that endowments in both countries are such that each both produces and consumes good 0.

Each country may tax or subsidize either imports or exports. For H, let Q_i and P_i denote, respectively, the domestic and international relative price (in terms of the numeráire) of good i, and τ_i one plus the *ad-valorem* trade tax t_i. Thus $Q_1 = \tau_1 P_1$ and $Q_2 = P_2 / \tau_2$. Analogous F variables will be distinguished by asterisks.

International trade

Equilibrium in the world market for good *1* is represented by $M_1(\tau_1 P_1) = X_1^*(P_1 / \tau_1^*)$, where M_1 and X_1^* respectively denote H import demand and F export supply. H's import tax and F's export tax thus determine P_1, independently of sector *2*. This in turn implies the following.

$$\frac{\tau_1}{P_1}\frac{dP_1}{dt_1} = -\frac{e_1}{e_1 + f_1^*}$$

and

$$\frac{\tau_1}{Q_1}\frac{dQ_1}{dt_1} = \frac{\tau_1}{P_1}\frac{dP_1}{dt_1} + 1 = \frac{f_1^*}{e_1 + f_1^*}$$

where $e_1 \equiv -\dfrac{\tau_1 P_1 M_1'}{M_1} > 0$ and $f_1^* \equiv \dfrac{P_1 X_1^{*\prime}}{\tau_1^* X_1^*} > 0$.

Similarly, equilibrium in the world market for good *2* can be represented by $M_2^*(\tau_2^* P_2) = X_2(P_2 / \tau_2)$. Thus,

$$\frac{\tau_2}{P_2}\frac{dP_2}{dt_2} = \frac{f_2}{f_2 + e_2^*}$$

and

$$\frac{\tau_2}{Q_2}\frac{dQ_2}{dt_2} = \frac{\tau_2}{P_2}\frac{dP_2}{dt_2} - 1 = -\frac{\overset{\bullet}{e_2}}{f_2 + \overset{\bullet}{e_2}}.$$

H imports of good *1* need not equal in value *H* exports of good *2*: Trade balance is reached with a net exchange of good *0*.

The population consists of two groups, distinguished by which specific factor they own. The real income of each group is given by the following.

$$\tilde{W}_i = \alpha_i + \pi_i(Q_i) + \alpha_i R + \alpha_i \left[s_1(Q_1) + s_2(Q_2) \right] \tag{1}$$

Here π_i denotes the income of specific factor i, $R = t_1 P_1 M_1 + t_2 Q_2 X_2$ equals the trade tax revenue (redistributed to the populace in lump-sum fashion), and consumer surplus equals
$s_i(Q_i) = u_i(d_i(Q_i)) - Q_i d_i(Q_i)$.

Trade policy for welfare maximization

To establish a frame of reference, consider the trade policy that would maximize national welfare $\tilde{W} = \tilde{W}_1 + \tilde{W}_2$. Propositions 1 and 2 below, and much of the supplementary discussion, are due to Bagwell and Staiger (2001, pp 286–295). I repeat it now only to make the present paper internally comprehensible.

Noting that $\pi_i' = x_i$ (production of good i) and that $s_i' = -d_i$, the first-order condition for the optimal choice of t_1 is

$$\frac{d\tilde{W}}{dt_1} = -M_1\frac{dP_1}{dt_1} + P_1 t_1 M_1' \left[P_1 + \tau_1 \frac{dP_1}{dt_1} \right]$$

$$= \frac{Q_1 P_1}{\tau_1} M_1' \left\{ -\left(\frac{M_1}{-Q_1 M_1'} \right) \frac{\tau_1}{P_1}\frac{dP_1}{dt_1} + t_1 \left[1 + \frac{\tau_1}{P_1}\frac{dP_1}{dt_1} \right] \right\} = 0.$$

This in turn reduces to

$$t_1 = \frac{1}{f_1{}^*},$$

the familiar optimum-tariff formula. Similarly, the condition $d\widetilde{W}/dt_2 = 0$ reduces to

$$t_2 = \frac{1}{e_2{}^*}.$$

If both governments use trade policy to maximize national welfare, the Nash equilibrium in trade policy becomes the following.

$$t_1 = \frac{1}{f_1{}^*\left(t_1, t_1{}^*\right)} \qquad\qquad t_2 = \frac{1}{e_2{}^*\left(t_2, t_2{}^*\right)}$$

$$t_1{}^* = \frac{1}{e_1\left(t_1, t_1{}^*\right)} \qquad\qquad t_2{}^* = \frac{1}{f_2\left(t_2, t_2{}^*\right)}$$

(2)

Proposition 1 *With welfare-maximizing governments, the Nash equilibrium in trade policy is given by **(2)**. Each government taxes both imports and exports.*

Note the following.

Remark 1 *Because of separability, the Nash equilibrium* t_i *and* $t_i{}^*$ *are jointly determined, for each i, independently of the other two trade taxes.*

Remark 2 *Because the model has three traded goods, in the Nash Equilibrium each country taxes* both *imports and exports of non-numeráire goods.*

III.   The Model: Lobbying

I now introduce the political-economy side of my model. For this I use a simplified version of the now-familiar model of Grossman and Helpman (1994, 2002).

Lobbies

I assume that α_1 and α_2 each organizes a lobby to bargain with the government over trade policy and lobby contributions. Grossman and Helpman (1994) allow some sectors to be organized and some not, but, since I wish to address the Anti-Trade-Bias Puzzle, it would not do to pre-determine the outcome by assuming that one sector organizes and one does not.

As Austen-Smith (1991, p 84) points out, " … lobbying activity is predominantly not financial, but rather to do with information transmission." In a world of imperfect information, a critical function of lobbying is to convey to the government information relevant to possible policy choices. Each lobby possesses inside information regarding its own industry and, therefore, presumably has a comparative advantage in lobbying about measures that directly affect that industry. But acquiring significant expertise to enable it also to lobby about policies directly influencing other sectors is costly. Thus lobbies in practice concentrate their efforts on influencing those policies that impact most directly on their members. I capture this by assuming that α_1 lobbies the government only about t_1 and that α_2 lobbies only about t_2. Nobody lobbies for policy regarding the numeráire good. Grossman and Helpman (1994), by contrast, assume that each organized sector lobbies about all trade policies.

> *Each group* α_i *organizes itself into a lobby to bargain with the govern-*
>
> **(A1)**

Although I've argued that the assertion that different lobbies have comparative advantages over distinct policy tools is realistic,[4] realism is not my reason for making the assumption. As indicated above, I must, to address meaningfully the Anti-Trade-Bias Puzzle, assume that either both groups organize or that neither does. I also intend to address the Terms-of-Trade Puzzle by giving trade-policy determination a political dimension. But if neither group

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[4]There's an "esthetic" aspect as well: Separability permeates the Grossman-Helpman model, with the prominent exception of lobbying goals — probably among the last places one would expect to find the exception.

organizes there is no politics, and if both organize there is again no political dimension to policy choice because, as Grossman and Helpman (1995, footnote 11) point out, the efforts of the two groups exactly cancel in this regard. Allowing each group a comparative advantage in lobbying over the instrument directly pertaining to its sector offers an escape from this conundrum. For then I can allow both sectors to organize while still giving a political dimension to policy choice, because their efforts will not cancel out.

The assumptions that there are but two non-numeráire goods and that all sectors organize are only for expositional clarity or, as just argued, to suit my purposes. Relaxing them would only complicate the algebra in ways already familiar from Grossman and Helpman. Although the assumption that each lobby addresses only one policy is more extreme than necessary, the idea that different lobbies have different comparative advantages over policies is realistic, and the departure from Grossman and Helpman (2002) is straightforward — see Helpman (1997).

Trade policies and international externalities

The α_1 lobby bargains with the government about t_1 and the contribution C_1 which that lobby will make. Unlike Grossman and Helpman (1994), I assume the government's objective function gives no direct weight to national welfare. This will sharpen my results without altering them in any essential way.

W_1 denotes the joint surplus of the government and the α_1 lobby, as they regard it, associated with t_1.

$$W_i = \alpha_i + \pi_i\left(Q_i\right) + \alpha_i R\rho + \alpha_i\left[s_1\left(Q_1\right) + s_2\left(Q_2\right)\right].$$

(3)

Here ρ denotes the relative importance the agents attach to tariff revenue. If $\rho = 1$, $\widetilde{W}_i = W_i$, and this conventional case will be the point of reference in what follows. But I want also to allow consideration of the possibility that $\rho < 1$, in recognition of the fact that public debate in industrial countries about trade policy almost never concerns itself with the consequences of such policies for government revenue.

From **(3)**, a change in t_1 produces the following effect on the joint surplus.

$$\frac{dW_1}{dt_1} = \alpha_1 \frac{P_1 M_1}{\tau_1} \frac{e_1 f_1{}^*}{e_1 + f_1{}^*} \left\{ \left[\frac{1}{f_1{}^*} - t_1 + \frac{\tau_1}{e_1} \right] \rho + \left[\frac{1 - \alpha_1}{\alpha_1} \frac{x_1}{M_1} - 1 \right] \frac{\tau_1}{e_1} \right\}$$ **(4)**

In the conventional case $\rho = 1$ this reduces to the following.

$$\frac{dW_1}{dt_1} = \alpha_1 \frac{P_1 M_1}{\tau_1} \frac{e_1 f_1{}^*}{e_1 + f_1{}^*} \left\{ \left[\frac{1}{f_1{}^*} - t_1 \right] + \left[\frac{1 - \alpha_1}{\alpha_1} \frac{x_1}{M_1} \frac{\tau_1}{e_1} \right] \right\}.$$ **(5)**

The two bracketed terms within the braces on the right-hand side of each expression respectively reflect what Grossman and Helpman (1995, p 688) refer to as the *terms-of-trade* and *political-support* motives for trade policy. The former term is perhaps slightly unsatisfactory because, although both motives are driven by a relative-price change, that relative price is P_1, not the terms of trade.[5] But I will use this term both because it is familiar from Grossman and Helpman and because it does capture well the essential distinction between the two motives.

It's clear from **(3)** that a change in t_i influences W_i in three ways: through its effect on the income of the factor specific to sector i, on consumer surplus, and on trade-tax revenue. The latter two are deflated by the relative size of the i lobby, but the first is not. Thus when t_i is manipulated to maximize W_i its effect on the income of the factor specific to sector i is relatively more important than when t_i is manipulated to maximize social welfare. This accounts for the political-support motive. When the α_1 lobby coincides with the entire population ($\alpha_1 = 1$) this motive disappears.

The political-support effect on the right-hand side of **(4)** involves a balance of the effect on specific-factor income, which calls for more protection, and the effect on consumer surplus, which calls for less. Since the case where the former influence dominates is likely to be the situation of practical relevance, I shall occasionally impose the following assumption.

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[5]The Home terms of trade is given by the index P_2/P_1, with either the numerator or the denominator (but not both) augmented by unity weighted to reflect the relative volume of trade in the numeráire good.

$$\frac{1-\alpha_1}{\alpha_1} \geq \frac{M_1}{x_1}$$

(A2)

$$\frac{1-\alpha_2 *}{\alpha_2 *} \geq \frac{M_2 *}{x_2 *}$$

Note also the role that ρ plays with regard to the terms-of-trade motive in **(4)**.

> **Remark 3** *A terms-of-trade motive can be present only to the degree that agents are motivated by a concern for trade-tax revenue.*

A change in t_1 also has an impact on the analogous foreign joint surplus, W_1^*,

$$\frac{dW_1 *}{dt_1} = -\alpha_1 * \frac{P_1 X_1 *}{\tau_1 \tau_1 *} \frac{e_1}{e_1 + f_1 *} \left\{ \rho \left[f_1 *+1 \right] t_1 * + \left[\frac{1-\alpha_1 *}{\alpha_1 *} \frac{x_1 *}{X_1 *} + 1 \right] \right\}.$$

(6)

The two bracketed terms within the braces on the right-hand side respectively reflect the international *terms-of-trade* and *political-support* externalities of trade policy.

> **Remark 4** *An increase in the Home tariff will exert a negative political-support externality on the Foreign government-cum-export lobby. The magnitude of the terms-of-trade externality depends upon the Foreign export policy, and could be positive if exports are subsidized.*

> **Remark 5** *A terms-of-trade externality can be present only to the degree that agents are motivated by a concern for trade-tax revenue.*

If I were to delete good *2* from my model, so that *H* imports good *1* from *F* in exchange for the numeráire good, my model would reduce to a special case of that used by Bagwell and Staiger (1999). In this case $\alpha_1^* = 1$, so that the political externality would drop out and only the terms-of-trade externality would remain.

Policy choice

Following Goldberg and Maggi (1999), I assume the bargaining solution maximizes the joint surplus W_1 of both parties. In doing so I am in effect assuming that the asymmetric information, which presumably causes the asymmetric influence of the respective lobbies, does not result in strategic behavior that precludes an efficient bargaining solution.[6] The first-order condition for this implies the following Home tariff on good *1*.

$$t_1 = \frac{1}{\rho}\frac{1}{f_1{}^*} + \left[\left(1 - \frac{1}{\rho}\right) + \left(\frac{1}{\rho}\right)\frac{1 - \alpha_1}{\alpha_1}\frac{x_1}{M_1}\frac{\tau_1}{e_1}\right]\frac{\tau_1}{e_1},$$

which reduces to the following when $\rho = 1$:

$$t_1 = \frac{1}{f_1{}^*} + \frac{1 - \alpha_1}{\alpha_1}\frac{x_1}{M_1}\frac{\tau_1}{e_1}.$$

Note that, for the importable sector, the terms-of-trade and political-support motives *reinforce* each other in the protectionist direction.

Turning next to the export sector,

$$\frac{dW_2}{dt_2} = \alpha_2 Q_2 X_2 \frac{e_2{}^*}{e_2{}^* + f_2}\left\{\rho\frac{f_2}{e_2{}^*} - \frac{1 - \alpha_2}{\alpha_2}\frac{x_2}{X_2}\frac{1}{\tau_2} - \rho\frac{t_2}{\tau_2}\left(1 + f_2\right) + \left(\rho - \frac{1}{\tau_2}\right)\right\}.$$

Thus, if t_2 is initially zero, $\left.\dfrac{dW_2}{dt_2}\right|_{t_2=0} < 0$ for all $\rho \leq 1$ if and only if the following holds.

$$\frac{1 - \alpha_2}{\alpha_2}\frac{x_2}{X_2}\frac{1}{f_2} > \frac{1}{e_2{}^*}. \tag{7}$$

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[6]Alternatively, I seek to describe the efficient solution, irrespective of whether the actual bargaining process will produce it.

Here the terms-of-trade and political-support motives work at cross purposes. If political-support motives dominate, so that the inequality is satisfied, an export subsidy would increase the joint surplus W_2. If, on the other hand, that inequality is violated, an export tax is called for. So, the analysis has reached a fork in the road. To address the two cases, consider the following assumption.

$$\frac{1-\alpha_2}{\alpha_2}\frac{x_2}{X_2}\frac{1}{f_2} > \frac{1}{e_2{}^*}$$

$$\frac{1-\alpha_1{}^*}{\alpha_1{}^*}\frac{x_1{}^*}{X_1{}^*}\frac{1}{f_1{}^*} > \frac{1}{e_1}$$

(A3)

(A3) in effect says that the political-support motive outweighs the terms-of-trade motive in each country. Consider two cases separately.

IV.   Terms-of-Trade Dominance

Suppose, first, that both inequalities in (A3) are *reversed*. In this case, terms-of-trade motives outweigh political-support motives, and an export tax is called for in each country, though it will be less than if political-support motives were absent.

If Foreign trade policy is derived analogously, the following Nash equilibrium in trade policy emerges when $\rho = 1$.

$$t_1 = \frac{1}{f_1 *} + \frac{1-\alpha_1}{\alpha_1} \frac{x_1}{M_1} \frac{\tau_1}{e_1} > 0$$

$$t_2 = -\frac{e_2 *}{e_2 * -1} \left[\frac{1-\alpha_2}{\alpha_2} \frac{x_2}{X_2} \frac{1}{f_2} - \frac{1}{e_2 *} \right] > 0$$

$$t_1 * = -\frac{e_1}{e_1 - 1} \left[\frac{1-\alpha_1 *}{\alpha_1 *} \frac{x_1 *}{X_1 *} \frac{1}{f_1 *} - \frac{1}{e_1} \right] > 0$$

$$t_2 * = \frac{1}{f_2} + \frac{1-\alpha_2 *}{\alpha_2 *} \frac{x_2 *}{M_2 *} \frac{\tau_2 *}{e_2 *} > 0$$

(8)

The formulae for export taxes yield positive values because of second-order conditions: Neither country would operate on an inelastic portion of its partner's import-demand curve.

> **Proposition 2** *If (A1) holds and both parts of (A3) are violated (i.e., terms-of-trade motives outweigh political-support motives) and trade taxes are fully valued ($\rho = 1$)(8) the Nash equilibrium in trade policy(8) features both import taxes and export taxes.*

Note the following.

> **Remark 6** *If, as here, all individuals and sectors organize in the Grossman-Helpman model, their efforts cancel out and the governments implement welfare-maximizing policies (2): See Grossman and Helpman (1995, footnote11). My different result is due to the assumption, in (A1), that organized sectors cannot lobby over all policies.*

No agent is concerned about cross effects, such as the effect on W_1 of a change in t_2. If, as in Grossman and Helpman (1994), the government gave some weight to national welfare, it would take such cross effects into account. This would alter **(8)** to cause it more nearly to resemble **(3)**. But, as long as the organized sectors cannot lobby over all policies and the government gives at least *some* weight to contributions, a distinction will remain. Ignoring a possible government concern with national welfare simply sharpens that distinction.

Remark 7 *Bagwell and Staiger (1999) exhibits Lerner symmetry, so that export taxes are redundant there,* **if** *import taxes are* **not** *bound.*

V.   Political-Support Dominance

Next, suppose that **(A2)** and **(A3)** hold,[7] so that political-support motives dominate terms-of-trade motives. In his case the Nash equilibrium in trade policy is as follows.

$$t_1 = \frac{1}{\rho f_1{}^*} + \left[\left(1 - \frac{1}{\rho}\right) + \left(\frac{1}{\rho}\right)\frac{1-\alpha_1}{\alpha_1}\frac{x_1}{M_1}\right]\frac{\tau_1}{e_1} > 0$$

$$t_2 = -\frac{e_2{}^*}{e_2{}^*-1}\left[\left(\frac{1}{\rho}\right)\frac{1-\alpha_2}{\alpha_2}\frac{x_2}{X_2}\frac{1}{f_2} - \frac{1}{e_2{}^*}\right] < 0$$

$$t_1{}^* = -\frac{e_1}{e_1-1}\left[\left(\frac{1}{\rho}\right)\frac{1-\alpha_1{}^*}{\alpha_1{}^*}\frac{x_1{}^*}{X_1{}^*}\frac{1}{f_1{}^*} - \frac{1}{e_1}\right] < 0$$

$$t_2{}^* = \frac{1}{\rho f_2} + \left[\left(1 - \frac{1}{\rho}\right) + \left(\frac{1}{\rho}\right)\frac{1-\alpha_2{}^*}{\alpha_2{}^*}\frac{x_2{}^*}{M_2{}^*}\right]\frac{\tau_2{}^*}{e_2{}^*} > 0$$

(9)

Proposition 3 *With **(A1)**, **(A2)**, and **(A3)**, the Nash equilibrium in trade policy is given by **(9)**. Neither country taxes exports.*

(Note that, if **(A2)** is not imposed, the bracketed term corresponding to each import tax will be negative for sufficiently small ρ).

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[7]The cases where one inequality in **(A2)** and/or **(A3)** holds and one is violated are straightforward and will be left to the dedicated reader.

Remark 8 *Export taxes fail to emerge here because governments* **choose** *not to implement them, not because trade agreements prevent them from doing so.*

This is due to **(A1)** and to the assumption, in **(A3)**, that political-support motives outweigh terms-of-trade motives.

Remark 9 *Proposition 3 offers a potential resolution of the Terms-of-Trade Puzzle.*

When political-support motives dominate, governments have no desire to tax exports. Thus trade agreements need not constrain them from doing so.

VI. Properties of Equilibrium When Political-Support Motives Dominate

Consider an initial situation in which each country neither taxes nor subsidizes exports and sets the import tariff that constitutes its best response to its partner's zero export tax. This situation is not a Nash equilibrium, since, by **(A3)**, **(7)** implies that either country can gain by an export subsidy. In Figure 1 below, J denotes H's best response to $\tau_1^* = 1$, and B denotes F's best response to $\tau_1 = 1$. B corresponds to an export subsidy by F, reflecting the assumption **(A3)** that political-support motives dominate terms-of-trade motives.

Best responses

The φ locus depicts all those combinations of τ_1 and τ_1^* implying the same value of Q_1 as at J: $Q_1 = Q_1^J$. Thus φ is the locus of solutions to

$$M_1\left(Q_1'\right) = X_1^* \left(Q_1' \Big/ \tau_1 \tau_1^*\right),$$

so that φ is a rectangular hyperbola. Since $Q_1{}^*$ is uniquely related to Q_1 via the market-clearing condition for good *1*, it too is constant along φ.

Now, suppose *F* were to depart from *J* by imposing an export subsidy $dt_1{}^* < 0$. Then an increase in the *H* tariff of $dt_1 = -\tau_1 dt_1{}^*$ will hold Q_1 and $Q_1{}^*$ unchanged: We move upwards and to the left along φ. This will maintain the initial situation except that *R* will rise by $-Q_1 M_1$ $dt_1{}^*$ and R^* will fall by $Q_1{}^* M_1 dt_1{}^*$. Thus the real income of both interest groups in *H* rises, and the reverse in *F*. This countervailing increase in its tariff constitutes a beneficial *H* response to *F*'s adoption of an export subsidy.

In like manner, $\varphi^{\,F}$ depicts the iso-domestic-price locus corresponding to free trade $(\tau_1 \tau_1{}^* = 1),$ and φ^* that corresponding to *B*. Since these three loci (all rectangular hyperbolae) correspond to different values of the domestic prices, they cannot intersect. Moving northwest along any one of these loci leaves all demands and supplies unchanged: The only effect is to shift trade-tax revenue from *F* to *H*.

At a point on φ such as *G* in Figure 1, *H* completely countervails an export subsidy by *F*. But could *H* do even better with a different response? Since *J* is an *H* best response, a small reduction in τ_1 from *J* will produce a zero first-order effect on W_1. A small reduction in τ_1 from *G* would produce exactly the same result as a similar reduction from *J*, with just one exception. Since τ_1 is larger at *G* than at *J*, the increase in M_1 produced by the fall in τ_1 would produce a greater increase in tariff revenue. Thus W_1 would increase, so that the *H* best-response curve (*BR*) must pass below φ.

To verify this intuition, note that **(4)** can be written as follows.

$$\frac{dW_1}{dt_1} = \alpha_1 P_1 M_1 \frac{e_1 f_1{}^*}{e_1 + f_1{}^*} \left\{ \left[\frac{1}{\tau_1 f_1{}^*} - \frac{t_1}{\tau_1} + \frac{1}{e_1} \right] \rho + \left[\frac{1-\alpha_1}{\alpha_1} \frac{x_1}{M_1} - 1 \right] \frac{1}{e_1} \right\}$$

$$\equiv F\left(Q_1, t_1\right).$$

Since point *J* denotes an *H* best response, $F\left(Q_1^J, t_1^J\right) = 0.$ Also,

$$\frac{\partial F_1\left(Q_1^J, t_1\right)}{\partial t_1} = -\frac{\rho}{\tau_1^{\,2}} \left[\frac{1}{f_1{}^*} + 1 \right] < 0. \tag{10}$$
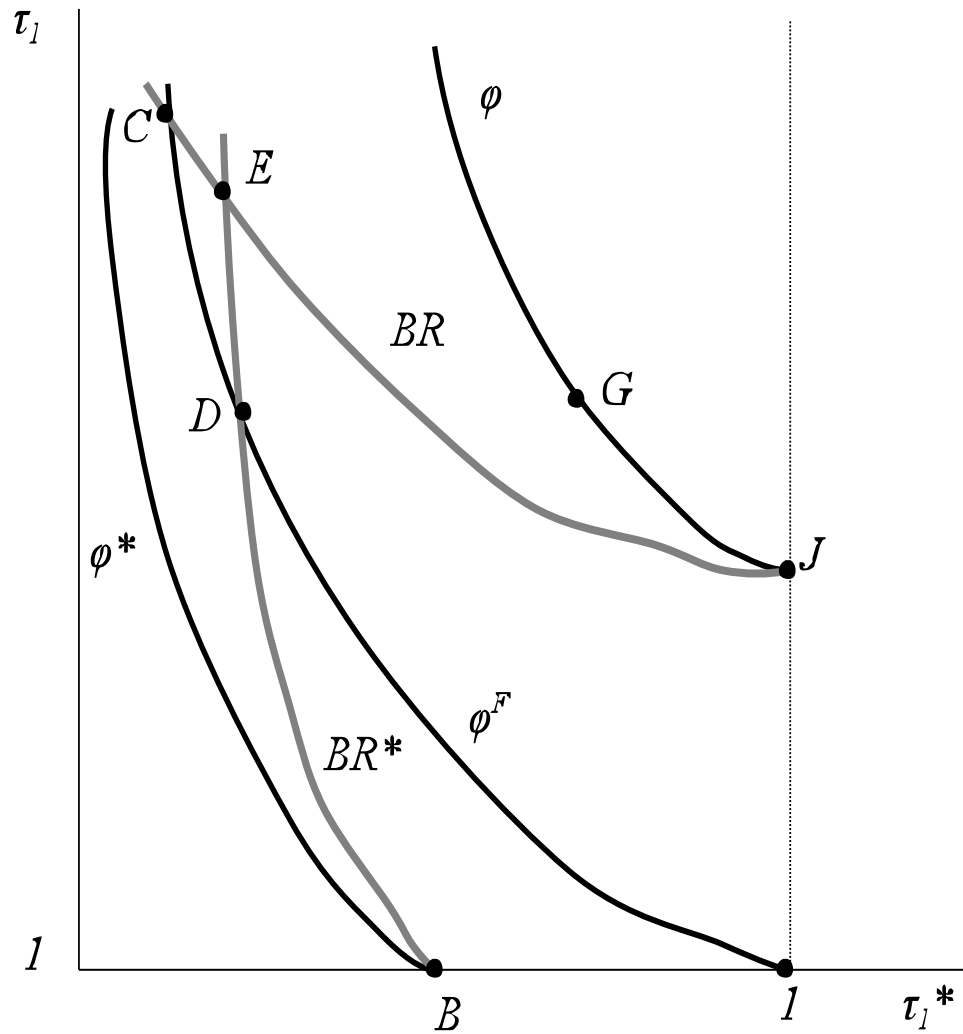
Figure 1 Political-Support Dominance

Thus, along the φ locus, $\partial W_1/\partial t_1 < 0$ if $t_1 > t_1^J$, so that H's best response lies below that locus.

Proposition 4 H*'s best response to an export subsidy by* F *is to countervail*
incompletely *the subsidy .*

If H were to adopt a policy of completely countervailing an export subsidy, F would not offer to pay one. H is willing to countervail only partially, thereby allowing F to stimulate exports, to capture for itself a portion of the subsidy by taxing imports.

Remark 10 *To stimulate exports,* F *must subsidize* H *as well as subsidizing its own exporters.*

Note that, from **(10)**, *H*'s temptation to countervail incompletely is *positively* related to ρ and, therefore, to the strength of the terms-of-trade motive, even though the *opportunity* to countervail, incompletely or not, would not arise if terms-of-trade motives dominated political-support motives.

Remark 11 *An increase in the importance attached to trade-tax revenue, and, therefore, to the terms-of-trade motive, increases the motive to countervail only partially.*

Since B is an F best response, a small reduction in the export subsidy (*i.e.*, a rise in τ_1*) from B will produce a zero first-order effect on W_1*. A small rise in τ_1* from any point northwest of B on φ* will produce exactly the same result as a similar rise from B, except that the fall in X_1* produced by the rise in τ_1* will produce a greater reduction in the total export subsidy. Thus W_1* increases and the F best-response curve (BR*) must pass above φ*.

Formally, note that

$$\frac{dW_1^*}{dt_1^*} = \frac{\alpha_1^* Q_1^* X_1^*}{\tau_1^*} \frac{e_1}{e_1 + f_1^*} \left\{ \left[\frac{f_1^*}{e_1} + 1 \right] \rho - \left[\frac{1 - \alpha_1^*}{\alpha_1^*} \frac{x_1^*}{X_1^*} + 1 \right] - \rho t_1^* f_1^* \frac{e_1 - 1}{e_1} \right\}$$

(11)

$$\equiv F^*\left(Q_1^*, t_1^* \right).$$

At point B, $F^*\left(Q_1^{B}*, t_1^{B}* \right) = 0$, since B is a F best response. Thus, at any other point on φ*, where $t_1^* < t_1^{B}* < 0$, $dW_1^*/dt_1^* = F^*\left(Q_1^{B}*, t_1^* \right) > 0$. So BR* lies to the right of φ*.

Remark 12 *An increase in the importance attached to trade-tax revenue, and, therefore, to the terms-of-trade motive, increases the motive to nullify only partially an import duty with an export subsidy.*

Equilibrium: the Export-Subsidy-Transfer Puzzle

The above detail about best responses now permits a closer look at the politically-dominant Nash equilibrium **(9)**. Allow each country to choose whether to adopt ($A = Y$) or not to adopt ($A = N$) a countervailing duty law. Adoption of such a law will constitute a commitment by that country to countervail exactly any export subsidy by its trading partner with a tariff of its own. Each country's strategy now consists of a policy triple: the two trade taxes or subsidies and setting A equal to Y or N. In each country, the government bargains with the import-competing lobby over the tariff and A, and it bargains independently with the export lobby over the export tax or subsidy.

If terms-of-trade motives outweigh political-support motives, the choice of A is of no significance because neither country wishes to subsidize exports: Equilibrium is described by **(8)** in either event. When political-support motives dominate, however, the choice of A is potentially significant.

As mentioned above, papers on trade policy sometimes have assumed away export subsidies and justified this by appealing to the existence of countervailing-duty laws. I now enquire whether this latter fact is consistent with the present model by allowing the choice of A to be endogenous.

At the free-trade point, $\tau_1 = 1 = \tau_1^*$, a small reduction in τ_1 must lower W_1, since this point is below BR. Moving up the φ^{F} locus, a small reduction in τ_1 must continue to produce the same effect, except that the increase in tariff revenue implied by the increase in imports becomes progressively greater. This can be made as high as wanted by moving far enough up the locus. Thus BR must eventually cut this locus, as shown at point C in Figure 1. By an argument analogous to that above, BR^* must cut φ^{F} at some point, shown as D in the figure.

Since BR and BR^* both cut φ^{F}, and from different sides, they must cut each other as well, shown by E in Figure 1. This corresponds to **(9)**. If H decides $A = N$ (*i.e.*, does not implement a countervailing-duty law), E will be the equilibrium. Were H instead to set $A = Y$, F would be constrained to operate on φ and would therefore choose J. From H's point of view, E is better than the point on φ directly above it, and that point is in turn better than J. So H chooses $A = N$ and the policy pair is given by E.

Proposition 5 *With (A1), (A2), and (A3), the Nash equilibrium in trade policy is given by (9). Neither country implements a countervailing duty law, both subsidize*

exports, and each appropriates part, but not all, of its partner's export subsidy
with a tariff.

What's going on is the following. The fact that an import tax-cum-foreign export subsidy produces an international transfer in effect implies that to stimulate exports F must subsidize not just its own exporters but the H government as well, to induce it to less-than-completely-countervail in equilibrium. If political-support motives are strong relative to terms-of-trade motives (which work through trade-tax revenue), H will demand a high subsidy and F will be willing to pay it. The Nash equilibrium will be characterized by large tariffs, large export subsidies, and consequently large transfers, but not necessarily by large effects on actual trade flows. With the opposite going on in the other sector, the net international transfer need not be significant, but each trade flow itself accomplishes a large transfer.

It has long been clear that an export subsidy together with an appropriate tariff by the trading partner can effect an international transfer that does not influence relative prices. This is convenient theoretically in enabling countries to achieve, using only trade policies, a *cooperative* trade agreement that requires an international transfer for both countries to benefit.[8] See Dixit (1987) and Grossman and Helpman (2002). My assertion here is that, *when* political-support motives dominate, such an argument is also crucial for the nature of a *non-cooperative* equilibrium.

> **Remark 13** *When political-support motives dominate terms-of-trade motives, the*
> *model generates the counterfactual predictions of no countervailing-duty laws,*
> *extensive export subsidization, and significant international transfers.*

I refer to this counterfactual implication of the model as the *Export-Subsidy-Transfer Puzzle.*

Note that, as implied by Remarks 11 and 12, a reduction in ρ (from unity perhaps) reduces the incentive for H and F, respectively, to depart from φ and from φ^*. This implies a presumption that the respective best-response curves hug φ and φ^* more closely, shifting the equilibrium E in Figure 1 to the northwest. This would increase the tariff, the subsidy, and the transfer, with an ambiguous effect on actual trade.

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[8] Whether this has ever been relevant in reality is something else.

Remark 14 *The model implies a presumption that a reduction in the significance* ρ *that agents attach to trade-tax revenue (and, therefore, in the relative importance of terms-of-trade motives) will* **accentuate** *the Export-Subsidy-Transfer Puzzle.*

Turn next to the Anti-Trade-Bias Puzzle. If *C* lies northwest of *D*, as shown in Figure 1, *E* will lie above φ^{F}, so that the policy pair on balance restricts trade. If the relative positions of *C* and *D* are reversed, the policy pair on balance stimulates trade. The international transfer implicit at point *C* is the minimum transfer the *H* government-cum-import competing lobby must be paid to induce it to accept the free-trade outcome, and the transfer implicit at point *D* is the largest the *F* government-cum-lobby is willing to pay for that outcome.

Proposition 6 *If (A1), (A2), and (A3) hold, the equilibrium in trade policy will have an anti-trade or a pro-trade bias according as* H *would require a greater or a lesser transfer to accept the free-trade outcome than* F *would be willing to pay.*

There appears to be no reason why one or the other circumstance should hold, so the Anti-Trade-Bias Puzzle is apparently not resolved.

Remark 15 *If political-support motives dominate terms-of-trade motives, the Terms-of-Trade Puzzle is resolved, the Anti-Trade-Bias Puzzle is not resolved, and the Export-Subsidy-Transfer Puzzle is introduced.*

If terms-of-trade motives dominate, the Anti-Trade-Bias Puzzle is resolved and the Export-Subsidy-Transfer Puzzle does not appear, but the Terms-of-Trade Puzzle reappears. In either case, the Received Theory in this three-good simplification delivers results dramatically at odds with reality. This simplification puts the counterfactual implications of the Received Theory into sharp relief: It does not generate them.

VII. *Complete* Political-Support Dominance: A Test

I now take the analysis of the preceding section to its logical extreme by considering the possibility that H and F care nothing about trade-tax revenue. I call this case Complete Political-Support Dominance, since it implies no weight at all is given to terms-of-trade motives. Thus it removes the key feature of the Received Theory. My purpose here is not to argue[9] that this assumption creates an attractive model: I instead wish to test whether sole reliance on terms-of-trade motives is the reason the Received Theory is so inconsistent with reality.

To allow determinate outcomes, suppose that agents value trade taxes in a lexicographic sense: I'll pay anything for something, but I'll pay no more than nothing for nothing.

$$\rho = 0, \text{ but, other things equal, agents prefer more trade-tax revenue to less.} \quad \textbf{(A4)}$$

Then, given **(A2)** and **(A4)**, **(4)** implies that $dW_1/dt_1 > 0$, so that H will wish a positive tariff on good 1. Furthermore, an increase in t_1 will raise x_1/M_1, so that it remains true that $dW_1/dt_1 > 0$: H will wish to set t_1 at the prohibitive level. Also, **(A4)** implies that H will be unwilling to surrender any of its market to F to obtain trade-tax revenue. So, if point J in Figure 1 corresponds to H's prohibitive tariff, its best-response curve will coincide with φ.

From **(11)**, **(A4)** implies that F will wish to subsidize exports. In particular, this is true at any point on H's best-response curve: There is no Nash equilibrium in t_1 and $t_1{}^*$ alone!

With **(A4)** holding, viewing policy choice as a triple now becomes crucial for an equilibrium to exist. If H sets t_1 equal to its prohibitive level and chooses $A = Y$, it commits itself to φ. Then the best F can do is to set $t_1{}^* = 0$ and thereby choose J. I now have the following equilibrium in policy.

$$
\begin{aligned}
t_1 \quad &\text{prohibitive,} \qquad t_2 = t_1{}^* = 0 \\
\\
t_2{}^* \quad &\text{prohibitive,} \qquad A = A^* = Y
\end{aligned}
\qquad \textbf{(12)}
$$

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[9]Regan (2004) advances such an argument.

Proposition 7 *With* **(A1)**, **(A2)**, **(A3)**, *and* **(A4)**, *the equilibrium in trade policy is given by* **(12)**. *It features countervailing-duty laws, neither export taxes nor export subsidies, and prohibitive tariffs.*

Remark 16 *Countervailing-duty laws emerge here as the result of non-cooperative choices by the two governments,* **not** *as a result of a trade agreement.*

In reality it is true that the GATT, in Article XVI, attempts to curtail the use of export subsidies and also provides a code of conduct regarding countervailing-duty laws for WTO members. But such laws were in existence *long* before the GATT.

Remark 17 *Proposition 7 offers a resolution of the Export-Subsidy-Transfer Puzzle.*

The suggestion is that, in each country by itself, the government and the export lobby can indeed increase their joint surplus by encouraging exports (given **(A3)**), but actually doing so is not consistent with equilibrium in a two-country, non-cooperative, policy-setting context, given **(A4)**.

Remark 18 *Proposition 7 offers a resolution of the Anti-Trade-Bias Puzzle.*

This follows from the endogenous introduction of countervailing-duty laws. Another implication of this endogenous introduction is the following.

Remark 19 *If political-support motives dominate terms-of-trade motives* **(A3)** *and no agent addresses trade-tax revenue* **(A4)**, *each government is powerless to offer its export lobby anything in Nash equilibrium.*

This will turn out to be the essential reason for trade agreements of the sort actually observed. This environment is *not* assumed: It's a direct consequence of the requirements for equilibrium when political-support effects *completely* outweigh terms-of-trade effects.

So, finally, the model offers a resolution of all the embarrassing puzzles. But to do so it imposes $\rho = 0$, which I have imposed only to test the sensitivity of the puzzles to terms-of-trade externalities. So, it's time to take stock. I offer two comments.

First, $\rho = 0$ is linked to a key feature of the Received Theory and of the Grossman-Helpman approach to trade policy. With **(A4)**, deciding whether to extend protection to a

sector amounts to weighing the positive effect on the sector's specific-factor income against the negative effect on consumer surplus. With **(A3)**, the former effect dominates, and this dominance increases as protection raises supply in the sector and reduces demand. A desire for trade-tax revenue (*i.e.* the negation of **(A4)**) is the sole potential motive for agents to impose less than prohibitive protection. This logic does not depend upon either of my simplifications that there are but two lobbies and that each lobbies only about the policy instrument directly affecting its own sector. Adding unorganized sectors would allow trade in those sectors, but would not affect the above logic with regard to organized sectors. Use of the Received Theory and of the Grossman-Helpman approach requires one to accept either the radical surgery of **(A4)** or a model clearly at odds with reality in the sense that it must display some combination of the three puzzles.

Second, imposing **(A4)** can not be regarded as a simple approximation to the idea that trade-tax revenue is less important to agents than other income ($\rho < 1$). Giving trade-tax revenue a reduced role in the objective functions just makes things *worse* by shifting E in Figure 1 further to the northwest. Such revenue must receive *no* weight at all to imply outcomes consistent with reality. The outcome implied by **(A4)** is a singularity, not the limiting case as ρ goes to zero.

> **Remark 20** *The Received Theory implies some combination of the three puzzles* ***unless*** *its key feature is eliminated by the imposition of **(A4)**.*

VIII. The Empirical Work

Preceding sections established that the Grossman-Helpman model must imply extremely implausible equilibria, and that the reason for this is the key role played by a concern for tariff revenue and for the terms of trade: the central premise of the Received Theory. But there is now a significant empirical literature [Goldberg and Maggi (1999), Gawande and Bandyopadhyay (2000), Mitra, Thomakos, and Ulubaşoğlu (2002), and McCallum (2004)] that does appear to offer support for the Grossman-Helpman approach, and, apparently, also for

the Received Theory, of which the former is a notable part. This section attempts a reconciliation.

These studies address the basic unilateral version (1994) of the Grossman-Helpman model. A fundamental problem is that countries are in fact constrained by cooperative multilateral trade agreements. Goldberg and Maggi (1999) deal with this by looking at non-tariff barriers, not determined by such agreements. But in fact such barriers often were instituted with significant bilateral negotiation, so it is not clear whether this helps much. Even worse, these barriers often involved surrendering trade rents to exporting countries. Since it is precisely a concern for such trade rents that enables the Grossman-Helpman model to give an interior solution in the first place, this is a potentially fatal objection. Still, other approaches, such as that of McCallum (2004), give broadly similar empirical results. So put these concerns to one side and look at those results.

The most important result is the finding that, in politically-organized, import-competing sectors, tariffs (or tariff equivalents) are positively related to the ratio of domestic production to imports. This can be interpreted as reflecting a trade-off between specific-factor income and consumer surplus—what most of us think of as the essence of a political economy view of protection. This result contrasts with earlier reduced-form empirical work, which found the opposite relation. Goldberg and Maggi (1999) plausibly argue that this discrepancy results from the distinction the Grossman-Helpman model makes between organized and unorganized sectors. This is the strongest empirical support for a political-economy view of protection of which I am aware, and the structure of the Grossman-Helpman model was instrumental in obtaining it.

But this has nothing to do with the role of the terms of trade, or of trade-tax revenue, that is central to the Received Theory. This enters into the Grossman-Helpman model via a predicted negative relation between protection and the domestic elasticity of demand for imported goods. A failure to find such a relation would be unfortunate for the Received Theory, but success would supply little support: There is a host of political reasons for a government to be reluctant to grant high protection when that would greatly reduce imports—the direct impact on the rest of the world.

Dealing with trade elasticities has also been a practical problem. Existing estimates are regarded as unreliable, and, whereas the theory suggests that the elasticities are endogenous, the empirical work does not attempt to explain them. They are instead put on the left-hand side of the estimated equation, understandable under the circumstances.

However, organized imports are just one class of traded goods for which the Grossman-Helpman model makes predictions. Imports are predicted to be subsidized whenever the

import-competing sector is not politically organized. The literature has shown that, in such sectors, protection is negatively related to the inverse import-penetration ratio, a result important for relating this work to earlier reduced-form studies, as noted above. But the literature is silent regarding the much more fundamental question of whether imports of such goods are in fact systematically subsidized.

The theory also predicts that all exports from unorganized sectors will be taxed. If one wished to look at the practical relevance of the role of terms-of-trade and trade-tax-revenue considerations—central to both the Received Theory and to its Grossman-Helpman special case—this is exactly where one should first look. For three reasons. **i** This prediction is a direct consequence of the assumed concern for the terms-of-trade and for trade-tax revenue. **ii** Export taxes are not constrained by trade agreements. **iii** This sign prediction does not depend upon the validity of estimates of trade elasticities. But, in spite of all this, the empirical literature is silent about the practical success of this most basic implication of the Grossman-Helpman model.

Exports from politically-organized sectors are predicted by the model to be either taxed or subsidized, depending on the relative strength of political considerations. But, again, the empirical literature does not report on this prediction.

To summarize. The empirical literature concerning the Grossman-Helpman model offers real support for a political-economy view of trade policy, and the structure of the model was useful in obtaining that support. But this literature provides no real evidence at all to support either the Received Theory or the Grossman-Helpman special case of that theory. For further on this theme, see Imai, Katayama, and Krishna (2005) and Ethier (2006).

IX. Concluding Remarks

The Received Theory of international trade agreements, the result of half a century of research by international trade theorists, suffers from fundamental puzzles that call into question its very relevance to reality. The *Terms-of-Trade Puzzle*: The Received Theory assumes that the sole purpose of trade agreements is to address terms-of-trade externalities, but actual GATT multilateral trade agreements just do not do this. The *Anti-Trade-Bias Puzzle*: Actual trade policies have always tried to restrict trade much more often than they

have tried to stimulate it, but the models used by the Received Theory do not imply this result, unless doctored up to produce it.

To address these problems I have explored a model, based on Grossman and Helpman (2002), simplified for transparency[10] by assuming just three goods and by allowing each lobby a (realistic) comparative advantage in lobbying over the policy instrument of direct relevance to it. This produced the following argument.

- If terms-of-trade motives dominate, each government will (counter-factually) employ both import tariffs and export taxes in Nash equilibrium. Any trade agreement would presumably wish to address export taxes (the Terms-of-Trade Puzzle).

- If political-support effects dominate, each government will tax imports but not exports (the Terms-of-Trade Puzzle resolved). They might on balance either restrict or stimulate trade (the Anti-Trade-Bias Puzzle not resolved). Also, and counter-factually, neither country will implement a countervailing-duty law, and each will, with an export subsidy only partly countervailed by its partner, "bribe" the other government into allowing more imports than it otherwise would (the Export-Subsidy-Transfer Puzzle introduced).

- If the key component of the Received Theory is removed, each government taxes imports, implements a countervailing-duty law, and neither taxes nor subsidizes exports, thereby eliminating all three puzzles.

- Empirical work stimulated by the Helpman-Grossman model has furnished strong support for the political-economy approach to trade policy. This empirical work does not, however, provide support for the Received Theory, or for the Grossman-Helpman subset of that theory.

It is the Received Theory's central assumption of terms-of-trade motivation that causes that theory to be hopelessly at odds with reality. Although it is the culmination of half a century of research, the Received Theory must be replaced.

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[10]The attentive reader will have observed that I have followed the research strategy described in Jones (1977).

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