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A political-economy theory of trade agreements

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A Political-Economy Theory of Trade Agreements (work in progress)

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1 Motivation

Why do countries engage in trade agreements?

What determines the extent and form of liberalization in trade agreements?

There are two broad theories:

1 - The standard theory postulates that trade agreements are motivated by trade externalities (Johnson, 1954, Mayer 1981). Even in the case of governments that may care about politics, contributions, or other concerns, terms of trade externalities are the *only* reason why they engage in trade agreements (Grossman Helpman, 1995, Bagwell-Staiger,1999).

2 - An alternative theory argues that trade agreements allow governments to deal with lack of commitment in relation to domestic agents. Such commitment problems may arise because of economic considerations, as in Staiger-Tabellini, 1987, or because of political considerations, as in Maggi and Rodríguez-Clare, 1998.

The present paper builds on Maggi and Rodríguez-Clare (MR). They formalize the idea that governments engage in trade agreements to foreclose domestic political pressures.

In Grossman and Helpman's model of protection for sale, the lobby compensates the government for any loss it incurs in granting protection. Thus, the government would not want to close this door...

MR show that this is not the case when there is capital mobility.

Given the expectation of protection in one sector, there is excessive investment in this sector. But since this happens before the government and lobby bargain over protection, the government is not compensated for this "long-run" distortion. If this distortion dominates the government's short-run gains from protection, the government would gain by commitment to free trade.

One limitation of the MR model is that they consider a small economy that only has the option of commitment to free trade or no commitment. A proper consideration of trade agreements should consider at least two countries and allow for commitment to arbitrary trade taxes.

Another limitation of the MR setup is that they do not consider the possibility of lobbying at the stage when the government is negotiating the trade agreement. We call this "ex-ante" lobbying and it is different from "ex-post" lobbying, which takes place after capital has been allocated.

Here we propose a more general setup with two large countries, arbitrary trade taxes and possible ex-ante lobbying. In addition to this, we examine the role of *imperfect* capital mobility on trade liberalization.

This leads to a theory of trade agreements that integrates both existing motives: TOT externalities and problems of domestic commitment...

... plus predictions consistent with the following casual observations:

- "Weak" tariff bindings rather than "strong" bindings

- The extent of trade liberalization is affected by politics

- The extent of trade liberalization increases with the degree of factor mobility

- The agreed tariff binding is declining in time

- The agreement generates a fall in both import tariffs and export subsidies.

2 The basic setup

Two countries, H and F, and two goods, N and M. The H country will be the natural importer of the M good.

We make the foreign country as simple as possible: it is an endowment economy, with exogenous quantities of goods N and M. We let x^* denote its endowment of good M, and Q that of good N.

The H country has a fixed amount of capital that it can allocate to produce either good.

CRS with one unit of capital producing one unit of each of the goods.

x denotes the level of capital allocated to producing M.

The H country chooses a specific tariff t on good M.

The F government does not intervene in trade.

The domestic price of good M in the H country is $p = p^* + t$, where p^* is the international price (equal to the domestic price in the F country).

In both countries preferences are given by

$$U = c_N + vc_M - c_M^2/2$$

thus the demand function for good M is

$$d(p) = v - p$$

Market clearing condition:

$$d(p) + d(p^*) = x + x^*$$

This yields

$$p^*(t, x) = v - \frac{1}{2}(x + x^* + t)$$

Then

$$p(t, x) = v - \frac{1}{2}(x + x^* - t)$$

Letting $m \equiv d(p) - x$ denote imports of the H country,

$$m(t, x) = \frac{1}{2}(\Delta x - t)$$

where $\Delta x \equiv x^* - x$. The welfare functions are

$$\begin{aligned} W &= (1 - x) + px + tm + s \\ W^* &= Q + p^* x^* + s^* \end{aligned}$$

To ensure that under free trade the H country is incompletely specialized and imports good M we impose

$$v - 1 < x^* < 2(v - 1)$$

For this range to be non-empty, we need $v > 1$. Moreover, for consumption of the N good to be nonnegative at free trade, need $v \leq 2$. We are going to maintain these assumptions throughout this section.

3 Short-run noncooperative equilibrium

The owners of capital allocated to the M sector organize as a lobby and give contributions to the government in exchange for protection.

The home government (G) maximizes

$$aW + C$$

The import-competing lobby (L) maximizes

$$px - C$$

G and L bargain efficiently over the tariff and contributions. L has all the bargaining power.

Given x, G and L choose t to maximize joint surplus:

$$J^{SR}(t, x) = aW(t, x) + p(t, x)x$$

This yields

$$t = t^J(x) = (1/3)(\Delta x + 2x/a)$$

Note that as $a \longrightarrow \infty$, then

$$t \longrightarrow t^W(x) \equiv \Delta x/3$$

Let us derive the contributions that keep G at its reservation utility for a given tariff. In the absence of contributions, G would choose $t^W(x)$. Thus, the contributions that make G just willing to choose a tariff $t \geq t^W()$ are

$$\begin{aligned} a\left[W(t^W(), x) - W(t, x)\right] &= -\int_{t^W()}^{t} aW_1(t, x)dt \\ &= -\int_{\Delta x/3}^{t} (a/4)(\Delta x - 3t)dt \\ &= (3a/8)\left(t - t^W(x)\right)^2 \end{aligned}$$

Hence, if $t \geq t^W(x)$, the contributions *per unit of capital* are:

$$c(t, x) = (3a/8x)\left(t - t^W(x)\right)^2$$

4 Long-run noncooperative equilibrium

In the long run, x is endogenous and is determined according to expectations about equilibrium protection in the absence of a trade agreement. The equilibrium conditions are then:

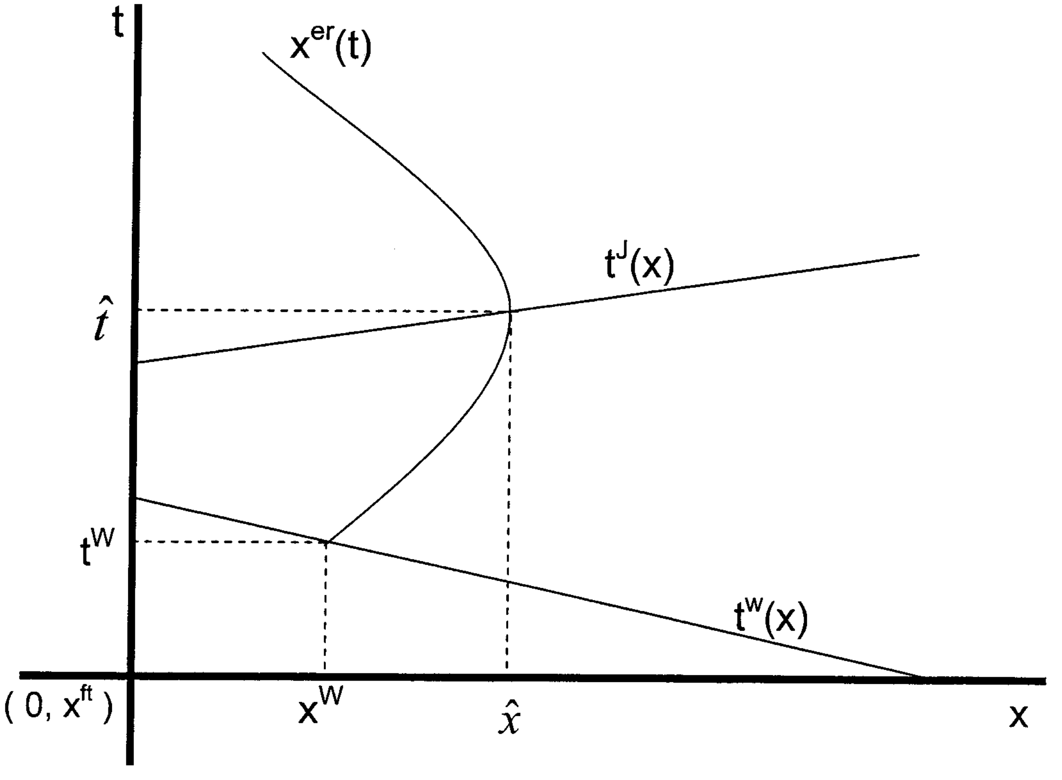
$$t = t^J(x)$$
$$p(x,t) - c(t,x) = 1$$

Let $(\hat{t}, \hat{x})$ denote a solution of this system.

Proposition 1: Let $\beta = x^{ft}/x^*$. Then if $a > (\beta + 2/3)/(1-\beta)$ there exists a unique long-run noncooperative equilibrium, and in this equilibrium the Home country is an importer of good M. The equilibrium tariff $\hat{t}$ is decreasing in a.

See Figure 1.

Figure 1



5 The optimal trade agreement

We now move backward one more step. Before x is allocated, the two governments and the lobby (GGL) bargain efficiently over the trade agreement. Side transfers are available, so the agreement maximizes the GGL joint welfare.

We allow for ex-ante lobbying by assuming that the lobby participates in the choice of the agreement and has a discount factor $\delta \in [0,1]$. The extreme cases $\delta = 0$ and $\delta = 1$ capture the cases of no ex-ante lobbying (as in our previous paper) and full ex-ante lobbying. Intermediate values of δ capture cases in which the lobby exerts pressure on the agreement but is more nearsighted than the governments.

The inherited level of x at the agreement stage is equal to $\widehat{x}$, the long-run equilibrium allocation in the absence of an agreement.

Following the agreement, each capital owner gets a chance to move its unit of capital with probability $z \in [0.1]$, thus, a fraction z of the capital in the M sector has the opportunity to move. The case $z = 0$ captures the case of fixed capital, the case $z = 1$ captures the case of perfect capital mobility. Investors are risk neutral.

We assume that agreements are perfectly enforceable.

The timing of the model is now the following:

1. The two governments and the lobby choose a trade agreement;

2. Capital is reallocated (when feasible);

3. Given the capital allocation and the constraints (if any) imposed by the agreement, the home government and the lobby choose the tariff.

There are two forms of agreement that we can consider:

- *weak bindings*, that is constraints of the type $t \leq \bar{t}$

- *strong* bindings, that is constraints of the type $t = \bar{t}$.

Proposition 2: Strong bindings cannot do better than weak bindings.

Intuition: weak bindings induce ex-post contributions, whereas strong bindings do not because they shut down the ex-post political process. If $\delta < 1$ this directly increases the ex ante joint surplus of GGL for given x. In addition to this, the presence of ex-post contributions mitigates the overinvestment problem.

Thus, our model is able to explain the use of weak bindings, which is pervasive in real trade agreements.

Next we characterize the optimal agreement. Focus first on the case in which capital is perfectly mobile, $z = 1$.

Given that $\widehat{x}$ is the inherited level of capital in the M sector, the ex-ante joint welfare of GGL for $x \leq \widehat{x}$ is

$$\Psi(t, c, x) = aW(t, x) + cx + aW^*(t, x) + \delta[x(p - c) + (\widehat{x} - x)]$$

(we do not need to consider the case $x > \widehat{x}$).

We now proceed by backward induction and "roll back" the equilibrium of the last period for given binding $\bar{t}$ and allocation x.

We can focus on the case $\bar{t} \leq t^J(x)$, in which the binding "bites", so we can set $t = \bar{t}$. A binding above $t^J(x)$ can never be optimal, so fron now on we will ignore the case $\bar{t} > t^J(x)$.

Equilibrium contributions given $\bar{t}$ and x:

$$c(\bar{t}, x) = \begin{cases} (3a/8x)\left(\bar{t} - t^W(x)\right)^2 \text{ if } t^W(x) \leq \bar{t} \leq t^J(x) \\ 0 \text{ if } \bar{t} < t^W(x) \end{cases}$$

If $\bar{t} > t^W(x)$ then G gets contributions, because its threat point in the negotiation with L is given by $t^W(x)$, but if $\bar{t} < t^W(x)$ then G gets no contributions, because G has no credible threat.

Ex-ante joint welfare of GGL given $\bar{t}$ and x:

$$\begin{aligned}\Psi(\bar{t}, x) &= aW(\bar{t}, x) + c(\bar{t}, x)x + aW^*(\bar{t}, x) \\ &\quad +\delta[xp(\bar{t}, x) - c(\bar{t}, x)x + (\widehat{x} - x)]\end{aligned}$$

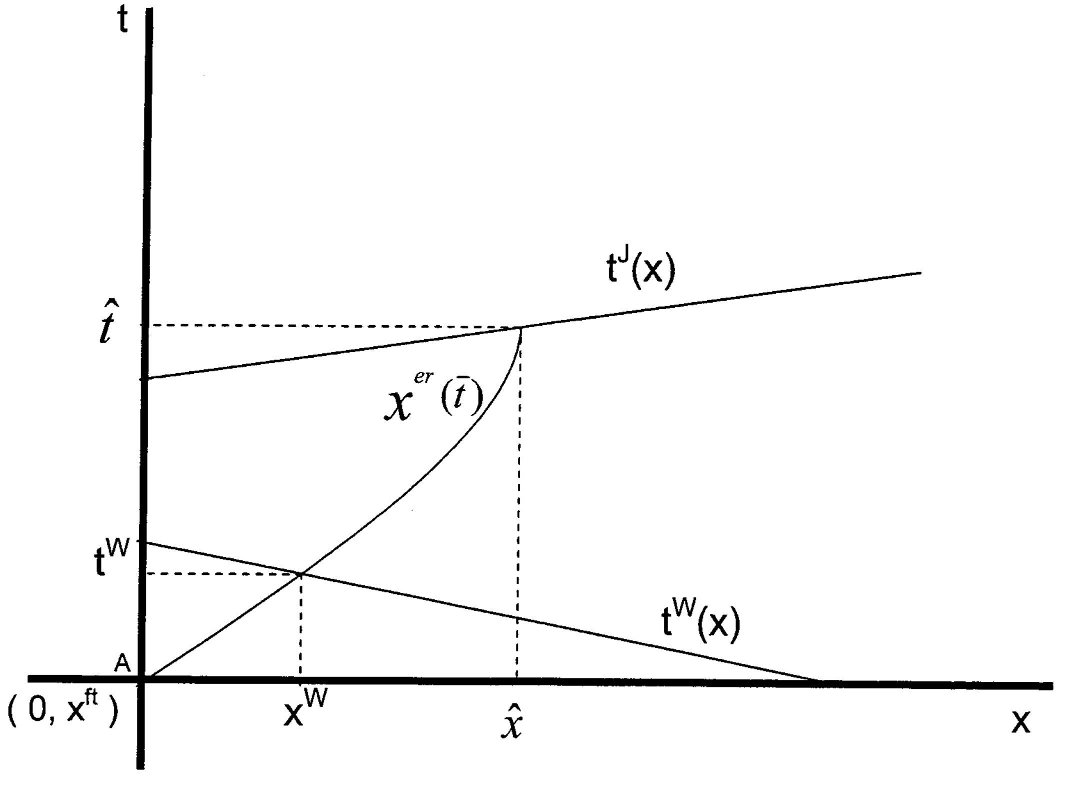
Let $x^{er}(\bar{t})$ be defined by

$$p(\bar{t}, x) - c(\bar{t}, x) = 1$$

Lemma 1: The equilibrium allocation conditional on a tariff binding $\bar{t} \leq \widehat{t}$ is given by $x^{er}(\bar{t})$.

See Figure 2.

Figure 2



This lemma implies that the optimal binding is the one that maximizes $\Psi(\bar{t}, x^{er}(\bar{t}))$ for $\bar{t} \leq \hat{t}$.

Proposition 3: In the case of perfect capital mobility, the optimal agreement is $\bar{t}^A = 0$ (free trade) for all δ and a.

Intuition: if capital is mobile, L anticipates that any rents will be dissipated by entry, and hence is not willing to compensate G for the long run distortions from protection. (This will of course no longer be true when capital is imperfectly mobile.)

Thus, when capital is mobile, the optimal agreement is free trade even in the presence of ex ante lobbying.

In this model there are two motives for a trade agreement: the standard TOT externality and the domestic commitment problem. We can disentangle the two with the following thought experiment.

Consider a hypothetical case in which G can commit domestically (subject to L's pressures) but acts noncooperatively vis-a-vis the F government. More precisely, suppose that at the beginning of the game G and L choose a tariff binding without cooperating with the F government; then capital is allocated; then G and L choose the tariff given the binding and the capital allocation.

Let $\bar{t}^{DC}$ be the binding that would be chosen in this case. Then $\bar{t}^{DC}$ maximizes

$$J(\bar{t}, x) = \Psi(\bar{t}, x) - aW^*(\bar{t}, x)$$

We can think of the movement from $\bar{t}^{DC}$ to $\bar{t}^{A} = 0$ as the component of trade liberalization that is due to the TOT motive, and the movement from $\hat{t}$ to $\bar{t}^{DC}$ as the component due to the domestic commitment motive.

Proposition 4: Let (x^W, t^W) be the intersection of the $t^W(x)$ curve with the $x^{er}(t)$ curve. Then $\bar{t}^{DC} = t^W$.

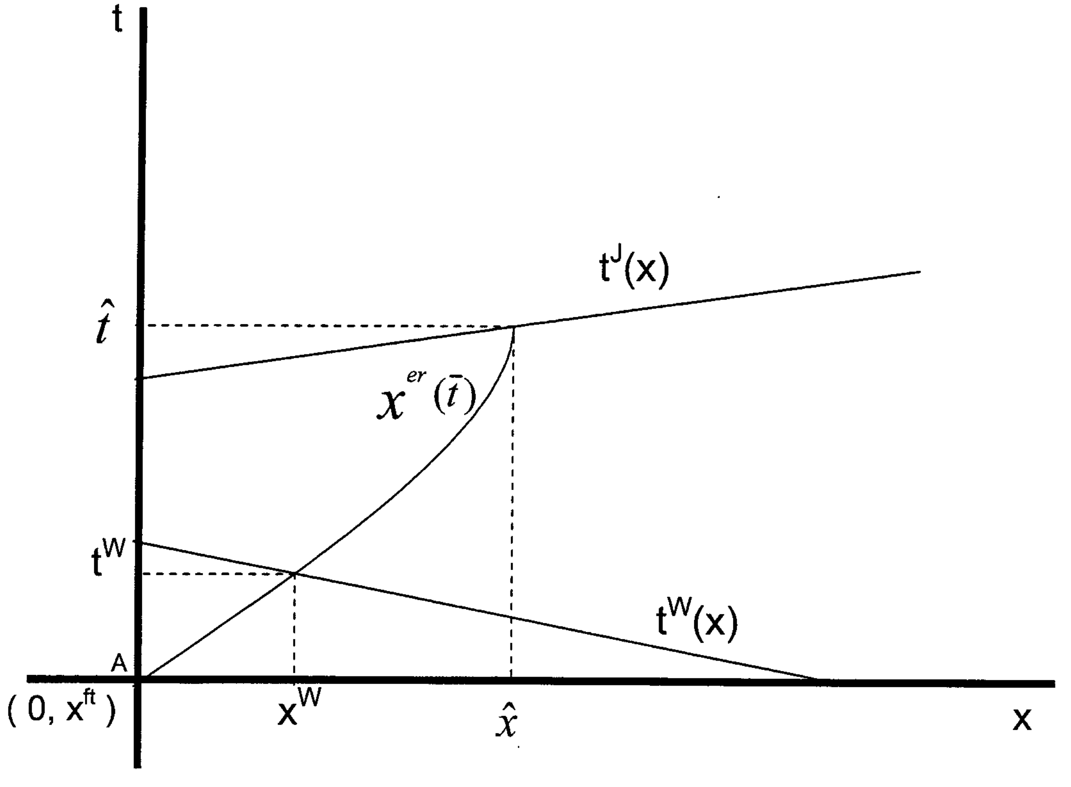
The TOT component of the agreement is just given by t^W, the "optimal" TOT tariff. This is consistent with the standard TOT models a' la GH and BS, where the optimal agreement just removes TOT considerations from the countries' protection levels.

The TOT component is independent of politics (a)...

... whereas the domestic-commitment component, $\hat{t} - \bar{t}^{DC}$, is larger when politics are more important (a is lower).

See Figure 2.

Figure 2



6 Imperfect capital mobility

As a first step, let us examine the extreme case in which capital is fixed at some level x. Then the optimal binding is

$$t^{\Psi}(x) \equiv \arg\max_{\bar{t}} \Psi(\bar{t}, x)$$

Claim: $t^{\Psi}(x) < t^{J}(x)$.

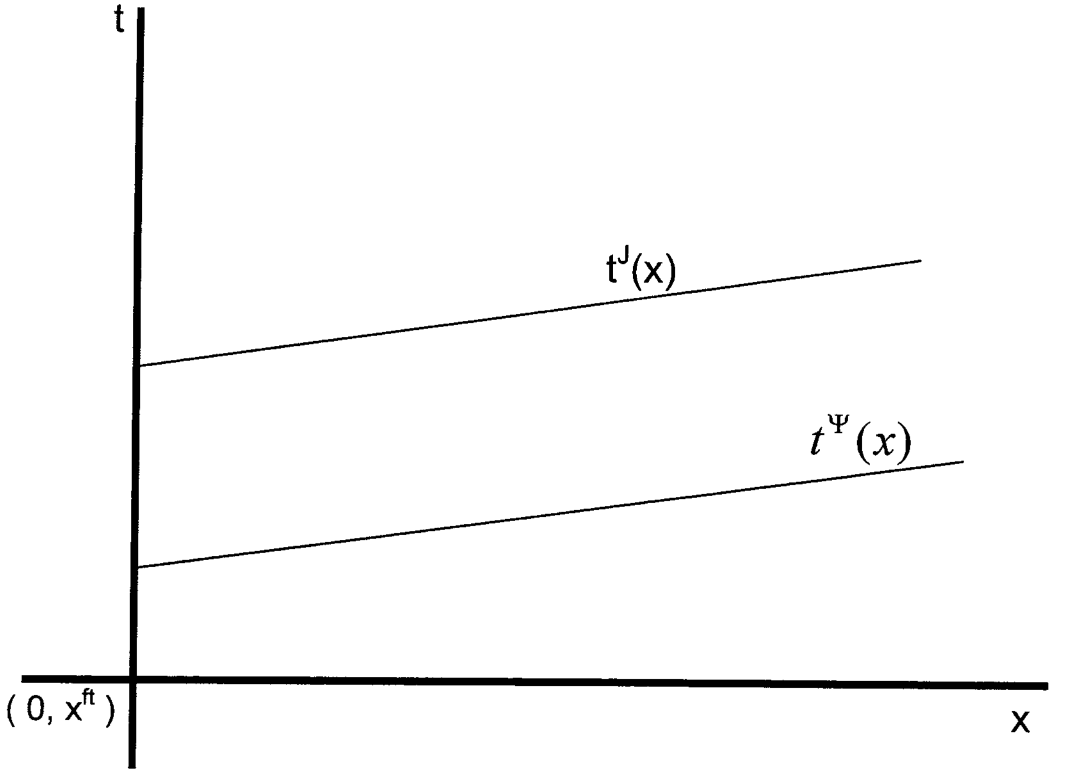
Proof: For $\bar{t} \geq t^{W}(x)$,

$$\Psi(\bar{t}, x) = aW(t^{W}(x), x) + aW^{*}(\bar{t}, x) + \delta[p(\bar{t}, x) - c(\bar{t}, x)]x$$

Note that $p(\bar{t}, x) - c(\bar{t}, x)$ is maximized at $t^{J}(x)$ and $W_{t}^{*} < 0$. The claim follows.

See Figure 3.

Figure 3



Digression: let us compare this case with the standard TOT story, as modeled e.g. in GH's 1995 paper.

The optimal agreement in GH's model is essentially the same as this case when $\delta = 1$. In this case $\Psi(\bar{t}, x)$ reduces to

$$\Psi(\bar{t}, x)|_{\delta=1} = aW(\bar{t}, x) + aW^*(\bar{t}, x) + xp(\bar{t}, x)$$

This is the joint surplus of the two governments and the lobby, just as in GH's model.

In this case ($\delta = 1$) a strong binding is equivalent to a weak binding, because contributions wash out in the ex-ante objective and they have no effect on the capital allocation.

If δ is lower than one, things are different:

- for $\bar{t} < t^W(x)$ there are no contributions, and the objective is qualitatively the same as in the case $\delta = 1$ (except that the relative weight of welfare vs. profits increases)

- but if the binding $\bar{t}$ exceeds $t^W(x)$ there are positive contributions, hence the objective is qualitatively different than in the GH case.

The optimal binding may be above or below $t^W(x)$, depending on the parameters; if it is above $t^W(x)$, then weak bindings are strictly better than strong bindings, because contributions enter positively in the objective $\Psi(\bar{t}, x)$.

Thus it suffices to perturb GH's model by lowering δ below one (even slightly), to find a role for weak bindings.

Next consider the domestic-commitment benchmark when x is fixed. The optimal binding now maximizes $J(\bar{t}, x)$.

For $\bar{t} \geq t^W(x)$,

$$J(\bar{t}, x) = aW(t^W(x), x) + \delta[p(\bar{t}, x) - c(\bar{t}, x)]x$$

which is maximized by $\bar{t} = t^J(x)$. For $\bar{t} < t^W(x)$, J is increasing in $\bar{t}$. Conclusion: $\arg\max_{\bar{t}} J(\bar{t}, x) = t^J(x)$, hence no binding is called for.

Thus, when x is fixed, the domestic-commitment component of the agreement is nil, and the whole tariff cut is coming from the TOT component. A domestic-commitment motive for trade agreements is present only if capital is mobile ($z > 0$).

To summarize, we have disentangled the role of δ from the role of z: when the only departure from the GH model is that the lobby is more nearsighted than G ($\delta < 1$), the only motive for trade agreements is still the TOT externality, *but* a role for weak bindings appears.

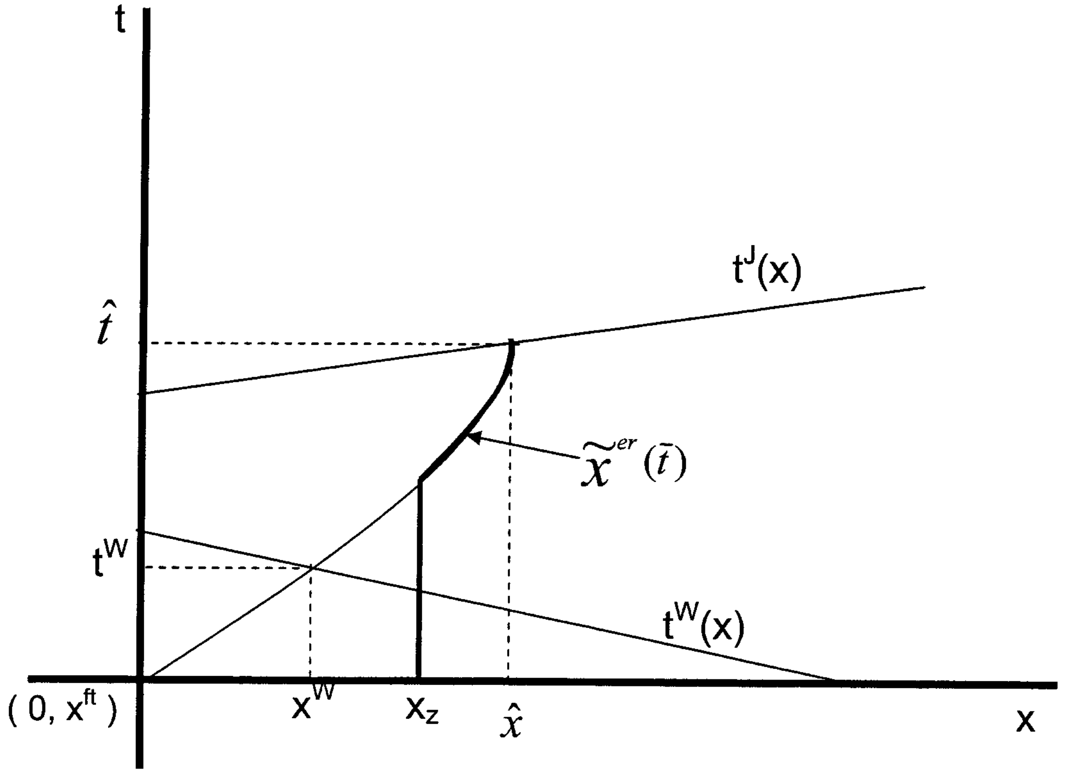
Now on to the more general case $z \in [0, 1]$.

Let us start by considering the equilibrium conditional on a given $\bar{t}$.

To develop intuition, suppose that $\bar{t} < \hat{t}$ and z is small. From Lemma 1, we know that if capital were perfectly mobile, the equilibrium allocation would be the one that equalizes returns given $\bar{t}$, that is $x^{er}(\bar{t}) < \hat{x}$. But if z is small, capital will not be able to exit sector M in sufficient amount to equalize returns across sectors. The allocation will then be $x_z \equiv (1 - z)\hat{x}$ and the rate of return will be higher in the N sector.

In general, the equilibrium allocation conditional on $\bar{t}$ is $\max\{x^{er}(\bar{t}), x_z\} \equiv \tilde{x}^{er}(\bar{t})$. This is simply the equal returns curve truncated at x_z. See Figure 4.

Figure 4



Lemma 2: Let max$\{x^{er}(\bar{t}), x_z\} \equiv \tilde{x}^{er}(\bar{t})$. The equilibrium allocation conditional on $\bar{t} \leq \hat{t}$ is given by $\tilde{x}^{er}(\bar{t})$.

This lemma implies that the optimal agreement is the one that maximizes $\Psi(\bar{t}, \tilde{x}^{er}(\bar{t}))$ for $\bar{t} \leq \hat{t}$.

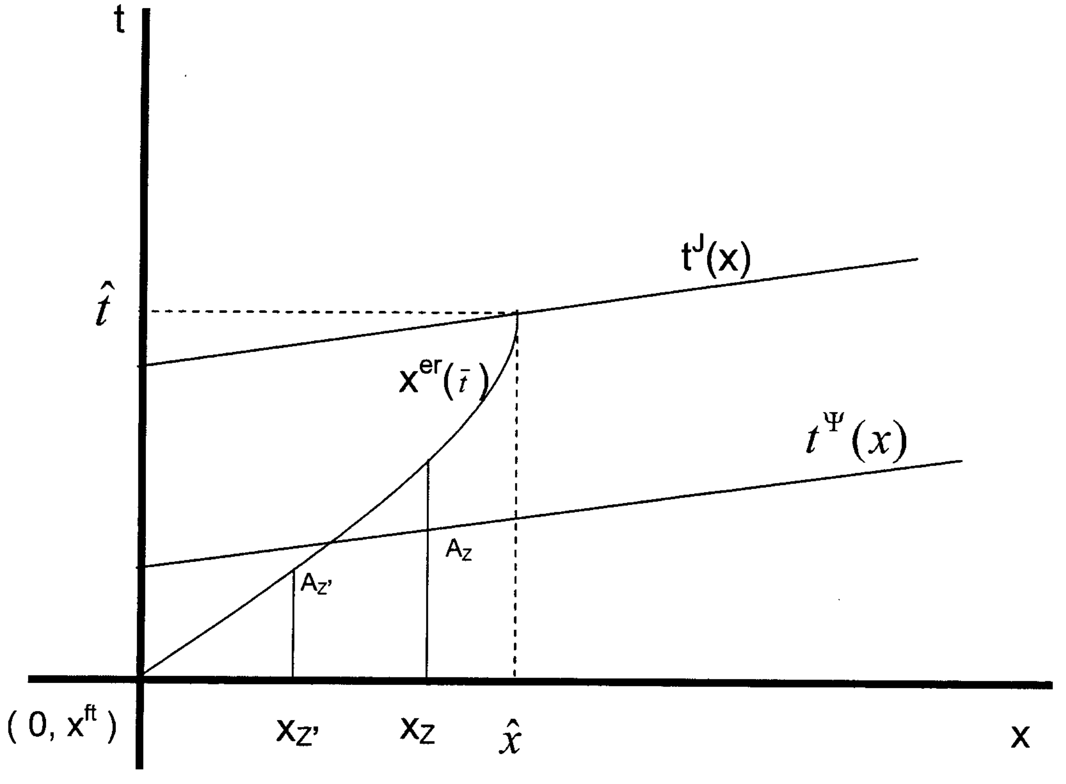
Proposition 5: Let $t^{er}(x)$ be the inverse of $x^{er}(\bar{t})$. The optimal tariff binding is given by

$$\bar{t}^A(z) = \begin{cases} \min\{t^{er}(x_z), t^{\Psi}(x_z)\} \text{ for } x_z \geq x^{ft} \\ 0 \text{ for } x_z < x^{ft} \end{cases}$$

and $\bar{t}^A(z)$ is decreasing in z.

See Figure 5.

Figure 5



This result suggests an empirical prediction: trade agreements should lead to deeper trade liberalization in sectors where production factors are more mobile.

Next we decompose the optimal agreement into its domestic-commitment and TOT components, and examine the effect of capital mobility on each component.

As in the previous section, the key step is to characterize the fictitious benchmark in which the home government (in agreement with the lobby) can commit domestically.

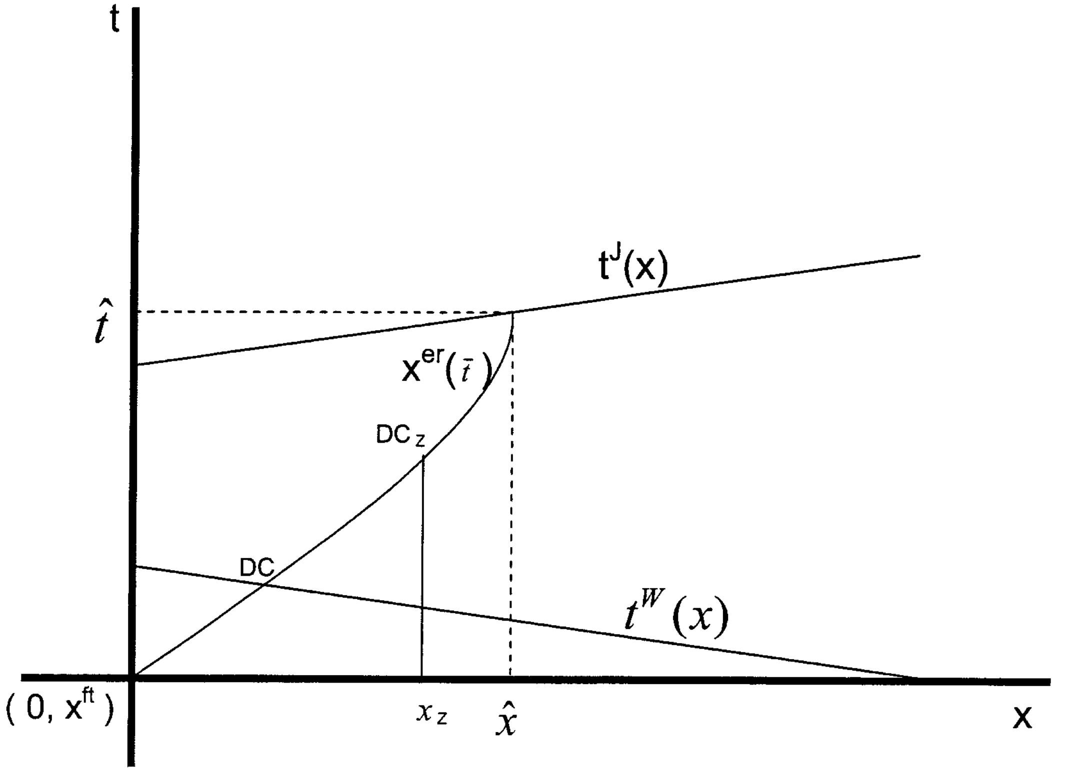
When the mobility constraint is binding ($x_z > x^W$), $\bar{t}^{DC}$ is given by $\min\{t^{er}(x_z), t^J(x_z)\} = t^{er}(x_z)$.

Proposition 6: In the domestic-commitment benchmark,

$$\bar{t}^{DC}(z) = \begin{cases} t^{er}(x_z) \text{ for } x_z \geq x^W \\ t^W \text{ for } x_z < x^W \end{cases}$$

See Figure 6.

Figure 6



The domestic-commitment component of the agreed-upon tariff cut, $\hat{t} - \bar{t}^{DC}(z)$, is clearly increasing in z.

What can we say about the effect of z on the TOT component, $\bar{t}^{DC}(z) - \bar{t}^{A}(z)$?

In general the answer is ambiguous, but notice that for small z the TOT component of the tariff cut *decreases* with z.

To see this, consider a small increase of z from zero. Then $\bar{t}^{DC}(z)$ goes down with infinite slope, while $\bar{t}^{A}(z)$ goes down with finite slope, therefore $\bar{t}^{DC}(z) - \bar{t}^{A}(z)$ decreases.

Thus we can say that the liberalization-deepening effect of factor mobility is entirely due to the domestic-commitment motive, at least for z relatively small.

Gradual trade liberalization

We think our model can explain also why trade agreements often entail a declining path for trade protection

Conjecture: Consider a multi-period extension of the model where (i) at the beginning of the game governments can commit to a tariff path for the future; (ii) in each period, each unit of capital gets a chance to move with probability z. Then the optimal agreement entails a declining path for the tariff.