ECONOMICS OF THE GATT/WTO

■ "…So if our theories really held sway, there would be no need for trade treaties: global free trade would emerge spontaneously from the unrestricted pursuit of national interest…" (Krugman, 1997)

■ Why then in trade negotiations does a government "…require a 'concession' from its trading partner(s) in order to do what is in any event best for its country"? (Bagwell and Staiger, 1999)

■ Observation that governments seek reciprocity in trade agreements often interpreted to mean trade negotiators are adopting a mercantilist perspective inconsistent with economic logic

Krugman (1991) observes that there are three simple rules about the objectives of negotiating countries:

- exports are good
- imports are bad
- *ceteris paribus*, an equal increase in imports and exports is good

"GATT-think" is "enlightened mercantilism", i.e., it is *mercantilist* in presuming countries unilaterally like to subsidize exports and tax imports, and *enlightened* in recognizing this could be destructive

- "GATT-think" then sees the trade policy problem as Prisoners' Dilemma – individually, countries have an incentive to be protectionist, yet collectively they gain from free trade

- However, if this is so wrong from an economic perspective, how is it that in fact "GATT-think" has turned out mostly right? What is its hidden logic?

  (i) Based on political pressure argument, government policy does not necessarily represent public interest, but rather small well-organized groups such as exporters and import-competing producers – which explains first two principles of "GATT-think"

  (ii) Despite ignoring gains from trade as economists understand them, in setting exporter interests as a counter-weight to import-competing interests, and by bargaining for access to each others' markets, trade negotiators do move system closer to free trade

  Since 1947, through 8 rounds of GATT, average ad valorem tariffs have fallen from over 40 percent to less than 4 percent, and membership of GATT/WTO has gone from 23 to 153 countries

- Bagwell and Staiger (1999), however, show that there is a basic economic logic for GATT/WTO. They start with a very basic question – what do governments gain from a trade agreement?

Essentially, there is an inefficiency governments wish to remove by being in a trade agreement - the inefficiency being terms of trade externalities of unilateral trade policies, i.e., imposition of an import tariff may drive down world price, imposing costs on exporters

- Key "pillars" of GATT are principles of *reciprocity* and *non-discrimination*:

  (i) Reciprocity – principle by which one country agrees to reduce level of protection in return for a reciprocal concession from trading partner

  (ii) Non-discrimination – concession given to one trading partner is given to all other trading partners

  Do these principles serve as simple rules of negotiation that promote efficiency?

- <u>Model:</u>

  (i) Economic environment

  2-countries, home and foreign (*), 2-goods, x and y produced competitively under increasing costs, x (y) being natural import good of home (foreign) country

  Home local relative prices are denoted as $p \equiv p_x / p_y = \tau p^w \equiv p(\tau, p^w)$, and foreign local relative prices are $p^* \equiv p_x^* / p_y^* = p^w / \tau^* \equiv p^*(\tau^*, p^w)$

$p^w \equiv p_x^* / p_y$ is world relative price, τ and τ^* being home and foreign *ad valorem* tariffs/subsidies, τ $(\tau^*) > 1$ for an import tariff and τ $(\tau^*) < 1$ for an import subsidy

Production in each country is a function of local relative prices, $Q_i = Q_i(p)$ and $Q_i^* = Q_i^*(p^*)$ for $i \in \{x, y\}$, while consumption is a function of local relative prices and tariff revenue $R(R^*)$, which is distributed as a lump-sum to home (foreign) consumers

Home and foreign consumption are respectively $D_i = D_i(p, R)$ and $D_i^* = D_i^*(p^*, R^*)$ for $i \in \{x, y\}$, with home tariff revenue being defined implicitly as $R = [D_x(p, R) - Q_x(p)][p - p^w], R = R(p, p^w)$, and also foreign tariff revenue being defined as $R^* = [D_y^*(p^*, R^*) - Q_y^*(p^*)][1 / p^* - 1 / p^w], R^* = R^*(p^*, p^w)$

Consumption then becomes $C_i(p, p^w) \equiv D_i(p, R(p, p^w))$ and $C_i^*(p^*, p^w) \equiv D_i^*(p^*, R^*(p^*, p^w))$, with home imports of x being $M_x(p, p^w) \equiv C_x(p, p^w) - Q_x(p)$, and home exports of y being $E_y(p, p^w) \equiv Q_y(p) - C_y(p, p^w)$, with similar expressions for foreign country imports of y, M_y^* and exports of x, E_x^*

Home and foreign budget constraints imply that, for any world price, trade balances:

(1) $\quad p^w M_x(p(\tau,p^w),p^w) = E_y(p(\tau,p^w),p^w)$

$\quad\quad M_y^*(p^*(\tau^*,p^w),p^w) = p^w E_x^*(p^*(\tau^*,p^w),p^w)$

the world equilibrium price $\tilde{p}^w(\tau,\tau^*)$ being determined by the y-market clearing condition

(2) $\quad E_y(p(\tau,\tilde{p}^w),\tilde{p}^w) = M_y^*(p^*(\tau^*,\tilde{p}^w),\tilde{p}^w)$

market-clearing for x being determined by (1) and (2)

Given an initial pair of tariffs, (2) determines world price, which along with tariffs then determines local prices, thereby implying production, consumption, imports, exports and tariff revenue

Also, in order to avoid the Lerner and Metzler paradoxes, impose conditions $dp/d\tau > 0 > dp^*/d\tau^*$ and $\partial\tilde{p}^w/\partial\tau < 0 < \partial\tilde{p}^w/\partial\tau^*$

(ii) Government objectives

Objectives of home and foreign governments are given as $W(p(\tau,\tilde{p}^w),\tilde{p}^w)$ and $W^*(p^*(\tau^*,\tilde{p}^w),\tilde{p}^w)$, and holding local price fixed, each government achieves higher welfare when its terms of trade improve:

(3) $\quad \partial W(p,\tilde{p}^w)/\partial\tilde{p}^w) < 0,$ and $\partial W^*(p^*,\tilde{p}^w)/\partial\tilde{p}^w) > 0$

Figure 1 illustrates initial tariff pair at $A \equiv (\tau, \tau^*)$, which is associated with a domestic iso-local price locus $p(A) \rightarrow p(A)$, and an iso-world price locus $p^w(A) \rightarrow p^w(A)$

A second iso-world price locus is given by $p^w(C) \rightarrow p^w(C)$, along which world price is lower than at A, implying improved terms of trade for home country, i.e., a reduction in world price that maintains home price is achieved with a move from A to B, given higher (lower) home (foreign) tariff

Implied income transfer of A to B only valued by home country – representation of government preferences general enough to include maximization of national income (Johnson, 1953/54), as well as distributional objectives (Hillman, 1982; Grossman and Helpman, 1994; 1995)

(iii) Purpose of reciprocal trade agreements

Assume governments want to participate in reciprocal trade agreements in order to achieve mutually beneficial changes in trade policy – a Pareto improvement, as measured by W and W^*, over what would be achieved through unilateral tariff setting

Reciprocal trade liberalization is mutual reductions in tariffs, and if an efficient reciprocal trade agreement is reached, it will be on a locus defined by:

Figure 1: World- and Local-Price Effects of Tariff Change
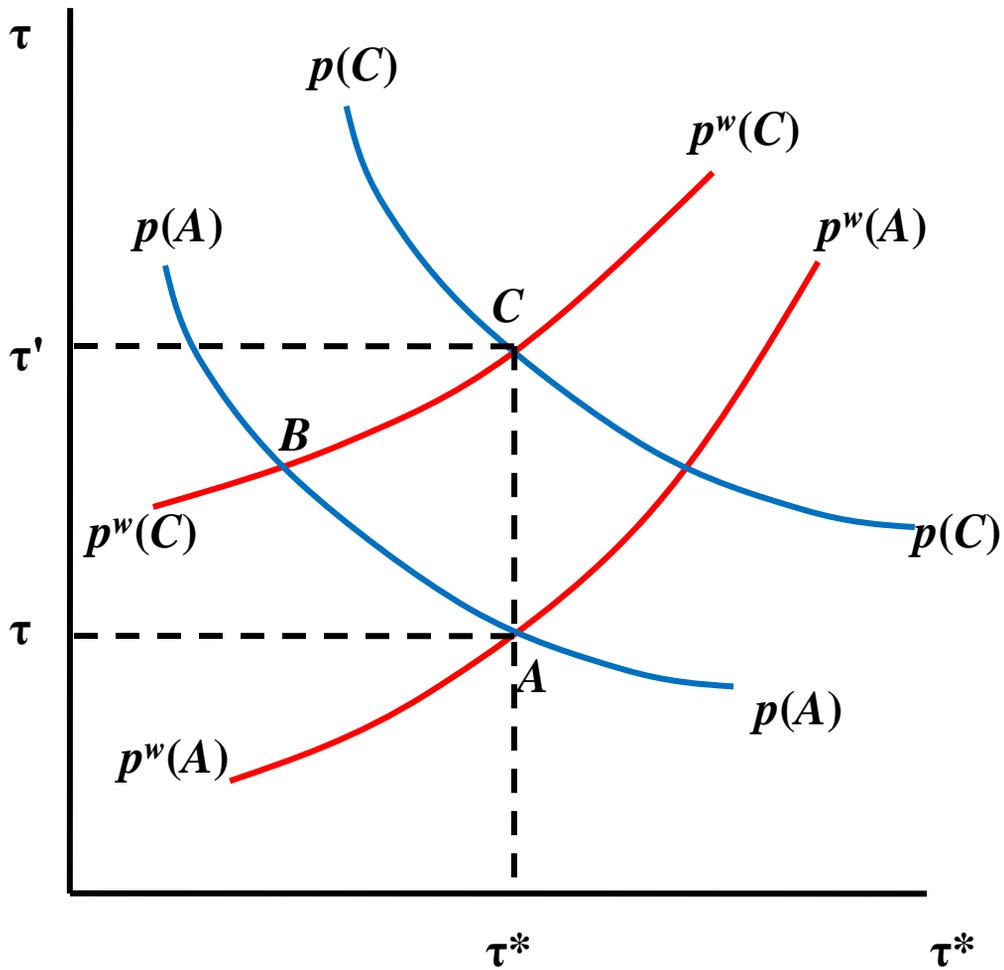
(4) $$[d\tau / d\tau^*]\big|_{dW=0} = [d\tau / d\tau^*]\big|_{dW^*=0}$$

In absence of reciprocal trade agreement, what will be inefficiencies? Each government sets trade policy to maximize objective function, given tariff choice of other country, resulting reaction functions being:

(5a) $\quad$ **Home** $: W_p[dp / d\tau] + W_{p^w}[\partial\tilde{p}^w / \partial\tau] = 0$

(5b) $\quad$ **Foreign** $: W_{p^*}^*[dp^* / d\tau^*] + W_{p^w}^*[\partial\tilde{p}^w / \partial\tau^*] = 0$

Where subscripts are partial derivatives, and with $\lambda \equiv [\partial\tilde{p}^w / \partial\tau] / [dp / d\tau] < 0$, $\quad \lambda^* \equiv [\partial\tilde{p}^w / \partial\tau^*] / [dp^* / d\tau^*] < 0$, **(5a) and (5b) can be re-written as:**

(6a) $\quad$ **Home** $: W_p + \lambda W_{p^w} = 0$

(6b) $\quad$ **Foreign** $: W_{p^*}^* + \lambda W_{p^w}^* = 0$

Best-response tariff for each government determined by impact local- and world-price movements have on welfare

At $A \equiv (\tau, \tau^*)$ **in Figure 1, holding** τ^* **constant, if home tariff raised to** τ', **a new tariff pair at** $C \equiv (\tau^1, \tau^*)$ **is induced, which lies on new iso-local price locus** $p(C) \rightarrow p(C)$, **and a new iso-world price locus** $p^w(C) \rightarrow p^w(C)$

Home government induces higher local price and lower world price, move from A to C being the combination of:

(i) A to B, change in world price, from 6(a) given by

       λW_{p^w}, which is strictly positive by (3)

(ii) B to C, induced increase in local price, which is W_p

Nash equilibrium tariffs (τ^N, τ^{*N}) are those that satisfy (6a) and 6(b). A Pareto improvement can be achieved through reciprocal trade agreement characterized by reciprocal trade liberalization

Proposition 1:

Nash equilibrium tariffs are inefficient

Proposition 2:

A reciprocal trade agreement must entail reciprocal trade liberalization

Terms of trade externality implies government faces less than full cost of imposing tariff, so they oversupply protection relative to efficient levels given preferences - externality is only inefficiency a reciprocal trade agreement can remedy

Consider a world where government does *not* value terms of trade effects of unilateral tariff choices, politically-optimal tariffs being defined as (τ^{PO}, τ^{*PO}), that simultaneously satisfies:

(7a) $\qquad$ **Home** $: W_p = 0$

(7b) $\qquad$ **Foreign** $: W_{p^*}^* = 0$

Where each government aims to maximize national income, politically optimal tariffs correspond to reciprocal free trade

Proposition 3:

Politically optimal tariffs are efficient

From Figure 1, home government considers domestic costs and benefits of a tariff increase through (i) increase in domestic price (B to C), and (ii) extent to which costs are shifted onto its trading partner through fall in world price (A to B)

In hypothetical case where government does not value (ii), only motivated by (i) – if both governments behave this way, politically optimal tariffs are efficient

Politically optimal tariffs not only efficient tariffs – use (4) to re-write efficiency locus as:

(8) $\qquad$ $(1 - A W_p)(1 - A^* W_{p^*}^*) = 1$

$$A \equiv (1 - \tau\lambda)/(W_p + \lambda W_{p^w}) \text{ and } A^* \equiv (1 - \lambda^*/\tau^*)/(W_{p^*}^* + \lambda^* W_{p^w}^*),$$

$A \neq 0,$ and $A^* \neq 0$ under assumption welfare functions are finite

(8) satisfied when $W_p=0$ and $W_p^*=0$, so that politically-optimal tariffs are efficient, but (8) also satisfied if $W_p\neq0$ and $W_p^*\neq0$

Starting from political optimum, other points on (8) can be reached by altering tariffs to generate local prices that are efficient given new distribution of world income implied by associated world-price movements

Assume that: (i) a unique Nash equilibrium exists; (ii) a unique political optimum exists; and (iii) political optimum lies on contract curve – point on efficiency locus yielding mutual gains to each government, relative to Nash welfare

In Figure 2, from Proposition 1, Nash tariffs (N) lie off efficiency locus (8), $E\rightarrow E$; from Proposition 2, relative to N, trade agreement can increase welfare of both governments with reduction in both tariffs; from Proposition 3, politically optimal tariffs *PO* lie on *EE*, iso-welfare curves being tangent along locus

Note at politically-optimal point, iso-welfare curves also tangent to iso-world price locus

Figure 2: Purpose of a Reciprocal Trade Agreement
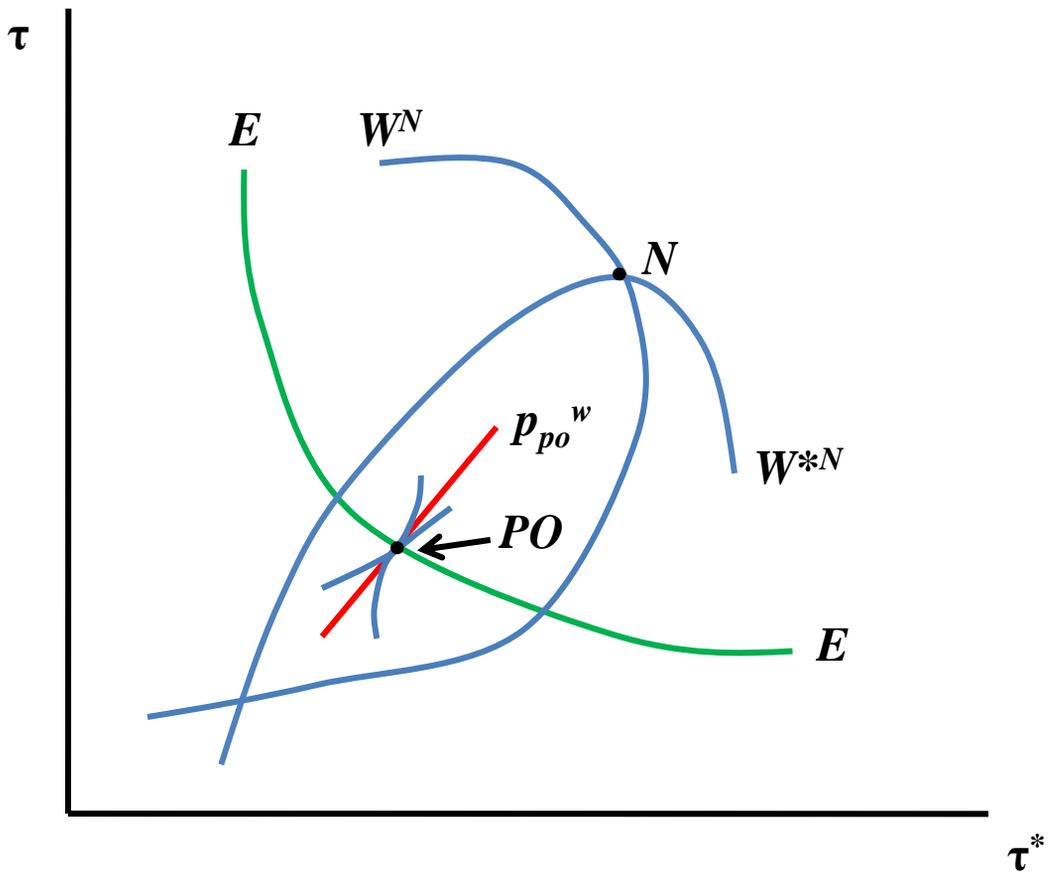
Reciprocal trade agreement allows governments to cooperate and replace higher Nash tariffs with tariffs on contract curve. How is trade agreement to be designed – "rules-based" vs. "power-based"?

GATT based on a rules-based approach reciprocity and non-discrimination

■ **<u>Reciprocity</u>:**

(i) Principle of Reciprocity

Mutual changes in trade policy generating equal changes in import volumes across trading partners

Tariff changes $\Delta\tau \equiv (\tau^1 - \tau^0)$ and $\Delta\tau^* \equiv (\tau^{*1} - \tau^{*0})$ conform to principle of reciprocity, provided:

$$\tilde{p}^{w0}[M_x(p(\tau^1, \tilde{p}^{w1}), \tilde{p}^{w1}) - M_x(p(\tau^0, \tilde{p}^{w0}), \tilde{p}^{w0})$$
$$= [M_y^*(p^*(\tau^{*1}, \tilde{p}^{w1}), \tilde{p}^{w1}) - M_y^*(p^*(\tau^{*0}, \tilde{p}^{w0}), \tilde{p}^{w0})]$$

where $\tilde{p}^{w0} \equiv \tilde{p}^w(\tau^0, \tau^{*0}), \tilde{p}^{w1} \equiv \tilde{p}^w(\tau^1, \tau^{*1})$, and changes in import volumes measured at world prices

Using (1) and (2), expression reduces to:

$$[\tilde{p}^{w1} - \tilde{p}^{w0}]M_x(p(\tau^1, \tilde{p}^{w1}), \tilde{p}^{w1}) = 0$$

i.e., mutual changes in trade policy conforming to reciprocity *leave world prices unchanged*

Unilateral tariff choices inefficient if governments motivated by ability to *change* world price – under reciprocity, terms of trade externality neutralized, as mutual tariff changes leave world price *fixed*

(ii) Reciprocity and Balance of Concessions

Notion of reciprocity embedded in GATT Article XXVIII – although governments typically seek a *balance of concessions* – as noted earlier, seems to defy economic logic

Bagwell and Staiger (1999) argue informal principle of reciprocity characterizing actual trade negotiations admits a straightforward economic interpretation

<u>Proposition 4:</u>

Starting at Nash equilibrium, reciprocal trade liberalization conforming to reciprocity increases each government's welfare monotonically until point where $\min[-W_p, W_{p*}^*] = 0$. If countries are symmetric, liberalization leads to politically optimal outcome

At Nash equilibrium, each government prefers more trade, but it would like to achieve this without, terms of trade loss. From (3) and (6a), $W_p < 0$ at Nash equilibrium, so domestic price is higher than government would like, given Nash world price

Home government would like to reduce tariff, lower domestic price and experience increase in trade volume, if it could without reducing terms of trade

Negotiated *mutual* reduction in tariffs that conforms to reciprocity generates higher trade volume without terms of trade loss – both governments benefit from tariff reductions, as long as trade liberalization does not go beyond point at which $\min[-W_p, W_{p*}^*] = 0$, i.e., where one government obtains preferred local price given initial Nash world price

Figures 3A and 3B illustrate Proposition 4 for case of symmetric and asymmetric countries:

(i)   In Figure 3A, iso-world price locus that runs through *N* also intersects at *PO* where both governments simultaneously achieve locally-preferred prices at politically optimal tariffs

(ii)   In Figure 3B, Nash iso-world price locus does not intersect *PO*, mutual benefits from liberalization terminating before *EE* is reached – i.e., at *Z*, home government achieves preferred local price

Reciprocity induces governments to act *as if* they do not value terms of trade movements associated with unilateral tariff selections, i.e., world price is fixed, and preferred tariff satisfies $W_p = 0$

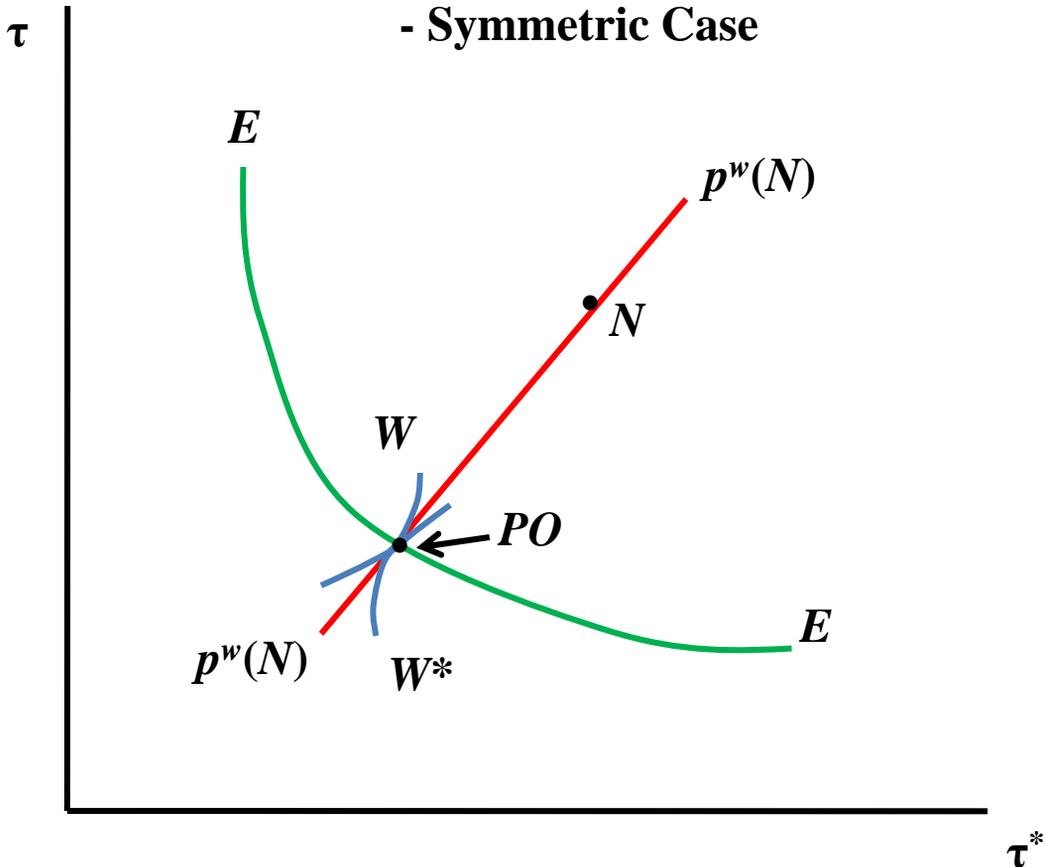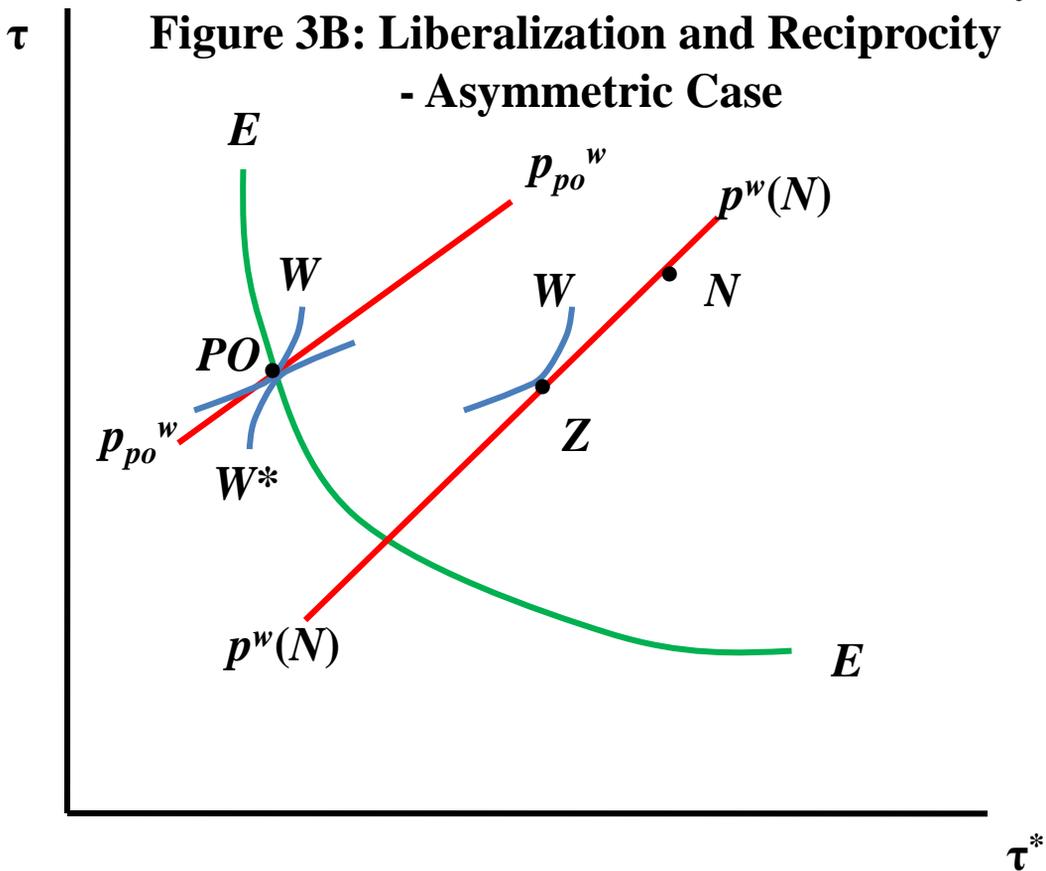# Figure 3A: Liberalization and Reciprocity - Symmetric Case

τ

E

$p^w(N)$

N

W

PO

$p^w(N)$

$W*$

E

τ^*

Figure 3B: Liberalization and Reciprocity - Asymmetric Case

τ

E

p_{po}^w

$p^w(N)$

W

W

N

PO

Z

p_{po}^w

$W*$

$p^w(N)$

E

τ^*

Looking at (6a), home government's preferred tariff satisfies $W_p=0$ when term $\lambda W_{p^w} = 0$ - this is true if government either does not value a change in terms of trade, $W_{p^w} \equiv 0$, or it expects a reciprocal tariff adjustment from foreign country, resulting in no change in terms of trade, $\lambda=0$

Returning to Krugman's (1991) rules of "enlightened mercantilism", Propositions 1-4 provide a formal interpretation of them:

- "exports are good" - reduction in import tariff levied by foreign country improves terms of trade
- "imports are bad" - concession implies reducing import tariff resulting in terms of trade decline
- "an equal increase in imports and exports is good" – balance of concessions serves to neutralize terms of trade decline that make unilateral trade liberalization undesirable

(iii) <u>**Reciprocity and Renegotiation:**</u>

Other application of reciprocity in GATT is how a country can renegotiate a previous agreement – under GATT Article XXVIII, country may propose to modify/withdraw a tariff concession, and partners are then able to withdraw *substantially equivalent concessions*

Bilateral negotiation game:

- Stage 1: Governments bargain over tariffs and a world price, $\bar{p}^w$, is determined
- Stage 2: Home government proposes domestic tariff, $\hat{\tau}$ at same time as foreign government offers a foreign tariff of $\hat{\tau}^*$. If proposals agree, implemented as outcome of negotiation
- Stage 3: If proposals do not agree, tariffs implemented are those that achieve greatest trade volume while satisfying restrictions of reciprocity and proposed imports

First determine tariffs that can be achieved under reciprocity in stages 2 and 3, and then describe stage 1 bargaining process

In Figure 4, there are three pairs of efficient tariffs, A, B, and PO, along with associated world price-loci. Also show loci representing tariffs for which $W_p = 0$ and $W^*_{p^*} = 0$ - by (8), each intersects efficiency frontier EE at PO and nowhere else

Suppose initial agreement is at A – foreign government prefers to move to A' where it achieves preferred local price, so it has incentive to propose $\tau^*(A')$, with implied domestic tariff of $\tau(A')$

Figure 4: Renegotiation under Reciprocity

τ

E

p^w(A)

A'

W*

p_{po}^w

A

p^w(A)

W

p^w(B)

W

W_p=0

W*

B'

PO

B

E

p_{po}^w

W*_{p*}=0

p^w(B)

τ*
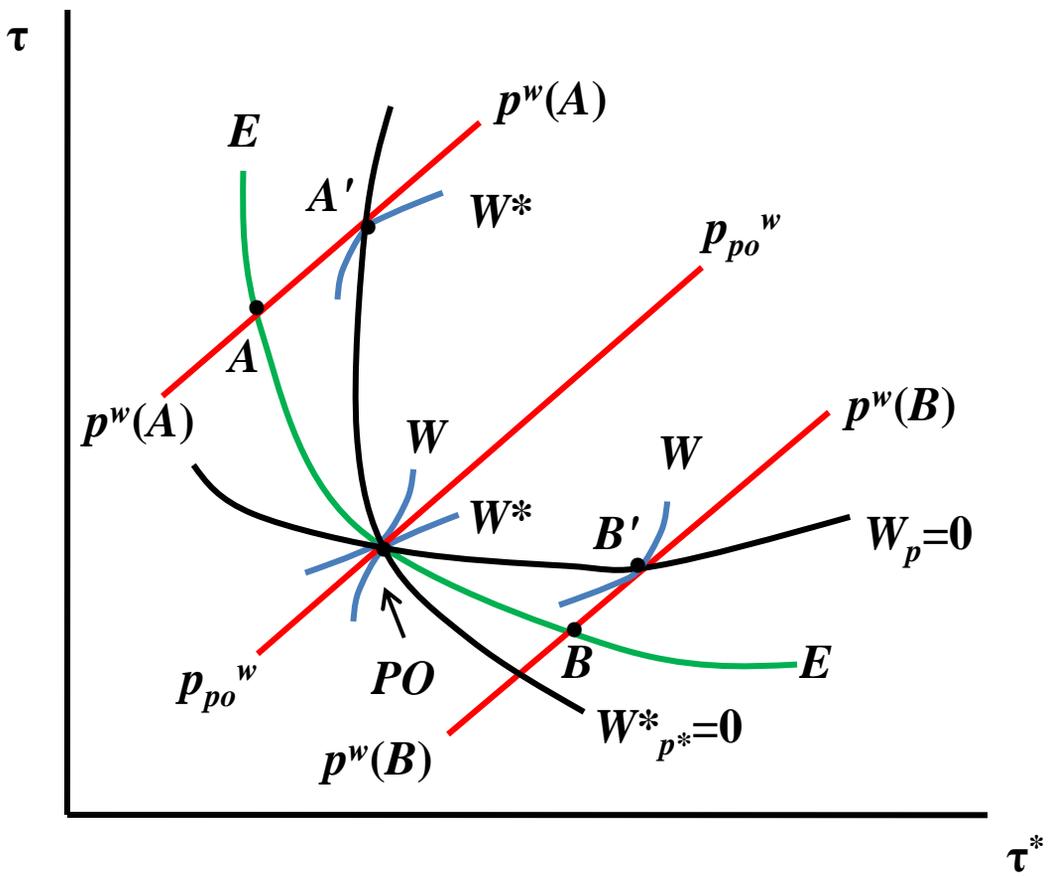
This is a dominant strategy for foreign government, i.e. *A* is not "renegotiation proof" under GATT rules. Apparent too that B also fails the renegotiation test, this time the home government withdrawing original concession to induce *B'*

Only one efficient tariff pair, if agreed to initially, that is impervious to renegotiation – the politically optimal pair, which is only point on *EE* at which each government gets its preferred local price for given world price

Tariff pair (τ,τ^*) can be implemented under reciprocity if there is a world price $\bar{p}^w$ such that outcome of stages 2 and 3 of bilateral negotiation game is uniquely (τ,τ^*) when governments make dominant proposals

<u>Proposition 5</u>:

An efficient trade agreement can be implemented under reciprocity if and only if characterized by tariffs set at politically optimal levels

i.e., if governments recognize potential for renegotiation under GATT rules, and if they seek efficient outcome, negotiations will result in politically optimal tariffs

In Figure 5A, locus of tariffs implementable under reciprocity in a reciprocal trade agreement corresponds to upper envelope of portions of $W_p=0$ and $W^*_{p^*}=0$ loci that lie inside Nash welfare contours of governments, i.e., $R{\rightarrow}PO{\rightarrow}R$

Figure 5B shows information in welfare space, W (W^*) on the axes and N at origin. Dashed curve is efficiency frontier, while bold curve corresponds to $R{\rightarrow}PO{\rightarrow}R$ – this shrinks feasible set of bargaining outcomes to lie inside frontier, except at PO

Constraint of reciprocity has effect of steering stage 1 bargaining game towards political optimum, i.e., limits extent to which one government can gain at other's expense relative to PO

Suppose governments bargain only over final tariffs with no possibility of renegotiation, feasible set of outcomes is dotted frontier in Figure 5B, and bargaining outcome would be say at A

Instead suppose the bilateral negotiation game is in place, feasible set is bold frontier in Figure 5B, solution now being B, where stage 1 bargaining is now closer to political optimum
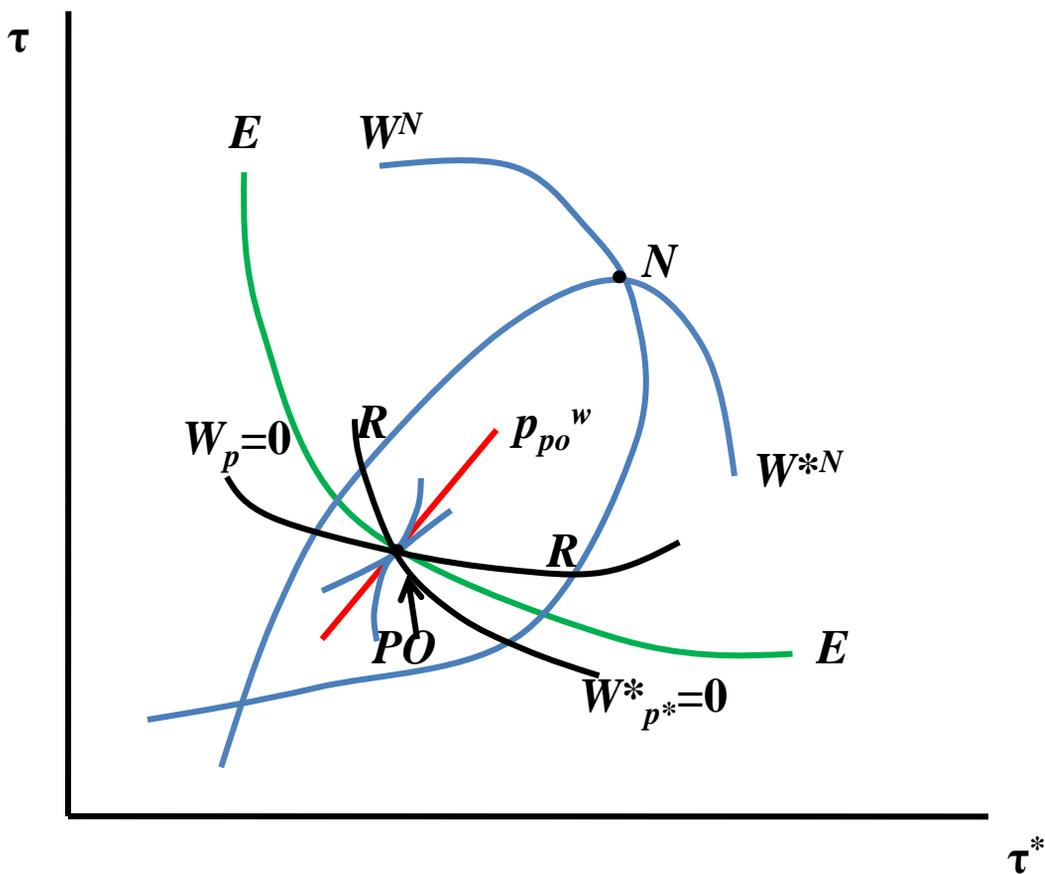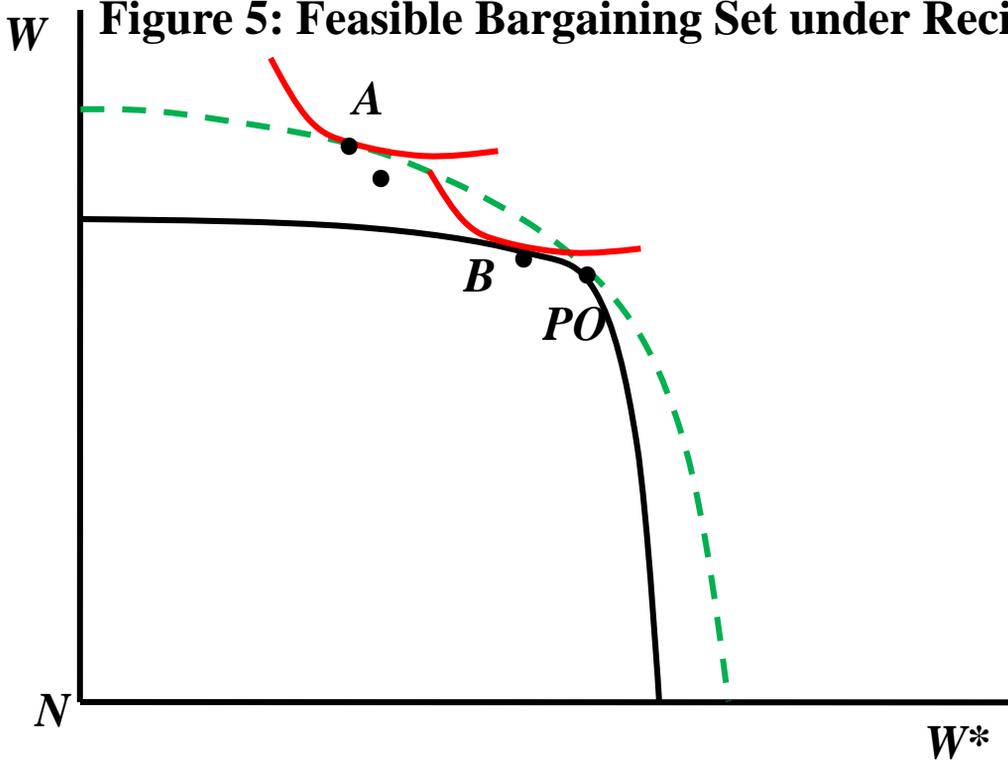
Figure 5A: Locus of Tariffs under Reciprocity

Figure 5A: Locus of Tariffs under Reciprocity

Labels in figure: τ (vertical axis), τ^* (horizontal axis), E, W^N, N, R, $W_p=0$, p_{po}^{w}, W^{*N}, R, PO, E, $W^*_{p^*}=0$

Figure 5: Feasible Bargaining Set under Reciprocity

Labels in figure: W (vertical axis), W^* (horizontal axis), A, B, PO, N

- **<u>Non-Discrimination and Reciprocity</u>:**

  Principle of non-discrimination as embodied in most-favored nation (MFN) clause, is second pillar of GATT

  Bagwell and Staiger (1999) extend their setting to a multi-country framework to assess role of non-discrimination in multilateral trade agreements

  Home government welfare function now embodies a novel pattern of externalities if it adopts discriminatory tariffs:

  (i) **Tariff selected by foreign government alters world prices, affecting home country's terms of trade, and imparts an externality via tariff revenue**

  (ii) **Tariff selected by foreign government may exert a home country externality through effect tariff has on foreign local price, and thereby home country's terms of trade and tariff revenue**

  Imagine home country sets a higher tariff on imports from foreign country 1 – it is now affected by composition of trade volume across countries

  Ceteris paribus **prefers more trade volume with country 1, but exports shares of *n* foreign countries also partly depend on their local prices, and therefore, they impart an externality when home tariffs are discriminatory**

Local price externality disappears when home government's tariffs satisfy MFN, terms of trade being affected only by common world price

Proposition 6:

Politically optimal tariffs are efficient if and only if they conform to MFN

i.e., politically optimal tariffs are efficient provided externalities countries impose on each other in their tariff choices travel only through world prices

Proposition 7:

An efficient multilateral trade agreement can be implemented under reciprocity only if characterized by tariffs conforming to MFN and set at politically optimal levels

Non-discrimination ensures all externalities travel through world prices, and principle of reciprocity serves to neutralize such externalities

If Stage-1 bargaining results in discriminatory tariffs, tariff choices impart both world-price and foreign-price externalities, reciprocity being ill-suited to handle the latter

Reciprocity and non-discrimination when used together can generate an efficient outcome:

(i)   **Non-discrimination/MFN ensures a single world price, and home government no longer has direct interest in composition of trade volume – welfare no longer affected by foreign local prices**

(ii)   **Reciprocity ensures single world price stays fixed**

■   **<u>Preferential Trade Agreements</u>:**

A major exception to the twin pillars of GATT is embodied in GATT Article XXIV – allowing creation of preferential trade agreements such as *free-trade areas* (NAFTA) and *customs unions* (EU)

As free-trade areas are inherently discriminatory, an implication of Proposition 7 is:

<u>Proposition 8</u>:

An efficient multilateral trade agreement cannot be implemented under reciprocity in presence of free-trade agreement

Follows from fact that members of free trade area maintain discriminatory tariffs against non-members of free-trade area, so externalities pass through local as well as world prices

With a customs union, members should eliminate all internal trade barriers as well as adopting a common external tariff, consequently, an additional implication of Proposition 7 is:

<u>Proposition 9</u>:

An efficient multilateral trade agreement can be implemented with reciprocity and a customs union, if members of customs union are internally integrated, and its external tariffs, along with tariffs of all other countries, conform to MFN and are set at politically optimal levels