Bilateralism, pure multilateralism, and the quest for global free trade

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1. Introduction

By permitting countries to form preferential trade agreements, Article XXIV of GATT provides an important exception to the MFN principle of non-discrimination.

MFN is at the heart of the WTO system so Article XXIV has been controversial.

Also, there is widespread concern regarding the effect PTAs have on multilateral trade liberalization. Why?

As per the WTO, about 200 PTAs are officially in force today; number expected to reach 400 by 2010 (305 of which fall under Article XXIV)

Mongolia is the only country that does not belong to a PTA.

On average, each country belongs to six PTAs (over 80% of which are FTAs).

2. Approach of the paper

We focus on free trade agreements (FTAs) and ask: would GATT serve the cause of global free trade more effectively if it did *not* include the exception to MFN provided by Article XXIV? Or, would global free trade be easier to achieve if all WTO members were to pursue trade liberalization on *only* a multilateral basis?

We consider a game of endogenous trade agreements between three countries where each country is free to pursue either

(a) bilateral or (b) multilateral or (c) no trade liberalization.

Analyze the *stable* Nash equilibria of this game – allow countries to deviate jointly and isolate coalition proof Nash equilibria (i.e. those Nash eq that are immune to self-enforcing coalitional deviations).

We then ask how ruling out the bilateral approach affects equilibrium outcomes. Bhagwati's (1991) famous question: Are FTAs building or stumbling blocs?

3. Preview of results

Under symmetry, while there exist multiple Nash equilibria, global free trade is the only stable equilibrium *regardless* of whether countries can pursue bilateral agreements or not.

When countries are asymmetric with respect to their endowment levels there exist circumstances where global free trade is a stable equilibrium *only if* countries can form bilateral FTAs.

Why?

If multilateralism is the only option, a single country has the ability to preserve the status quo by voting against global free trade. However, if bilateral agreements are feasible, a country that tries to do so can find itself *worse off* relative to the status quo if its trading partners implement a bilateral trade agreement.

Anticipating this, it can then become a willing participant in multilateral free trade.

Model also isolates circumstances where bilateralism undermines global free trade. For example, when both free trade and a bilateral FTA between two large countries are stable equilibria, a strictly multilateral approach can ensure that global free trade is uniquely stable.

However, this negative effect of bilateralism obtains over a fairly small parameter space. Second, the option to form bilateral agreements necessarily lowers the likelihood of being stuck with the status quo.

Analysis implies that to properly account for the role of bilateralism, need to better understand *why* countries choose to enter into bilateral agreements when multilateral trade liberalization is an option.

Model points to the importance of allowing for heterogeneity across countries.

4. Related literature

Aghion et. al. (2007) examine a leading country's choice between sequential and multilateral bargaining. Here: *all* countries are free to negotiate FTAs and no transfers are allowed.

Goyal and Joshi (2006) and Furusawa and Konishi (2007): employ the network formation game developed by Jackson and Wolinsky (1996) to isolate stable networks. Not directly concerned with the multilateralism vs bilateralism question.

Riezman (1999): a cooperative game theory approach; solves for the core under some numerical examples.

Krishna (1998): an FTA reduces incentives for multilateral trade liberalization. No equilibrium FTAs.

Models of repeated interaction between countries – see Bagwell and Staiger (1997 and 1998), Bond et. al. (2001), Bond and Syropoulos (1996), Freund (2000), and Saggi (2006).

5. Underlying trade model

Model builds on partial equilibrium framework of Bagwell and Staiger (1997 and 1998).

Three countries: a, b, and c; three goods: A, B, and C and a numeraire good w.

Each country's market served by two competing exporters.

Country a's endowment $(0, x/2, x/2)$; b: $(y/2, 0, y/2)$; and c: $(z/2, z/2, 0)$.

All countries have large enough endowments of w to ensure trade balance.

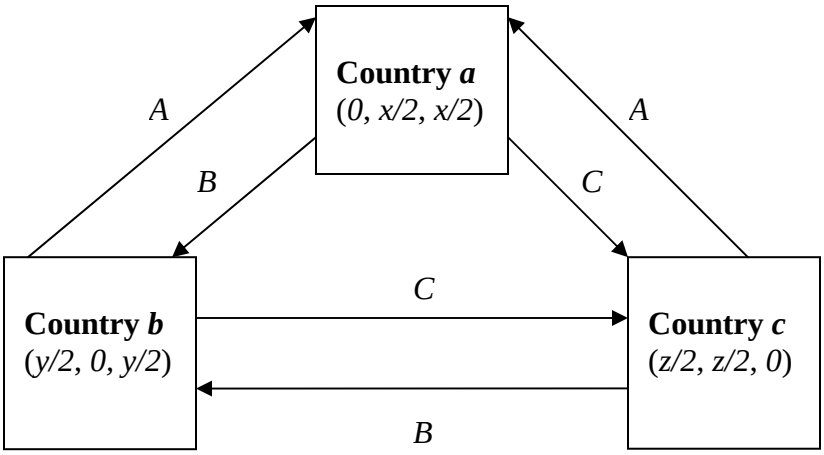

Figure 0: The Pattern of Trade

Demand for good i in country j is given by

$$D(P_i^j) = \alpha - \beta P_i^j$$

Pattern of trade: each country imports a single good from the other two and exports different goods to each of them.

No-arbitrage conditions for good A:

$$P_A^a = P_A^b + t = P_A^c + t$$

Since country a has no endowment of good A, we have

$$M_A^a = \alpha - \beta P_A^a$$

Country b's exports of good A equal:

$$X_A^b = y/2 - [\alpha - \beta P_A^b]$$

Similarly,

$$X_A^c = z/2 - [\alpha - \beta P_A^c]$$

Market clearing for good A

$$M_A^a = X_A^b + X_A^c$$

Equilibrium price of good A in country a:

$$P_A^a = \frac{6\alpha - y - z}{6\beta} + \frac{2t}{3}$$

Using these prices, the volume of trade is easily calculated. Country a's imports of good A:

$$M_A^a = \frac{y + z}{6} - \frac{2\beta t}{3}$$

where the exports of each of its trading partners are

$$X_A^b = \frac{2y - z}{6} - \frac{\beta t}{3} \text{ and } X_A^c = \frac{2z - y}{6} - \frac{\beta t}{3}$$

Country a's welfare:

$$W^a(t) = \sum_J CS_J^a + \sum_J PS_J^a + TR^a$$

Consumer surplus

$$\sum_J CS_J^a = \frac{1}{2\beta}\left[(M_A^a)^2 + (\alpha - \beta P_B^a)^2 + (\alpha - \beta P_C^a)^2\right]$$

Producer surplus

$$\begin{aligned}\sum_J PS_J^a &= (x/2 - X_B^a)\, P_B^a + (x/2 - X_C^a)\, P_C^a \\ &\quad + X_B^a(P_B^b - t) + X_C^a(P_C^c - t)\end{aligned}$$

Tariff revenue

$$TR^a = t(X_A^b + X_A^c)$$

6. Endogenous trade agreements

Status quo or no agreement: each country imposes a (non-prohibitive) tariff t on both its trading partners.

Liberalization game:

I) Each country announces whether or not it wants to form an FTA with each of the other two countries.

II) Given trade agreements, trade and consumption take place.

Why FTAs? If you sign an FTA, give up the right to manipulate your TOT but partner does the same.

So FTAs eliminate the negative TOT externality (Bagwell and Staiger, 1997 and 1998).

Strategy set of country i:

$$\Omega_i = \{\{\phi, \phi\}, \{j, \phi\}, \{\phi, k\}, \{j, k\}\}$$

Possible regimes:

(*i*) Status quo $\langle\{\Phi\}\rangle$ – no announcements match or everyone announces $\{\phi, \phi\}$.

(*ii*) Bilateral FTA $\langle\{ij\}\rangle$ – i and j announce each other's names.

(*iii*) Two independent FTAs in which i is the common member $\langle\{ij, ik\}\rangle$ – obtains when (1) $j \epsilon \alpha_i$ and $i \epsilon \alpha_j$ and (2) $k \epsilon \alpha_i$ and $i \epsilon \alpha_k$. This is a 'hub' and 'spoke' type arrangement where i is the hub, so denote by $\langle\{ih\}\rangle$.

(*iv*) Free trade $\langle\{F\}\rangle$ obtains when $\alpha_i = \{j, k\}$ for $i, j = a, b, c$.

7. Remarks

- Different announcements can give the same outcome.
  - Consider $\alpha_a = \{b, \phi\}$, $\alpha_b = \{a, c\}$, $\alpha_c = \{\phi, b\}$. These announcements give $\langle\{ab, ac\}\rangle$.
  - Suppose: $\alpha_a = \{b, c\}$, $\alpha_b = \{a, c\}$, $\alpha_c = \{\phi, b\}$. Also yield $\langle\{ab, ac\}\rangle$.

- If only the multilateral route is open then

$$\Omega_i = \{\{\phi, \phi\}, \{\{j, k\}\}$$

  so that any unilateral deviation from $\langle\{F\}\rangle$ results in no agreement.

- By contrast, in its absence, if country i deviates from $\langle\{F\}\rangle$, it faces the FTA $\langle\{ij\}\rangle$ as a non-member. This turns out to matter a great deal.

8. Equilibrium trade agreements

Symmetry: $x = y = z = e$.

Obvious that $\langle\{\Phi\}\rangle$ is a Nash equilibrium.

Is a bilateral FTA a Nash? Yes, $w_i(ij) > w_i(\Phi)$.

What about a hub and spoke arrangement such as $\langle\{ih\}\rangle$?

Lemma 1: *Under $\langle\{ih\}\rangle$, the hub country (i) is better off while each spoke country (i.e. j and k) is worse off relative to free trade.*

Implication: Hub will not deviate from $\langle\{ih\}\rangle$.

What about spokes? Turns out that $w_j(ih) > w_j(ik)$ iff $t < t_h \equiv \frac{e}{7\beta}$. So neither spoke wants to revoke its FTA with the hub if $t < t_h$.

Is $\langle\{F\}\rangle$ Nash?

Lemma 1 implies that no country will revoke any *one* of its FTAs.

No incentive to break *both* FTAs either because $w_i(F) > w_i(jk)$.

Proposition 1: *No agreement* $\langle\{\Phi\}\rangle$*, a bilateral FTA* $\langle\{ij\}\rangle$*, and free trade* $\langle\{F\}\rangle$ *are all Nash equilibria. In addition,* $\langle\{ih\}\rangle$ *is also a Nash equilibrium iff* $t \leq t_h$*.*

Stable agreements: Allow countries to deviate jointly and isolate Nash equilibria that are immune to *self-enforcing* coalitional deviations.

Which of these survive?

9. Stable trade agreements

Start with $\langle\{\Phi\}\rangle$.

Countries i and j have an incentive to jointly deviate from $\langle\{\Phi\}\rangle$ to $\langle\{ij\}\rangle$.

Since $\langle\{ij\}\rangle$ is Nash, the initial joint deviation of i and j from $\langle\{\Phi\}\rangle$ to $\langle\{ij\}\rangle$ is self-enforcing.

This implies that $\langle\{\Phi\}\rangle$ is *not* stable.

Now consider $\langle\{ih\}\rangle$.

Lemma 1 implies that j and k will deviate from $\langle\{ih\}\rangle$ to $\langle\{F\}\rangle$ (from which there are no further deviations).

Thus, $\langle\{ih\}\rangle$ is *also not* stable.

Big question: is $\langle\{F\}\rangle$ stable? For this, need to rule out:

- JF1: Deviation of i and j from $\langle\{F\}\rangle$ to $\langle\{\Phi\}\rangle$.
- JF2: Deviation of j and k from $\langle\{F\}\rangle$ to $\langle\{ih\}\rangle$.
- JF3: Deviation of i and j from $\langle\{F\}\rangle$ to $\langle\{ij\}\rangle$.

Since $w_i(F) > w_i(\Phi)$ JF1 cannot occur. Similarly, since $w_j(ih) < w_j(F)$ JF2 can be ruled out.

What about JF3? We have $w_i(F) > w_i(ij)$ iff $t > t_l \equiv \frac{e}{9\beta}$. But this condition is actually not needed.

Suppose $t < t_l$. Then JF3 will occur but is it self-enforcing?

To check this, need to rule out

(a) FD1: Deviation of i from $\langle\{ij\}\rangle$ to $\langle\{\Phi\}\rangle$ and

(b) FD2: Deviation of i from $\langle\{ij\}\rangle$ to $\langle\{ih\}\rangle$.

FD1 will not occur but FD2 will – country i wants to be a hub. So $\langle\{F\}\rangle$ is stable.

Finally, is $\langle\{ij\}\rangle$ stable? No because i and k want to form an FTA when $t < t_l$.

Proposition 2A: *Under symmetry, when countries are free to pursue both bilateral and multilateral trade agreements, free trade is the unique stable equilibrium.*

Now suppose that only the multilateral route is available.

First note that $\langle\{\Phi\}\rangle$ and $\langle\{F\}\rangle$ are both Nash.

Which is stable?

All three countries want to deviate from $\langle\{\Phi\}\rangle$ to $\langle\{F\}\rangle$. No unilateral or joint incentive to *further deviate* from $\langle\{F\}\rangle$, so $\langle\{\Phi\}\rangle$ is *not* stable.

Irrelevance of bilateralism:

Proposition 2B: *Under symmetry, free trade is the unique stable equilibrium even under a purely multilateral approach to trade liberalization.*

Thus, under symmetry, GATT Article XXIV has no real effect. So what is all the fuss about?

9. When, why, and how bilateralism matters

CASE I: Let $x < y = z = e$: country a is small relative to the other two.

No country is a price taker here.

Might be more accurate to think of income rather than size if all countries have equal amounts of a numeraire good.

The smaller a country's endowment, the smaller its volume of exports and the larger its volume of imports (of non-numeraire goods that are subject to tariffs).

Countries that import more have relatively *more to gain* from using tariffs.

Similarly, those that export less, have *less to lose* from other countries' tariffs.

As a result, a country's willingness to enter into a bilateral FTA with another depends positively on its own endowment and negatively on its partner's endowment.

Lemma 2: *There exist no self-enforcing deviations of large countries from free trade.*

This is related to the result under symmetry where a coalitional deviation from free trade to a bilateral FTA can be susceptible to a further deviation that leads to a hub and spoke arrangement.

Proposition 3: *Let* $x_t \equiv e^{bc} + \frac{7\beta t}{4}$. *Free trade is stable if* $e^{bc} \leq x$ *whereas a bilateral FTA between the two large countries (i.e.* b and c*) is stable if either (a)* $x \leq e^{bc}$ *or (b)* $e^{bc} < x < x_t$ *and* $t < t_l$. *Finally, none of the other trade agreements are stable*.

Figure 1: Stable agreements ($x \leq y = z = 3$)

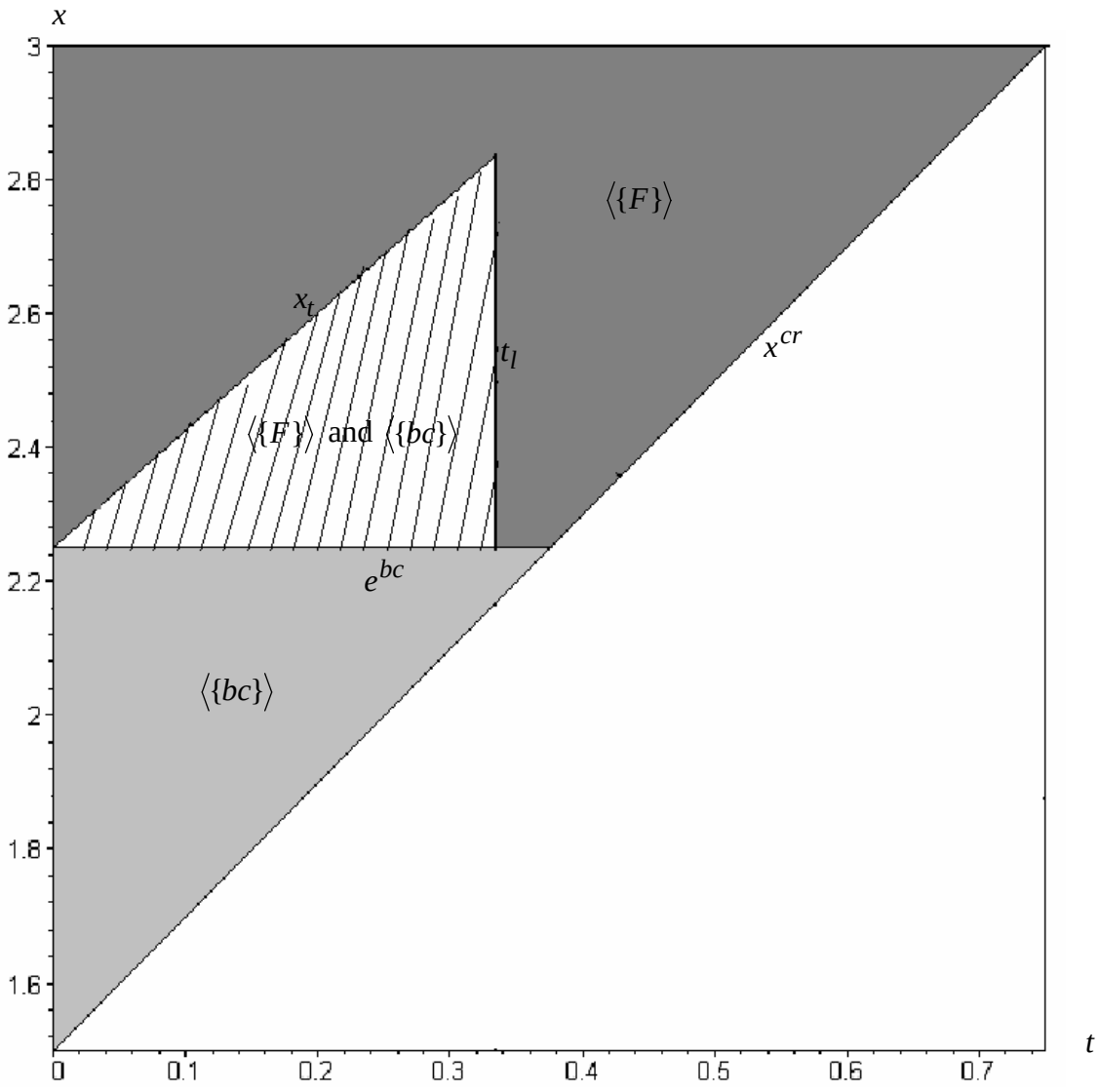

Figure 1: Stable agreements

What happens under pure multilateralism?

Viability of free trade depends critically upon the small country:

(a) Under multilateralism, free trade is uniquely stable iff $e^{\phi} < x$.

(b) Or else, status quo is uniquely stable.

NOTE: By contrast, we never get status quo under bilateralism.

Figure 2: Stable agreements under multilateralism

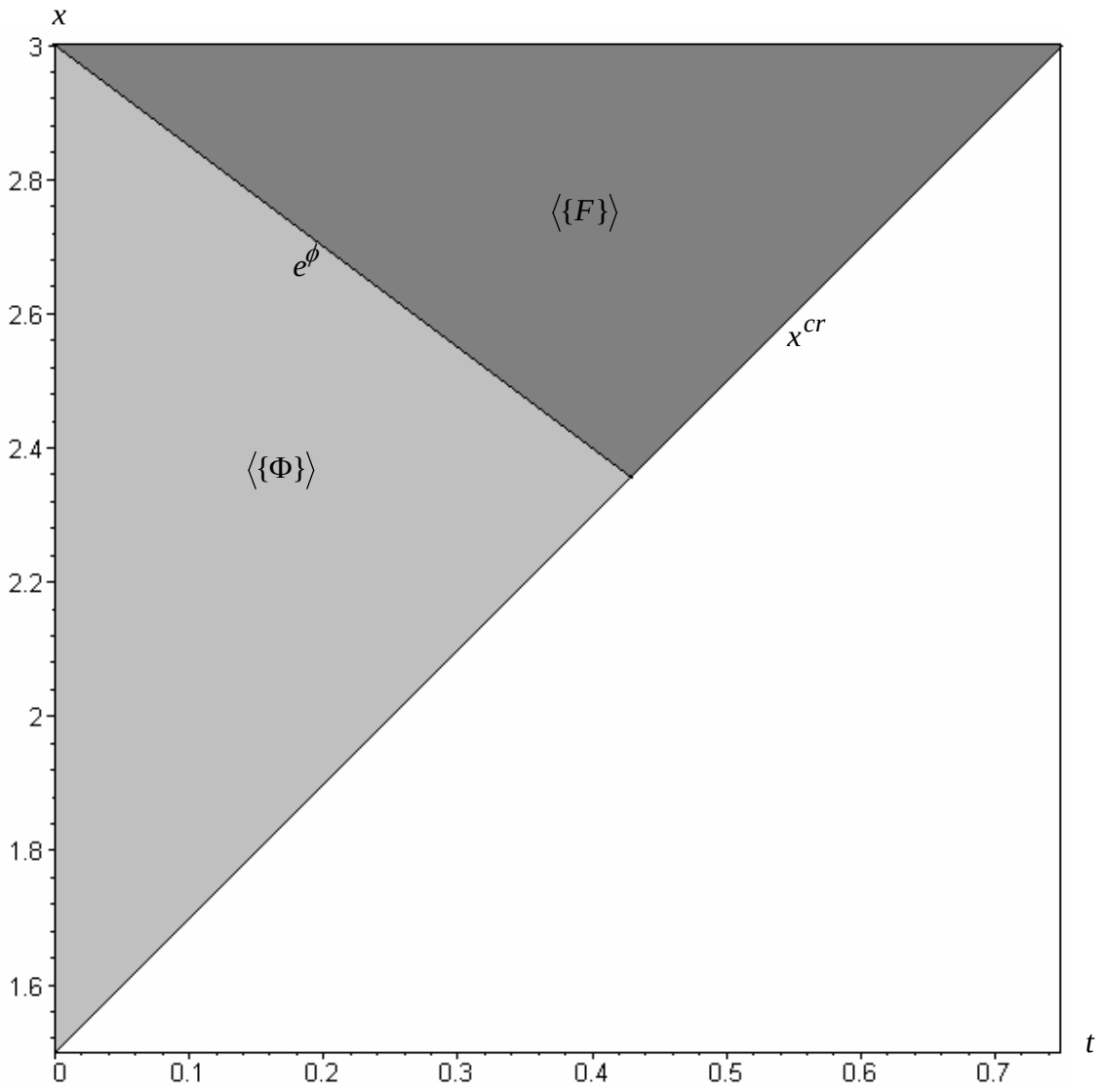

Figure 2: Stable agreements under pure multilateralism

Proposition 4: *Suppose free trade is stable when* $t < t_l$ *and* $e^{bc} < x < x_t$*. Then,*

(i) the freedom to pursue bilateral agreements is necessary for achieving global free trade whenever $e^{bc} < x < e^{\phi}$ *and*

(ii) a purely multilateral approach yields the status quo instead of a bilateral trade agreement between the two larger countries whenever $x < e^{bc}$*.*

Intuition: under a purely multilateral approach, a country that is reluctant to liberalize can effectively prevent liberalization between other countries and the removal of such 'veto power' can sometimes be necessary to achieve global free trade – if $\langle\{bc\}\rangle$ can be formed, country a's outside option is worse than status quo.

Figure 3: Beneficial effects of bilateralism

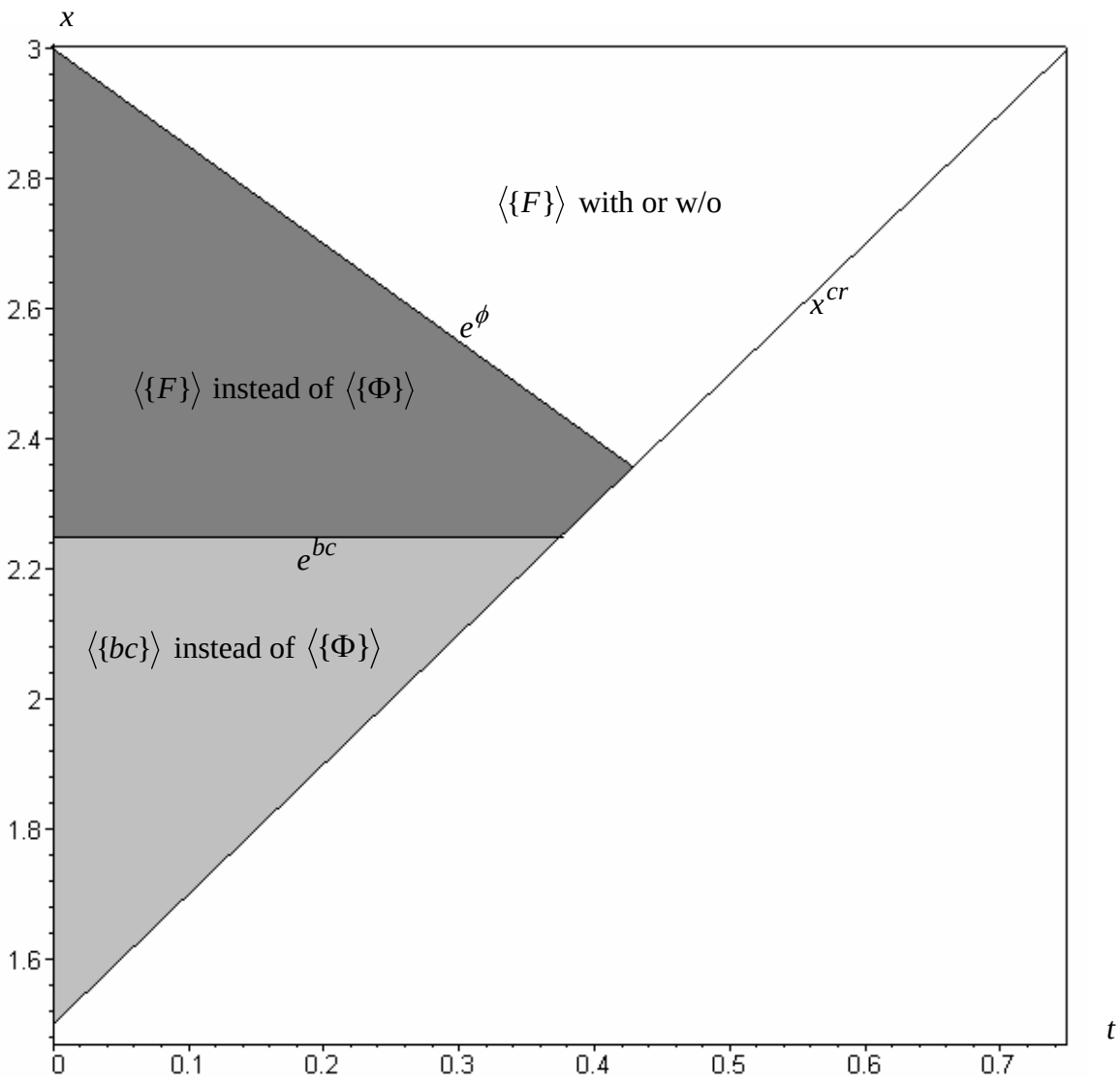

Figure 3: Beneficial bilateralism

What if $\langle\{bc\}\rangle$ is stable when $t < t_l$ and $e^{bc} < x < x_t$?

Then, bilateralism has the following effects:

(i) it yields global free trade instead of the status quo when either (a) $x_t < x < e^{\phi}$ or (b) $e^{bc} < x < e^{\phi}$ and $t > t_l$;

(ii) it yields an FTA between the two big countries as opposed to the status quo when either (a) $x < e^{bc}$ or (b) $x < e^{\phi}$, $x < x_t$ and $t < t_l$; and

(iii) it undermines global trade liberalization by yielding $\langle\{bc\}\rangle$ instead of $\langle\{F\}\rangle$ whenever $e^{\phi} < x < x_t$ and $t < t_l$.

Figure 4: Mixed effects of bilateralism

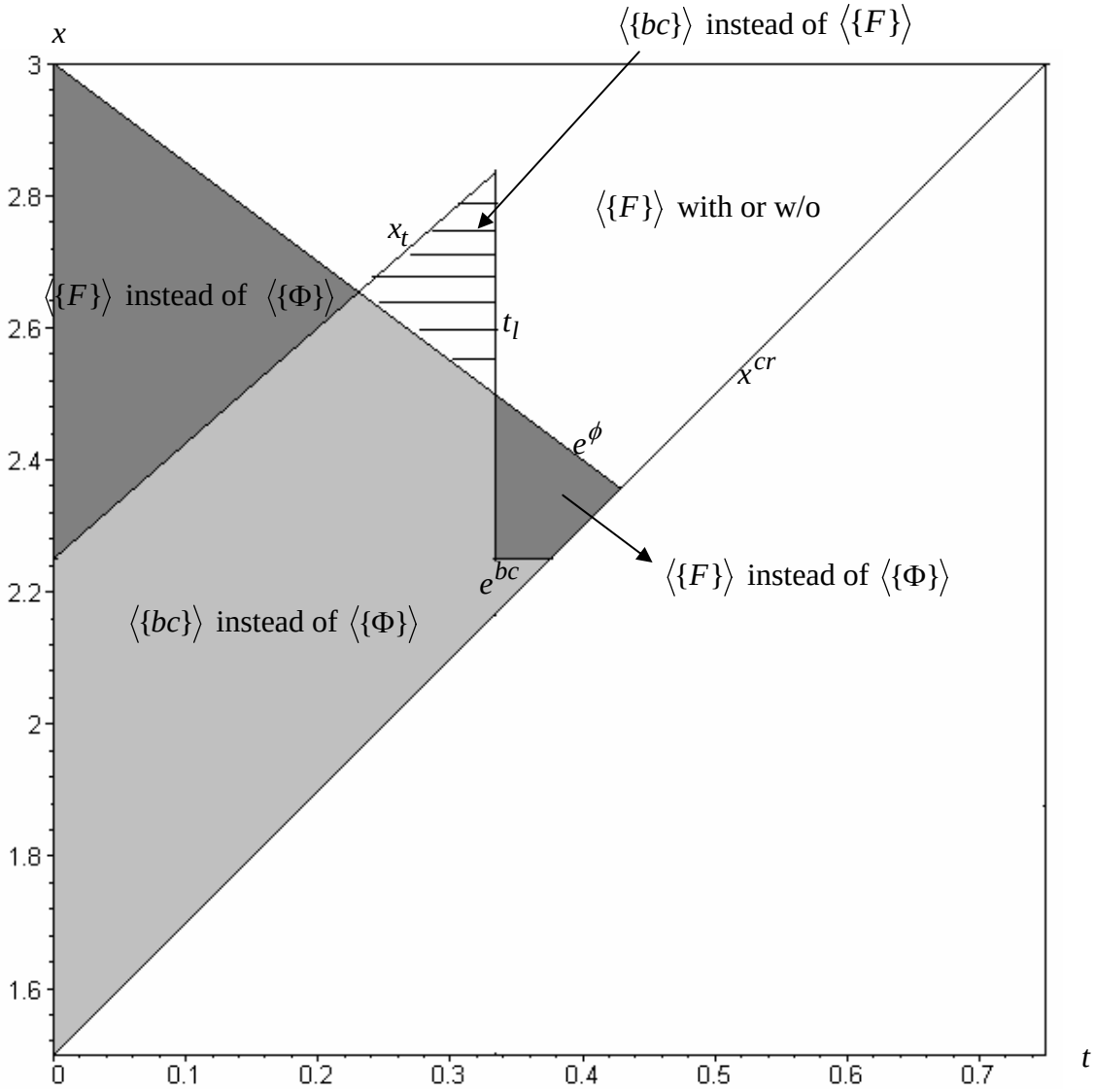

Figure 4: Mixed effects of bilateralism

Under (iii) multilateralism benefits *all* countries.

Why?

In its absence, while all countries are willing to deviate from $\langle\{bc\}\rangle$ to $\langle\{F\}\rangle$, this deviation is not self-enforcing because countries a and b further deviate from $\langle\{F\}\rangle$ to $\langle\{ab\}\rangle$. But multilateralism rules out this further deviation.

Proposition 5: *When multilateralism yields global free trade instead of a bilateral FTA between the two large countries, it benefits all countries. However, when it yields the status quo as opposed to a bilateral FTA between the two large countries, it benefits the small country whereas it hurts the two large countries.*

CASE II: Now suppose $x = y < z = e$, i.e. countries a and b are smaller than country c.

Proposition 6: *Free trade* $\langle\{F\}\rangle$ *is the unique stable equilibrium when (a)* $z < e^{\phi - ac}$ *or (b)* $z <$ min$\{e^{\phi}$,$e^{ah}\}$;

(ii) $\langle\{ah\}\rangle$ *is uniquely stable if* $e^{ah} < z < e^{ah-ab}$;

(iii) $\langle\{ab\}\rangle$ *is uniquely stable if* $e^{ah-ab} < z$;

(iv) no agreement $\langle\{\Phi\}\rangle$*, a bilateral FTA between a large and a small country (i.e.* $\langle\{ac\}\rangle$ or $\langle\{bc\}\rangle$*) and the pair of bilateral FTAs with the large country as hub* $\langle\{ch\}\rangle$ *are never stable.*

Figure 5: Stable agreements under case 2 ($x = y = 3 < z$).

Role of bilateralism similar to before.

Figure 6: Stable agreements under multilateralism

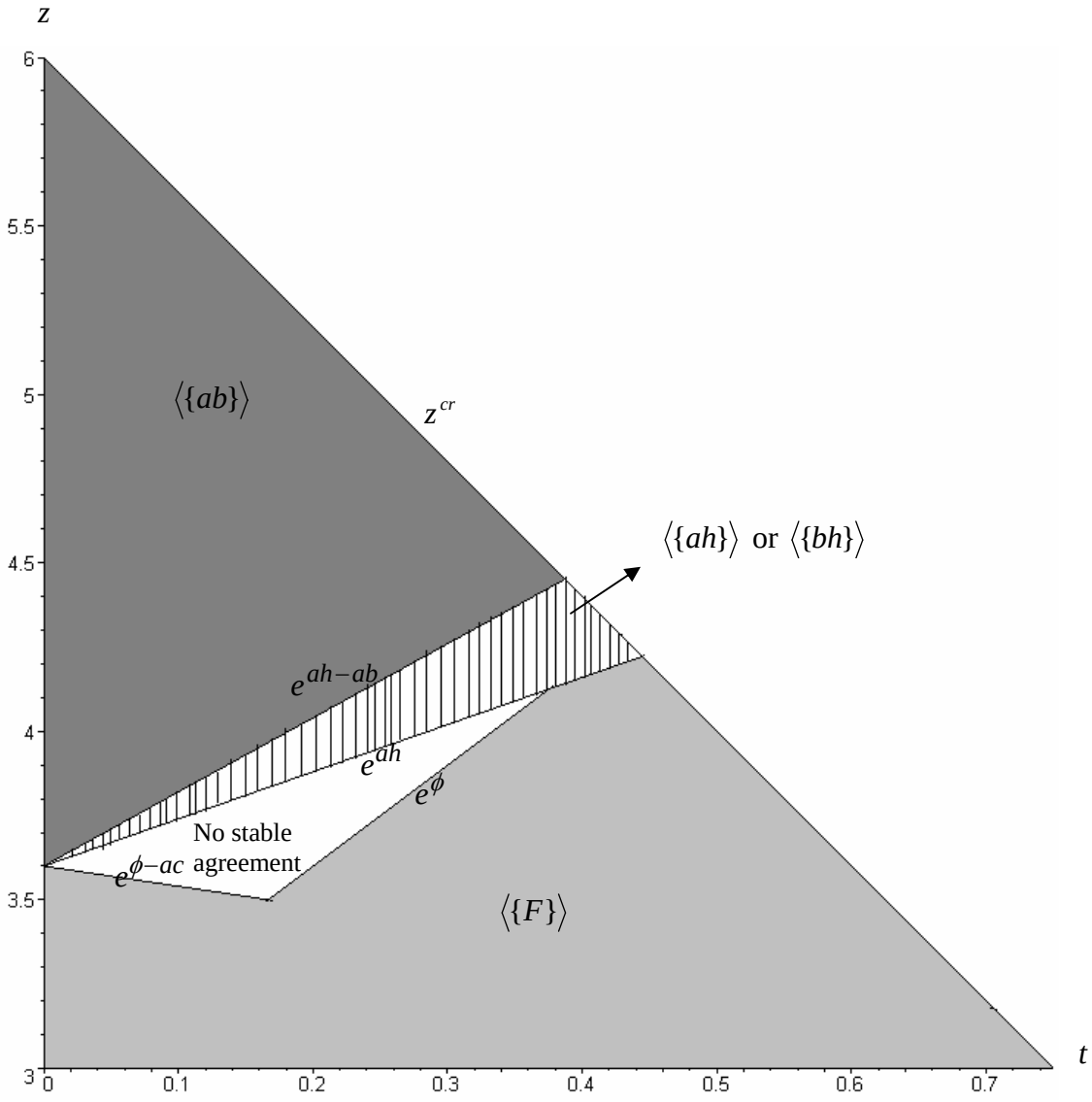

Figure 5: Stable agreements under case 2

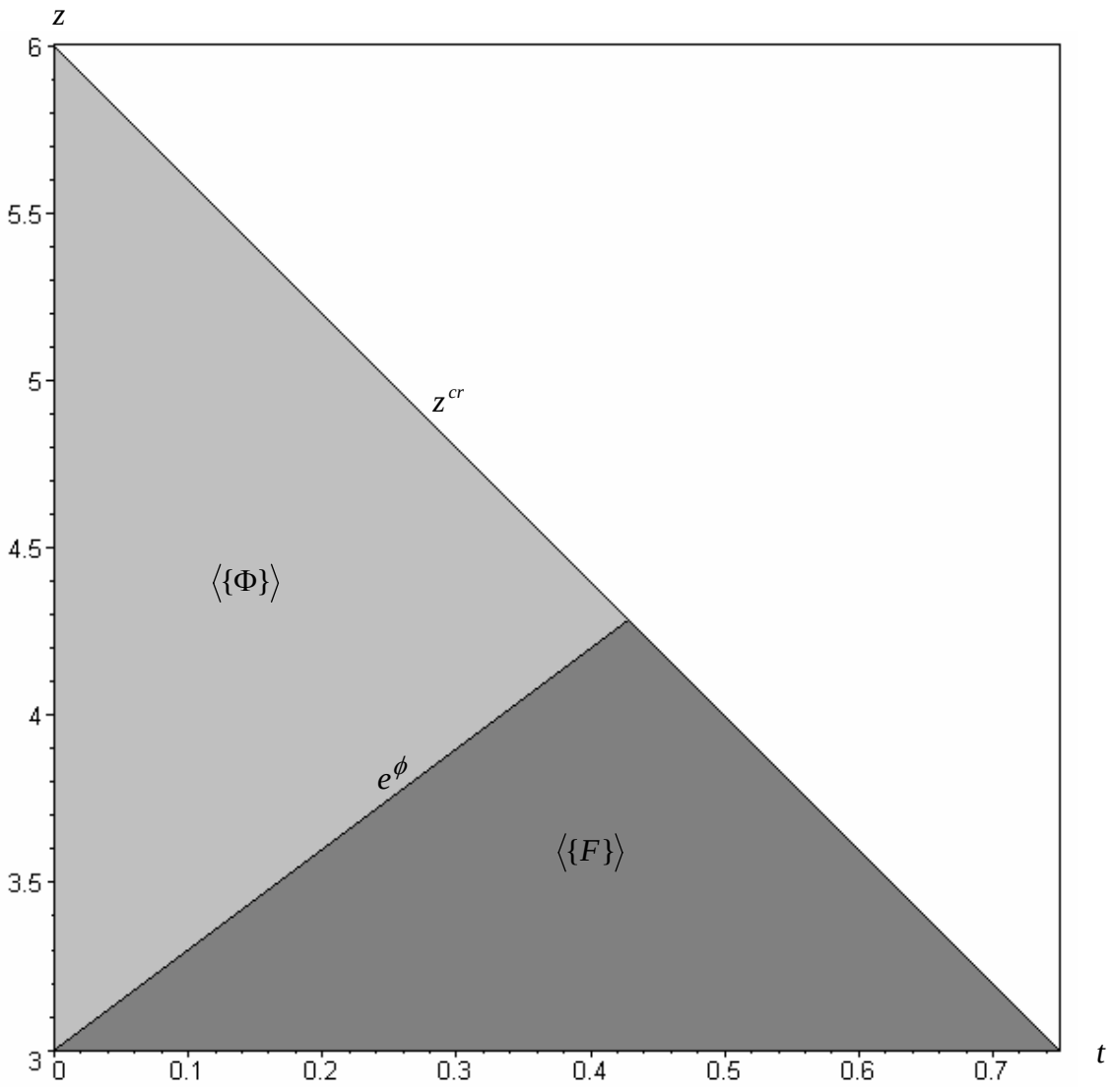

Figure 6: Stable trade agreements under pure multilateralism

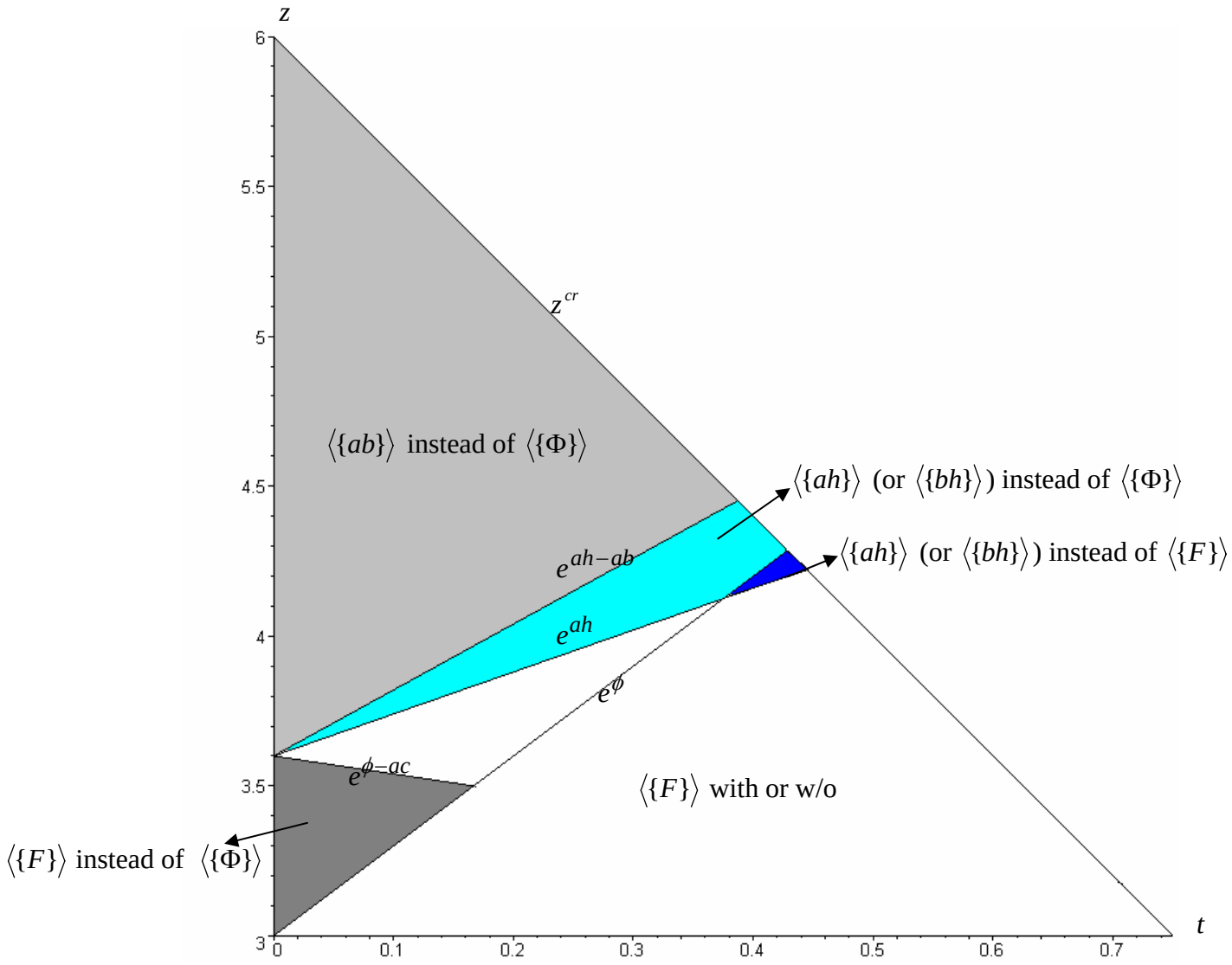

Figure 7: Effects of bilateralism under case 2

13. Concluding remarks

Paper analyzes the debate regarding FTAs in an environment that explicitly models the process of FTA formation and allows each country to form more than a single FTA.

There exist circumstances where global free trade obtains as an equilibrium *only if* countries are free to form bilateral FTAs. Literature has somewhat overlooked this.

FTAs can deliver welfare improving trade liberalization when multilateral free trade is infeasible.

For bilateral FTAs to emerge as stable equilibria and for multilateralism to really matter, need some heterogeneity across countries.

Similar results hold under oligopolistic intraindustry trade (Saggi and Yildiz, 2006).

Current research: an alternative view of multilateralism and incorporating endogenous tariffs.