The Economics of Trade Agreements & the design of Global Climate Accords

Frank D. Graham Memorial Lecture
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Introduction

- According to the ToT theory of international trade agreements
  - countries use trade agreements to internalize the international pecuniary (ToT) externalities imposed by their trade policies
  - and thereby escape from a ToT driven Prisoners' Dilemma (Johnson, 1953-54, Grossman and Helpman, 1995, Bagwell and Staiger,1999)

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  - and thereby escape from a ToT driven Prisoners' Dilemma (Johnson, 1953-54, Grossman and Helpman, 1995, Bagwell and Staiger,1999)
- According to the Commitment theory
  - countries use trade agreements to help their govs make policy commitments to their own private sectors (eg, limits to state aid)
  - and thereby solve a domestic commitment problem (Staiger and Tabellini, 1987, Maggi and Rodriguez-Clare, 1998)

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- Plus elements of commitment issues
  - as in the hold-up problem emphasized by Battaglini and Harstad (2016)
- And there may be opportunities for linkage across trade and climate issues (Maggi, 2016)
- I will focus here on the problems caused by international externalities
  - and how agreements can be designed to address them

Introduction

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- In answering this question, I will touch on the following issues:
  - participation
  - workable externality mitigating strategies
  - border tax adjustments
  - enforcement linkage
  - participation linkage
  - negotiation linkage

Designing an international agreement

- An international agreement must generate Pareto gains for the member governments relative to Nash

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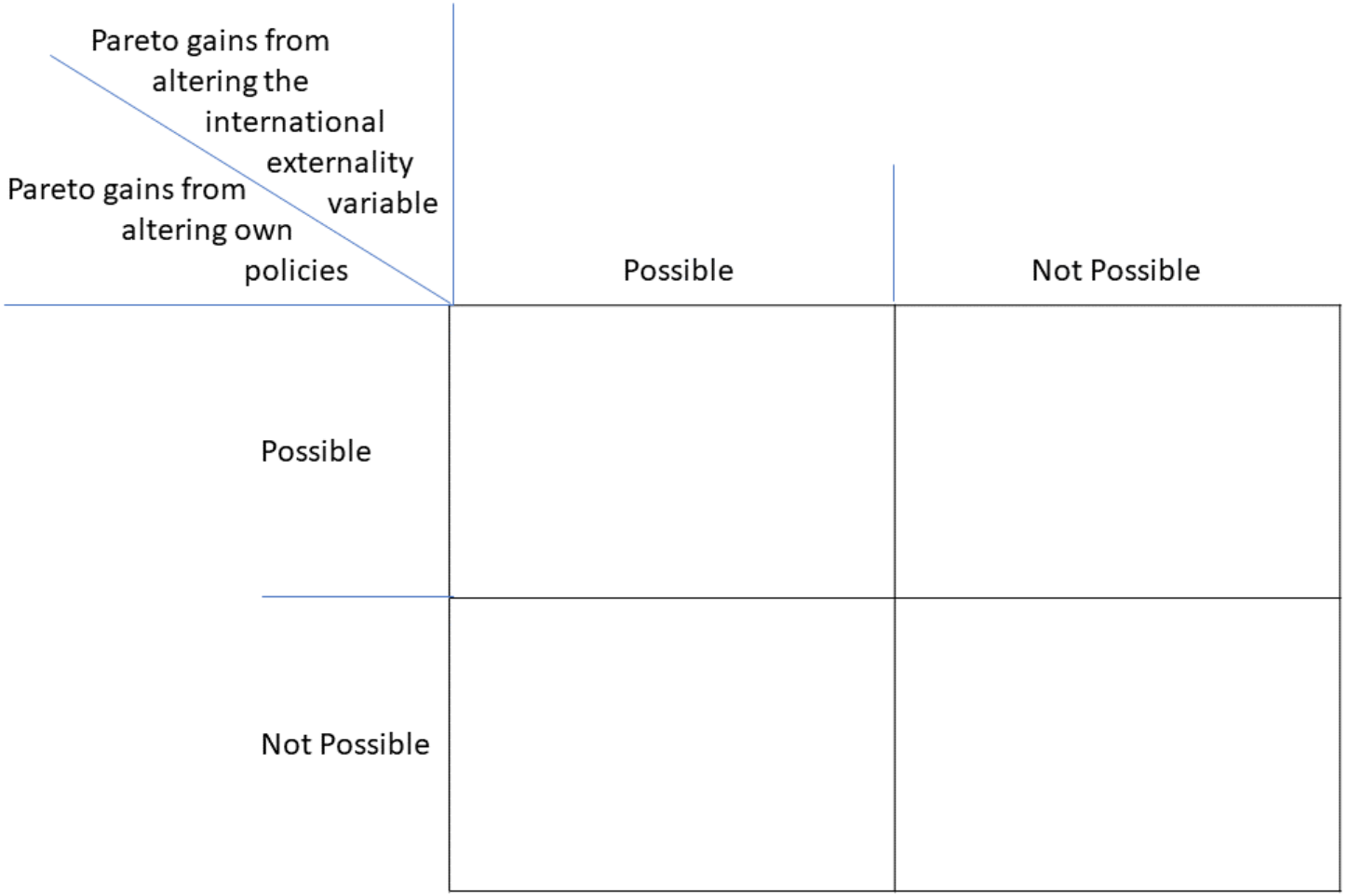
- To inform the design of the agreement, identify the source of the Pareto gains
- In the case of agreements to address an international externality
  - Pareto gains could come from altering the level of the international externality variable
  - Pareto gains could come from altering own policies away from unilateral best-response

A taxonomy


Pareto gains from altering the international externality variable
Pareto gains from altering own policies
Possible
Not Possible
Possible
Not Possible

The source of gains from a trade agreement

- ToT theory provides simple framework within which to interpret the source of gains from a trade agreement
- Two-good two-country competitive general equilibrium trade model
- Govs use tariffs τ and τ^* to serve objectives

$$W(p(\tau, \widetilde{p}^w), \widetilde{p}^w) \quad \text{and} \quad W^*(p^*(\tau^*, \widetilde{p}^w), \widetilde{p}^w)$$

  - satisfying $W_{\widetilde{p}^w} < 0 < W^*_{\widetilde{p}^w}$
  - $\Longrightarrow$ govs would like to move the international externality variable in opposite directions

The source of gains from a trade agreement

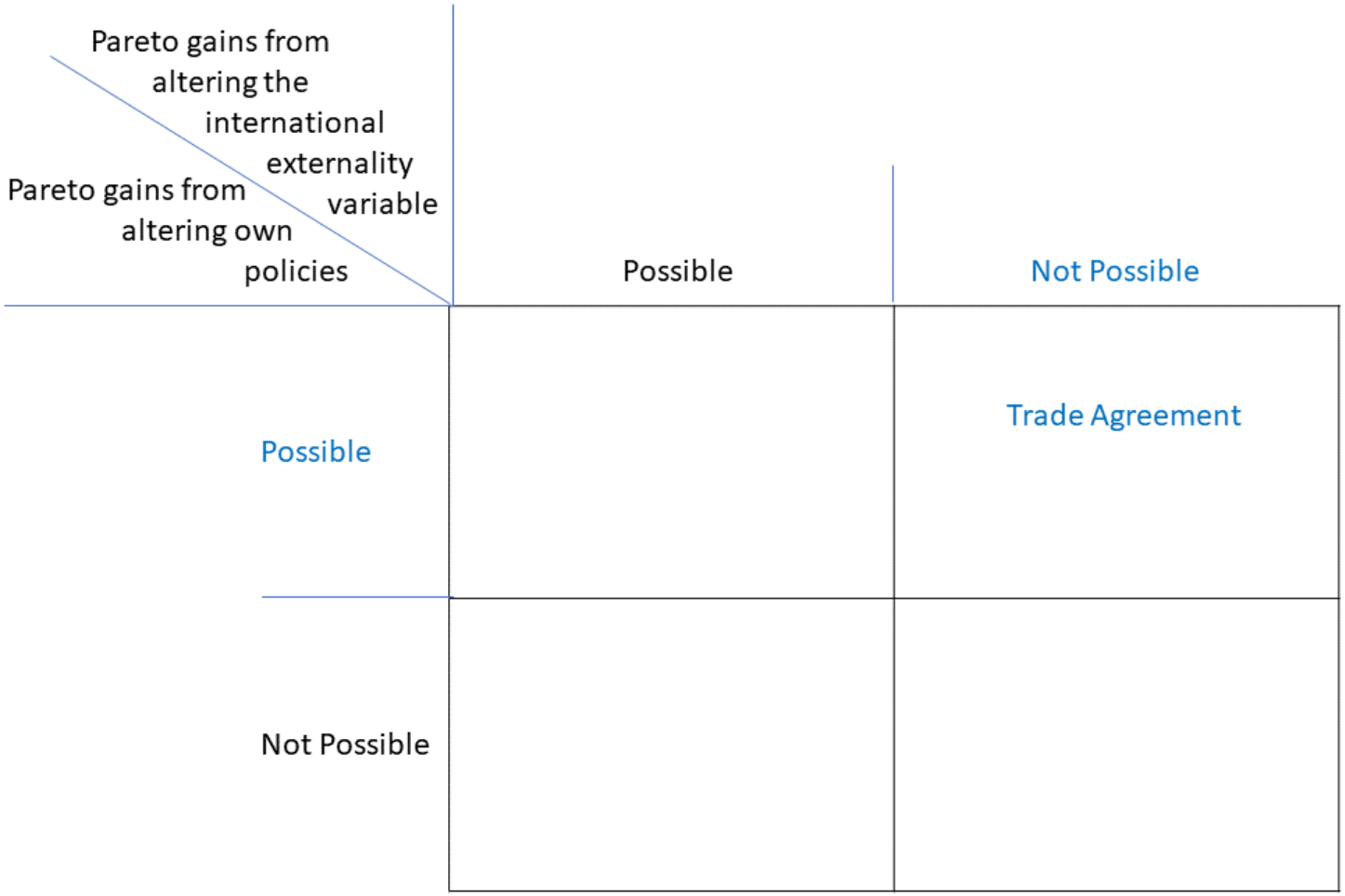
- Nash tariffs satisfy

$$W_p \overset{(+)}{\frac{dp}{d\tau}} + W_{\widetilde{p}^w} \overset{(-)}{\frac{\partial \widetilde{p}^w}{d\tau}} = 0; \qquad W^*_{p^*} \overset{(-)}{\frac{dp^*}{d\tau^*}} + W^*_{\widetilde{p}^w} \overset{(+)}{\frac{\partial \widetilde{p}^w}{d\tau^*}} = 0$$

$$\Longrightarrow \quad W_p < 0 < W^*_{p^*} \text{ at Nash tariff choices}$$

- Pareto gains can be achieved by *freezing* the level of the international externality variable
  - with $\widetilde{p}^w(\overset{(-)}{\tau}, \overset{(+)}{\tau^*})$, gains then come from the reduction in domestic distortions that result from own liberalization
- Changes in the level of the international externality variable cannot generate Pareto gains
  - reflects the international redistribution associated with $\widetilde{p}^w$ movements

The structure of Trade Agreements



The source of gains from a climate accord

- A pair of two-good competitive general equilibrium closed economies
- Govs use taxes t and t^* to serve objectives

$$W(q(t), p(t), C(t) + C^*(t^*)) \text{ and } W^*(q^*(t^*), p^*(t^*), C(t) + C^*(t^*))$$

  - satisfying $W_{[C+C^*]} < 0$ and $W^*_{[C+C^*]} < 0$; $\frac{dC}{dt} < 0$ and $\frac{dC^*}{dt^*} < 0$
  - $\Longrightarrow$ govs would like to move the international externality variable in the same direction

The source of gains from a climate accord

- Nash taxes satisfy $\frac{dW}{dt} = 0$ and $\frac{dW^*}{dt^*} = 0 \implies$

$$\frac{d[W + W^*]}{dt} = \frac{dW^*}{dt} = W^*_{[C+C^*]} \frac{dC}{dt} > 0$$

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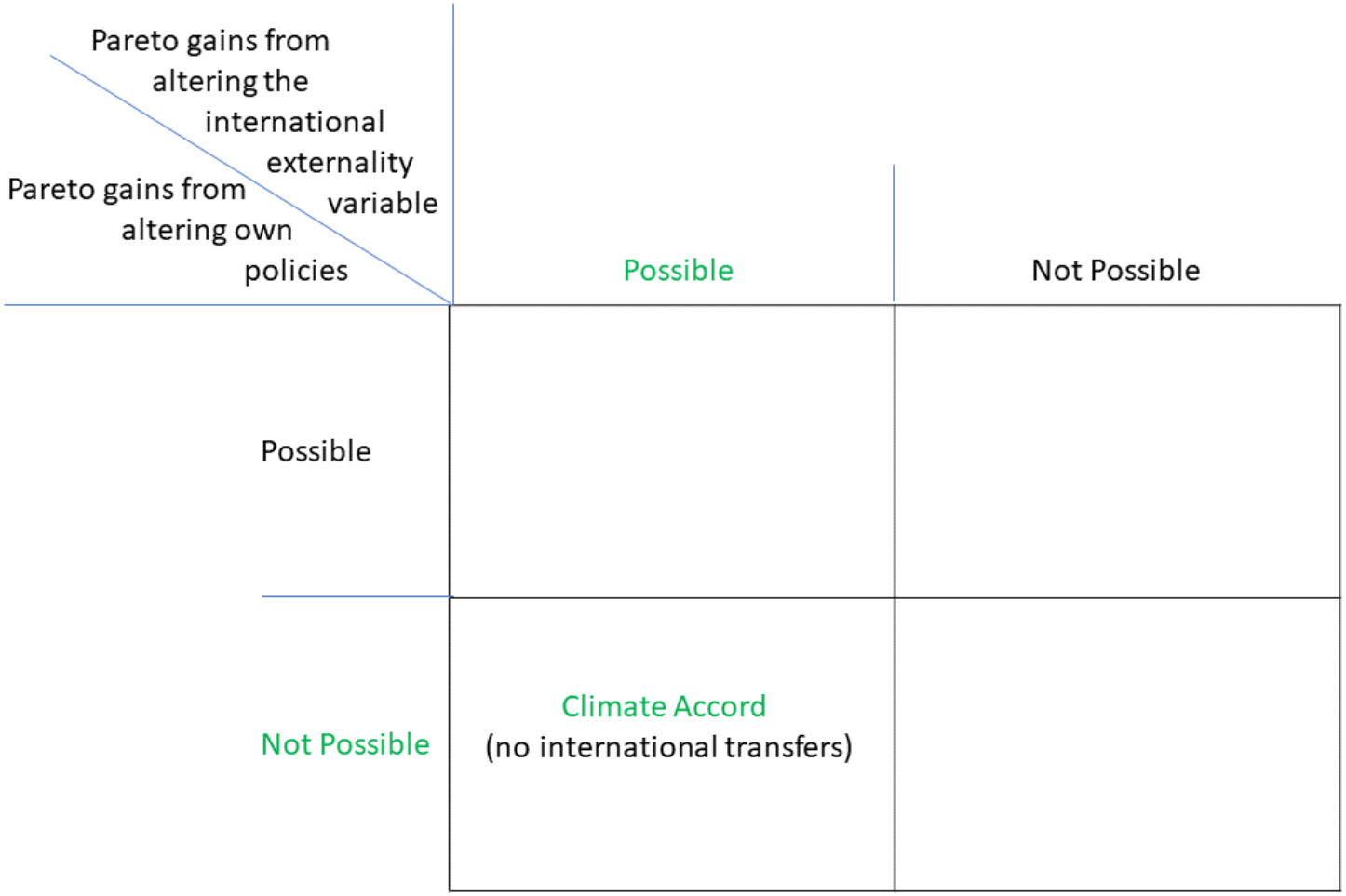
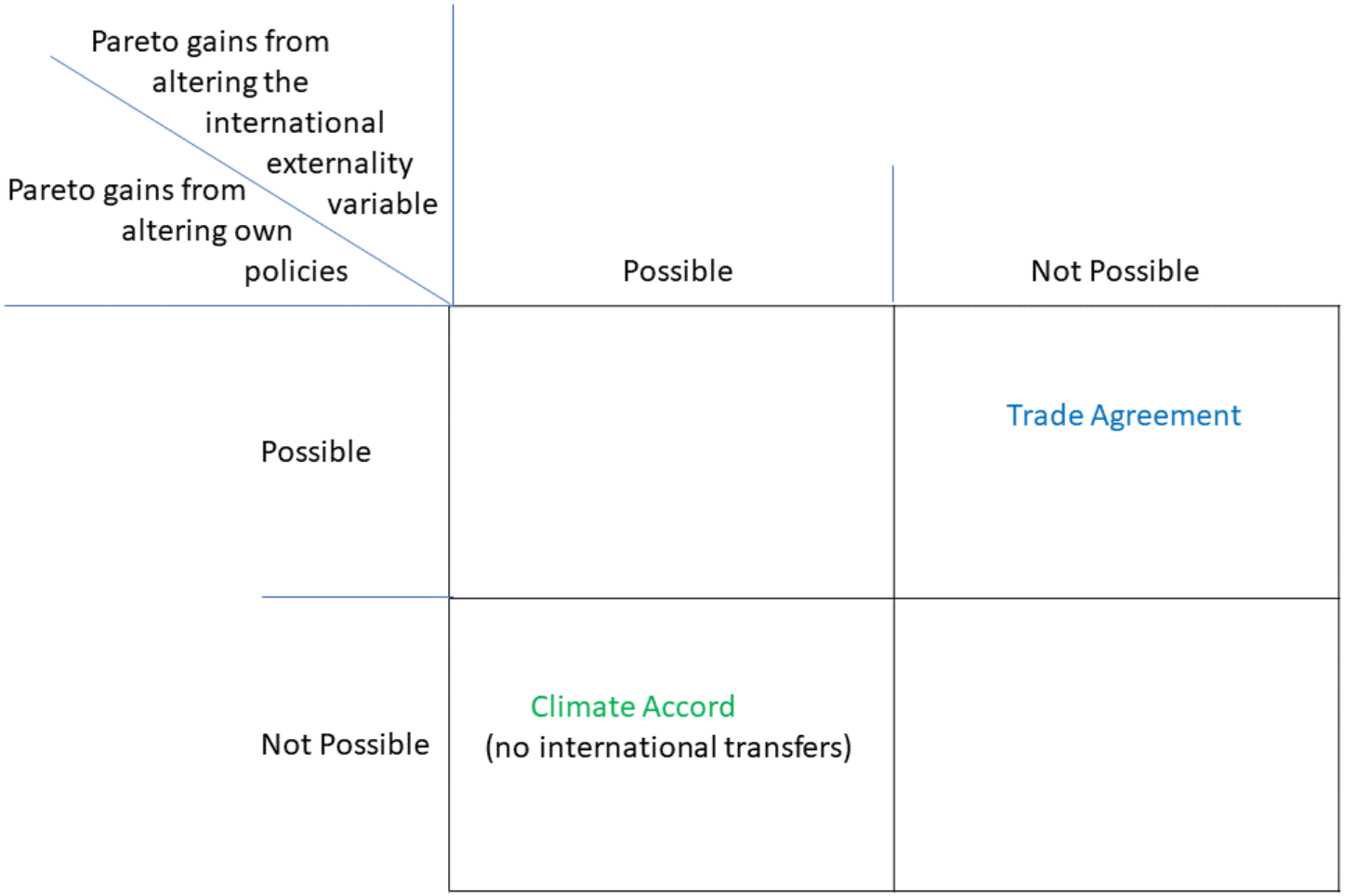
  at Nash tax choices

- Pareto gains come from *altering* the level of the international externality variable
  - reducing global carbon output $C + C^*$
- In the absence of international transfers, no Pareto gains possible from determining which countries alter their policies
  - who undertakes the costly carbon mitigation to reduce $C(t) + C^*(t^*)$

The structure of Climate Accords



The structure of Trade Agreements and Climate Accords



The source of Pareto gains from a trade agreement: changes in own policies

The source of Pareto gains from a climate accord: changes in the level of the international externality variable

Implication

- The goal of a trade agreement
  - *eliminate the influence* of movements in the international externality variable on policy choices
  - an environment that freezes the level of the international externality variable when a country makes its policy choices can achieve this goal

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  - *eliminate the influence* of movements in the international externality variable on policy choices
  - an environment that freezes the level of the international externality variable when a country makes its policy choices can achieve this goal
- The goal of a climate accord
  - policy choices that *internalize the full impact* of movements in the international externality variable
  - an environment that freezes the international externality variable when a country makes its policy choices cannot achieve this goal

Participation

- Why is securing participation a key challenge in global climate accords but less so for trade agreements?

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- Often observed that this is so because tariff discrimination allows non-members to be excluded from the trade liberalization of members
  - hence trade liberalization is not a public good

Participation

- Why is securing participation a key challenge in global climate accords but less so for trade agreements?
- Often observed that this is so because tariff discrimination allows non-members to be excluded from the trade liberalization of members
  - hence trade liberalization is not a public good
- But even in the absence of tariff discrimination, non-members can at most enjoy only *incidental* benefits from a trade agreement

$$W^{**}(p^{**}(\tau^{**}, \widetilde{p}^{w}), \widetilde{p}^{w})$$

versus

$$W^{**}(q^{**}(t^{**}), p^{**}(t^{**}), C(t) + C^{*}(t^{*}) + C^{**}(t^{**}))$$

Remaining questions

- How does the GATT/WTO architecture work to eliminate the influence of movements in $\tilde{p}^w$ on policy choices?
- How does the GATT/WTO architecture work when there is both a trade and a climate problem to solve?

The GATT/WTO architecture

- The two pillars of the GATT/WTO architecture
  - Non-discrimination (MFN)
  - Reciprocity
- How does the GATT/WTO architecture work to eliminate the influence of movements in $\tilde{p}^w$ on policy choices?

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  - in a multi-country world, MFN keeps the trade policy externality running through $\tilde{p}^w$, as simple as in a 2-country world

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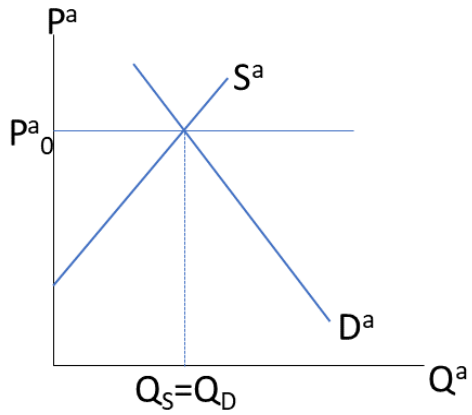
- MFN
  - in a multi-country world, MFN keeps the trade policy externality running through $\tilde{p}^w$, as simple as in a 2-country world
- Reciprocity
  - defines a measured, *proportionate response* to a country's trade policy changes by its trading partners; can be interpreted as freezing $\tilde{p}^w$
  - a change in trade policies from (τ^0, τ^{*0}) to (τ^1, τ^{*1}) satisfies the principle of reciprocity iff it offers a balance of concessions in that $\tilde{p}^w(0)[M(1) - M(0)] = E(1) - E(0)$

The GATT/WTO solution to the trade agreement problem

- A closed economy



The GATT/WTO solution to the trade agreement problem

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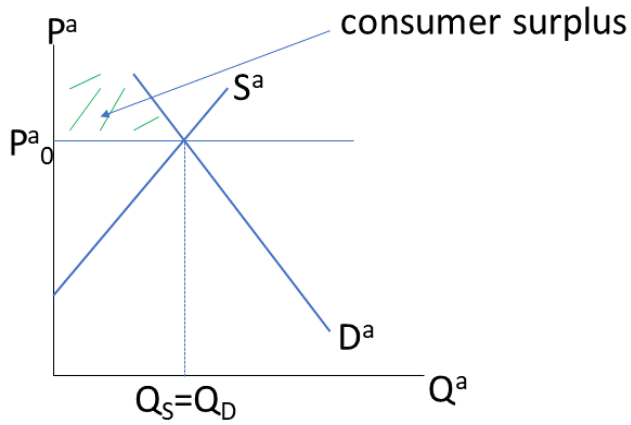

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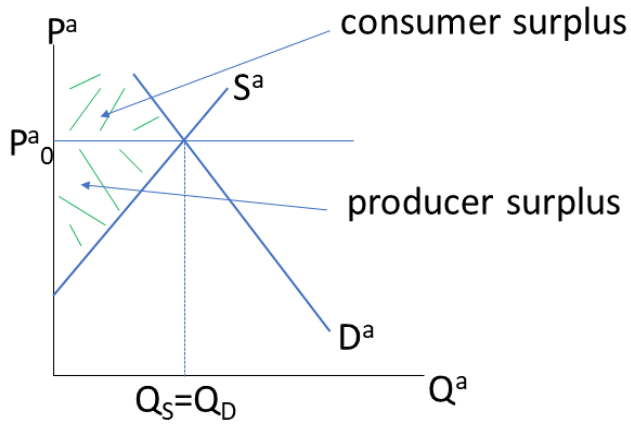

A small open economy

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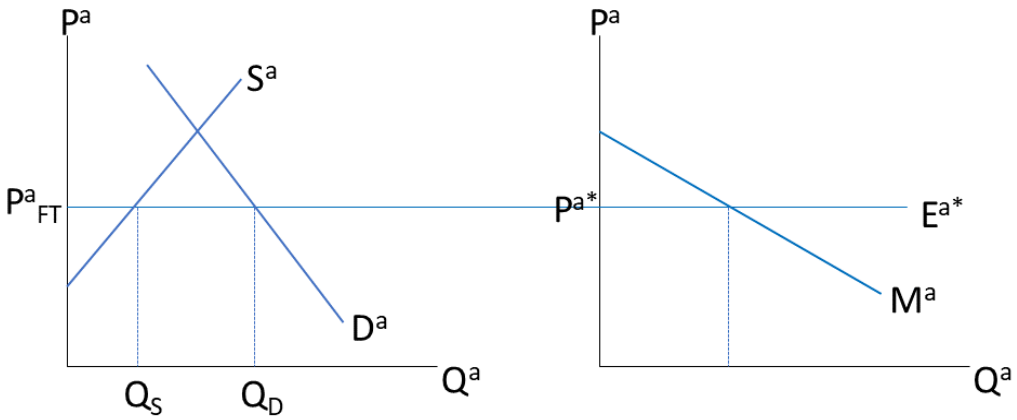

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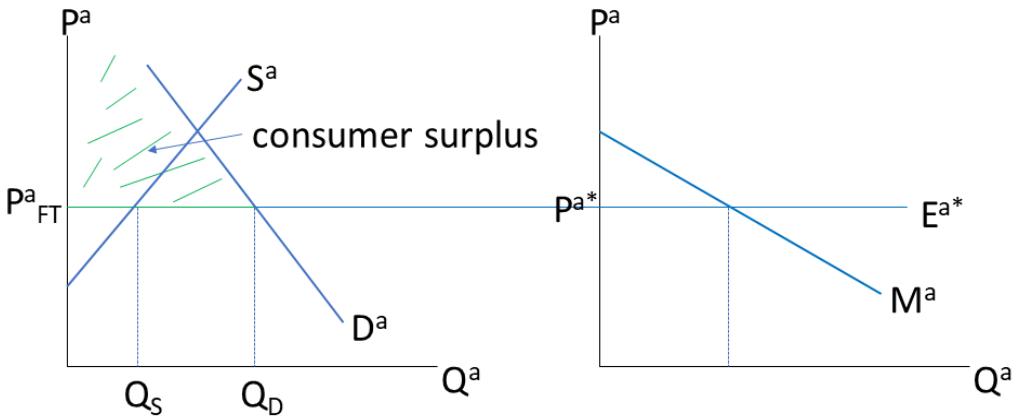

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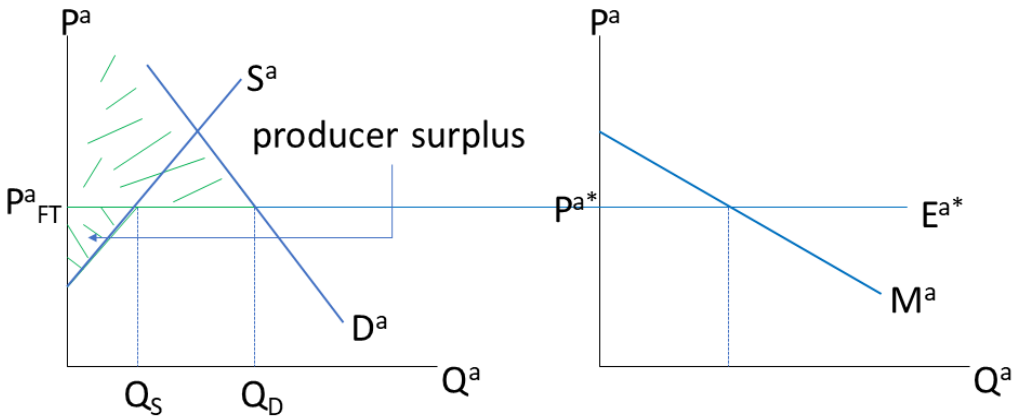

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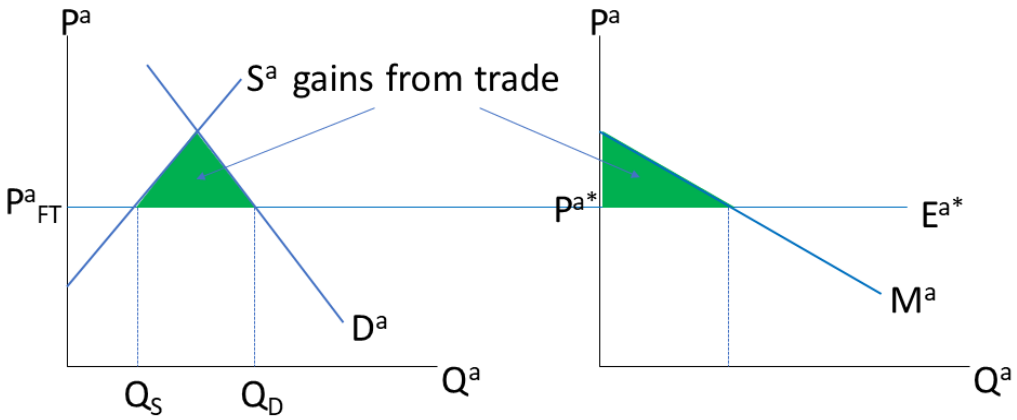
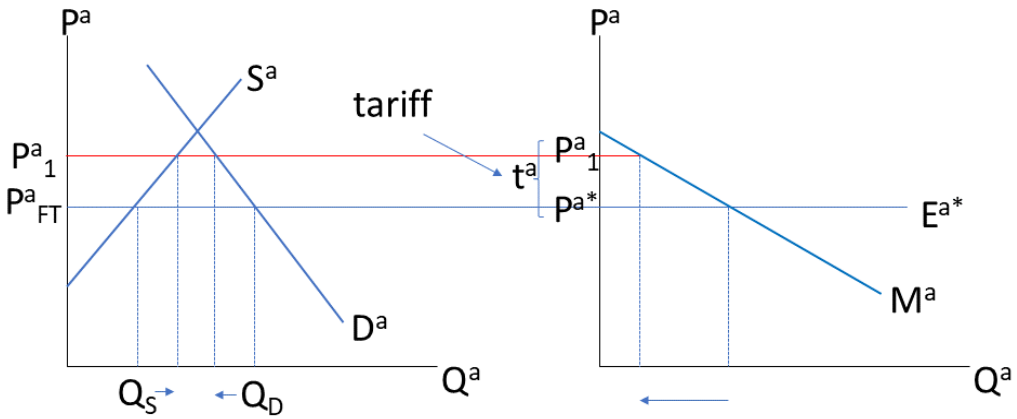


A small country's unilateral tariff choice

- A *small country's* unilateral tariff choice



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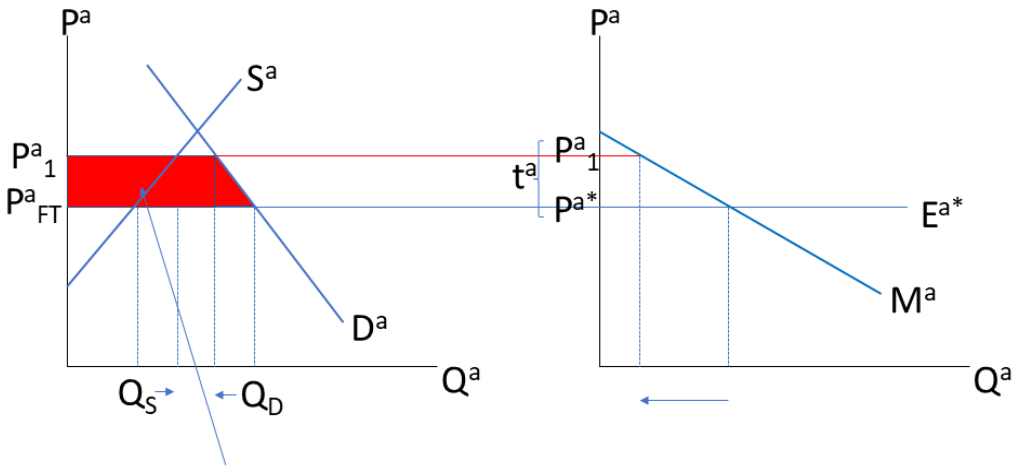

Loss of consumer surplus

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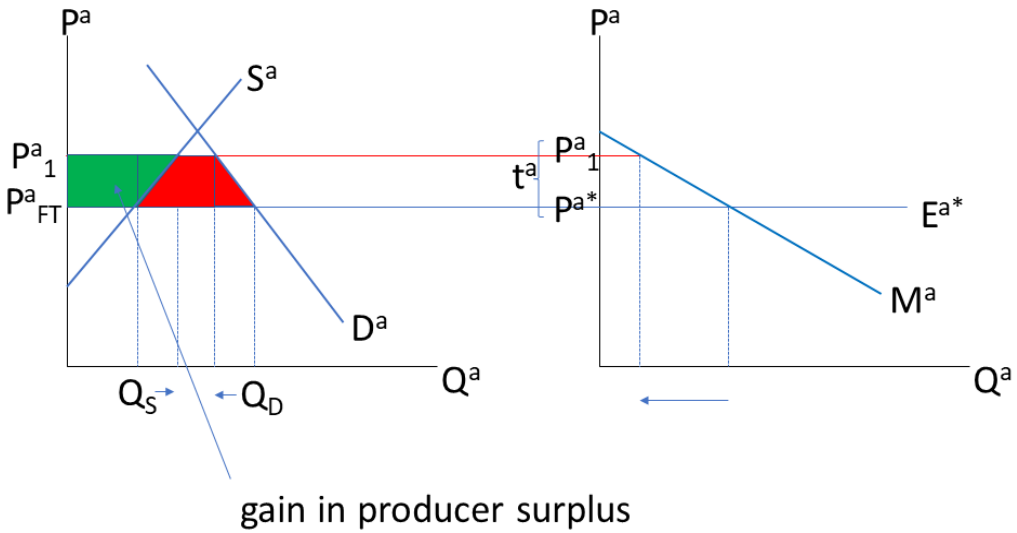

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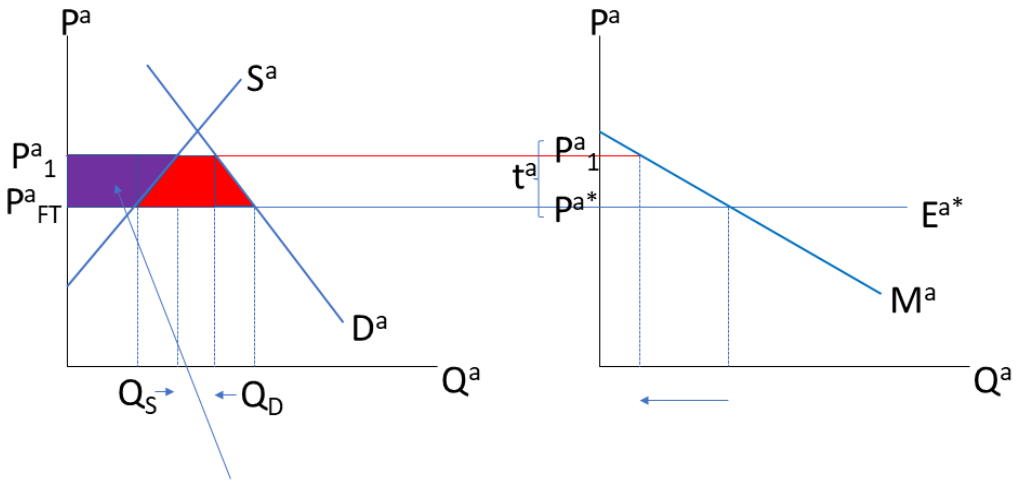

gov's valuation of shifting surplus from consumers to producers

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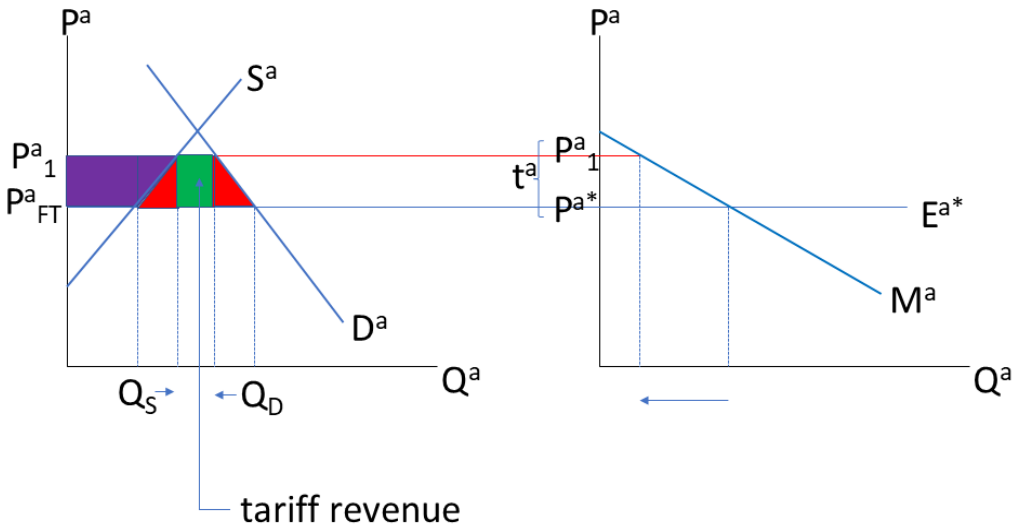

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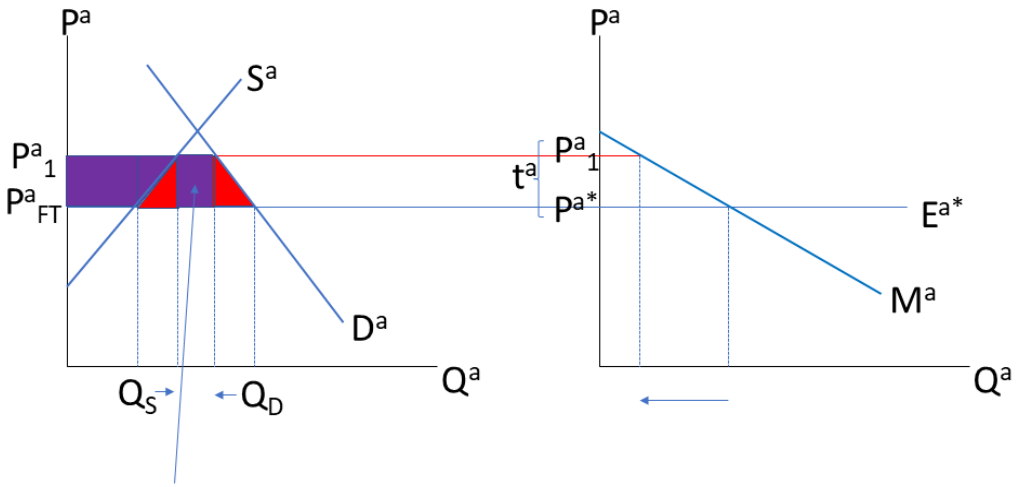

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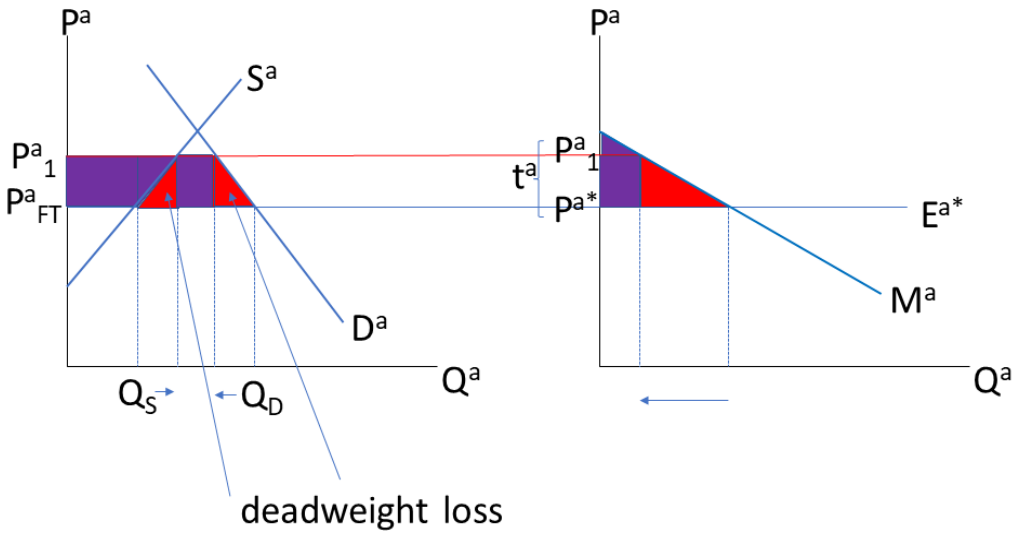

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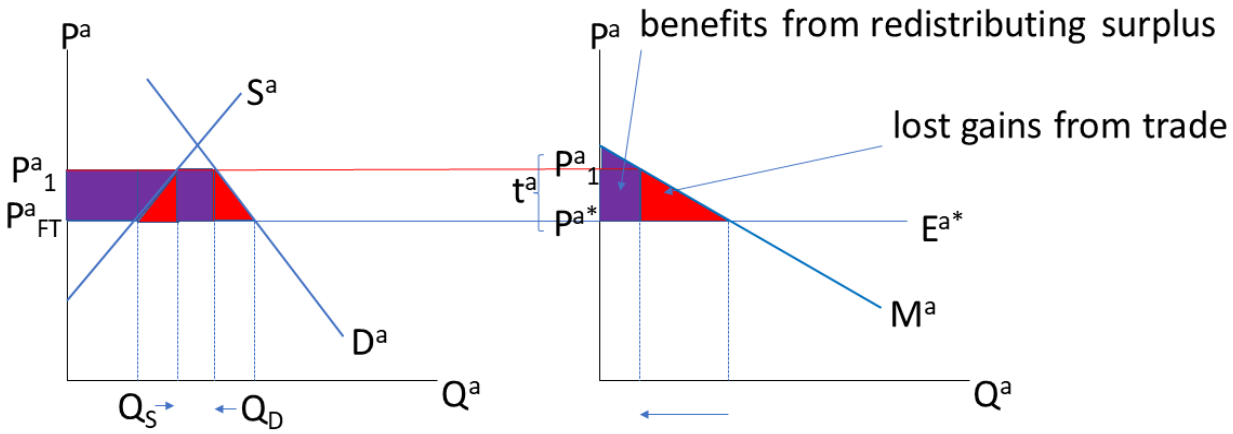

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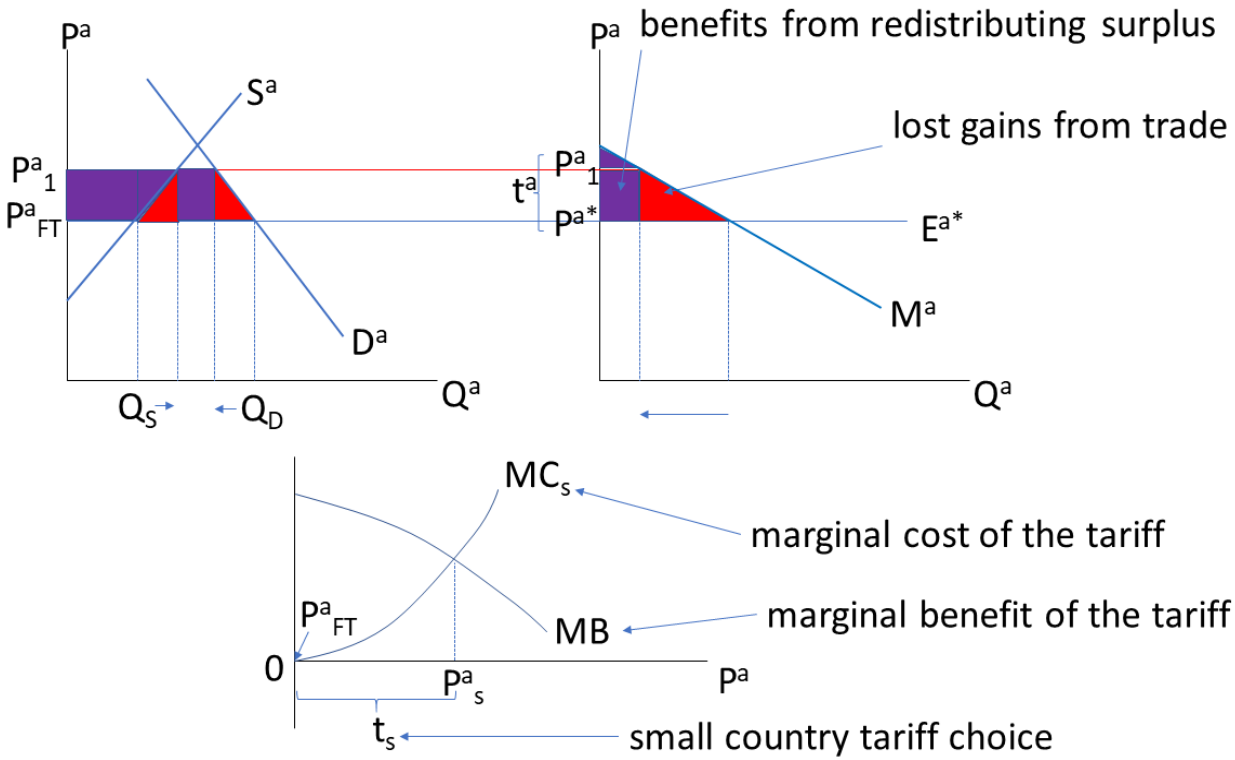

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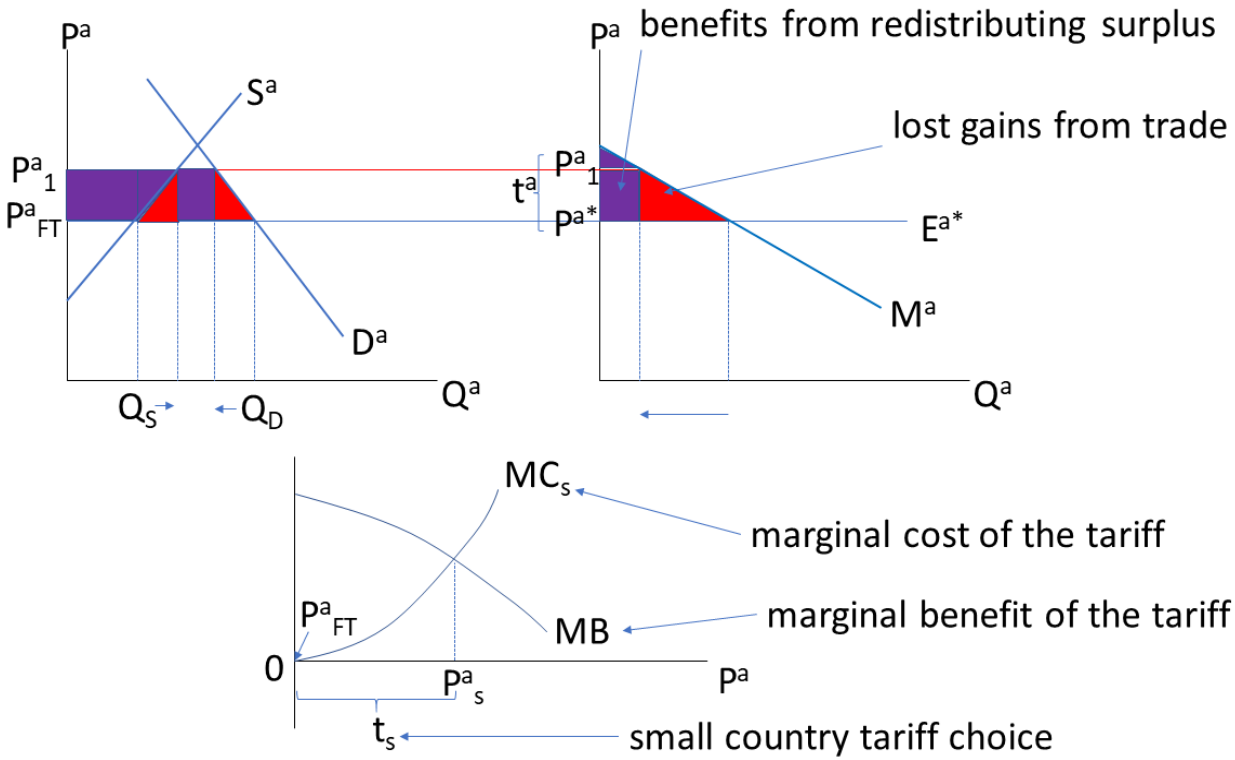
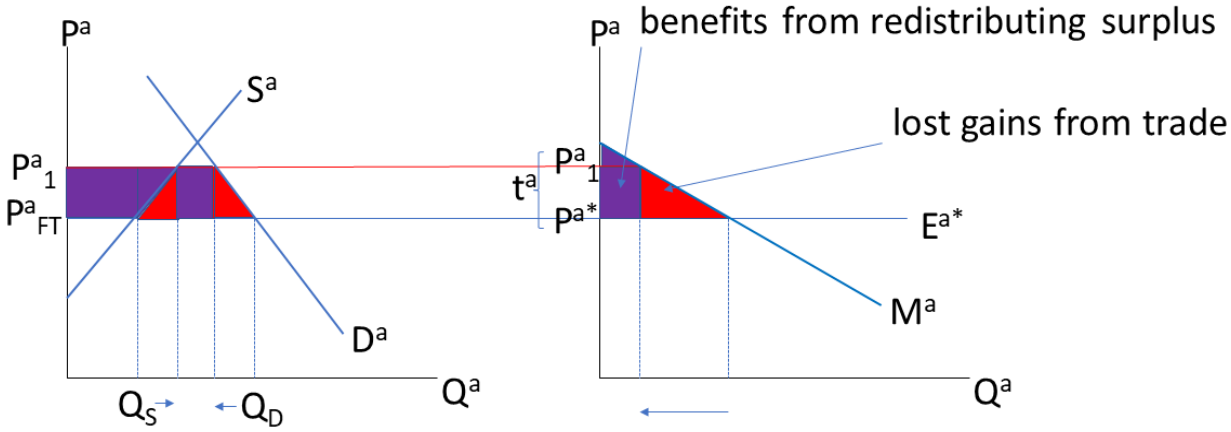


- A *small* country's policy choices impose no externalities on the world
- $\Rightarrow$ Policy choices are *internationally efficient* in a world of small countries, given national government objectives
- No international inefficiency, nothing for a trade agreement to do!

A large country's unilateral tariff choice

- A *large country's* unilateral tariff choice (recall small country)



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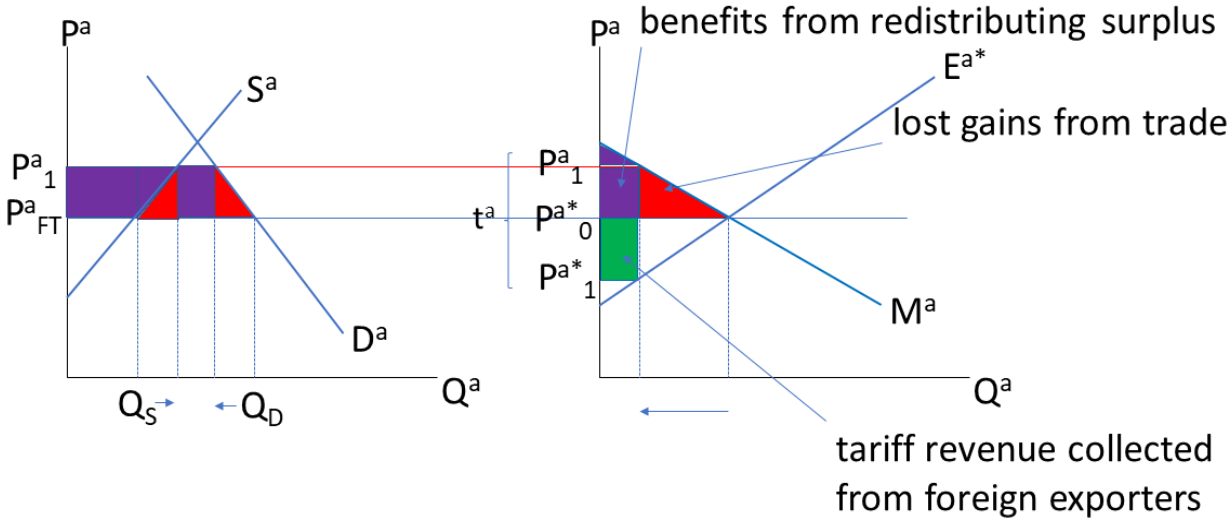

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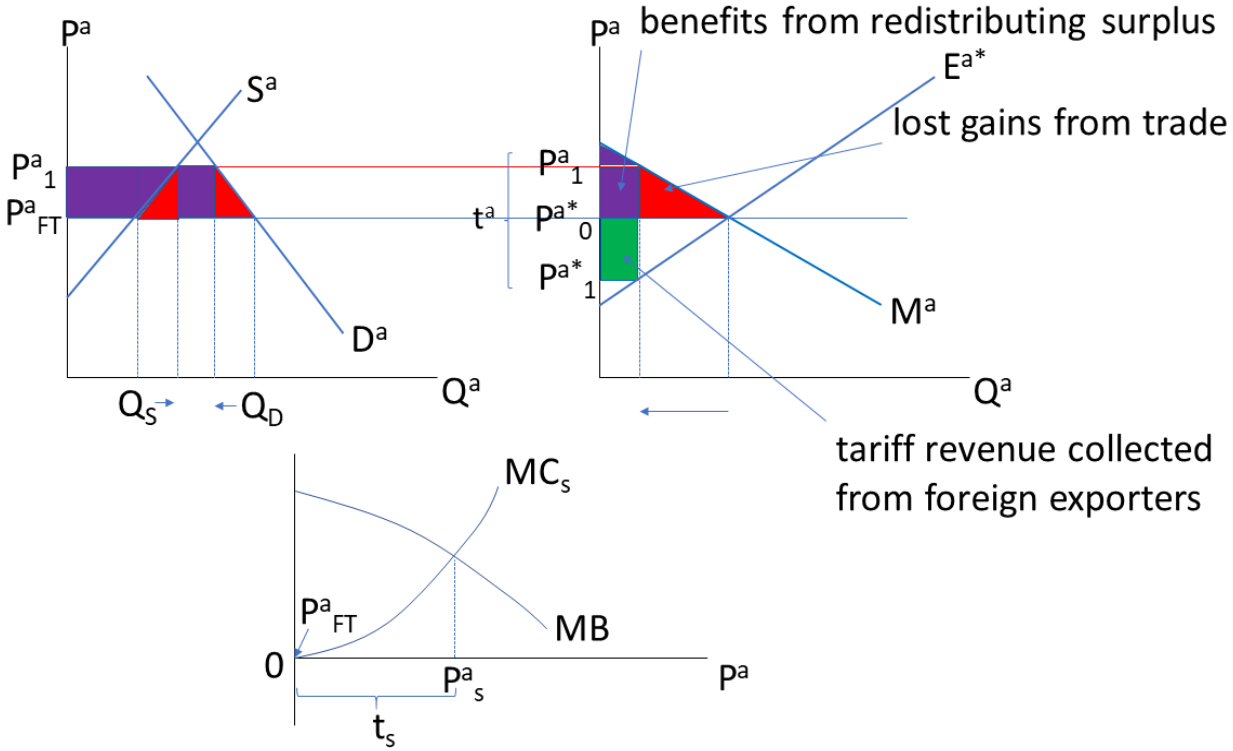

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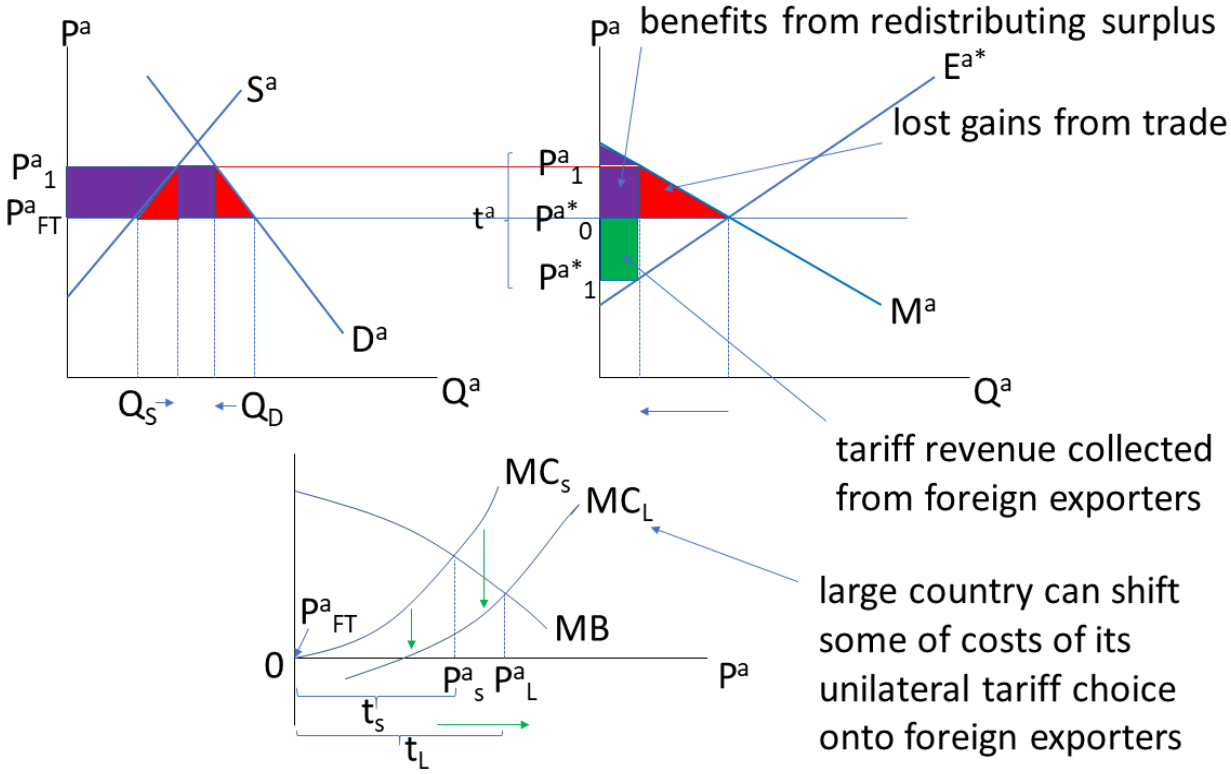

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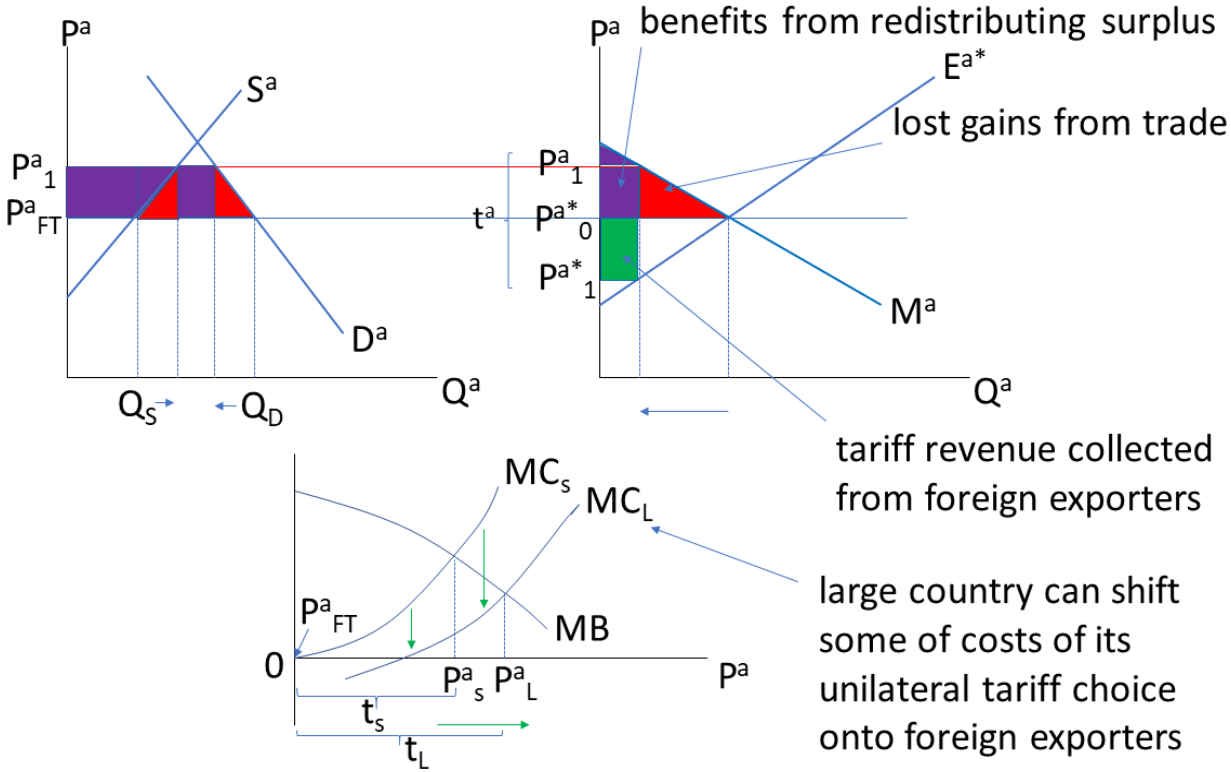
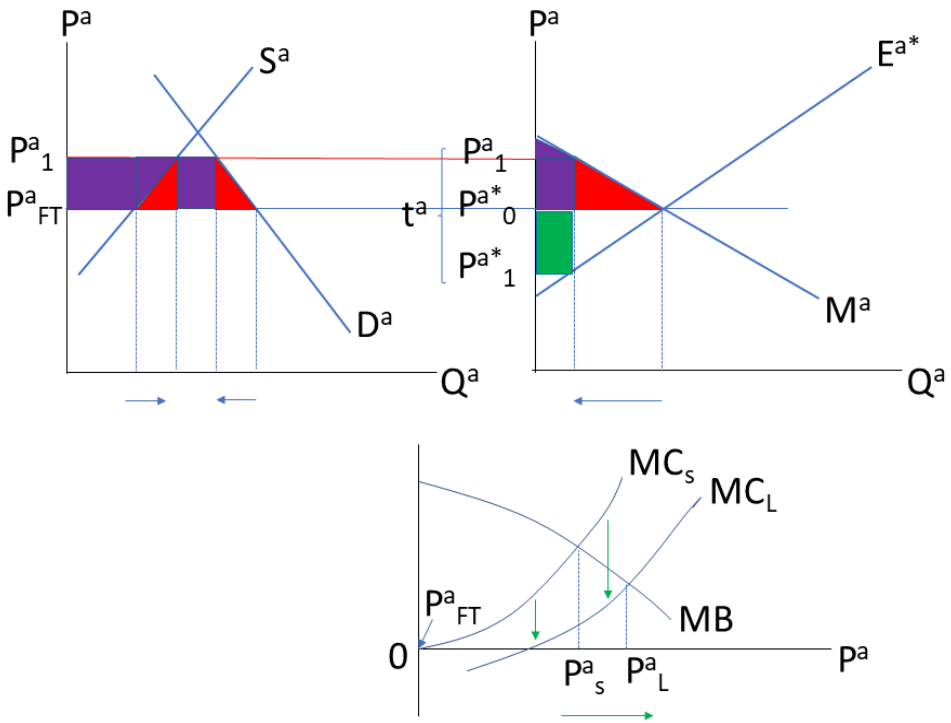


- A large country's tariffs impose negative externalities on the world
- $\Rightarrow$ Tariff choices are *internationally inefficient* (too high) in a world with large countries, given national government objectives
- Address the inefficiency, and a mutually beneficial agreement possible!

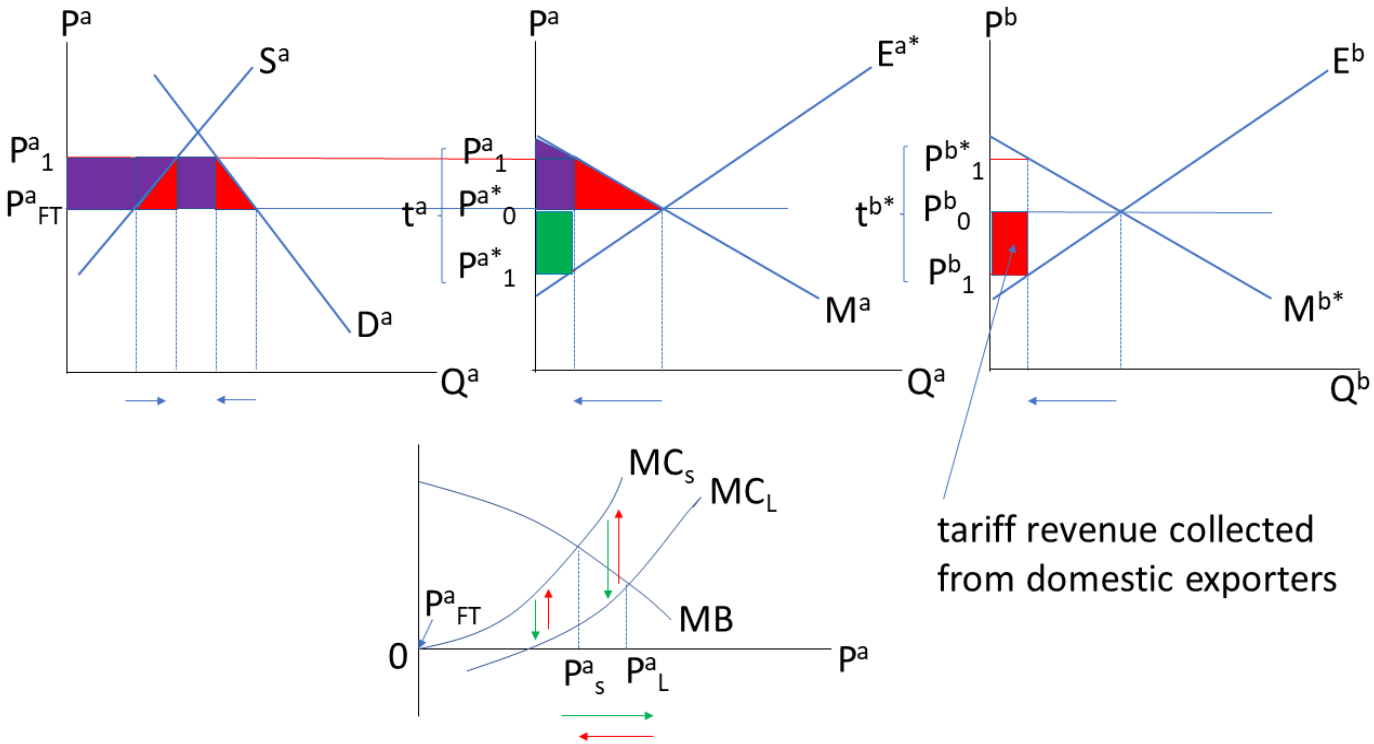
Reciprocity

- Recall a large country's unilateral tariff choice



Unilateral tariff choice in the presence of reciprocity

- A measured, *proportionate response* by its trading partner



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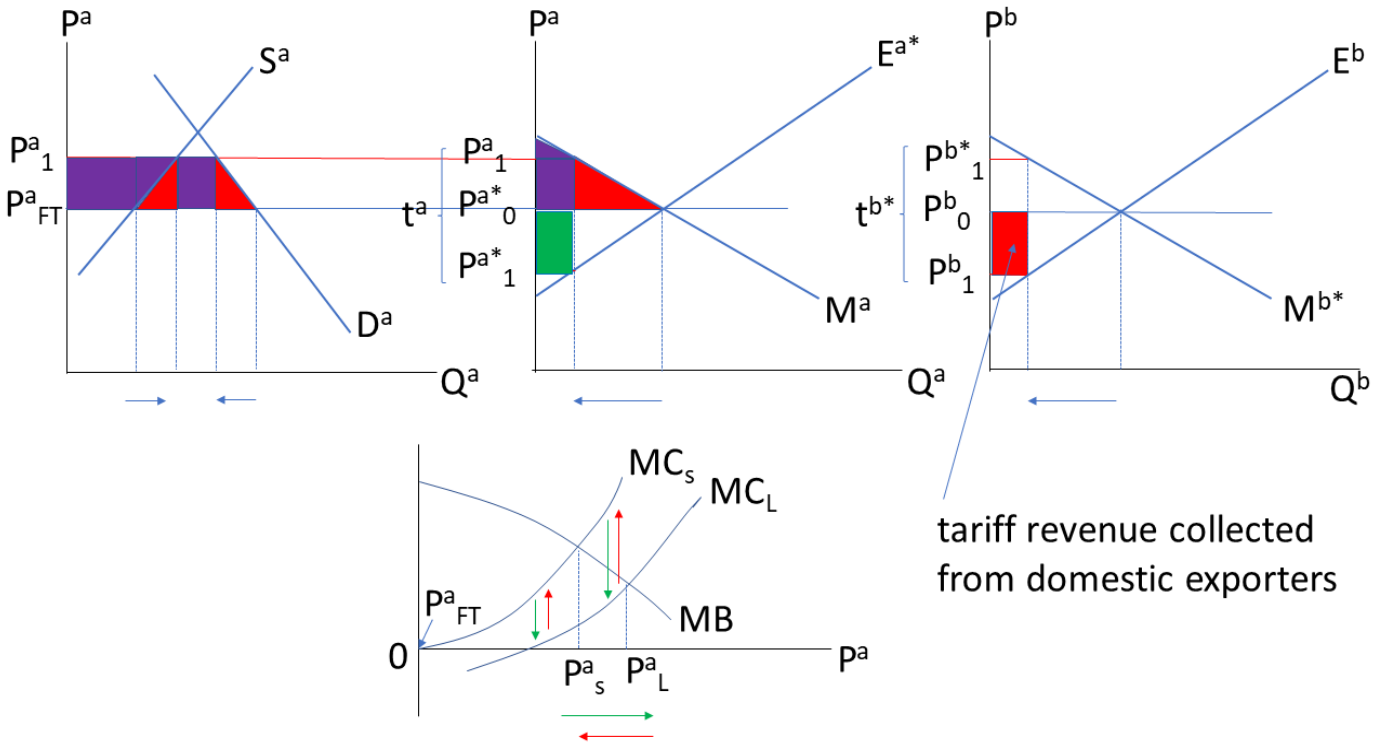


- The large country faces the trade-offs of a small country
- $\Rightarrow$ Legitimacy: A multilateral trade institution built on the pillars of MFN and reciprocity should work well to help governments solve the fundamental trade agreement problem

Reciprocity in action: reciprocal retaliation

NYTimes March 2 2018

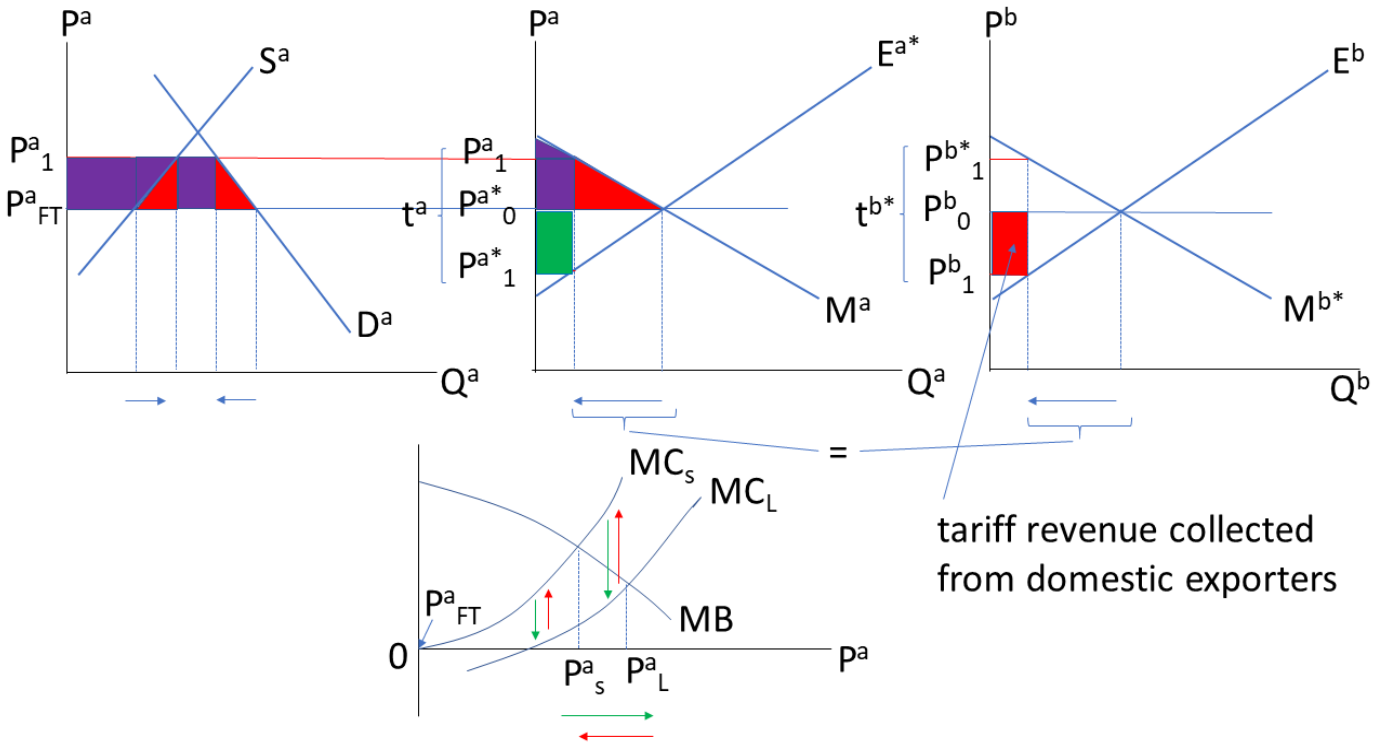
Trump's Tariffs Prompt Global Threats of Retaliation

... The European Union detailed a three-step plan to penalize $3.5 billion of American trade — the same amount of European steel and aluminum the bloc estimates would be harmed by the planned tariffs. It proposed taxing American exports including bourbon, bluejeans, orange juice, cranberries, rice and motorcycles. The European Union could then ... bring a case against the United States at the World Trade Organization.

A European Union official said that the bloc had been preparing for the announcement for months and that everything was in place for a swift, proportionate response. ...

Unilateral tariff choice in the presence of reciprocity

- A *proportionate response* by its trading partners



- The large country faces the trade-offs of a small country
- $\Rightarrow$ Like a small country, it cannot reduce the costs to its citizens of its tariff choice by shifting some of those costs onto foreign companies
  - nothing left for a trade agreement to do!

This is not a trade war

- This is how the GATT/WTO system works to *avoid* a trade war

The Organization's control over countermeasures of this kind enables it to keep such measures within reasonable limits: to allow countermeasures commensurate with the action which occasions them; and to hold in check emotional reactions which might result in punitive measures by countries injured against the country responsible for the injury. The control over countermeasures is a check on the development of trade wars. (US Council of the ICC, 1955)

Enforcement

- What keeps countries operating within this rules-based system?
  - the off-equilibrium threat of an all-out trade war

Enforcement

- What keeps countries operating within this rules-based system?
  - the off-equilibrium threat of an all-out trade war
- What might the beginning of a trade war look like?

Escalating Trade Fight, Trump Threatens Higher Taxes on European Cars

By EMILY COCHRANE New York Times MARCH 3, 2018

WASHINGTON — President Trump warned on Saturday that he would apply higher taxes on imported European cars if the European Union carried through on its threat to retaliate against his proposed stiff new tariffs on steel and aluminum.

"If the E.U. wants to further increase their already massive tariffs and barriers on U.S. companies doing business there, we will simply apply a Tax on their Cars which freely pour into the U.S.," Mr. Trump wrote on Twitter from Florida, where he was spending part of the weekend. "They make it impossible for our cars (and more) to sell there. Big trade imbalance!"

The GATT/WTO in a world of trade and climate problems

- How does the GATT/WTO architecture work when there is both a trade and a climate problem to solve?

The GATT/WTO in a world of trade and climate problems

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- N the population of importing country H, H gov policies τ and t
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- Welfare

$$W = CS + \lambda \cdot PS + REV - \theta N \cdot [s(q) + s^*(q^*)]$$

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  - political economy weights λ for the H gov, λ^* for the F gov
  - θ the damage to per-capita welfare from another unit of carbon output

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- The nature of Nash inefficiencies when $\theta = 0$

$$\text{Tariffs too high} \quad : \quad \tau^N + \tau^{*N} = \frac{1}{\eta_{e^*}} + \frac{1}{\eta_m} > 0 = \bar{\tau}^E$$

$$\text{Taxes set efficiently} \quad : \quad t^N = t^E; \quad t^{*N} = t^{*E}$$

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- Conditional on Nash carbon taxes, tariffs too high, reflecting international pecuniary externality (trade problem)

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- $\Rightarrow$ Nature of remaining inefficiencies under GATT/WTO when $\theta > 0$
  - carbon taxes inefficient, but only due to international non-pecuniary externality

$$t^N - t^E = -N^*\frac{\theta}{q};\quad t^{*N} - t^{*E} = N\frac{\theta}{q^*}$$

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- Could the GATT/WTO approach deliver efficient tariffs (conditional on the efficient carbon taxes)?

Border tax adjustments

- Yes, but only if H's import tariff rises with its higher carbon tax (BTA)

$$\text{from} \quad \tau^E(t^N) = \left[\frac{s^* \times \eta_{s^*}}{e^* \times \eta_{e^*}}\right] \times N\frac{\theta}{q^*}$$

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- and F's export subsidy rises with its higher carbon tax (BTA)

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- $\Rightarrow$ The implied BTA is *not* based on carbon content of imports
  - "market access" preserving: each country adjusts its tariff to neutralize the competitive effect of its higher carbon tax and leave $\widetilde{p}^w$ unchanged

Enforcement linkage

- Suppose a climate accord raises carbon taxes to their efficient levels

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- $\Rightarrow$ WTO enforcement of efficient carbon taxes requires more severe tariff retaliation than implied by the GATT/WTO reciprocity norm

Participation linkage

- To address free-riding on the carbon taxes of others, the Climate Club proposal of Nordhaus (2015) envisions adding a set of "climate amendments" to the WTO that would

> ...*"explicitly allow uniform tariffs on nonparticipants within the confines of a climate treaty; it would also prohibit retaliation against countries who invoke the mechanism."*

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  - but not all GATT members saw it in their interest to create the WTO
- To implement the Climate Club proposal, could mimic the strategy used in creating the WTO
  - the major players could formally withdraw from the WTO and enter a new treaty creating the Green WTO

Participation and enforcement linkage

- Suppose the Green WTO were created with
  - no change to the WTO beyond the climate amendments envisioned by Nordhaus
  - no external enforcement mechanism for carbon tax commitments beyond that implied under the GATT/WTO reciprocity norm
  - universal participation

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  - universal participation
- What would this accomplish?

Participation and enforcement linkage

- Within the Green WTO
  - H solves

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- Same as with GATT/WTO shallow-integration reciprocity and no climate accord
- $\Rightarrow$ Even universal participation in climate accord won't accomplish much unless enforcement of climate commitments goes beyond GATT/WTO reciprocity norms

Negotiation linkage

- Sticking point in the WTO Doha Round: a basic asymmetry
  - BRICS willing to cut tariffs in exchange for reciprocal tariff cuts from industrialized countries, but industrialized countries have few tariffs left to cut and want BRICS to do this non-reciprocally

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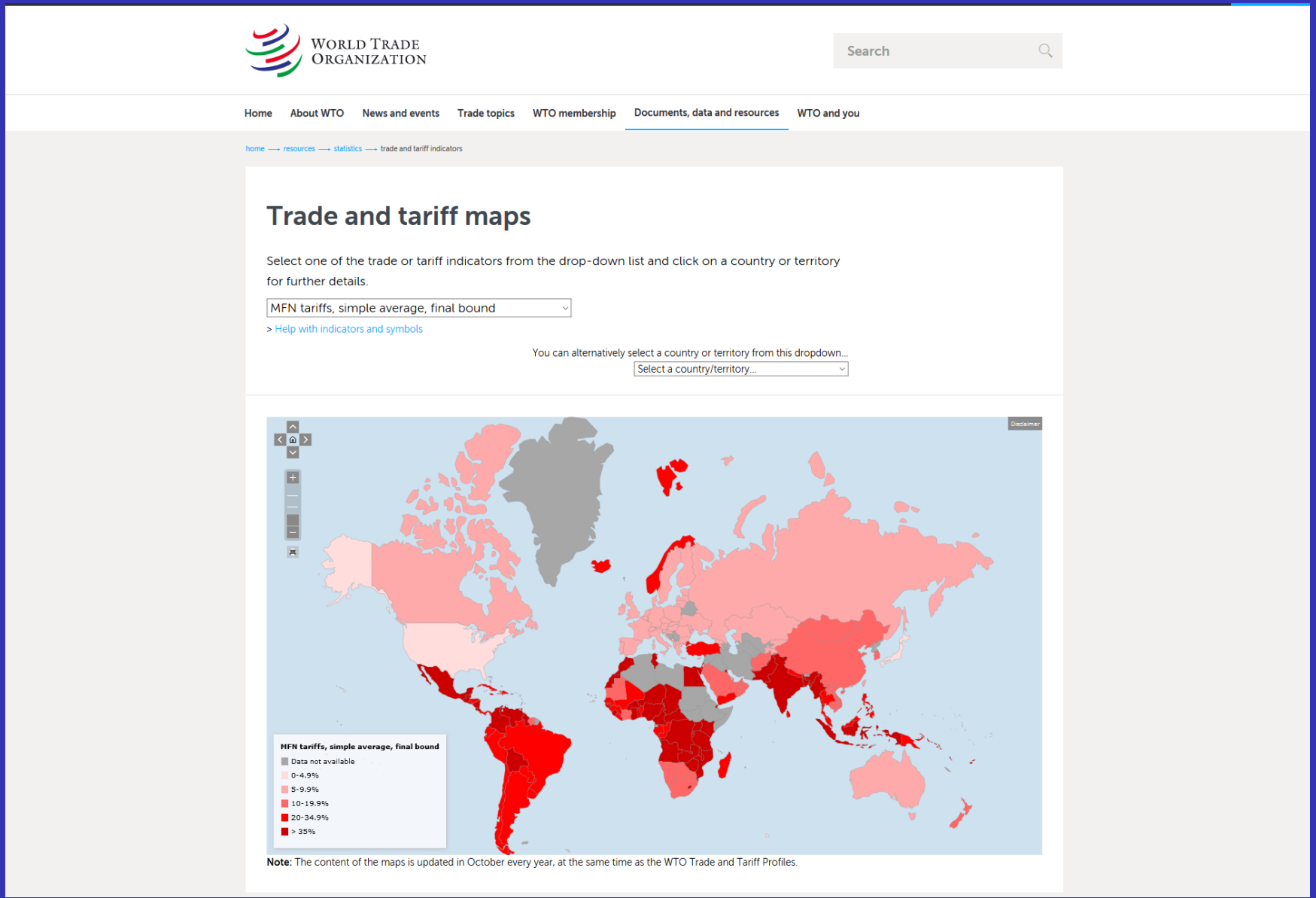
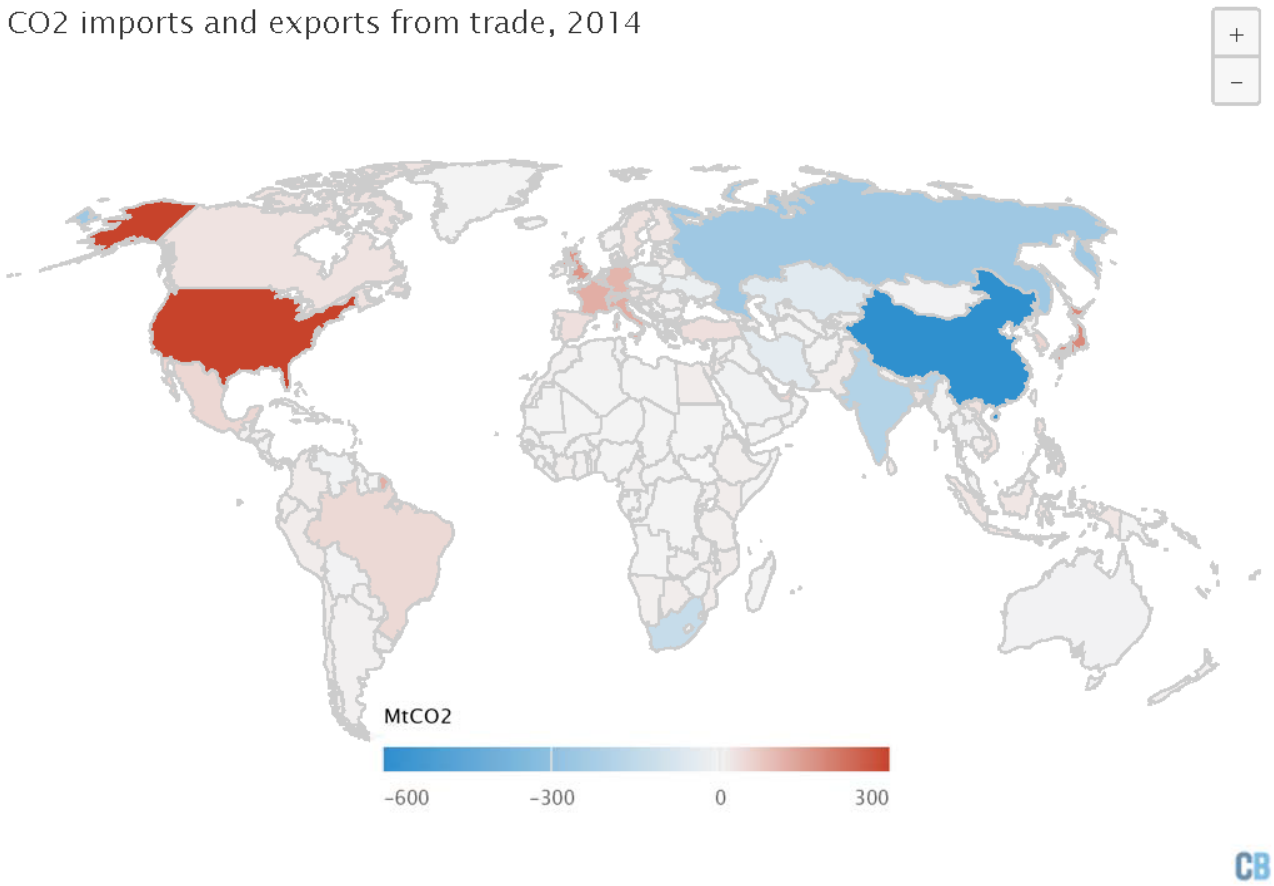
- An opportunity for negotiation linkage?

BRICS tariff cuts ...



... in exchange for US/EU carbon tax commitments



Global CO2 imports and exports from trade in 2014. Based on data from the Global Carbon Project (http://www.globalcarbonproject.org/carbonbudget/16/data.htm). Note that 2014 is the latest year where CO2 import/export data is available. Also note that the scale goes from -600 to 300MtCO2. Chart by Carbon Brief using Highcharts (https://www.highcharts.com/).

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- $\Rightarrow$ BRICS must give more than reciprocal tariff cuts in exchange for industrialized country carbon taxes to make this work

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  - the heightened importance of dynamic considerations/threshold effects associated with global climate concerns
  - other differences?
- What is needed is careful analysis to identify and understand the differences and commonalities across problems
  - and what these imply for effective institutional design

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- And in the mean time, were he here today, what might Frank D. Graham advise?


KEEP
CALM
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