

Trade Policy

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International Trade II, Chapter 9

Trade Policy Literature

Key questions

- Why are countries protectionist? Can protectionism ever be “optimal”? Can we explain how trade policies vary across countries, industries, and time?
- How should trade agreements be designed? Can we explain the main institutional features of actual trade agreements, e.g. WTO, NAFTA, EU?

Why is international trade not free?

- **Optimal tariff argument:** Even when free trade is Pareto optimal, a large enough country will have a unilateral incentive to use trade taxes to tilt the terms of trade in its favor.
- **Second-best argument:** In the presence of domestic distortions (non-economic objectives, learning-by-doing, price or wage rigidity, commitment problems), and when direct correction of these distortions is not possible, trade taxes might improve welfare.
- **Political economy:** Trade taxes are a way to redistribute income across different groups in society. They are used when more efficient means are not available or prove to be too costly.

Why is international trade not free?

To analyze trade policies, one needs to take a stand on

- **Economic environment:** What is the market structure? Are there distortions, e.g. unemployment or pollution?
- **Political environment:** What is the objective function that governments aim to maximize, e.g. social welfare, the welfare of the median voter, political support? What are the trade policy instruments, e.g. import tariffs, quotas, and product standards? Are trade policy instruments the only instruments available?
- **Constraints on the set of feasible contracts:** Do trade agreements need to be self-enforcing? How costly is it to “complete” contracts?

Outline

I - Optimal trade policy

II - Political economy

III - Trade wars and trade talks

Optimal trade policy theory

Optimal trade policy

- We will restrict ourselves to environments such that
 - All markets are perfectly competitive
 - There are no distortions
 - Governments only care about the welfare
- The only motive for trade protection is **price manipulation**
 - For clarity, “optimal trade policy” might be better termed “**unilaterally optimal trade policy driven by terms-of-trade motives.**”
 - Terms-of-trade motives will be explained in two slides.
- How should trade tariffs vary across countries and industries?

A general framework

- Consider a social planner maximizes the utility of the representative consumer subject to a feasibility constraint and an import “affordability” constraint

$$\begin{aligned} \max_{\{X, m\}} \quad & u(X + m) \\ \text{s.t.} \quad & F(X, V) \leq 0; \quad m^T \pi(m) \leq 0, \end{aligned}$$

where X denotes the production vector, V the endowment vector, m the net import vector (so $C = X + m$), and $\pi(m)$ is the vector of world prices.

- The first-order conditions can be written as

$$u_i(C) = \lambda \cdot F_i(X, V), \text{ for all } X_i; \tag{1}$$

$$u_i(C) = \mu \left(\pi_i + \sum_{j=1}^I m_j \frac{\partial \pi_j}{\partial m_i} \right), \text{ for all } m_i; \tag{2}$$

where λ and μ are the Lagrange multipliers.

A general framework

- Which type of policies can achieve these allocations in a decentralized way?
- From consumer and producer behavior in a competitive economy we have

$$\begin{cases} u_i = \omega p_i^c \\ F_i = \varepsilon p_i \end{cases} \Rightarrow u_i = F_i \cdot \frac{\omega p_i^c}{\varepsilon p_i}$$

where p^c and p denote consumer and producer prices, respectively

- Only relative prices matter. To achieve (1), the optimal policies will not create a wedge between consumer prices and producer prices. i.e., $\frac{\omega p_i^c}{\varepsilon p_i} = \lambda \Rightarrow p_c = p$ for all i
 - Consumption taxes or production subsidies are not optimal
- By choice of units, we can next write (2) as

$$p_i = \pi_i + \sum_{j=1}^n m_j \frac{\partial \pi_j}{\partial m_i}, \quad (3)$$

- Optimal policies create a wedge between domestic prices and international prices
- \rightarrow Countries have incentives to manipulate their export prices relative to import price (i.e. Terms of trade, or ToT)

No cross-price effects

- In the absence of cross-price effects, condition (3) becomes:

$$p_i = \pi_i + m_i \frac{\partial \pi_i}{\partial m_i}$$

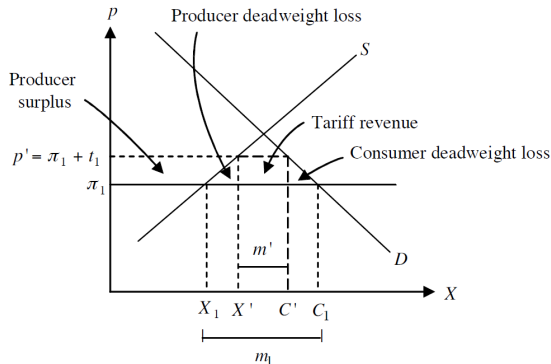
- If the country is large enough, then $\frac{\partial \pi_i}{\partial m_i} > 0 \Rightarrow$ big country wants to tax imports ($p_i > \pi_i, m_i > 0$) and tax exports ($p_i < \pi_i, m_i < 0$)
- **Intuition:** In a competitive economy, the effect of a marginal unit of exports or imports neglects its effects on prices, and therefore on export revenue or import cost
 - A government can internalize this pecuniary externality by introducing trade taxes
- Optimal add-valorem tariff is:

$$\frac{p_i}{\pi_i} - 1 = \frac{m_i}{\pi_i} \frac{\partial \pi_i}{\partial m_i}, \quad (4)$$

which corresponds to the inverse of the import demand elasticity. Import less elastic \rightarrow small $\frac{\partial m_i}{m_i} \rightarrow$ greater the RHS term \rightarrow higher (unilateral) optimal tariff rate

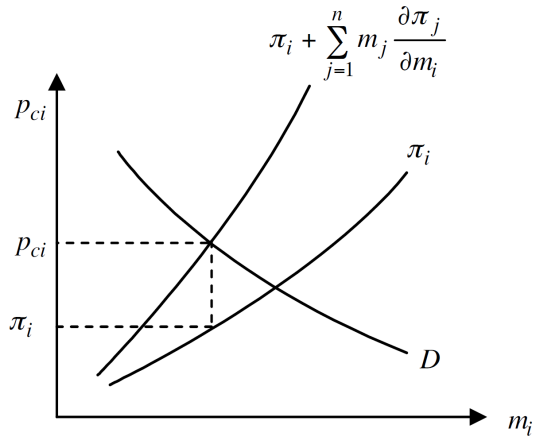
Welfare effect of tariff: small economy

$$v(p, l) = wL + \sum_{i=1}^n \Pi_i(p_i) + \sum_{i=1}^n S_i(p_i) + \sum_{i=1}^n (p_i - \pi_i) m_i(p_i).$$



Small economies optimally set tariffs to zero.

Optimal tariff: big economy



Greater the ToT effect ($\frac{m_i \partial \pi_i}{\partial m_i}$), higher the (unilateral) optimal tariff rate

Optimal trade policy - Caveats

- While this **terms-of-trade theory of trade negotiations** is the dominant theory of trade negotiations, it is subject to a number of important caveats that we will now discuss:
 - ① It assumes that countries have market power in world markets
 - ② It cannot explain the treatment of export policy instruments
 - ③ Economic historians tell a different story of the trade war in the 1930s

Optimal trade policy – Caveats

Market power

- A key assumption underlying the terms-of-trade theory is that countries can actually affect the terms-of-trade
- This requires that they face an upward-sloping export supply curve so that shifts in their import demands influence the world price (which may not be the case)
- It is important to note that even small countries can have market power if they produce differentiated products
- In reality, policymakers rarely claim to impose tariffs to manipulate terms of trade
- In reality, small (often developing) countries often impose higher tariffs

Optimal trade policy – Caveats

Export policy instruments

- Real-world trade agreements tend to constrain export subsidies but not export taxes, which is hard to reconcile with the terms-of-trade theory
- In particular, export subsidies deteriorate a country's terms-of-trade and therefore should be welcomed by its trading partners
- Conversely, export taxes improve a country's terms-of-trade and have overall very similar effects to import tariffs
- Essentially, a country can improve its terms-of-trade either by using its monopsony power to reduce its import prices or by using its monopoly power to increase its export prices

Optimal trade policy – Caveats

The 1930s

- Irwin (2012) argues that the worldwide protectionism in the 1930s was a direct consequence of the financial turmoil of the 1930s which left countries struggling to keep their gold reserves
- Germany and the “exchange control bloc” countries did not change the gold parity of their currencies but imposed severe capital controls which impeded intertemporal trade
- Britain and the “sterling bloc” countries left the gold standard and imposed significant import barriers in an attempt to slow down the depreciation of their currencies
- France and the “gold bloc” countries kept the gold standard and tried to rebalance their current accounts through massive protectionism in the form of non-tariff measures such as quotas

Optimal trade policy evidence

Optimal trade policy evidence

- Despite these caveats, the empirical literature broadly supports the terms-of-trade theory of trade negotiation
- We will now briefly discuss the most prominent contributions: Broda et al (2008), Bagwell and Staiger (2011), Ludema and Mayda (2013), and Bown and Crowley (2013)

Broda, Limao and Weinstein (2008)

- Recall the optimal tariff is given by the inverse of import demand elasticity

$$\tau_j \equiv \frac{p_j}{\pi_j} - 1 = \frac{d\pi_j m_j}{dm_j \pi_j} \equiv e_j,$$

- Adding country dimension, a testable relationship is given by:

$$\tau_{ic} \equiv \frac{p_{ic}}{\pi_j} - 1 = \frac{d\pi_j m_{ic}}{dm_{ic} p_{ic}} \equiv e_{ic}$$

Broda, Limao and Weinstein (2008)

- To test this relationship, Broda, Limao and Weinstein (2008, BLW henceforth) first estimate e_i
 - 'Identification through heteroskedasticity' idea as Feenstra (AER, 1994) or Broda and Weinstein (QJE, 2006)
- BLW then, having estimated e_i , estimate the relationship between tariff and e_i
- But for which countries? They do this on countries that (in certain time periods) were not part of the GATT/WTO and hence were presumably free to charge their unilaterally optimal tariff

Are the (inverse) elasticity estimates sensible? By type of good

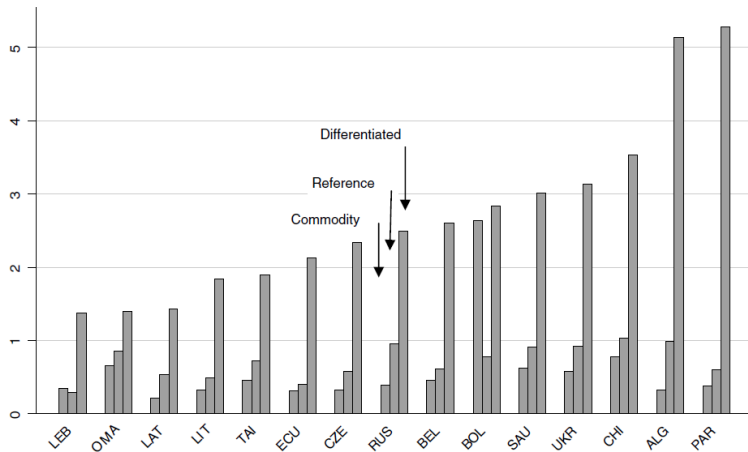


FIGURE 2. MEDIAN INVERSE ELASTICITIES BY PRODUCT TYPE
(Goods classified by Rauch into commodities, reference priced products, and differentiated products)

Are the elasticity estimates sensible? Similarity within same good

TABLE 4—CORRELATION OF INVERSE EXPORT SUPPLY ELASTICITIES ACROSS COUNTRIES

Dependent variable: Statistic	Log inverse export supply			
	Beta	Standard error	R^2	Number of observations
Algeria	0.80	(0.07)	0.13	739
Belarus	0.80	(0.07)	0.14	703
Bolivia	0.82	(0.09)	0.13	647
China	0.54	(0.06)	0.11	1,125
Czech Republic	0.61	(0.05)	0.12	1,075
Ecuador	0.73	(0.08)	0.12	753
Latvia	0.57	(0.07)	0.09	872
Lebanon	0.71	(0.08)	0.11	782
Lithuania	0.70	(0.07)	0.13	811
Oman	0.39	(0.08)	0.04	629
Paraguay	0.94	(0.11)	0.14	511
Russia	0.53	(0.05)	0.11	1,029
Saudi Arabia	0.48	(0.06)	0.08	1,036
Taiwan	0.31	(0.08)	0.02	891
Ukraine	0.83	(0.07)	0.17	730
Median	0.70	(0.07)	0.12	782

Note: Univariate regression of log inverse export supply elasticities in each country on the average of the log inverse elasticities in that good for the remaining 14 countries.

Results (scatter of country averages)

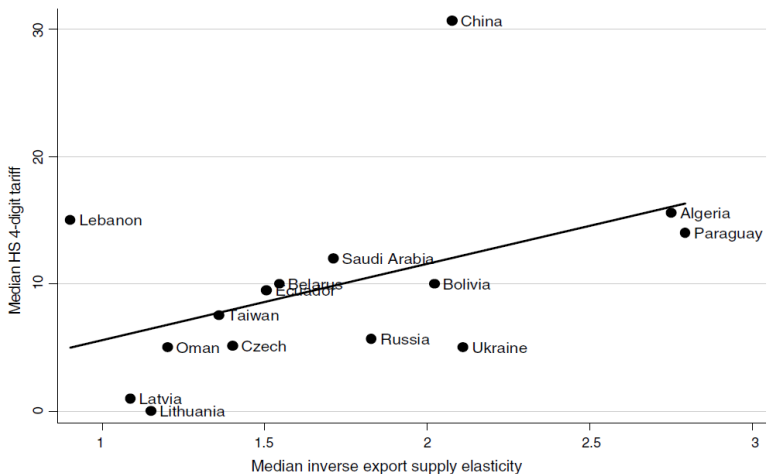


FIGURE 3. MEDIAN TARIFFS AND MARKET POWER ACROSS COUNTRIES

Optimal trade policy evidence (contd.)

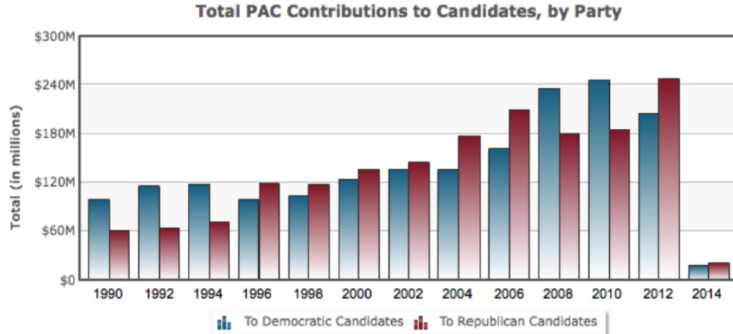
- Bagwell and Staiger (2011) document that countries joining the WTO tend to make deeper tariff cuts in industries in which they face higher import volumes
- This is consistent with the terms-of-trade theory since these are the industries in which tariffs generate the largest terms-of-trade externalities
- Ludema and Mayda (2013) show that countries agreed on lower tariffs in industries in which there is a higher exporter concentration in the Uruguay Round of trade negotiations
- This is consistent with the terms-of-trade theory since these are the industries in which the terms-of-trade externalities are easiest to internalize

Optimal trade policy evidence (contd.)

- Bown and Crowley (2013) find that temporary tariffs imposed under US antidumping and safeguard laws are higher in industries with higher import volumes
- This is consistent with the terms-of-trade theory since these are the industries with the highest temptation to defect
- While I find these empirical results encouraging, I am concerned that none of these papers seriously considers any alternative hypotheses
- Alternative hypotheses are now available in the literature (see below) and my conjecture is that their predictions are similar

Political economy theory

Motivation: political action committees (PAC) contribution by party



Motivation: PAC contributions - financial sector

Accountants: \$2,018,817



37% to Dems / 63% to Repubs

Commercial Banks: \$2,769,836



32% to Dems / 68% to Repubs

Credit Unions: \$889,250



47% to Dems / 53% to Repubs

Finance/Credit Companies: \$629,820



29% to Dems / 71% to Repubs

Insurance: \$4,837,342



39% to Dems / 61% to Repubs

Misc Finance: \$348,160



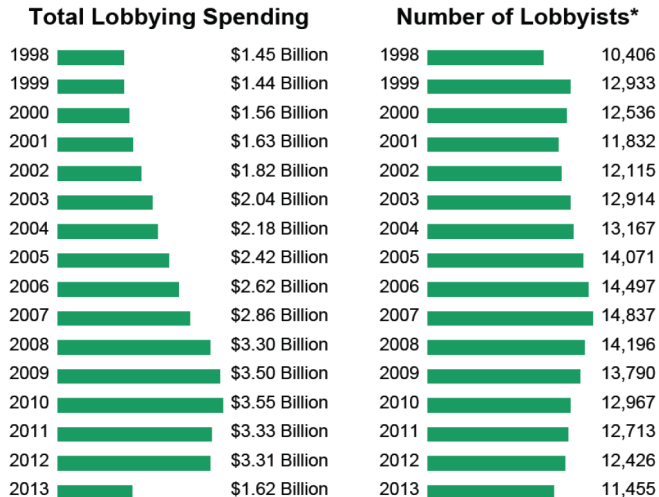
33% to Dems / 67% to Repubs

Real Estate: \$2,231,322



39% to Dems / 61% to Repubs

Motivation: lobbying



Political economy: alternative approaches

- Consider a **small** economy with $n + 1$ goods: one produced with labor and n produced with labor and a sector-specific input. Preferences are **quasi-linear**. Wage is the numeraire.
- For given tariffs $t_i = p_i - \pi_i$, the indirect utility is:

$$v(\mathbf{p}) = I + \sum_{i=1}^n \Pi_i(p_i) + \sum_{i=1}^n S_i(p_i) + \sum_{i=1}^n (p_i - \pi_i) m_i(p_i)$$

- **Baseline Result:** If only terms of trade (ToT) motive, the optimal tariffs will be zero.

Alternative Theory I: Direct Democracy

Mayer (1984) - Tariff Determined by Direct Voting

Model Overview

- Focuses on a two-sector HO model where voting determines a single import tariff.
- Individual optimal tariffs depend on capital distribution per person.
- The equilibrium tariff is the median voter's optimal tariff (i.e., median voter theorem applies)

In a quasi-linear economy, they can vote on each tariff separately

- Voter with sector i ownership share γ :

$$p_i(\gamma) = \arg \max_p [\gamma \Pi_i(p) + S_i(p) + (p - \pi_i)m_i(p)].$$

- Equilibrium tariff:

$$p_i - \pi_i = (\gamma_i^m - 1) \frac{X_i(p_i)}{[-\partial m_i / \partial p_i]},$$

where γ_i^m is the median voter's ownership share in sector i .

- Counterintuitive implication: **High ownership concentration implies import subsidies!**

Alternative Theory II: Political Support Function

Hillman (1982) - Tariff Determined by Balancing Economic Distortions with Industry Profits

Political support function:

- In the quasi-linear economy, the political support function can be expressed as:

$$\sum_i^n b_i [\Pi_i(p_i) - \Pi_i(\pi_i)] + v(\mathbf{p}) - v(\boldsymbol{\pi})$$

- In this event, the equilibrium tariff is:

$$p_i - \pi_i = \frac{b_i X_i(p_i)}{-\partial m_i / \partial p_i}$$

In other words, protection increases when the industry has a higher weight in the political support function, is larger in size, and faces a less elastic import demand.

Alternative Theory III: Protection for sale

Grossman and Helpman (1994)

- Grossman and Helpman (1994) develop a lobbying model
- They use the quasi-linear model and embody it in a framework of menu auctions
 - In the first stage, special interest groups (SIGs) offer campaign contributions $C_i(\mathbf{p})$ for $i \in L$. The contributions are designed to buy policies
 - In the second stage, the policy maker chooses the policy vector \mathbf{p} to maximize

$$aW(\mathbf{p}) + \sum_{i \in L} C_i(\mathbf{p}),$$

where $W(\cdot)$ is aggregate welfare and a is the weight on welfare relative to contributions

- The government's objective function can be justified by a probabilistic voting model, where uninformed voters' decisions are influenced by campaign intensity (the money comes from contributions from special interest groups (SIGs)).

Determinants of protection

- Solving for the equilibrium p delivers:

$$p_i - \pi_i = \frac{l_i - \alpha_0}{a + \alpha_0} \frac{X_i}{-\partial m_i / \partial p_i}, \quad \text{or} \quad \frac{p_i - \pi_i}{p_i} = \frac{l_i - \alpha_0}{a + \alpha_0} \frac{1}{\mu_i \varepsilon_i}$$

where l_i is an indicator variable that equals 1 when $i \in L$ and 0 otherwise, $\alpha_0 = \sum_{i \in L} \alpha_i$ is the fraction of people represented by SIGs, $\mu_i = m_i / X_i$ is the import penetration ratio and ε_i is the import demand elasticity

- Protection is positive if and only if a sector is organized
- Protected sectors are afforded larger protection when fewer people belong to SIGs and the policy maker places lower weight on welfare. When $\alpha_0 = 1$ there is no protection
- Among the protected sectors, sectors with a smaller import penetration ratio and smaller import demand elasticities are more heavily protected

Political economy evidence

Protection for sale: empirical implementation

- Goldberg and Maggi (1999) propose an empirical implementation of the protection-for-sale model, by exploiting cross-industry variation in trade protection
- There is little variation in tariffs, so Goldberg and Maggi use nontariff barriers (NTBs); coverage ratios
- Because the demand elasticities ε_i are not measured accurately, they take them from other studies and estimate

$$\varepsilon_i \rho_i = \frac{l_i - \alpha_0}{a + \alpha_0} \left(\frac{1}{\mu_i} \right)$$

where ρ_i is the coverage ratio, and it replaces $(p_i - \pi_i)/p_i$

- They define a sector as organized if its PAC contributions exceed a certain level
- They regress $\varepsilon_i \rho_i$ on $1/\mu_i$ for organized sectors and for not organized sectors
- The estimates are precise and the model has substantial explanatory power
- The estimates imply $\alpha_0 \approx 85\%$ and $a \approx 50 - 70$ (very high!)

Empirical implementation

- Gawande and Bandyopadhyay (2000) use a similar methodology, except for
 - Account for tariffs on intermediates
 - They too obtain a high a
 - Organized groups are identified from an auxiliary regression that predicts PAC spending from trade variables
- Mitra, Thomakos and Ulubasoglu (2002) estimate the model on Turkish data, during and after the military regime. They use tariffs and NTB coverage ratios. α and α_0 are higher in the post military regime period
- McCalman (2004) estimates the model for Australia, using tariffs
 - Comparing estimates in the late sixties and early nineties, he argues that the model predicts well the policy of trade liberalization (an increase in α and α_0 and the role of sectoral characteristics)

Empirical implementation

- Mitra, Thomakos and Ulubasoglu (2006) provide a sensitivity analysis for the U.S. tariffs and NTB coverage ratios
 - They argue that all importing sectors should be treated as organized
 - Estimating the equation

$$\varepsilon_i \mu_i \rho_i = \beta \equiv \frac{l_i - \alpha_0}{a + \alpha_0}.$$

- They argue that
 - The data do not reject the hypothesis that β is the same for what in previous studies was taken to be organized and not organized sectors
 - Kolmogorov-Smirnov tests of the distribution of the LHS variable do not reject the hypothesis that the distribution is the same in the two groups of sectors

Trade wars and trade talks

Trade wars and trade talks

- As pointed out by Johnson (1953-54), this classic optimal tariff argument naturally gives rise to a terms-of-trade theory of trade wars and trade talks
- To see this, suppose that there is a second industry in which Home is now an exporter, which is a mirror image of the industry discussed above
- It should be clear that Foreign then also has an incentive to impose an import tariff and that both countries' attempts to manipulate their terms-of-trade cancel out
- In the end, tariffs only bring about dead-weight losses in the non-cooperative equilibrium thus giving rise to incentives for trade negotiations

Trade wars and trade talks (contd.)

		Foreign	
		Zero tariff	Optimal tariff
Home	Zero tariff	0	$-(b+d)+e > 0$ Gain
	Optimal tariff	$-(b^*+d^*)-e < 0$ Large loss	$-(b+d) - (b^*+d^*) < 0$ Loss

- This table lists the payoffs relative to free trade in such a mirror-image scenario
- As can be seen, protection is a dominant strategy so that a trade war is the unique Nash equilibrium
- Moreover, both countries lose relative to free trade in this Nash equilibrium – a prisoner's dilemma
- Trade negotiations can thus be interpreted as helping countries escape this prisoner's dilemma - **GATT/WTO/RTAs (next lecture)**

Quantification

- Recent research has also begun to develop quantitative models of trade wars and trade talks, which can be used to perform counterfactual experiments
- Ossa (2014), for example, simulates fully escalated trade wars and fully efficient trade talks and asks how far away we are from these extremes
- His results suggest that around 85% of the possible gains from trade negotiations have already been reaped in past trade negotiations
- His model features terms-of-trade effects but also includes profit-shifting effects, which arise in “new” trade models discussed before

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