The Purpose, Design and Implementation of Trade Agreements

Ohlin Lectures

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Dartmouth

September 27-28 2016

Introduction

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  - sometimes hard to pin down
  - but we know it when we see it
  - and we are seeing a lot of it

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- Individuals are the ultimate drivers of globalization, but governments set the rules of the game
  - the rules can be very important to the outcome

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  - a focus on tariffs and other trade impediments imposed at the border
- But the WTO's Doha Round, begun in 2001, has disappointed
- Meanwhile, the action has moved elsewhere

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  - The Trans Pacific Partnership (TPP)
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  - The Trans Pacific Partnership (TPP)
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- ...and an apparent backlash against at least some dimensions of globalization
  - from those who have not shared in the gains
  - from those who feel sovereignty of their governments has been eroded

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  - the problem of cross-border policy externalities
- Important to understand
  - why GATT worked
  - the economic environment it is best suited for
  - whether changes in the economic environment imply the need for changes in design of trade agreements

Ohlin Lectures

- Two self-contained but related lectures
- Lecture I.
  - Trade Agreements and Tariff Bargaining: The Terms-of-Trade Theory and the Torquay Round
- Lecture II.
  - Trade Agreements as Incomplete Contracts: Rules, Disputes and Court Learning

Lecture I

Trade Agreements and Tariff Bargaining

The Terms-of-Trade Theory and the Torquay Round

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Introduction

- The GATT/WTO has presided over the largest and most sustained negotiated trade liberalization in history
- Yet the WTO faces challenges, evidenced by the now-suspended Doha Round of multilateral trade negotiations
  - Newcomers at the bargaining table creating *tariff asymmetries* across negotiating partners that are incompatible with reciprocity
  - *Externalities* associated with MFN and the potential for free riding
  - *PTAs* as potential stumbling blocks to GATT/WTO liberalization
  - Growing importance of *offshoring* and *trade in services*

Introduction

- What accounts for GATT's success as a bargaining forum?
- Is this bargaining forum still suited for the modern global economy?
- Focus on
  - Tariff bargaining in the GATT Torquay Round: "Multilateral Trade Bargaining: A First Look at the GATT Bargaining Records" (with Kyle Bagwell and Ali Yurukoglu), September 2016; and "Multilateral Trade Bargaining and Dominant Strategies" (with Kyle Bagwell), September 2016
  - Implications of the rise in offshoring: "Trade Agreements and the Nature of Price Determination" (with Pol Antras), AER P&P, May 2012; and "Offshoring and the Role of Trade Agreements" (with Pol Antras), AER, December 2012

Tariff Bargaining

- Detailed negotiation data, recently declassified by the WTO
  - First 5 GATT rounds span 1947-1961, involve more than 1,500 pairs of bargaining countries, resulted in over 70,000 agreed tariff cuts
  - Simultaneous bilateral bargaining between pairs of countries over multiple tariff lines, all subject to MFN
  - Bargaining records include full sequence of formal requests and offers, and outcomes (agreed tariffs or statement of no agreement)
- An initial look at a slice of the GATT bargaining records
  - Focus on Torquay Round (1950-51), and within this on the complete set of 24 bilaterals undertaken by the US

Relevance

- Understanding these earlier negotiations is important for addressing the challenges facing modern trade agreements
  - Writings of the time emphasize trade bargaining challenges with clear counterparts today: tariff asymmetries, MFN externalities, PTAs
  - Doha attempting to adapt traditional bargaining protocols on goods trade to deal with new emphasis on liberalization of trade in services
- And analyzing these high stakes international negotiations contributes to economists' understanding of bargaining more generally

Approach

- Combine ToT theory with key GATT institutional features
- Show that the resulting theory provides a useful lens for interpreting the GATT bargaining data
- Use the theory to guide analysis of offers and bargaining failure

A ToT Perspective on the Trade Negotiation Problem

- ToT theory provides simple framework within which to interpret two of the most basic features of GATT tariff negotiations
- I) Provides reason why negotiators would view own-tariff cuts as "concessions" and seek foreign tariff cuts for their exporters
  - two-good two-country competitive general equilibrium trade model
  - gov objectives $W(p(\tau, \widetilde{p}^w), \widetilde{p}^w)$ and $W^*(p^*(\tau^*, \widetilde{p}^w), \widetilde{p}^w)$ satisfying $W_{\widetilde{p}^w}(p, \widetilde{p}^w) < 0 < W^*_{\widetilde{p}^w}(p^*, \widetilde{p}^w)$
  - Nash tariffs satisfy

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

  - $\Longrightarrow$ $W_p < 0 < W^*_{p^*}$ at Nash tariff choices; own-tariff cut a concession but matched with foreign tariff cut we can both gain

Shallow Integration

- II) Provides basis for narrow focus on tariff negotiations
  - a domestic standard in each country, σ and σ^*, impacts that country's production possibilities: $\widetilde{p}^w = \widetilde{p}^w(\sigma, \sigma^*, \tau, \tau^*)$
  - gov objectives $W(\sigma, p(\tau, \widetilde{p}^w), \widetilde{p}^w)$ and $W^*(\sigma^*, p^*(\tau^*, \widetilde{p}^w), \widetilde{p}^w)$ satisfying $W_{\widetilde{p}^w}(\sigma, p, \widetilde{p}^w) < 0 < W^*_{\widetilde{p}^w}(\sigma^*, p^*, \widetilde{p}^w)$
  - conditions for efficient policy choices

$$\frac{[\tau W_p + W_{\widetilde{p}^w}]\frac{\partial \widetilde{p}^w}{\partial \tau^*}}{W_p \frac{dp}{d\tau} + W_{\widetilde{p}^w}\frac{\partial \widetilde{p}^w}{\partial \tau}} = \frac{W^*_{p^*}\frac{dp^*}{d\tau^*} + W^*_{\widetilde{p}^w}\frac{\partial \widetilde{p}^w}{\partial \tau^*}}{[\frac{1}{\tau^*}W^*_{p^*} + W^*_{\widetilde{p}^w}]\frac{\partial \widetilde{p}^w}{\partial \tau}}$$

$$W_\sigma + W_p \frac{dp}{d\tau}\frac{d\tau}{d\sigma}\Big|_{d\widetilde{p}^w=0} = 0 \text{ and } W^*_{\sigma^*} + W^*_{p^*}\frac{dp^*}{d\tau^*}\frac{d\tau^*}{d\sigma^*}\Big|_{d\widetilde{p}^w=0} = 0$$

  - top condition describes efficient trade volumes; bottom conditions describe each country's efficient policies to deliver this trade volume

Shallow Integration

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- Nash violates top condition
  - $\Rightarrow$ tariffs too high/trade volumes too low
- Nash satisfies bottom conditions
  - $\Rightarrow$ conditional on trade volumes, Nash policy choices efficient
- $\Longrightarrow$ Shallow integration
  - expand market access to efficient levels with tariff commitments
  - apply "MA preservation" rules to subsequent policy adjustments
  - and achieve policy efficiency

ToT Theory plus Key GATT Institutional Features

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- Strict adherence to reciprocity and MFN together
  - can induce truth-telling on the part of govs

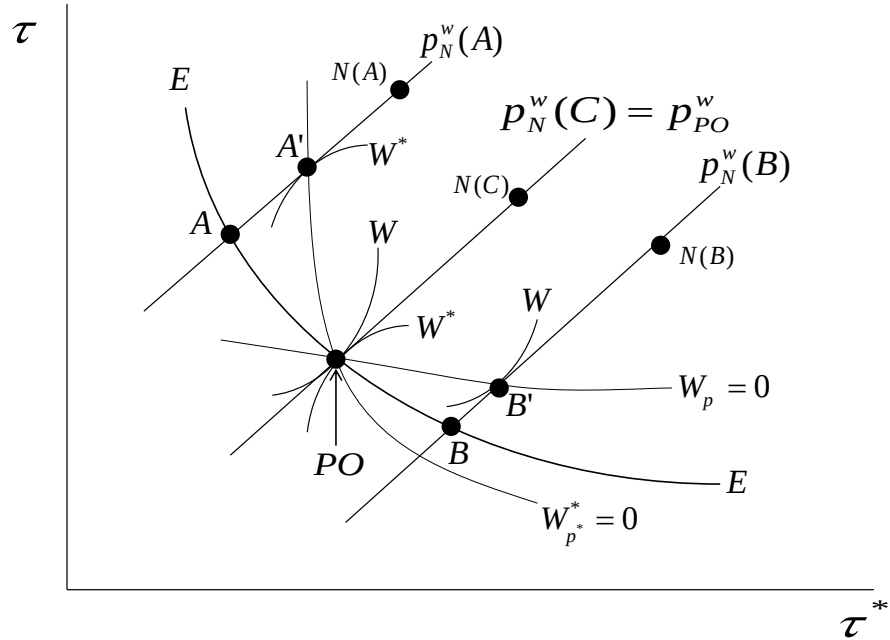

Figure 1: Reaction curves

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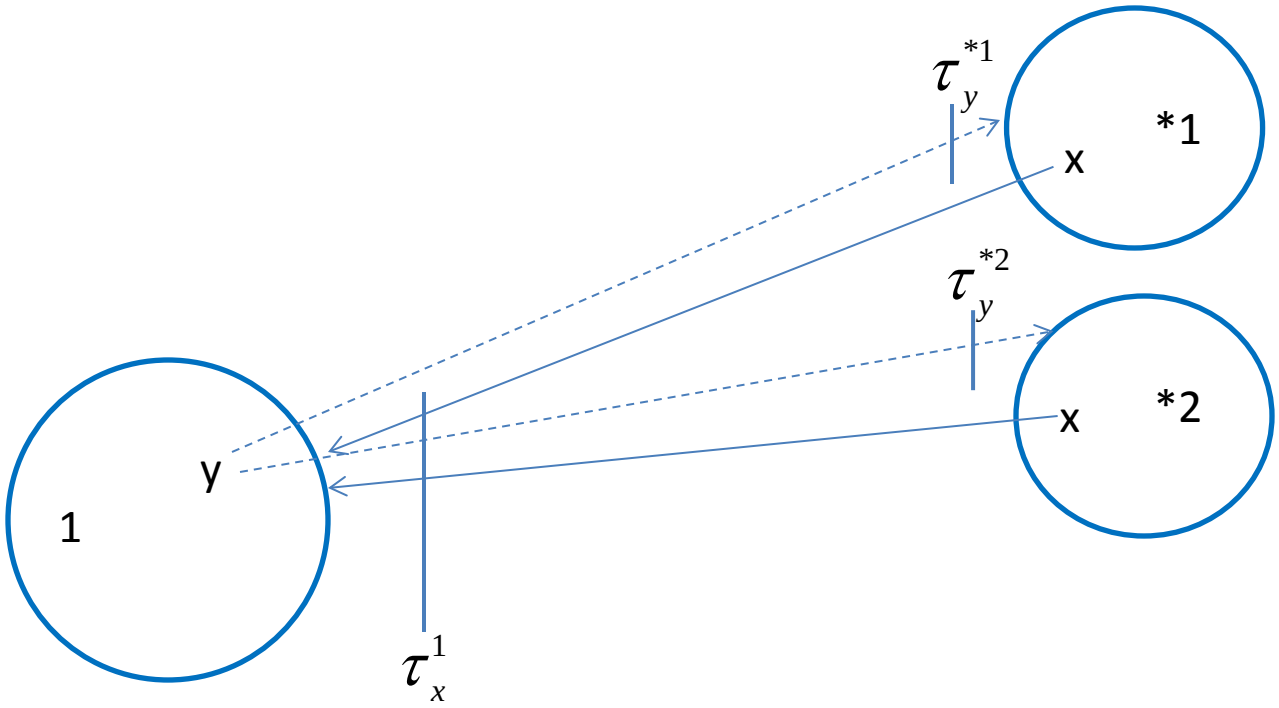

Reciprocity and MFN

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- Strict adherence to reciprocity and MFN together
  - can induce truth-telling on the part of govs
  - and eliminate bargaining externalities across bargaining pairs
- And only multilateral reciprocity, not bilateral reciprocity, required

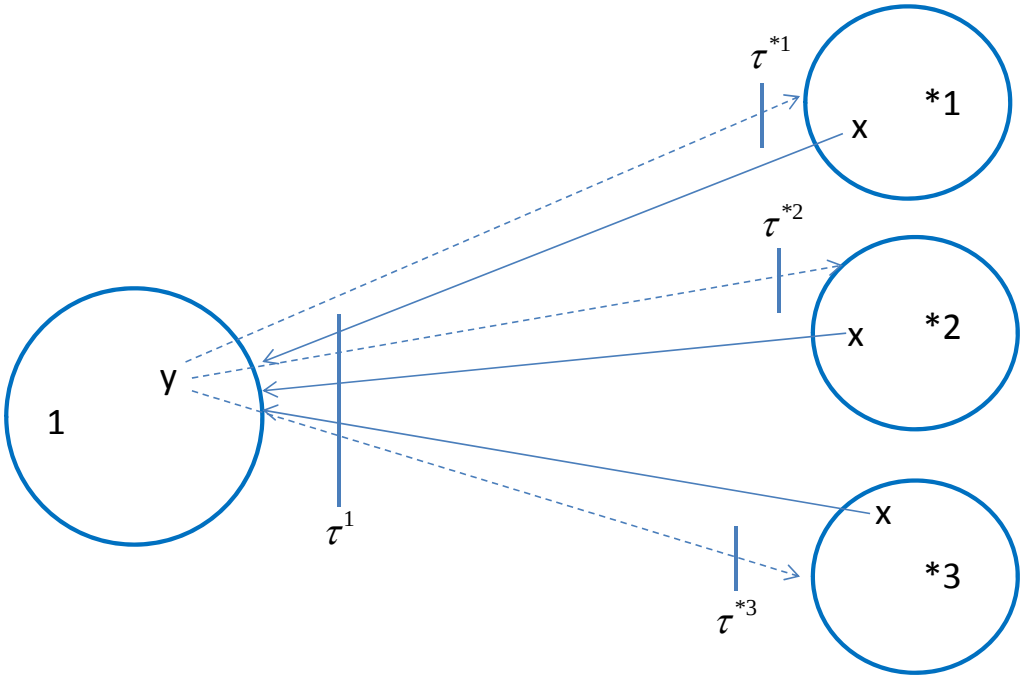
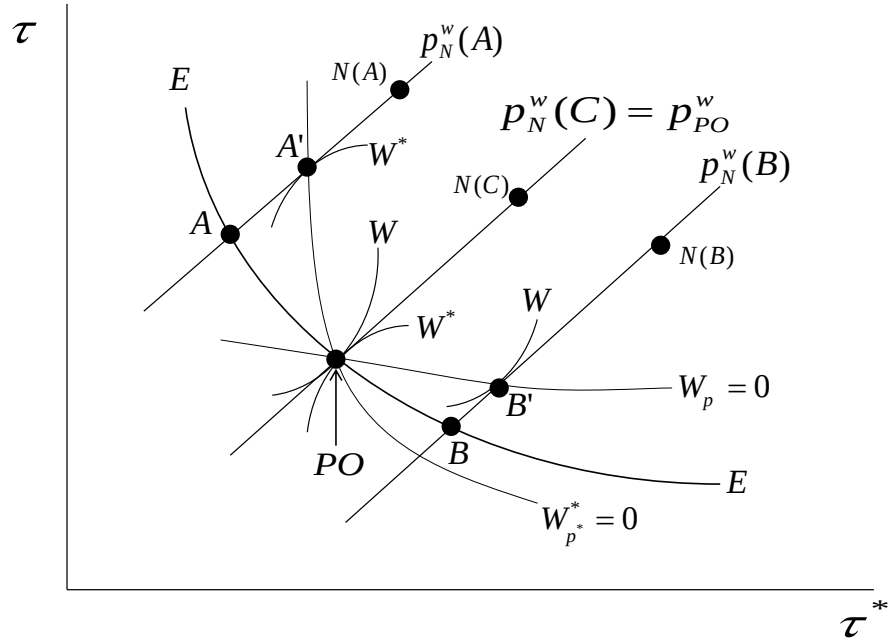


Figure 2: Multilateral Reciprocity

ToT Theory plus Key GATT Institutional Features

- But simplicity comes at potential cost
  - If GATT bargaining partners are asymmetric
  - strict adherence to reciprocity and MFN implies rationing, prevents govs from reaching the full information efficiency frontier



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ToT Theory plus Key GATT Institutional Features

- But simplicity comes at potential cost
  - If GATT bargaining partners are asymmetric
  - strict adherence to reciprocity and MFN implies rationing, prevents govs from reaching the full information efficiency frontier
- $\therefore$ ToT theory plus strict adherence to multilateral reciprocity and MFN implies
  - a dominant strategy for each gov to offer own-tariff cuts that deliver the import volume it desires at the fixed terms of trade, followed by
  - a phase of multilateral rebalancing to ensure dual requirements of multilateral reciprocity and voluntary exchange are respected

The Torquay Bargaining Protocol

- The initial (first stage) requests were common knowledge
- The initial (second stage) offers were privately observed between the relevant pairs of countries
- A's initial (public) request of B and A's initial (private) offer to B forms A's initial (private) bargaining proposal to B
    - the initial proposals served as the basis for the start of (third stage) bilateral offer/counteroffer bargaining, the outcome of which became common knowledge at the conclusion of the bilateral
- As outcomes of concluded bilaterals became common knowledge, some ability to make adjustments to previously concluded bilaterals

Stylized Facts

- First, the numbers of back-and-forth offers and counter offers in any bargain were relatively small (Fig 5)

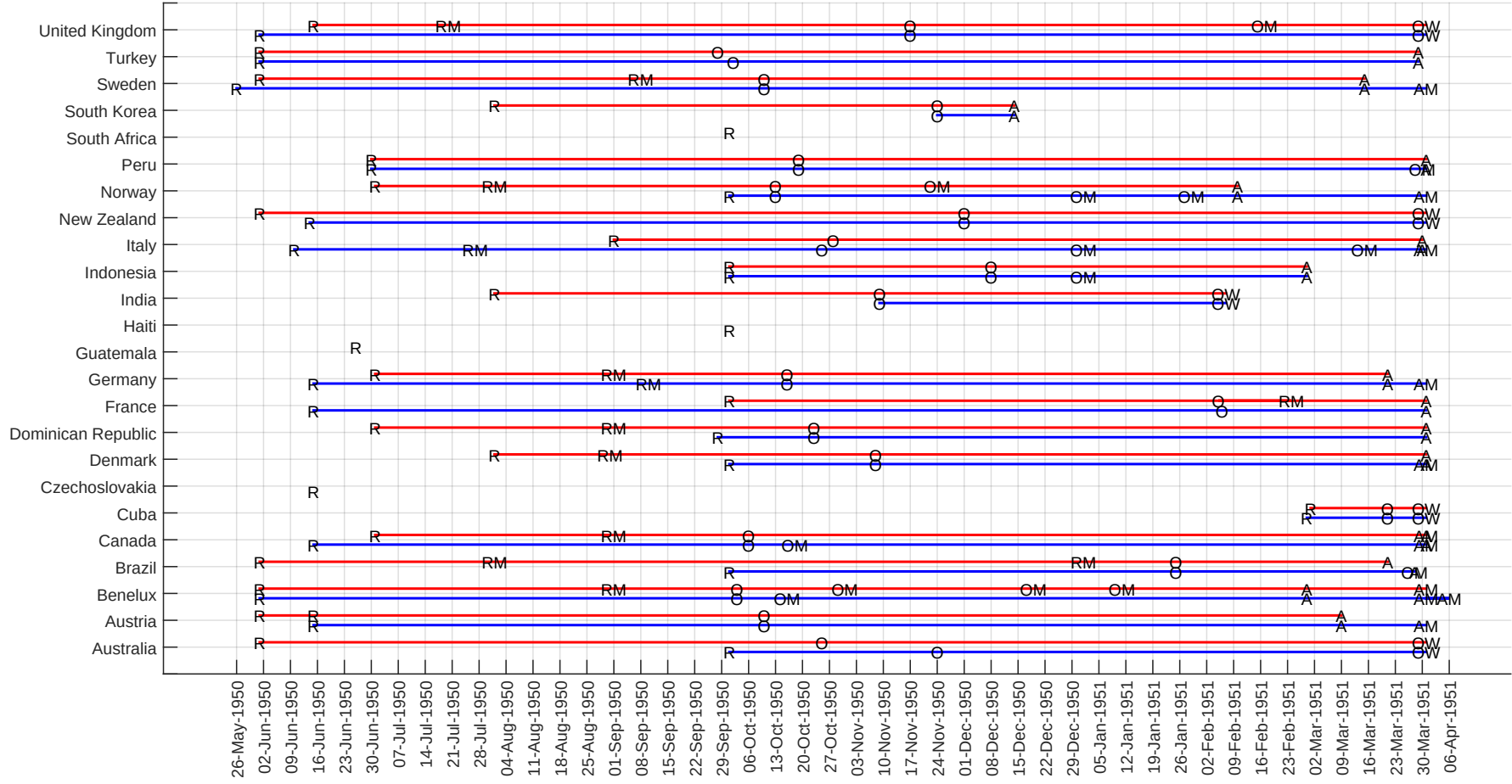

Figure 5: Timing of Actions in the US Torquay Bilaterals

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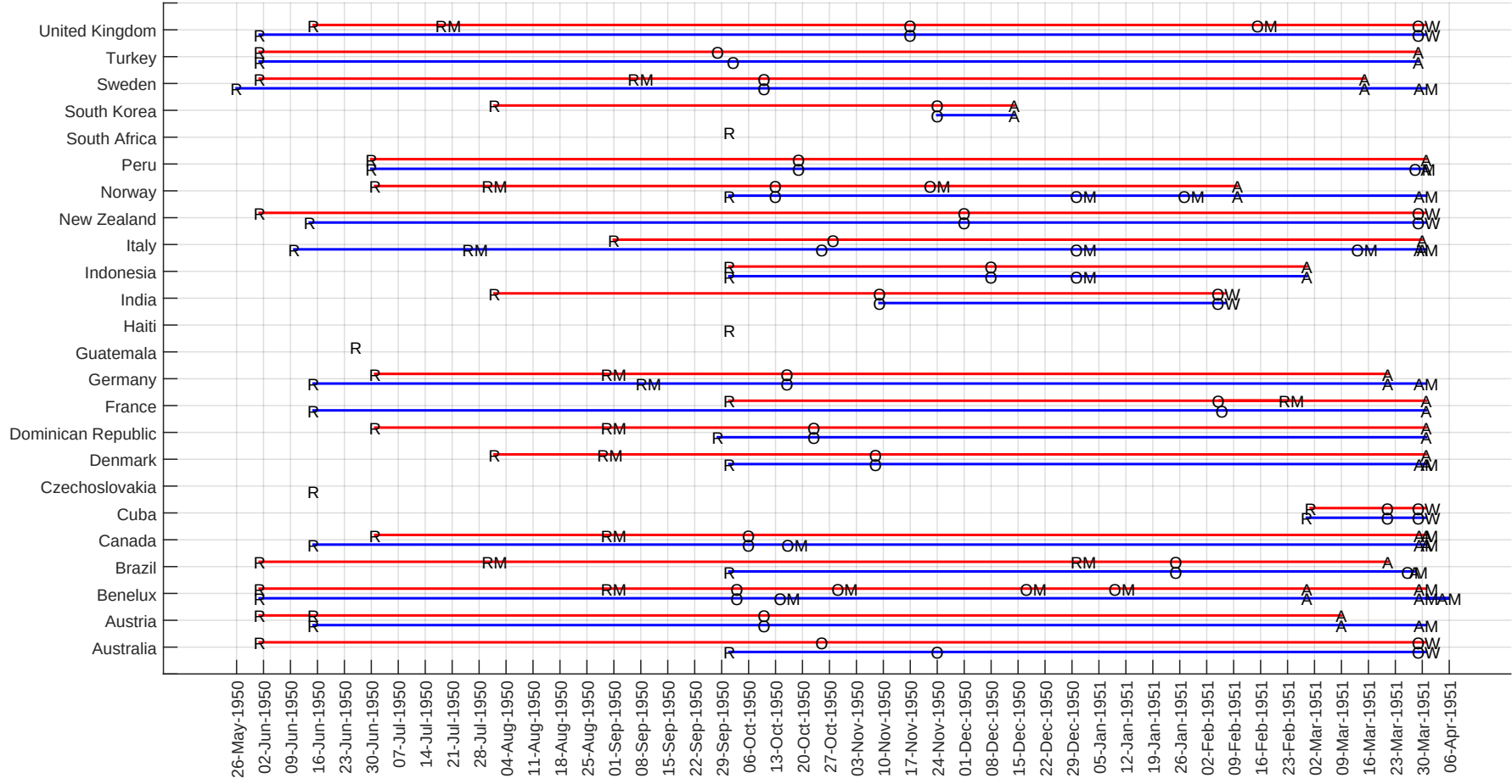
  - countries responded to imbalances in the outstanding offers by adjusting their own offers rather than by adjusting their requests (Fig 5)



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  - countries responded to imbalances in the outstanding offers by adjusting their own offers rather than by adjusting their requests (Fig 5)
- Third, adjustments in offers typically took a simple and striking form
  - offers for given import goods were rarely deepened as the round progressed, suggesting absence of strategic bargaining (Fig 4; Table 5)

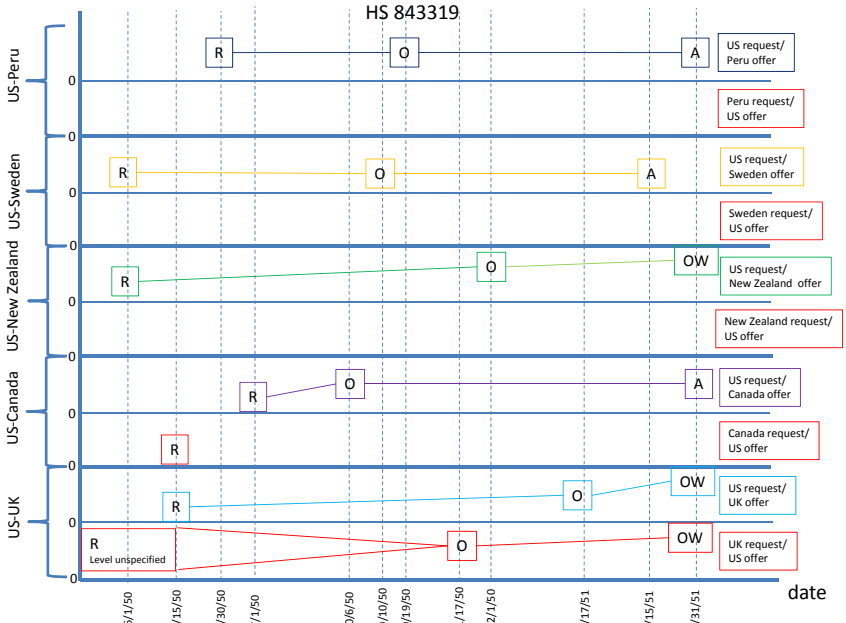

Figure 4: Requests and Offers on Lawn Mowers in US Torquay Bilaterals

		Sales			Purchases		
		Ad Val	**Specific**	**All**	**Ad Val**	**Specific**	**All**
Initial Request	N	1402	716	2118	2788	2117	4905
over	Mean	0.615	0.648	0.626	0.645	0.820	0.721
Existing Tariff	SD	0.167	0.199	0.179	0.202	0.244	0.238
	Min	0.000	0.000	0.000	0.000	0.000	0.000
	Max	1.000	1.000	1.000	1.000	1.000	1.000
Initial Offer	N	423	197	620	691	953	1644
over	Mean	1.192	1.155	1.181	1.472	1.193	1.310
Initial Request	SD	0.505	0.825	0.624	0.683	0.500	0.600
	Min	0.033	0.000	0.000	0.000	0.000	0.000
	Max	5.000	10.000	10.000	5.000	6.667	6.667
Finalized Concession	N	399	167	566	543	924	1467
over	Mean	1.195	1.083	1.162	1.291	1.190	1.227
Initial Request	SD	0.541	0.560	0.549	0.444	0.531	0.503
	Min	0.033	0.000	0.000	0.000	0.000	0.000
	Max	5.000	4.571	5.000	3.571	8.000	8.000
Finalized Concession	N	1267	610	1877	1222	1122	2344
over	Mean	1.000	1.025	1.008	1.006	0.992	0.999
Initial Offer	SD	0.066	0.437	0.255	0.192	0.269	0.232
	Min	0.020	0.000	0.000	0.000	0.000	0.000
	Max	1.714	10.000	10.000	2.933	5.500	5.500
Finalized Concession	N	1273	608	1881	1240	1170	2410
over	Mean	0.673	0.678	0.675	0.878	0.897	0.887
Existing Tariff	SD	0.184	0.196	0.188	0.192	0.206	0.199
	Min	0.008	0.333	0.008	0.000	0.000	0.000
	Max	1	1	1	1	1	1

Table 5: This table conveys requests, offers, concessions and existing tariffs in proportion to each other. Some goods appear in both the ad valorem and specific columns. Sales concern US tariffs. Purchases concern non-US tariffs.

Stylized Facts

- First, the numbers of back-and-forth offers and counter offers in any bargain were relatively small (Fig 5)

- Second, once the initial proposals were on the table, the focus of bargaining narrowed to each country's own-tariff-cut offers
  - countries responded to imbalances in the outstanding offers by adjusting their own offers rather than by adjusting their requests (Fig 5)

- Third, adjustments in offers typically took a simple and striking form
  - offers for given import goods were rarely deepened as the round progressed, suggesting absence of strategic bargaining (Fig 4; Table 5)
  - instead, adjustments typically involved a country "shopping around" its initial tariff-cut offers and ultimately reducing as necessary the depth of its overall (multilateral) offer (Fig 6; Table 3)

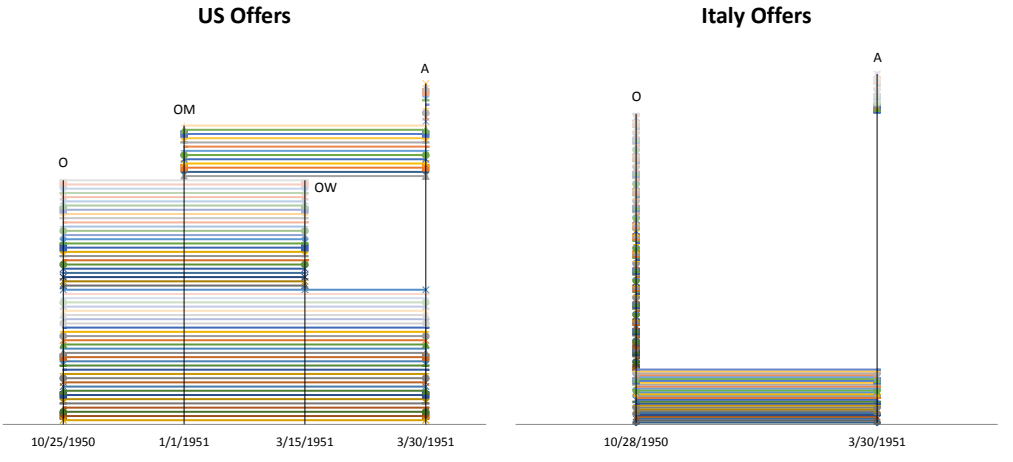

Figure 6: Extensive margin adjustments in US negotiations with Italy

			By Negotiating Partner			
	Unique	Total	Mean	SD	Min	Max
Sales						
HS6 requests	2586	4387	182.792	384.709	0	1692
HS6 request modifications	65	65	2.708	11.323	0	55
HS6 offers	1769	2635	109.792	195.404	0	783
HS6 offer modifications	218	225	9.375	19.882	0	77
HS6 offers on requests	1357	1107	46.125	87.097	0	349
Fraction HS6 offers on requests	0.767		0.315	0.282	0	1
HS6 offers without request	412	1528	63.667	114.024	0	434
Fraction HS6 offers without request	0.233		0.518	0.339	0	1
HS6 final concessions	1260	1589	66.208	126.891	0	475
HS6 final concessions with requests	962	680	28.333	54.513	0	174
Fraction final concession with request	0.763		0.263	0.292	0	1
HS6 final concession without request	298	909	37.875	79.459	0	308
Fraction final concessions without request	0.237		0.362	0.353	0	1
Purchases						
HS6 requests	2298	5104	212.667	188.645	0	667
HS6 request modifications	436	496	20.667	55.038	0	267
HS6 offers	1844	3665	152.708	168.606	0	574
HS6 offer modifications	264	270	11.250	29.846	0	114
HS6 offers on requests	1595	2793	116.375	130.484	0	555
Fraction HS6 offers on requests	0.865		0.634	0.402	0	1
HS6 offers without request	249	872	36.333	80.429	0	379
Fraction HS6 offers without request	0.135		0.200	0.293	0	1
HS6 final concessions	1505	2396	99.833	166.179	0	574
HS6 final concessions with requests	1302	1682	70.083	124.558	0	555
Fraction final concession with request	0.865		0.486	0.420	0	1
HS6 final concession without request	203	714	29.750	78.763	0	371
Fraction final concessions without request	0.135		0.139	0.200	0	1

Table 3: Sales and Purchases by US. Sales concern US tariffs. Purchases concern non-US tariffs. Requests correspond to negotiating partners seeking a tariff reduction. Offers correspond to a country offering a tariff reduction. Unique refers to the number of unique HS6 codes. Total refers to the number of HS6 code-country pairs.

Interpretation

- A potential interpretation of these stylized facts, consistent with implications of ToT theory plus MFN & multilateral reciprocity
  - a country would propose for a given import good the tariff that generated its preferred trade volume for a fixed terms of trade,
  - with the expectation that any subsequent "rebalancing" of offers necessary for multilateral reciprocity would arise later in the round after all offers had been recorded
  - and that this might lead to a reduction in the depth of its overall (multilateral) offer

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  - and that this might lead to a reduction in the depth of its overall (multilateral) offer
- A striking feature that warrants further study
  - when a country chose to reduce the depth of its offers, it did so with adjustments on the "extensive margin," not on the "intensive margin"

GATT's Multilateralization of Reciprocity

- The multilateralization of the reciprocity constraint viewed as key innovation of GATT (ICITO, 1949, p. 10)

Multilateral tariff bargaining, as devised at the London Session of the Preparatory Committee in October 1946 and as worked out in practice at Geneva and Annecy, is one of the most remarkable developments in economic relations between nations that has occurred in our time. It has produced a technique whereby governments, in determining the concessions they are prepared to offer, are able to take into account the indirect benefits they may expect to gain as a result of simultaneous negotiations between other countries, and whereby world tariffs may be scaled down within a remarkably short time.

GATT's Multilateralization of Reciprocity

- Was the relaxation of bilateral reciprocity afforded by the multilateral nature of the GATT bargaining forum a key to GATT's success?
- Look for indirect evidence: exploit unexpected breakdown in US-UK bilateral
  - if govs expected indirect trade benefits from the MFN tariff cuts negotiated between 3^{rd}-countries to achieve multilateral reciprocity
  - then we should see evidence of efforts to rebalance their bargains when they learned of the US-UK bilateral collapse
  - whereas no such reaction would be expected if strictly bilateral reciprocity had been demanded and achieved all along

GATT's Multilateralization of Reciprocity

- Two ways to rebalance: 3^{rd} countries could retrench on offers to US; or US could reorient UK offers directly to 3^{rd} countries
- Did 3^{rd} countries retrench on offers to US once it was known that the US-UK bilateral had failed? Yes, if France is excluded as special
  - "news" date 2/18/51
  - 2,282 HS6-country pair offers to US outstanding on 2/17/51
  - 1,856 such offers at end of round
- Did the failure of the US-UK bilateral lead the US to reorient its UK offers directly to 3^{rd} countries? Yes, strong evidence of this
  - Table 11

	OLS	OLS	Probit	Probit	OLS	OLS	Probit	Probit
$USOffUKAUNZ_i$	0.0623**	0.0700**	0.314*	0.485***	0.0564*	0.0666**	0.294*	0.449***
	(0.0283)	(0.0282)	(0.168)	(0.147)	(0.0274)	(0.0271)	(0.161)	(0.136)
$\log(1+USImp_i)$					0.0122**	0.00690*	0.0591***	0.0475*
					(0.00485)	(0.00347)	(0.0194)	(0.0258)
$\log(1+USImp_{i,f})$					-0.0112**	-0.00899**	-0.0517***	-0.0594**
					(0.00478)	(0.00355)	(0.0183)	(0.0237)
$\log(1+USImpUKAUNZ_i)$					-0.00195	9.41e-05	-0.0113	-0.00299
					(0.00295)	(0.00135)	(0.0154)	(0.0122)
Observations	1,815	1,815	1,815	1,668	1,815	1,815	1,815	1,668
R-squared	0.009	0.293			0.027	0.302		
Country FE	No	Yes	No	Yes	No	Yes	No	Yes
HS1 FE	No	Yes	No	Yes	No	Yes	No	Yes
Cluster SE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 11: Regression of whether an HS6 product - country pairing offered by the US was added after 2/18/1951 (after the breakdown of US and UK bilateral negotiation) on whether the product in question was offered by the US to the UK. A positive coefficient implies that a product is more likely to be offered by the US following the US-UK bilateral breakdown if the US was offering a concession on this product to the UK before the negotiation failure. SE's clustered by negotiating partner. *, **, and *** denote significance at the 90%, 95%, and 99% confidence levels, respectively.

Implications of Reciprocity and MFN

- Assumption 1: The US strictly adhered to reciprocity and MFN
  - $\Longrightarrow$ difference between initial US tariff offers and final agreed US tariff levels reflects extent of bargaining failure for US tariffs
- Can pattern of U.S. bargaining failure be explained with bargaining frictions that do not invalidate Assumption 1?

$$\begin{aligned} TorqFail_i^{US} &= \alpha_0 + \alpha_1 HHI_i + \alpha_2 HHI_i^2 + \alpha_3 PTA_i + \alpha_4 WANT_i \\ &\quad + \alpha_5 ABSENT_i + \alpha_6 UNDIFF_i + \alpha_7 \log(\omega_i) \\ &\quad + \alpha_8 \hat{\lambda}_i + \alpha_9 PREVBND_i + \epsilon_i \end{aligned}$$

$$\begin{aligned} TorqOffer_i^{US} &= \beta_{HS1} + \beta_1 HHI_i + \beta_2 HHI_i^2 + \beta_3 PTA_i + \beta_4 WANT_i \\ &\quad + \beta_5 ABSENT_i + \beta_6 UNDIFF_i + \beta_7 \log(\omega_i) \\ &\quad + \beta_8 REQ_i + \beta_9 PREVBND_i + \epsilon_i \end{aligned}$$

Implications of Reciprocity and MFN: Spillovers

- Product-level bargaining failure occurs when no supplier accepts the offer on that product
- When spillovers a problem, more concentrated supply reduces number of possible offers but increases probability that any one offer accepted, can reduce the chance of bargaining failure
- When spillovers not a problem, more concentrated supply just reduces number of possible offers, raising the chance of bargaining failure
- MFN does not appear to introduce major free-rider problem
  - Offer equation: above moderate concentration, product-level offer less likely with greater concentration
  - Failure equation: product-level bargaining failure more likely with greater supplier concentration
  - Table 12

	Offer Probit	Failure OLS	Failure OLS	Failure OLS	Offer Probit	Failure OLS	Failure OLS	Failure OLS
HHI	0.774	0.990***	1.019***	0.842***	0.830	0.831***	0.891***	0.636**
	(0.491)	(0.238)	(0.253)	(0.244)	(0.530)	(0.252)	(0.266)	(0.258)
HHI^2	-0.976**	-0.616***	-0.651***	-0.531***	-1.045**	-0.467**	-0.543**	-0.337
	(0.381)	(0.186)	(0.214)	(0.194)	(0.410)	(0.197)	(0.224)	(0.205)
WANT	0.0245***	-0.00257*	-0.00232	-0.00164	0.0277***	-0.00248	-0.00193	-0.00197
	(0.00632)	(0.00143)	(0.00160)	(0.00147)	(0.00695)	(0.00151)	(0.00169)	(0.00156)
ABSENT	-0.192**	0.0922**	0.0852*	0.0834*	-0.167	0.0990**	0.0863*	0.0852*
	(0.0964)	(0.0465)	(0.0509)	(0.0480)	(0.103)	(0.0488)	(0.0521)	(0.0505)
PTA	0.318***	0.0826***	0.0935**	0.0609**	0.363***	0.0718***	0.0968**	0.0371
	(0.0594)	(0.0259)	(0.0414)	(0.0268)	(0.0636)	(0.0275)	(0.0449)	(0.0289)
REQ	0.552***	0.0128	0.0363		0.504***	0.0368	0.0803	
	(0.0548)	(0.0267)	(0.0743)		(0.0597)	(0.0288)	(0.0682)	
PrevBound	0.215***	-0.0719**	-0.0647*	-0.0845***	0.207**	-0.0571*	-0.0433	-0.0844**
	(0.0749)	(0.0316)	(0.0381)	(0.0327)	(0.0805)	(0.0339)	(0.0392)	(0.0351)
UNDIFF	0.0457	-0.105***	-0.103***	-0.118***	0.0560	-0.124***	-0.120***	-0.152***
	(0.0616)	(0.0278)	(0.0282)	(0.0246)	(0.0673)	(0.0303)	(0.0308)	(0.0269)
$log(\omega)$					0.0539***	-0.0122**	-0.00853	-0.0271***
					(0.0130)	(0.00551)	(0.00759)	(0.00553)
$\hat{\lambda}$			0.0626	-0.0171			0.127	-0.0847
			(0.185)	(0.0528)			(0.180)	(0.0590)
Observations	3,064	1,636	1,636	1,636	2,694	1,456	1,456	1,456
R-squared		0.109	0.109	0.040		0.127	0.127	0.053
HS1 FE	Y	Y	Y	N	Y	Y	Y	N

Table 12: Offer and failure equations conditional on theoretical predictors. Columns 1 and 5 correspond to the offer equation, estimated as a Probit. Columns 2-4 and 6-8 correspond to failure equations. Columns 2 and 6 do not make any selection correction. Columns 3 and 7 use the inverse Mills ratio from the offer equation, but no excluded variables. Columns 4 and 8 exclude REQ and HS1 fixed effects from the failure equation. Columns 1-4 omit ω, the market power measure as it is not available for all products. WANT is defined with respect to the principal supplier in the offer regression, whereas it is defined with respect to the highest US import volume (for the good in question) country who received the offer in the failure regression. *, **, and *** denote significance at the 90%, 95%, and 99% confidence levels, respectively.

Implications of Reciprocity and MFN: PTAs

- On net, PTAs are building blocks, not stumbling blocks
  - Offer equation: product-level offer more likely where PTA members have a principal supplying interest
  - Failure equation: failure of product-level offer more likely where PTA members have a principal supplying interest
  - Table 12
- Probability of successful US product-level offer rises from 0.36 to 0.41 when PTA members are principal suppliers

	Offer Probit	Failure OLS	Failure OLS	Failure OLS	Offer Probit	Failure OLS	Failure OLS	Failure OLS
HHI	0.774	0.990***	1.019***	0.842***	0.830	0.831***	0.891***	0.636**
	(0.491)	(0.238)	(0.253)	(0.244)	(0.530)	(0.252)	(0.266)	(0.258)
HHI^2	-0.976**	-0.616***	-0.651***	-0.531***	-1.045**	-0.467**	-0.543**	-0.337
	(0.381)	(0.186)	(0.214)	(0.194)	(0.410)	(0.197)	(0.224)	(0.205)
WANT	0.0245***	-0.00257*	-0.00232	-0.00164	0.0277***	-0.00248	-0.00193	-0.00197
	(0.00632)	(0.00143)	(0.00160)	(0.00147)	(0.00695)	(0.00151)	(0.00169)	(0.00156)
ABSENT	-0.192**	0.0922**	0.0852*	0.0834*	-0.167	0.0990**	0.0863*	0.0852*
	(0.0964)	(0.0465)	(0.0509)	(0.0480)	(0.103)	(0.0488)	(0.0521)	(0.0505)
PTA	0.318***	0.0826***	0.0935**	0.0609**	0.363***	0.0718***	0.0968**	0.0371
	(0.0594)	(0.0259)	(0.0414)	(0.0268)	(0.0636)	(0.0275)	(0.0449)	(0.0289)
REQ	0.552***	0.0128	0.0363		0.504***	0.0368	0.0803	
	(0.0548)	(0.0267)	(0.0743)		(0.0597)	(0.0288)	(0.0682)	
PrevBound	0.215***	-0.0719**	-0.0647*	-0.0845***	0.207**	-0.0571*	-0.0433	-0.0844**
	(0.0749)	(0.0316)	(0.0381)	(0.0327)	(0.0805)	(0.0339)	(0.0392)	(0.0351)
UNDIFF	0.0457	-0.105***	-0.103***	-0.118***	0.0560	-0.124***	-0.120***	-0.152***
	(0.0616)	(0.0278)	(0.0282)	(0.0246)	(0.0673)	(0.0303)	(0.0308)	(0.0269)
$log(\omega)$					0.0539***	-0.0122**	-0.00853	-0.0271***
					(0.0130)	(0.00551)	(0.00759)	(0.00553)
$\hat{\lambda}$			0.0626	-0.0171			0.127	-0.0847
			(0.185)	(0.0528)			(0.180)	(0.0590)
Observations	3,064	1,636	1,636	1,636	2,694	1,456	1,456	1,456
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Table 12: Offer and failure equations conditional on theoretical predictors. Columns 1 and 5 correspond to the offer equation, estimated as a Probit. Columns 2-4 and 6-8 correspond to failure equations. Columns 2 and 6 do not make any selection correction. Columns 3 and 7 use the inverse Mills ratio from the offer equation, but no excluded variables. Columns 4 and 8 exclude REQ and HS1 fixed effects from the failure equation. Columns 1-4 omit ω, the market power measure as it is not available for all products. WANT is defined with respect to the principal supplier in the offer regression, whereas it is defined with respect to the highest US import volume (for the good in question) country who received the offer in the failure regression. *, **, and *** denote significance at the 90%, 95%, and 99% confidence levels, respectively.

Implications of Reciprocity and MFN

- Tariff cuts more likely to be offered on products where
  - the country has substantial market power (ToT theory)
  - tariff cuts have been agreed to previously (Gradualism)
  - the ingredients for successful barter are present
- Once tabled, offers more likely to succeed where
  - the country has substantial market power (ToT theory)
  - tariff cuts have been agreed to previously (Gradualism)
- Offers more likely to fail for differentiated products (Ossa, 2014)
- Table 12

	Offer Probit	Failure OLS	Failure OLS	Failure OLS	Offer Probit	Failure OLS	Failure OLS	Failure OLS
HHI	0.774	0.990***	1.019***	0.842***	0.830	0.831***	0.891***	0.636**
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Takeaway on Torquay

- Identification of several stylized facts about the tariff negotiations
  - Consistent with ToT theory plus key institutional features of GATT
- Final bargains appear to reflect multilateral, not bilateral, reciprocity
  - Supports a central claim of practitioners about GATT as an institution
- MFN does not appear to introduce a major free-rider problem
  - Consistent with ToT theory plus key institutional features of GATT
- Reducing the exercise of market power a focus of tariff negotiations
  - Confirms a central prediction of the ToT theory
- A building block effect of PTAs
  - Their presence stimulates more offers, each with less chance of success, but on net more successful offers

Offshoring

- A fundamental question for modern research on commercial policy: What is the purpose of international trade agreements?
  - Answer has implications for understanding the design and operation of trade agreements that we observe
- International externality view dominates in accounting for observed features and operation of trade agreements
  - But what form does the international externality take?
  - And if form changes, must agreements change to remain successful?

Approach

- Theme 1: Nature of international price determination a key determinant of the nature of the international externality, can have profound impact on the design of an effective trade agreement
- Theme 2: Rise of offshoring may alter the design of effective trade agreements through its impact on the nature of price determination
- First discuss trade agreements and the nature of price determination
- Then through this lens discuss implications for trade agreements of rise in offshoring

Trade Agreements and the Nature of Price Determination

- ToT Theory of Trade Agreements:
  - in the Nash equilibrium, tariffs are inefficiently high but domestic policies are internationally efficient
  - $\Longrightarrow$ basis for shallow integration coupled with MA preservation rules
- Nature of international price determination is important for these predictions:
  - "deep" integration needed when prices are not fully disciplined by market clearing (bilateral bargaining)

Market Clearing with Perfect Competition

- Perfectly competitive trade model: **F**oreign ('$*$') exports a single good to **H**ome
- Measure $\frac{1}{2}$ of H consumers with demand $D(p)$
- Measure $\frac{1}{2}$ of F consumers with demand $D(p^*)$
- Measure 1 of firms in F with increasing-concave production technology $y^* = F(L^*)$
- Measure Λ of workers in each country paid a wage of 1 (pinned down by outside sector)

Market Clearing with Perfect Competition

- H has import tariff τ, F has both export tax τ^* and labor subsidy s^* (applied only to the export sector), all defined in specific terms
- Govs are social welfare maximizers (W and W^*)
- Efficient policies maximize world welfare and deliver $T^e \equiv \tau^e + \tau^{*e} = 0$, $s^{*e} = 0$. No surprise (no frictions)
- Nash policies: FOCs $\Rightarrow \tau^N = \hat{p}^*/\eta_E^*$, $\tau^{*N} = \hat{p}/\eta_M$ and $s^{*N} = 0$ (where all prices and elasticities are evaluated at the Nash policies)
- Why isn't s^{*N} distorted?
  - τ^* is first best for ToT manipulation in this setting

Market Clearing with Perfect Competition

- **Shallow integration:** Suppose H agrees to eliminate its tariff and F agrees to eliminate its tariff and in addition F agrees to a **"market access preservation" constraint** on its future choices of s^*:

$$\frac{d\tau^*}{ds^*} = \frac{-d\hat{p}/ds^*}{d\hat{p}/d\tau^*}$$

- Reflects essential mission of GATT/WTO rules: provide secure property rights over negotiated market access
- Then F solves

$$\frac{dW^*}{ds^*} = \frac{\partial W^*}{\partial s^*} - \frac{\partial W^*}{\partial \tau^*}\frac{d\hat{p}/ds^*}{d\hat{p}/d\tau^*} = 0$$

  with W^* evaluated at $\tau = 0$
- Delivers $s^{*R} = 0$ and $\tau^{*R} = 0$; with $\tau = 0$, efficiency frontier achieved

Market Clearing with Market Power

- Does this result depend on absence of market power?
- A monopoly firm in F; H and F markets segmented
  - special form of imperfect competition, but insights are more general
- Efficient policies $T^e = 0, \;\; s^{*e} = 1/\eta_D^*$: No role for tariffs, but F subsidizes labor to ensure price equals marginal cost in each market
- Nash: FOCs $\Rightarrow \tau^N = -\hat{x}/\left(d\hat{x}/d\tau\right) - \hat{p}/\eta_D, \;\; \tau^{*N} = \hat{p}^*/\eta_D^*$ and $s^{*N} = 1/\eta_D^*$ (with all prices/elasticities evaluated at Nash policies)
- Note: $s^{*N} \neq s^{*e}$, but conditional on trade volume s^{*N} is efficient

Market Clearing with Market Power

- **Shallow integration:** Suppose H agrees to eliminate its tariff and F agrees to set its tariff at a level $\bar{\tau}^*$ s.t. $\hat{x}(s^{*N}, 0 + \bar{\tau}^*) = \hat{x}(s^{*e}, T^e)$, and F agrees to constrain its future choices of s^* according to

$$\frac{d\tau^*}{ds^*} = \frac{-d\hat{x}/ds^*}{d\hat{x}/d\tau^*}$$

- Then F solves

$$\frac{dW^*}{ds^*} = \frac{\partial W^*}{\partial s^*} - \frac{\partial W^*}{\partial \tau^*}\frac{d\hat{x}/ds^*}{d\hat{x}/d\tau^*} = 0$$

  with W^* evaluated at $\tau = 0$

- Delivers $s^{*R} = s^{*e}$ and $\tau^{*R} = 0$; with $\tau = 0$, efficiency frontier again achieved (key: $s^{*R} = s^{*e}$ *conditional* on efficient trade volume)

Matching Model

- Now suppose international prices determined by bilateral bargaining
- Measure 1 of consumers each matched with measure 1 of producers; no possibility of rematching (0 outside option of the agents)
  - extreme assumption but results generalize to any pricing not fully disciplined by market clearing
- Each producer produces an amount of x with the production function $F(L)$ in anticipation of payoff obtained upon matching
- Consumer utility $u(x)$, where u is increasing and concave
- Cost of producing x sunk at time of matching, consumer and producer Nash bargain over surplus, with producer capturing share $\alpha \in (0, 1)$

Matching Model

- **International match**: F seller takes her good to H market; tariff costs not yet sunk, so ex-post surplus over which parties negotiate is $S\left(L, \tau+\tau^{*}\right) \equiv u\left(F\left(L\right)\right)-\left(\tau+\tau^{*}\right) F\left(L\right)$
- Labor L hired by F selling to H is then determined by maxing $\alpha S\left(L, \tau+\tau^{*}\right)-\left(1-s^{*}\right) L$; defines $\hat{L}(s^{*}, \tau+\tau^{*})$, trade volume $F(\hat{L})$
- **Local (F) match**: tariffs irrelevant to bargaining surplus, so labor hired by F selling to F is $\hat{L}^{*}(s^{*})$ and production for local sales is $F(\hat{L}^{*})$
- Efficient policies $T^{e}=0, \;\; s^{*}=1-\alpha$: no role for tariffs, and F labor subsidy resolves the under-investment in L
- Nash policies: FOCs $\Rightarrow \tau^{N}+\tau^{*N}>0, \;\; s^{*N}>1-\alpha$
- Hence, $T^{N}>T^{e}$, but now s^{*N} is inefficient **even conditional on trade volume**

Matching Model: Shallow Integration

- Consider F's preferred τ^* and s^* to deliver efficient trade volume
- Efficient trade volume is $F(\hat{L}(1-\alpha,0))$, so starting from efficient policies changes in τ^* and s^* must satisfy

$$\frac{d\tau^*}{ds^*} = -\frac{d\hat{L}/ds^*}{d\hat{L}/d\tau^*}$$

- Then F solves

$$\frac{dW^*}{ds^*} = \frac{\partial W^*}{\partial s^*} - \frac{\partial W^*}{\partial \tau^*}\frac{d\hat{L}/ds^*}{d\hat{L}/d\tau^*} = 0$$

- Delivers $s^{*R} > s^{*e}$. Hence, shallow negotiations **cannot** achieve the efficiency frontier

Matching Model: Interpretation

- "World"/exporter price:

$$\hat{p}^w = \frac{\alpha u(F(\hat{L}))}{F(\hat{L})} + \underbrace{(1-\alpha)\,\tau^*}\ -\alpha\tau$$

- But

$$\frac{d\tau^*}{ds^*} = -\frac{d\hat{L}/ds^*}{d\hat{L}/d\tau^*} > 0,$$

  so F maintains trade volume with **an increase in** τ^* and s^* while raising $\hat{p}^w$ and improving its ToT

- $\Longrightarrow$ Shallow integration cannot fully eliminate ToT manipulation when international prices are determined through bargaining

- But if negotiations impose $s^* = s^{*e}$ (i.e., **"deep" integration**), then efficiency frontier is immediately achieved

Takeaway on Offshoring

- According to ToT theory, market access/shallow integration approach can achieve efficiency
- But when prices are not fully disciplined by market clearing (bilateral bargaining), deep integration needed
- How much are international prices disciplined by market clearing?
  - arguably less and less so with the increase in offshoring
- How sensitive is the performance of the market-access/shallow integration approach to the nature of international price determination?
  - some suggestive evidence: rise of deep-integration FTAs (Orefice and Rocha 2011); signs of greater difficulty liberalizing trade through WTO negotiations in sectors where customized inputs are especially prevalent

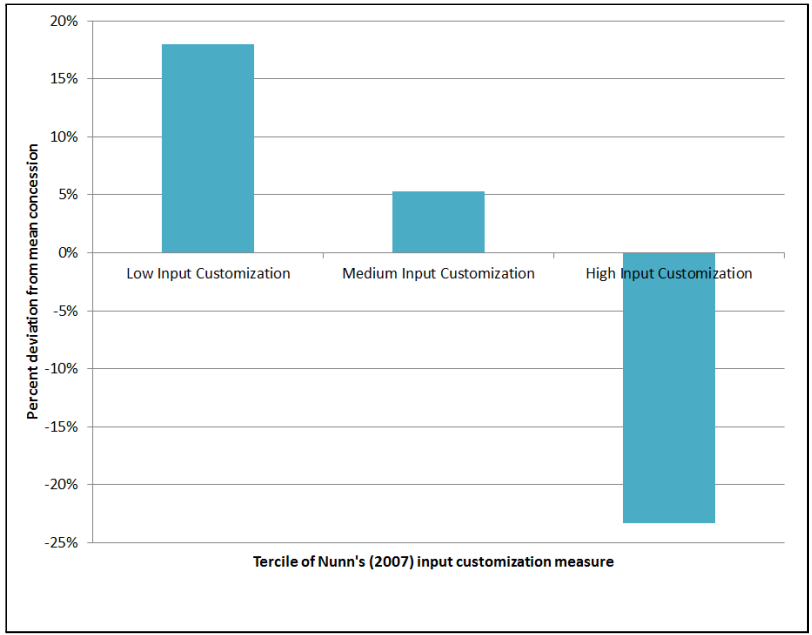

Figure 1: Percent deviation from mean concession by tercile of input customization measure

Takeaway on Offshoring

- According to ToT theory, market access/shallow integration approach can achieve efficiency
- But when prices are not fully disciplined by market clearing (bilateral bargaining), deep integration needed
- How much are international prices disciplined by market clearing?
  - arguably less and less so with the increase in offshoring
- How sensitive is the performance of the market-access/shallow integration approach to the nature of international price determination?
  - some suggestive evidence: rise of deep-integration FTAs (Orefice and Rocha 2011); signs of greater difficulty liberalizing trade through WTO negotiations in sectors where customized inputs are especially prevalent
- Important questions for the architecture of the WTO moving forward

Reciprocity

- Reciprocity in GATT/WTO
  - 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

$$\tilde{P}^w(0)[M(1) - M(0)] = E(1) - E(0).$$

  - Fixes the terms of trade (terms of exchange of market access)

- Norm of negotiation (reciprocity going down)
  - Govs make tariff proposals that satisfy reciprocity
  - $\Longrightarrow$ No bargaining over the terms of exchange

- Rule of renegotiation (reciprocity going up)
  - Voluntary exchange: no gov can be forced to import more volume than it proposes at the fixed terms of trade
  - $\Longrightarrow$ No bargaining over the volume of exchange

The French are Special

- A November 8 1950 *New York Times* article ran with the headline

  French Now Seek New Tariff Duties: Torquay Trade Body Amazed as Paris Negates Efforts to Relax Import Curbs

- A March 11 1951 *New York Times* article stated

  France, which was frightening all participants in November with the number of items on which she wanted to raise duties (mostly items on which the French granted reductions in the earlier meetings at Geneva and Annecy) has mollified most of her trading partners..., all after prolonged and sometimes acrimonious bargaining in dozens of hotel rooms.

Lecture II

Trade Agreements as Incomplete Contracts

Rules, Disputes and Court Learning

Robert W. Staiger

Dartmouth

September 2016

Introduction

- Many puzzling features of real-world trade agreements
- ...Design of rules
  - mix of rigidity and discretion (GATT/WTO: tariff bindings, escape clause, domestic policies, national treatment)
- ...Settlement of disputes
  - role of court (GATT/WTO: interpretive, gap-filling)
- Hard to square with complete contracts perspective

Introduction

- Trade agreements are obviously incomplete contracts
  - WTO agreement fills 24,000 pages and is still far from anything resembling a complete contract
- Can design and operation of trade agreements be understood from *incomplete contracts* perspective?

Introduction

- Trade agreements are obviously incomplete contracts
  - WTO agreement fills 24,000 pages and is still far from anything resembling a complete contract
- Can design and operation of trade agreements be understood from *incomplete contracts* perspective?
- Focus on
  - *rules*: "Trade Agreements as Endogenously Incomplete Contracts" (with Henrik Horn and Giovanni Maggi), AER, March 2010
  - *disputes*: "The Role of Dispute Settlement Procedures in International Trade Agreements" (with Giovanni Maggi), QJE, February 2011
  - *court learning*: "Learning By Ruling: A Dynamic Model of Trade Disputes" (with Giovanni Maggi), mimeo, June 2016

Rules

- Real-world trade agreements display an interesting combination of *rigidity* and *discretion*
- Consider the GATT/WTO
  - trade instruments bound; domestic instruments largely left to discretion, but must satisfy National Treatment, and now (WTO) regulation of subsidies
  - bindings rigid, but with "escape clauses"
- Why?
- An incomplete contracts perspective can account for these features

Sources of Incompleteness

- A number of possible sources of contract incompleteness
- Focus on two features of fundamental importance to trade negotiators

- Wide array of trade-relevant policies
  - border instruments but also internal/domestic instruments
  - controlling opportunism requires *comprehensive policy coverage*
- Uncertainty about future economic/political conditions
  - calls for agreements that are *highly contingent*

Approach

- Introduce *contracting costs* (along the lines of Battigalli and Maggi, 2002) explicitly into economic analysis of trade agreements
- Study their implications for the structure of the optimal (incomplete) agreement
- Show that contracting costs can help explain some of the core features of the GATT/WTO

The Model

- Partial-equilibrium analysis
- Two countries, H and F, two non-numeraire goods, 1 and 2
- H a natural importer of good 1/exporter of good 2
- Sectors 1 and 2 are mirror-image, so focus on sector 1
- Illustrate main points with linear demand/supply case
  - Demand: $D(p) = \alpha - \beta p$; $D^*(p^*) = \alpha^* - \beta^* p^*$
  - Supply: $X(q) = \lambda q$; $X^*(q^*) = \lambda^* q^*$
- H chooses tariff τ, separate consumption taxes on domestic and foreign products (t_h and t_f), production subsidy (s)
- F does not intervene in this sector

The Model

- Arbitrage: $q^* = p^*; \quad q = p - t_h + s; \quad p^* = \quad p - \tau - t_f$
- The price relationships more compactly:

$$p = p^* + T; \quad q = p^* + T + S$$

where $T \equiv \tau + t_f$ and $S \equiv s - t_h$

- Market clearing: $p = p(T, S); q = q(T, S); p^* = q^* = p^*(T, S)$
- Importing country H experiences a negative consumption externality equal to $-\gamma D$ with $\gamma > 0$
- Govs maximize welfare, so (with focus on sector 1):

$$\begin{aligned} W &= CS + PS + T \cdot M - S \cdot X - \gamma D \\ W^* &= CS^* + PS^* \end{aligned}$$

Efficient and Nash Policies

- Globally efficient policies maximize $W^G \equiv W + W^*$, yielding

$$T^{eff} = \gamma; \;\; S^{eff} = -\gamma$$

(with $T \equiv \tau + t_f$ and $S \equiv s - t_h$, e.g. $t_f = \gamma = t_h$ and $\tau = 0 = s$)

- Nash equilibrium policies:

$$\begin{aligned} T^{NE} &= \gamma + \frac{p^*}{\eta^*} \\ S^{NE} &= -\gamma \end{aligned}$$

- Note: $T^{NE} > T^{eff}; \;\; S^{NE} = S^{eff}$
- $\Longrightarrow$ Nash trade taxes inefficiently high: ToT manipulation
- $\Longrightarrow$ Nash domestic instruments set at efficient levels

Uncertainty

- To simplify, focus on one-dimensional uncertainty
- Consider two possible sources of uncertainty
  - consumption externality (γ)
  - import demand level (α)
- Timing:
  (1) The agreement is drafted
  (2) Uncertainty is resolved
  (3) Policies are chosen subject to the constraints set by the agreement

The Costs of Contracting

- Focus on *instrument-based* agreements
- Key idea: more detailed agreements are more costly to write
  - c_p: cost of including a *policy* variable (τ, t_f, s, t_h)
  - c_s cost of including a *state* variable (γ, α)
- Cost of writing an agreement: $C = c_s \cdot n_s + c_p \cdot n_p$, with n_s (n_p) the number of state (policy) variables in the agreement
- $\Omega \equiv EW^G(\cdot)$: expected gross-of-contracting-costs global welfare
- An *optimal agreement* maximizes expected net global welfare, $\omega \equiv \Omega - C$

Optimal Agreements

- Recall: $T = \tau + t_f$; $S = s - t_h$. Hence T and S the relevant policy variables, with cost $2c$ for each

$\Longrightarrow$ *An agreement that constrains the effective subsidy S while leaving the import tax T to discretion cannot improve over the Nash equilibrium, and therefore cannot be an optimal agreement.*

- Broad intuition: contracting over S alone is useless because inefficiency in the NE concerns T, not S

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- Broad intuition: contracting over S alone is useless because inefficiency in the NE concerns T, not S
- $\Longrightarrow$ If contracting costs lead to incomplete policy coverage, focus of contract will be on import taxes, not domestic instruments

Uncertainty about the Consumption Externality

- Assume γ uncertain
- Note: $\{FB\}$ agreement is $\{T = \gamma; S = -\gamma\}$, which costs $4c_p + c_s$
  - if c_p and c_s small enough, $\{FB\}$ optimal
  - if large enough, empty agreement (NE payoffs) optimal
  - What happens between these two extremes?
- Two ways to save on contracting costs relative to $\{FB\}$
  - agreement can be *rigid* (i.e. non-contingent)
  - and/or it can leave some policies to *discretion*
- Consider simple instrument-based agreements that impose separate equality constraints on T and S (e.g. $(T = \gamma)$ or $(S = 10)$)

Uncertainty about the Consumption Externality

- Can focus on three kinds of agreement (aside from $\{FB\}$ and $\{\emptyset\}$)
  - $\{T, S\}$ (rigidity)
  - $\{T(\gamma)\}$ (discretion)
  - $\{T\}$ (both rigidity and discretion)
- Basic trade-off:
  - rigid agreement prevents ToT manipulation, but Pigouvian intervention only "on average"
  - discretion creates scope for manipulating ToT, but achieves state-contingency "for free"
- Two basic questions
  - When is it optimal to leave S out of the contract (discretion)?
  - When is it optimal to leave γ out of the contract (rigidity)?

Discretion

- Benefits of excluding S from the contract
  - saves $2c_p$
  - achieves state-contingency in S "for free" (a benefit if contract is *rigid*)
- Costs of excluding S from the contract
  - comes in form of S distortions to manipulate ToT
  - higher when S a *good substitute* for T for ToT manipulation
  - higher when *monopoly power* in trade higher
  - higher when *import volume* higher

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- $\Longrightarrow$ Possible explanation for rising tension between trade agreements and national sovereignty

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- But suppose γ now fixed at $\bar{\gamma}$ and α uncertain
  - $\{FB\}$ agreement is rigid/non-contingent: $\{T = \bar{\gamma}; S = -\bar{\gamma}\}$
- Can focus on two kinds of agreements: $\{T(\alpha)\}$ and $\{T\}$
  - $\{T(\alpha)\}$ can be optimal as a way to manage incentives to distort S
  - novel interpretation of escape clause (import volume effect)
- If uncertainty over α grows large enough, optimum can switch from $\{T(\alpha)\}$ to $\{T = \bar{\gamma}; S = -\bar{\gamma}\}$

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  - novel interpretation of escape clause (import volume effect)
- If uncertainty over α grows large enough, optimum can switch from $\{T(\alpha)\}$ to $\{T = \bar{\gamma}; S = -\bar{\gamma}\}$
- $\Longrightarrow$ Surprising result: large uncertainty in α can make it *more* likely that optimal agreement is rigid
- $\Longrightarrow$ More broadly, source of uncertainty matters for tradeoff between rigidity and discretion in optimal agreement

National Treatment

- Return to world of uncertain γ and consider rationale for NT clause
- Extend feasible set of agreements by allowing for an NT clause, that is a constraint $t_h = t_f$, costing $2c_p$
- An *NT-based* agreement includes the NT clause
  - the price relationships are now: $p = p^* + \tau + t$; $q = p^* + \tau + s$
  - recall for non-NT: $p = p^* + T$; $q = p^* + T + S$
- $\{NT, \tau, s\}$ costs less than $\{FB\}$ and ties down producer price wedge $q - p^*$, leaves consumer price wedge $p - p^*$ to discretion
  - not possible with non-NT agreements

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- $\{NT, \tau, s\}$ costs less than $\{FB\}$ and ties down producer price wedge $q - p^*$, leaves consumer price wedge $p - p^*$ to discretion
  - not possible with non-NT agreements
- $\Longrightarrow$ NT-based agreement optimal if low substitutability between t and τ for ToT manipulation
  - gets close to first best ($\{t^{eff} = \gamma, \tau^{eff} = 0, s^{eff} = 0\}$) by achieving state-contingency "for free" via discretion over internal taxes

Takeaway on Rules

- An analysis of trade agreements as *endogenously* incomplete contracts
- Provides a novel explanation for:
  - the emphasis on border instruments in real world trade agreements and evolution toward behind-the-border liberalization
  - "escape clauses" in response to surging import demand
  - the National Treatment provision in GATT/WTO
- The potential appeal of a dispute settlement body, as a mechanism to "complete" the incomplete contract?

Disputes

- Most models of trade agreements treat disputes as synonymous with enforcement
- But in a typical WTO dispute, role played by DSB amounts to "completing" various dimensions of an incomplete contract
  - disagreements over what was signed on to: *Interpretation*
  - instances where legal text of the agreement is silent: *Gap-filling*
  - DSB might even grant exceptions to rigid obligations: *Modification*
- Evaluate potential role of DSB in completing an incomplete contract
- Highlight interaction between design of contract and design of DSB

Approach

- Along with *rigidity* and *discretion*, introduce a third form of contractual incompleteness: *vagueness*
- Three possible (non-enforcement) roles of the DSB
  - *interpret* aspects of contract that are *vague*
  - *fill gaps* where contract is silent and therefore leaves *discretion*
  - grant exceptions and thereby *modify* aspects of contract that are *rigid*
- Or, the DSB can serve none of these functions and simply enforce contractual obligations that are unambiguous
- What is contract form and DSB role maximize the ex-ante joint payoff of the govs, i.e., the optimal *institution*?

The Model

- A single industry; importing gov chooses $T \in \{FT, P\}$ to maximize $\omega(T; s)$, where $s \equiv (s_1, s_2, ..., s_N)$ is a state vector
- The exporting gov is passive in this industry; its payoff is $\omega^*(T; s)$
- Each state variable represents a binary event, such as "there is/is not an import surge" or "the domestic industry does/does not shut down"

- Importing gov's gain from protection:
  $\gamma(s) \equiv \omega(P; s) - \omega(FT; s) > 0$ for all s
- Exporting gov's loss from protection:
  $\gamma^*(s) \equiv \omega^*(FT; s) - \omega^*(P; s) > 0$ for all s
- Joint (positive or negative) gain from protection:
  $\Gamma(s) \equiv \gamma(s) - \gamma^*(s)$; $\Gamma(s) < 0$ for $s \in \sigma^{FT}$ and $\Gamma(s) > 0$ for $s \in \sigma^P$

Contracts

- State variables s_i are verifiable, but too costly to describe in contract
- Consider the following possible contracts:
  - *Rigid* (R) contract: $T = FT$ for all s
  - *Discretionary* (D) contract: P allowed for all s. (Same as no contract)
  - *Vague* (V) contract: P is allowed if and only if v (where v is a vague sentence such as "there is substantial injury to the domestic industry")

    The truth function of v is the following:

$$\text{Sentence } v \text{ is } \begin{cases} \textit{True} & \textit{if} \quad s \in \mathbf{T} \\ \textit{False} & \textit{if} \quad s \in \mathbf{F} \\ \textit{Undefined} & \textit{otherwise} \end{cases}$$

  where $\mathbf{T}$ ($\mathbf{F}$) a set of "extreme" states where v clearly true (false)

- Assume $\mathbf{T} \subset \sigma^P$ and $\mathbf{F} \subset \sigma^{FT}$ and truth function of v is common knowledge to govs and DSB

The DSB

- DSB operates within mandate (if no applicable mandate, not invoked)
- Enforcement role of DSB kept in background
- If the DSB invoked to settle a dispute, the exporter (complainant) incurs cost c^* and the importer (defendant) incurs cost c
- If invoked, DSB observes s and a noisy (unbiased) signal of $\Gamma(s)$, and it issues a *ruling*, T^{DSB}
  - attempts to complete contract as govs would have, by choosing T^{DSB} to maximize the expected joint payoff of govs given the signal
  - ruling automatically enforced
- DSB recommends the wrong policy with probability $q(s)$
  - let $q(s) \equiv qk(s)$ where $k(s) \in [0, \frac{1}{2}]$ for all s and $q \in [0, 1]$

Candidate Institutions

- The contract can be silent (D), rigid (R) or vague (V)
- The DSB can be given an "activist" mandate to
  - *fill gaps* (g) where contract is silent and therefore leaves *discretion*
  - grant exceptions and thereby *modify* (m) *rigid* aspects of contract
  - *interpret* (i) *vague* aspects of contract
- Or, the DSB can be given a "non-activist" mandate (n) to simply enforce contractual obligations that are unambiguous

Contract / DSB Role	Silent	Rigid	Vague
Non-activist	D_n	R_n	V_n
Activist	D_g: DSB fills gaps	R_m: DSB allows exceptions	V_i: DSB interprets

Timing

Stage 0 The institution is designed

Stage 1 The state of the world s is realized

Stage 2 The importer gov chooses policy $T \in \{FT, P\}$

Stage 3 The exporter gov decides whether to file with the DSB

Stage 4 If invoked, the DSB issues a ruling $T^{DSB} \in \{FT, P\}$

Stage 5 Payoffs are realized

Analysis

Disputes with an Activist DSB

- Exporter gov files a complaint iff $T = P$ and

$$\Pr(\text{DSB ruling is } FT \mid s) \cdot \gamma^*(s) > c^* \tag{F}$$

- Importer gov chooses $T = P$ if either (F) fails, or if (F) holds but

$$\Pr(\text{DSB ruling is } P \mid s) \cdot \gamma(s) > c$$

- Focus on small filing costs:

$$\frac{1}{2}\gamma^*(s) > c^* \text{ and } \frac{1}{2}\gamma(s) > c \text{ for all } s$$

Disputes with an Activist DSB

- Consider the D_g institution
- In states $s \in \sigma^{FT}$:
  - if $qk(s) < \frac{c}{\gamma(s)}$ then $T = FT$ and DSB not invoked
  - if $qk(s) > \frac{c}{\gamma(s)}$ then $T = P$ and DSB invoked
- In states $s \in \sigma^{P}$:
  - if $qk(s) < \frac{c^*}{\gamma^*(s)}$ then $T = P$ and DSB not invoked
  - if $qk(s) > \frac{c^*}{\gamma^*(s)}$ then $T = P$ and DSB invoked
- Notice: two kinds of disputes, always caused by opportunism
  - importer tries to "get away with protection"
  - exporter tries to "get away with forcing free trade"
- With an activist DSB, first best achieved in states with no dispute, where DSB works *off-equilibrium*

The Optimal Institution

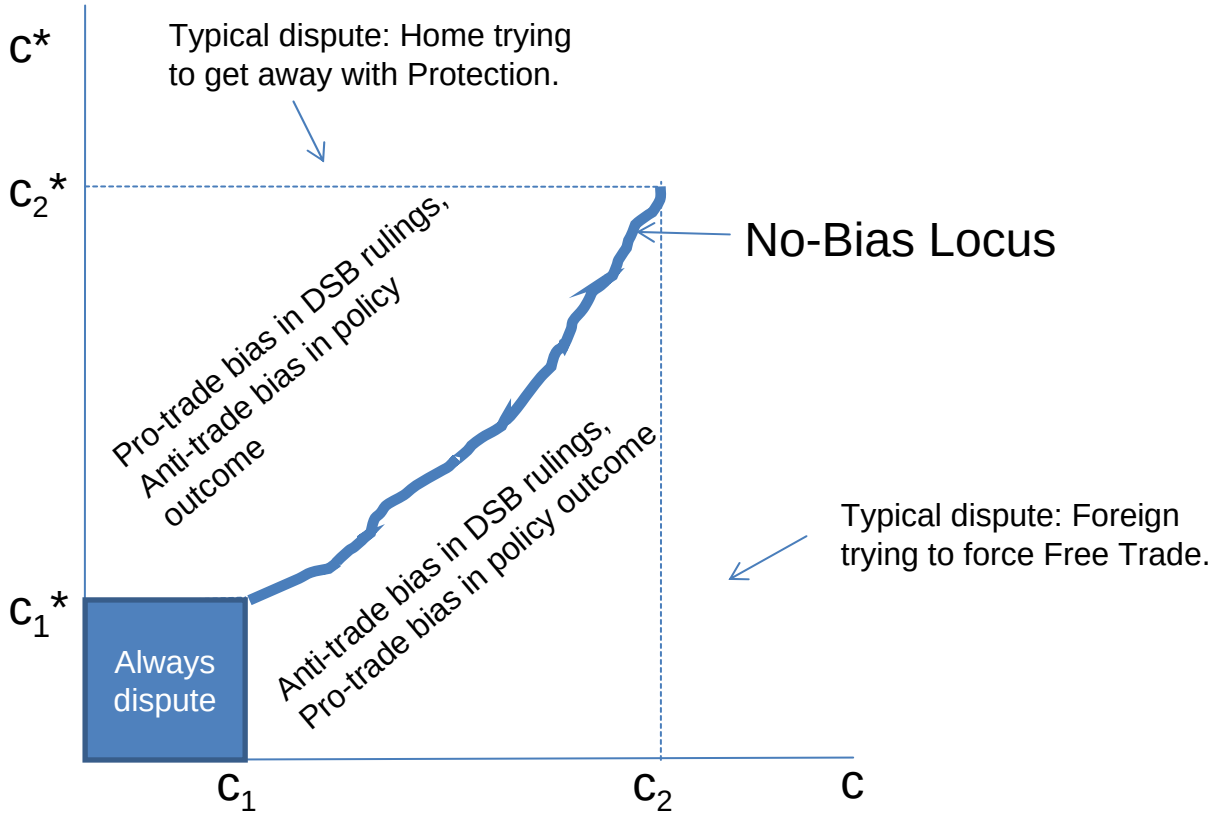
$\Longrightarrow$ *There exist critical levels* q_1 *and* q_2 *(with* $0 < q_1 \leq q_2 \leq 1$*) such that: for* $q < q_1$ *the optimal institution is* D_g*; for* $q_1 < q < q_2$ *the optimal institution is* V_i*; and for* $q > q_2$ *the optimal institution is either* V_n *or* R_n*.*

- Leave govs with greater discretion and provide DSB with mandate to reign in that discretion the better the DSB information
- If q sufficiently small, the first-best outcome achieved even though
  - the contract is highly incomplete
  - the use of DSB is costly
  - DSB rulings are imperfect
  - but DSB must be given activist mandate
- No "modification" role for the DSB in the optimal institution
- Non-monotonic relationship between frequency of equilibrium disputes and performance of optimal institution relative to first best

A Pro-Trade Bias in the DSB?

- Empirically, an apparent "pro-trade bias" in DSB rulings
  - complainants win 85% – 90% of GATT/WTO cases
- What can account for this?
- Could be result of a *selection bias* in DSB rulings
- When c^* is high relative to c,
  - disputes mostly about importer trying to get away with protection
  - $\Longrightarrow$ *Rulings* exhibit a "pro-trade bias" (b/c complainant mostly right)
  - but *equilibrium policies* exhibit an "anti-trade bias" (b/c importer acts opportunistically more often than exporter)
  - Fig 1

Figure 1


c*
Typical dispute: Home trying to get away with Protection.
c2*
No-Bias Locus
Pro-trade bias in DSB rulings, Anti-trade bias in policy outcome
Typical dispute: Foreign trying to force Free Trade.
c1*
Always dispute
Anti-trade bias in DSB rulings, Pro-trade bias in policy outcome
c1
c2
c

Precedent Setting

- Should DSB rulings set legal *precedent* for future rulings?
  - govs create the contract ("civil law") and provide DSB with a mandate
  - precedent $\Rightarrow$ DSB rulings help complete the contract ("common law")
- Consider a two-period version of the static model developed above
  - in a prior *Period* 0, the institution is created
  - *Period* 1 and *Period* 2 then proceed as in the static model
- The state s is *iid* across the two periods
- If rulings set precedent, a *Period*-1 ruling for the realized state s' will apply also in *Period* 2 if the realized state is again s'
- Trade-off: precedent induces more filings (bad); saves on duplicative filing costs in states where filing would occur anyway (good)

Precedent Setting

$\Longrightarrow$ *Consider a given activist DSB role (g or i). As q increases from 0, first the introduction of precedent has no effect, then it becomes strictly undesirable, and finally it is strictly desirable as q approaches 1.*

- Intuition:
  - when DSB sufficiently well-informed, little chance of equilibrium filing absent precedent, so little expected savings of duplicative filing costs
  - when sufficiently poorly informed, DSB invoked in most every state, so little chance that precedent will induce additional filings

$\Longrightarrow$ *There exists an intermediate range of q such that, for a given activist DSB role (g or i), it is optimal to give the DSB precedent-setting authority if δ is sufficiently low, while it is preferable not to do so if δ is sufficiently high.*

- Intuition: high δ magnifies additional filing that comes with precedent

Takeaway on Disputes

- Trade disputes can play important roles beyond enforcement
  - A contract that has gaps or is vague, and a gap-filling/interpretive DSB, is optimal if quality of DSB information sufficiently high
- Relationship between frequency of disputes and performance of optimal institution is non-monotonic
- Selection effects can explain "pro-trade bias" in WTO DSB rulings
  - but same conditions imply an "anti-trade bias" in policy outcomes
- Giving the DSB precedent-setting authority is sub-optimal unless:
  - the DSB is poorly informed/govs care little about the future
- Can court learning be an important feature in this institutional environment?

Court Learning

- There have been over 500 disputes in the WTO since 1995. Sometimes govs settle early, sometimes they "fight it out" to a court (DSB) ruling. In GATT+WTO, about 50% of disputes settle early.

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- Stakes of trade disputes can be large, so important to understand what determines dispute initiation and resolution.
- Some interesting dynamic patterns: countries fight less as time goes by. Plots 1+2.

Note: The vertical axis records the ratio X/Z, where X is the average number of disputes or rulings involving dyads of a given age, and Z is the average trade volume of dyads in this age group.

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- Stakes of trade disputes can be large, so important to understand what determines dispute initiation and resolution.
- Some interesting dynamic patterns: countries fight less as time goes by. Plots 1+2.
- The judicial system is being used less and less... Is this bad news?

Approach

- Propose a theory that can explain this trend as a result of judicial learning (good news, not bad news).
- A key model prediction: If there is learning by ruling, the frequency of disputes and rulings should decline with court experience.
  - (holding institution fixed).
- Check if WTO data is consistent with the above prediction, and attempt to gauge the importance and scope of judicial learning.
  - In the empirical literature on learning by doing, econometricians (try to) measure productivity directly.
  - Can't measure court accuracy directly here, but can try to infer learning effects *indirectly* using model predictions.

Model Overview

- Key model ingredients:
  - Importing gov chooses a policy, exporting gov chooses whether to dispute;
  - If a dispute is initiated, govs bargain "in the shadow of the law," subject to negotiation costs;
  - If invoked, DSB issues a ruling to maximize govs' joint payoff based on noisy information;
  - Learning by ruling: court accuracy increases with experience, but at diminishing rate;
  - Govs are "large" players that repeatedly engage in disputes (so they internalize benefits of court learning).

Model Overview

- Why might disputants go to court in equilibrium?
- Main explanation in existing literature: bargaining failure due to incomplete information (or overconfidence about court's ruling).
- Focus here on a different reason why govs may go to court: learning-by-ruling (plus negotiation costs and "large" players).

Theoretical Results

- If trade policy is continuous (e.g. a tariff):
  - In a static setting, there is never a ruling.
  - In a dynamic setting, the presence of court learning can give rise to equilibrium rulings.
  - Likelihood of rulings and disputes decreases with past cumulative rulings, at least if govs are patient enough.
  - Likelihood of settlement conditional on a dispute may go up or down with cumulative rulings.
- If trade policy is discrete (e.g. a regulatory regime), a reason for baseline rulings even in static setting, but otherwise similar results.

Empirical evidence

- Focus on a key implication of the model: the likelihood of current rulings and disputes should tend to decrease with cumulative rulings.
- Dual objective: (1) Check if key model prediction is consistent with data; (2) If so, gauge the strength and scope of learning by ruling.
- Explore the effect of cumulative rulings at various levels (country dyad, article, general).

Regressions

- Focus first on the impact of court experience on the likelihood of rulings. Start with undirected-dyads, then use directed dyads. Table 3.

Table 3: OLS

VARIABLES	Undirected Dyad	
	(1) $D\_\overleftrightarrow{ij}kt$	(2) $R\_\overleftrightarrow{ij}kt$
$CR\_\overleftrightarrow{ij}kt$	0.0345***	0.0138***
	(0.00734)	(0.00470)
$CR\_n(\overleftrightarrow{ij})kt$	-0.00140***	-0.000849**
	(0.000474)	(0.000354)
$CR\_\overleftrightarrow{ij}nkt$	-0.00135***	-0.000525***
	(0.000362)	(0.000126)
$CR\_n(\overleftrightarrow{ij})nkt$	-1.09e-05	-8.13e-06
	(1.32e-05)	(1.76e-05)
t	0.00130**	0.00317***
	(0.000603)	(0.000699)
t^2	-1.84e-05	-0.000106
	(3.17e-05)	(6.77e-05)
Constant	-0.00806**	0.00311
	(0.00329)	(0.00377)
Observations	439,584	112,560
R^2	0.044	0.021
$\overleftrightarrow{ij}$FE	Y	Y
kFE	Y	Y
CE	$\overleftrightarrow{ij}$	$\overleftrightarrow{ij}$

Clustered standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3: OLS

VARIABLES	Undirected Dyad (1) D_$\overleftrightarrow{ij}$kt	Undirected Dyad (2) R_$\overleftrightarrow{ij}$kt	VARIABLES	Directed Dyad (3) D_$\overrightarrow{ij}$kt	Directed Dyad (4) R_$\overrightarrow{ij}$kt
CR_$\overleftrightarrow{ij}$kt	0.0345***	0.0138***	CR_$\overrightarrow{ij}$kt	0.0150***	0.0119**
	(0.00734)	(0.00470)		(0.00525)	(0.00549)
CR_n($\overleftrightarrow{ij}$)kt	-0.00140***	-0.000849**	CR_$\overrightarrow{(ni)j}$kt	0.00288**	0.000884
	(0.000474)	(0.000354)		(0.00127)	(0.000797)
CR_$\overleftrightarrow{ij}$nkt	-0.00135***	-0.000525***	CR_$\overrightarrow{i(nj)}$kt	0.00100	0.000407
	(0.000362)	(0.000126)		(0.00139)	(0.000927)
CR_n($\overleftrightarrow{ij}$)nkt	-1.09e-05	-8.13e-06	CR_$\overrightarrow{ji}$kt	0.0128**	-0.00122
	(1.32e-05)	(1.76e-05)		(0.00493)	(0.00250)
			CR_$\overrightarrow{other}$kt	-0.00160***	-0.000957***
				(0.000374)	(0.000254)
			CR_$\overrightarrow{ij}n$kt	-0.00117***	-0.000713***
				(0.000188)	(0.000187)
			CR_$\overrightarrow{(ni)j}$nkt	-5.47e-06	6.72e-06
				(1.28e-05)	(2.23e-05)
			CR_$\overrightarrow{i(nj)}$nkt	-5.33e-05**	-5.12e-05*
				(2.13e-05)	(2.82e-05)
			CR_$\overrightarrow{ji}$nkt	-0.000199	8.92e-05
				(0.000261)	(0.000103)
			CR_$\overrightarrow{other}$nkt	-6.42e-06	-3.11e-06
				(1.01e-05)	(1.55e-05)
t	0.00130**	0.00317***	t	0.00112**	0.00249***
	(0.000603)	(0.000699)		(0.000435)	(0.000521)
t^2	-1.84e-05	-0.000106	t^2	-1.90e-05	-8.47e-05*
	(3.17e-05)	(6.77e-05)		(2.44e-05)	(5.00e-05)
Constant	-0.00806**	0.00311	Constant	-0.00820***	-6.12e-06
	(0.00329)	(0.00377)		(0.00256)	(0.00289)
Observations	439,584	112,560	Observations	545,142	149,520
R^2	0.044	0.021	R^2	0.029	0.017
$\overleftrightarrow{ij}$FE	Y	Y	$\overrightarrow{ij}$FE	Y	Y
kFE	Y	Y	kFE	Y	Y
CE	$\overleftrightarrow{ij}$	$\overleftrightarrow{ij}$	CE	$\overrightarrow{ij}$	$\overrightarrow{ij}$

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

$\overleftrightarrow{ij}$FE ($\overrightarrow{ij}$FE) are undirected (directed) dyad fixed effects. kFE are article fixed effects.

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- Focus first on the impact of court experience on the likelihood of rulings. Start with undirected-dyads, then use directed dyads. Table 3.
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- Note positive coefficient of t trend: suggests that court learning can explain declining trend in rulings (Plots 1+2).
- Results of dispute regressions are similar, except for the positive defendant-article specific effect: a "bandwagon" mechanism?

Table 3: OLS

VARIABLES	Undirected Dyad (1) D_$\overleftrightarrow{ij}$kt	Undirected Dyad (2) R_$\overleftrightarrow{ij}$kt	VARIABLES	Directed Dyad (3) D_$\overrightarrow{ij}$kt	Directed Dyad (4) R_$\overrightarrow{ij}$kt
CR_$\overleftrightarrow{ij}$kt	0.0345***	0.0138***	CR_$\overrightarrow{ij}$kt	0.0150***	0.0119**
	(0.00734)	(0.00470)		(0.00525)	(0.00549)
CR_n($\overleftrightarrow{ij}$)kt	-0.00140***	-0.000849**	CR_$\overrightarrow{(ni)j}$kt	0.00288**	0.000884
	(0.000474)	(0.000354)		(0.00127)	(0.000797)
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Alternative interpretations of empirical evidence

- In principle *legal precedent* could explain article-specific effects,
  - but it is unlikely to explain disputant-specific effects.
- Govs learning about *each other*?
  - Our data does not support this story: likelihood of rulings does not decrease with cumulative *settlements*.
- A *backlog* of cases coming out of GATT, hence the flurry of disputes in early WTO years?
  - If so, we would expect cumulative settlements to have similar impact as cumulative rulings, but this is not the case.
- *"Bad news"* story?
  - Not obvious this would predict that both rulings *and* disputes decline with cumulative rulings as our findings indicate.

Final Thoughts

- It is important to understand
  - why GATT worked
  - the economic environment it is best suited for
  - whether changes in the economic environment imply the need for changes in design of trade agreements
- At stake is
  - the future path of globalization
  - which international institutions will set the rules of globalization
  - what trade-offs we will face in our globalized world
- Twenty five years ago Paul Krugman coined the phrase 'GATT-think':

  ...a simple set of principles that is entirely consistent, explains most of what goes on in the negotiations, but makes no sense in terms of economics.

- Many open questions remain, but from this starting point the economic analysis of trade agreements has made important progress