

The Distributional Consequences of Preferential Trade Liberalization: Firm-Level Evidence

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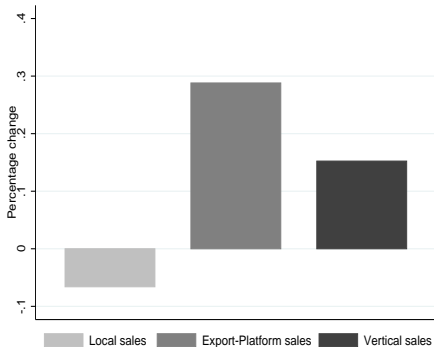
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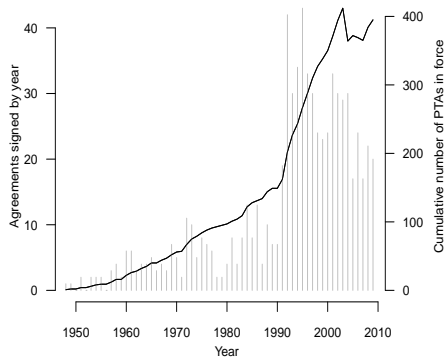
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September 2, 2015

The Globalization of Production



The growing importance of global supply chains, i.e. vertical and export-platform sales (1989-2009).

Trade Governance



The dramatic proliferation of preferential trade agreements since 1994, i.e. the *New Regionalism*.

Backlash

The New York Times

The Opinion Pages
The Great Divide

On the Wrong Side of Globalization

By JOSEPH E. STIGLITZ

March 15, 2014, 5:06 pm

The Great Divide is a series about inequality.

Trade agreements are a subject that can cause the eyes to glaze over, but we should all be paying attention. Right now, there are trade proposals in the works that threaten to put most Americans on the wrong side of globalization.



Research questions

- Who benefits from preferential trade agreements (PTAs)?
- How do PTAs affect the operations of multinational corporations (MNCs)?

Answers

- PTAs trigger a huge redistribution effect among powerful economic and political actors
- A small number of large MNCs benefit from preferential liberalization
 - MNCs activities increase through the reductions of trade costs
 - Market concentration in host countries increases (on average) 12% after the formation of trade agreements with the US

Road Map

- 1 Overview
- 2 Theory
- 3 Empirical Analysis
- 4 Conclusion

Literature Review

- **Effect** of international economic institutions on **trade**: Rose (2004); Goldstein et al. (2007); Baccini et al. (forthcoming)
- **Effect** of international economic institutions on **FDI**: Büthe and Milner (2008; 2014); Ántras and Foley (2009); Kenyon and Margalit (2013), Baccini and Dür (forthcoming)
- **Distributive consequences** of international economic institutions among countries: Gowa and Kim (2005), Goldstein et al. (2007)

Our Contribution

- Theory
 - Redistribution effects *within* countries
 - PTAs → heterogeneous MNCs activities
- Empirical Analysis
 - Exploring the micro-foundations of cooperation using firm-level data
 - Testing the mechanism hinging on trade cost reduction

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Three Building Bloks

- 1 New New Trade Theory (Melitz 2003)
- 2 Forming PTAs reduces trade costs
- 3 Preferential liberalization have a heterogeneous effect on MNCs activities

Melitz's Model (2003)

- Exporters and MNCs face larger fixed and variable costs compared to firms serving only the domestic market
- Open economy equilibrium: only the most productive firms compete on both domestic and foreign markets
- Trade liberalization → lower variable costs
 - Exporters and MNCs increase their activities
 - Increasing competition, which pushes less productive firms out of the market
 - Reallocation of sales from the least productive exiting firms to the most productive surviving firms

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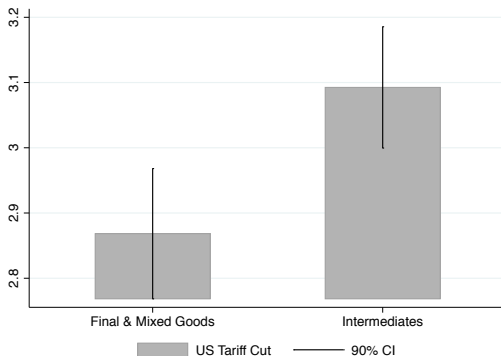
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PTAs and Trade Costs

- Lower tariffs, especially in intermediates

Tariff Cuts in US PTA by Type of Product



Note: The figure displays the differences between MNF tariffs prior to the formation of PTAs and preferential tariffs (PRF) after a PTA is in force by type of product classified as intermediate or consumption and mixed use. The categorization of products come from Francois and Pindyuk (2012) and Bekkers et al. (2012). The whiskers represent 90% confidence intervals.

PTAs and Trade Costs

- Lower tariffs, especially in intermediates
- Trade-related provisions enhancing market competition

Design of U.S. PTAs

PTA	Year	Services	Investment	IPRs	Competition	Government Procurement	Depth	Enforcement
US-Australia	2004	Yes	Yes	Yes	Yes	Yes	3.19	4.25
US-Bahrain	2004	Yes	Yes	Yes	No	Yes	3.01	4.50
US-CAFTA-DR	2004	Yes	Yes	Yes	No	Yes	3.13	4.50
US-Canada	1988	Yes	Yes	No	No	Yes	1.90	4.00
US-Canada	1992	Yes	Yes	Yes	Yes	Yes	2.74	4.25
US-Chile	2003	Yes	Yes	Yes	No	Yes	2.90	4.50
US-Colombia	2006	Yes	Yes	Yes	Yes	Yes	3.40	4.50
US-Jordan	2000	Yes	Yes	Yes	No	Yes	2.59	4.50
US-Korea	2007	Yes	Yes	Yes	Yes	Yes	3.26	4.25
US-Mexico	1992	Yes	Yes	Yes	Yes	Yes	2.74	4.25
US-Morocco	2004	Yes	Yes	Yes	No	Yes	3.19	4.50
US-Oman	2006	Yes	Yes	Yes	No	Yes	3.19	4.50
US-Panama	2007	Yes	Yes	Yes	No	Yes	3.19	4.50
US-Peru	2006	Yes	Yes	Yes	Yes	Yes	3.33	4.50
US-Singapore	2003	Yes	Yes	Yes	Yes	Yes	3.01	4.25
US-Vietnam	2000	Yes	Yes	Yes	No	No	2.69	0.50

Note: Depth is built using a latent trait analysis on 48 dummy variables related to trade-related provisions. Data are available at <http://www.designoftradeagreements.org/> ▶ Go to design figure

Hypotheses

Type of activity	PTA \times Firm Productivity/Size
Vertical FDI	Positive effect through discriminatory tariff cuts implemented by the US (H1)
Export-Platform FDI	Positive effect through discriminatory tariff cuts implemented by US partners (H2)

▶ Go to the HPs

Data

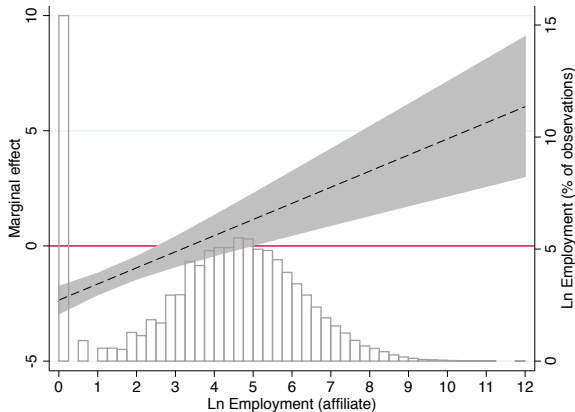
- Firm-level data (Bureau of Economic Analysis)
 - Entire universe of U.S. MNCs
 - Fine-grained data at the level of each foreign affiliate
 - Benchmark Surveys conducted quinquennially
- Tariff data (WITS)
- PTAs data (Desta)

Model

$$S_{ajit} = \alpha + \beta_1 PTA\ Cut_{ij,t-1} + \beta_2 Size_{aji,t-1} + \beta_3 PTA\ Cut_{ij,t-1} \\ \times Size_{aji,t-1} + \beta_4 C_{i,t-1} + \varphi_i + \varsigma_j + \tau_t + \epsilon_{ajit}$$

- DV: log of affiliate sales (vertical and export platform)
- $PTA\ Cut_{ij,t-1}$: $\frac{(MFN-PRF)}{MFN}$ implemented by the US with country j (for vertical) and implemented by country j with the US (for export-platform)
- $Size_{aji,t-1}$: number of employees of US affiliates
- $C_{i,t-1}$ are economic and political control variables
- φ industry-, ς country-, and τ period fixed effects

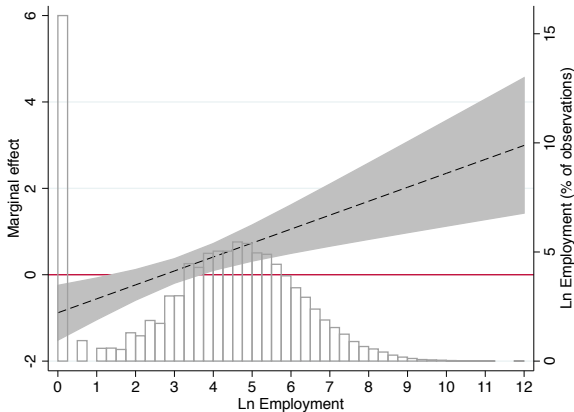
Vertical Sales & Preferential Tariff Cuts



Note: Marginal effect of US preferential tariff cuts on vertical sales by firm size. 90% confidence intervals..

[Go to the table](#)

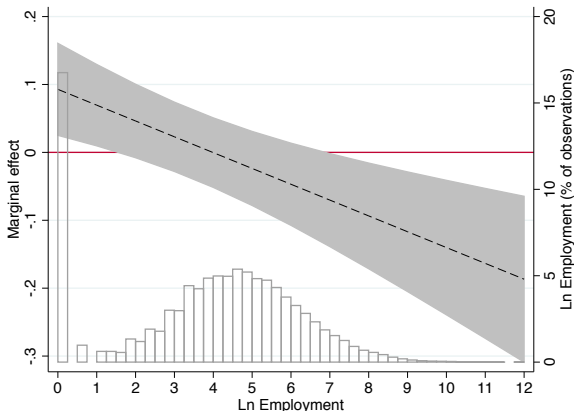
Export-Platform Sales & Preferential Tariff Cuts



Note: Marginal effect of host PTA tariff cuts on export-platform sales by firm size. 90% confidence intervals.

[Go to the table](#)

Vertical Sales & PTA Depth (Zero Tariff Cuts Industries)



Note: Marginal effects of host country PTA Depth on affiliate sales to the U.S. 90% confidence intervals.

[Go to the table](#)

Market Concentration Pre- and Post-PTA

	Herfindahl-Hirschman Sales Index						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Ln (GDP/capita)	-0.171*** (0.054)	-0.176*** (0.045)	-0.176*** (0.045)	-0.182*** (0.052)	-0.188*** (0.042)	-0.171*** (0.047)	-0.172*** (0.047)
Ln (population)	0.093 (0.068)	0.126* (0.072)	0.126* (0.072)	0.101 (0.068)	0.142* (0.072)	0.125* (0.073)	0.125* (0.073)
GATT Only		-0.038 (0.029)	-0.038 (0.029)		-0.043 (0.027)	-0.038 (0.029)	-0.038 (0.029)
WTO		0.043* (0.025)	0.043* (0.025)		0.047* (0.024)	0.041* (0.024)	0.042* (0.024)
BIT with US		-0.004 (0.016)	-0.004 (0.016)		-0.006 (0.017)	-0.005 (0.015)	-0.005 (0.015)
PTA with US	0.029* (0.016)	0.027* (0.016)				0.017 (0.021)	
PTA Depth			0.009* (0.005)				0.007 (0.006)
PTA Tariff Cuts				0.053*** (0.019)	0.051*** (0.018)		
Observations	19555	19555	19555	17792	17792	19063	19063
R-squared	0.0964	0.0803	0.0806	0.0939	0.0749	0.0752	0.0758
Countries	166	166	166	164	164	166	166
Log-likelihood	8824.1	8840.6	8841.3	8181.0	8201.2	8714.0	8714.7
Note:						Sectors with no PTA cuts	

Note: The dependent variable is the Herfindahl-Hirschman Index of Sales among affiliates of U.S. MNCs. Columns 6–7: dropping industries with tariff cuts from the sample. All models include country-industry and year fixed effects.

Identification Strategies

- Including HQ-year and country-industry-year fixed effects
- Including country- and industry-specific time trends
- Including parent firm-level fixed effects
- Limiting the sample to industries with 0 sales *before* the formation of PTAs [▶ Go to Checks](#)
- Instrumental variables [▶ Go to IV](#)
- Placebo test for horizontal sales [▶ Go to placebo](#)

Conclusion

- PTAs increase MNC supply chain activities
- Who benefits from PTAs?
 - A relatively small number of the most productive firms
 - Firm-level (not sectoral) factors determine political mobilization over PTAs
 - Relevant mechanism: old fashion tariff cuts

Policy Implications

- Gains yes, but for few → PTAs as private goods
- Concerns about inequality and influence of the largest firms
- Collusion between North MNCs and South countries?

PTAs and Global Value Chains

Nike CEO: We're still hopeful a deal can be reached to drop Vietnam tariffs on footwear

May 1, 2014, 5:44pm EDT Updated: May 1, 2014, 10:20pm EDT

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[Jon Chesto](#)

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The Obama administration's quest for fast-track authority to get an Asian-Pacific trade deal done has run into serious resistance in Congress.

But that doesn't seem to have dimmed [Nike](#) CEO Mark Parker's hopes for a deal, at least not based on what he's saying publicly.

Parker, speaking at a Chief Executives' Club of Boston event at the Boston Harbor Hotel on Thursday, said he remains hopeful that Trans-Pacific Partnership negotiations will reach a satisfactory conclusion. For Nike, [that would mean a deal that would eliminate tariffs](#) on athletic shoes made in Vietnam. (More than 40 percent of Nike's shoes were made in Vietnam last year.)

Policy Implications

- Gains yes, but for few → PTAs as private goods
- Concerns about inequality and influence of the largest firms
- Collusion between North MNCs and South countries?
- Good news for development?

Citizens' Attitude Toward TPP

Vietnam Most Enthusiastic Among TPP Countries

	Trade is good	Trade increases wages	Trade creates jobs	Trade lowers prices	Foreign companies buying is good	Foreign companies building factories is good
	%	%	%	%	%	%
Vietnam	95	72	78	31	59	80
Malaysia	87	47	57	9	45	78
Chile	85	27	52	28	53	68
Peru	81	42	55	24	59	70
Mexico	71	31	43	24	50	69
Japan	69	10	15	27	17	58
U.S.	68	17	20	35	28	75

Source: Spring 2014 Global Attitudes survey. Q27-Q32.

PEW RESEARCH CENTER

Conclusion

Thank you for your attention!

Hypothesis 1: PTA and Vertical FDI

- Entering into a PTA with the U.S. results in:
 - Increase in sales to U.S. (vertical activity)
 - 1 Tariff cut implemented by the US
 - 2 Increase in vertical sales should scale with firm productivity

Hypothesis 2: PTA and Export-platform FDI

- Entering into a PTA with the U.S. results in:
 - Increase in sales to third market (export-platform activity)
 - 1 preferential tariff cuts implemented by host country
 - 2 Increase in export-platform sales should scale with productivity
 - 3 note: no tariff reduction with third countries

Model (Vertical Sales)

$$S_{ajit} = \alpha \text{PTA US Cut}_{ij,t-1} + \beta \text{Size}_{aji,t-1} + \omega \text{PTA US Cut}_{ij,t-1} \\ \times \text{Size}_{aji,t-1} + \gamma C_{i,t-1} + \varphi_i + \varsigma_j + \tau_t + \epsilon_{ajit}$$

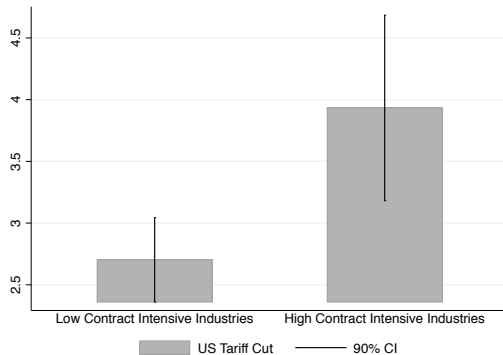
- DV: log of firm a vertical sales
- $\text{PTA US Cut}_{ij,t-1}$: $\frac{(\text{MFN}-\text{PRF})}{\text{MFN}}$ implemented by the US with country j
- $\text{Productivity}_{aji,t-1}$: number of employees of US affiliates
- $C_{i,t-1}$ are economic and political control variables
- φ industry-, ς country-, and τ period fixed effects
- standard errors adjusted for country-level clustering

Model (Export-platform Sales)

$$S_{ajit} = \alpha \text{PTA Partner Cut}_{ij,t-1} + \beta \text{Size}_{aji,t-1} + \omega \text{PTA Partner Cut}_{ij,t-1} \\ \times \text{Size}_{aji,t-1} + \gamma C_{i,t-1} + \varphi_i + \varsigma_j + \tau_t + \epsilon_{ajit}$$

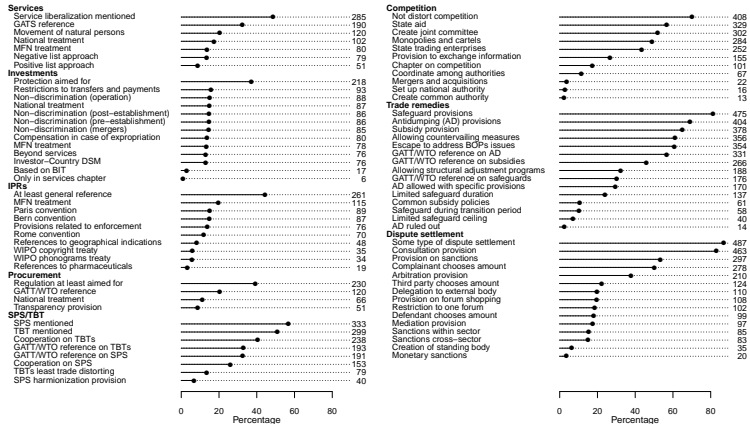
- DV: log of firm a export-platform sales
- $\text{PTA Partner Cut}_{ij,t-1}$: $\frac{(\text{MFN}-\text{PRF})}{\text{MFN}}$ implemented by partner j with the US
- $\text{Size}_{aji,t-1}$: number of employees of US affiliates
- $C_{i,t-1}$ are economic and political control variables
- φ industry-, ς country-, and τ period fixed effects

Tariff Cuts in US PTA by Type of Products



Note: The figure displays the differences between MNF tariffs prior to the formation of PTAs and preferential tariffs (PRF) after PTA is in force, by type contract intensity. The measure of contract intensive product comes Nunn (2007). The whiskers represent 90% confidence intervals.

Trade-related Provisions



Note: Data on Depth available at <http://www.designoftradeagreements.org/>.

Summary Statistics

Firm level variables

Variable	Observations	Average	Std. Dev.	Min	Max
Ln Total Sales	82,946	9.534	3.116	..	..
Ln Horizontal Sales	82,946	8.532	3.819	..	..
Ln Export Platform Sales	82,946	3.440	4.569	..	..
Ln Vertical Sales (to US)	82,946	2.154	3.731	..	..
Ln Employment (affiliate)	82,946	4.038	2.245	..	..
Ln PPE Assets (affiliate)	82,946	7.428	3.579	..	..
Productivity (headquarter)	74,394	0.178	0.610	..	..

.. Omitted to preserve anonymity of reporters

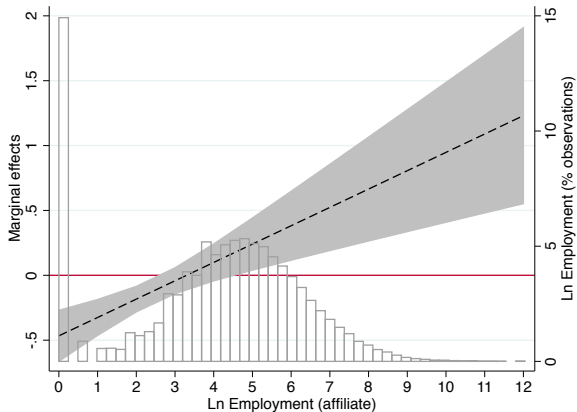
Country level variables

Variable	Observations	Average	Std. Dev.	Min	Max
Ln GDP/capita (partner)	708	8.177	1.593	4.451	11.851
GATT Only (partner)	708	0.250	0.433	0	1
WTO (partner)	708	0.500	0.500	0	1
BIT with US	708	0.189	0.392	0	1
Ln Cumulative PTA (partner)	708	3.168	1.063	0	5.352
PTA with US	708	0.049	0.217	0	1
Tariff Cut (US)	697	0.115	0.656	0	5.784
Tariff Cut Proportional (US)	697	0.030	0.162	0	1
Tariff Cut PTA (partner)	680	0.009	0.087	0	1
Tariff Cut WTO (partner)	708	0.001	0.016	0	0.272
Tariff Cut WTO Proportional (US)	707	0.002	0.020	0	0.245

PTAs and Vertical Sales

	Ln Vertical Sales			Ln Export Platform Sales			Ln Horizontal Sales		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Ln GDP/capita	0.188 (0.179)	0.187 (0.178)	0.026 (0.277)	-0.437* (0.237)	-0.438* (0.237)	-0.212 (0.203)	0.637** (0.285)	0.637** (0.286)	0.754*** (0.228)
GATT only	0.250 (0.177)	0.248 (0.176)	0.235 (0.216)	0.563*** (0.202)	0.560*** (0.204)	0.619*** (0.173)	0.346* (0.188)	0.345* (0.188)	0.380** (0.164)
WTO member (partner)	0.153 (0.248)	0.151 (0.248)	0.228 (0.265)	0.505* (0.262)	0.502* (0.264)	0.396* (0.218)	0.074 (0.158)	0.072 (0.158)	0.098 (0.142)
BIT with US	0.190 (0.115)	0.186 (0.115)	0.089 (0.141)	0.248 (0.264)	0.248 (0.263)	0.413* (0.247)	0.097 (0.238)	0.095 (0.238)	0.159 (0.246)
Cumulative PTA Depth	0.124*** (0.043)	0.129*** (0.043)	0.130*** (0.046)	0.338*** (0.105)	0.341*** (0.107)	0.266*** (0.088)	-0.003 (0.069)	-0.0001 (0.072)	-0.048 (0.056)
Ln Employment (affiliate)	0.450*** (0.023)	0.453*** (0.023)	0.472*** (0.022)	0.619*** (0.035)	0.618*** (0.035)	0.623*** (0.036)	0.670*** (0.024)	0.668*** (0.024)	0.671*** (0.023)
PTA with US	-0.586*** (0.116)			1.242*** (0.282)			0.561 (0.505)		
PTA x Ln Employment	0.150*** (0.043)			-0.284*** (0.053)			-0.121 (0.092)		
PTA Depth		-0.194*** (0.047)			0.435*** (0.104)			0.183 (0.170)	-0.045 (0.057)
PTA Depth x Ln Employment		0.048*** (0.017)			-0.101*** (0.020)			-0.040 (0.032)	
PTA Tariff Cuts (US)			-2.352*** (0.360)						
PTA Tariff Cuts (US) x Ln Employment			0.700*** (0.172)						
PTA Tariff Cuts (Partner)						-0.881** (0.386)			-1.170** (0.534)
PTA Tariff Cuts (Partner) x Ln Employment						0.323*** (0.107)			0.278*** (0.085)
Observations	84093	84093	74876	84093	84093	72310	84093	84093	72310
R-squared	0.106	0.106	0.115	0.156	0.155	0.144	0.196	0.196	0.202
Countries	166	166	164	166	166	164	166	166	164
Log-likelihood	-217536.9	-217548.1	-192195.9	-231263.4	-231264.5	-199672.4	-205355.9	-205362.8	-175609.1

PTAs with US and Vertical Sales



Note: Marginal Effect of PTA with US on Vertical Sales. 90% confidence intervals.

Effects of Design Features (Zero Tariff Cuts Industries)

	Ln Vertical Sales			
	(1)	(2)	(3)	(4)
Ln GDP/capita	0.076 (0.246)	0.034 (0.270)	0.340** (0.163)	0.340** (0.163)
GATT only	0.253 (0.203)	0.245 (0.213)	0.264 (0.177)	0.263 (0.177)
WTO member (partner)	0.236 (0.255)	0.246 (0.262)	0.067 (0.243)	0.066 (0.244)
BIT with US	0.135 (0.123)	0.111 (0.130)	0.199** (0.116)	0.199** (0.116)
Cumulative PTA Depth	0.096** (0.045)	0.106** (0.047)	0.120*** (0.044)	0.121*** (0.045)
Ln Employment (affiliate)	0.472*** (0.022)	0.472*** (0.022)	0.450*** (0.022)	0.450*** (0.022)
Tariff Cuts (US)	-6.128*** (0.487)	-4.893*** (0.790)		
PTA Tariff Cuts (US) x Ln Employment	0.698*** (0.181)	0.706*** (0.178)		
PTA with US	3.308*** (0.309)		0.275** (0.116)	
PTA Depth		0.751*** (0.186)		0.093** (0.041)
PTA x Ln Employment			-0.067*** (0.022)	
PTA Depth x Ln Employment				-0.024*** (0.008)
Observations	74876	74876	75038	75038
R-squared	0.117	0.116	0.0824	0.0824
Countries	164	164	163	163
Log-likelihood	-192148.0	-192178.1	-191706.8	-191706.7
Note:				Drop affiliates with zero pre-PTA sales

▶ Go back

Robustness Checks

	Ln Vertical Sales						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Ln GDP/capita	-0.057 (0.361)	-0.029 (0.272)	-0.058 (0.252)		-0.009 (0.281)	0.087 (0.226)	-0.075 (0.296)
GATT only	0.284 (0.237)	0.223 (0.196)	0.396** (0.170)		0.221 (0.195)	0.415** (0.165)	0.318* (0.191)
WTO member (partner)	0.259 (0.243)	0.268 (0.224)	0.277 (0.195)		0.274** (0.126)	0.336 (0.207)	0.244 (0.210)
BIT with US	0.004 (0.177)	0.065 (0.148)	0.238* (0.131)		0.071 (0.294)	0.365*** (0.118)	0.053 (0.148)
Cumulative PTA Depth	0.174*** (0.057)	0.118** (0.047)	0.182*** (0.064)		0.187*** (0.043)	0.146*** (0.052)	0.188*** (0.067)
Ln Employment (affiliate)		0.651*** (0.028)	0.571*** (0.025)	0.500*** (0.026)	0.570*** (0.025)	0.495*** (0.022)	0.536*** (0.029)
Tariff Cuts (US)	0.799 (0.685)	-3.169*** (0.242)	-1.494*** (0.421)		-1.605*** (0.601)	-3.753*** (0.666)	0.239 (0.238)
Productivity (affiliate)	0.349*** (0.025)						
PTA Tariff Cuts (US) x Aff. Productivity	0.761*** (0.237)						
PTA Tariff Cuts (US) x Ln Employment		0.812*** (0.149)	0.570*** (0.177)	0.637*** (0.168)	0.532*** (0.178)	0.608*** (0.177)	0.620*** (0.185)
PTA Depth					-0.057 (0.115)	0.483*** (0.136)	
Observations	62558	63329	74876	74876	74876	74876	72659
R-squared	0.0745	0.132	0.179	0.0729	0.183	0.227	0.183
Countries	160	162	164	164	164	164	164
Log-likelihood	-164518.6	-164362.7	-182793.5	-180749.3	-182609.6	-180546.2	-175032.0
Note	Affiliate productivity	Drop affiliates with no employees	HQ-year fixed effects	Country-industry-year fixed effect	HQ-year fixed effect and Country trend	HQ-year fixed effect and Industry trend	Drop affiliates with zero pre-PTA sales

▶ Go back

Instrumenting PTA Cut (US)

- Instrument: preferential tariff cuts implemented by other countries that form PTAs with the same US partner
- Intuition: US negotiates the same preferential tariff deal to level the playing field
- Caveat: only a sub-sample of PTAs can be instrumented due to data availability

PTAs Used to Build the Instrument

PTA Instrumented	Signature	Ratification	PTA used as instrument	Signature	Ratification
US-Australia	18 May 2004	1 January 2005	Thailand-Australia	5 July 2004	1 January 2005
US-Chile	6 June 2003	1 January 2004	South Korea-Chile	15 February 2003	1 April 2004
US-South Korea	30 June 2007*	15 March 2012	India-South Korea	7 August 2009	1 January 2010
US-Costa Rica	5 August 2004	1 January 2009	Canada-Costa Rica	23 April 2001	1 November 2002
US-Peru	12 April 2006**	1 February 2009	Canada-Peru	29 May 2008	1 August 2009
US-Singapore	6 May 2003	1 January 2004	Japan-Singapore	13 January 2002	30 November 2002

* Amended on December 3, 2010.

** Ratified with amendments on February 1, 2009.

Identification Strategy Conditions

- Country A is a good candidate to enter into the instrument if:
 - 1 Country A is relatively small/less developed country compare to the US
 - 2 Country A PTA is formed at about the same time than the US PTA
 - 3 PTA Cut (US) is highly correlated with PTA Cut (Country A),
 $\rho = 0.45$
 - 4 US MFN tariffs are weakly correlated with Country A MFN,
 $\rho = 0.08$

First Stage

$$Cut_{ij,t-1} = \beta_1 Comp. Cut_{ij,t-1} + \beta_2 Size_{ij,t-1} + \beta_3 Comp Cut_{ij,t-1} \\ \times Size_{ij,t-1} + \beta_4 X_{j,t-1} + \varphi_j + s_i + \tau_{t-1} + \eta_{ij,t-1}$$

$$Cut_{ij,t-1} \times Size_{ij,t-1} = \beta_1 Comp Cut_{ij,t-1} + \beta_2 Size_{ij,t-1} \\ + \beta_3 Comp Cut_{ij,t-1} \times Size_{ij,t-1} + \beta_4 X_{j,t-1} + \\ + \varphi_j + s_i + \tau_{t-1} + \zeta_{ij,t-1}$$

Second Stage

$$S_{ij,t} = \beta_1 \widehat{Cut}_{ij,t-1} + \beta_2 Size_{ij,t-1} + \beta_3 \widehat{Cut} \times \widehat{Size}_{ij,t-1} + \beta_4 X_{j,t-1} + \varphi_j + \varsigma_i + \tau_{t-1} + \epsilon_{ij,t-1}$$

- $\widehat{Cut}_{ij,t-1}$ and $\widehat{Cut} \times \widehat{Size}_{ij,t-1}$ are predicted values from the first stage

Instrumental Variables: Results

Dependent Variable	(1)	(2)	(3)	(4)	(5)	(6)
	First Stage		2nd Stage	First Stage		2nd Stage
	PTA Tariff Cuts (US)	PTA Tariff Cuts (US) x Ln Assets	Vertical Sales	PTA Tariff Cuts (US)	PTA Tariff Cuts (US) x Ln Empl.	Vertical Sales
Ln GDP/capita	0.002 (0.009)	0.023 (0.087)	0.412** (0.189)	0.002 (0.009)	0.013 (0.046)	0.309* (0.167)
GATT only	-0.001 (0.002)	-0.011 (0.023)	0.300 (0.191)	-0.001 (0.002)	-0.007 (0.012)	0.318* (0.183)
WTO member (partner)	-0.001 (0.005)	-0.008 (0.044)	0.138 (0.257)	-0.001 (0.005)	-0.005 (0.023)	0.146 (0.235)
BIT with US	-0.001 (0.002)	-0.006 (0.015)	0.135 (0.093)	-0.001 (0.002)	-0.003 (0.008)	0.183* (0.094)
Ln Cumulative PTAs	-0.003 (0.002)	-0.027 (0.022)	0.017 (0.032)	-0.003 (0.002)	-0.014 (0.012)	0.034 (0.029)
Ln Assets (PPE, affiliate)	0.00003 (0.00002)	0.0006* (0.0004)	0.242*** (0.013)			
Ln Employment (affiliate)				-0.00004 (0.00005)	0.0002 (0.0002)	0.475*** (0.022)
<i>Instruments</i>						
Competitor Cut	0.901*** (0.048)	-0.123 (0.227)		0.907*** (0.072)	-0.294*** (0.065)	
Competitor Cut x Ln Assets	0.011* (0.006)	1.024*** (0.123)				
Competitor Cut x Ln Employment				0.020*** (0.007)	1.077*** (0.106)	
<i>Instrumented</i>						
PTA Tariff Cuts (US)			-2.914*** (0.349)			-1.993*** (0.664)
PTA Tariff Cuts (US) x Ln Assets			0.285*** (0.048)			
PTA Tariff Cuts (US) x Ln employment						0.370** (0.147)
Observations	68444	68444	68444	68444	68444	68444
Countries	150	150	150	150	150	150
R_squared	0.896	0.889	0.181	0.896	0.891	0.197
Kleibergen-Paap Wald rk F statistics	47.27***			51.71***		
Kleibergen-Paap rk LM statistics	3.96**			4.07**		
Anderson-Rubin Wald test	43.56***			10.17***		

All models include benchmark year and industry fixed effects

Balance of Covariates Before and After Weighting

Original sample

Variable	Treatment			Control		
	mean	variance	skewness	mean	variance	skewness
Ln Employment	4.293	5.726	-0.418	3.996	4.916	-0.408
Ln Assets (PPE)	7.713	13.450	-0.842	7.381	12.690	-0.807
Exporter	0.483	0.250	0.068	0.478	0.250	0.090
Positive Sales to US	0.960	0.038	-4.698	0.947	0.050	-4.009
Agr. and Mining	0.040	0.039	4.675	0.045	0.043	4.393
Manufacturing	0.404	0.241	0.390	0.375	0.234	0.515
Telecomm.	0.031	0.030	5.436	0.021	0.020	6.704
Wholesale	0.218	0.171	1.363	0.250	0.188	1.154
Services	0.299	0.210	0.878	0.305	0.212	0.850

After entropy weighting

Variable	Treatment			Control		
	mean	variance	skewness	mean	variance	skewness
Ln Employment	4.293	5.726	-0.418	4.293	4.681	-0.493
Ln Assets (PPE)	7.713	13.450	-0.842	7.712	11.790	-0.901
Exporter	0.483	0.250	0.068	0.483	0.250	0.068
Positive Sales to US	0.960	0.038	-4.698	0.960	0.038	-4.697
Agr. and Mining	0.040	0.039	4.675	0.040	0.039	4.675
Manufacturing	0.404	0.241	0.390	0.404	0.241	0.391
Telecomm.	0.031	0.030	5.436	0.031	0.030	5.436
Wholesale	0.218	0.171	1.363	0.218	0.171	1.363
Services	0.299	0.210	0.878	0.299	0.210	0.878

Balanced Sample: Results

	(1)	(2)	(3)	(4)	(5)	(6)
	Vertical Sales	Vertical Sales	Vertical Sales	Vertical Sales	Export-Platform Sales	Export-Platform Sales
Ln GDP/capita	0.161 (0.237)	0.102 (0.228)	0.195 (0.204)	-0.031 (0.266)	-0.828* (0.475)	-1.018** (0.466)
GATT only	0.348* (0.190)	0.351** (0.172)	0.242 (0.167)	0.284 (0.178)	0.638** (0.265)	0.472* (0.257)
WTO	0.356 (0.258)	0.377* (0.227)	0.275 (0.257)	0.289 (0.238)	0.858** (0.369)	0.793** (0.375)
BIT with US	0.344* (0.184)	0.369** (0.180)	0.264* (0.149)	0.240 (0.165)	0.168 (0.278)	0.090 (0.311)
Ln Cumulative PTAs (partner)	0.060 (0.039)	0.083* (0.046)	0.030 (0.036)	0.053 (0.052)	0.325*** (0.118)	0.306** (0.127)
PTA with US	0.045 (0.103)	0.029 (0.109)	-0.967*** (0.252)	-0.455*** (0.157)	0.479*** (0.130)	1.901*** (0.310)
Productivity (headquarter)		-0.003 (0.041)				
PTA with US x Productivity		0.157** (0.061)				
Ln Assets (PPE, affiliate)			0.218*** (0.021)			
PTA with US x Ln Assets			0.130*** (0.042)			
Ln Employment (affiliate)				0.435*** (0.033)		0.654*** (0.037)
PTA with US x Ln Employment				0.127*** (0.048)		-0.322*** (0.053)
Observations	82946	74394	82946	82946	82946	82946
R-squared	0.261	0.267	0.302	0.310	0.267	0.309
Countries	165	163	165	165	165	165

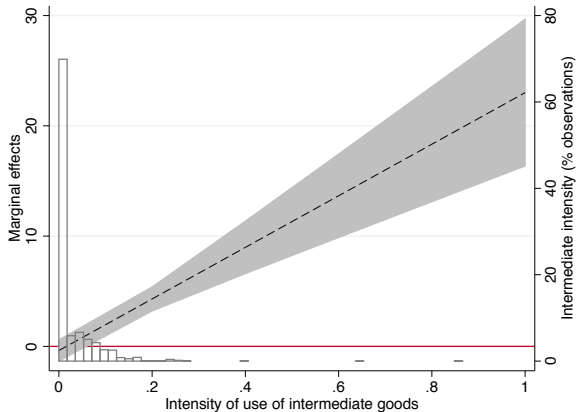
All models include benchmark year and industry fixed effects

Export-Platform Sales and Intermediates

<i>Dependent Variable</i>	(1) Imported Intermediates from HQ	(2) Export Sales	(3) Export Sales
Ln GDP/capita	0.003 (0.152)	-0.063 (0.448)	
GATT only	0.345* (0.196)	0.527** (0.229)	
WTO member (partner)	-0.151** (0.063)	0.272 (0.307)	
BIT with US	0.240 (0.160)	0.496 (0.424)	
Ln Cumulative PTAs (partner)	-0.022 (0.026)	0.227** (0.092)	
PTA Tariff Cuts (partner)	0.335** (0.154)		
WTO Cuts (partner)		-0.505 (0.436)	-0.506 (0.389)
Intermediate intensity		-0.205 (0.745)	-0.100 (0.738)
WTO Cuts (partner) x Intermediate intensity		22.662*** (3.643)	21.796*** (3.353)
Constant	2.369** (1.186)	1.620 (3.262)	5.364*** (0.223)
Observations	51824	69988	69988
R-squared	0.0624	0.0906	0.207
Countries	158	164	164
Fixed effects	Country, Year	Country, Year, Industry	Country-year, Industry

Note: The dependent variable in Column 1 is the log of the sales of goods for further processing from the US parent company to the affiliate. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Export-Platform Sales and the WTO in Intermediates

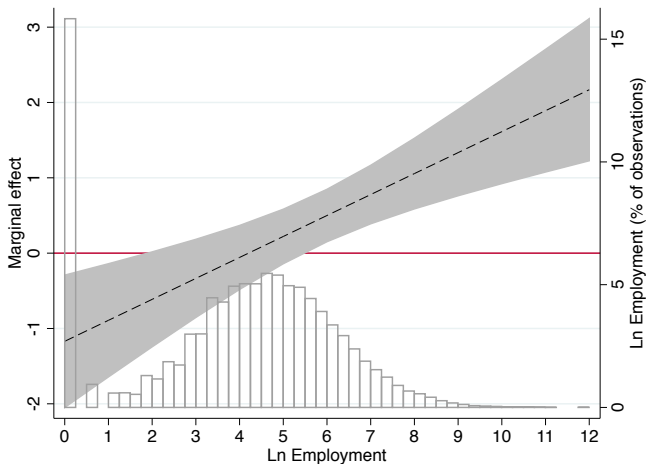


Note: Marginal effect of host MFN tariff cuts on export-platform sales by intensity of use of intermediate goods.
 90% confidence intervals.

Horizontal Sales: Results

	Ln Vertical Sales			Ln Export Platform Sales			Ln Horizontal Sales		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Ln GDP/capita	0.188 (0.179)	0.187 (0.178)	0.026 (0.277)	-0.437* (0.237)	-0.438* (0.237)	-0.212 (0.203)	0.637** (0.285)	0.637** (0.286)	0.754*** (0.228)
GATT only	0.250 (0.177)	0.248 (0.176)	0.235 (0.216)	0.563*** (0.202)	0.560*** (0.204)	0.619*** (0.173)	0.346* (0.188)	0.345* (0.188)	0.380** (0.164)
WTO member (partner)	0.153 (0.248)	0.151 (0.248)	0.228 (0.265)	0.505* (0.262)	0.502* (0.264)	0.396* (0.218)	0.074 (0.158)	0.072 (0.158)	0.098 (0.142)
BIT with US	0.190 (0.115)	0.186 (0.115)	0.089 (0.141)	0.248 (0.264)	0.248 (0.263)	0.413* (0.247)	0.097 (0.238)	0.095 (0.238)	0.159 (0.246)
Cumulative PTA Depth	0.124*** (0.043)	0.129*** (0.043)	0.130*** (0.046)	0.338*** (0.105)	0.341*** (0.107)	0.266*** (0.088)	-0.003 (0.069)	-0.0001 (0.072)	-0.048 (0.056)
Ln Employment (affiliate)	0.450*** (0.023)	0.453*** (0.023)	0.472*** (0.022)	0.619*** (0.035)	0.618*** (0.035)	0.623*** (0.036)	0.670*** (0.024)	0.668*** (0.024)	0.671*** (0.023)
PTA with US	-0.586*** (0.116)			1.242*** (0.282)			0.561 (0.505)		
PTA x Ln Employment	0.150*** (0.043)			-0.284*** (0.053)			-0.121 (0.092)		
PTA Depth		-0.194*** (0.047)			0.435*** (0.104)			0.183 (0.170)	-0.045 (0.057)
PTA Depth x Ln Employment		0.048*** (0.017)			-0.101*** (0.020)			-0.040 (0.032)	
PTA Tariff Cuts (US)			-2.352*** (0.360)						
PTA Tariff Cuts (US) x Ln Employment			0.700*** (0.172)						
PTA Tariff Cuts (Partner)						-0.881** (0.386)			-1.170** (0.534)
PTA Tariff Cuts (Partner) x Ln Employment						0.323*** (0.107)			0.278*** (0.085)
Observations	84093	84093	74876	84093	84093	72310	84093	84093	72310
R-squared	0.106	0.106	0.115	0.156	0.155	0.144	0.196	0.196	0.202
Countries	166	166	164	166	166	164	166	166	164
Log-likelihood	-217536.9	-217548.1	-192195.9	-231263.4	-231264.5	-1999672.4	-205355.9	-205362.8	-175609.1

Horizontal Sales: Marginal Effect (Host Country)



Horizontal Sales: Marginal Effect (U.S.)

