

Deep Trade Agreements and Vertical FDI: The Devil is in the Details

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Introduction

How are preferential trade agreements (PTAs) and offshoring related?

Offshoring can be done in 2 modes:

- outside the boundaries of the firm (arm's length trade) \Rightarrow foreign outsourcing
- within the boundaries of the firm (within firms trade) \Rightarrow foreign direct investment (FDI)

PTAs can be

- shallow \Rightarrow tariff agreements
- deep \Rightarrow including provisions beyond tariff commitments

Is the *depth* of PTAs associated to more offshoring?

Does the *content* of deep PTAs affect the mode of offshoring?

What are Deep PTAs?

PTAs are usually thought of as reciprocal market access exchanges involving tariff cuts and the reduction of other border measures

The coverage of PTAs in terms of policy areas has widened and deepened over time

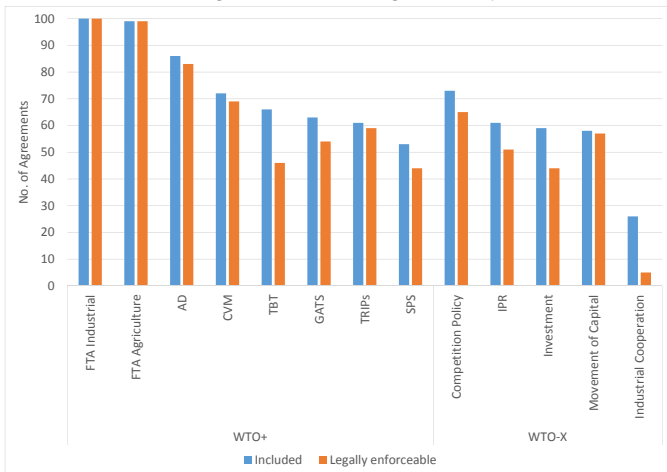
Modern day trade agreements contain provisions that cover a wide array of non-tariff measures, both at the border and behind-the-border. For example:

- technical barriers to trade (TBT)
- sanitary and phytosanitary (SPS) measures
- rules on investment
- intellectual property rights (IPR) protection
- provisions on anti-corruption
- competition policy
- labor standards, etc.

Content of Deep PTAs

WTO constructed a dataset on the content of preferential trade agreements by mapping a total of 52 disciplines across 100 PTAs signed between 1958 and 2011

Number of agreements including selected provisions



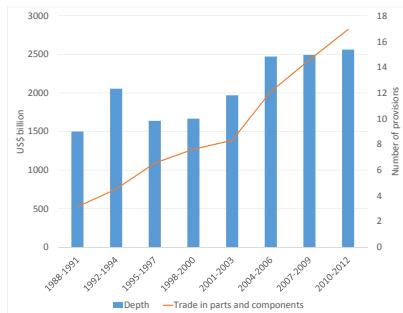
Deep PTAs and the Internationalization of Production

The recent wave of PTAs has brought the question of how trade agreements relate to the international organization of production to the forefront of trade research and of the trade policy debate (see, among others, Lawrence (1996), Baldwin (2011) Antras and Staiger (2012) and WTO (2011))

The key insight of the theoretical literature is that the “depth” of trade agreements is associated with the international fragmentation of production

What about empirical evidence?

Offshoring and Deep PTAs



Orefice and Rocha (2014) investigate the dual relationship between deep integration and trade in parts and components and find that:

- signing deeper trade agreements increases trade in parts and components by almost 12 percent
- higher levels of trade in production networks increases the likelihood of signing deeper agreements

Content of Deep PTAs and the Composition of Offshoring

The empirical analysis on the impact of PTAs on vertical FDI is guided by the theory in Antras and Helpman (2008)

- PTA provisions improving the contractibility of components (μ_m) are associated with an increase in profitability under vertical integration relative to outsourcing, leading to an increase in the share of firms engaging in FDI
- PTA provisions improving the contractibility of headquarter services (μ_h) are associated with an increase in profitability under outsourcing relative to vertical integration, leading to a decrease in the share of firms engaging in FDI

Improving the Contractibility of Components

With better contracting of components (μ_m), final good producers in the North are less dependent on the power of incentives they can offer to the suppliers of components in the South, thus making vertical integration more attractive

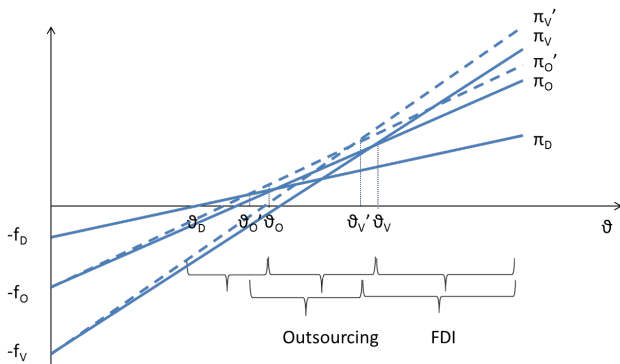


Figure: Effects of PTA provisions improving contractibility of components ($\uparrow \mu_m$)

Data on the Content of Deep PTAs

35 agreements signed by the Germany (EU), 11 by Japan, and 11 by the USA

Depth

- number of legally enforceable provisions
- indexes from Principal Component Analysis (see Orefice and Rocha (2014))

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Content

- μ_m includes SPS, TBT, consumer protection, customs, and export taxes
- μ_h includes GATS, TRIPS, IPR, investment, and movement of capital

h -provisions	N. of Agreements	m -provisions	N. of Agreements
GATS	32	SPS	22
TRIPS	43	TBT	24
IPR	39	Consumer protection	26
Investment	31	Customs	56
Movement of capital	41	Export taxes	42

▶ Figure

Data on FDI

FDI

We follow the methodology of Alfaro and Charlton (2009) to identify three types of foreign direct investment, namely vertical, horizontal and complex using information about ownership, revenues and sector from ORBIS [▶ FDI types](#)

We focus on vertical FDI

Econometric specifications

PTA depth and vertical FDI:

$$\begin{aligned} FDI_{ijkt} = & \beta_1 DEPTH_{ijt} + \beta_2 \log(Tariff)_{ijkt} + \\ & + \beta_3 INSTITUTIONS_{jt} + \beta_4 BIT_{ijt} + \gamma_1 X_{jt} + \gamma_2 X_{ij} + \\ & + \delta_k + \delta_{it} + \epsilon_{ijkt} \end{aligned}$$

PTA content and vertical FDI:

$$\begin{aligned} FDI_{ijkt} = & \beta_1 \mu_{h,ijt} + \beta_2 \mu_{m,ijt} + \beta_3 DEPTH_{ijt} + \beta_4 \log(Tariff)_{ijkt} + \\ & + \beta_5 INSTITUTIONS_{jt} + \beta_6 BIT_{ijt} + \gamma_1 X_{jt} + \gamma_2 X_{ij} + \\ & + \delta_k + \delta_{it} + \epsilon_{ijkt} \end{aligned}$$

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Baseline results

Table: Vertical FDI and Deep PTAs

	FDI (log of revenues in 1000\$)			
	Depth		Content	
	(1)	(2)	(3)	(4)
PTA	0.573** (0.227)			
N. of Provisions		0.0185*** (0.00662)	0.00162 (0.00832)	0.00303 (0.0184)
Dummy $\mu_h = 1$ if at least one h provision			-0.943* (0.515)	
Dummy $\mu_m = 1$ if at least one m provision			1.479*** (0.457)	
Discrete μ_h				-0.0254 (0.233)
Discrete μ_m				0.570*** (0.213)
Tariff (log)	0.0420 (0.235)	-0.0588 (0.236)	-0.0110 (0.231)	-0.00303 (0.231)
Rule of Law	0.319** (0.124)	0.295** (0.121)	0.292** (0.122)	0.300** (0.123)
BIT	0.0622 (0.143)	0.0331 (0.138)	-0.00897 (0.139)	0.00571 (0.141)
Observations	4,816	4,777	6,888	6,888
R-squared	0.244	0.240	0.239	0.239
Industry-4dig FE	Yes	Yes	No	No
Industry-6dig FE	No	No	Yes	Yes
Country-Year FE	Yes	Yes	Yes	Yes

Country and country-year fixed effects are referred to the country of the parent firm. All regressions control for distance, contiguity, colony relationship, common language, a dummy for China, GDP, GDP per capita, and remoteness of the country of the subsidiary. Robust standard errors in parentheses are clustered at the 6 digits NAICS level.

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

Conclusion

The theoretical and empirical literature explores the relationship between deep trade agreements and the international organization of production

- Deep trade agreements are associated to fragmentation of production and more trade in parts and components

We add to this line of work by showing that the content rather than the depth of PTAs matters for the way goods are traded internationally -i.e. within-firms (FDI) or at arm's length

- PTA provisions that improve the contractibility of components (μ_m) relative to headquarter services (μ_h) are associated to more vertical FDI

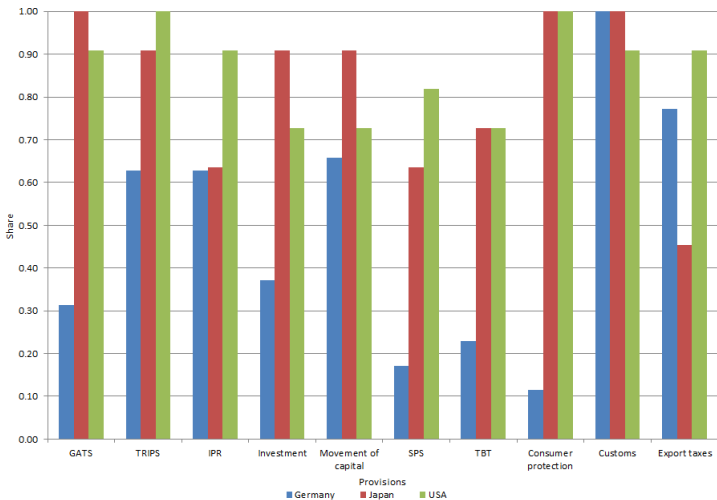


Figure: Frequency of *h*- and *m*-provisions in trade agreements by country

Table: Distribution of Vertical, Horizontal, and Complex FDI

Type	Number of Subsidiaries	Share
Vertical	25230	13.11
Horizontal	26904	13.98
Complex	776	0.40
Non-identified	139603	72.52

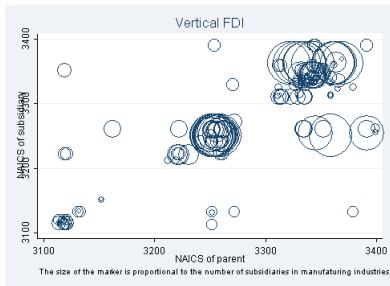


Figure: Vertical FDI

Endogeneity

As in Orefice and Rocha (2014), we instrument PTA depth and the μ 's between country i and country j with the weighted average depth or the μ 's of all the agreements signed by i and j with any other country excluding the agreement between i and j

$$DEPTH_{ijt}^{IV} = \frac{\sum_{s \in S} w_{ist} DEPTH_{ist} + \sum_{s \in S} w_{jst} DEPTH_{jst}}{N_{it} + N_{jt}}$$

where N_{it} (N_{jt}) is the number of mapped agreements of country i (j) in year t excluding the agreement with j (i) and w_{jst} are weights that take into account the GDP similarity between country i and s and between country j and s in time t

IV results

Table: Vertical FDI and Deep Integration - IV

	FDI (log of revenues in 1000\$)			
	Depth		Content	
	(1)	(2)	(3)	(4)
PTA	1.229*** (0.318)			
N. of Provisions		0.0558*** (0.0102)	-0.0367* (0.0204)	-0.0244 (0.0248)
Dummy $\mu_h = 1$ if at least one h provision			-2.388 (1.606)	
Dummy $\mu_m = 1$ if at least one m provision			4.551*** (1.415)	
Discrete μ_h				-0.342 (0.411)
Discrete μ_m				2.493*** (0.378)
Tariff (log)	0.106 (0.210)	-0.133 (0.233)	0.212 (0.215)	0.0195 (0.230)
Rule of Law	0.382*** (0.123)	0.370*** (0.126)	0.363*** (0.106)	0.462*** (0.109)
BIT	0.161 (0.136)	0.223 (0.145)	-0.0572 (0.110)	0.164 (0.127)
Observations	4,816	4,692	6,764	6,764
R-squared	0.240	0.232	0.229	0.233
Industry-4dig FE	Yes	Yes	No	No
Industry-6dig FE	No	No	Yes	Yes
Country-Year FE	Yes	Yes	Yes	Yes

Country and country-year fixed effects are referred to the country of the parent firm. All regressions control for distance, contiguity, colony relationship, common language, a dummy for China, GDP, GDP per capita, and remoteness of the country of the subsidiary. Robust standard errors in parentheses are clustered at the 6 digits NAICS level.

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