

Intellectual Property-Related Preferential Trade Agreements and the Composition of Trade

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Introduction

- International economists focus their analysis on commercial policies (tariffs, investment and service barriers) and changes in technology and transport costs.
- Far less studied but at least as important are trade-related regulatory systems:
 - Rules of origin;
 - Investment regulations;
 - Competition policy;
 - Financial markets regulation;
 - Technical product standards;
 - Labor protection rules, etc.
 - Intellectual property rights

The globalized IPRs system

- Last 20+ years have seen unprecedented expansion and harmonization of IPRs protection.
 - TRIPS at the WTO, subject to dispute settlement;
 - Additional WIPO treaties and rules;
 - “TRIPS-Plus” requirements in various PTAs; MFN requirements in TRIPS ratchet up protection.
 - Extension of investment protection guarantees to IPRs in BITs, IIAs, and PTAs.

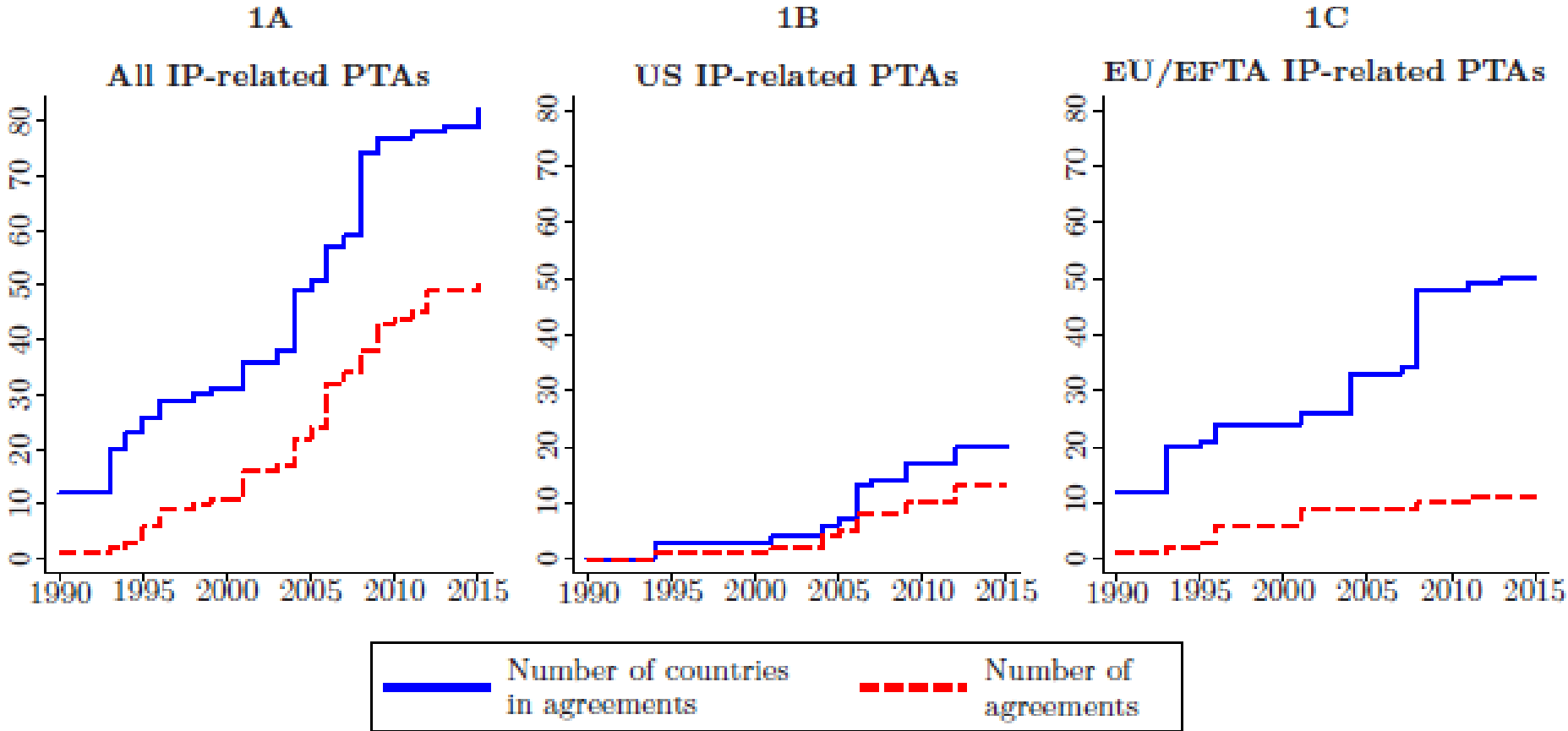
Expanding attention paid to IPR over time in PTAs and Partnership Agreements

- US-Israel FTA 1985: one paragraph mentioning NT and MFN.
- NAFTA 1994: essentially anticipated TRIPS.
- US-Jordan FTA 2001 (“gold standard” IPR): 5 pages, added some TRIPS-Plus features in patent standards, pharma, test data, digital CRs and anti-circumvention.
- US-Chile 2004: regularized test data periods, PV patents.
- US-Australia 2005: further pharma protection, linkage, limits on CR exceptions.
- US-Korea 2012: further limits on CR exceptions, patents for new uses, no pre-grant opposition, detailed rules on ISPs, extensive enforcement.
- TPP: biologics test data protection, trade secrets obligations, criminal enforcement.
- EU Partnership Agreements increasingly focus on IP issues, especially GIs.

IP-related PTAs

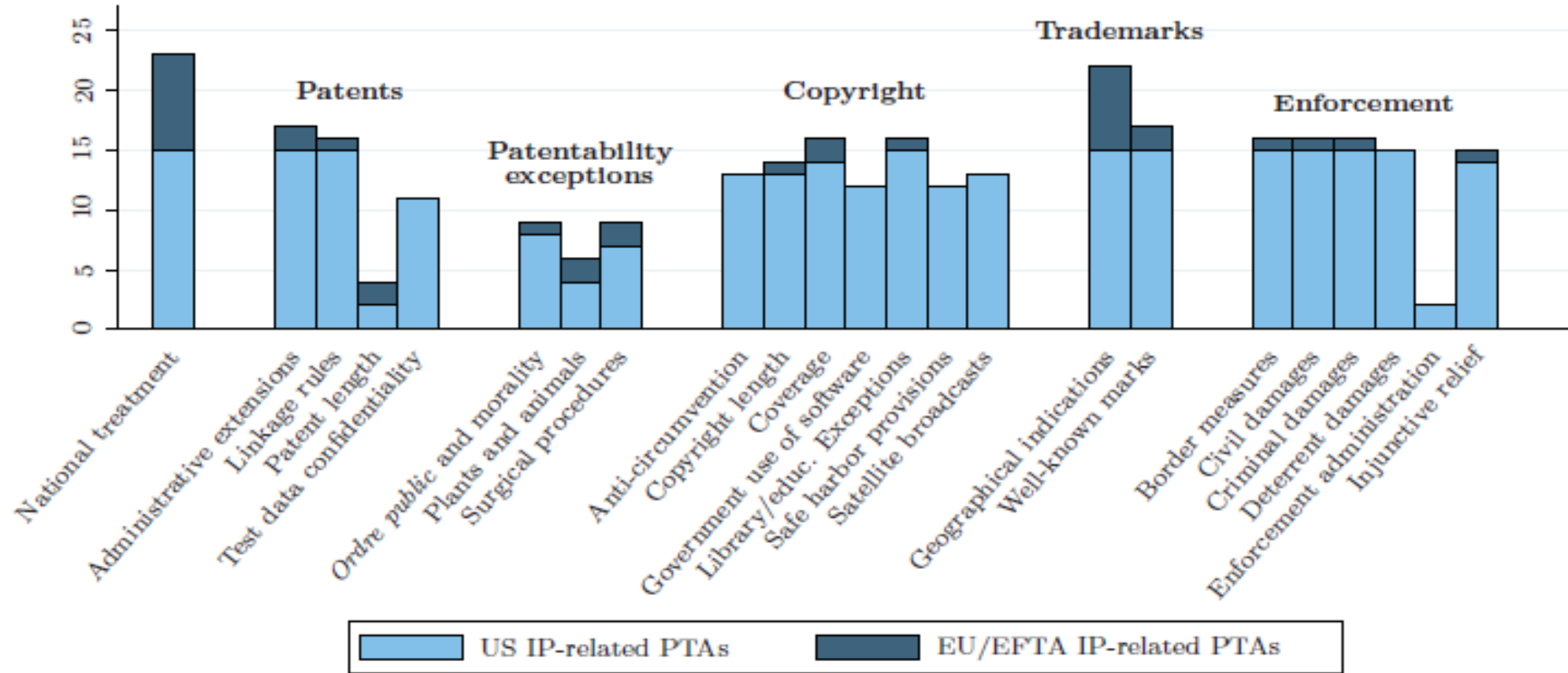
- Well over 400 PTAs exist currently (more if we include sector-specific agreements).
- 50 (as of 2015) have IP chapters of varying complexity. Most of these involve a developed country partner but newer developing-country PTAs increasingly feature them.
- 82 countries are now members of at least one such PTA (Figure 1A).
- We will define our “treatment” PTAs as those involving the US or EU/EFTA as a partner (Figure 1B and 1C).
- These PTAs vary in their legal coverage (Figure 2).
- It is also significant that PTAs increasingly feature additional chapters on related regulation areas (Figure XX, not in paper).

Figure 1: Number of IP-related trade agreements and number of countries with membership in one or more IP-related trade agreements by year, 1990 to 2015



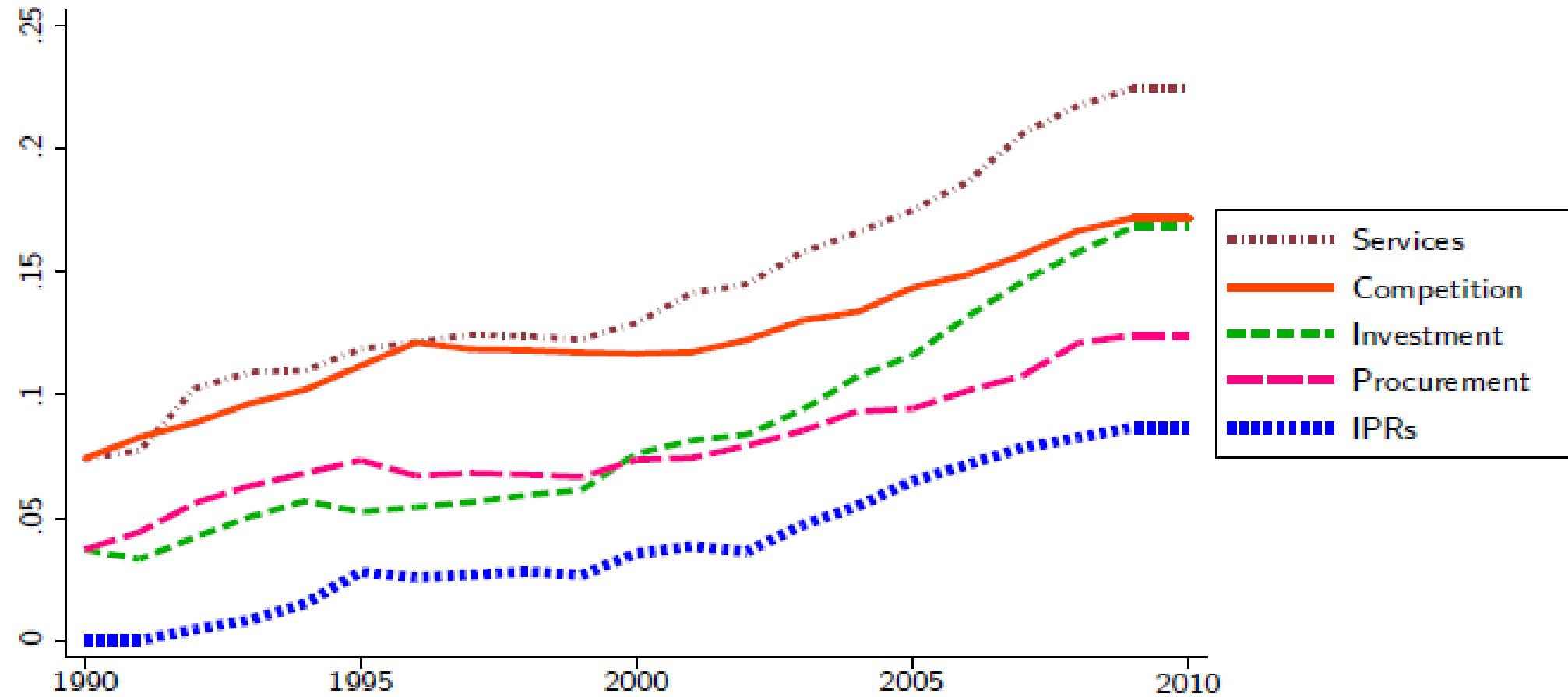
Source: Based on data from Dür et al. (2014)

Figure 2: Number of IP-related trade agreements by presence of specific provisions



Source: Authors' construction

Figure: Share of existing trade agreements with non-trade provisions



Motivation

- All of this suggests a potentially rich area for trade research on the economic effects of IPRs (and regulatory chapters) of PTAs.
- Some questions to be asked:
 - Do IP-related PTAs matter beyond the effects of TRIPS?
 - Are there impacts on trade, FDI, licensing, and innovation?
 - How do IPRs affect fixed costs of entering markets (by different modes) and does this vary within IP-related PTAs compared to others?
 - Are there interactions between IPRs and tariff cutting in PTAs?
 - Are there interactions between IPRs and other regulatory elements of PTAs?
 - Is there endogenous selection of IPRs chapters?
- Current paper is a first attempt at the most basic question: do IP-related PTAs have exceptional effects on member countries' aggregate trade flows?
- Paper's results raise more questions than they answer.

Identification approach

- Our analysis uses a DID approach to study imports and exports. We apply the method to both TRIPS effects and IP-related PTA (IPA) effects.
- Data sample: all countries in Comtrade, 1993-2013, exports and imports broken down into high-IP and low-IP goods.
- Sectors further broken down into specific IP-sensitive types of goods (patents, CRs, TMs) and then specific IP-intensive sectors.

Identification approach

- So identification is based on:
 - Difference 1: subset of countries joined an IPA with US or EU/EFTA (treatment), others did not (control). Dummy variable for year of joining and after. Also broken down by income group (development level).
 - Corresponding difference in dates at which countries came into compliance with TRIPS.
 - Difference 2: effects should differ between high-IP (treatment) and low-IP (control), using various definitions.
 - Difference 3: our preferred specification focuses on countries joining IPAs *after* becoming compliant with TRIPS.
- Endogeneity: we take TRIPS and IPRs rules in PTAs to be exogenously imposed in most PTA partners.
 - Developing and emerging countries would not likely adopt such rules endogenously.
 - For most PTA members the IPRs chapters are seen as secondary to gaining market access.

Baseline case: Imports and exports of high-IP vs. low-IP goods

- Essential questions:
 - Is there an impact of IPAs on high-IP versus low-IP trade?
 - Is there a difference between TRIPS and IPAs?
- Regression:

$$\log(TR_{ist}) = \beta_1 \log(GDP_{it}) + \beta_2 High-IP_s \times \log(GDP_{it}) + \beta_3 IPA_{it} + \beta_4 High-IP_s \times IPA_{it} \quad (1)$$
$$+ \beta_5 TRIPS_{it} + \beta_6 High-IP_s \times TRIPS_{it} + \alpha_{gst} + \alpha_i(\alpha_{it}) + \varepsilon_{ist}$$

Baseline case

- TR_{ist} = imports or exports of country i in s (high or low-IP), year t .
- IPA_{it} = indicator variable for whether i is a member of at least one IPA (in force) at t .
 - Definition 1: entered an IPA at any time (“contemporaneous”)
 - Definition 2: entered an IPA after in compliance with TRIPS (“post”).
- $TRIPS_{it}$ = indicator variable for whether i is compliant with TRIPS at t .
- $HighIP_s$ = indicator variable for high-IP industry group.
- FE’s for income group-sector-year and countries or country-year (latter is preferred).
- β_3 = extra trade effect in low-IP of IPA vs. non-IPA (β_5 for TRIPS).
- β_4 = extra trade effect within IPA of high-IP vs. low-IP (β_6 for TRIPS).

Case 2: effects also vary by income group

- Regression:

$$\begin{aligned} \log(TR_{ist}) = & \beta_1 \log(GDP_{it}) + \beta_2 High-IP_s \times \log(GDP_{it}) \\ & + \beta_3 IPA_{it} + \sum_g \beta_{4g} Group_i \times IPA_{it} + \sum_g \beta_{5g} Group_i \times High-IP_s \times IPA_{it} \\ & + \beta_6 TRIPS_{it} + \sum_g \beta_{7g} Group_i \times TRIPS_{it} + \sum_g \beta_{8g} Group_i \times High-IP_s \times TRIPS_{it} \\ & + \alpha_{gst} + \alpha_{it} + \varepsilon_{ist} \end{aligned} \quad (2)$$

- Group = low-income (LI), middle-income (MI), or high-income (HI) based on World Bank definitions in 1995. Proxy for development levels.

Case 2

- β_{4g} = extra trade effect in low-IP of IPA in group g (we exclude HI).
- β_{5g} = extra trade effect within IPA on high-IP goods in group g (include all groups).
- Similar for TRIPS (β_{7g} , β_{8g}).
- Results are in Table 2 for imports and Table 3 for exports.

Key results imports: cases 1 and 2 (Table 2)

- Market size matters for imports and there is a positive interaction in trade between GDP and high-IP sectors.
- IPA membership seems to have little direct effect on imports (column 1).
- TRIPS compliance has distinctive direct impacts on imports in low-IP versus high-IP (column 1).
- Permitting heterogeneous interactions broken down by income groups yields new results:
 - IPAs: high-IP imports rise sharply compared to low-IP (which fall) in low-income.
 - There are parallel effects of TRIPS in imports of middle-income.
- These results are robust to country time trends and post-TRIPS entry into IPAs.

Table 2: Aggregate imports of IP-intensive commodities

	(1)	(2)	(3)	(4)
		Contemporaneous entry		Post-TRIPS entry
	Homogeneous effects	Country FEs	Country time trends	Country time trends
log (GDP)	0.743*** (0.0593)	0.736*** (0.0594)	0.731*** (0.0593)	0.732*** (0.0594)
High-IP \times log (GDP)	0.0890*** (0.0119)	0.0923*** (0.0117)	0.0923*** (0.0117)	0.0920*** (0.0112)
IPA	-0.0463 (0.0592)	-0.0937 (0.0901)	-0.0945 (0.0907)	0.0305 (0.0859)
High-IP \times IPA	-0.0267 (0.0644)			
Mid-inc. \times IPA		0.111 (0.111)	0.111 (0.111)	-0.0628 (0.112)
Low-inc. \times IPA		-0.470** (0.210)	-0.472** (0.210)	-0.596*** (0.208)
High-inc. \times High-IP \times IPA		0.0367 (0.122)	0.0367 (0.122)	0.0248 (0.107)
Mid-inc. \times High IP \times IPA		-0.105 (0.0679)	-0.105 (0.0679)	-0.0410 (0.0716)
Low-inc. \times High IP \times IPA		0.660*** (0.103)	0.660*** (0.103)	0.659*** (0.103)

TRIPS	-0.153*** (0.0575)	0.122 (0.108)	0.122 (0.108)	0.100 (0.106)
High IP×TRIPS	0.200*** (0.0487)			
Mid-inc.×TRIPS		-0.327** (0.134)	-0.327** (0.134)	-0.296** (0.132)
Low-inc.×TRIPS		-0.286* (0.152)	-0.288* (0.152)	-0.266* (0.150)
High-inc.×High IP×TRIPS		-0.114 (0.145)	-0.114 (0.145)	-0.102 (0.140)
Mid-inc.×High IP×TRIPS		0.292*** (0.0538)	0.292*** (0.0538)	0.269*** (0.0530)
Low-inc.×High IP×TRIPS		0.142 (0.0959)	0.142 (0.0959)	0.142 (0.0958)
Observations	6,176	6,176	6,176	6,176
R-squared	0.981	0.981	0.981	0.981
Income group-sector-year FE	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	No
Country trends	No	No	No	Yes
Number of countries	185	185	185	185

Notes: Robust standard errors clustered by country are reported in parentheses. The omitted IPA and TRIPS dummies in columns (3) and (4) are High-inc.×IPA and High-inc.×TRIPS. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Key results exports: cases 1 and 2 (Table 3)

- Market size (capacity) also matters for exports and high-IP sectors.
- Again, IPA has little direct effect on exports.
- TRIPS direct effects are similar (- in low-IP; + in high-IP) for both imports and exports.
- Heterogeneity in income groups:
 - Direct exports effects of IPAs are insignificant but there is a highly significant positive effect in high-IP goods among middle-income.
 - Direct exports effects of TRIPS are negative, with some offset in high-IP goods.
- Evident results at this point:
 - High-IP imports in low-income countries are stimulated by IPAs and in middle-income countries by TRIPS.
 - High-IP exports in middle-income countries are stimulated by IPAs.
 - TRIPS may diminish overall trade in both groups but expands high-IP exports in middle-income.

Table 3: Aggregate exports of IP-intensive commodities

	(1)	(2)	(3)	(4)
		Contemporaneous entry		Post-TRIPS entry
	Homogeneous effects	Country FEs	Country time trends	Country time trends
log (GDP)	0.449*** (0.133)	0.448*** (0.134)	0.442*** (0.133)	0.438*** (0.132)
High-IP \times log (GDP)	0.209*** (0.0644)	0.219*** (0.0646)	0.219*** (0.0646)	0.225*** (0.0641)
IPA	-0.231* (0.134)	-0.208 (0.238)	-0.207 (0.237)	-0.236 (0.237)
High-IP \times IPA	0.346 (0.211)			
Mid-inc. \times IPA		-0.129 (0.285)	-0.132 (0.284)	-0.210 (0.283)
Low-inc. \times IPA		0.382 (0.356)	0.377 (0.355)	0.402 (0.353)
High-inc. \times High IP \times IPA		0.387 (0.464)	0.387 (0.464)	0.359 (0.414)
Mid-inc. \times High IP \times IPA		0.561*** (0.211)	0.561*** (0.211)	0.785*** (0.217)
Low-inc. \times High IP \times IPA		-0.610* (0.367)	-0.610* (0.367)	-0.601 (0.365)

TRIPS	-0.367** (0.156)	0.374 (0.313)	0.378 (0.312)	0.364 (0.295)
High IP×TRIPS	0.451* (0.273)			
Mid-inc.×TRIPS		-0.825** (0.381)	-0.831** (0.381)	-0.810** (0.368)
Low-inc.×TRIPS		-0.870** (0.415)	-0.882** (0.414)	-0.864** (0.402)
High-inc.×High IP×TRIPS		-1.074* (0.587)	-1.074* (0.587)	-1.036* (0.547)
Mid-inc.×High IP×TRIPS		0.700* (0.408)	0.700* (0.408)	0.678* (0.404)
Low-inc.×High IP×TRIPS		0.602 (0.372)	0.602 (0.372)	0.595 (0.372)
Observations	6,139	6,139	6,139	6,139
R-squared	0.918	0.920	0.920	0.920
Income group-sector-year FE	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	No
Country trends	No	No	No	Yes
Number of countries	186	186	186	186

Notes: Robust standard errors clustered by country are reported in parentheses. The omitted IPA and TRIPS dummies in columns (3) and (4) are High-inc.×IPA and High-inc.×TRIPS. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Case 3: disaggregating high-IP goods by IPR type

- Regression:

$$\begin{aligned} \log(TR_{ist}) = & \beta_1 \log(GDP_{it}) + \sum_s \beta_{2s} Type_s \times \log(GDP_{it}) \\ & + \beta_3 IPA_{it} + \sum_g \beta_{4g} Group_i \times IPA_{it} + \sum_g \sum_s \beta_{5gs} Group_i \times Type_s \times IPA_{it} \\ & + \beta_6 TRIPS_{it} + \sum_g \beta_{7g} Group_i \times TRIPS_{it} + \sum_g \sum_s \beta_{8gs} Group_i \times Type_s \times TRIPS_{it} \\ & + \alpha_{gst} + \alpha_{it} + \varepsilon_{ist} \end{aligned} \quad (3)$$

- $Type_s$ = indicator variables for high-IP sector dependence on patents, CRs, or TMs.
- This is a basic attempt to get at whether the varying coverage in IPAs matters for trade.

Key results imports: case 3 (Table 4)

- Note these are *single* regressions with larger sample sizes.
- Incorporate country time trends and post-TRIPS entry.
- The relative expansion of high-IP imports in low-income IPA economies exists in all 3 types of IP.
- Imports are not much affected by IPA membership among middle-income countries.
- But TRIPS is different: a direct reduction in low-IP imports but a strong increase in each type of IP among middle-income.
- Low-income imports of TM-sensitive goods seem to rise due to TRIPS.
- These findings suggest that results in the literature of a pro-imports effect of TRIPS may be due to a combination of TRIPS and IPAs.

Table 4: Aggregate imports by type of IP-intensiveness (single regression)

	(1) IPA		(2) TRIPS
log (GDP)	0.762*** (0.0613)		
PAT \times log (GDP)	0.110*** (0.0117)		
CR \times log (GDP)	-0.0927*** (0.0223)		
TM \times log (GDP)	0.0529*** (0.0125)		
IPA	-0.107 (0.128)	TRIPS	0.118 (0.178)
Mid-inc. \times IPA	0.0689 (0.149)	Mid-inc. \times TRIPS	-0.379* (0.197)
Low-inc. \times IPA	-0.596*** (0.227)	Low-inc. \times TRIPS	-0.309 (0.216)
High-inc. \times PAT \times IPA	-0.0335 (0.110)	High-inc. \times PAT \times TRIPS	-0.0353 (0.123)
High-inc. \times CR \times IPA	0.318 (0.208)	High-inc. \times CR \times TRIPS	-0.208 (0.487)
High-inc. \times TM \times IPA	0.297* (0.155)	High-inc. \times TM \times TRIPS	-0.0167 (0.164)

Mid-inc. \times PAT \times IPA	-0.0735 (0.0762)	Mid-inc. \times PAT \times TRIPS	0.312*** (0.0582)
Mid-inc. \times CR \times IPA	0.0494 (0.126)	Mid-inc. \times CR \times TRIPS	0.442*** (0.147)
Mid-inc. \times TM \times IPA	0.0938 (0.0653)	Mid-inc. \times TM \times TRIPS	0.160*** (0.0590)
Low-inc. \times PAT \times IPA	0.652*** (0.121)	Low-inc. \times PAT \times TRIPS	0.121 (0.105)
Low-inc. \times CR \times IPA	0.832*** (0.124)	Low-inc. \times CR \times TRIPS	0.0479 (0.158)
Low-inc. \times TM \times IPA	0.737*** (0.0893)	Low-inc. \times TM \times TRIPS	0.267*** (0.0912)
Observations			12,335
R^2			0.973
Income group-sector-year FE			Yes
Country time trends			Yes

Notes: Robust standard errors clustered by country are reported in parentheses. The omitted IPA and TRIPS dummies are High-inc. \times IPA and High-inc. \times TRIPS. Reported coefficients are estimated from a single regression of aggregate imports on the set of controls in equation (3). *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Key results exports (case 3): Table 5

- Middle-income countries in IPAs see significantly higher exports in all 3 IP types.
- With this breakdown, TRIPS seems to have negative direct effects on exports of both middle-income and lower-income economies.
- But both patent-dependent and TM-dependent exports have significantly positive coefficients in middle-income; also in TM for low-income.
- These TM effects may reflect growth in footwear and furniture exports.

Table 5: Aggregate exports by type of IP-intensiveness (single regression)

	(1) IPA		(2) TRIPS
log (GDP)	0.290** (0.142)		
PAT \times log (GDP)	0.222*** (0.0631)		
CR \times log (GDP)	0.147** (0.0598)		
TM \times log (GDP)	0.360*** (0.0696)		
IPA	-0.582* (0.315)	TRIPS	0.995** (0.459)
Mid-inc. \times IPA	-0.0756 (0.360)	Mid-inc. \times TRIPS	-1.513*** (0.520)
Low-inc. \times IPA	0.723 (0.449)	Low-inc. \times TRIPS	-1.682*** (0.567)
High-inc. \times PAT \times IPA	0.547 (0.421)	High-inc. \times PAT \times TRIPS	-1.086** (0.522)
High-inc. \times CR \times IPA	0.791** (0.364)	High-inc. \times CR \times TRIPS	-1.450* (0.771)
High-inc. \times TM \times IPA	0.444 (0.522)	High-inc. \times TM \times TRIPS	-1.343* (0.764)

Mid-inc. \times PAT \times IPA	0.868*** (0.229)	Mid-inc. \times PAT \times TRIPS	0.616* (0.357)
Mid-inc. \times CR \times IPA	1.168*** (0.302)	Mid-inc. \times CR \times TRIPS	0.459 (0.362)
Mid-inc. \times TM \times IPA	0.751*** (0.222)	Mid-inc. \times TM \times TRIPS	0.855** (0.408)
Low-inc. \times PAT \times IPA	-0.662 (0.411)	Low-inc. \times PAT \times TRIPS	0.496 (0.376)
Low-inc. \times CR \times IPA	0.200 (0.446)	Low-inc. \times CR \times TRIPS	-0.00335 (0.418)
Low-inc. \times TM \times IPA	-0.0578 (0.419)	Low-inc. \times TM \times TRIPS	0.767* (0.420)
Observations			12,090
R^2			0.915
Income group-sector-year FE			Yes
Country time trends			Yes

Notes: Robust standard errors clustered by country are reported in parentheses. The omitted IPA and TRIPS dummies are High-inc. \times IPA and High-inc. \times TRIPS. Reported coefficients are estimated from a single regression of aggregate exports on the set of controls in equation (3). *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Case 4: Disaggregating high-IP goods by industrial cluster

- Regression:

$$\begin{aligned} \log(TR_{ist}) = & \beta_1 \log(GDP_{it}) + \sum_s \beta_{2s} Sector_s \times \log(GDP_{it}) & (4) \\ & + \beta_3 IPA_{it} + \sum_g \beta_{4g} Group_i \times IPA_{it} + \sum_g \sum_s \beta_{5gs} Group_i \times Sector_s \times IPA_{it} \\ & + \beta_6 TRIPS_{it} + \sum_g \beta_{7g} Group_i \times TRIPS_{it} + \sum_g \sum_s \beta_{8gs} Group_i \times Sector_s \times TRIPS_{it} \\ & + \alpha_{gst} + \alpha_{it} + \varepsilon_{ist} \end{aligned}$$

- Now $Sector_s$ = indicator for analytical instruments (AI), biopharmaceuticals (BIO), chemicals (CHEM), information and communication technologies (ICT), medical devices (MED), and production technologies (PT).

Key results (case 4): Tables 6 and 7

- For high-income countries, both imports and exports of BIO are sensitive to IPA membership.
- Exports of CHEM, MED, and PT are also positively affected.
- For middle-income economies all of the export triple interactions are significantly positive. This seems to be a primary trade effect of IPA membership.
- Low-income countries have generally positive import impacts but negative export effects in the IPA interactions. Exception is BIO.
- TRIPS compliance reduces low-IP imports and exports in both types of developing countries.
- But triple interactions with TRIPS are again significantly positive for middle-income imports. This seems to be a primary trade effect of TRIPS.

Table 6: Aggregate imports by IP-intensive industry cluster (single regression)

	(1) IPA		(2) TRIPS
log (GDP)	0.664*** (0.0711)		
AI × log (GDP)	0.277*** (0.0204)		
BIO × log (GDP)	0.0808*** (0.0308)		
CHEM × log (GDP)	0.265*** (0.0211)		
ICT × log (GDP)	0.140*** (0.0189)		
MED × log (GDP)	0.153*** (0.0193)		
PT × log (GDP)	0.197*** (0.0168)		
IPA	-0.104 (0.155)	TRIPS	0.347 (0.232)
Mid-inc. × IPA	0.0708 (0.176)	Mid-inc. × TRIPS	-0.683*** (0.256)
Low-inc. × IPA	-0.512** (0.224)	Low-inc. × TRIPS	-0.587** (0.272)
High-inc. × AI × IPA	-0.0670 (0.158)	High-inc. × AI × TRIPS	0.0121 (0.300)
High-inc. × BIO × IPA	0.639*** (0.198)	High-inc. × BIO × TRIPS	0.0381 (0.499)
High-inc. × CHEM × IPA	0.307 (0.186)	High-inc. × CHEM × TRIPS	-0.306 (0.434)
High-inc. × ICT × IPA	-0.199 (0.173)	High-inc. × ICT × TRIPS	-0.154 (0.328)
High-inc. × MED × IPA	0.180 (0.137)	High-inc. × MED × TRIPS	-0.144 (0.244)
High-inc. × PT × IPA	-0.0618 (0.176)	High-inc. × PT × TRIPS	-0.394* (0.214)

Mid-inc. × AI × IPA	-0.0817 (0.119)	Mid-inc. × AI × TRIPS	0.389*** (0.142)
Mid-inc. × BIO × IPA	0.168 (0.123)	Mid-inc. × BIO × TRIPS	0.343** (0.162)
Mid-inc. × CHEM × IPA	-0.168* (0.0880)	Mid-inc. × CHEM × TRIPS	0.434*** (0.120)
Mid-inc. × ICT × IPA	-0.0138 (0.144)	Mid-inc. × ICT × TRIPS	0.537*** (0.103)
Mid-inc. × MED × IPA	-0.0876 (0.0815)	Mid-inc. × MED × TRIPS	0.240* (0.125)
Mid-inc. × PT × IPA	-0.154* (0.0809)	Mid-inc. × PT × TRIPS	0.193** (0.0898)
Low-inc. × AI × IPA	0.342* (0.177)	Low-inc. × AI × TRIPS	0.322* (0.166)
Low-inc. × BIO × IPA	1.363*** (0.200)	Low-inc. × BIO × TRIPS	-0.0576 (0.196)
Low-inc. × CHEM × IPA	0.352** (0.147)	Low-inc. × CHEM × TRIPS	0.271** (0.122)
Low-inc. × ICT × IPA	0.462*** (0.0921)	Low-inc. × ICT × TRIPS	0.174 (0.127)
Low-inc. × MED × IPA	0.809*** (0.153)	Low-inc. × MED × TRIPS	-0.0381 (0.203)
Low-inc. × PT × IPA	0.154 (0.207)	Low-inc. × PT × TRIPS	0.207* (0.122)
Observations			21,414

Table 7: Aggregate exports by IP-intensive industry cluster (single regression)

	(1) IPA		(2) TRIPS
log (GDP)	0.300** (0.140)		
AI× log (GDP)	0.313*** (0.0674)		
BIO× log (GDP)	0.401*** (0.0723)		
CHEM× log (GDP)	0.491*** (0.0800)		
ICT× log (GDP)	0.306*** (0.0865)		
MED× log (GDP)	0.411*** (0.0615)		
PT× log (GDP)	0.265*** (0.0548)		
IPA	-0.773* (0.417)	TRIPS	1.028* (0.553)
Mid-inc.×IPA	-0.206 (0.475)	Mid-inc.×TRIPS	-1.598*** (0.601)
Low-inc.×IPA	1.383** (0.544)	Low-inc.×TRIPS	-1.503** (0.646)
High-inc. × AI × IPA	0.748 (0.502)	High-inc. × AI × TRIPS	-0.520 (0.701)
High-inc. × BIO × IPA	2.146*** (0.570)	High-inc. × BIO × TRIPS	-1.156 (0.745)
High-inc. × CHEM × IPA	1.108* (0.571)	High-inc. × CHEM × TRIPS	-1.216 (0.761)
High-inc. × ICT × IPA	0.193 (0.561)	High-inc. × ICT × TRIPS	-0.793 (0.724)
High-inc. × MED × IPA	0.978** (0.468)	High-inc. × MED × TRIPS	-1.502* (0.782)
High-inc. × PT × IPA	0.864** (0.426)	High-inc. × PT × TRIPS	-1.170* (0.644)

Mid-inc. × AI × IPA	1.272*** (0.346)	Mid-inc. × AI × TRIPS	0.743** (0.359)
Mid-inc. × BIO × IPA	1.221*** (0.375)	Mid-inc. × BIO × TRIPS	0.0956 (0.361)
Mid-inc. × CHEM × IPA	0.650*** (0.243)	Mid-inc. × CHEM × TRIPS	0.763* (0.390)
Mid-inc. × ICT × IPA	1.418*** (0.405)	Mid-inc. × ICT × TRIPS	0.777 (0.475)
Mid-inc. × MED × IPA	1.483*** (0.368)	Mid-inc. × MED × TRIPS	0.414 (0.390)
Mid-inc. × PT × IPA	1.069*** (0.271)	Mid-inc. × PT × TRIPS	0.490 (0.340)
Low-inc. × AI × IPA	-1.473*** (0.343)	Low-inc. × AI × TRIPS	0.298 (0.410)
Low-inc. × BIO × IPA	1.123** (0.524)	Low-inc. × BIO × TRIPS	0.366 (0.492)
Low-inc. × CHEM × IPA	-1.243* (0.751)	Low-inc. × CHEM × TRIPS	0.354 (0.537)
Low-inc. × ICT × IPA	0.965 (0.855)	Low-inc. × ICT × TRIPS	0.657* (0.351)
Low-inc. × MED × IPA	-0.737** (0.299)	Low-inc. × MED × TRIPS	0.455 (0.407)
Low-inc. × PT × IPA	-1.349*** (0.354)	Low-inc. × PT × TRIPS	0.441 (0.370)
Observations			20,253

Conclusions and extensions

- Initial evidence here is that IP-related PTAs are an important determinant of trade composition.
- Imports of high-IP goods seem to be stimulated by IPA membership most in low-income countries but exports are more sensitive in middle-income countries.
- In many dimensions these IPA effects seem to dominate those of TRIPS.
- But this work needs to be extended and refined. Some ideas:
 - Extend to sectoral trade to distinguish (1) intermediates versus final goods; and (2) intensive versus extensive margin effects.
 - Extend to bilateral trade to see if there are “IP-related” trade diversion and trade creation.
 - Study channels through which these effects may be happening (FDI, R&D, patenting, etc.)
 - Study whether IP chapters interact with other regulatory features of PTAs, including tariff cuts.