

INTERNATIONAL

# A (more) systematic exploration of the trade effects of product-specific Rules of Origin\*

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## Objectives

- Exploratory paper in the footsteps and spirit of Nogues et al (1986)
- To what extent do Product Specific RoOs (PSRs) present in all PTAs affect the intensity of bilateral flows? (already explored by Estvadeordal (2000), Carrère-Melo (2006) and others, but in selected FTAs, e.g. NAFTA). Here across all PTA in DTA
- Novelty: exploration over all publicly available reciprocal FTAs in the 'Deep Trade Agreement (DTA)' data base.
- DTA covers 181 exporters and 181 importers over 1990-2015 on a yearly basis. Bilateral flows at HS6 level.
- Data on HS6 level bilateral trade flows from CEPII and preferential margins calculated from WITS.
- Simulate move to more flexible PSR regime on bilateral on intensity of bilateral trade. (take away: Adopting a flexible PSR rule: bilateral exports up by 5-15%)
- Results also support for harmonization and simplification of non-preferential RoO advocated by Hoekman and Inama (2018) and others.

## Deep Trade Agreement (DTA) data base

- Data collection by Angeli et al. (2020) reported in (Mattoo et al. eds 2020) *Handbook of Deep Trade Agreements.*
- Reciprocal PTAs (almost exclusively FTAs). EBA, AGOA not included.
- Regime of registration of trade flows not available. No data on preference utilization rates (PURs), nor choice of PTA when several available.
- Here concentration on Product Specific RoO (PSRs), all mutually exclusive. Regime-wide rules (non-exclusive) 'captured' in FEs.
- 17 mutually exclusive categories of PSRs aggregated to 7 categories (4 stand-alone and 3 composite)- see below.
- Bilateral import flows from CEPIIs BACI database. Tariffs from WITS.

### Data preparation

Steps	Sample period	Nbr of countries	Nbr of products	Change in nbr of observations	Nbr of observations	Change in trade value	<b>Trade value</b> (in billion USD)
Raw data	1990-2015	181	5 018		121 224 927		156 580
exclude small exporters (<25 percentile)				-1,2%	119 820 171	-0,2%	156 324
exclude if <=5 years of observed trade				-18,7%	97 435 976	-1,7%	153 721
data at 5 years intervals	1990, 1995, 2000, 2005, 2010, 2015	135 exporters, 181 importers		-77,6%	21 803 233	-77,7%	34 280
exclude trade flows<1000 USD				-13,5%	18 854 670	-0,003%	34 279
exclude if MFN=0 & PSR=1				-2,4%	18 393 110	-6,1%	32 171
exclude products in RTA without PSR				-5,0%	17 480 272	-9,7%	29 061
Final data	1990, 1995, 2000, 2005, 2010, 2015	135 exporters, 181 importers	5 018		17 480 272		29 061

Notes: \* 22.8% of those products (207,790 observations) are in an RTA with a zero applied MFN tariff. Changes in number of observations and in trade value are from each step. Source: Authors.

## Classifying mutually exclusive PSRs

Rules to aggregate the 17 categories into 7 categories listed in previous slide:

- 1. CTC not disaggregated into sub levels (CC[15%], CH[71], CS[14%]) except for robustness check,
- 2. Group all types of combinations of 'and' into one group (COM),
- 3. Group all types of alternatives 'either/or' in one group (ALT).
- 4. Group all rules with an exception to CTC in one group (EXC)

	4 stand-alone rules:		<u>3 composite rules:</u>
•	WO: wholly obtained (1)	•	EXC: Any rule with a CTC and an exception [5]
•	CTC: change in tariff classification (2)	•	COM: rules with combination ('and') criteria
•	VCR: value content (3)		(without exception in CTC) [6]
•	TR: technical requirement (4)	•	ALT: rules with alternative ('or') criteria (without
			exception in CTC) [7]

Ranking PSRs by expected restrictiveness on trade flow at HS6 level

#### **Stand-alone rules**

(a)  $CC \le CH \le CS$  across CTC categories ;

(b)  $(VC < 40\%) \le (VC = 40\%) \le (VC \ge 40\%)$ 

(c) CC<CH<CS

(d) TR> CTC (usually Technical requirements when CTC deemed insufficient to satisfy ST rule)

(e) TR> VC (but depends on VC threshold)

(f) WO (?) very product-specific but likely to be more restrictive than other stand-alone rules

 $\rightarrow$  (a), (b), (c), (d) predictions hold in model estimates

#### **Composite Rules (predictions more tricky)**

(g) ALT < COM (complexity raises compliance costs)

(h) ALT<VC<CTC<TR (on grounds of transparency, complexity and choice)

(i) CTC<EXC<COM

 $\rightarrow$  (g) prediction holds in model estimates, others ambiguous

## **PSR Patterns (details in annex)**

## Patterns (1)

Estimates for panel with 6 intervals of 5 years each. Number of PTA in each year in partenthesis: 1990(3), 1995(17), 2000(28), 2005(51), 2020(95), 2015(128) [A0]

Shift in distribution of PSRs [A1]

- Except for Wholly obtained (WO) much less used, others are stable and evenly distributed
- Share of flexible rules (ALT) reduced by 2/3 to 13%
- Share of VCRs doubled to 15%
- Share of technical (TR) fell to 17%. Share of EXC stable.

Distribution of PSRs across Pmargs\* [A2,A3,A4]

 Distribution of PSRs across bins right-skewed Pmarg fairly evenly distributed. Outliers concentrated in VCR and TR [A4] and [A7]

\* Pmarg proxied by applied MFN (A2,A3]. ¼ of tariff lines above 15% are excluded from preferential liberalization (Espitia et al. 2020). Here, excluded lines are in control group. 8

# Patterns (2)

Distribution of PSRs across HS2 sections [A5]

- CTC accounts for over 10% of PSRs in all HS2 categories.
- Flexibility (ALT) accounts for over 20% of PSRs for 7 sectors. Animal products only sector with less than 10% of ALT.
- TR concentrated in plastics, textiles, and transportation

Distribution of PSRs by HS2 [A6]

- Textiles: Large array of PSRs relatively evenly distributed (VCR, TR, EXC); highest share of ALT...
- Chemicals and machinery: large share of CTC at subheading level
- Textiles and machinery have largest dispersion with large combination of ALT and COM

**Gravity model (HS6-level)** 

## Panel OLS estimates of structural Gravity model (HS6 level)

$$lnX_{ijkt} = \beta_0 + \beta_1 D_{ijt}^{PSR} + \delta_{ijk} + \eta_{ikt} + \theta_{jkt} + \epsilon_{ijkt}$$

with i = 1, ..., 135; j = 1, ..., 181; k = 1, ..., 5018; t = 1, ..., 6

- *lnX<sub>ijkt</sub>*: logarithm of bilateral imports of HS6-product *k* between country *i* and *j* in panel-year *t*.
- D<sub>PSR</sub>: dummy taking 1 in the presence of a PSR attached to a preferential tariff, 0 otherwise (i.e. control group consists of trade outside of RTAs).
- $\delta_{ijk}$ : bilateral country-product fixed effects
- $\eta_{ikt}$  and  $\theta_{jkt}$ : good-specific outward and inward Multilateral Resistance terms
- $\epsilon_{ijkt}$ : standard error clustered at the treatment level.

(1)

## Final data structure

Data: Bilateral import flows from CEPIIs BACI database and tariffs from WITS. No intra-EU trade. Intra-national trade flows not controlled for.



Notes: in *ijkt*, *i* stands for exporter, *j* importer, *k* HS6-product, *t* panel year. \*indicates the average across all sample years.

PSR categories: WO = wholly obtained; TR = technical requirement; VCR = value content requirement; ALT = alternative ('or'); CTC = change in tariff classification; COM = combination ('and'); EXC = exception.

Source: Authors.

## **Cross-section estimates**

Import value in million USD  $X_{i jkt}$ 

#### Table 2: Preference margins, PSRs and bilateral trade flows: cross-section estimates

Dependent variable:

PTA dummy always significant; lower in later years

• •	
>) ** 7)	<ul> <li>Bilateral flows</li> </ul>
1 1 1)	higher than in
) )) **	control group and
+) **	positively related
8) **	to Pmarg.

not always ated with sity of trade

vity varbs s significant at HS6 level

Cross section year:	19	90	19	95	20	00	20	05	20	10	20	15	Signifi
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	valua
Presence of product-specific rules of origin (PSR)	0.710***		0.420***		0.376***		0.152**		0.251***		0.148***		value
	(0.252)		(0.133)		(0.082)		(0.060)		(0.055)		(0.053)		
Preferential margin (PM) in log		0.715***		0.213***		0.130*		0.363***		0.253***		0.482***	
		(0.121)		(0.082)		(0.068)		(0.057)		(0.059)		(0.066)	
Wholly obtained (WO) dummy		0.622		-0.113		-0.134**		0.085*		-0.176***		-0.081**	Bilat
		(0.420)		(0.136)		(0.059)		(0.049)		(0.037)		(0.037)	Dila
Change in Tariff Classification only (CTC) dummy		0.279**		-0.075**		-0.181***		0.044**		-0.050***		-0.011	higho
		(0.120)		(0.032)		(0.028)		(0.020)		(0.015)		(0.014)	Ilighe
Value content requirement only (VCR) dummy		0.540***		0.430***		0.014		0.172***		0.027		0.019	
		(0.201)		(0.049)		(0.032)		(0.024)		(0.019)		(0.019)	contro
Technical Requirement only (TR) dummy		0.243		0.093*		-0.128***		-0.029		-0.078***		-0.058**	
		(0.159)		(0.051)		(0.039)		(0.030)		(0.023)		(0.024)	positiv
Alternative (ALT) dummy		0.339***		0.158***		-0.050		0.149***		0.088***		0.090***	p 0 0
		(0.109)		(0.041)		(0.034)		(0.025)		(0.020)		(0.018)	to Pm
Combination (COM) dummy		-		0.309***		0.200***		0.243***		0.079***		0.064***	
				(0.050)		(0.046)		(0.029)		(0.026)		(0.024)	
Exception (EXC) dummy		-		-		-		· · ·		· - /		-	
													PSRs
Common official or primary language	0.369***		0.464***		0.437***		0.435***		0.455***		0.455***		
	(0.069)		(0.050)		(0.045)		(0.042)		(0.045)		(0.051)		correl
Contiguity	0.270		0.605***		0.486***		0.539***		0.627***		0.641***		conci
0, 7	(0.360)		(0.155)		(0.137)		(0.121)		(0.114)		(0.120)		incton
Distance in log	-0.725***		-0 725***		-0.767***		-0.830***		-0 797***		-0.836***		msten
5	(0.043)		(0.032)		(0.028)		(0.033)		(0.033)		(0.033)		£1
Constant	16.989***	10.668***	16.793***	10.663***	16.960***	10.472***	17.686***	10.575***	17.586***	10.770***	18.039***	10.858***	TIOWS
	(0.382)	(0.002)	(0.286)	(0.002)	(0.244)	(0.002)	(0.292)	(0.002)	(0.293)	(0.002)	(0.291)	(0.002)	
Fixed effects	ik, ik	ik. ik. ii	ik. ik	ik. ik. ii	ik. ik	ik. ik. ii	ik. ik	ik, ik, ii	ik, ik	ik. ik. ii	ik, ik	ik, ik, ii	
Observations	971,967	971,653	2,478,389	2,477,555	3,046,614	3,045,609	3,407,029	3,406,039	3,454,516	3,453,560	3,061,203	3,060,232	Grav
Adjusted R-squared	0.53	0.57	0.51	0.56	0.52	0.56	0.52	0.57	0.53	0.58	0.55	0.60	Gru
Robust standard errors are in parentheses.   Cluster-level:	ij	ijk	วโพวพ										
*** p<0.01, ** p<0.05, * p<0.1			-			-	-	-	-	-	-	-	aivvdy
·			•		•		•	I				I	

#### Panel estimates: Dummy for PTA and by quantile (tab.3)

Dependent variable:	Import value in million USD									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)			
Dummy for presence of preferential tariff (PPT) attached to PSROO	0.079***									
	(0.004)									
OECD exporter/OECD importer dummy * PPT dummy		0.043***								
non OECD eventer/nen OECD impeter dummut BBT dummu		(0.008)								
non-OECD exponen non-OECD imponer dummy "PPT dummy		(0.007)								
OECD exporter/ non-OECD importer dummy * PPT dummy		0.127***								
		(0.006)								
non-OECD exporter/ OECD importer dummy * PPT dummy		-0.086***								
		(0.008)								
25th quantile: PPT dummy			-0.082***							
			(0.006)							
50th quantile: PPT dummy				-0.038***						
				(0.007)						
75th quantile: PP1 dummy					0.156***					
Dummy for intermediates * PPT dummy					(0.009)	0.090***				
Duniny of memoriales 111 duniny						(0.006)				
Dummy for final goods * PPT dummy						0.071***				
						(0.006)				
Dummy for preferential tariff * Dummy for preference margin (PM) <= 5%							0.051***			
							(0.008)			
Dummy for preferential tariff * Dummy for preference margin (PM) > 5%							0.084***			
Constant	10 770***	10 767***	9 095***	10 525***	10 066***	10 761***	(0.004)			
Constant	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)			
Fixed effects	(0.000)	(0.000)	(0.001)	ijk, ikt, jkt	(0.001)	(0.000)	(0.000)			
Observations	15,224,938	15,224,938	15,224,938	15,224,938	15,224,938	15,124,042	15,224,938			
Adjusted R-squared	0.67	0.67	0.32	0.43	0.47	0.67	0.67			
Robust standard errors, clustered at symmetric country-pairs and product (ijk)	level, are in pa	rentheses.								

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

Col. (1) Results robust to different samples. See [A8]. Quantile results in table [A9] 14

# Bilateral flows by Pmarg

Figure 6: Coefficients by interval of preferential margins (column 7)



Notes: Coefficient from table 4 column 7 with confidence intervals at the 95%-level.

Coherent with parametric and non-parametric estimates returning administrative compliance costs 2-5% range

## Estimates across PSR categories

 $lnX_{ijkt} = \beta_0 + \sum_{PSR_n=1}^7 \beta_{PSR_n} D_{ijkt}^{PSR_n} + \sum_{PSR_n=1}^7 \gamma_{PSR_n} D_{ijkt}^{PSR_n} \ln PM_{ijkt} + \sigma_{ijt} + \delta_{ijk} + \eta_{ikt} + \theta_{jkt} + \epsilon_{ijkt}$ 

Here reference category is EXC. Treatment is at the ijkt-level so we add bilateral timevariant fixed effects, oijt. Controls for unobservable trade costs between exporter and importer that change over time such as other components of PTA\_ijt that may affect equally all tariff lines like regime-wide rules.

Controlling for preferential margin, are trade effects stronger for more flexible PSR type?

## Trade intensity by PSR (controlling for Pmarg.) Tab. 3

#### Table 5: Results on preferential margin and PSR categories

Dependent variable:	Import value ir	million USD	X <sub>ijkt</sub>
	(1)	(2)	(3)
Ln Preference margin (PM)~	0.425***		
	(0.046)		
Ln PM * Wholly obtained (WO) dummy		0.267*	0.236
		(0.155)	(0.154)
Ln PM * Change in Tariff Classification only (CTC) dummy		0.454***	
		(0.106)	
Ln PM * Change in Chapter (CC) dummy			0.257*
			(0.153)
Ln PM * Change in Heading (CH) dummy			0.497***
			(0.147)
Ln PM * Change in Subheading (CSH) dummy			0.809***
			(0.222)
Ln PM * Value content requirement only (VCR) dummy		0.960***	0.964***
		(0.101)	(0.102)
Ln PM * Technical Requirement only (TR) dummy		0.120	0.123
		(0.092)	(0.092)
Ln PM * Alternative (ALT) dummy		0.911***	0.912***
		(0.081)	(0.081)
Ln PM * Combinations (COM) dummy		-0.130	-0.130
		(0.127)	(0.127)
Ln PM * Exception (EXC) dummy		-0.223**	-0.224**
		(0.107)	(0.107)

## Trade intensity by PSR (Tab.3 col. 2)



Notes: Dots indicate the estimated coefficients of each of the seven PSR categories with confidence intervals for each estimate. The red line indicates zero trade effects. For instance, the dot for the PSR category 'Value Content Requirement (VCR)' indicates the estimated coefficient of 0.960 from table 5, column 2. The lines indicate the coefficient ranges for the VCR category within the confidence interval. Source: Coefficients from table 5, column 2.

## Trade intensity by PSR (Tab.3 col. 3)

Figure 8: Coefficients across PSR categories with split for CTC into CC, CH, CS (table 5, column 3)



Also see A10: Plausible results when VCR broken down into 3 categories

Notes: Dots indicate the estimated coefficients of each of the seven PSR categories with confidence intervals for each estimate. The red line indicates zero trade effects. For instance, the dot for the PSR category 'Value Content Requirement (VCR)' indicates the estimated coefficient of 0.964 from table 5, column 3. The lines indicate the coefficient ranges for the VCR category within the confidence interval. Source: Coefficients from table 5, column 3.

## within PTAs estimates across PSR categories

$$\begin{aligned} lnX_{ijkt} &= \beta_0 + \sum_{\substack{PSR_n = 1 \\ + \theta_{jkt} + \epsilon_{ijkt}}}^6 \beta_{PSR_n} D_{ijkt}^{PSR_n} + \sum_{\substack{PSR_n = 1 \\ PSR_n = 1}}^6 \gamma_{PSR_n} D_{ijkt}^{PSR_n} \ln PM_{ijkt} + \sigma_{ijt} + \delta_{ijk} + \eta_{ikt} \end{aligned}$$

Same estimating equation. But now sample is 740,000 (rather than 15,000,000) Here sample is restricted to trade flows within PTAs

Same question as previously : For same preferential margin, are trade effects stronger for the more flexible PSR types?

# Estimates within PTAs



ALT strongest positive effect compared to EXC which is the reference category. All others are not significantly different across each other, but different compared to EXC.

Dependent variable: Import value in million USDX <sub>ijkt</sub>	
	(1)
Alternative (ALT) dummy	-0.488***
	(0.089)
Change in Tariff Classification only (CTC) dummy	-0.381***
	(0.083)
Combinations (COM) dummy	-0.053
	(0.142)
Technical Requirement only (TR) dummy	-0.254**
	(0.128)
Value content requirement only (VCR) dummy	-0.428***
	(0.108)
Wholly obtained (WO) dummy	-0.518***
	(0.179)
Ln PM * Alternative (ALT) dummy	2.989***
	(0.500)
Ln PM * Change in Tariff Classification only (CTC) dummy	1.977***
	(0.481)
Ln PM * Combinations (COM) dummy	1.535***
	(0.536)
Ln PM * Technical Requirement only (TR) dummy	1.985***
	(0.538)
Ln PM * Value content requirement only (VCR) dummy	1.388***
	(0.533)
Ln PM * Wholly obtained (WO) dummy	2.288***
	(0.655)
Constant	11.500***
	(0.061)
Fixed effects	ijk, ikt, jkt, ijt
No. of observations	743,904
Adjusted R-squared	<u>0</u> 162

## Comparing results across samples



#### All trade flows

Trade flows across PTAs

#### Simulations

#### Moving to flexible PSR across the board



#### Moving from restrictive to flexible PSRs ((EXC, COM, WO, CTC) replaced by ALT)

Average over 1990-2015

- Adopting the ALT rule increases exports in the 5%-15% range
- Scatter shows larger gains at lower pc income levels.
- On average, bilateral trade flows up by 5.4% for non-OECD and 5.2% for OECD



# Density of simulated trade growth under RTA

Figure 11: Density of simulated trade growth under RTA, average over 1990-2015 by pair



Source: Authors.

# Conclusions

- Over 1990-2015, share of flexible rules (ALT) reduced at expense of VCRs
- CTC over 10% of PSRs across all HS2 categories; TRs concentrated in plastics, textiles, transport. Large array of PSRs in Textiles.
- Paucity of information (preferential margins, lack of data on utilization of preferences limits exercise of identification of PSRs on HS6 level trade flows)
- ....but patterns from panel estimates are plausible in the light of (our...) expectations.
- Higher intensity at HS level for trade flows in reciprocal RTAs.
- Controlling for level of preference margin elasticity of trade intensity to PSR is stronger for flexible than restrictive rules.
- Result holds when comparisons are restricted to trade flows in RTAs.
- Simulation of simplification/harmonization: Moving away from restrictive rules could increase bilateral trade flows in 5-15% range.

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## **ANNEX 1: Sample preparation**

### Number of reciprocal RTAs in data set (final sample) (A0)

Figure A1: Number of RTAs in force across year intervals in the sample



#### Note:

Source: Authors. See list of RTAs in table A2

## Classifying mutually exclusive PSRs (A00)

DTA classified mutually exclusive PSR into 17 categories. Paper aggregates to 7 categories (see next slide)\*

Figure 1: Criteria and mapping of product-specific rules of origin



\* Bilateral trade flows can be registered under different reciprocal RTAs (e.g. Vietnam under 3). Since we do not know RTA selection when trade flow is registered, PSR is selected from the one in last implemented RTA.

#### Composition of PSRs per period and number of PTAs (A1)



Shifts in frequency distribution of PSRs:

- WO least used
- Other PSRs evenly distributed
- Share of ALT ↓ by 2/3 over period
- Share of VCR doubled
- Share of TR fell to 17%

# Distribution of imports by tariff line and preference margins (A2)

Share of imports by tariff lines (2016)



Notes: MFN tariffs between members of a customs union are excluded from the data. Source: Espitia et al. (2020, figure 7).

## Distribution of Preferential tariffs (all years) (A3)



Source: Authors.

# Boxplots of preferential margins (Pmargs) by PSR category (A4)



All 6 periods. Pmargs above 50% (1.2% of sample) excluded:

Note: Pmargs computed as difference between applied MFN and zero since no data on applied bilateral tariffs. A real shortcoming !

# Distribution of PSRs: by section (A5)

#### Table A1: Distribution of PSR categories by HS sections (average over 1990-2015)

HS section   PSR category	wo	СТС	VCR	TR	ALT	CUM	EXC	СС	СН	CS	
Animal products	22,8	20,1	4,5	15,4	9,0	3,3	4,9	12,3	7,4	0,3	100
Vegetables	17,0	23,3	4,7	12,9	11,9	4,8	2,1	10,4	11,0	1,9	100
Foodstuffs	5,0	21,2	6,5	13,3	16,5	3,3	13,1	7,4	11,9	1,9	100
Mineral products	0,9	22,1	8,0	15,4	21,8	6,7	3,0	3,8	18,2	0,1	100
Chemicals	0,0	16,7	12,9	14,4	27,0	6,1	6,2	0,5	10,5	5,7	100
Plastic/rubbers	0,1	14,5	16,7	17,9	21,5	8,6	6,3	0,0	12,4	2,0	100
Raw hides, skins, leathers	0,1	31,0	2,8	7,6	18,3	2,8	6,4	7,6	22,9	0,4	100
Wood products	0,1	30,9	6,7	10,5	13,1	3,9	4,0	2,3	25,8	2,8	100
Textiles	0,3	7,8	11,7	23,2	22,9	7,6	18,6	2,5	5,3	0,0	100
Footwear/headgear	0,0	20,4	9,8	11,2	17,6	4,8	15,8	2,3	13,1	5,0	100
Stone/glass	0,0	25,7	8,0	12,1	16,8	5,3	6,3	4,6	20,3	0,9	100
Metals	0,0	27,4	4,8	10,5	16,7	5,4	7,9	3,0	23,3	1,1	100
Machinery/electrical	0,2	8,5	30,8	19,8	20,8	5,8	5,6	0,0	4,6	3,8	100
Transportation	0,0	8,6	27,2	19,5	19,2	11,3	5,6	0,1	6,4	2,1	100
Miscellaneous	0,0	17,2	15,5	11,5	25,3	9,2	4,0	2,0	9,9	5,3	100

## Distribution of PSRs: across sections (A6)

#### Table A1: Distribution of PSR categories across HS sections (average over 1990-2015)

HS section   PSR category	WO	СТС	VCR	TR	ALT	CUM	EXC	СС	СН	CS
Animal products	26,8	2,2	0,7	1,9	0,9	1,0	1,2	8,7	1,2	0,3
Vegetables	50,0	6,5	1,7	4,1	2,9	3,7	1,2	18,4	4,4	3,7
Foodstuffs	17,6	7,1	2,9	5,1	4,9	3,1	9,4	15,8	5,7	4,4
Mineral products	0,7	1,6	0,8	1,3	1,4	1,3	0,5	1,7	1,9	0,0
Chemicals	0,0	10,3	10,5	10,1	14,7	10,6	8,3	1,8	9,3	25,0
Plastic/rubbers	0,3	5,5	8,3	7,6	7,1	9,1	5,1	0,1	6,7	5,4
Raw hides, skins, leathers	0,1	2,7	0,3	0,8	1,4	0,7	1,2	4,3	2,9	0,3
Wood products	0,3	9,4	2,7	3,6	3,5	3,3	2,6	4,5	11,2	5,9
Textiles	2,2	6,6	13,1	22,3	17,0	18,1	33,6	13,6	6,4	0,1
Footwear/headgear	0,0	2,2	1,4	1,4	1,7	1,5	3,7	1,6	2,1	3,8
Stone/glass	0,1	7,0	2,9	3,7	4,0	4,0	3,7	7,9	7,9	1,7
Metals	0,4	21,8	5,1	9,4	11,6	12,0	13,4	14,9	26,5	6,0
Machinery/electrical	1,3	6,9	33,1	18,2	14,8	13,2	9,8	0,1	5,3	22,0
Transportation	0,0	1,5	6,3	3,9	2,9	5,5	2,1	0,1	1,6	2,6
Miscellaneous	0,1	8,7	10,3	6,6	11,2	13,0	4,4	6,4	7,2	18,8
	100	100	100	100	100	100	100	100	100	100

#### Distribution of PSRs by Pmarg bins (A7)

Figure A1: Frequency distribution of preferential margins across PSR categories by bins



Stable right-skewed distribution with largest share located above 5% and below 20%.



Notes: Figure displays the distribution of PSRs across 7 bins. Distribution of PSRs across bins adds up to 100%. Abbreviations to PSRs introduced in table 1. Source: Authors.

#### **Annex 2: Additional results**

# Baseline with different sample periods (A8)

Dependent variable:	Import value in million USD $X_{i jkt}$							
	(1)	(2)	(3)	(4)	(5)	(6)		
Sample period considered:	1990-2015	1995-2015	2000-2015	1990-2000	2005-2015	1990-2005		
Dummy = 1 for trade under PSR	0.079***	0.033***	0.029***	0.246***	0.040***	0.090***		
	(0.004)	(0.004)	(0.005)	(0.012)	(0.006)	(0.007)		
Constant	10.770***	10.781***	10.815***	10.870***	10.925***	10.778***		
	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)		
Fixed effects			ikt, jkt	, ijk, ijt				
Observations	15,224,938	14,229,166	11,657,465	5,017,605	8,562,930	8,374,857		
Adjusted R-squared	0.67	0.67	0.68	0.64	0.69	0.65		
Robust standard errors, clustered	at symmetric	country-pairs	s and product	: (ijk)-level, a	re in parenth	eses.		

Table 1: Trade effects of the presence of product-specific rules of origin: different periods

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

## Quantile results (A9)

Figure 5: Quantile regression results with confidence intervals at 95%-level



Note: Clustered standard errors are asymptotic. Source: Authors' estimates per bins of five quantiles.

## Estimates by PSRs with VCR sub-categories (A10)



Notes: Dots indicate the estimated coefficients and lines indicate the 5%-significance levels for each estimate. The red line indicates zero trade effects.