Effects of Regional Trade Agreements on the Duration and Hazard Rate of Exporting: Lessons from Agricultural Trade

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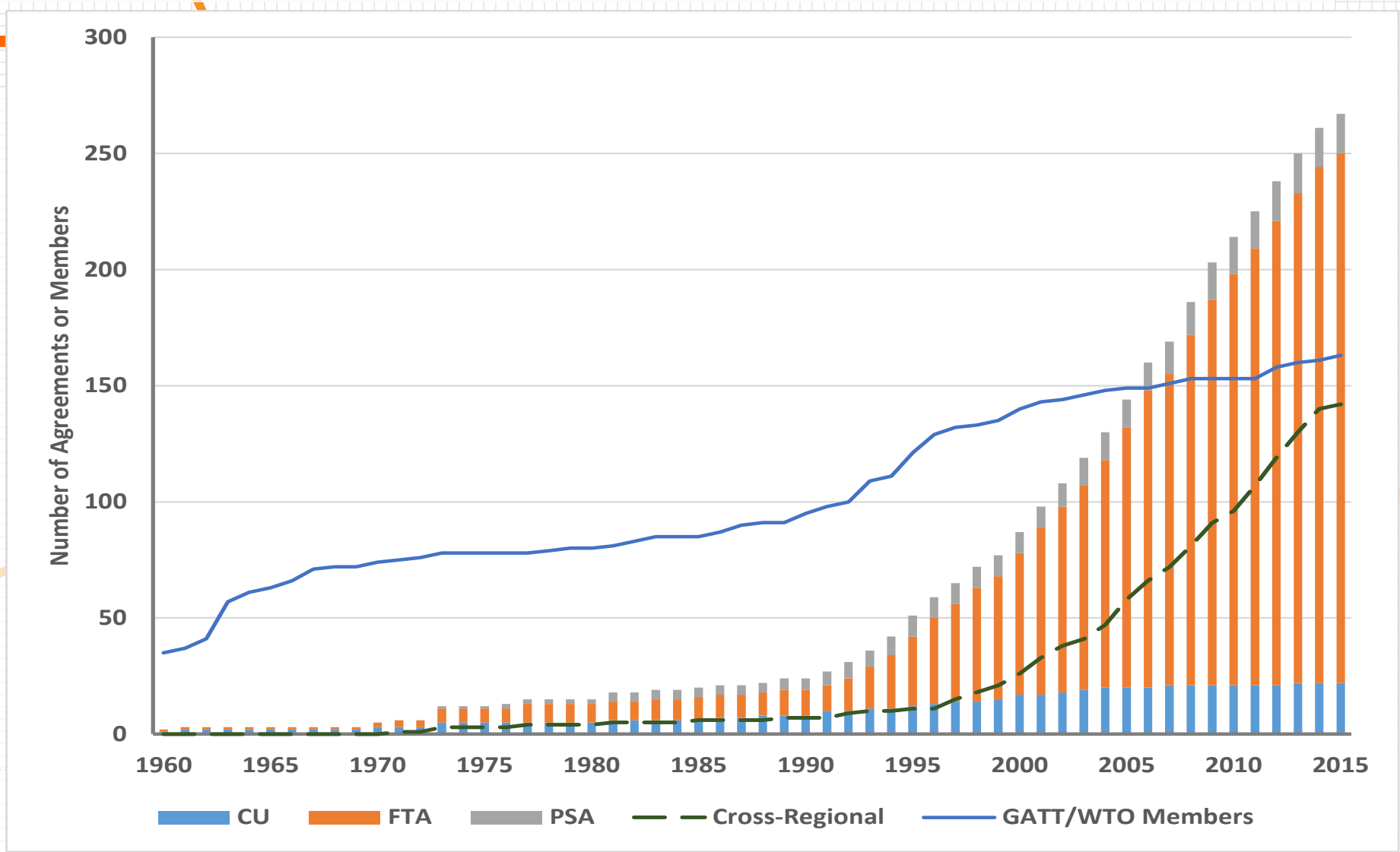
Outline

- Background
- Literature on RTA Trade effects
- Motivation and Objectives
- Data and duration model
- Results
- Conclusions

Rising Free Trade Agreements (and stalling WTO agreements

- Regional trade agreements (RTAs) have increased significantly over the years
- This includes recent large plurilateral agreements in force (CPTPP) and under negotiation (RECP, EU-U.S.).
- Spread of RTAs significant development in global trading system
  - > 600 notifications of RTAs (signed, in negotiation, in consideration)
  - 301 RTAs in force (Sep 2019)
  - Since inception, WTO has received an average of ~ 25 notifications/yr
  - All WTO members party to at least one RTA and most participate in multiple agreements (avg. = 6)

Growth in Number of Agreements



Source: Grant, Boys and Marchant (2018)

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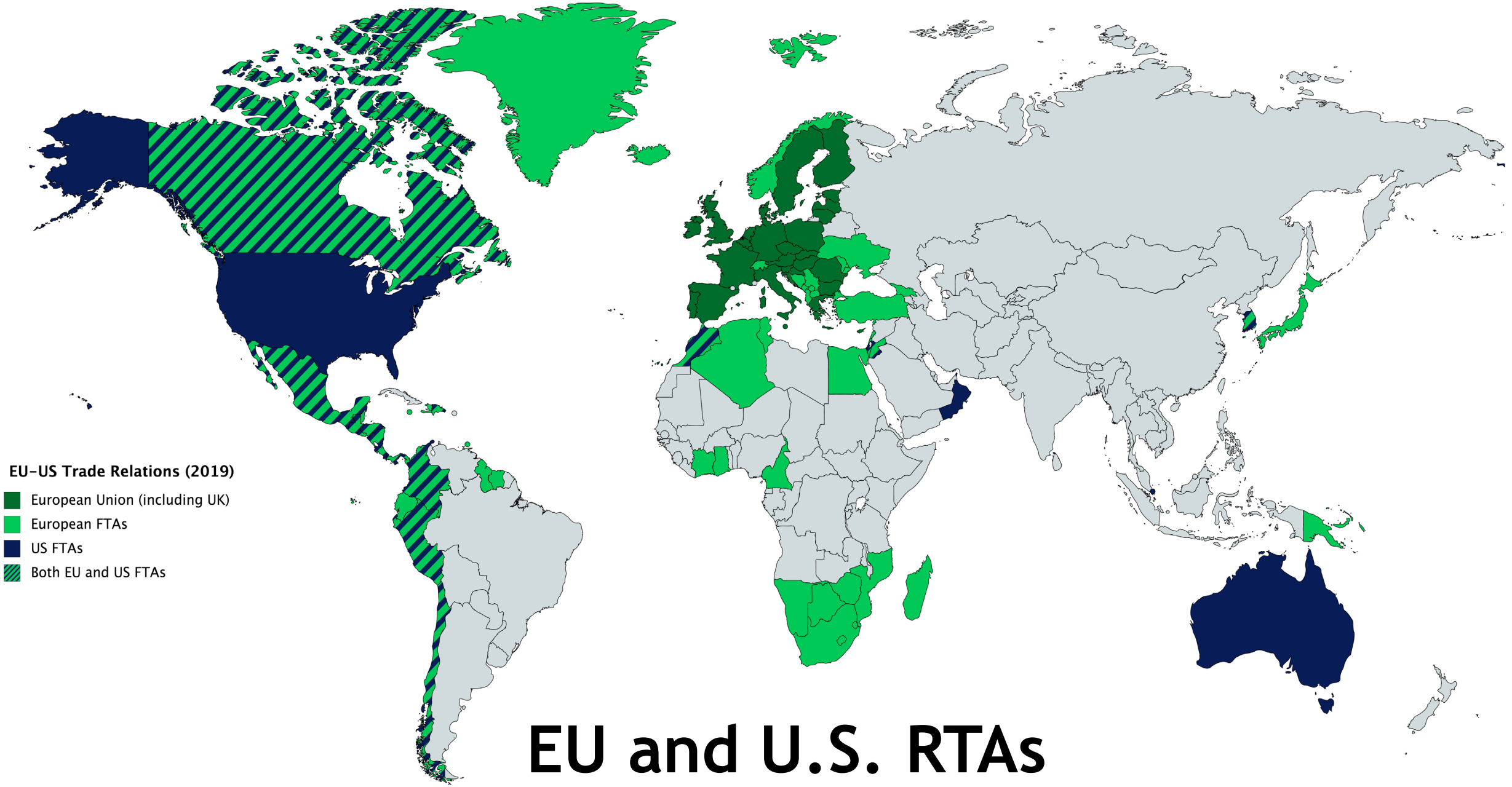

EU and U.S. RTAs

FTA Market Overview in Major Agricultural Markets

Region	No. of RTA Partners (Jan. 2019)	No. of RTAs Being Negotiated (Jan. 2019)
Unit	Count	Count
Insiders		
European Union	75	12
China	24	3
Japan	20	2
Canada	23	4
Australia	32	1
Mexico	62	1
Malaysia	50	1
Chile	61	0
Vietnam	54	2
Peru	60	0
New Zealand	33	1
Avg./Total	**44.9**	**2.5**
Outsiders		
United States	20	1
India	52	4
Brazil	37	1
Russia	13	2
Korea	59	2
Avg./Total	**36.2**	**2.0**

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FTA Competition in High-Growth Asian Markets

- EU has early notifications of new FTAs with 7/8 Asian growth markets.
- U.S. has one early notification – U.S.-EU
- Last new FTA entered into force was Columbia in 2012

Asian Market	Competitor FTA Activity
India	EU Notification
China	Australia EIF
Japan	EU, AUS, Canada/CPTPP
Vietnam	EU Notification, CPTPP
Thailand	EU Notification/CPTPP
Philippines	EU Notification
Indonesia	EU Notification
Malaysia	EU Notification/CPTPP/BRA

RTA Literature

- Existing literature overwhelmingly supports idea that RTAs generate impressive trade flow gains
  - Baier, Bergstrand and Clance 2016; Baier, Bergstrand and Feng 2014; Baier and Bergstrand 2007, 2009; Kohl 2014; Kohl, Brakman, and Garreston 2015; Grant, Boys and Marchant 2018; Grant 2013; Grant and Boys 2012; Grant/Lambert 2008; Sun/Reed; Lambert and Mcoy 2009; Koo et al. 2006; Jean and Bureau 2016)
- More subtle feature of the RTA data, however, is that agreements vary by:
  - **Non-tariff SPS coverage of RTAs**
  - Depth (CU, FTAs, Partial scope)
  - Membership composition
  - Rules of origin
  - Treatment of non-members
  - Transitional periods of trade liberalization
  - Regional vs. Cross-regional RTAs
- Significant scope for future research on effects of RTAs

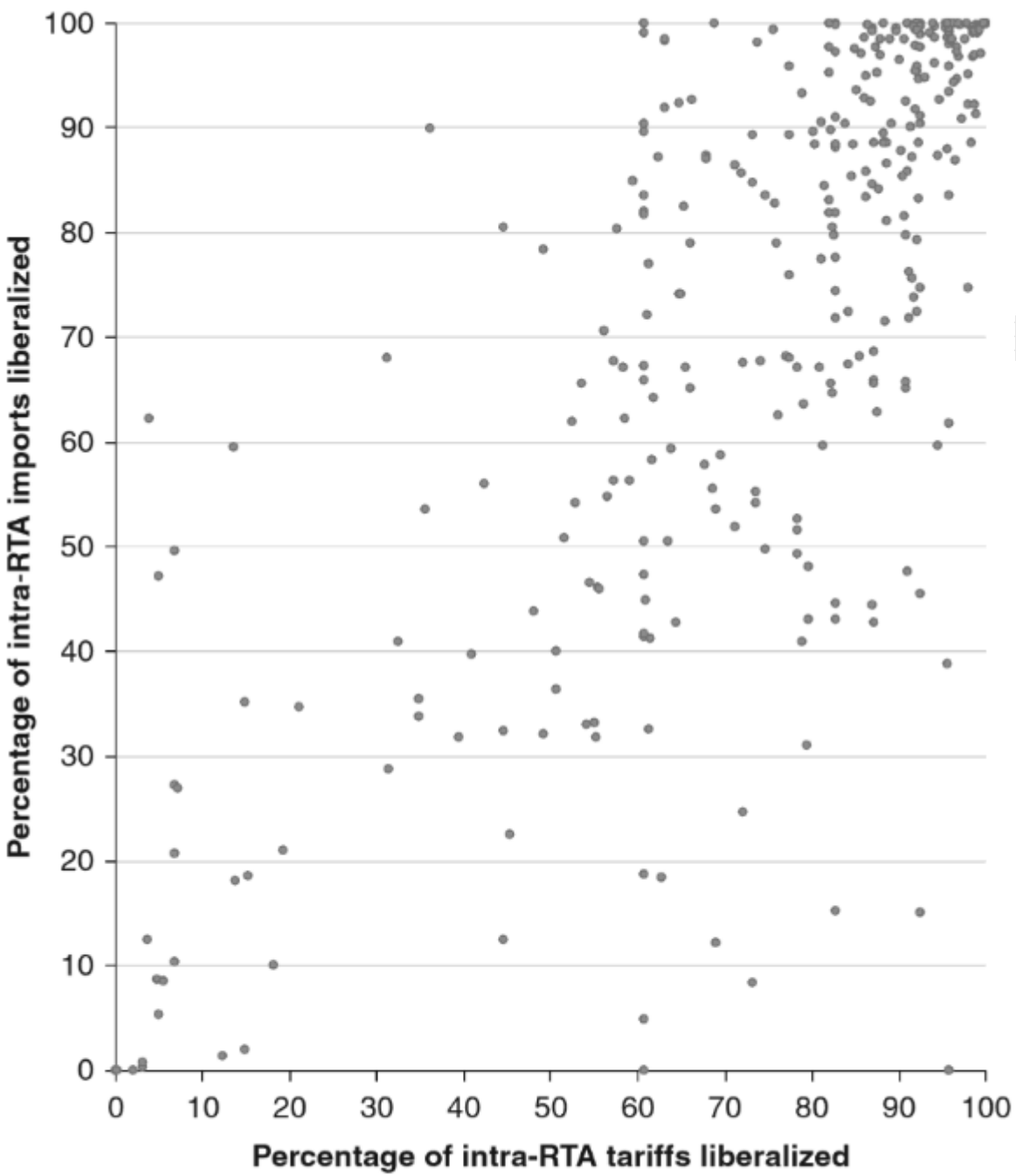
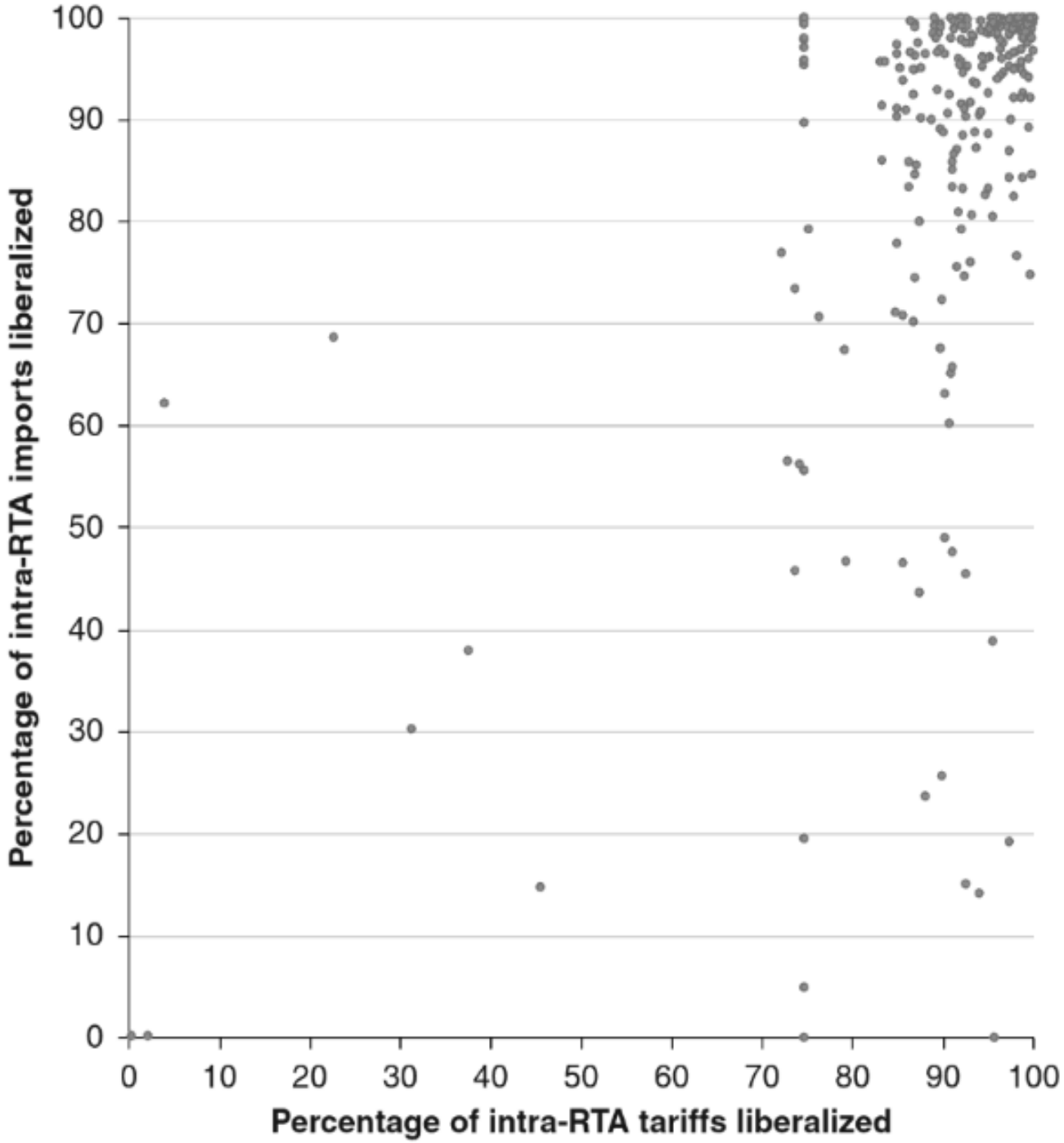


Figure 1.2 All products liberalized at entry into force of the RTA



Motivation

- *Traditional Questions* - Whether RTAs “create” or “divert” trade still important for global trading system
- *Digging deeper* – less is known about degree to which SPS coverage inside RTAs explains the RTA trade and duration effect
- This project attempts to fill this void

Specific Objectives of IATRC Commissioned Report

- **Global RTA trade and duration database:** Develop a global product line database of trade and duration analysis of U.S. and global agricultural export relationships over the period 1995-2017
- **RTA/SPS Mapping:** Map detailed RTA notifications maintained by the Center for Agricultural Trade at Virginia Tech and SPS topics covered by these agreements
- **RTA Trade and Duration Empirical Assessment:**
  - Quantify the RTA trade and hazard effect conditional on the depth of SPS coverage pursued by RTA agreements.
- **Disseminate project results:** IATRC Commissioned paper, peer-reviewed publications and professional presentations.

Data

- 4 digit SITC, 1980-2016
- Trade relationship defined as importer-exporter-product triplet
  - Nearly 375,000 trade relationships
  - Nearly two-thirds of trade relationships have multiple spells of service
- Spell length is number of consecutive years that a trade relationship has positive trade
  - Approximately 1 million spells of service across all trade relationships
  - Approximately 30,000 of spells are left-censored

Spells of Service Across Relationships

Total number of spells	Number of relationships	Frequency
1	134,428	36.0%
2	76,474	20.5%
3	57,277	15.4%
4	41,116	11.0%
5	28,352	7.6%
6	17,629	4.7%
>6	17,686	4.7%
Total	372,962	100.0%

Observed Spell Length

Spell length (years)	Number of spells	Frequency
1	519,803	51.6%
2	153,952	15.3%
3	72,816	7.2%
4	42,529	4.2%
5	29,050	2.9%
6	22,000	2.2%
7	16,105	1.6%
8	13,219	1.3%
9	10,214	1.0%
10	9,061	0.9%

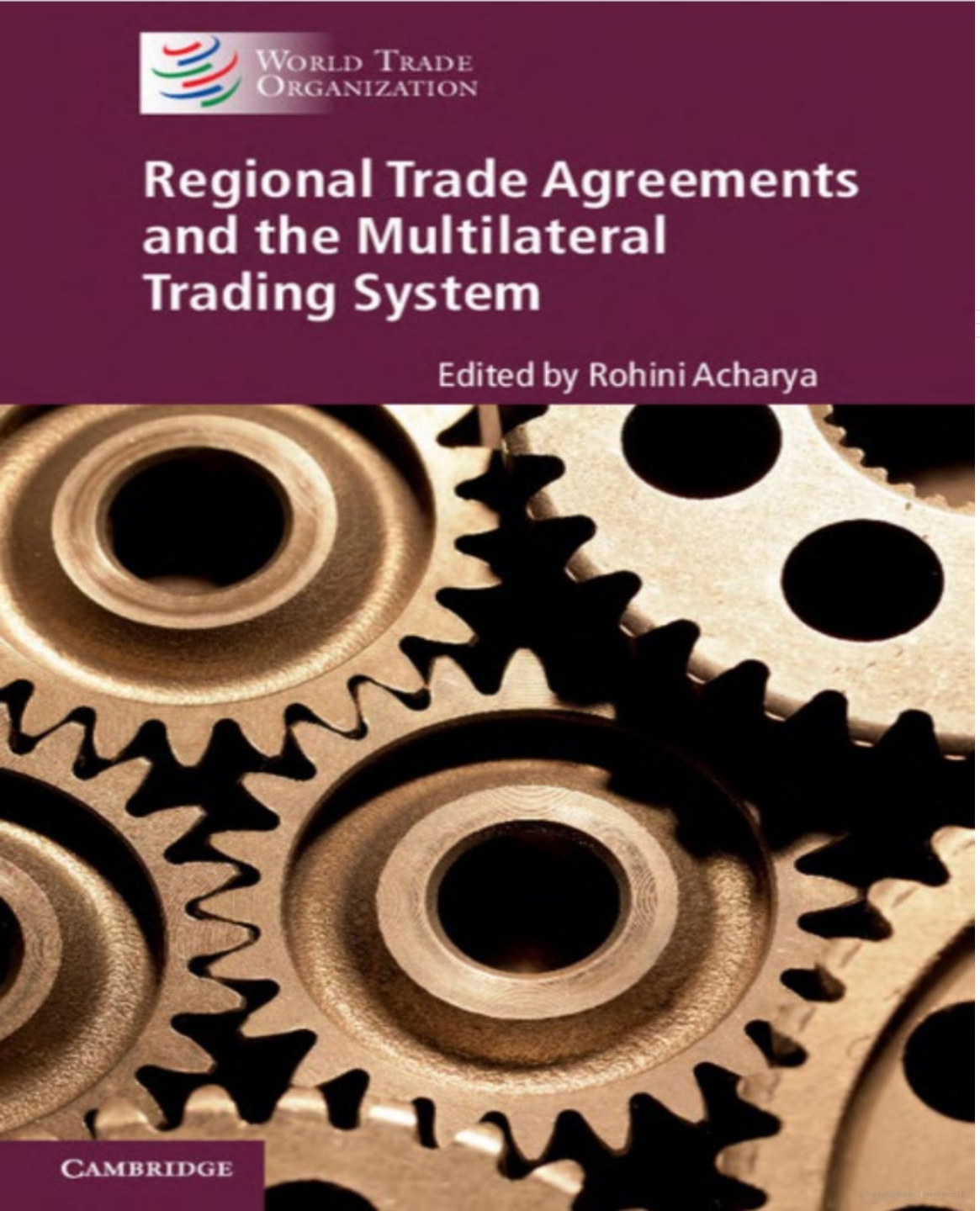
Empirical Model

- Dependent variable:
  - = 1 if spell of service ends in given year
  - = 0 if spell of service is ongoing

- Independent variables:
  - Duration (number of years in current spell of service)
  - Relative exchange rate
  - GDP in importing and exporting countries (log)
  - Distance (log)
  - Gravity-type binary variables
  - Share common border and common language
  - Whether importer or exporter is landlocked

Empirical Model: Continued

- Other independent variables:
  - Import market conditions (number of exporters serving given importer-product market)
  - Exporter experience (number of importer-product markets served by a given exporter-product pair)
  - Peripheral export markets (inverse share of exports of product k to destination d by exporter o)
  - Binary controls for multiple spells of service
  - Define 9 aggregate importer and exporter regions: Base region is western Europe
  - RTA Implementation (0-4 yrs; 5-9 yrs; 10-14 yrs; 15 or more yrs)



SPS Coverage and Beyond WTO Indicators:

Thank You to Rohini Acharya and Lee Ann Jackson!

Acharya, R. 2016. "Regional Trade Agreements and the Multilateral Trading System, Cambridge University Press, September 2016: https://doi.org/10.1017/CBO9781316676493

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Empirical Model: Trade Policy Variables

- SPS characteristics in RTAs
  - Definition of SPS measures
  - Equivalence and mutual recognition
  - Risk assessment
  - Transparency
  - Harmonization
  - Regionalization/pest-free areas
  - Special and differential treatment
  - Technical assistance
  - Dispute resolution mechanisms
  - Control, inspection, and approval

SPS Characteristics by RTA in Sample

SPS Characteristics	None	Material present	Beyond WTO
Definition of SPS measures	83	75	6
Equivalence and mutual recognition	108	41	15
Risk assessment	119	18	27
Transparency	101	7	56
Harmonization	100	54	10
Regionalization/pest-free areas	115	14	35
Special and differential treatment	159	2	3
Technical assistance	110	46	8
Dispute resolution mechanisms	5	86	73
Control, inspection, and approval	120	22	22

SPS Characteristics Sample Means

SPS Characteristics	Full Sample	Without EU
Dispute resolution mechanisms	0.321	0.218
Definition of SPS measures	0.182	0.058
Transparency	0.171	0.062
Equivalence and mutual recognition	0.159	0.049
Harmonization	0.156	0.045
Technical assistance	0.147	0.035
Regionalization/pest-free areas	0.140	0.026
Control, inspection, and approval	0.137	0.023
Risk assessment	0.131	0.016
Special and differential treatment	0.122	0.005

Estimation

- Discrete-time duration model: Hess and Persson (2013)
- Discrete-time hazard rate: $h_{it} = P\left(T_i < t_{t+1} \middle| T_i > t_t, x_{it}\right) = G\left(x'_{it}\beta + \gamma_t\right)$
- Log-likelihood function: $\ln \ell = \sum_{i=1}^{n} \sum_{t-1}^{t_t} \left[y_{it} \ln\left(h_{it}\right) + \left(1 - y_{it}\right) \ln\left(1 - h_{it}\right) \right]$
  - where y_{it}= 1 if spell of service end ends in time t
  - Similar to likelihood functions for binary panel regression models
  - If h is normal distribution, use probit estimator

Estimation: Continued

- Left-censored spells of service
  - Hess and Persson suggest dropping all left-censored spells of service
  - Peterson et al (2018) use trade data prior to beginning of sample period of mitigate problem
  - Fewer RTAs implemented before 1990, use 1990-2016 as sample period
  - Left-censored spells of service will have a beginning duration of 11 years.

- Estimate separate models by:
  - WTO Multilateral Trade Negotiation sector categories
  - Individual RTA: NAFTA

Preliminary Results on Hazard Rate of Exporting: Reductions in Average Hazard Rate

Product Category	RTA Only	SPS	RTA + SPS
		Percentage reduction	
Dairy	17.3	31.6	49.0
Meats	6.8	29.6	36.3
Beverages & tobacco	11.5	18.0	29.4
Cereals	2.4	25.4	27.9
Oilseeds	7.1	16.9	24.0
Fruits & vegetables	1.9	20.1	21.9

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- **Center for Agricultural Trade (CAT)**
- https://aaec.vt.edu/extension/Agricultural-Trade-Center.html

SPS Characteristic Frequencies by RTA

	Full Sample			Without EU		
SPS Characteristics	**None**	**Present**	**>WTO**	**None**	**Present**	**>WTO**
Definition of SPS measures	598,045	218,965	486,535	598,045	161,230	32,766
Equivalence and mutual recognition	685,848	124,061	493,636	628,113	124,061	39,867
Risk assessment	797,542	14,973	491,030	739,807	14,973	37,261
Transparency	641,735	66,915	594,895	584,000	66,915	141,126
Harmonization	699,919	126,731	476,895	642,184	126,731	23,126
Regionalization/pest-free areas	762,446	32,162	508,937	704,711	32,162	55,168
Special and differential treatment	831,762	18,014	453,769	774,027	18,014	0
Technical assistance	732,208	82,565	488,772	674,473	82,565	35,003
Dispute resolution mechanisms	57,922	1,090,965	154,658	57,922	579,461	154,658
Control, inspection, and approval	771,984	18,346	513,215	714,249	18,346	59,446