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What Type of Institutions Matter More to World Trade -
National or Supranational? A Comparative Gravity
Analysis Controlling for Institutional and Governance
Environment

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Asia-Pacific Research and Training Network on Trade

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What Type of Institutions Matter More to World Trade - National or Supranational?

**A Comparative Gravity Analysis
Controlling for Institutional and
Governance Environment**

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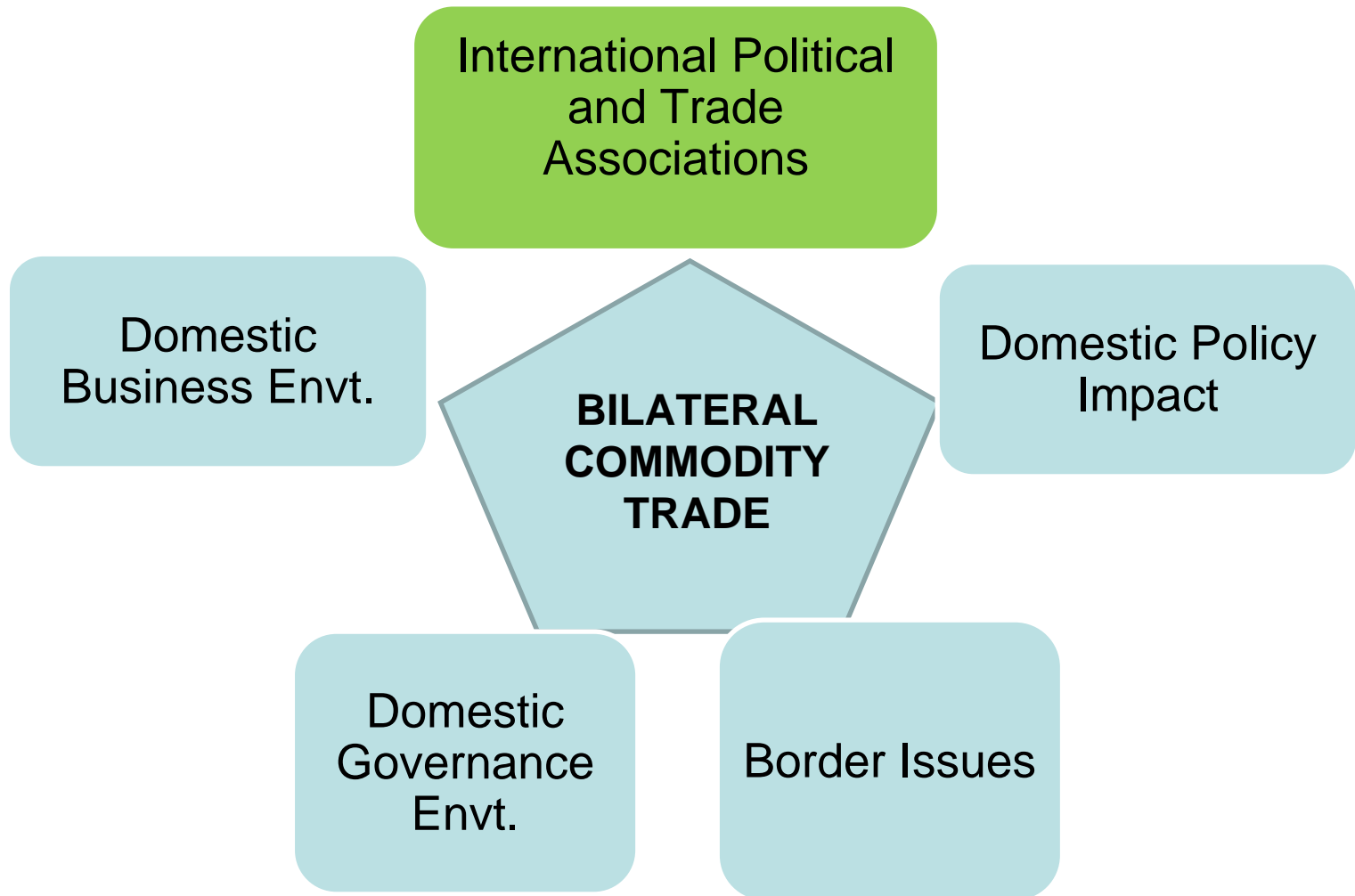
PROBLEM

Distance Effect in International Trade...

- According to the data available for any recent year, many country pairs have a low volume of trade and even more country pairs have no trade at all.
- Although there are obvious differences in economic strength and size between countries, economic and demographic differences alone would not justify such disproportionality (Linders et al., 2008).

RESPONSE

- From this disconnect, this paper draws its motivation to attempt further articulation of the Distance Puzzle in terms of institutions.
- Aim is to extend the conceptualization of distance to incorporate the heterogeneity of institutional environment.
- A potential comparison is attempted between the relative importance of national and supranational institutions.
- Strategy adopted is to estimate a series of specifications of the famous gravity model of trade controlling for multiple indicators of institutional quality at both national and supranational level.



Challenge 1 -Gauging National Institutional Quality

- **Quality of Business Institutional Environment:**
Doing-business Data
- **Institutional Bottlenecks at Trading Interfaces :**
Enabling Trade Data
- **Domestic Trade Policy Effect :** trade restrictiveness index by Hiscox and Kastner (2002)
- **Governance Variables :** World Governance Indicators

Doing Business Data

- (1) Starting a business;
- (2) Registering property;
- (3) Getting credit;
- (4) Contract Enforcement.

Enabling Trade Data

- (1) Market access,
- (2) border administration,
- (3) transport and communications infrastructure, and
- (4) the business environment.

1. Tariffs and non-tariff barriers 2. Proclivity to trade 3. Efficiency of customs administration 4. Efficiency of import-export procedures 5. Transparency of border administration 6. Availability and quality of transport infrastructure 7. Availability and quality of transport services 8. Availability and use of ICTs 9. Regulatory environment 10. Physical security.

Domestic Trade Policy Effect

- I use the ICY index of trade restrictiveness by Hiscox and Kastner (2002) as a measure of the level of policy restrictiveness to trade by a country. The index developed via a gravity estimation reports values for 76 countries.
- I predict the trade policy effect index values for the remaining countries in my data set making use of the fact that an extremely high (0.87) correlation exists between this index and the GDP per capita (purchasing power parity) values for 2005. Since I am not including the GDP per capita values in the gravity estimation, the above imputation of values does not produce any statistical anomaly to the gravity regressions.

World Governance Indicators

- 1. *Voice and Accountability (VA)* – measuring the extent to which a country's citizens are able to participate in selecting their government
- 2. *Political Stability and Absence of Violence (PV)* – measuring perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means,
- 3. *Government Effectiveness (GE)* – measuring the quality of public services, the quality of the civil service and the degree of its independence from political pressures,
- 4. *Regulatory Quality (RQ)* – measuring the ability of the government to formulate and implement sound policies and regulations
- 5. *Rule of Law (RL)* – measuring the extent to which agents have confidence in and abide by the rules of society
- 6. *Control of Corruption (CC)* – measuring the extent to which public power is exercised for private gain

Challenge 2 - Addressing the Problem of Handling Multiple Indicators

- I perform (classical) multidimensional scaling (MDS) on data from doing business dataset, enabling trade dataset and world governance indicators dataset, in order to reduce the dimensionality of data while preserving the variability.

Correlation between percapita GDP and Domestic Institutional Quality Variables

	GDPp.cap.	DB	ET	Gov
GDPpercapita	1			
Doing Business	0.2411	1		
Enabling trade	-0.9159	-0.2037	1	
Governance	-0.8996	-0.2015	0.9369	1

Challenge 3-Guaging Supranational Institutional Env't.

Political and trading association membership

Political or Trading Bloc	Number of Members considered for analysis
ASEAN	10
ACP	79
SAARC	7
APEC	22
EU	25
MERCOSUR	5
NAFTA	3
OECD	31
OPEC	11

Challenge 4 - Estimation Technique

- Liu (2007) believes the case of more than 50 percent of the observations reporting zero trade flows as a standard corner solution problem, and suggests the Tobit model
- However, Tobit model suffers from the inability to handle residuals which are not normal and homoscedastic.

Estimation technique....contd.

- Based on the recommendations of many including Silva and Tenreyro (2006), I estimate the gravity model using the **Poisson maximum likelihood** method
- Following Linders et al. (2008), the **hurdle poisson-logit maximum likelihood** model also tried... in two stages, the first stage as logit estimation (logically similar to a selection model) and then fitting poisson model for the non-zero values of the dependent variable.
- I also implement the **negative binomial model** and the **zero-inflated forms of both the poisson and the negative binomial model**.

Estimation technique....contd.

- In implementing different specifications, the various institutional variables have been introduced separately along with the key gravity variables. This was performed with the intention of identifying the unique effect of each variable in every functional form and performs the partial role of robustness check as well.

Model	Version	Dependant variable	Explanatory variables
log normal	1	log imports	basic variables
	2	log imports	basic+doing business variables
	3	log imports	basic+enabling trade variables
	4	log imports	basic+trade restrictiveness variables
	5	log imports	basic+governance variables
	6	log imports	basic+trade and political association membership dummies
tobit	1	log imports	basic variables
	2	log imports	basic+doing business variables
	3	log imports	basic+enabling trade variables
	4	log imports	basic+trade restrictiveness variables
	5	log imports	basic+governance variables
	6	log imports	basic+trade and political association membership dummies
poisson maximum likelihood	1	imports	basic variables
	2	imports	basic+doing business variables
	3	imports	basic+enabling trade variables
	4	imports	basic+trade restrictiveness variables
	5	imports	basic+governance variables
	6	imports	basic+trade and political association membership dummies
hurdle poisson-logit maximum likelihood (first stage-logit and	1	imports	basic variables
	2	imports	basic+doing business variables
	3	imports	basic+enabling trade variables
	4	imports	basic+trade restrictiveness variables
	5	imports	basic+governance variables
	6	imports	basic+trade and political association membership dummies

Challenge 5 - Incorporation of Country Specific Fixed Effects

- Recent literature on gravity models (Matyas, 1998; Egger, 2000; Anderson and van Wincoop, 2003) increasingly recommend this practice

Implementation of fixed effect model

Model	Version	Dependant variable	Explanatory variables
log normal	basic	log imports	basic variables+ all fixed effects
	augmented	log imports	basic+ doing business variables+ enabling trade variables+ trade restrictiveness variables+ governance variables+ all fixed effects
poisson maximum likelihood~importer FE	basic	imports	basic variables+ importer fixed effects only
	augmented	imports	basic+ doing business variables+ enabling trade variables+ trade restrictiveness variables+ governance variables+ importer fixed effects only
poisson maximum likelihood~exporter FE	basic	imports	basic variables+ exporter fixed effects only
	augmented	imports	basic+ doing business variables+ enabling trade variables+ trade restrictiveness variables+ governance variables+ exporter fixed effects only
hurdle poisson-logit maximum likelihood (first stage-logit and second stage-poisson)	basic	imports	basic variables+ all fixed effects
	augmented	imports	basic+ doing business variables+ enabling trade variables+ trade restrictiveness variables+ governance variables+ all fixed effects

Summary of Results

problem of space...

But, I will read from my conclusions...Sorry!

Dear Ladies & Gentlemen,
THANK YOU FOR YOUR KIND ATTENTION

Selection Committee & ARTNET,
THANK YOU FOR THE AWARD