INTERNATIONAL ECONOMICS

Lecture 3 — November 15, 2022

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Last week

- Openness: Far from perfect
- Gravity: Who trades with whom, and how much?
 - \rightarrow Main idea: the "'larger" the more; the "'closer" the more!
- Naïve vs. general vs. structural gravity

This week

- Trade costs
- Head-Ries Index
- Estimating gravity

TRADE COSTS

Trade costs

- total of all of the costs/frictions that impede trade from origin to destination
 - ightarrow bilateral and multilateral
 - transportation costs
 - tariffs and non-tariff barriers (quotas,...)
 - administrative hurdles: "red tape"
 - contractual frictions
 - corruption
 - securing trade finance
 - ightarrow not only in international trade

Trade costs

- enter many (all?) modern models of trade
- clearly not frictionless world
- Obstfeld & Rogoff (2000): trade costs may explain "the six big puzzles" of international macro
- trade costs matter for welfare calculations
- could be endogenous, driven by the market structure of the trading sector

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- haircuts not very tradable, video on Youtube is
 - ightarrow everything else is in between

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- fundamental problem in developing countries: quality of their transportation infrastructure

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 - ightarrow Just measure them (if possible)!

Figure 1 Worldwide Air Revenue per Ton-Kilometer



Source: International Air Transport Association, World Air Transport Statistics, various years.

Figure 2 Air Transport Price Indices



Source: International Civil Aviation Organization (ICAO), "Survey of Air Fares and Rates," various years; U.S. Department of Labor Bureau of Labor Statistics (BLS) import/export price indices, http://www.bls.gov/mxp/.

Tramp Price Index

(with U.S. GDP deflator and with commodity price deflator)



Source: United Nations Conference on Trade and Development, Review of Maritime Transport, various years.

Note: Tramp prices deflated by a U.S. GDP deflator and tramp prices deflated by commodity price deflator.

Liner Price Index

(with German GDP deflator and with German traded goods price deflator)



Source: United Nations Conference on Trade and Development Review of Maritime Transport, various years.

Note: Liner prices deflated by a German GDP deflator and liner prices deflated by a German traded-goods price deflator.

Trade costs: Trade policies

- Transportation costs have come down a lot
- What about trade policy-related costs?
 - \rightarrow Tariffs
 - \rightarrow Quotas
 - $\rightarrow\,$ NTBs: Time at the border, ...

TABLE 2 Simple and Trade-Weighted Tariff Averages—1999				
Country	Simple	TW		
	Average	Average		
Arrentina	14.8	11.3		
Australia	4.5	4.1		
Bahamas	0.7	0.8		
Bahrain	7.8	_		
Bangladesh	22.7	21.8		
Barbados	19.2	20.3		
Belize	19.7	14.9		
Bhutan	15.3	-		
Bolivia	9.7	9.1		
Brazil	15.5	12.3		
Canada	4.5	1.3		
Chile	10.0	10.0		
Colombia	12.2	10.7		
Costa Rica	6.5	4.0		
Czech Republic	5.5	-		
Dominica	18.5	15.8		
Ecuador	13.8	11.1		
European Union	3.4	2.7		
Georgia	10.6	-		
Grenada	18.9	15.7		
Guyana	20.7	-		
Honduras	7.5	7.8		
Hong Kong	0.0	0.0		
India	30.1	-		
Indonesia	11.2	-		
Jamaica	18.8	16.7		
Japan	2.4	2.9		
Korea	9.1	5.9		
Mexico	17.5	6.6		
Montserrat	18.0	-		
New Zealand	2.4	3.0		
Nicaragua	10.5	11.0		
Paraguay	13.0	6.1		
Peru	13.4	12.6		
Philippines	9.7	-		
Romania	15.9	8.3		
Saudi Arabia	12.2	-		
Singapore	0.0	0.0		
Slovenia	9.8	11.4		
South Africa	6.0	4.4		
St. Kitts	18.7			
St. Lucia	18.7	-		
St. Vincent	18.3	-		
Suriname	18.7	-		
Switzerland	0.0	0.0		
Taiwan	10.1	6.7		
Trinidad	19.1	17.0		
Uraguay	4.9	4.5		
USA	2.9	1.9		
Venezuela	12.4	13.0		

Notes: The data are from UNCTAD's TRAINS database (Haveman repackaging). A "-" indicates that trade data for 1999 are unavailable in TRAINS.

Figure: Anderson and Wincoop (2004)

	Mean	Standard Deviation	Minimum	Maximum	Number of Observations
Africa and Middle East	41.83	20.41	10	116	35
COMESA	50.10	16.89	16	69	10
CEMAC	77.50	54.45	39	116	2
EAC	44.33	14.01	30	58	3
ECOWAS	41.90	16.43	21	71	10
Euro-Med	26.78	10.44	10	49	9
SADC	36.00	12.56	16	60	8
Asia	25.21	11.94	6	44	14
ASEAN 4	22.67	11.98	6	43	6
CER	10.00	2.83	8	12	2
SAFTA	32.83	7.47	24	44	6
Europe	22.29	17.95	5	93	34
CEFTA	22.14	3.24	19	27	7
CIS	46.43	24.67	29	93	7
EFTA	14.33	7.02	7	21	3
ELL FTA	14.33	9.71	6	25	3
European Union	13.00	8.35	5	29	14
Western Hemisphere	26.93	10.33	9	43	15
Andean Community	28.00	7.12	20	34	4
CACM	33.75	9.88	20	43	4
MERCOSUR	29.50	8.35	22	39	4
NAFTA	13.00	4.58	9	18	3
Total sample	30.40	19.13	5	116	98

TABLE 1.—DESCRIPTIVE STATISTICS BY GEOGRAPHIC REGION REQUIRED TIME FOR EXPORTS

Note: Seven countries belong to more than one regional agreement. Source: Data on time delays were collected by the Doing Business team of the World Bank/IFC. They are available at www.doingbusiness.org.

Figure: Djankov, Freund, and Pham (2010)

Estimating trade costs

- Sometimes difficult to measure directly, likely not full picture
- most commonly-employed method to measure full extent of trade costs: gravity equation

$$X_{ij} = G S_i M_j \phi_{ij}$$

 $\rightarrow\,$ implicitly comparing trade we observe to trade we expect to see in frictionless world

HEAD-RIES INDEX

Head-Ries index

- Head & Ries (2001): trade costs as residual
- Suppose *intra*national trade is free, i.e. $\tau_{ii} = 1$
 - \rightarrow normalization of trade costs
- suppose that *inter*national trade is symmetric, i.e. $\tau_{ij} = \tau_{ji}$

Head-Ries index

- 'phi-ness' of trade:

$$HRI = \sqrt{\frac{X_{ij}X_{ji}}{X_{ii}X_{jj}}}$$
$$= \sqrt{\frac{G S_i M_j \phi_{ij}G S_j M_i \phi_{ji}}{G S_i M_i \phi_{ii}G S_j M_j \phi_{jj}}}$$
$$= \sqrt{\frac{\phi_{ij}\phi_{ji}}{\phi_{ii}\phi_{jj}}}$$
$$= \sqrt{\phi_{ij}\phi_{ji}}$$
$$= \phi_{ij} = \phi_{ji}$$

ESTIMATING GRAVITY

Parameterizing trade costs

- Alternative strategy: estimating the effect of known trade costs on trade

$$X_{ij} = G S_i M_j \phi_{ij}$$

e.g. as
$$\log X_{ij} = \log S_i + \log M_j + \alpha_{dist} \log dist_{ij} + \ldots + \epsilon_{ij}$$

or better as
$$X_{ij} = \exp\left(\log S_i + \log M_j + \alpha_{\mathsf{dist}} \log \mathsf{dist}_{ij} + \ldots\right) \cdot \nu_{ij}$$

 \rightarrow (approximate with GDPs or better) use fixed effects for S_i and M_i

TRADE DATA

Customs data: What product was exported/imported when from where?

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- quantity: mostly weight, sometimes additional units

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- \rightarrow generally good availability and "surprisingly" good data quality!

NOW: HANDS ON DATA

Gravity: Distance and Size



Source: Own computation and visualization, data from UN Comtrade und CEPII

Conclusion

- Trade costs: Some easily measurable

 \rightarrow Others: hidden

- Head-Ries Index: Trade costs as a residual
- Estimating gravity