Overview

- How is our understanding of trade changing?
  - New data
  - New facts
  - New theory

- What will be new in the next decade?
  - More new data
  - Another round of facts
  - New theory

Old and 'New' Trade Theory

- ## Old Trade Theory

  - Heckscher, Ohlin, Ricardo

  - Comparative advantage drives trade

  - A world of industries, factors, and countries

  - No firms

- ## 'New' Trade Theory

  - Krugman, Helpman, Ethier

  - Differentiated varieties, increasing returns

  - Intra-industry trade in horizontally-differentiated varieties

  - Symmetric (identical) firms

Challenges to Old and 'New' Trade Theory

- Exporting firms are rare

- Exporting firms are everywhere

- Exporters are different

- Performance induces exporting

- Exporting does not drive productivity

- Trade induces reallocation (intra-industry)

Table 2: Exporting and Exporting Firms in U.S. Manufacturing, 2002

NAICS Industry		Percent of Firms	Percent of Firms that Export	Mean Exports as a Percent of Total Shipments
311	Food Manufacturing	7.5	15	15
312	Beverage and Tobacco Product	0.8	21	9
313	Textile Mills	1.1	27	14
314	Textile Product Mills	1.7	14	11
315	Apparel Manufacturing	2.7	8	14
316	Leather and Allied Product	0.3	24	15
321	Wood Product Manufacturing	5.2	10	17
322	Paper Manufacturing	2.1	28	9
323	Printing and Related Support	10.1	6	13
324	Petroleum and Coal Products	1.0	12	13
325	Chemical Manufacturing	4.5	35	16
326	Plastics and Rubber Products	5.3	30	11
327	Nonmetallic Mineral Product	5.8	9	13
331	Primary Metal Manufacturing	1.8	33	11
332	Fabricated Metal Product	17.8	16	12
333	Machinery Manufacturing	8.7	36	16
334	Computer and Electronic Product	4.6	40	23
335	Electrical Equipment, Appliance,	1.9	41	13
336	Transportation Equipment	3.8	34	14
337	Furniture and Related Product	5.4	8	9
339	Miscellaneous Manufacturing	7.8	19	15
Aggregate Manufacturing		100	20	15

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Exporters are rare and everywhere.

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Exporter Premia in U.S. Manufacturing, 2002

	Exporter premia		
	(1)	(2)	(3)
Log employment	1.19	0.97	
Log shipments	1.48	1.08	0.08
Log value-added per worker	0.26	0.11	0.10
Log TFP	0.02	0.03	0.05
Log wage	0.17	0.06	0.06
Log capital per worker	0.32	0.12	0.04
Log skill per worker	0.19	0.11	0.19
Additional covariates	None	Industry fixed effects	Industry fixed effects, log employment

Exporters are bigger, faster and stronger.

Exporting and Performance

- Large, productive firms become exporters
  - U.S. - Bernard and Jensen
  - Germany - Bernard and Wagner
  - Mexico, Colombia, Morocco - Clerides, Lach, and Tybout
  - Many others

- Exporters do not become more productive

- Exporters do grow faster, die less often

Theoretical Responses

- Bernard, Eaton, Jensen and Kortum (2003)

- Melitz (2003)

- And many others

Theoretical Responses

- ## Heterogeneous firms

  - Fixed, innate productivity (differs across firms)
  - Single product, horizontally differentiated
  - Increasing returns

- ## Costs of exporting

  - Variable and fixed

- ## Predictions

  - High productivity firms become exporters
  - Trade liberalization leads to aggregate productivity growth through reallocation
    - Deaths, New exporters, Expanding exporters

Summary

Firms (and firm heterogeneity) matter

- New source of welfare gains

- Role for trade in firm turnover and labor market churning

- Lingering questions about the nature of trade costs

- More work to do on which firms enter and why

New Data - Export Transactions

- Linked/Longitudinal Firm Trade Transaction Database (LFTTD)
  - Transaction level trade data
    - Universe of US import and export transactions, 1992-2004
    - Date of shipment
    - Firm and related party (multinational) identifiers
    - Country of origin/destination
    - Product identifier (10-digit HS code)
    - Mode of transport
    - Value and quantity (unit values)

  - Longitudinal Business Database [LBD] (Jarmin and Miranda 2002)
    - Use LBD to match above exporting firms to their U.S. employment, industry participation, entry/exit, etc.

U.S. trade is very concentrated

Firm-Export-Size Distributions by Decile, 2002

The top decile of exporters accounts for 95 percent of exports

Source: Bernard, Redding, and Schott (2009), Multi-Product Firms and Trade Liberalization

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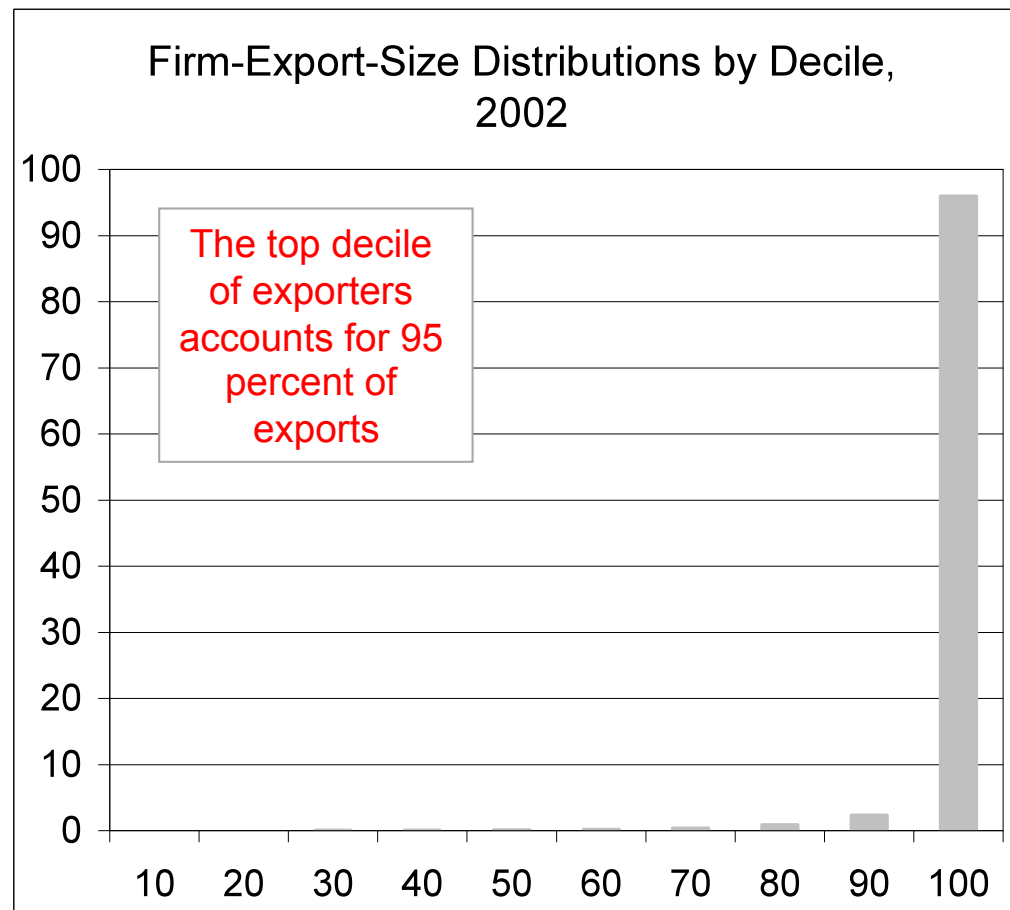
Exporters, Products and Countries

Share of Exporting Firms						
Number of Products	Number of Countries					
	1	2	3	4	5+	All
1	38.2	2.1	0.6	0.3	0.5	41.6
2	7.5	6.7	1.2	0.5	0.8	16.7
3	2.9	2.8	2.0	0.7	1.0	9.4
4	1.5	1.3	1.2	0.9	1.2	6.1
5+	4.0	2.8	2.6	2.5	14.2	26.2
All	54.2	15.7	7.7	4.8	17.7	100

Share of Export Value						
Number of Products	Number of Countries					
	1	2	3	4	5+	All
1	0.2	0.1	0.0	0.0	0.2	0.5
2	0.2	0.2	0.0	0.1	0.2	0.7
3	0.1	0.1	0.1	0.1	0.3	0.7
4	0.1	0.1	0.1	0.1	0.4	0.7
5+	2.2	1.4	1.1	0.9	91.8	97.4
All	2.7	1.8	1.3	1.2	92.9	100

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Extensive margins of trade

- Are the extensive margins important?

- How does aggregate trade adjust in the long run and the short run?

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Reductions in Trade Costs

- Use a "gravity" specification to examine how the margins of trade vary with trade costs (distance) in a cross-section of countries

- Decompose 2002 exports to country c, x_c, into four components

- f_c	number of unique firms	
- p_c	number of unique products	Extensive Margins
- d_c	"density" of trade	
- x_c	mean value per observation	Intensive Margin

where

$d_c =$ observations$_c$ / (f_c p_c)

$x_c = x_c$ / observations$_c$

note: $p_c d_c =$ observations$_c$ / f_c = products/firm

Margins of Trade and Gravity

- Decompose total U.S. exports to each trade partner in 2002
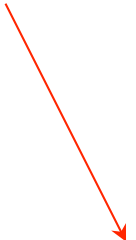
$$x_c = f_c p_c \frac{o_c}{f_c p_c} \left(\frac{1}{o_c} \sum_p \sum_c x_{cpf} \right)$$
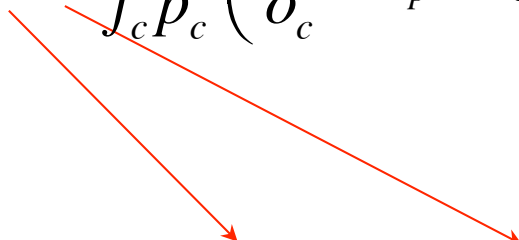
$$\ln z_c = \gamma + \delta \ln \text{distance}_c + \lambda \ln \text{GDP}_c + \varepsilon_c$$

	$\ln(\text{Value}_c)$	$\ln(\text{Firms}_c)$	$\ln(\text{Products}_c)$	$\ln(\text{Density}_c)$	$\ln(\text{Intensive}_c)$
$\ln(\text{Distance}_c)$	-1.37	-1.17	-1.10	0.84	0.05
	0.17	0.15	0.15	0.13	0.10
$\ln(\text{GDP}_c)$	1.01	0.71	0.55	-0.48	0.23
	0.04	0.03	0.03	0.03	0.02
Constant	7.82	0.52	3.48	-2.20	6.03
	1.83	1.59	1.55	1.37	1.07
Observations	175	175	175	175	175
R^2	0.82	0.76	0.68	0.66	0.37

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Margins of Trade and Gravity

- Decompose total U.S. exports to each trade partner in 2002

$$x_c = f_c p_c \frac{o_c}{f_c p_c} \left(\frac{1}{o_c} \sum_p \sum_c x_{cpf} \right)$$

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Well known negative relationship between total exports and distance

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Margins of Trade and Gravity

- Decompose total U.S. exports to each trade partner in 2002
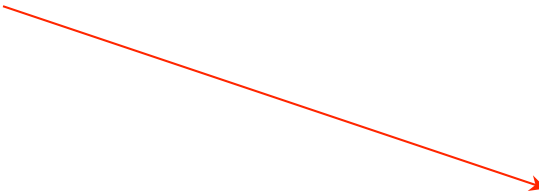
$$x_c = f_c p_c \frac{o_c}{f_c p_c} \left(\frac{1}{o_c} \sum_p \sum_c x_{cpf} \right)$$

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The number of firms and products declines sharply with distance.

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Margins of Trade and Gravity

- Decompose total U.S. exports to each trade partner in 2002

$$x_c = f_c p_c \frac{o_c}{f_c p_c} \left(\frac{1}{o_c} \sum_p \sum_c x_{cpf} \right)$$

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The relationship between the intensive margin and distance is ambiguous: firms' already-exported products expand but they also export smaller products

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Summary

Extensive margins within firms are important

- More productive firms export to more products to more countries

- Extensive margins magnify productivity differences

- More work to do on how firms respond to trade and policy shocks

Intermediaries in Trade

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Non-Producers

- What is the role of intermediaries in trade, in economy more generally

- Trade models typically assume producers in one country trade directly with final consumers in another

- Trade can involve long chains of potentially independent actors, with goods moving through wholesale and retail networks that affect both the magnitude and nature of trade frictions and therefore trade patterns and welfare gains from trade

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Intermediaries

- Wholesale and retail firms account for 23% of US firms and 25% of US employment in 2000 (BJS 2009)

- Wholesale firms account for:

  - 10% of exports and 23% of imports in the US

  - 35% of imports in Chile (Blum, Claro and Horstmann, 2009)

  - 20% of exports in China (Ahn, Khandelwal, and Wei 2010)

  - 11% of exports and 37% of imports in Italy

Products and Countries

- Trade by non-producers is typically in different products and to/from different countries than trade by producers

- These firms respond differently to trade costs

Italy

Wholesale Export Share & Market Size (Extra EU15), 2003

Italy

Wholesale Export Share & Governance Indicator

b=-0.036 (0.006)

Italy

Wholesale Export Share & Number of Trade Documents (Extra EU15), 2003

Observed Value ● — Fitted values

Italy

Wholesale Export Share & Number of days required to import

b=0.049 (0.009)
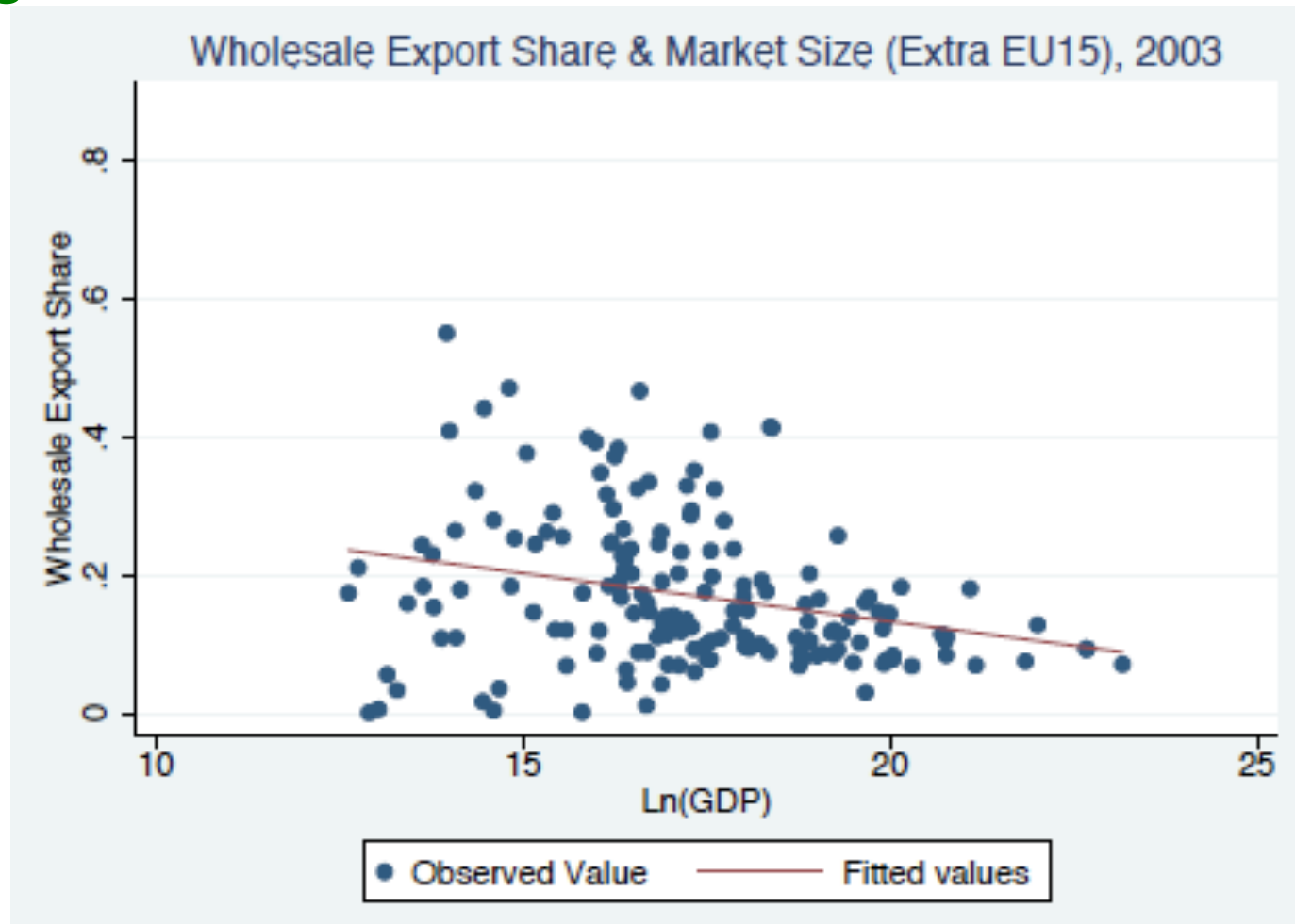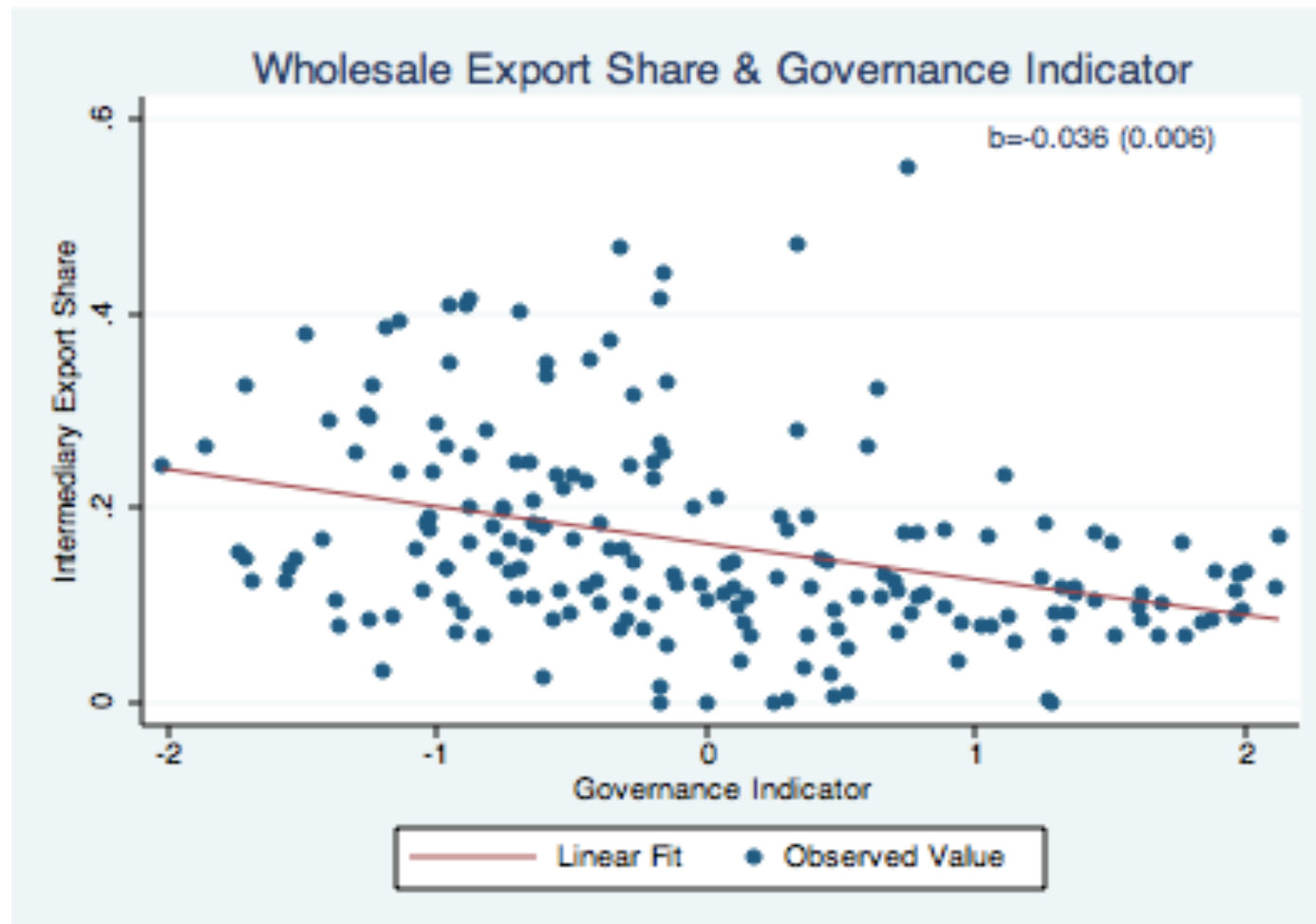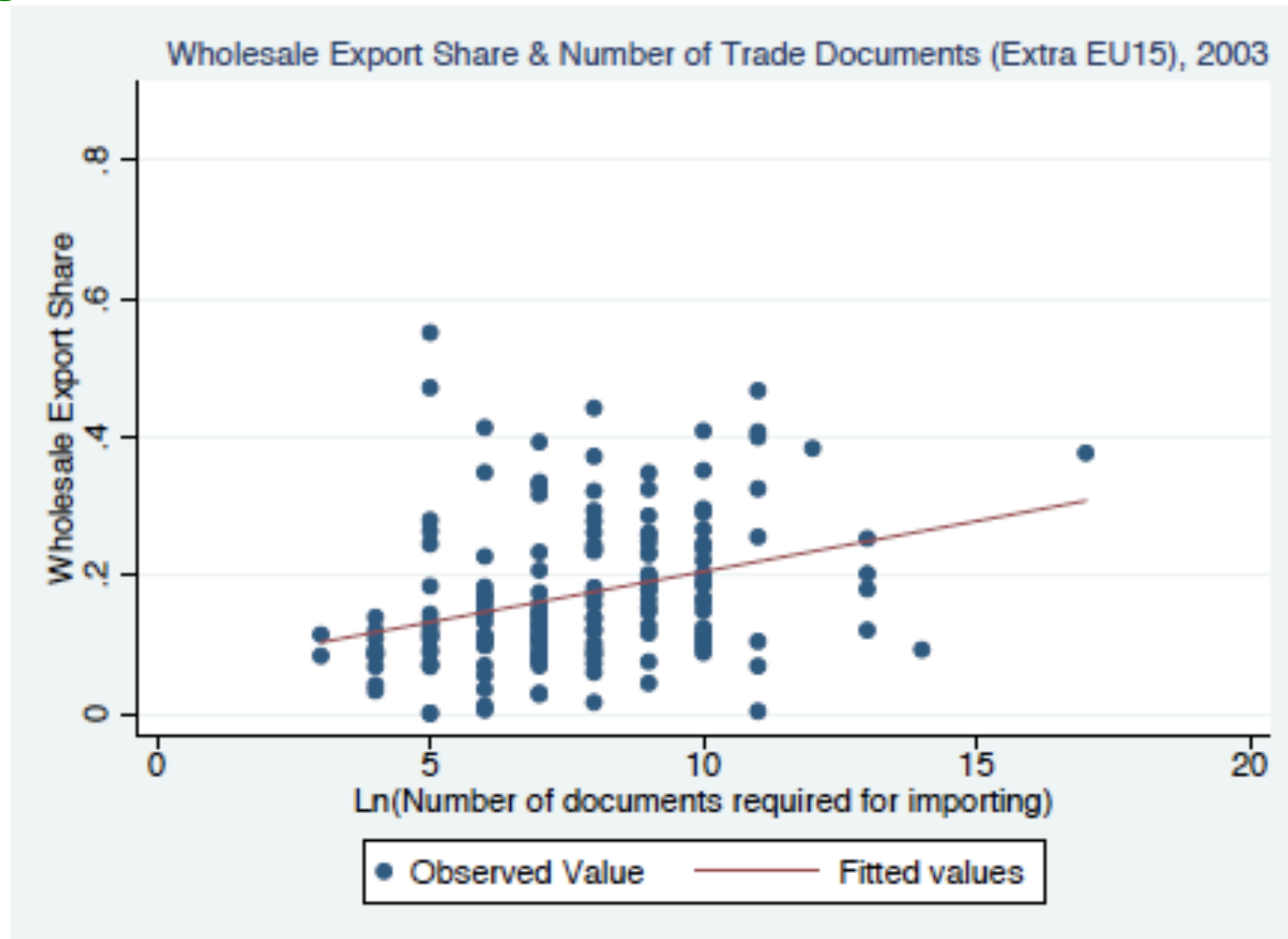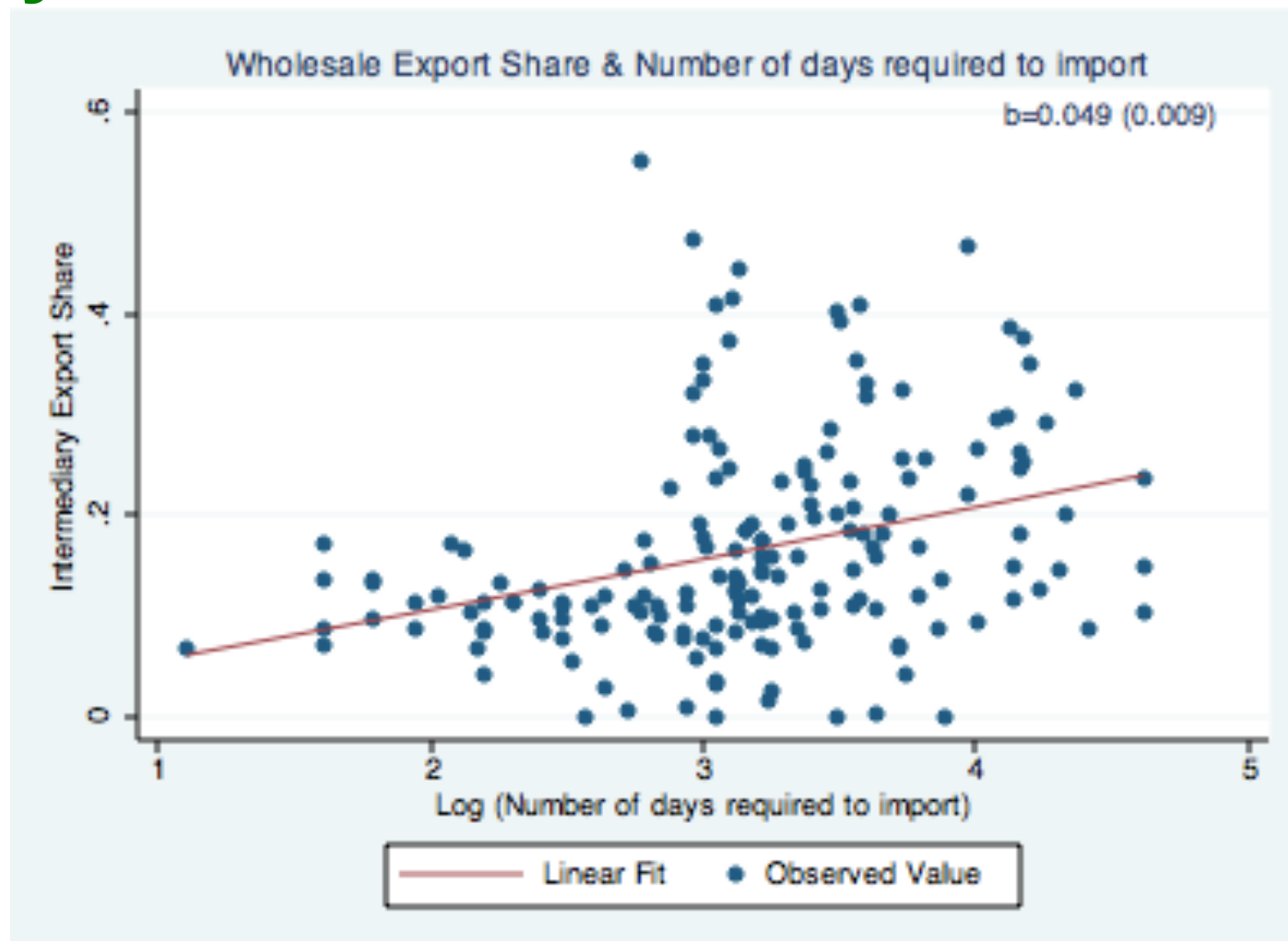
Summary – Intermediaries in Trade

- Trading firms exhibit substantial heterogeneity in terms of firm characteristics and product/country mix

- Raises issues of the decision to do joint production of the good and the services associated with trade

- Just beginning to develop our understanding of trade by intermediaries.

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Importers – It Takes Two

Premia at Trading Firms, 1997

	Exporter	Importer	Exporter and Importer
Log Employment	1.54	1.57	1.91
Log Shipments	0.30	0.28	0.33
Log Shipments per Worker	0.30	0.28	0.33
Log TFP	0.03	0.05	0.02
Log Wages	0.06	0.10	0.05
Log Capital per Worker	0.30	0.28	0.38
Log Skill per Worker	0.17	0.18	0.21

Importers are bigger, faster and stronger too.

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Multinationals and Intra-Firm Trade

Big Firms

Source: Bernard, Jensen, and Schott (2008), Importers, Exporters, and Multinationals: A Portrait of Firms in the U.S. that Trade
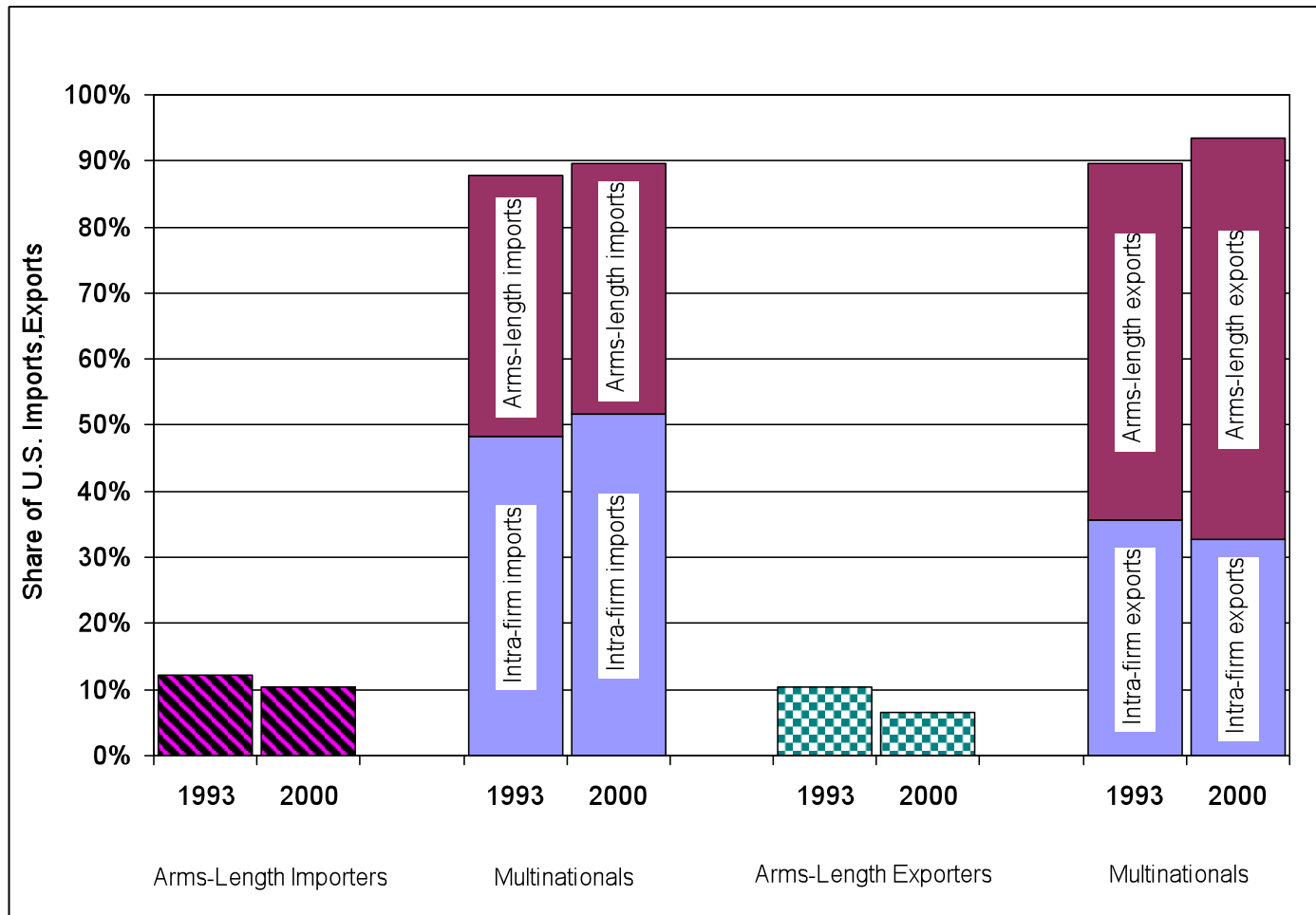
Asian Crisis – U.S. Exports

Asia
Export Value

-21%
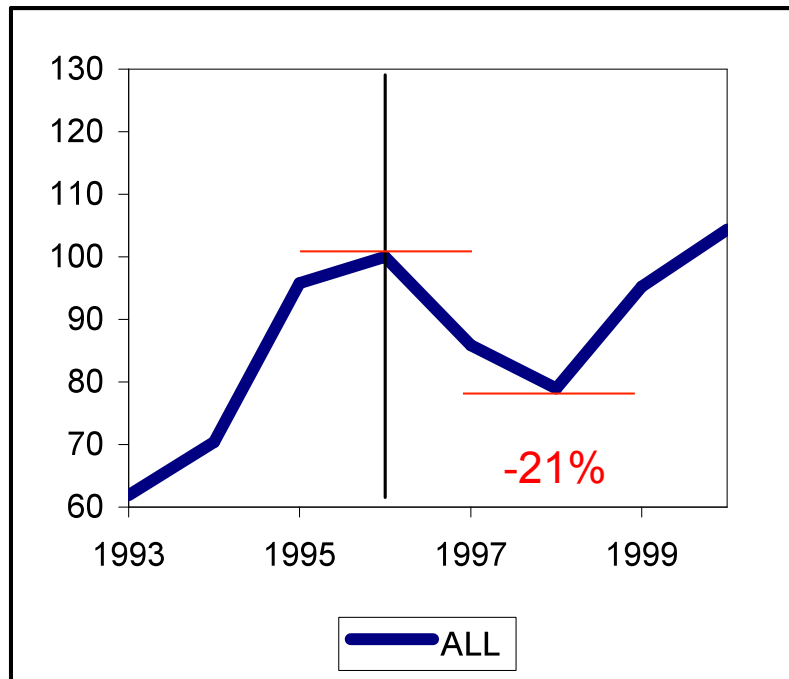
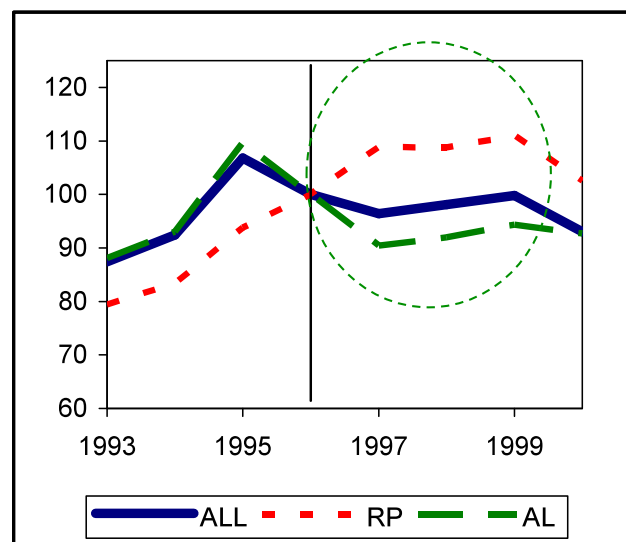### Rest of World
Export Value

5%
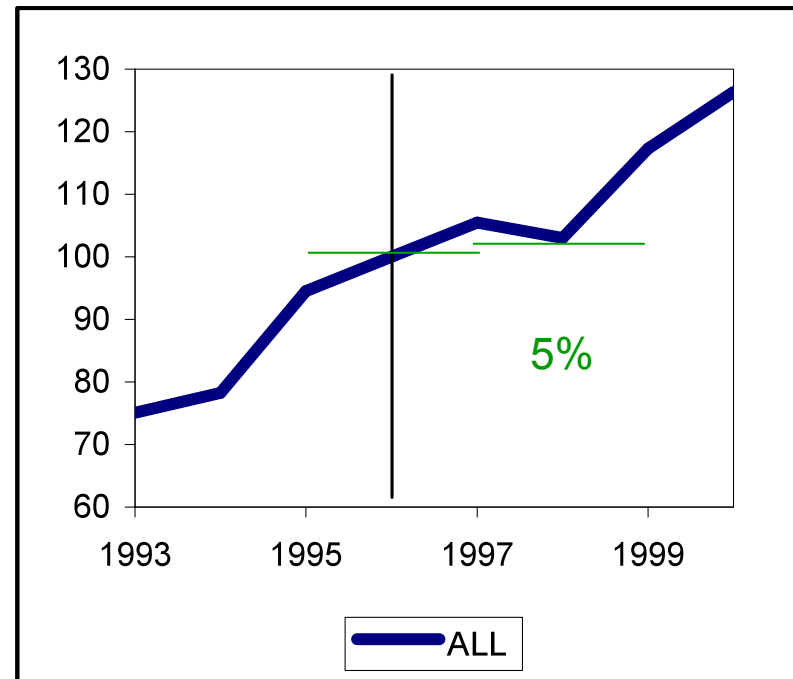
Asian Crisis – RP vs AL Exports

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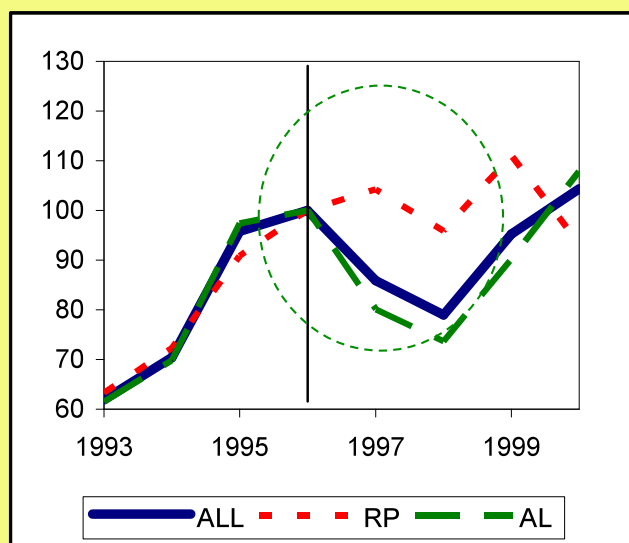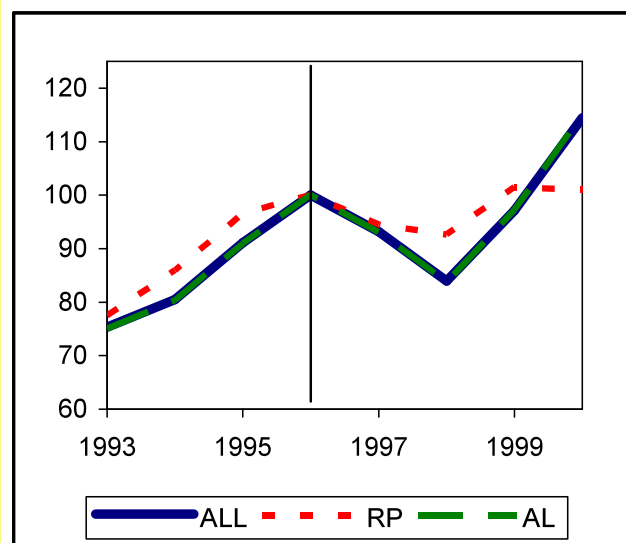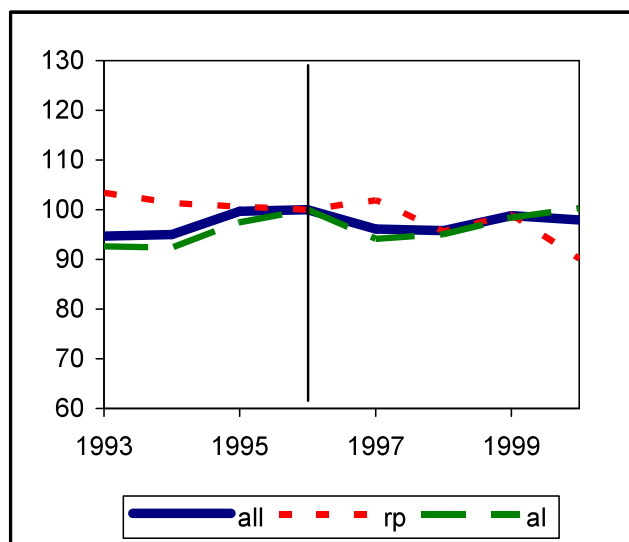
Summary – Related Party Trade

- Response of related-party trade to Asian crisis is quite different from that of arm's-length trade

- Share of intra-firm trade varies by product, firm and country

- We know surprising little about the variation in intra-firm trade over time across countries

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B E R N A R D

Conclusions

Firms in international trade is just beginning

- Trade is very concentrated

- The big exporting firms are also big importers

- Importing firms are also bigger, faster and stronger

- Large exporters ship many products to many countries

- Across countries, extensive margins matter
  - Number of firms
  - Number of products

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Thank you

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Variation within Industries

PHOTO FILMS, PAPERS, PLATES & CHEMICALS
Intra-firm Share and Total Imports by Country

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