

The Effects of Trade Agreements: A Firm-Level Perspective

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Trade Theory: Country-Level Analysis

- Assumes that average production cost is independent of output level.
- Gains from trade result from across-industry reallocations of labour, capital, etc.

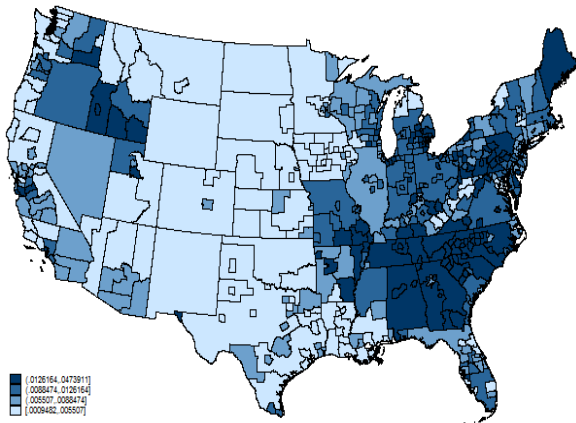
Trade Theory: Industry-Level Analysis

- Assumes that average production cost **falls as output increases**.
- Additional gains from trade result from
 - Higher productivity from higher output
 - More product variety available to consumers
 - Lower mark-ups due to increased competition

Predicted Distributional Impacts of Trade

Export-oriented regions, industries, and workers benefit from trade while import-oriented ones are harmed by trade.

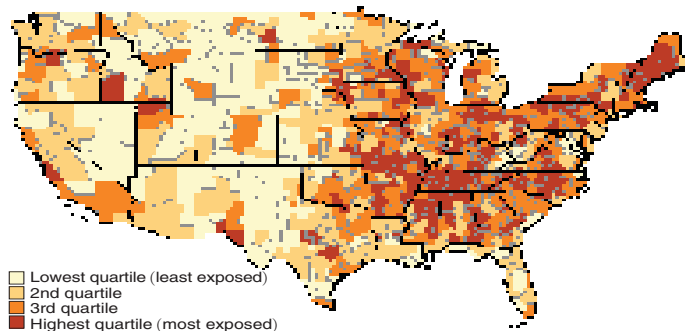
US Regional Exposure to Trade with Mexico



Source: Hakobyan and McLaren (2016)

US Regional Exposure to Trade with China

Panel B. Trade Exposure by Commuting Zone, 1990–2007



Source: Autor, Dorn, and Hanson (2013)

Modern Trade Theory: Firm-Level Analysis

- Assumes that average production cost falls as output increases.
- Assumes that firms within an industry differ in their productivity – firms are heterogeneous.
- Incorporates variable and fixed costs of trade.

Focus on Three Insights from Modern Trade Theory

- 1 There are Additional Effects on Productivity of Increased Trade
- 2 The Fixed Costs of Participating in International Markets Matter
- 3 Modern Trade Theory Leads to Modern Empirical Analysis

Productivity Effects

- 1 There are Additional Effects on Productivity of Increased Trade

Basic Model

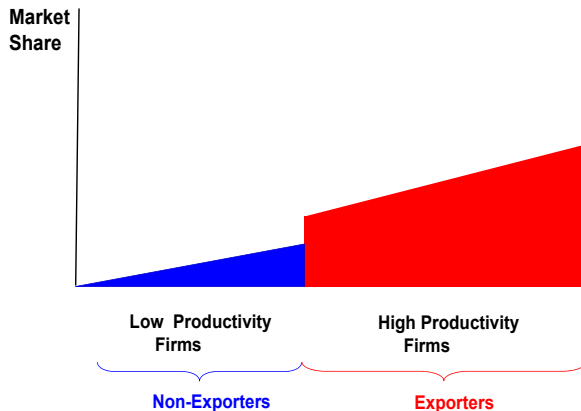
Melitz (2003)

Heterogeneous firms in the same industry choose whether or not to export and how much to export.

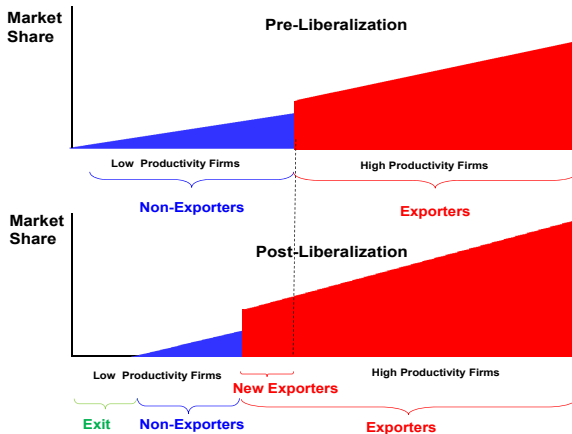
Because there are fixed costs of exporting, the more productive firms will export while the less productive will not export.

Basic Model

Melitz (2003)



Effects of Trade Liberalization



Effects of Trade Liberalization

A decrease in trade costs, a decrease in tariffs, or expanded trading opportunities \implies

● An increase in profits from exporting \implies

- Expansion by incumbent exporters
- Entry by new exporters

These firms gain from increased trade (winners).

Effects of Trade Liberalization

Expansion by exporters \implies

- An increase in the demand for labour \implies
 - An increase in wages \implies
 - A decrease in profits from domestic sales \implies
 - Contraction by some non-exporters
 - Exit by some non-exporters

These firms are harmed by increased trade (losers).

Effects of Trade Liberalization

Contraction and exit by less productive firms and expansion by more productive firms \implies

- An increase in average industry productivity due to reallocation within an industry
- Winners and losers within an exporting industry

Extensions

These effects extend to firms' decisions regarding innovating, importing intermediates, global value chains, ...

Trade can increase differences in productivity across firms **within an industry**.

Empirical Evidence: Canadian Manufacturing Data

For 1974-2010 among Canadian manufacturing firms, labour productivity was 13% higher for exporters than for non-exporters.

Source: Baldwin and Yan (2017)

Canadian manufacturing firms which began exporting between 1984 and 1996 were 58% larger and 7% more productive than non-exporters.

Source: Lileeva and Trefler (2010)

Empirical Evidence: US-Canada Free Trade Agreement

Estimates of effects of US-CFTA on Canadian manufacturing productivity:

Source	Productivity Increase
Growth of most productive plants	4.1%
Contraction & exit of least productive plants	4.3%
Incumbent exporters' investments	1.4%
New exporters' investments	3.5%

Sources: Trefler (2004) and Lileeva and Trefler (2010)

Policy Implications

- The degree of firm heterogeneity within an industry matters for the impact of trade policy.

Policy Implications

- Trade policy negotiators need access to quantitative studies based on firm-level and plant-level data.

(For example, to obtain estimates of the degree of heterogeneity within an industry.)

Policy Implications

- There should be increased emphasis on the links between trade policy and firm, industry, and aggregate productivity.
- Trade policies should be coordinated with productivity, innovation, investment, and industrial policies.

Policy Implications

- There should be increased attention to the distributional impacts of trade policies across firms and workers **within** industries.
- Trade policy should be inclusive and should be coordinated with domestic policy to assist firms and workers in adjusting to changes in policy. (Tapp (2017))

Importance of Fixed Costs

2 Fixed Costs of Participating in International Markets Matter

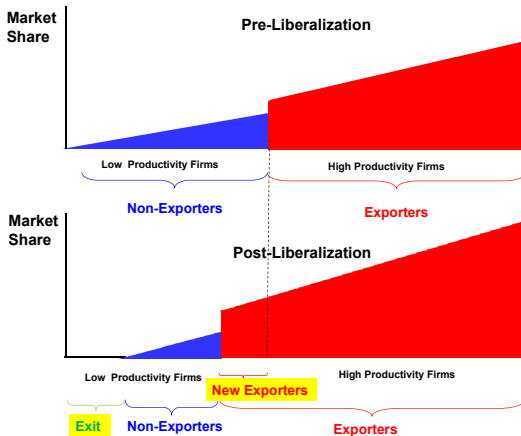
Extensive Margin Responses

In the presence of fixed costs of trade...

There are intensive and **extensive margin** responses to changes in the trading environment:

- Intensive Margin Responses: Changes in trade flows of existing products by existing firms in existing markets
- **Extensive Margin Responses:** Changes in the number and composition of firm and markets

Effects of Trade Liberalization



Policy Implications

- There should be increased emphasis on the impact of trade policy on **potential** trade flows due to extensive margin effects:
 - Entry of new trading firms.
 - Expansion of traded products that previously were not traded.
 - Expansion of traded products into new markets.

Policy Implications

- There should be increased emphasis on lowering fixed costs and regulatory obstacles that inhibit market access for trading firms.

Empirical Analysis

3 Modern Trade Theory Leads to Modern Empirical Analysis

Firm-level Empirical Analysis

Firm-based trade theory implies an increased need for firm-level and plant-level empirical analysis to:

- guide the theory
- test the theory
- assess the impact of trade policy

Firm-based trade theory guides firm-level empirical analysis.

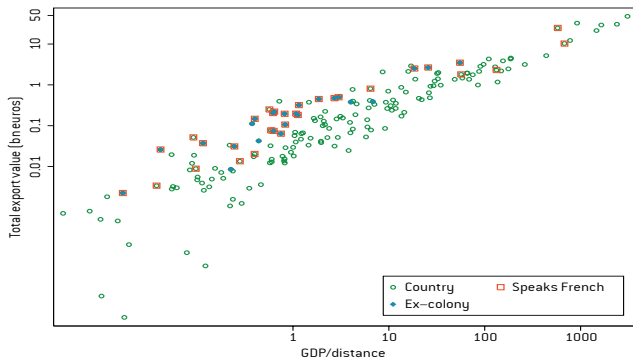
Example: Empirical Gravity Analysis

Traditional empirical gravity analysis is based on the idea that the volume of trade between two countries depends on

- Their size
- Measures of bilateral characteristics such as:
 - Distance between countries
 - Whether countries share a common language
 - Whether countries have a regional trade agreement (RTA)
 - ...

Empirical Gravity

Figure 16: The forces of gravity for France in 2003



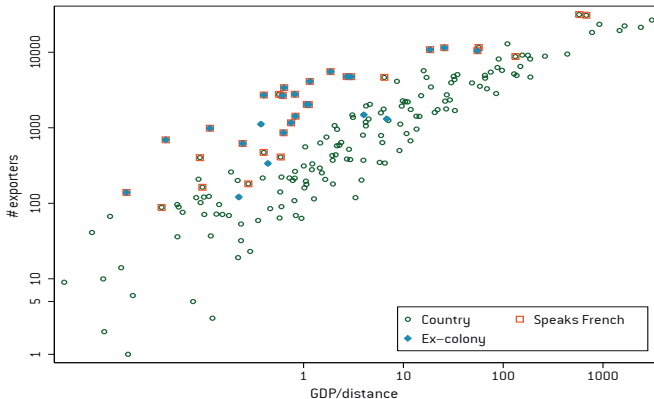
Source: Mayer and Ottaviano (2007)

Empirical Gravity

Modern trade theory implies that we should examine extensive and intensive margin responses separately.

Empirical Gravity

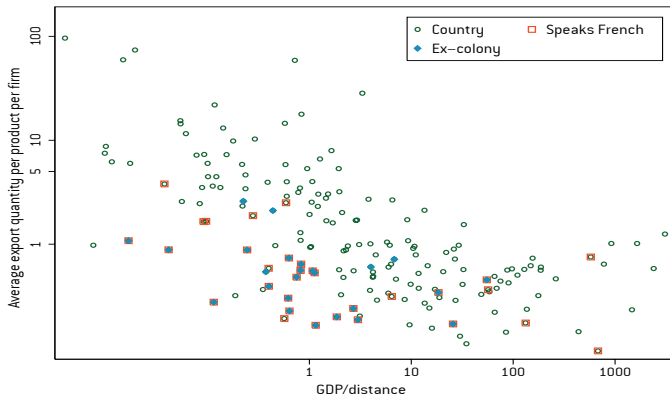
Figure 17: The extensive margin



Source: Mayer and Ottaviano (2007)

Empirical Gravity

Figure 18: The intensive margin



Source: Mayer and Ottaviano (2007)

Policy Implications

Helpman, Melitz, and Rubenstein (2008) conclude:

“... Regional Trade Agreements ... predominantly reduce the fixed costs of trade:

they have a great influence on a firm's choice of export location,
but not on its export volume

once the exporting decision has been made.”

Empirical Gravity

Modern trade theory showed that Traditional Empirical Gravity equations were misspecified.

Empirical Gravity: Multi-Country Trade

	Traditional Gravity	Theory-Based Gravity
Bilateral Characteristic	Impact on Trade Volume	Impact on Trade Volume
Distance (1% increase)	-1.00%	-0.80%
Common Language	123%	28%
RTA	0%	50%

69 countries; 1986-2006

Source: UN & WTO Publication (2016)

Gravity: Canadian Inter-Provincial Trade Agreements

Estimated Impact on Inter-Provincial Trade Volumes

Provincial Trade Agreement	Theory-Based Gravity Without International Flows	Theory-Based Gravity With International Flows
OPP (1993)	11%	13%
APA (1996)	37%	36%
TCA (2009)	-30%	-30%
PARE (2009)	-29%	-27%
TILMA/NWPTA (2007/2010)	9%	7%

10 provinces, US, ROW; 1992-2013

Source: Lapham & Teeter (2019)

Based on Beaulieu & Zaman (2019)



Gravity: Importance of Provincial Borders

Estimated Intra-Provincial Trade Volumes Relative to Inter-Provincial Trade Volumes

Year	Theory-Based Gravity Without International Flows	Theory-Based Gravity With International Flows
1995	26	119
2001	25	114
2007	25	112
2013	24	108

10 provinces, US, ROW; 1992-2013

Source: Lapham & Teeter (2019)

Based on Beaulieu & Zaman (2019)



Contributions of Firm-Level Theoretical Analyses of Trade

- 1 Models with firm heterogeneity provide explanations for features of disaggregated trade data that cannot be addressed with homogeneous firm models.
- 2 Models with firm heterogeneity have improved our understanding of the mechanisms through which economies respond to trade liberalization.
- 3 This increased understanding of the margins along which an economy adjusts to trade liberalization are important for evaluating the welfare effects of increased trade.

The Importance of Heterogeneity

4 Recent developments in trade theory and firm-level data analysis recognize the importance of heterogeneity in:

- Countries
- Regions within countries
- Industries
- Firms' technologies
- Firms' participation in international markets
- Firms' responses to changes in trade policy
- Products

Effects of Trade Policy

- 5 Changes in trade policy induce intensive and extensive margin adjustments.
- 6 The effects of trade policy depend crucially on the composition of firms within industries.
- 7 Trade policy changes have distributional effects within industries.

Sources of Gains from Trade

8 There are many sources of gains from trade:

- Comparative advantage
- Increased productivity due to higher output
- Increased product variety
- Lower markups
- Increased productivity due to across-firm reallocations
- Trade-induced product and production innovations

Estimating the Effects of Inhibitors and Promoters of Trade

- 9 Allows for separate measures of the effects on intensive versus extensive margin responses.
- 10 Provision of new estimates from theoretically grounded empirical gravity analysis.

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