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# Firm heterogeneity and trade

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# References for this lecture

- BBGV Chapter 4
  - Paragraphs 4.7, 4.8

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# Comparison of models: Assumptions

	Ricardo	HOS	Krugman
Production factors	1	2	-
Within-country mobility of inputs	Yes	Yes	Yes
Between-country mobility of inputs	No	No	No
Technology / productivity	Heterogeneous	Homogeneous	Homogeneous
Relative factors' endowment	-	Heterogeneous	-
Trade frictions	No	No	No
Returns to scale	Constant	Constant	Increasing
Commodities	Homogeneous	Homogeneous	Heterogeneous (varieties)

# Comparison of models

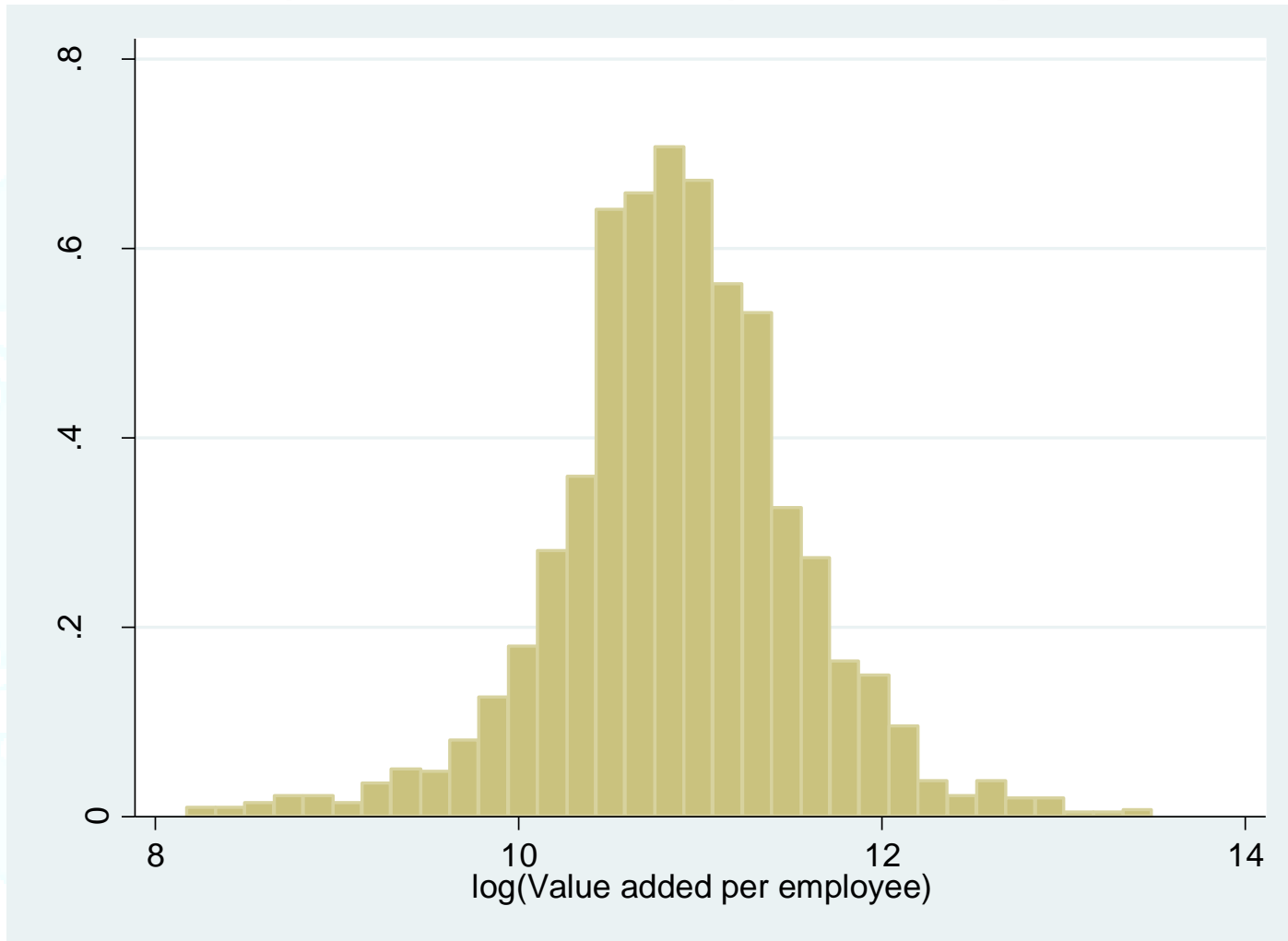
## Predictions of the model

	Ricardo	HOS	Krugman
Inter-industry trade	Yes	Yes	-
Intra-industry trade	No	No	Yes
Full specialization	Yes	Not necessarily	Yes (in varieties)
Commodity price equalization	Yes	Yes	-
Factor(s) price equalization	No	Yes	-
Trade is mutually beneficial	Yes	Yes	Yes

# Trade and firm dynamics

- The model of **trade with monopolistic competition** predicts a '**competition effect**'
- Some **firms exit** the market and the **remaining firms gain market shares**
- The **basic model**, however, is based on the **assumption of identical firms** (except for the variety they produce)

# Firm heterogeneity in labour productivity (in log)

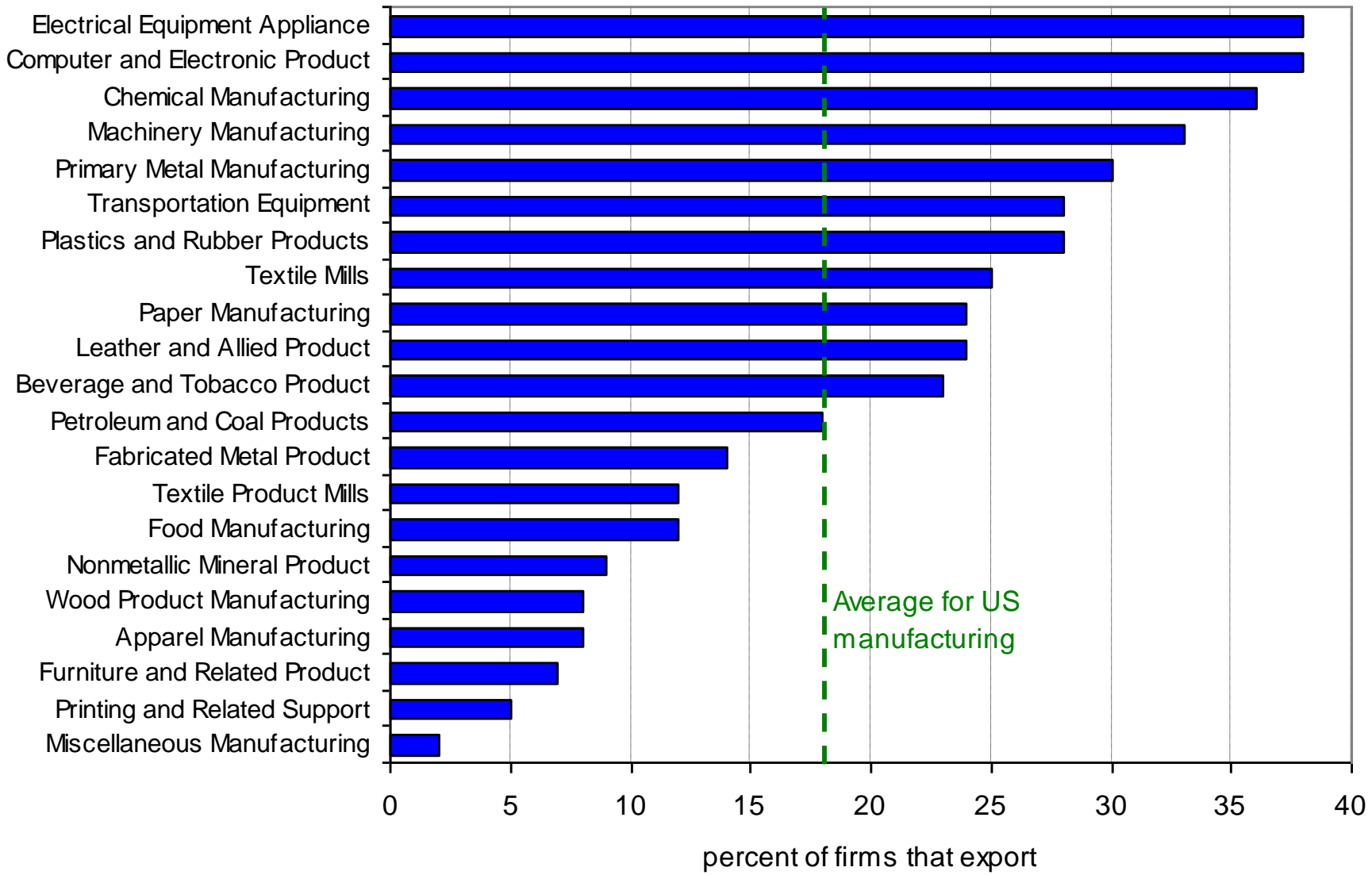


# Firm heterogeneity and trade

- Only **few firms import or export**
- Also **within sectors** in which a country has **comparative advantage** (or is well endowed with the intensive factor), only a **selection of firms** actually **exports**

**Figure 4.8** Export orientation of US manufacturing firms, 2002

Export orientation of US manufacturing firms, 2002





# Firm heterogeneity and trade

- As only **few firms** actually **trade**, it is important to understand which are the **characteristics** of these firms
- Are these firms **larger**? Are they more **'efficient'**? Are they more **productive**? Are they more **technologically-endowed**?

# Firm heterogeneity (Italy)

	Exporter premia (%)
Size (employees)	69.5
Labour productivity (VA per employee)	11.4
Capital stock per employee	18.9
Share of graduates	23.5
Probability of doing R&D	17
Probability of adopting a product innovation	14.4
Probability of adopting a process innovation	9.7
Probability of applying for a patent	4.2
Probability of doing FDI	1.9

Italian manufacturing firms. Sector and year dummies included.  
Source: Mediocredito Centrale, years 1995-2007

# Firm heterogeneity (US)

*Table 4.3 Exporter premia in US manufacturing, 2002*

	Exporter premia (%)
Employment	164
Shipments	194
Value-added per worker	12
TFP – total factor productivity	3
Wage	6
Capital per worker	13
Skill per worker	12
Additional covariates	Industry fixed effects

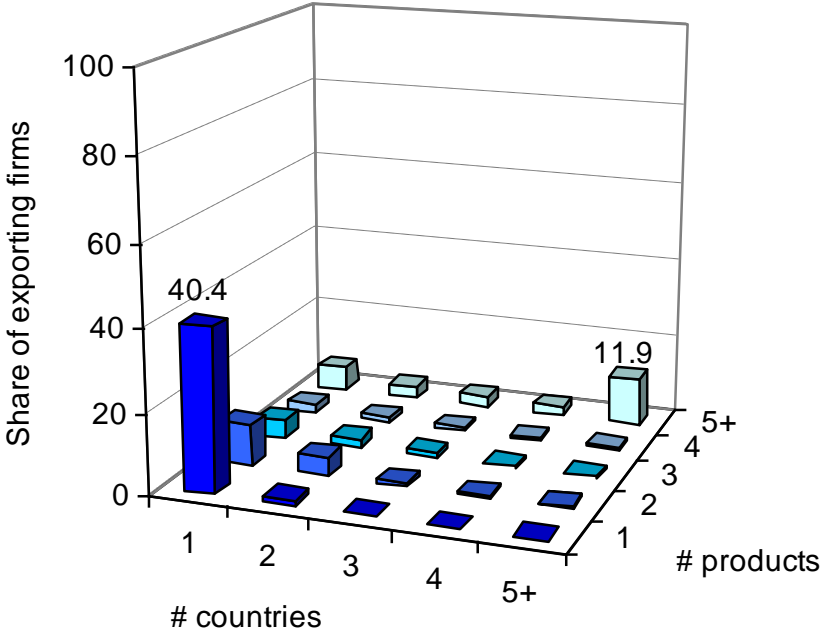
Source: based on Bernard et al. (2007, Table 3); all results are significant at the 1 percent level.

# Firm heterogeneity

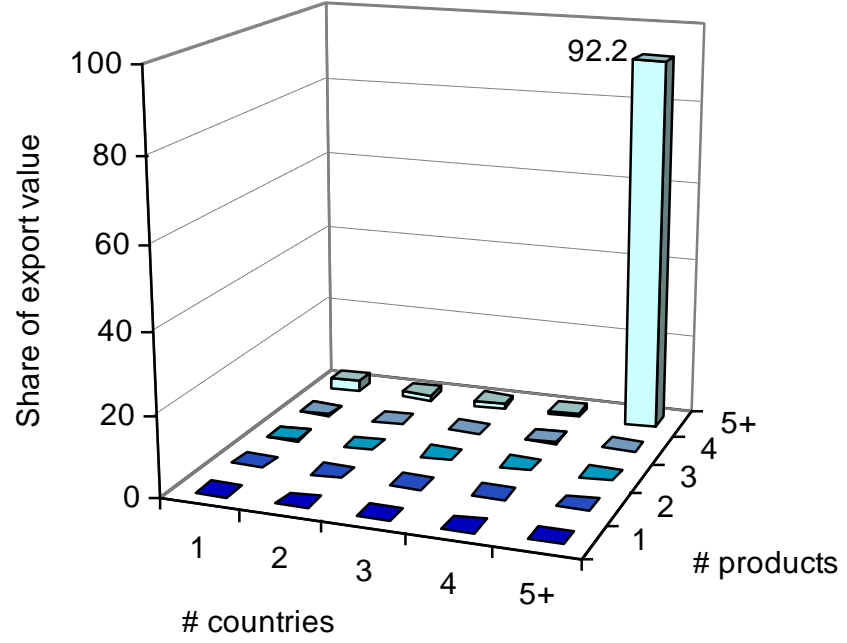
- **Exporting firms are:**
  - **Larger**
  - More **capital** intensive
  - With a more **skilled** labour force
  - More **productive**
  - More **innovative**

**Figure 4.9** Distribution by number of products and export destinations; USA, 2000

a. Share of exporting firms



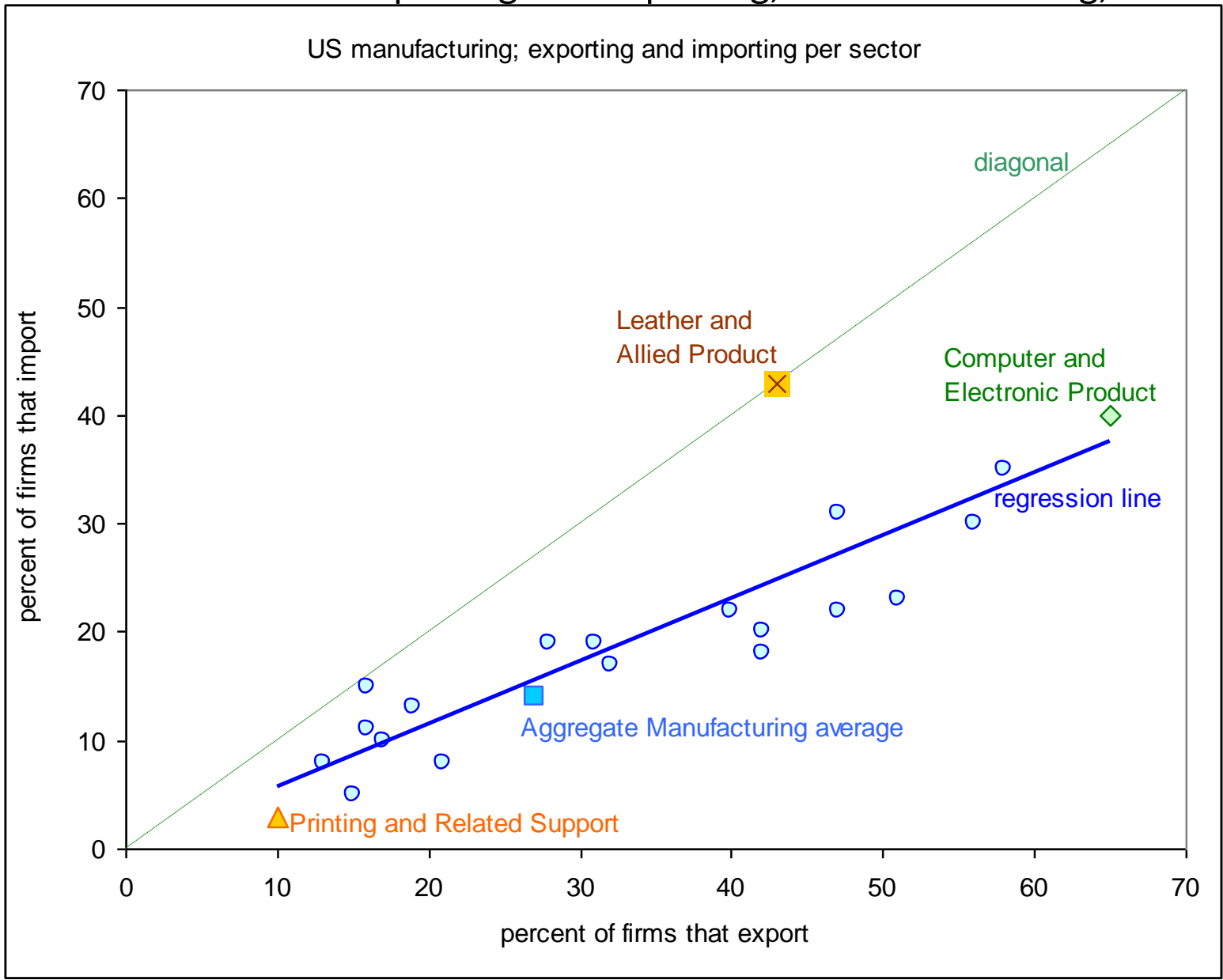
b. Share of export value



# Heterogeneity between exporting firms

- Almost **half** (40.4) of **US exporting** firms just export **one product** to just one **country**
- Firms that export **five or more products** to five or more **countries** account for **92.2** percent of total **export**

**Figure 4.10** Simultaneous exporting and importing; US manufacturing, 1997



# Import and export

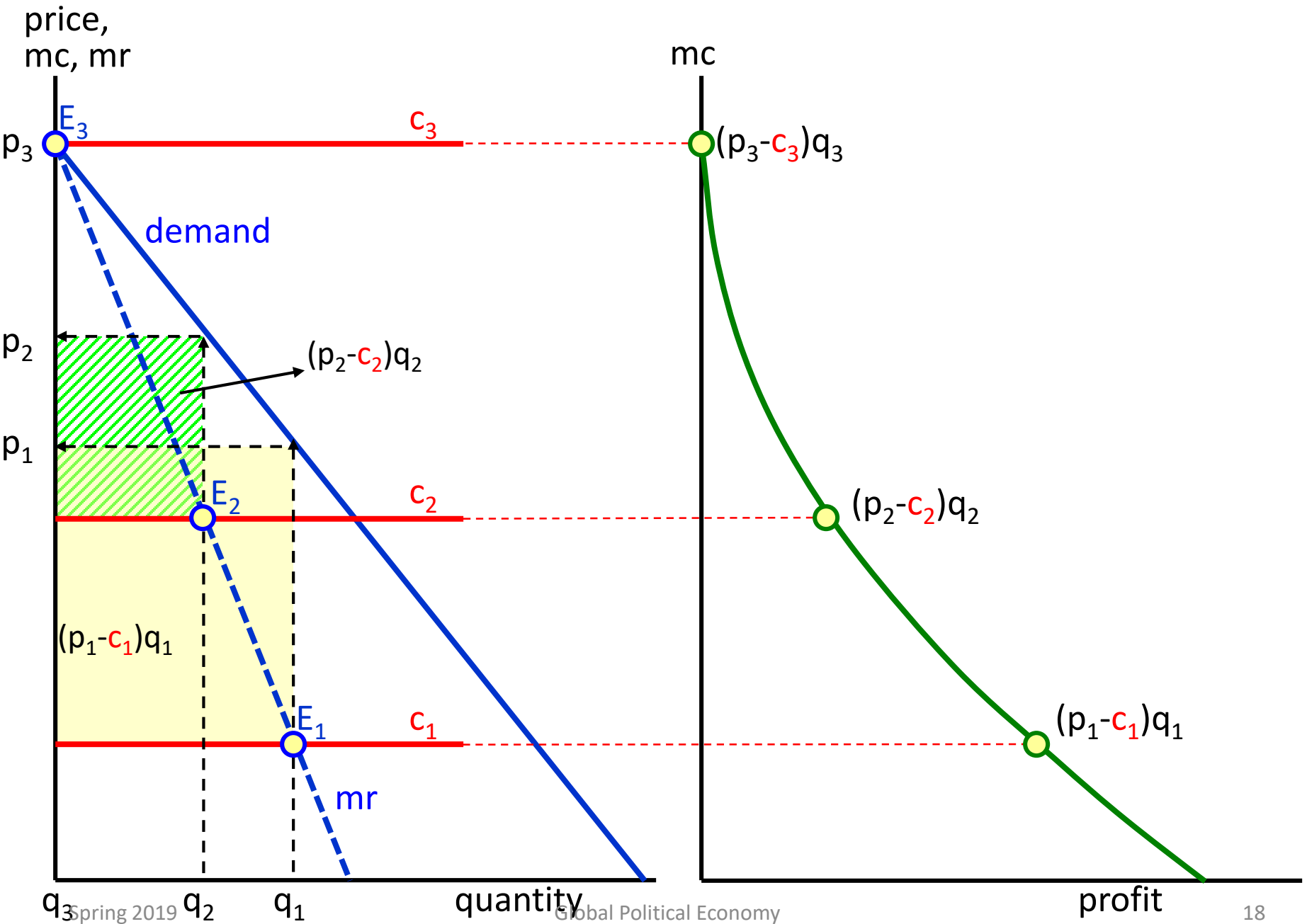
- There exist a positive **correlation** between **exporting** and **importing**
- **41 percent** of the **exporting** firms also **import**
- **79 percent** of **importers** also **export**



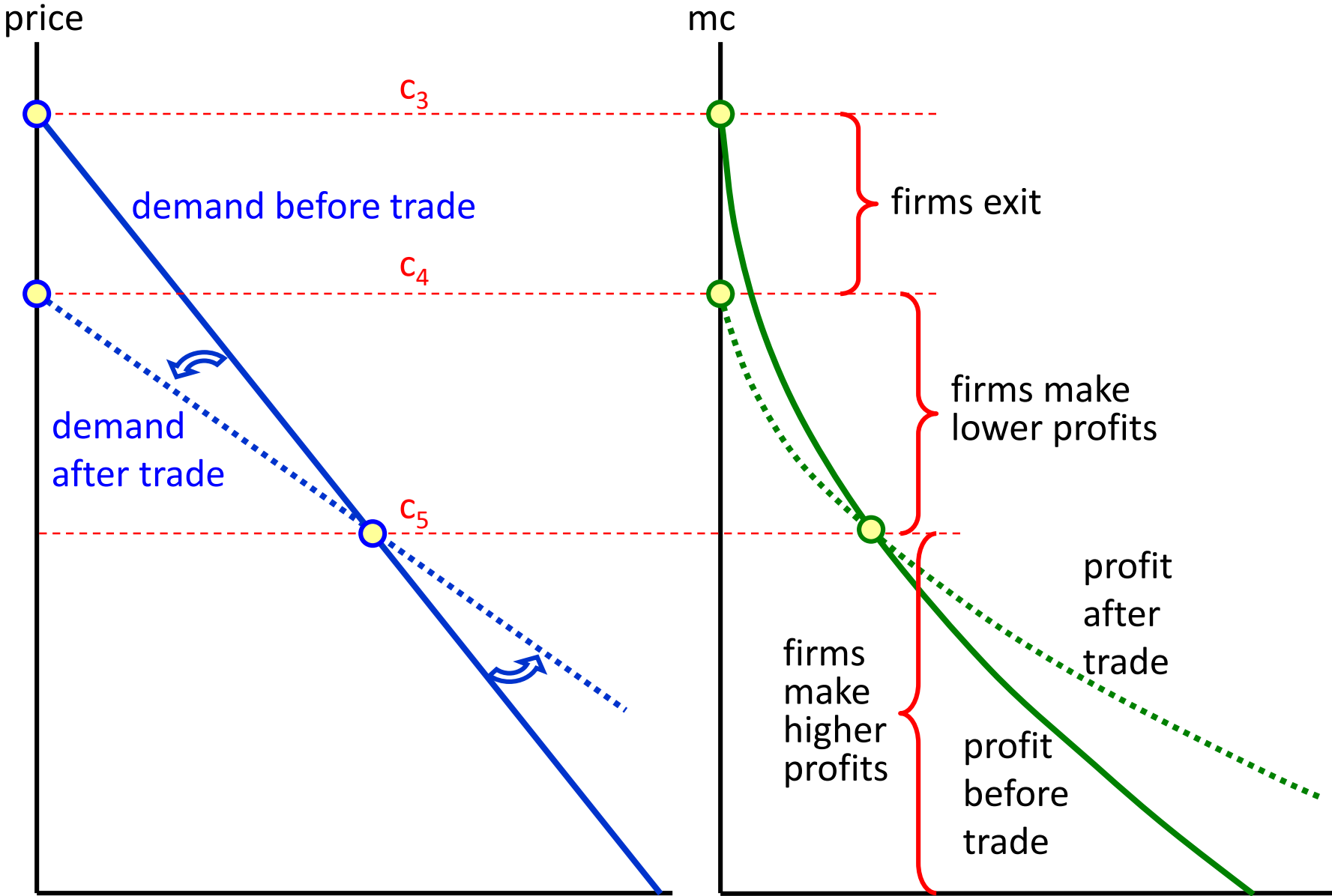
# Trade and selection

- For a **given demand** and **market** structure, firms with **higher marginal costs** make **less profits** than firms with lower marginal costs
- If profits are **below zero** (due to too high marginal costs), the firm **exits** the market

**Figure 4.11** Firm heterogeneity, prices, and profits



**Figure 4.12** Firm heterogeneity and trade



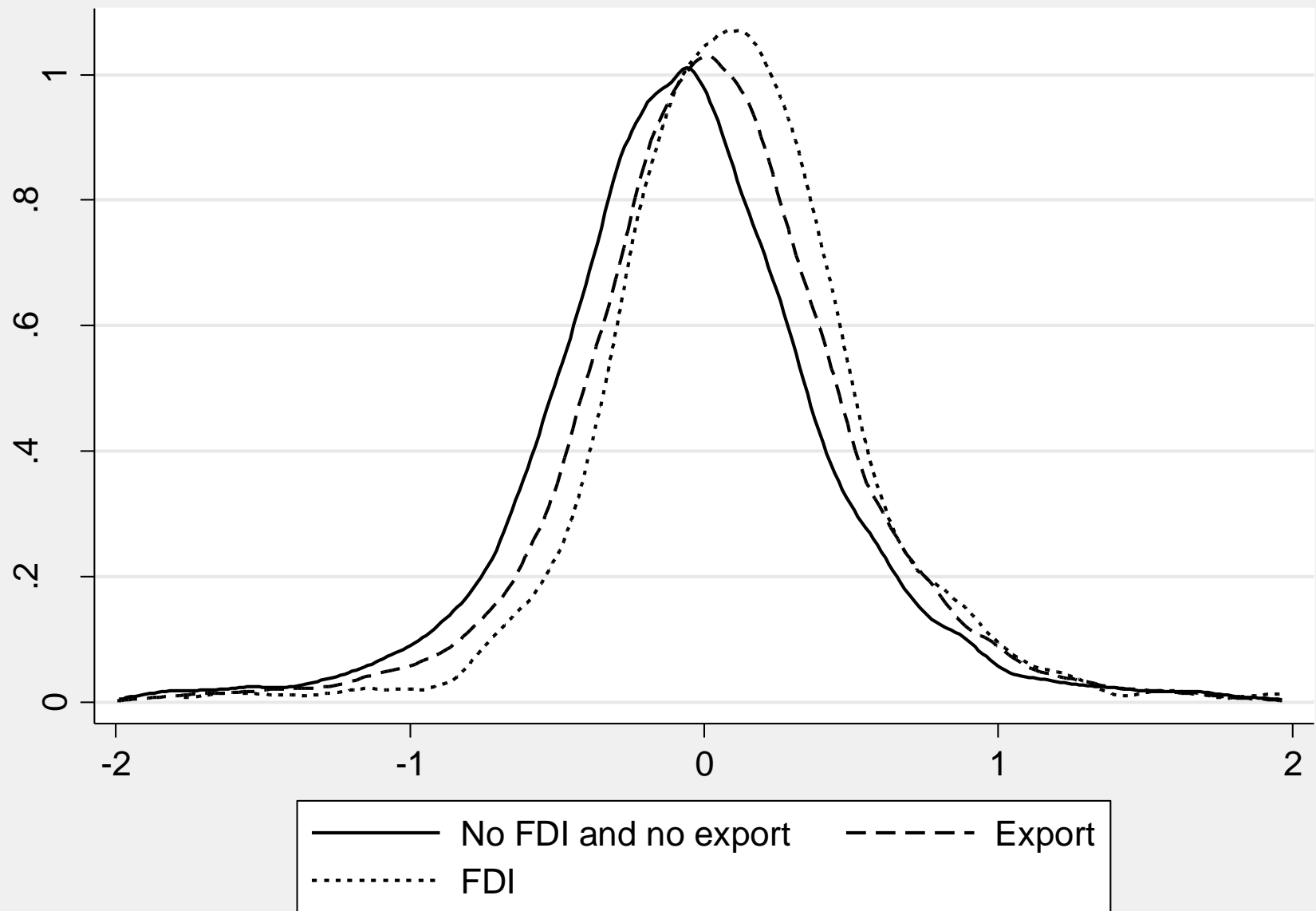
# Trade and selection

- Trade induce a **counterclock wise rotation** of the **demand curve** → demand becomes **more elastic**
- As we will see in the coming lectures, firms that **engage in trade** need to incur in a series of **fixed costs of exporting** → only firms with a **sufficiently high productivity** can bear the fixed cost of exporting
  - **Least productive** firms will **exit** the market
  - Firms with **intermediate productivity** will **remain** on the market but **cannot bear** the **fixed cost of exporting**
  - Firms with **high productivity** will **increase** their **market share** and also **export**
- Doing **FDI** is even **more 'costly'** → further **selection**

# Trade and selection

	Exporter premia (%)	FDI premia (%)
Size (employees)	69.5	164.0
Labour productivity (VA per employee)	11.4	11.1
Capital stock per employee	18.9	22.4
Share of graduates	23.5	23.4
Probability of doing R&D	17	29.5
Probability of adopting a product innovation	14.4	24.3
Probability of adopting a process innovation	9.7	16.3
Probability of applying for a patent	4.2	11.4
Probability of doing FDI	1.9	-
Probability of exporting	-	20.7

- Doing FDI is even more 'costly' → further selection



Italian manufacturing firms. Labour productivity partialled out of sector and year dummies. Source: Mediocredito Centrale, years 1995-2007