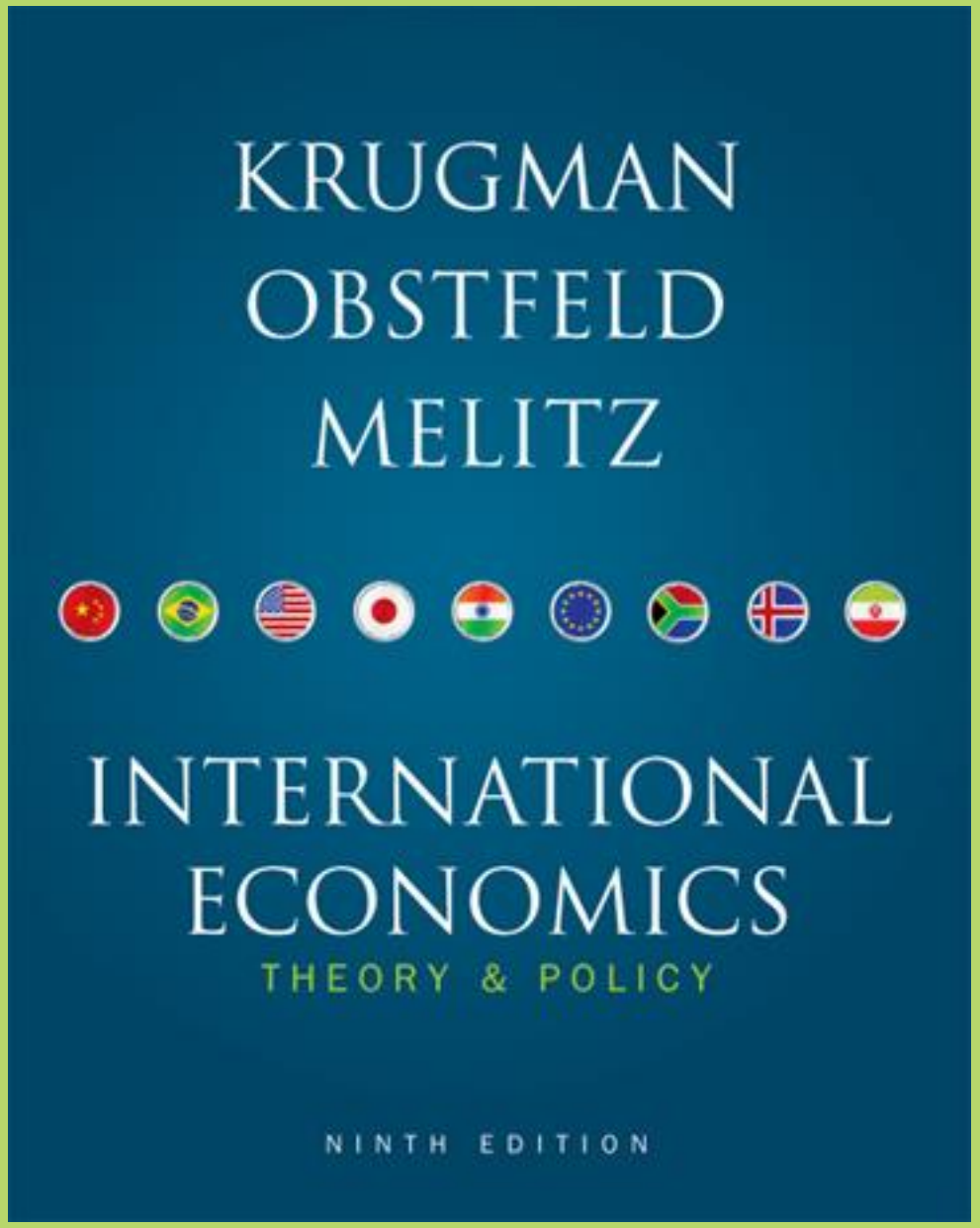
Firms in the Global Economy: Export Decisions, Outsourcing, and Multinational Enterprises

(adapted by Guido Baldi)



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Preview

- Monopolistic competition and trade
- The significance of intra-industry trade
- Firm responses to trade: winners, losers, and industry performance
- Multinationals and outsourcing

Introduction

- When economies of scale exist, large firms may be more efficient than small firms, and the industry may consist of a monopoly or a few large firms.
  - Production may be imperfectly competitive in the sense that excess or monopoly profits are captured by large firms.
- Internal economies of scale result when large firms have a cost advantage over small firms, causing the industry to become uncompetitive.

Introduction (cont.)

- Internal economies of scale imply that a firm's average cost of production decreases the more output it produces.
- Perfect competition that drives the price of a good down to marginal cost would imply losses for those firms because they would not be able to recover the higher costs incurred from producing the initial units of output.
- As a result, perfect competition would force those firms out of the market.

Introduction (cont.)

- In most sectors, goods are differentiated from each other and there are other differences across firms.
- Integration causes the better-performing firms to thrive and expand, while the worse-performing firms contract.
- Additional source of gain from trade: As production is concentrated toward better-performing firms, the overall efficiency of the industry improves.
- Study why those better-performing firms have a greater incentive to engage in the global economy.

The Theory of Imperfect Competition

- In imperfect competition, firms are aware that they can influence the prices of their products and that they can sell more only by reducing their price.
- This situation occurs when there are only a few major producers of a particular good or when each firm produces a good that is differentiated from that of rival firms.
- Each firm views itself as a price setter, choosing the price of its product.

Monopoly: A Brief Review

- A **monopoly** is an industry with only one firm.
- An **oligopoly** is an industry with only a few firms and strategic interaction among firms.
- Monopolistic competition: an industry with a few firms and no strategic interaction among firms.

Monopoly: A Brief Review

- Assume that the **demand curve** the firm faces is a straight line $Q = A - B(P)$, where Q is the number of units the firm sells, P the price per unit, and A and B are constants.
- $Q = A\text{-}BP$ (equation 1)
- Revenue for the firm is:

  $R = PQ = (A\text{-}Q)/B\ Q$ (2)
- **Marginal revenue** equals

  $MR = P\text{-}Q/B$ (3)

Monopoly: A Brief Review (cont.)

- Suppose that **total costs** are
- $C = F + cQ$ *(4)*

where *F* is fixed costs, those independent of the level of output, and *c* is the constant marginal cost.

Marginal costs are:

- MC = c (5)
- Average costs:

C/Q=AC =F/Q+c (6)

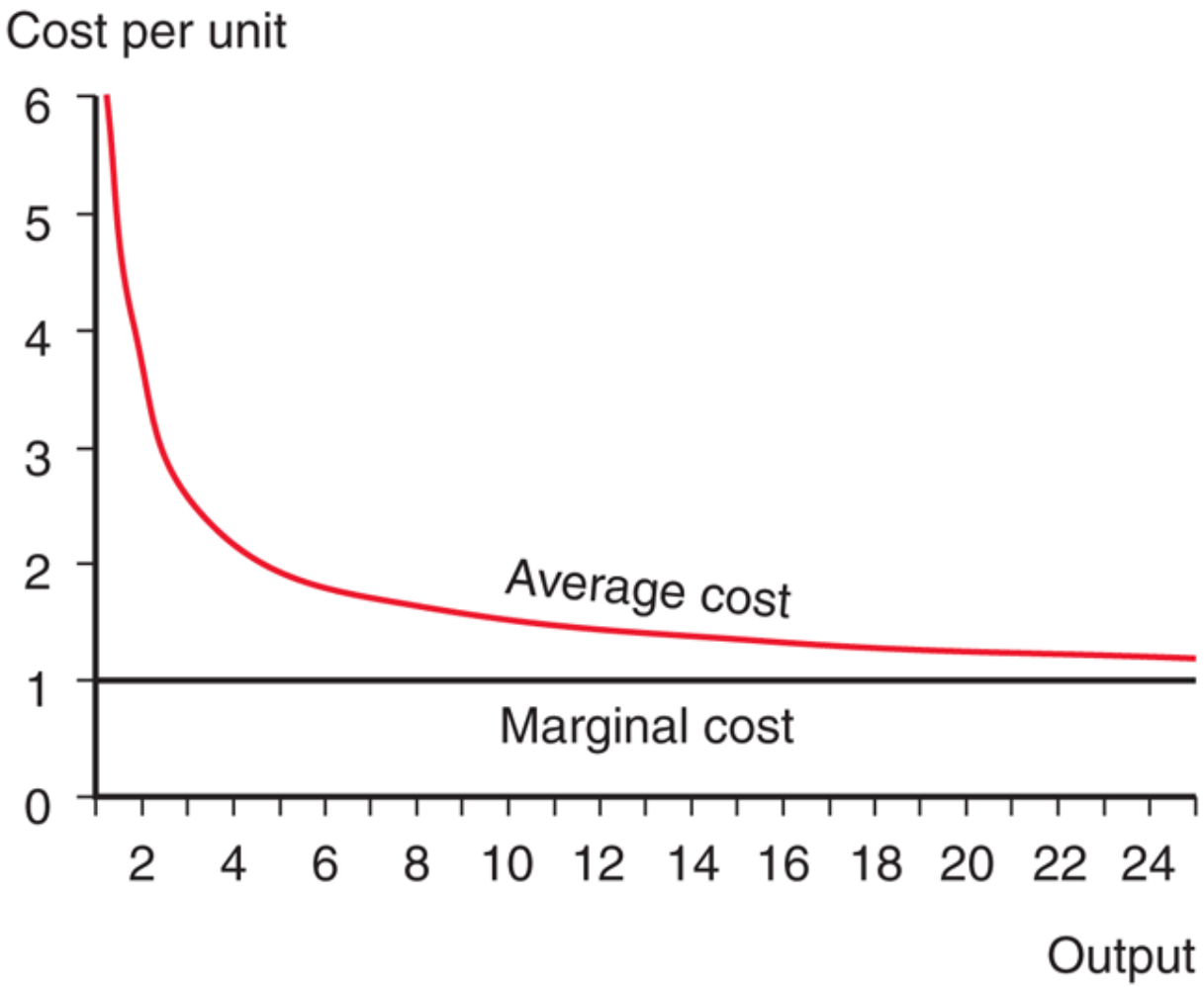
Monopoly: A Brief Review (cont.)

- **Average cost** is the cost of production (C) divided by the total quantity of production (Q).

$$AC = C/Q = F/Q + c$$

- **Marginal cost** is the cost of producing an additional unit of output.
- A larger firm is more efficient because average cost decreases as output Q increases: internal economies of scale.

Fig. 8-2: Average Versus Marginal Cost



Profits for the monopolist

- $\pi = PQ - C$ *(7)*
- Maximize profits:
- $\partial\pi/\partial Q = A/B - 2Q/B - c = 0$ *(8)*
- We have MR=MC:
- *A/B-2Q/B=c or, using (3):*
- *P-Q/B=c*
- From (8), we can derive the quantity: Q=A/2-cB/2

Monopoly: A Brief Review (cont.)

- The profit-maximizing output occurs where marginal revenue equals marginal cost.
  - At the intersection of the *MC* and *MR* curves, the revenue gained from selling an extra unit equals the cost of producing that unit.

- The monopolist usually earns some monopoly profits because other firms cannot enter the market.

Monopolistic Competition

- **Monopolistic competition** is a simple model of an imperfectly competitive industry that assumes that each firm
  1. can differentiate its product from the product of competitors, and
  2. takes the prices charged by its rivals as given.

Monopolistic Competition (cont.)

- A firm in a monopolistically competitive industry is expected to sell
  - **more** as total sales in the industry increase and as prices charged by rivals increase.
  - **less** as the number of firms in the industry increases and as the firm's price increases.
- These concepts are represented by the function:

Monopolistic Competition (cont.)

$$Q = S[1/n - b(P - \overline{P})]$$

- Q is an individual firm's sales
- S is the total sales of the industry
- n is the number of firms in the industry
- b is a constant term representing the responsiveness of a firm's sales to its price
- P is the price charged by the firm itself
- $\overline{P}$ is the average price charged by its competitors

Monopolistic Competition (cont.)

- $Q = S/n + SbP^{-} - SbP$
- Solve this for P and substitute for P in R = PQ:
- $R = PQ = (1/nb + P^{-} - Q/Sb)Q$

- $MR = P - Q/Sb$

Monopolistic Competition (cont.)

- Assume that firms are symmetric: all firms face the same demand function and have the same cost function.
  - Thus all firms should charge the same price and have equal share of the market $Q = S/n$
  - Then: $MR = P - 1/nb$

Monopolistic Competition (cont.)

- A first equilibrium condition is that $MR = MC$.
- The cost function is given by:

$$C = F + cQ$$

- MR = MC implies

$$P = c + 1/nb$$

- This is called the ”PP”-curve.

Monopolistic Competition (cont.)

- A second equilibrium condition is that profits π are zero (revenue minus marginal and fixed costs) because other firms will enter the market if there were positive profits:
- $\pi = PQ - C = 0$
- Therefore, it must also be
- $\pi/Q=P-C/Q=P-AC=0$
- $Or: P=AC$

Monopolistic Competition (cont.)

- Average costs depend on the size of the market and the number of firms because:

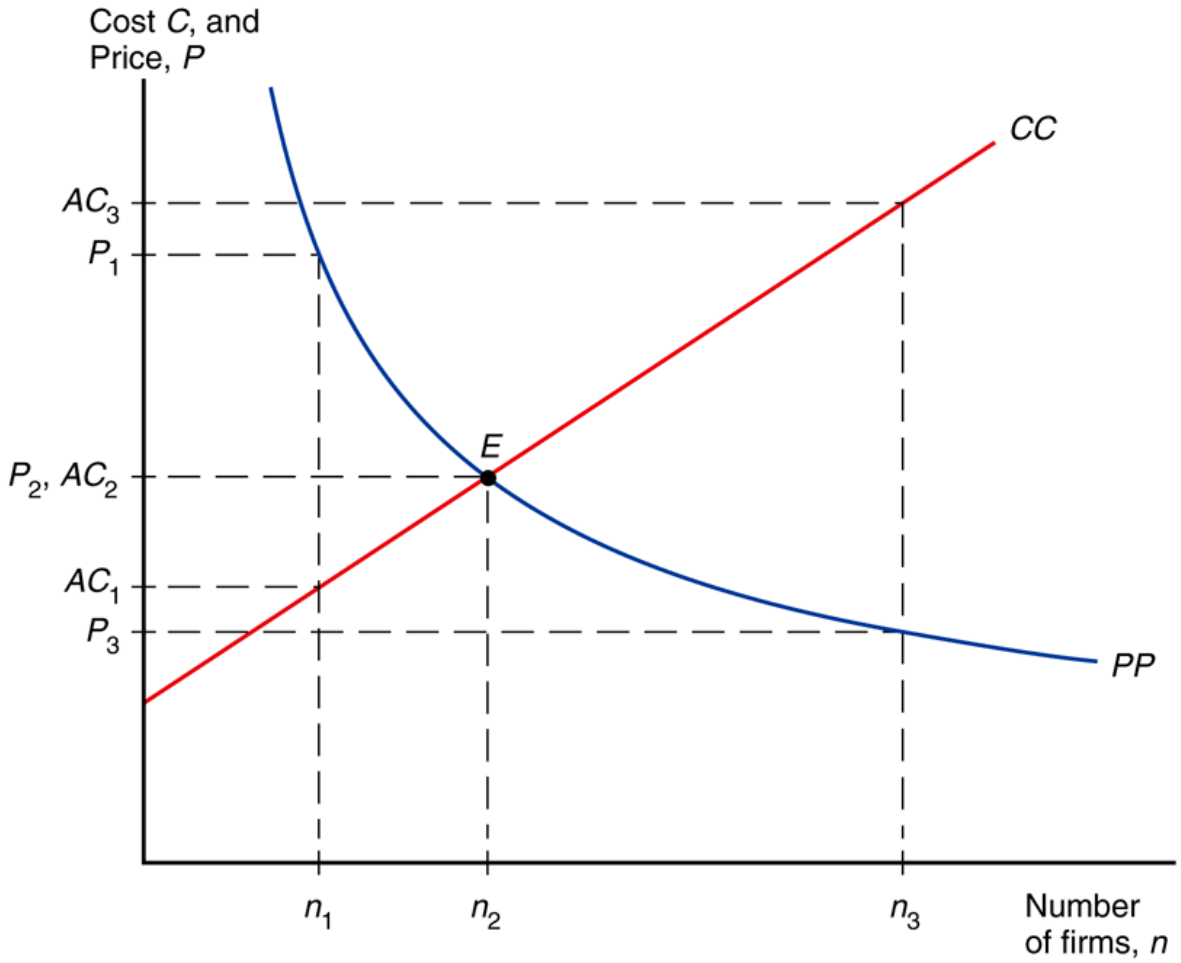
$$AC = C/Q = F/Q + c = n\,F/S + c$$

- As the number of firms *n* in the industry increases, the average cost increases for each firm because each produces less.
- As total sales *S* of the industry increase, the average cost decreases for each firm because each produces more.

Monopolistic Competition (cont.)

- Using P=AC, we get:
- $P = F\ n/S + c$
- This is called the CC-Curve

Fig. 8-3: Equilibrium in a Monopolistically Competitive Market



Monopolistic Competition (cont.)

- Consider again the PP curve derived from the condition MR = MC:

$$P = c + 1/nb$$

- As the number of firms n in the industry increases, the price that each firm charges decreases because of increased competition.

Monopolistic Competition (cont.)

- Now consider again the CC-Curve derived from the second equilibrium condition P=AC:
- $P = F\, n/S + c$
- The average cost that each firm pays increases in n because more firms implies less output for each firm and therefore higher average costs.

Monopolistic Competition (cont.)

- At some number of firms, the price that firms charge (which decreases in *n*) matches the average cost that firms pay (which increases in *n*).
  - At this long-run equilibrium number of firms in the industry, firms have no incentive to enter or exit the industry.

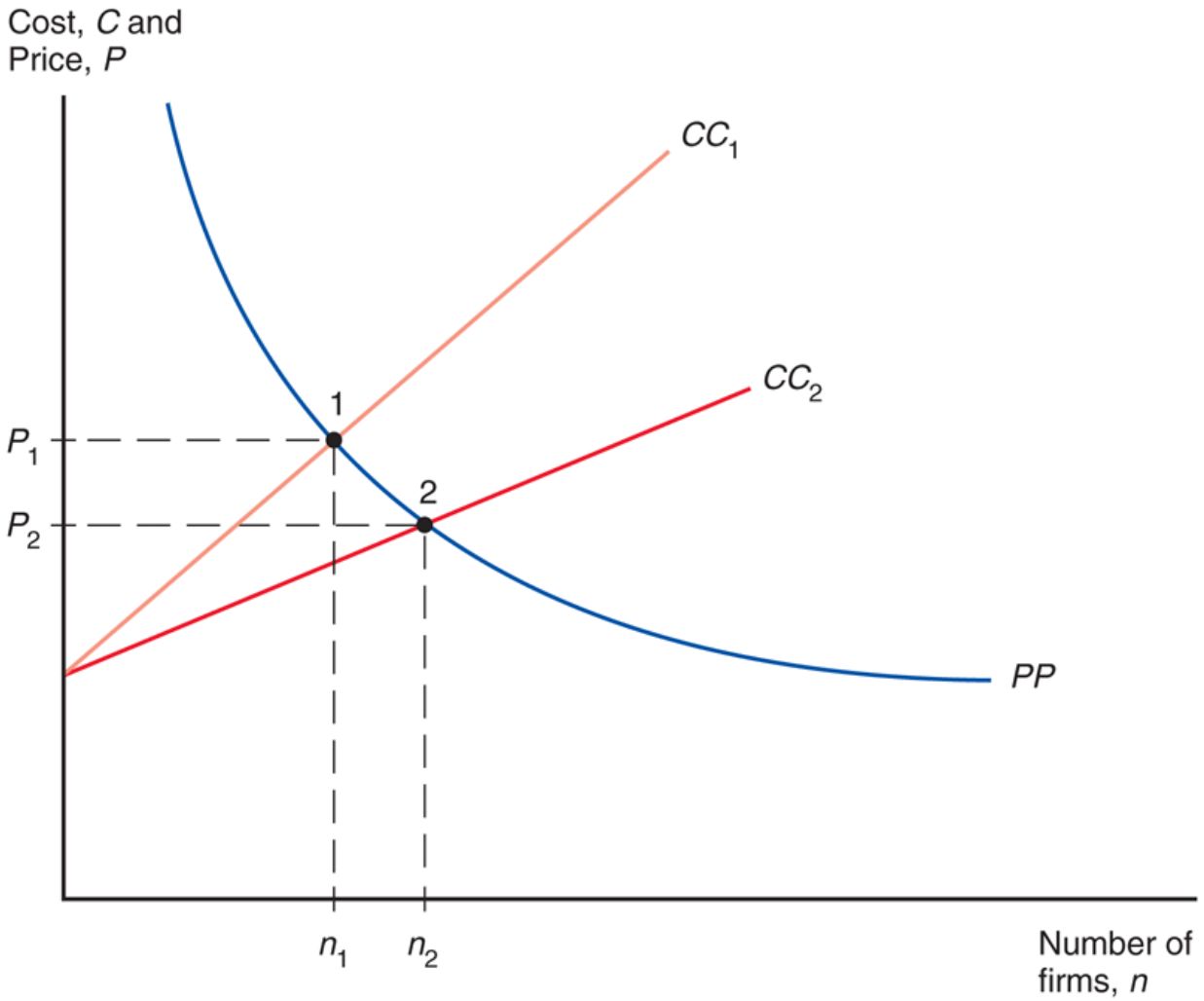
Monopolistic Competition (cont.)

- If the number of firms is greater than or less than the equilibrium number, then firms have an incentive to exit or enter the industry.
  - Firms have an incentive to exit the industry when price < average cost.
  - Firms have an incentive to enter the industry when price > average cost.

Monopolistic Competition and Trade

- Because trade increases market size, trade is predicted to decrease average cost in an industry described by monopolistic competition.
  - Industry sales increase with trade leading to decreased average costs: $AC = n(F/S) + c$
- Because trade increases the variety of goods that consumers can buy under monopolistic competition, it increases the welfare of consumers.
  - And because average costs decrease, consumers can also benefit from a decreased price.

Fig. 8-4: Effects of a Larger Market



Monopolistic Competition and Trade (cont.)

- As a result of trade, the number of firms in a new international industry is predicted to increase relative to each national market.
  - But it is unclear if firms will locate in the domestic country or foreign countries.
- Integrating markets through international trade therefore has the same effects as growth of a market within a single country.

Fig. 8-5: Equilibrium in the Automobile Market

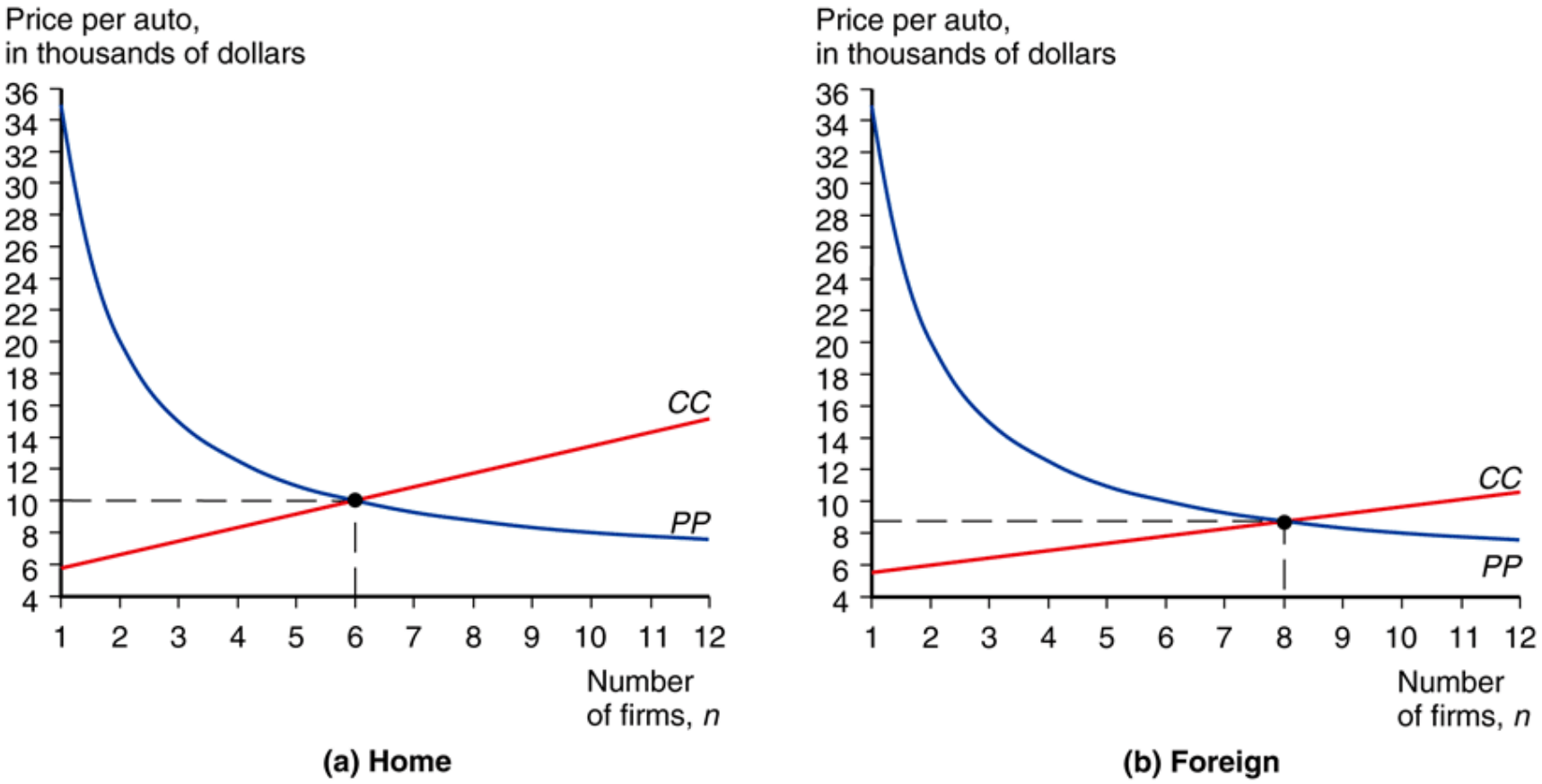
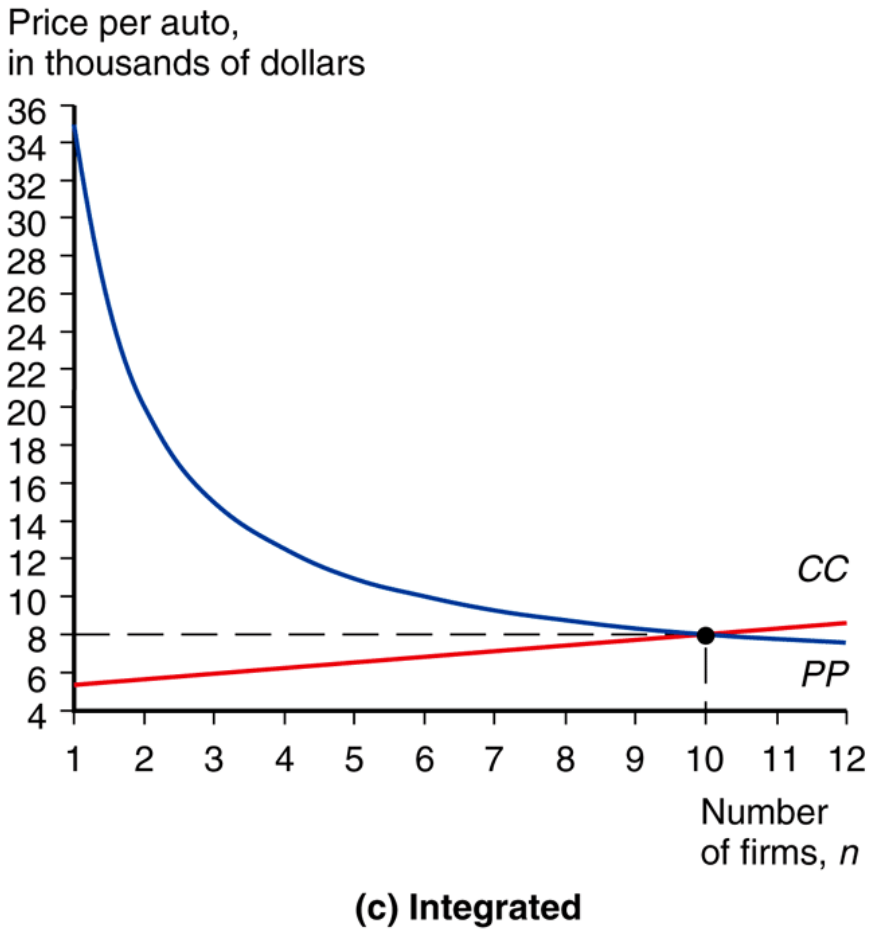


Fig. 8-5: Equilibrium in the Automobile Market (cont.)



(c) Integrated

Table 8-1: Hypothetical Example of Gains from Market Integration

TABLE 8-1 Hypothetical Example of Gains from Market Integration

	Home Market, Before Trade	Foreign Market, Before Trade	Integrated Market, After Trade
Industry output (# of autos)	900,000	1,600,000	2,500,000
Number of firms	6	8	10
Output per firm (# of autos)	150,000	200,000	250,000
Average cost	$10,000	$8,750	$8,000
Price	$10,000	$8,750	$8,000

Monopolistic Competition and Trade (cont.)

- Product differentiation and internal economies of scale lead to trade between similar countries with no comparative advantage differences between them.
  - This is a very different kind of trade than the one based on comparative advantage, where each country exports its comparative advantage good.

The Significance of Intra-industry Trade

- **Intra-industry trade** refers to two-way exchanges of similar goods.
- Two new channels for welfare benefits from trade:
  - Benefit from a greater variety at a lower price.
  - Firms consolidate their production and take advantage of economies of scale.
- A smaller country stands to gain more from integration than a larger country.

The Significance of Intra-industry Trade (cont.)

- About 25–50% of world trade is intra-industry.
- Most prominent is the trade of manufactured goods among advanced industrial nations, which accounts for the majority of world trade.
  - For the United States, industries that have the most intra-industry trade—such as pharmaceuticals, chemicals, and specialized machinery—require relatively larger amounts of skilled labor, technology, and physical capital.

Table 8-2: Indexes of Intra-Industry Trade for U.S. Industries, 2009

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Metalworking Machinery	0.97
Inorganic Chemicals	0.97
Power-Generating Machines	0.86
Medical and Pharmaceutical Products	0.85
Scientific Equipment	0.84
Organic Chemicals	0.79
Iron and Steel	0.76
Road Vehicles	0.70
Office Machines	0.58
Telecommunications Equipment	0.46
Furniture	0.30
Clothing and Apparel	0.11
Footwear	0.10

Productivity differences across firms

- In this basic model, firms are symmetric. However, some firms are more productive than others. Extension of our basic model that takes these differences into account is the "Melitz-model". (More complicated, not covered formally in this lecture)

Productivity differences across firms

- The basic intuition in the Melitz model:
- Increased competition tends to hurt the worst-performing firms — they are forced to exit.
- The best-performing firms take the greatest advantage of new sales opportunities and expand the most.
- When the better-performing firms expand and the worse-performing ones contract or exit, overall industry performance improves.
  - Trade and economic integration improve industry performance as much as the discovery of a better technology does.

Trade Costs and Export Decisions

- Most U.S. firms do not report *any* exporting activity at all — sell only to U.S. customers.
  - In 2002, only 18% of U.S. manufacturing firms reported any sales abroad.
- Even in industries that export much of what they produce, such as chemicals, machinery, electronics, and transportation, fewer than 40 percent of firms export.
- This is probably due to trade costs. A major reason why trade costs reduce trade so much is that they drastically reduce the number of firms selling to customers across the border.
  - Trade costs also reduce the volume of export sales of firms selling abroad.

Trade Costs and Export Decisions (cont.)

- Trade costs add two important predictions to our model of monopolistic competition and trade:
  - Why only a subset of firms export, and why exporters are relatively larger and more productive (lower marginal costs).
- Overwhelming empirical support for this prediction that exporting firms are bigger and more productive than firms in the same industry that do not export.
  - In the United States, in a typical manufacturing industry, an exporting firm is on average more than twice as large as a firm that does not export.
  - Differences between exporters and nonexporters are even larger in many European countries.

Table 8-3: Proportion of U.S. Firms Reporting Export Sales by Industry, 2002

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Printing	5%
Furniture	7%
Apparel	8%
Wood Products	8%
Fabricated Metals	14%
Petroleum and Coal	18%
Transportation Equipment	28%
Machinery	33%
Chemicals	36%
Computer and Electronics	38%
Electrical Equipment and Appliances	38%

Source: A. B. Bernard, J. B. Jensen, S. J. Redding, and P. K. Schott, "Firms in International Trade," *Journal of Economic Perspectives* 21 (Summer 2007), pp. 105–130.

Multinationals and Outsourcing

- **Foreign direct investment** refers to investment in which a firm in one country *directly controls or owns* a subsidiary in another country.
- If a foreign company invests in at least 10% of the stock in a subsidiary, the two firms are typically classified as a **multinational corporation**.
  - 10% or more of ownership in stock is deemed to be sufficient for direct control of business operations.

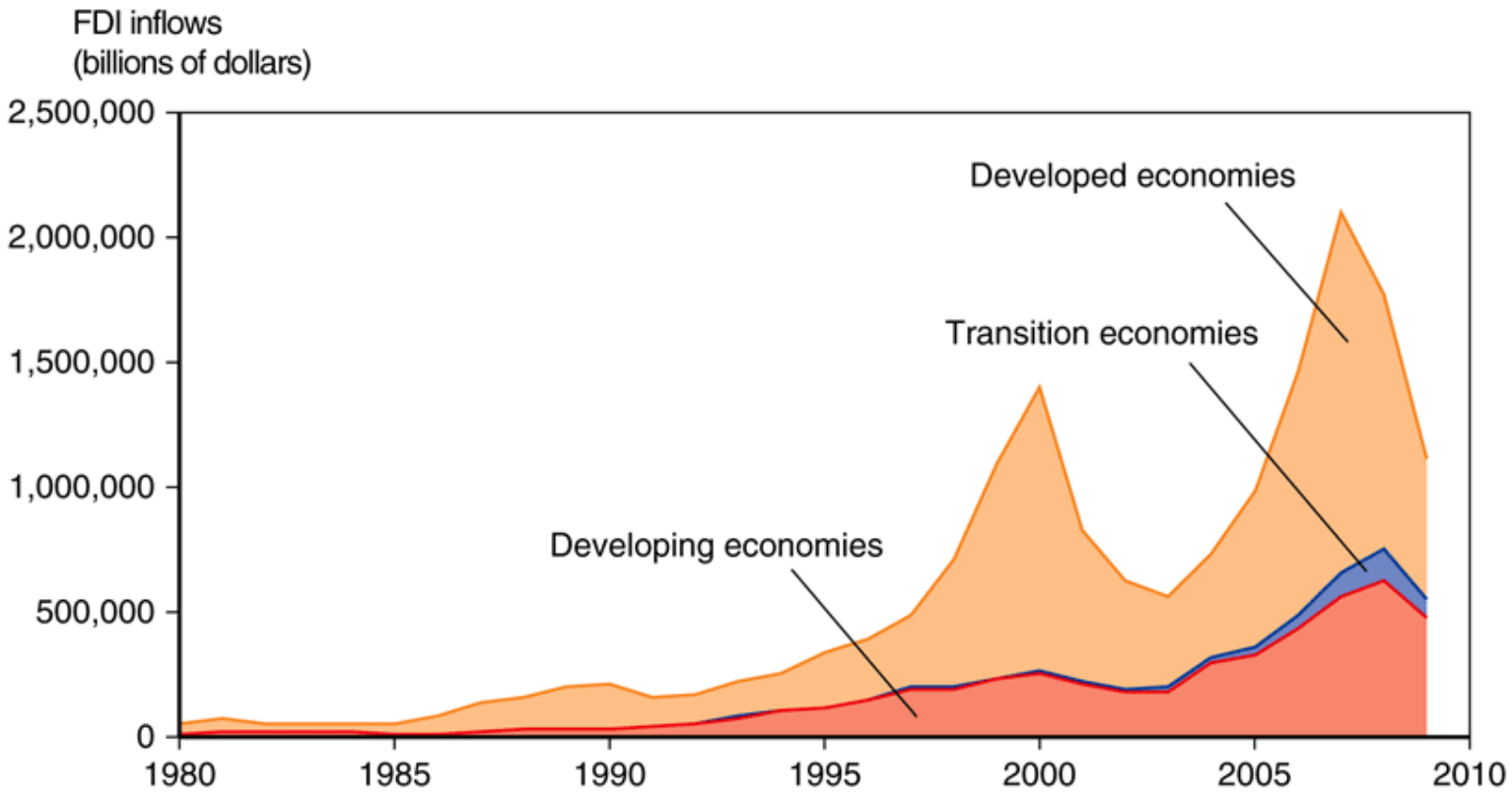
Multinationals and Outsourcing (cont.)

- *Greenfield* FDI is when a company builds a new production facility abroad.
- *Brownfield* FDI (or cross-border mergers and acquisitions) is when a domestic firm buys a controlling stake in a foreign firm.
- Greenfield FDI has tended to be more stable, while cross-border mergers and acquisitions tend to occur in surges.

Multinationals and Outsourcing (cont.)

- Developed countries have been the biggest recipients of inward FDI.
  - much more volatile than FDI going to developing and transition economies.
- Steady expansion in the share of FDI flowing to developing and transition countries.
  - Accounted for half of worldwide FDI flows in 2009.
- Sales of FDI affiliates are often used as a measure of multinational activity.

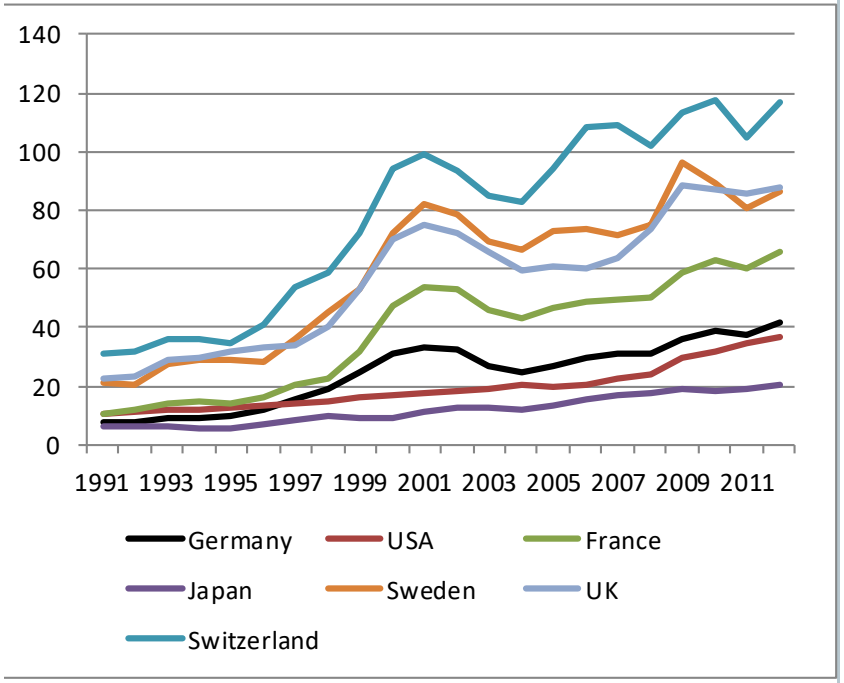
Fig. 8-9: Inflows of Foreign Direct Investment, 1980-2009



Cumulated FDI Flows

Cumulated FDI outflows

in % GDP

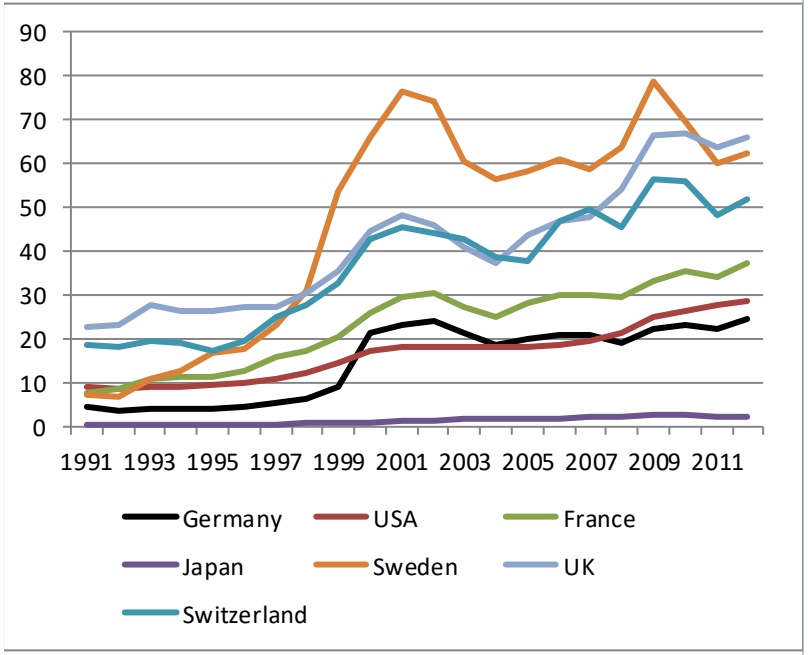


Source: IMF, own calculations

Last Observation: 2012

Cumulated FDI inflows

in % GDP



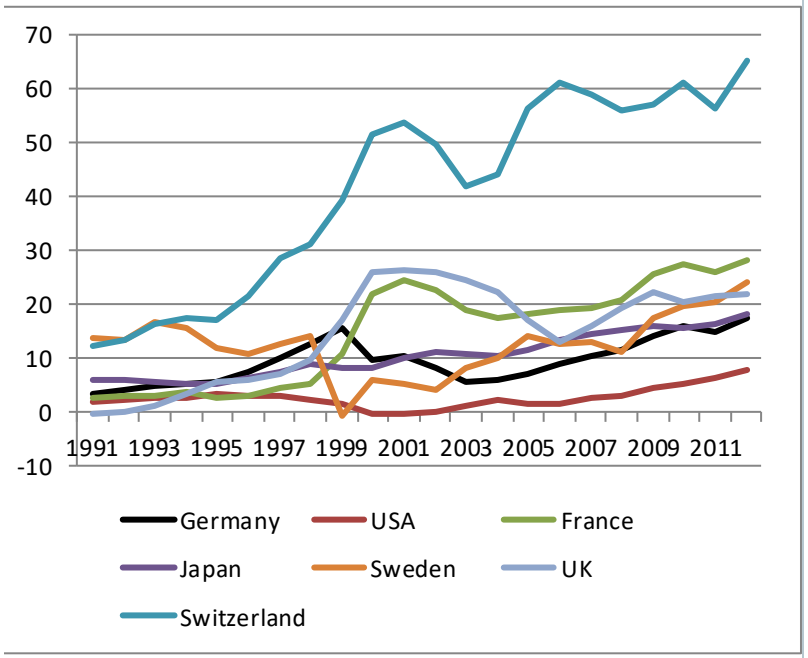
Source: IMF, own calculations

Last Observation: 2012

FDI Flows

Cumulated net FDI

in % GDP



Source: IMF, own calculations

Last Observation: 2012

Foreign Direct Investment of Multinational Entreprises in their host countries		
	in percent of GDP	in percent of corporate investment
Czech Republic	4.9	27.5
Poland	2.8	24.3
Austria	2.3	16.3
Sweden	2.2	13.9
United Kingdom	2.1	23.0
Portugal	2.0	16.5
Netherlands	1.6	14.9
Germany	1.3	11.4
Spain	1.3	9.0
France	1.1	9.2
United States	1.0	10.5
Finland	0.9	7.4
Italy	0.9	8.4
Source: OECD, own calculations.		

Multinationals and Outsourcing (cont.)

- Two main types of FDI:
  - **Horizontal FDI** when the affiliate replicates the production process (that the parent firm undertakes in its domestic facilities) elsewhere in the world.
  - **Vertical FDI** when the production chain is broken up, and parts of the production processes are transferred to the affiliate location.

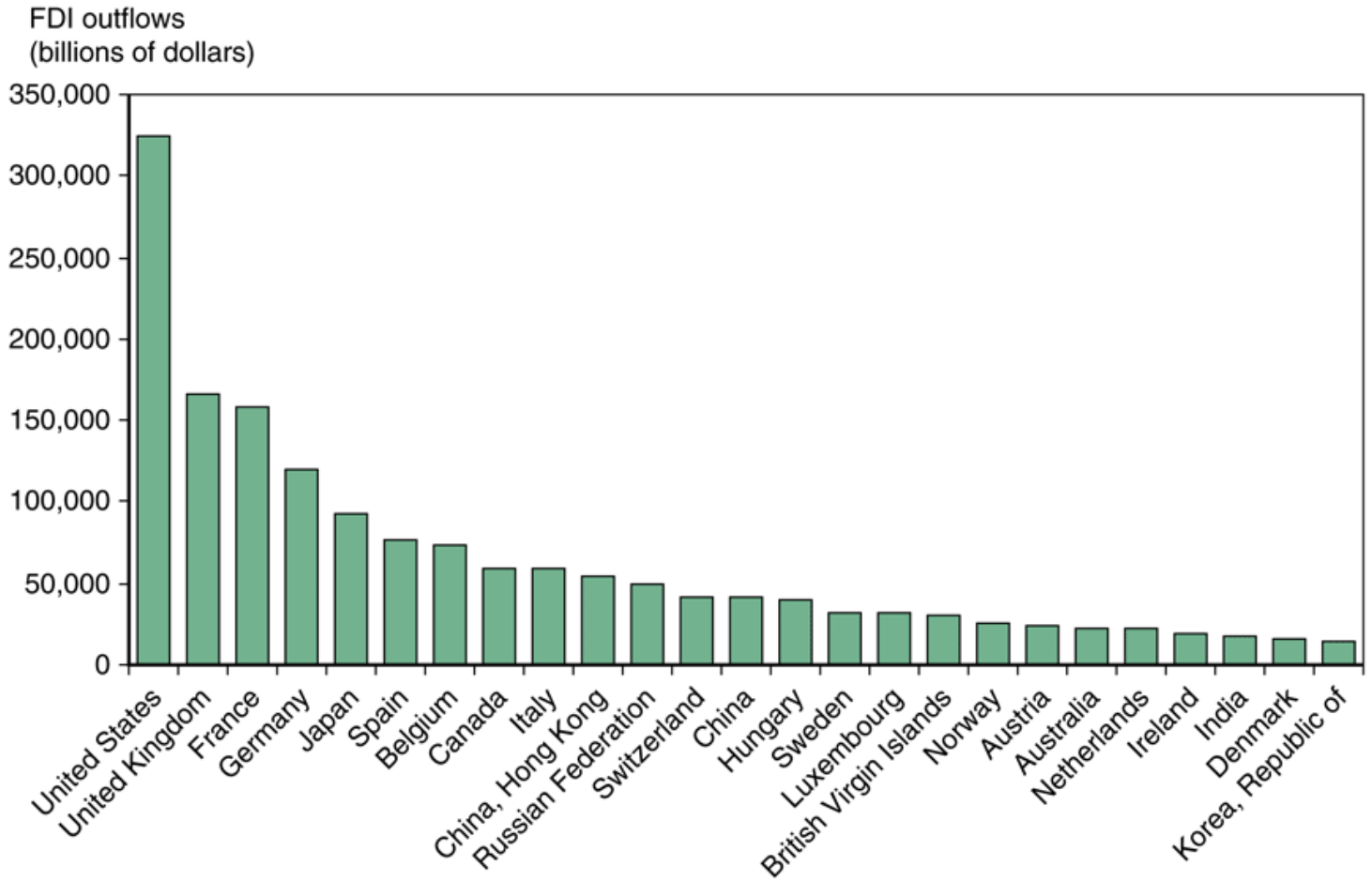
Multinationals and Outsourcing (cont.)

- Vertical FDI is mainly driven by production cost differences between countries (for those parts of the production process that can be performed in another location).
  - Vertical FDI is growing fast and is behind the large increase in FDI inflows to developing countries.

Multinationals and Outsourcing (cont.)

- Horizontal FDI is dominated by flows between developed countries.
  - Both the multinational parent and the affiliates are usually located in developed countries.
- The main reason for this type of FDI is to locate production near a firm's large customer bases.
  - Hence, trade and transport costs play a much more important role than production cost differences for these FDI decisions.

Fig. 8-10: Outward Foreign Direct Investment for Top Countries, 2007-2009



Source: UNCTAD, World Investment Report, 2010.

The Firm's Decision Regarding Foreign Direct Investment

- *Proximity-concentration* trade-off:
  - High trade costs associated with exporting create an incentive to locate production near customers.
  - Increasing returns to scale in production create an incentive to concentrate production in fewer locations.

The Firm's Decision Regarding Foreign Direct Investment (cont.)

- FDI activity concentrated in sectors with high trade costs.
  - When increasing returns to scale are important and average plant sizes are large, we observe higher export volumes relative to FDI.
- Multinationals tend to be much larger and more productive than other firms (even exporters) in the same country.

The Firm's Decision Regarding Foreign Direct Investment (cont.)

- The horizontal FDI decision involves a trade-off between the per-unit export cost t and the fixed cost F of setting up an additional production facility.
- If $t(Q) > F$, costs more to pay trade costs t on Q units sold abroad than to pay fixed cost F to build a plant abroad.
  - When foreign sales large $Q > F/t$, exporting is more expensive and FDI is the profit-maximizing choice.
  - Low costs make more apt to choose FDI due to larger sales.

The Firm's Decision Regarding Foreign Direct Investment (cont.)

- The vertical FDI decision also involves a trade-off between cost savings and the fixed cost *F* of setting up an additional production facility.
  - Cost savings related to comparative advantage make some stages of production cheaper in other countries.

The Firm's Decision Regarding Foreign Direct Investment (cont.)

- Foreign **outsourcing** or **offshoring** occurs when a firm contracts with an independent firm to produce in the foreign location.
  - In addition to deciding the **location** of where to produce, firms also face an **internalization** decision: whether to keep production done by one firm or by separate firms.

The Firm's Decision Regarding Foreign Direct Investment (cont.)

- Internalization occurs when it is more profitable to conduct transactions and production within a single organization. Reasons for this include:

1. **Technology transfers**: transfer of knowledge or another form of technology may be easier within a single organization than through a market transaction between separate organizations.
   - Patent or property rights may be weak or nonexistent.
   - Knowledge may not be easily packaged and sold.

The Firm's Decision Regarding Foreign Direct Investment (cont.)

2. **Vertical integration** involves consolidation of different stages of a production process.
   - Consolidating an input within the firm using it can avoid holdup problems and hassles in writing complete contracts.
   - But an independent supplier could benefit from economies of scale if it performs the process for many parent firms.

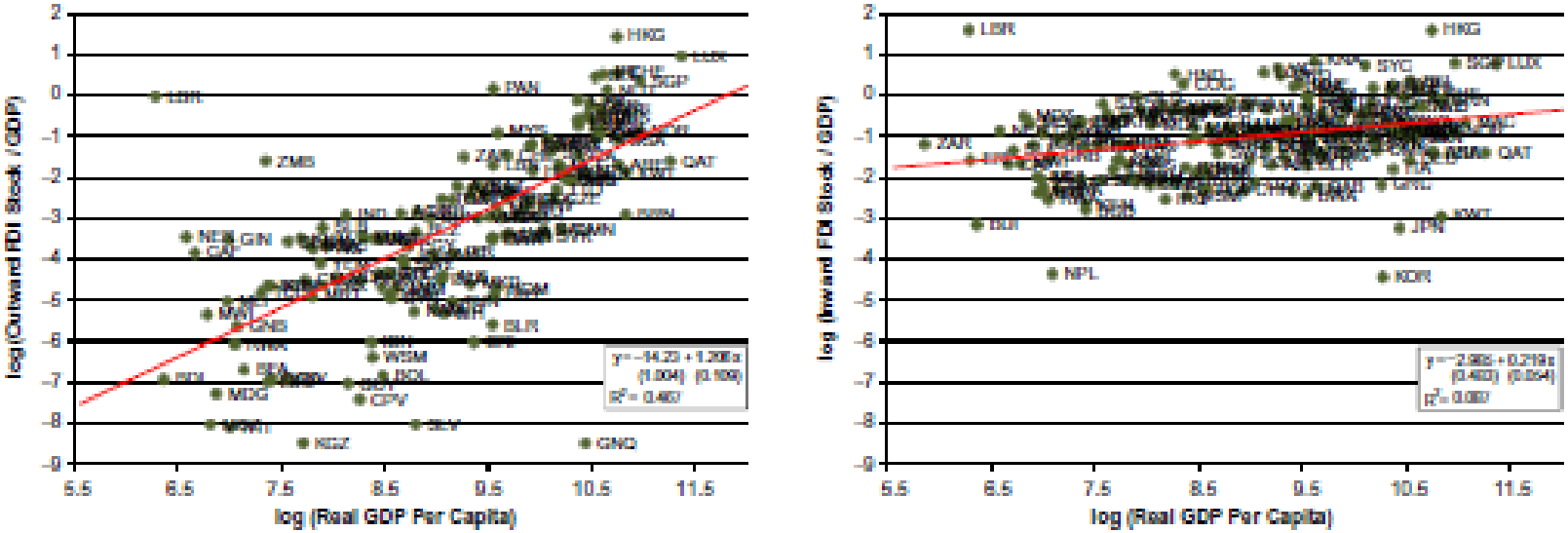
The Firm's Decision Regarding Foreign Direct Investment (cont.)

- Foreign direct investment should benefit the countries involved for reasons similar to why international trade generates gains.
  - Multinationals and firms that outsource take advantage of cost differentials that favor moving production (or parts thereof) to particular locations.
  - FDI is very similar to the relocation of production that occurred *across* sectors when opening to trade.
  - There are similar welfare consequences for the case of multinationals and outsourcing: Relocating production to take advantage of cost differences leads to overall gains from trade.

Some facts about multinational firms and the structure of international trade (see Antras and Yeaple, 2014)

- 1) **Fact One:** Multinational activity is primarily concentrated in developed countries where it is mostly two-way. Developing countries are more likely to be the destination of multinational activity than the source.

Aggregate FDI Stocks and Development (Antras and Yeaple, 2014)



Sources: UNCTAD and World Bank.

Figure 2.1 Aggregate FDI Stocks and Development

Some facts about multinational firms and the structure of international trade (see Antras and Yeaple, 2014)

- Fact Two:The relative importance of multinationals in economic activity is higher in capital-intensive and R&D intensive goods, and a significant share of two-way FDI flows is intra-industry in nature.
- Fact Three: Both the parents and the affiliates of multinational firms tend to be larger, more productive, more R&D intensive, and more export oriented than nonmultinational firms.

Some facts about multinational firms and the structure of international trade (see Antras and Yeaple, 2014)

- Fact Four: Within multinational enterprises, parents are relatively specialized in R&D while affiliates are primarily engaged in selling goods in foreign markets, particularly in their host market.