Lecture 7a:

Imperfect competition – Review

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C181 – International Trade

Spring 2018

Introduction

Introduction to "New Trade Theory":

Trade with imperfect competition

- Intro and facts
- Basics of imperfect competition
- Trade with monopolistic competition

Extensions:

- Heterogeneous firms
- Role of trade costs
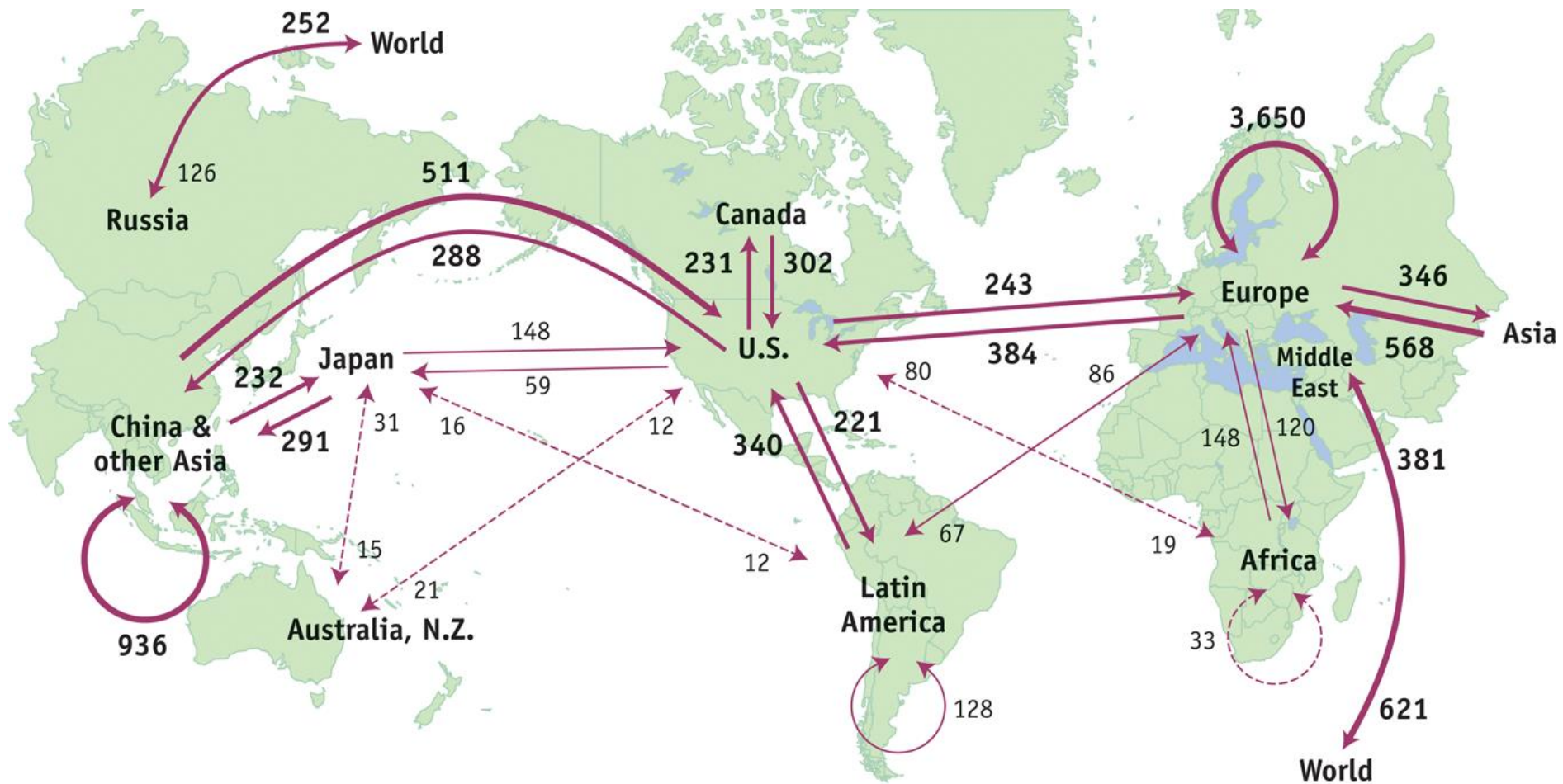
Does perfect competition exist?

Introduction

Two countries trade more when they are more *dissimilar* :

a) True for both H-O and Ricardian model

b) True for H-O but not the Ricardian model

c) True for the Ricardian model but not H-O

d) False for both of these models.

Total world trade flows in 2006: $11,600 billion

World Trade in Goods

- - - - -	< $50 billion
——	$50–150 billion
——	$150–500 billion
——	> $500 billion

Introduction

	Share of World Trade (%)		Share of World Trade (%)
Europe (internal trade)	31	Asia (exports)	27
Europe (internal) plus trade with the U.S.	37	Middle East and Russia (exports)	9
Americas (internal trade)	11	Africa (exports)	3
Europe and the Americas (exports)	60	Australia and New Zealand (exports)	1.4

Introduction

In the data:

- There are large trade flows between similar countries

Introduction

In the data:

- There are large trade flows between similar countries

And furthermore:

- There are imports and exports of very similar good
        (e.g.: Golf clubs, cars, machines, etc.)

➔ Most trade look like "shipping coal back to Newcastle"!

Introduction

(b) EXPORTS

Rank	Country	Value of Imports (millions)	Quantity of Golf Clubs (thousands)	Average Price ($/club)
1	Canada	$64.9	837	77
2	Japan	41.7	430	97
3	United Kingdom	35.8	446	80
4	Korea	33.9	419	81
5	Australia	14.1	189	75
6	Singapore	6.8	65	104
7	Hong Kong	6.7	72	92
8	Argentina	2.7	35	77
9	Malaysia	2.5	31	83
10	South Africa	2.3	25	93
11	Netherlands	1.8	18	102
12	Thailand	1.7	22	77
13-83	Various countries	11.3	136	83
	All 83 countries	226.2	2,725	83

Introduction

(a) IMPORTS

Rank	Country	Value of Imports (millions)	Quantity of Golf Clubs (thousands)	Average Price ($/club)
1	China	$254.2	14,482	18
2	Thailand	13.5	132	102
3	Vietnam	7.2	504	14
4	Japan	5.8	47	125
5	Taiwan	1.1	69	16
6	Malaysia	1.1	12	89
7	Mexico	0.3	40	8
8	Hong Kong	0.3	16	18
9	Macao	0.2	5	43
10	United Kingdom	0.1	12	10
11	Canada	0.1	3	25
12	Korea	0.1	1	54
13-25	Various countries	0.1	11	8
	All 25 countries	284.2	15,335	19

Introduction

In the Heckscher-Ohlin and Ricardian models, *dissimilar* countries trade more.

If two countries are *identical*:

- They have the same relative price in autarky
- Hence the world price with trade is the same as in autarky
- Production and consumption are the same with or without trade
➔ There is no trade (and no gain from trade)

Introduction

What are we missing?
Why countries both import and export golf clubs?

Introduction

A golf club story:

- Golf clubs are in facts not all alike: all brands are different.

Introduction

A golf club story:

- Golf clubs are in facts not all alike: all brands are different.

→ countries produce different brands

→ Gains from having access to different varieties!

Cheese!
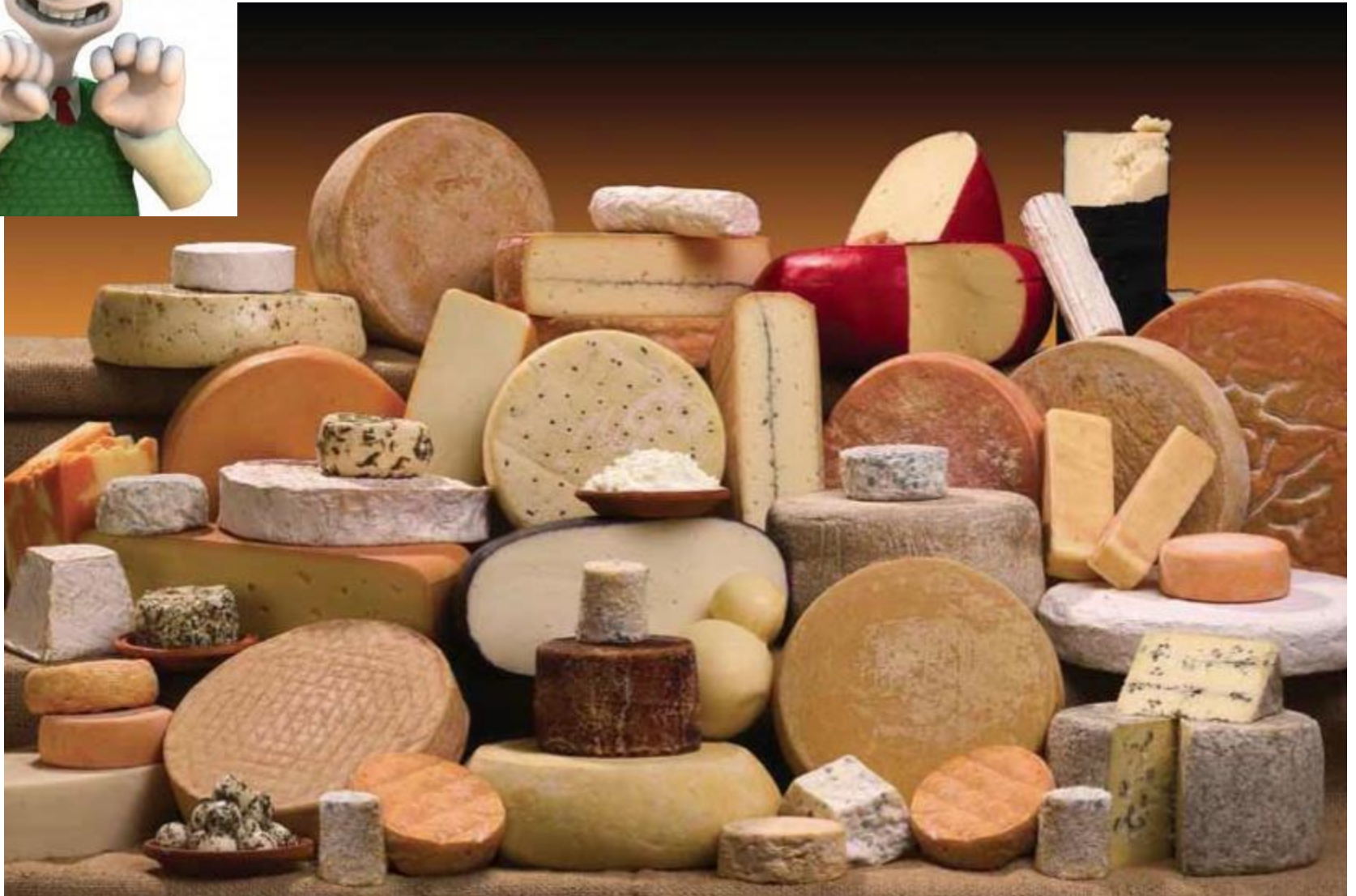
Introduction

A golf club story:

- Golf clubs are in facts not all alike: all brands are different.

→ countries produce different brands

→ Gains from having access to different varieties!

- Brands and product differentiations are essential in most industries

2013 Rank	2012 Rank	Brand	Brand Name	Region/Country	Sector	Brand Value ($m)
1	2		Apple	United States	Technology	98,316
2	4		Google	United States	Technology	93,291
3	1		Coca-Cola	United States	Beverages	79,213
4	3		IBM	United States	Business Services	78,808
5	5		Microsoft	United States	Technology	59,546
6	6		GE	United States	Diversified	46,947
7	7		McDonald's	United States	Restaurants	41,992
8	9		Samsung	South Korea	Technology	39,610
9	8		Intel	United States	Technology	37,257
10	10		Toyota	Japan	Automotive	35,346
11	11		Mercedes-Benz	Germany	Automotive	31,904
12	12		BMW	Germany	Automotive	31,839
13	14		Cisco	United States	Technology	29,053

14	13	Disney	Disney	United States	Media	28,147
15	15	HP	HP	United States	Technology	25,843
16	16	Gillette	Gillette	United States	FMCG	25,105
17	17	LOUIS VUITTON	Louis Vuitton	France	Luxury	24,893
18	18	ORACLE	Oracle	United States	Technology	24,088
19	20	amazon	Amazon	United States	Retail	23,620
20	21	HONDA	Honda	Japan	Automotive	18,490
21	23	H&M	H&M	Sweden	Apparel	18,168
22	22	pepsi	Pepsi	United States	Beverages	17,892
23	24	AMERICAN EXPRESS	American Express	United States	Financial Services	17,646
24	26	Nike	Nike	United States	Sporting Goods	17,085
25	25	SAP	SAP	Germany	Technology	16,676
26	28	IKEA	IKEA	Sweden	Home Furnishings	13,818

27	27	UPS	UPS	United States	Transportation	13,763
28	36	eBay	eBay	United States	Retail	13,162
29	34	Pampers.	Pampers	United States	FMCG	13,035
30	29	Kellogg's	Kellogg's	United States	FMCG	12,987
31	31	Budweiser	Budweiser	United States	Alcohol	12,614
32	33	HSBC	HSBC	United Kingdom	Financial Services	12,183
33	32	J.P.Morgan	J.P. Morgan	United States	Financial Services	11,456
34	39	Volkswagen	Volkswagen	Germany	Automotive	11,120
35	30	Canon	Canon	Japan	Electronics	10,989
36	37	ZARA	Zara	Spain	Apparel	10,821
37	35	NESCAFÉ.	Nescafé	Switzerland	Beverages	10,651
38	38	GUCCI	Gucci	Italy	Luxury	10,151
39	42	L'ORÉAL PARIS	L'Oréal	France	FMCG	9,874

40	41	PHILIPS	Philips	Netherlands	Electronics	9,813
41	43	accenture	Accenture	United States	Business Services	9,471
42	45	Ford	Ford	United States	Automotive	9,181
43	53	HYUNDAI	Hyundai	South Korea	Automotive	9,004
44	48	Goldman Sachs	Goldman Sachs	United States	Financial Services	8,536
45	51	SIEMENS	Siemens	Germany	Diversified	8,503
46	40	SONY	Sony	Japan	Electronics	8,408
47	44	THOMSON REUTERS	Thomson Reuters	Canada	Media	8,103
48	50	citi	Citi	United States	Financial Services	7,973
49	52	DANONE	Danone	France	FMCG	7,968
50	47	Colgate	Colgate	United States	FMCG	7,833
51	55	Audi	Audi	Germany	Automotive	7,767
52	69	f	Facebook	United States	Technology	7,732

Introduction

Trade with brands

- Even if countries are similar, they are producing different brands

This can help answer two key questions:

- What generates trade between countries?
- What are the gains from trade?

Introduction

What determines brands and brand value?

Model?

Introduction

What determines brands and brand value?

- Consumers enjoy being able to choose among a large *variety* of golf clubs

- There are costs involved in creating a new brand.

- Each brand has a *monopoly power* over its own golf clubs but competitors would still negatively affect demand and prices.

Introduction

Key ingredients for the new trade model
(Krugman 1979, Nobel prize in 2008)

1) Goods are **differentiated**, i.e. not strictly identical.

2) We allow for **imperfect competition**: "Monopolistic competition" firms can influence the price they charge, *but no strategic interaction.*

3) Firms enjoy **increasing returns to scale**, by which we mean that the average costs for a firm fall as more output is produced.

Introduction

Roadmap for this chapter:

1- Basics of imperfect competition and IRS

2- Trade with "monopolistic competition"

3- Differences between firms

Book:

- Chapter 8 of Krugman, Obstfeld and Melitz

  (primary source for these lectures on imperfect competition)

- Chapter 6 of Feenstra and Taylor

  (nice illustrations but graphs that are difficult to understand)

Introduction

Related topics to be discussed:

- Problem set 4

    US and Canada Trade

- Trade costs: some facts and illustrations

    How to model the role of distance

1- Review: Basics of Imperfect Competition

Monopoly Equilibrium

What determines prices and quantities?

1- Review: Basics of Imperfect Competition

Monopoly Equilibrium

What determines prices and quantities?

Quantities and prices chosen to maximize profits

1- Review: Basics of Imperfect Competition

Monopoly Equilibrium

- MR: The extra revenue earned from selling one more unit is called the marginal revenue.

- MC: The extra cost generated by producing one more units is called the marginal cost.

Equilibrium: MC = MR

Assumption throughout the chapter:

- MC is constant
- MR decreases with production

Monopoly Equilibrium

How to obtain MR?

- Revenues = $P \cdot Q$

- MR = derivative w.r.t Q

$$\rightarrow \quad MR = P + Q \cdot \frac{\partial P}{\partial Q}$$

Monopoly Equilibrium

How to obtain MR?

- Revenues = $P \cdot Q$

- MR = derivative w.r.t Q

$$\rightarrow \quad MR = P + Q \cdot \frac{\partial P}{\partial Q}$$

- Notes: $\dfrac{\partial P}{\partial Q} < 0$

$\rightarrow$ MR decreases with Q (price decreases with Q)

$\rightarrow$ MR is smaller than P

Monopoly Equilibrium

- When firms maximize profits: MR = MC
- Under perfect competition: MR = P ("price taker")

  which leads to MC = P

- Under imperfect competition:

$$MR = P + Q \cdot \frac{\partial P}{\partial Q}$$

Monopoly Equilibrium

- When firms maximize profits: MR = MC
- Under perfect competition: MR = P ("price taker")
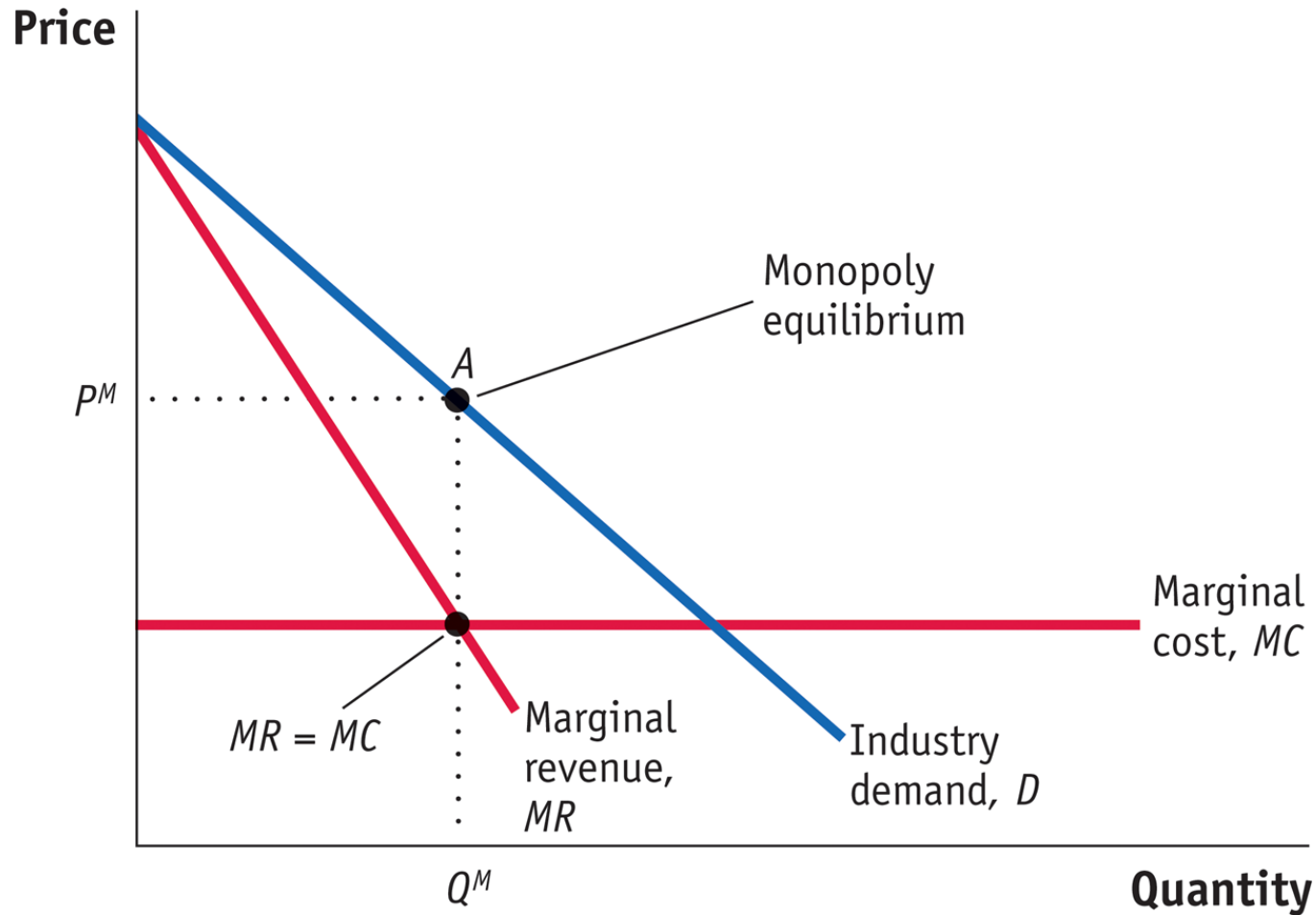   which leads to MC = P

- Under imperfect competition:

$$MR = P + Q. \frac{\partial P}{\partial Q} \ < \ P$$

MR accounts for the effect on demand: an increase in output lowers the price, and thus lowers revenues:

→ **Monopolists produce less than competitive firms**

1- Review: Basics of Imperfect Competition

Monopoly Equilibrium

1- Review: Basics of Imperfect Competition

Monopoly Equilibrium

Example with linear demand:

$$Q = A - B \; x \; P$$

1- Review: Basics of Imperfect Competition

Monopoly Equilibrium

Example with linear demand:

$$Q = A - B \times P$$

➔ $P = -\dfrac{Q}{B} + \dfrac{A}{B}$

➔ $\dfrac{\partial P}{\partial Q} = -\dfrac{1}{B}$

➔ $Q . \dfrac{\partial P}{\partial Q} = -\dfrac{Q}{B}$

➔ $MR = P - \dfrac{Q}{B}$

Monopoly Equilibrium

Example with linear costs:

"Increasing returns to scale"

$$C = F + c \; x \; Q$$

1- Review: Basics of Imperfect Competition

Monopoly Equilibrium

Example with linear costs:
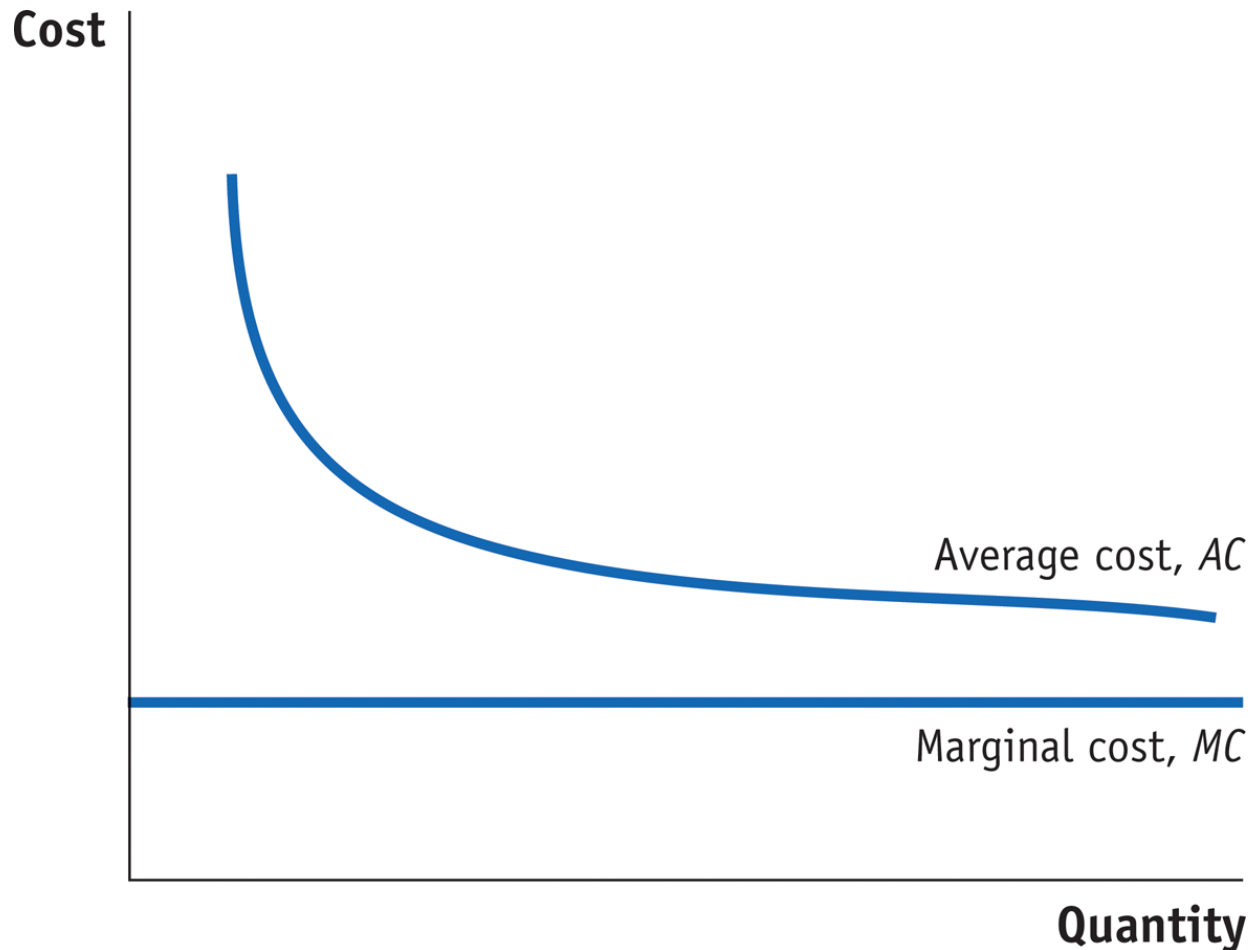
"Increasing returns to scale"

$$C = F + c \; x \; Q$$

➔ MC = c

Average cost decreases with Q:

➔ AC = c + F / Q

Illustration: AC and MC with increasing returns to scale

1- Review: Basics of Imperfect Competition

Numerical example:

Quantity Q	Variable Costs = $Q \cdot MC$ (MC = $10)	Total Costs = Variable Costs + Fixed Costs (FC = $100)	Average Costs = Total Costs/Quantity
10	$100	$200	$20
20	200	300	15
30	300	400	13.3
40	400	500	12.5
50	500	600	12
100	1,000	1,100	11
Large Q	$10 \cdot Q$	$10 \cdot Q + 100$	Close to 10

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Monopoly Equilibrium

Example with linear costs:

"Increasing returns to scale"

How to interpret fixed costs F?

1- Review: Basics of Imperfect Competition

Monopoly Equilibrium

Example with linear costs:

"Increasing returns to scale"

How to interpret fixed costs F?

- R&D to discover a new product
- Marketing to differentiate the product
- Fixed costs of setting a new plant
- Costs of creating a new business, etc.

In practice: F can be very large!

1- Review: Basics of Imperfect Competition

Monopoly Equilibrium

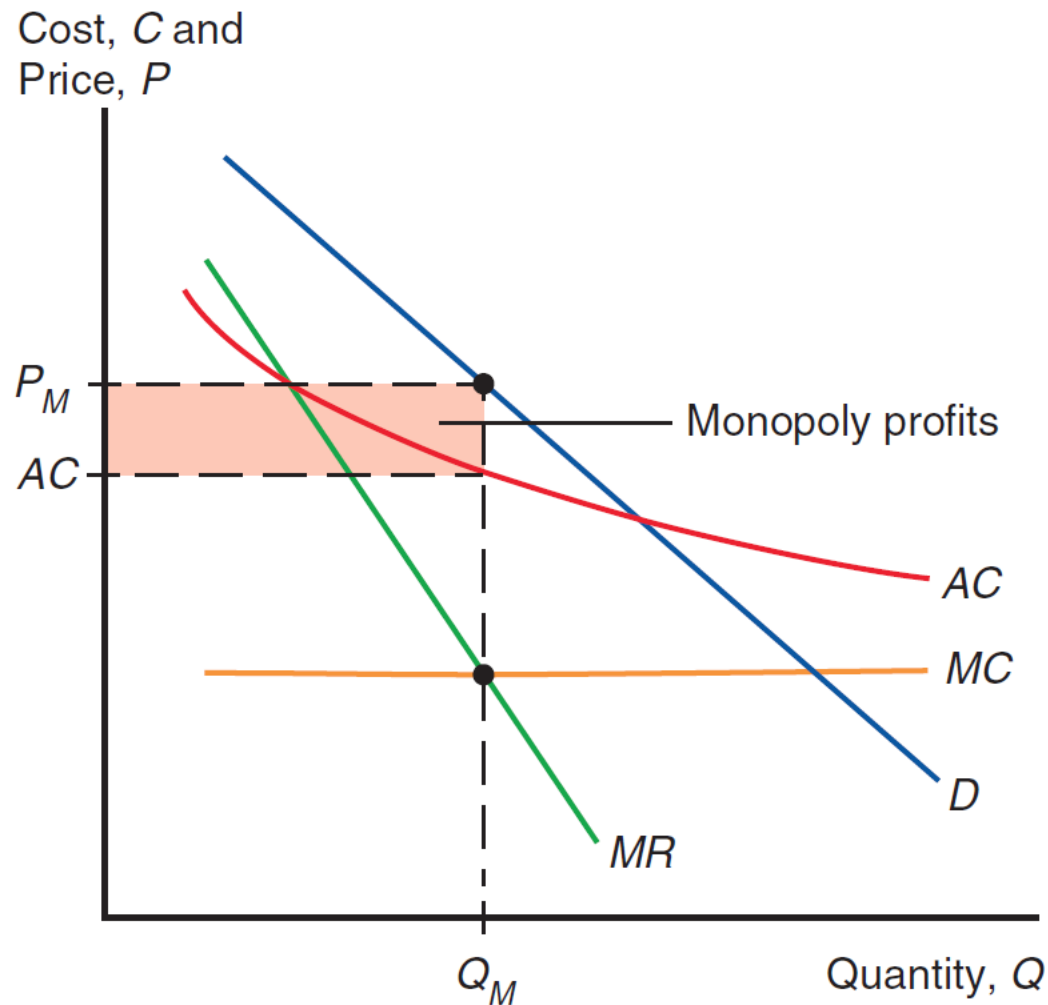Profits?

1- Review: Basics of Imperfect Competition

Monopoly Equilibrium

Profits

profits = revenues – costs

$$= \quad P.Q \quad - (c.Q + F)$$

$$= \quad (P - AC) . Q$$

1- Review: Basics of Imperfect Competition

Monopoly Equilibrium

1- Review: Basics of Imperfect Competition

Monopoly Equilibrium

Profits

profits = revenues – costs

$$= \quad P.Q \quad – (c.Q + F)$$

$$= \quad (P – AC) . Q$$

PS: Profits may be positive (high prices or low fixed costs) or negative (e.g. low P or high F)

Oligopoly

- Like monopoly, firms don't take price as given

- Firms account for how their production affects prices

- Also account for how their production affect their competitor's point of view

➔ Equilibrium involve game theory and depends on how firms interact with each others

➔ Complicated to handle with trade & many firms!!

1- Review: Basics of Imperfect Competition

Clicker question

Under imperfect competition, marginal revenues (MR) equal:

a) Prices (P)

b) Marginal costs (MC)

c) Average costs (AC)

d) Both a) and b)

e) Both a) and c)

1- Review: Basics of Imperfect Competition

NEXT LECTURES: "Monopolistic competition"

- Firms don't take price as given

→ Firms account for how their production affects prices

- But take the price of their competitors as given!

→ Greatly simplifies equilibrium

→ "Brands" in an almost a competitive environment