PubPol/Econ 541

Class 18

Scale Economies and Imperfect Competition

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Quiz

	Q6	Q7	Q8
Mean	7.60	7.73	8.00
Median	7	7.5	9
Max	10	10	10
Min	5.5	6	4
S.D.	1.69	1.35	2.07

Paper 2

- Due Wednesday 8:30 AM
- I'm still available for group zooms if needed

Pause for News

Assumptions

Old Trade Theories	New Trade Theories
Constant returns to scale	Increasing returns to scale
Perfect competition	Imperfect competition
Homogeneous products	Differentiated products
Firms irrelevant	Firms identical

Outline

- Scale Economies
- Monopolistic Competition
- Heterogeneous Firms

Pause for Discussion

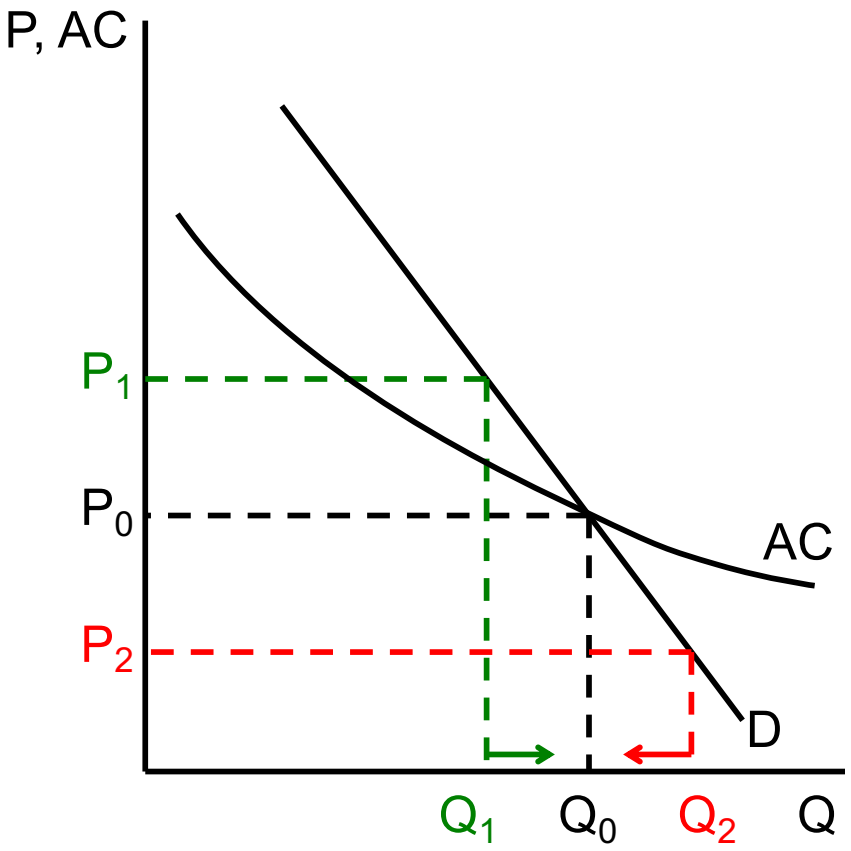
Questions on KOM

- What are economies of scale, and how do external economies of scale differ from internal economies of scale?
- What are some reasons why the costs of a number of firms producing the same thing might be lower if they are located close together than if they are far apart?

Outline

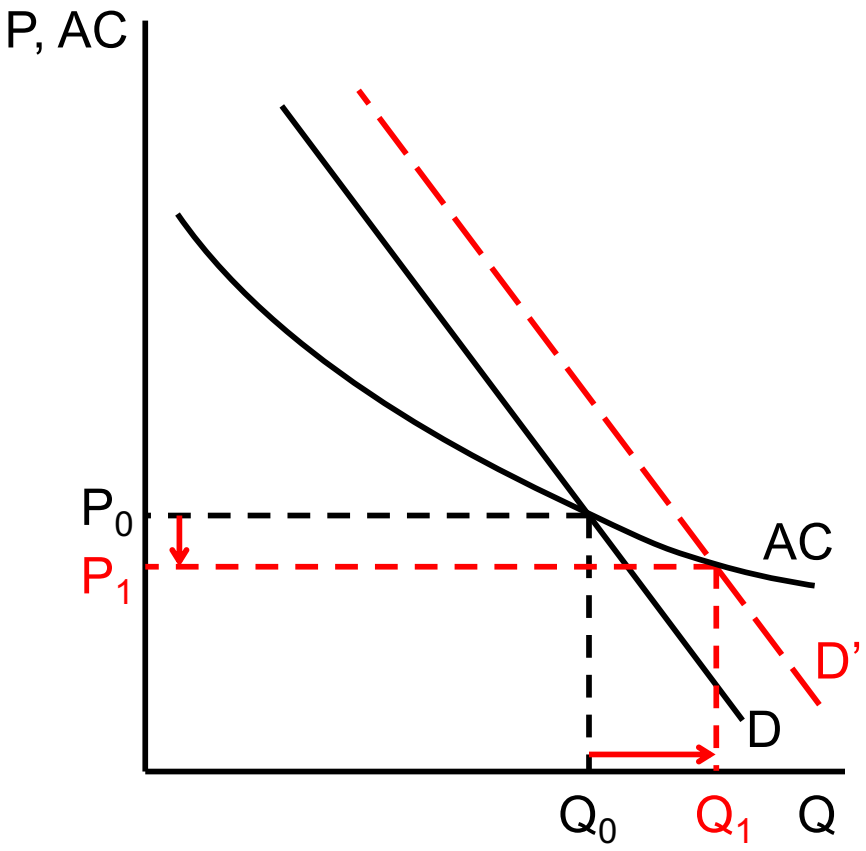
- Scale Economies
- Monopolistic Competition
- Heterogeneous Firms

Scale Economies



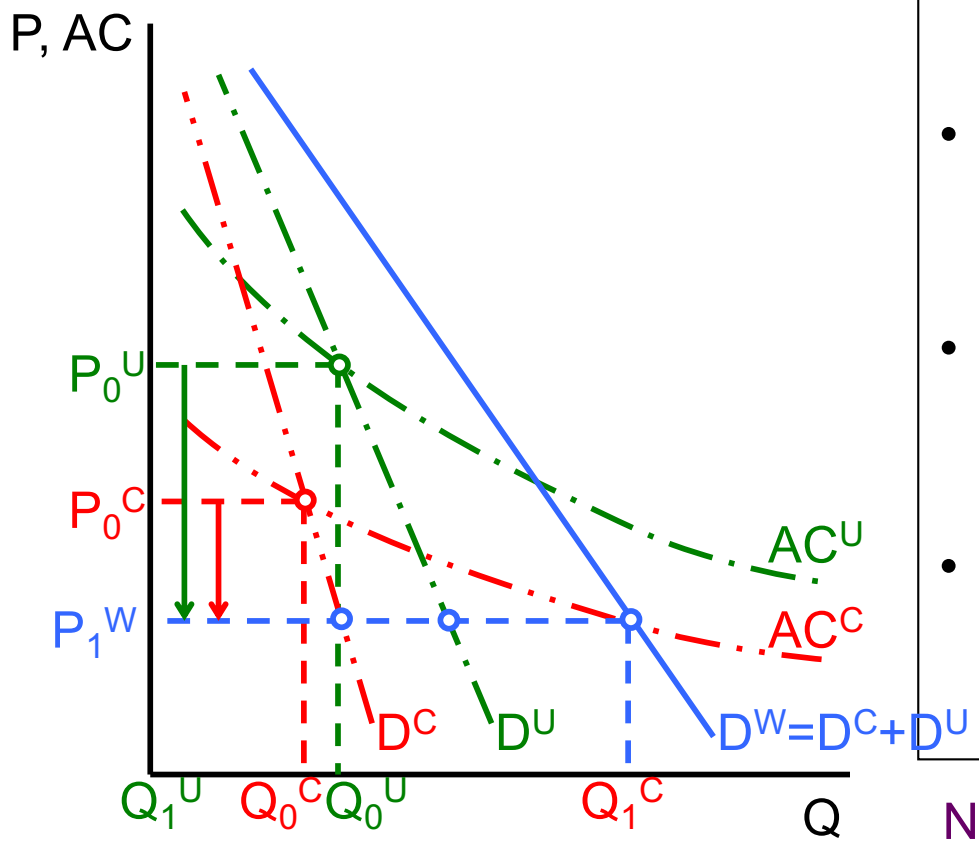
- With scale economies, average cost falls with higher output
- Equilibrium is output at which P=AC
  - i.e., zero excess profit
- Dynamics
  - Think of arbitrary output causing price from D-curve
  - Profit (P>AC) causes expansion
  - Loss (P<AC) causes contraction
  - Market is stable if D steeper than AC

Scale Economies



- Contrary to usual markets, a rightward shift in demand causes price to fall

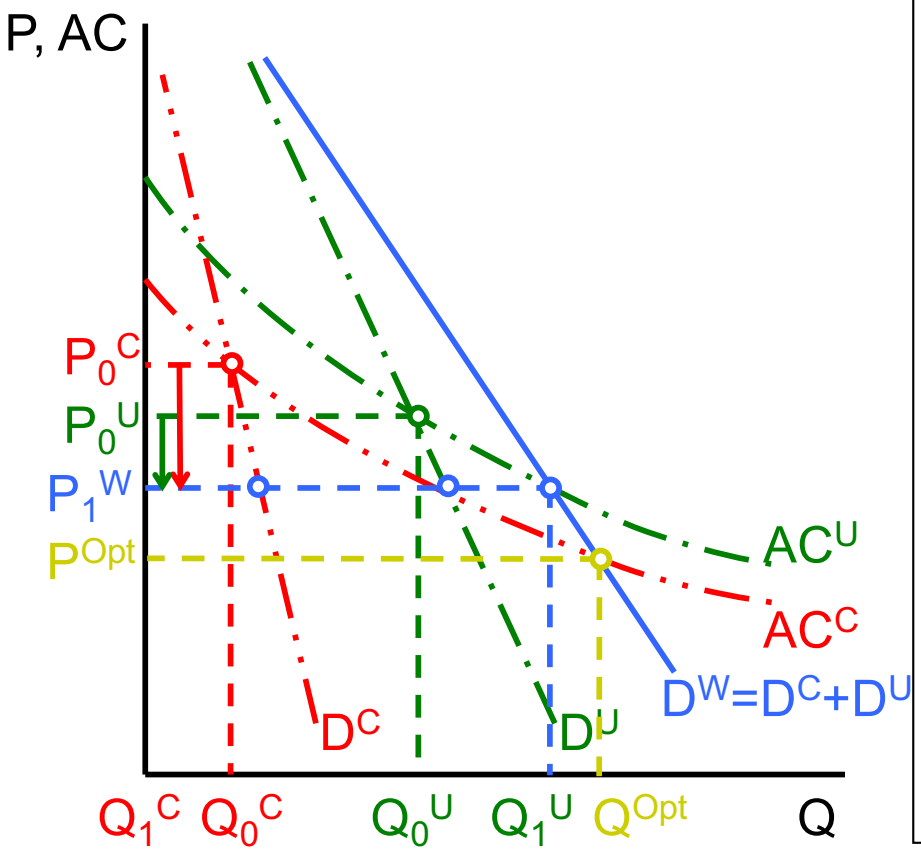
Two-Country Autarky and Trade



- Suppose US has higher cost than China
- Without trade
  - US has $P_0^U=AC^U$
  - China has $P_0^C=AC^C$
- With trade, China underprices US and takes the whole world market
- Price falls in both countries and demanders gain in both, the US by more

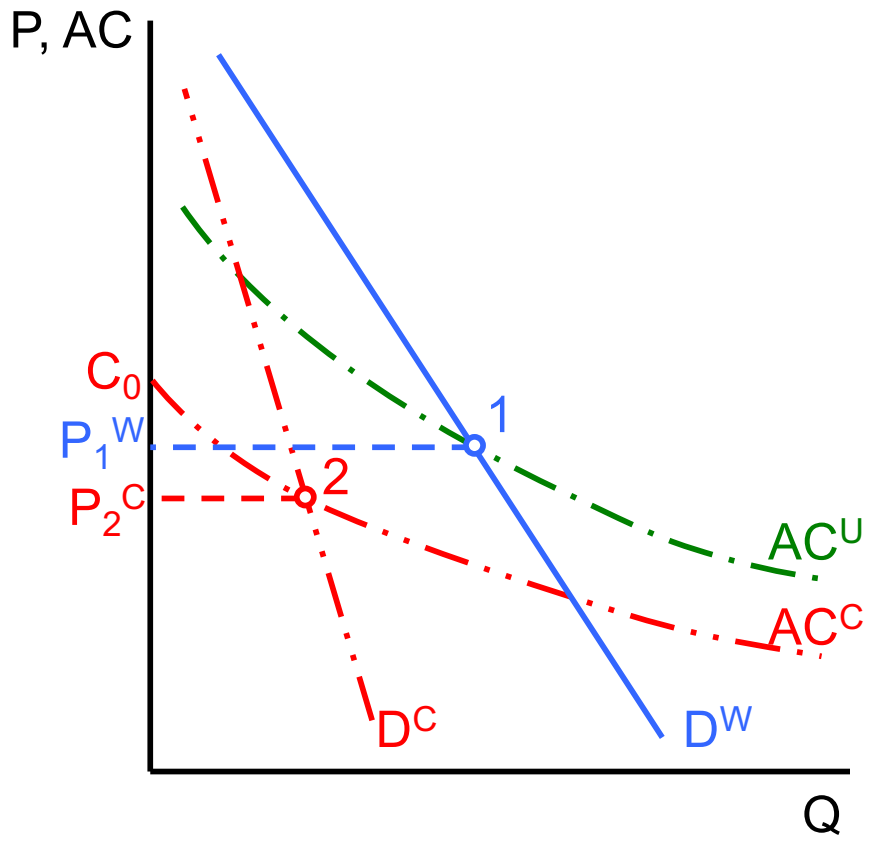
NOTE: Here the country with lower AC curve also has lower autarky price and exports the good. Those won't always be the case. See next.

Case of Less Demand in Low-Cost Country



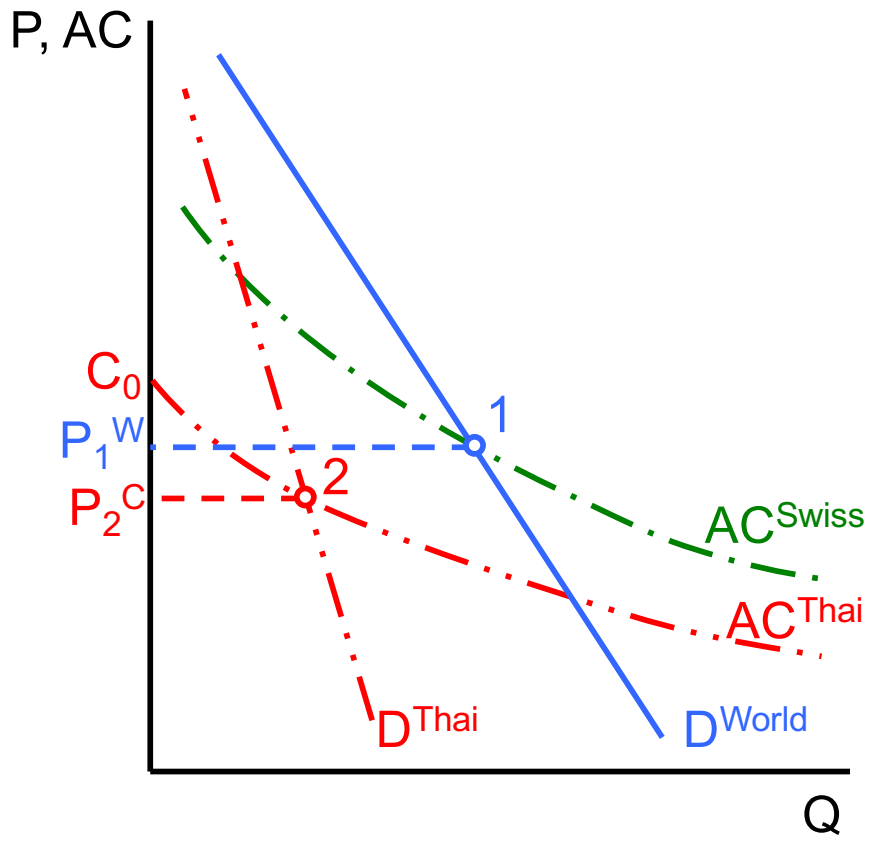
- Now, with less demand, China's autarky price is higher than the US, even though AC curve is lower
- With trade, US underprices China even though it has the higher AC curve, and US takes the whole world market
- Price falls in both countries and demanders gain in both, the US by less
- World would benefit more if somehow China took whole market at Q^{Opt}

Potential Loss from Trade



- Suppose China is initially not producing, so that free trade is at point 1
- Even with lower AC curve, China cannot enter, because its cost of initial output is $C_0 > P_1^W$
- If China cuts off trade with high tariff, it moves to point 2, with lower price. Both suppliers and demanders in China gain
- So China gains by not trading!

Potential Loss from Trade



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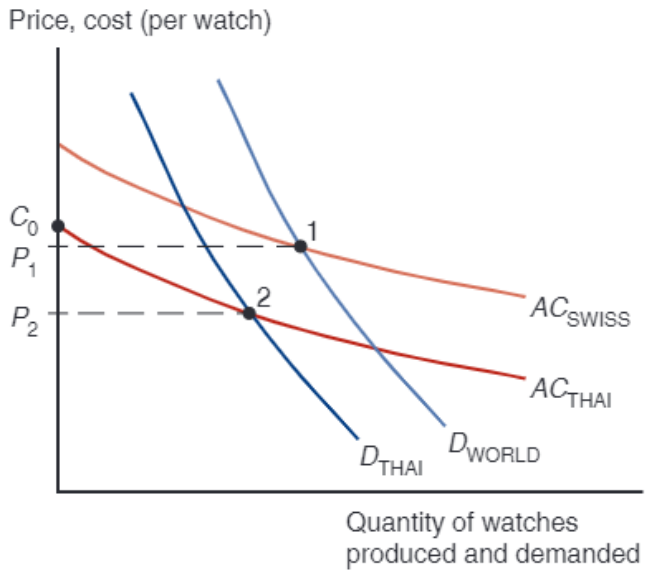
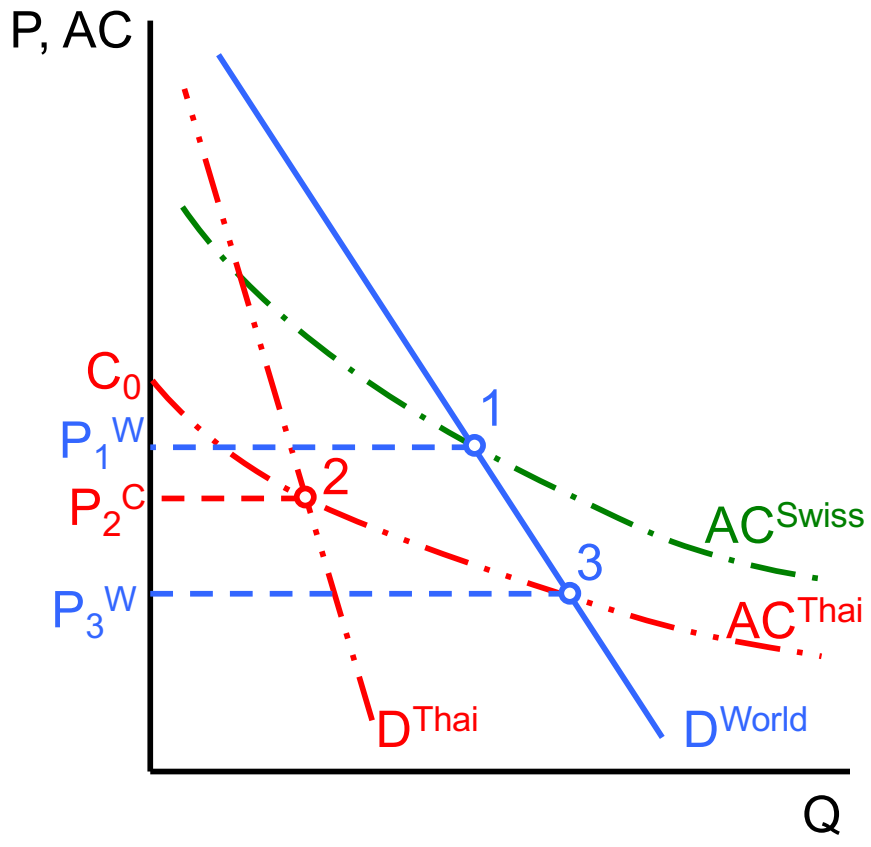
- So China gains by <u>not</u> trading!
- This is the textbook's example of Swiss and Thai watches

Figure 7.5 External Economies and Losses from Trade



When there are external economies, trade can potentially leave a country worse off than it would be in the absence of trade. In this example, Thailand imports watches from Switzerland, which is able to supply the world market (D_{WORLD}) at a price (P_1) low enough to block entry by Thai producers, who must initially produce the watches at cost C_0. Yet if Thailand were to block all trade in watches, it would be able to supply its domestic market (D_{THAI}) at the lower price, P_2.

Infant-Industry Protection



- Note that after using protection to get the industry started, Thailand and the world can then both gain even more by returning to free trade, since Thailand now starts with a cost below P_1^W.
- The new world price becomes P_3^W, with Thailand meeting all of world demand
- This is an example of the "infant industry argument" for protection

Pause for Discussion

Questions on KOM

- Can the “forward falling” be interpreted the same way as a conventional upward sloping supply curve, saying how much industry will supply at each given price?
- Also, though not mentioned in the text, how does this differ from a “backward bending supply curve” that one sees in other contexts, such as labor supply?

Questions on KOM

- How does opening to trade with external economies of scale differ from the partial equilibrium models earlier in the course?
  - Do low-cost suppliers still export?
  - Do high-cost suppliers still reduce production, and their countries import?
  - Does price rise in the low-price country and fall in the high-price country?
  - Does a move to free trade cause winners and losers in both countries?

Outline

- Scale Economies
- Monopolistic Competition
- Heterogeneous Firms

Monopolistic Competition

- Economy: many (n, which is variable) firms, all alike but producing differentiated products
- Model
  - Cost per firm: $C = F + cQ$
    - where F=fixed cost, c=marginal cost, Q=output
  - Demand per firm: $D = S/n - Sb(P - \bar{P})$
    - where S=market size, n=# of firms, P=firm's price, $\bar{P}$ =average of all firms' prices, b>0 is a parameter
  - Equilibrium: $P = \bar{P} = C/Q;\ Q = D$

Average cost falls with higher output
$C/Q = c + F/Q$

Demand per firm
- Falls with n, P
- Rises with $\bar{P}$

Supply = demand
All firms charge same price and make zero profit

Monopolistic Competition

- Conditions:
  - CC Curve:

    Average cost:

    $$AC = n\left(\frac{F}{S}\right) + c$$

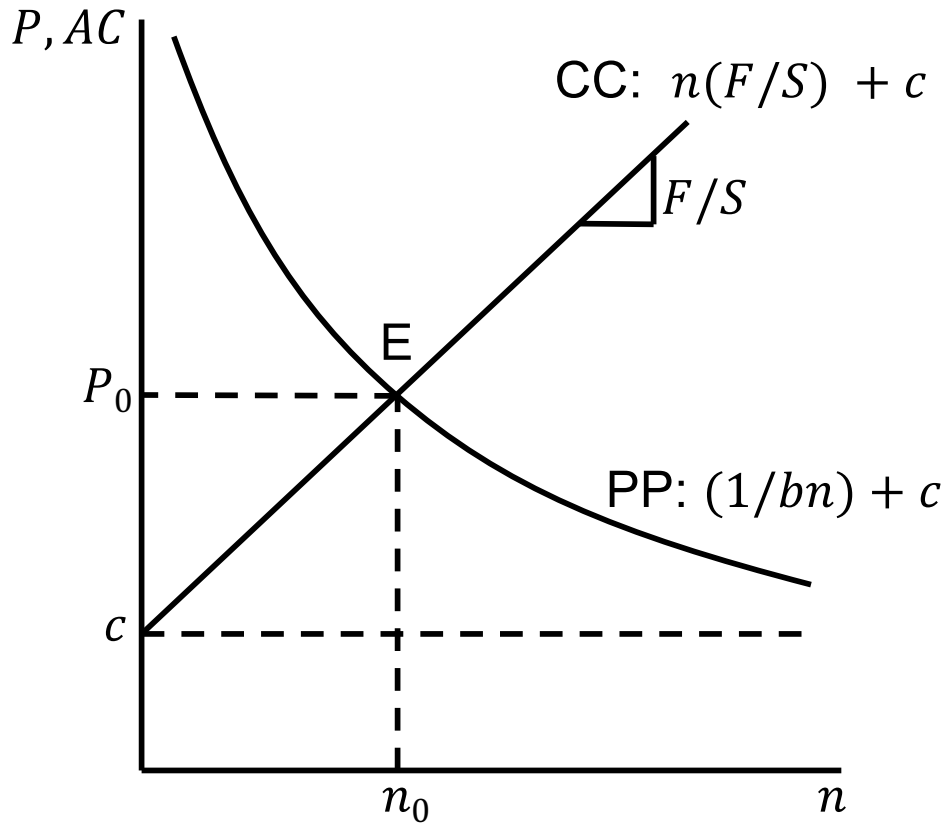
  - PP Curve:

    Monopoly price:

    $$P = (1/bn) + c$$

  - Equilibrium:

    $$P = AC$$

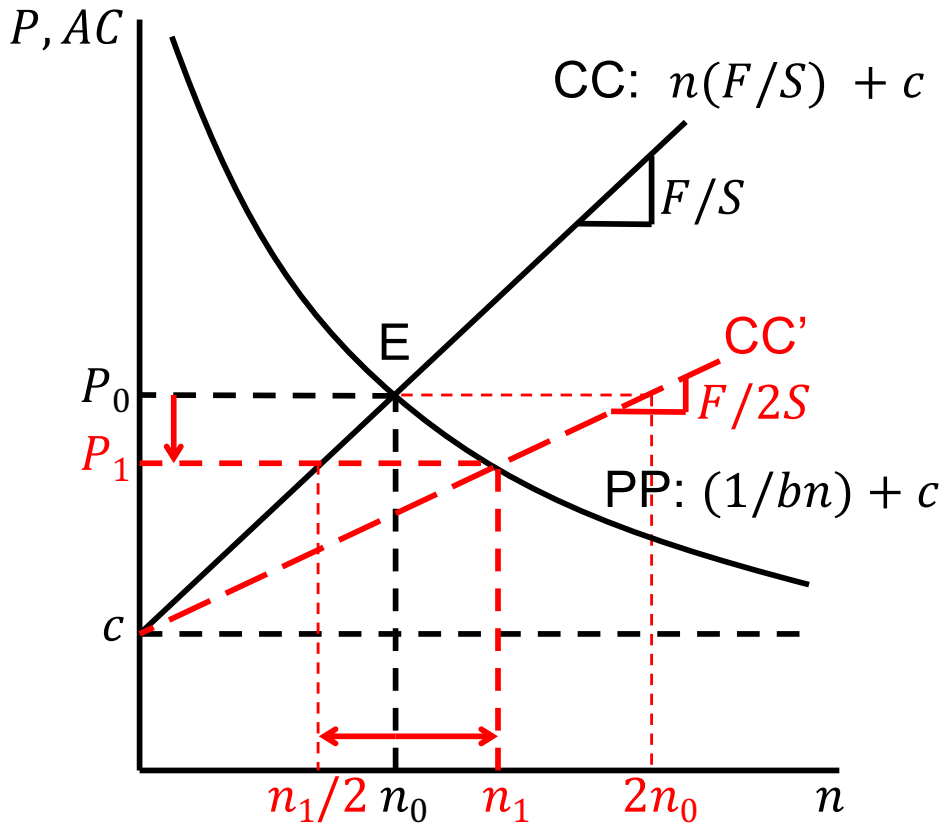


Derived in text from MR=MC
(marginal revenue = marginal cost)

Monopolistic Competition

- World of 2 identical countries: world is just like 1, except S is twice as large
- Move from autarky to 2-country free trade causes
  - Price to fall
  - Number of firms to rise,

    but not to double
    - Thus number in each country falls



Pause for Discussion

Questions on KOM

- Why do “internal economies of scale” lead to imperfect competition?
- What two things contribute to the gap between price on a demand curve facing a monopolistic firm and its marginal revenue?
- How then is this related to the markups of price above marginal cost that firms charge?

Questions on KOM

- The monopolistic competition model in the text is depicted with two curves, the upward sloping CC curve and the downward sloping PP curve, with the number of firms in the industry, *n*, on the horizontal axis. What, intuitively, do these two curves represent, and why are they shaped as they are?

Questions on KOM

- What assumption is captured by saying that the equilibrium is the intersection of the CC and PP curves?
- Why can the monopolistic competition model lead to trade without comparative advantage?
- In the monopolistic competition model, are there any losers from trade?

Questions on KOM

- What are the replacements in the monopolistic competition model of the following three assumptions, and how does each contribute a new reason for gain from trade?
  - perfect competition,
  - constant returns to scale, and
  - product homogeneity

Outline

- Scale Economies
- Monopolistic Competition
- Heterogeneous Firms

Heterogeneous Firms

- Old Trade Theory (Ricardo, Heckscher-Ohlin, Specific Factors) had
  - Constant returns to scale
  - Perfect competition
  - Homogeneous products
  - Thus firms played no role

Heterogeneous Firms

- New Trade Theory (Krugman, etc.) had
  - Increasing returns to scale
  - Imperfect competition
  - Differentiated products
  - Firms played important roles, but
  - They were assumed identical

Heterogeneous Firms

- New, New Trade Theory (Melitz) has
  - Most of the assumptions of New Trade Theory, but
  - Heterogeneous firms
- How?
  - Firms differ in their productivities, each coming from a random drawing

Heterogeneous Firms

- Other features of a Melitz Model
  - Aside from productivity parameters, firms are identical
  - Each produces a differentiated product and engages in monopolistic competition
    - Hence each firm has zero expected profits (prior to drawing its random productivity)
  - There are fixed costs of
    - Production,
    - and also of Exporting

Heterogeneous Firms

- Fixed costs of production imply
  - Increasing returns to scale
  - If productivity is too low (thus cost high), firm
    - Won't sell enough to cover cost
    - Will exit
  - If productivity is high enough, firm
    - Charges lower price
    - Makes profit
    - Stays in the market

Heterogeneous Firms

- Fixed costs of exporting imply
  - If productivity is not much above breaking even on domestic market, firm would run a loss if it exported
  - Only firms with the highest productivity export

Heterogeneous Firms

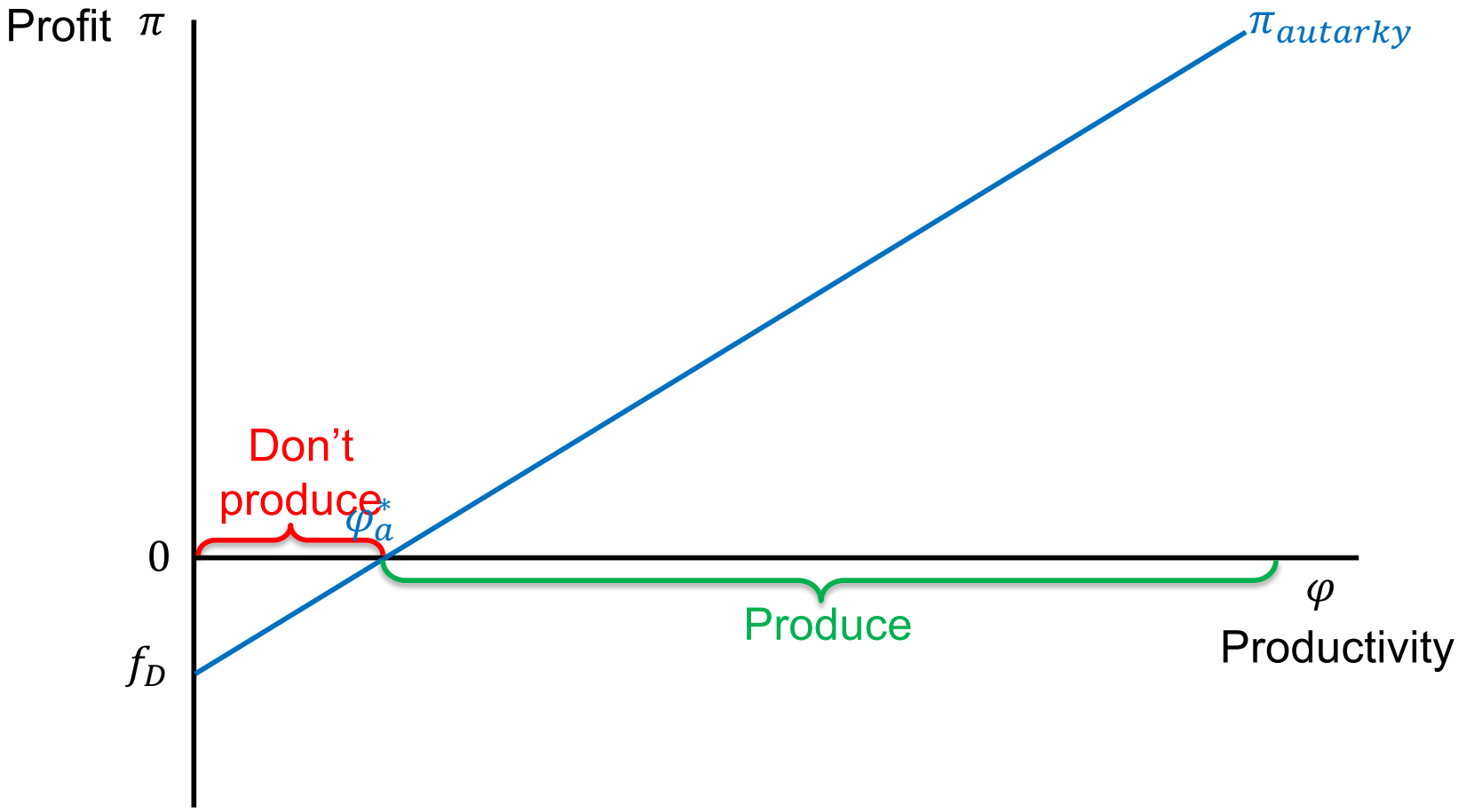
- Effects of a fall in trade barriers
  - Highest-productivity firms, already exporting, expand both output and exports
  - High-productivity firms, start to export
  - Low productivity firms reduce output
  - Lowest productivity firms shut down
- Implications of more trade
  - Fewer firms, lower prices
  - Higher average productivity

Thus a new source of gain from trade!

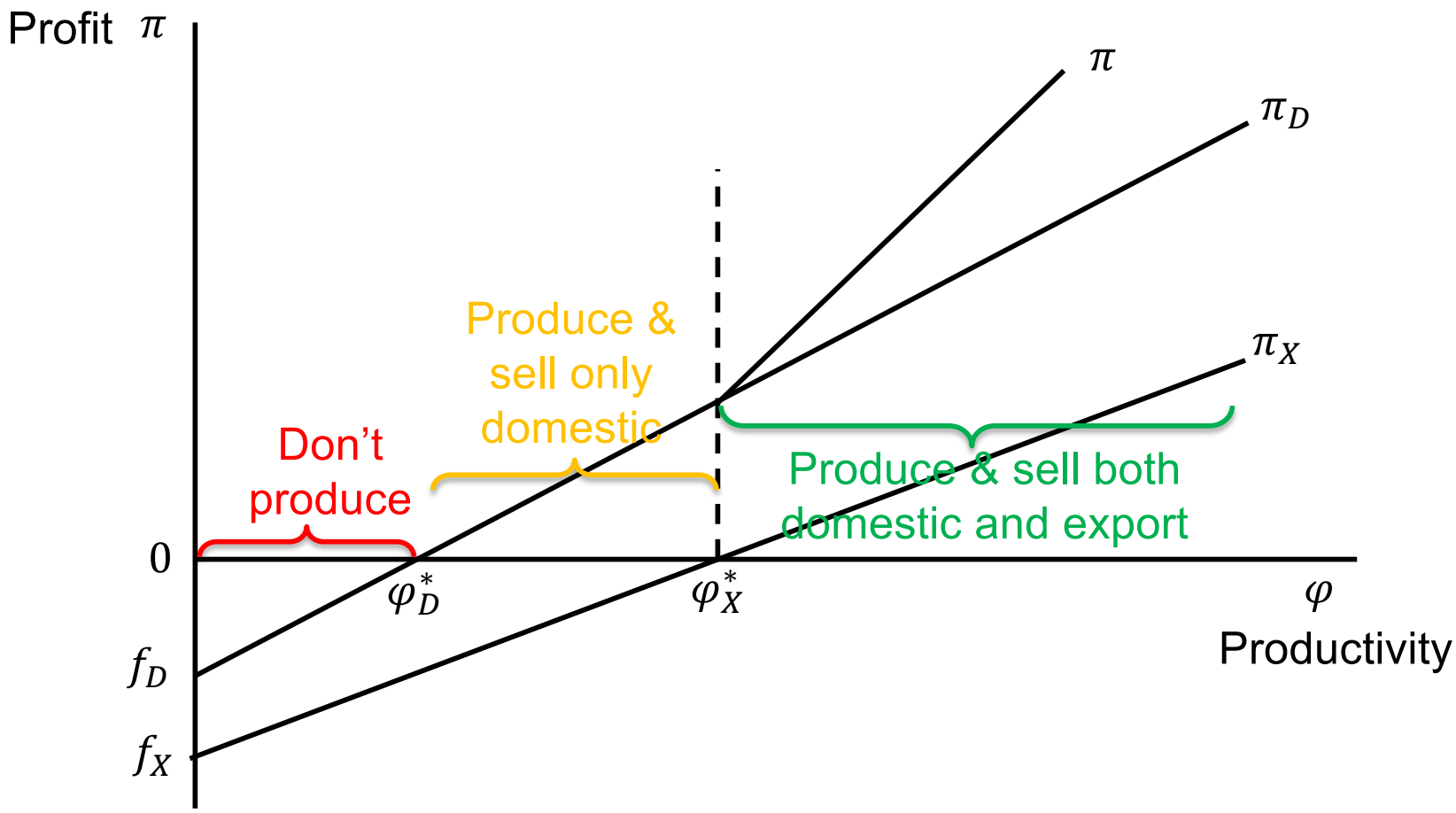
Heterogeneous Firms

- Sketch of the Melitz model:
  - π = profit (revenue – variable cost – fixed cost)
  - φ = random productivity
    - Higher φ means
      - Lower marginal cost
      - Lower price
      - Greater sales
      - More variable profit (revenue minus variable cost)
  - f_D = fixed cost of production & domestic sales
  - f_X = fixed cost of exports

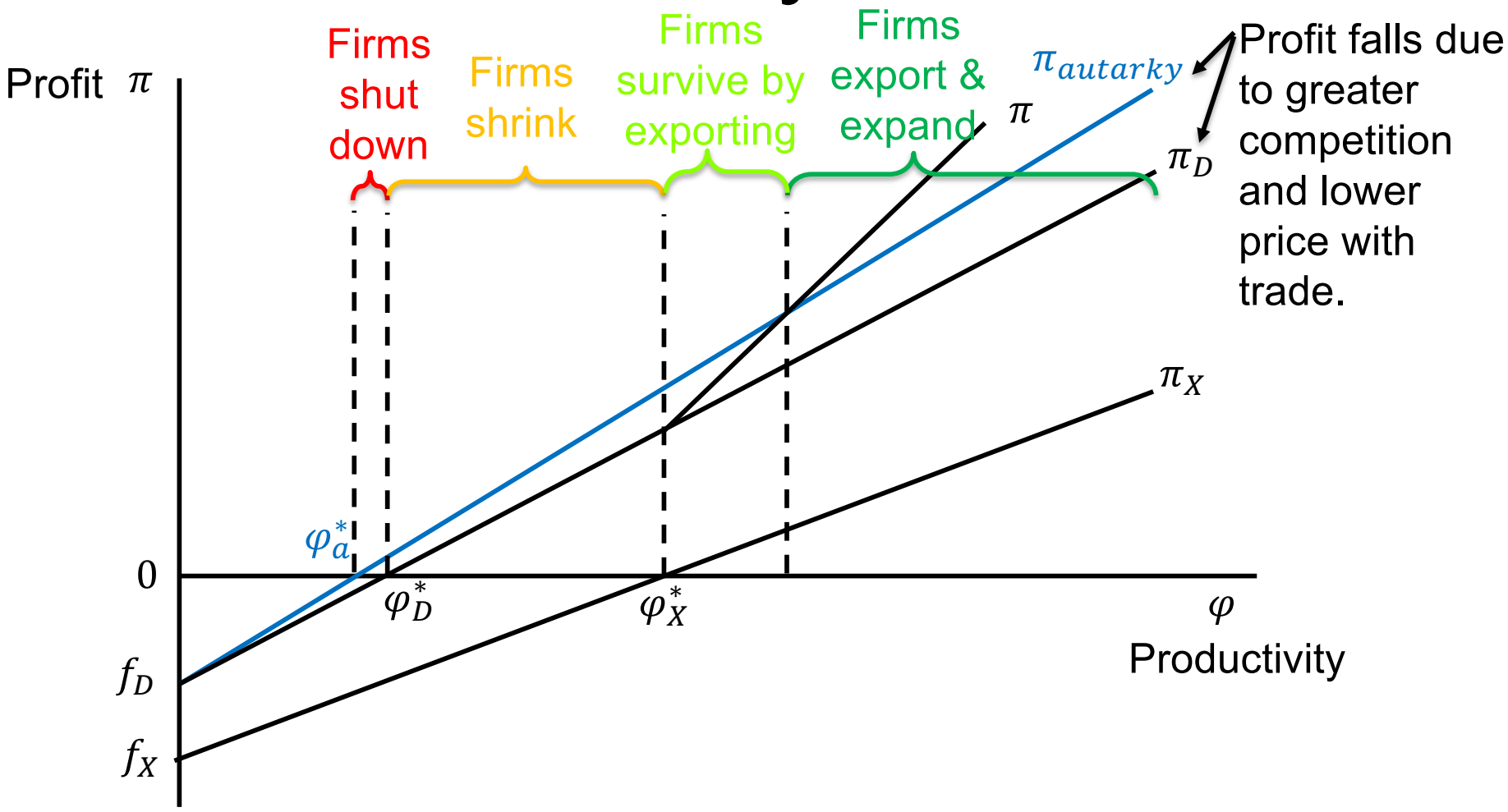
Equilibrium in Autarky



Equilibrium with Trade



Move Autarky to Trade



Pause for Discussion

Questions (not asked before)

- It seems obvious that firms differ. Why was that not allowed with perfect competition?
- Explain the new source of gain from trade that the heterogeneous firm model introduces?