Economics Basics: a review

FRST 318/537c - Forest and Conservation Economics

January, 2015

Economics review

Warning: the following slides are necessary but, admittedly, quite boring.

Outline

- Demand, Supply & Market Equilibrium
- Assessing Change in Welfare
- (The importance of) elasticities

Lab structure

- This is likely the only PowerPoint presentation!
- Usually:
  - Go over concepts that may have been unclear in the lecture and hand back quizzes
  - Answer any questions you may have
  - Complete problem sets & work on case studies

Course website

http://courses.forestry.ubc.ca/FRST318

- Class lectures
- Problem sets
- Readings (*or links to readings*)
- Syllabus and detailed course outline

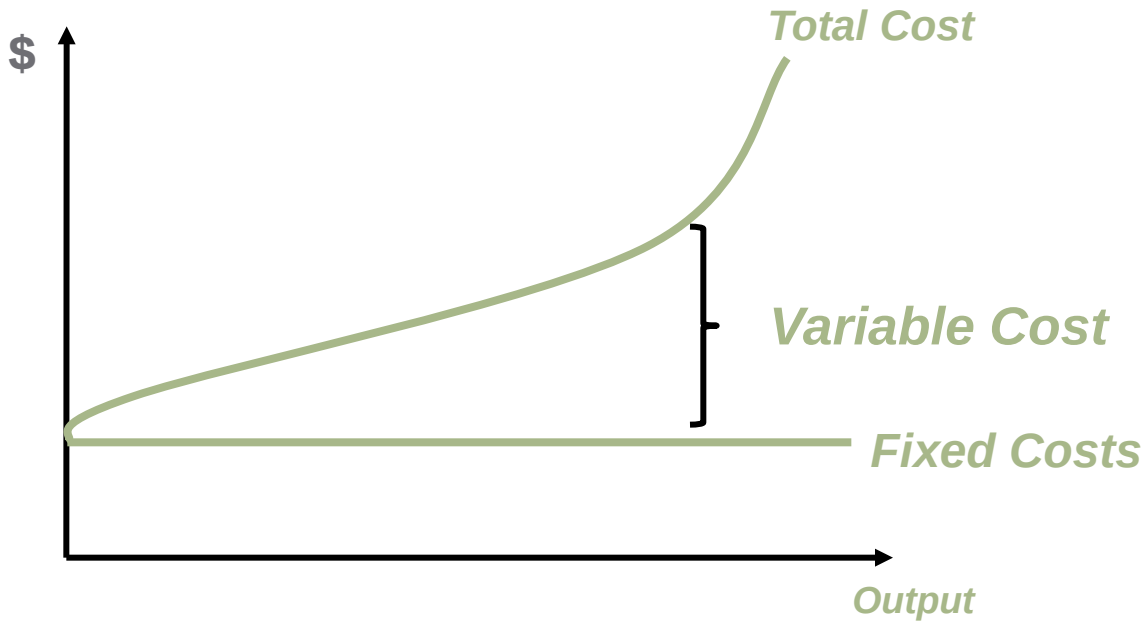
Cost Concepts

- What is a supply curve?
- Types of costs
  - Fixed Costs
  - Variable Costs
- The importance of marginal costs versus average costs

Types of Costs

- Fixed Costs
  - Production expense that *does not* vary with output
  - Examples?
- Variable costs
  - Production expense that *does* change with output
  - Examples?

Fixed Cost, Variable Cost, and Total Cost



Algebra of Costs

- TC=FC + TVC
- And ATC=AFC + AVC
- Where:
  - TC = Total Cost
  - FC = Fixed Cost
  - TVC = Total Variable Cost and
  - ATC=TC/Q and so forth....

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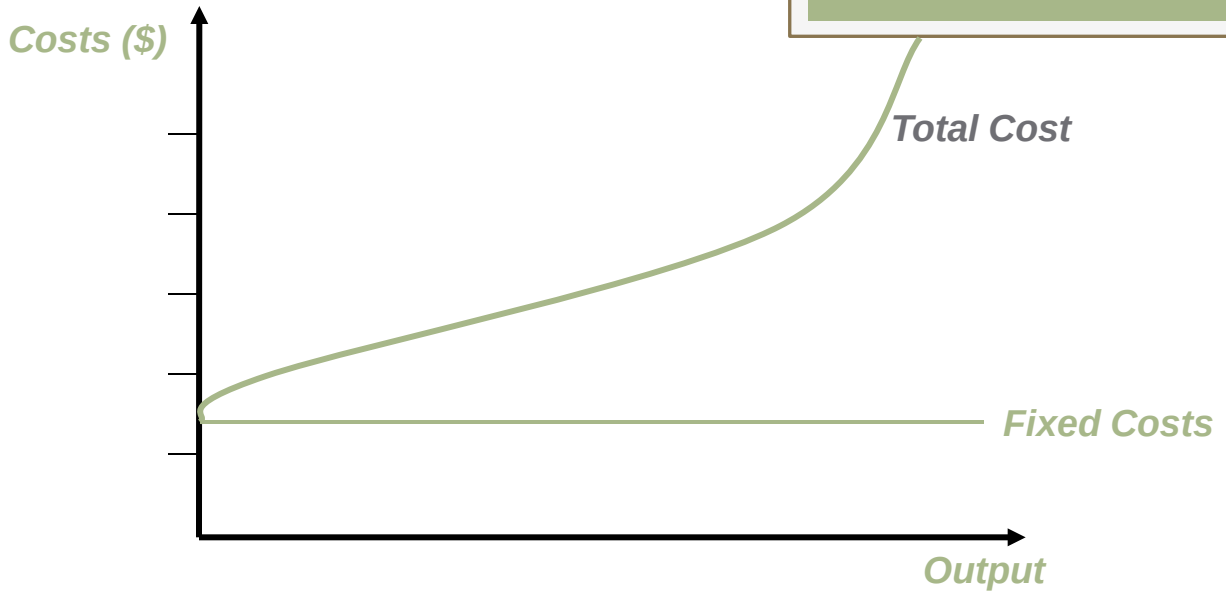

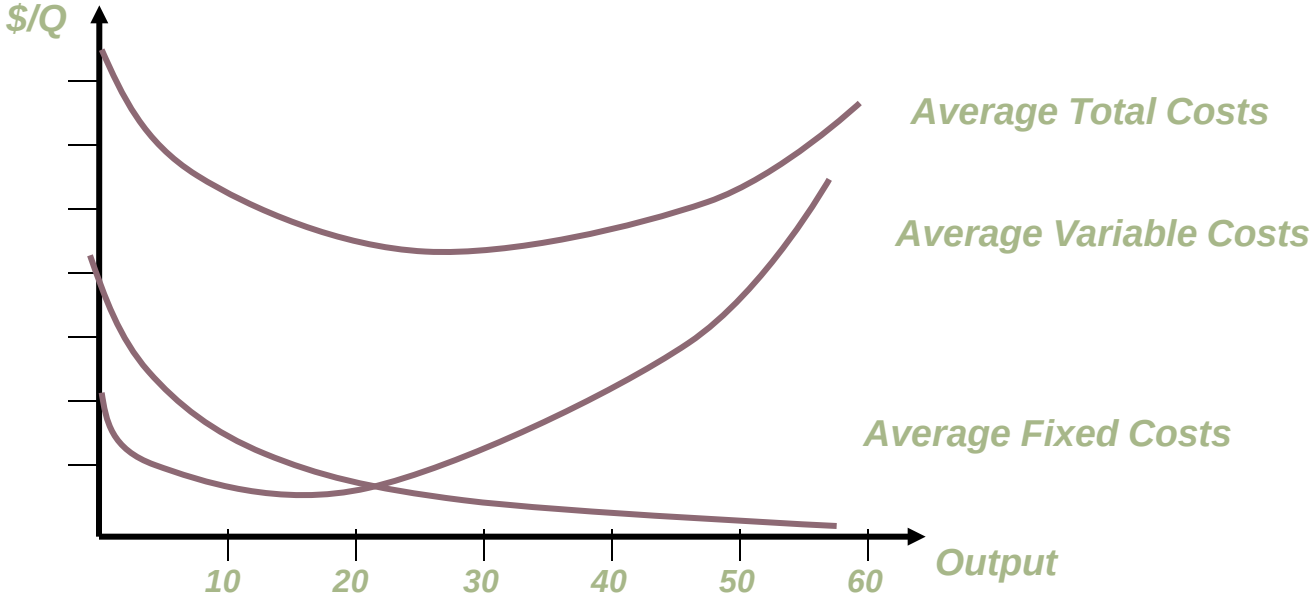

Marginal Costs

- Marginal cost (MC) = Change in Total Costs/Change in outputs
- $MC = \Delta TC/\Delta Q$
- Since fixed costs remain the same, it is the change in total variable costs that marginal cost measures
- It is also the case that the marginal cost curve represents the slope of the cost curve

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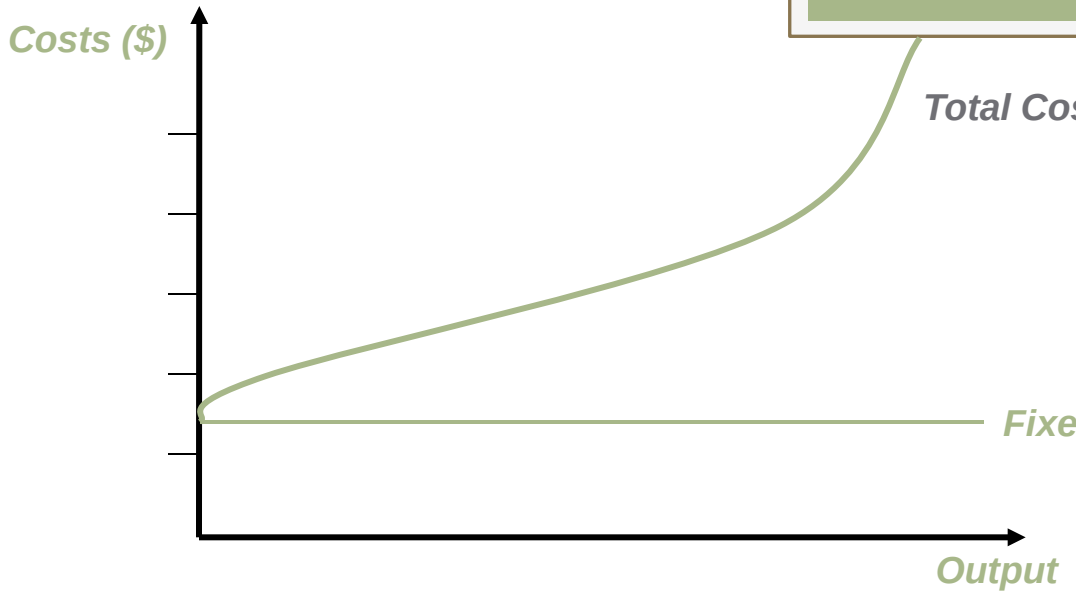
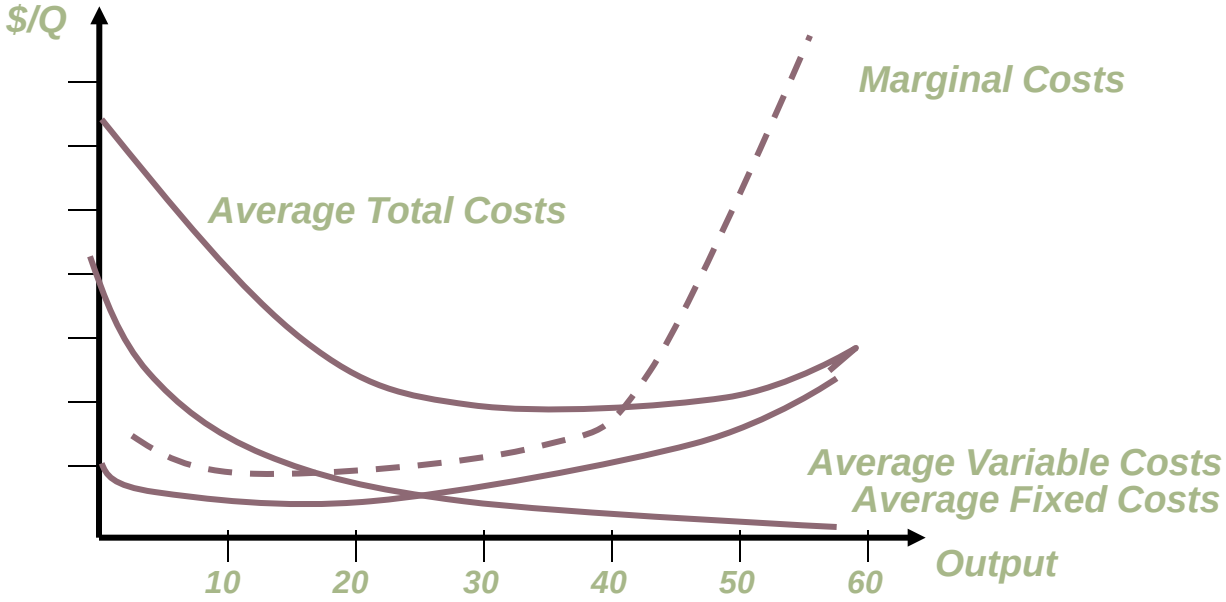


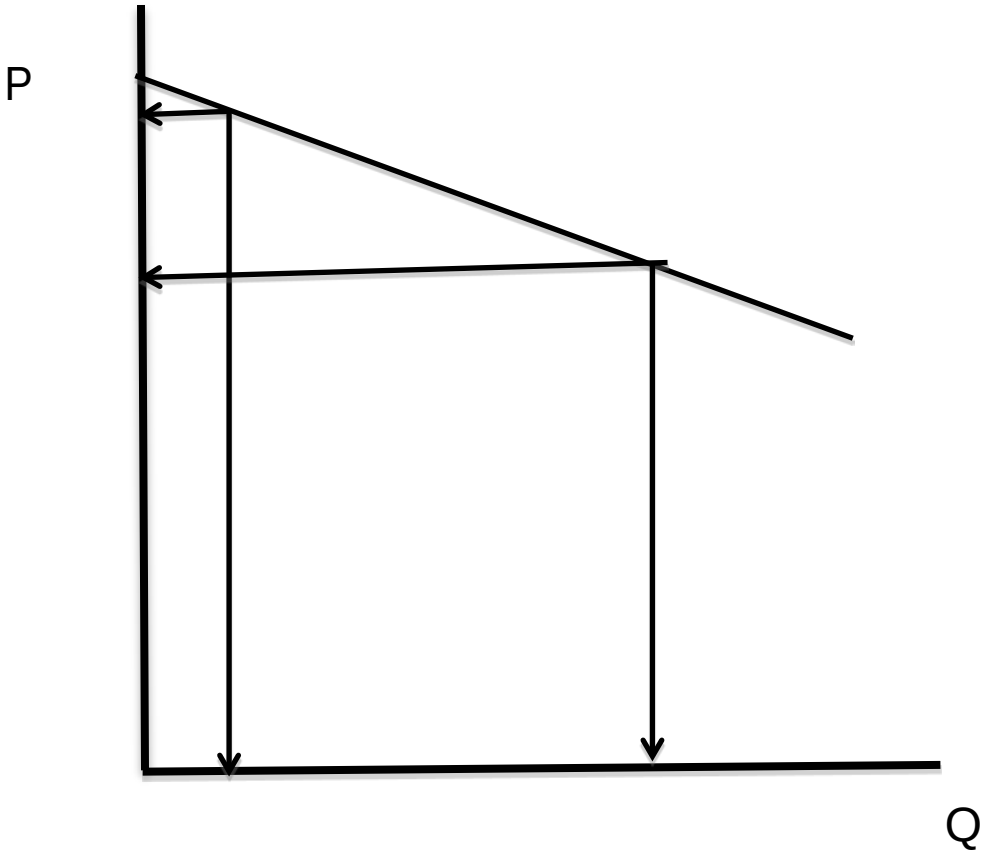


Returning to the Supply Curve

- It turns out that the the supply curve is the marginal cost curve for each firm:

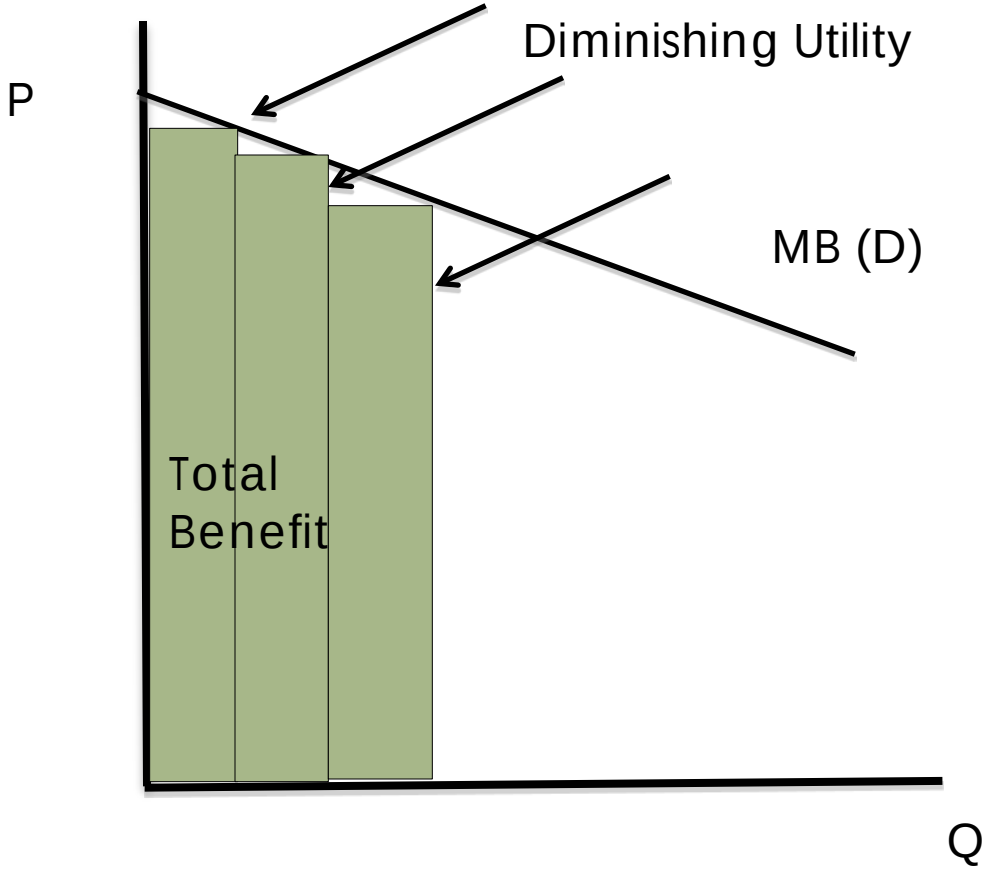
$$S = MC$$

Demand Curves



Source:
http://www.dietsinreview.com/diet_column/07/joey-chestnut-wins-nathans-famous-hot-dog-eating-contest-by-eating-16052-calories/

Also a measure of value



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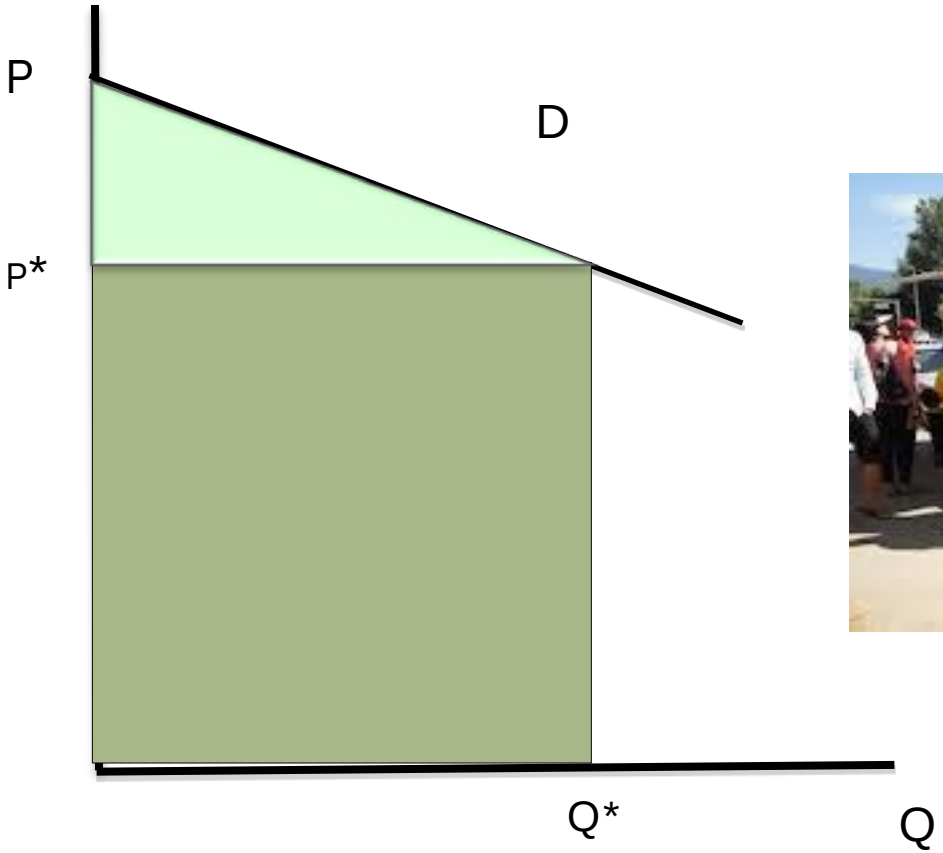

First Fundamental Assumption

- Firms are interested in profit-maximizing
  - Given that profits = Total Revenues – Total Costs, or π = TR-TC, the highest level of profit is found where the difference between these two is the greatest (so not necessarily where TR is highest, or TC lowest)
- Firms find this point by examining what the contribution to profit (if any) is from producing another unit of output

Second Fundamental Assumption

- Perfect Competition
  - This means that all firms are price-takers (they have no influence on the price)
  - They see perfectly flat (infinitely elastic) demand curves (although overall market demand curve is downward sloping)
  - When the demand curve is flat Marginal Revenue is constant and equals Price.
  - Therefore firms will price at marginal cost, or choose their production level (Q*) such that MC(Q*)=P

Profit-Maximizing Rule

- This is equivalent to setting Marginal Revenue equal to Marginal Cost, or MR=MC
- In other words, will you get more for that additional unit than it costs? If MR>MC, then you are making a profit on it and should expand
- If however MR<MC, then you are losing money-and producing too much
- Under assumption of perfect competition, P=MR then P=MC

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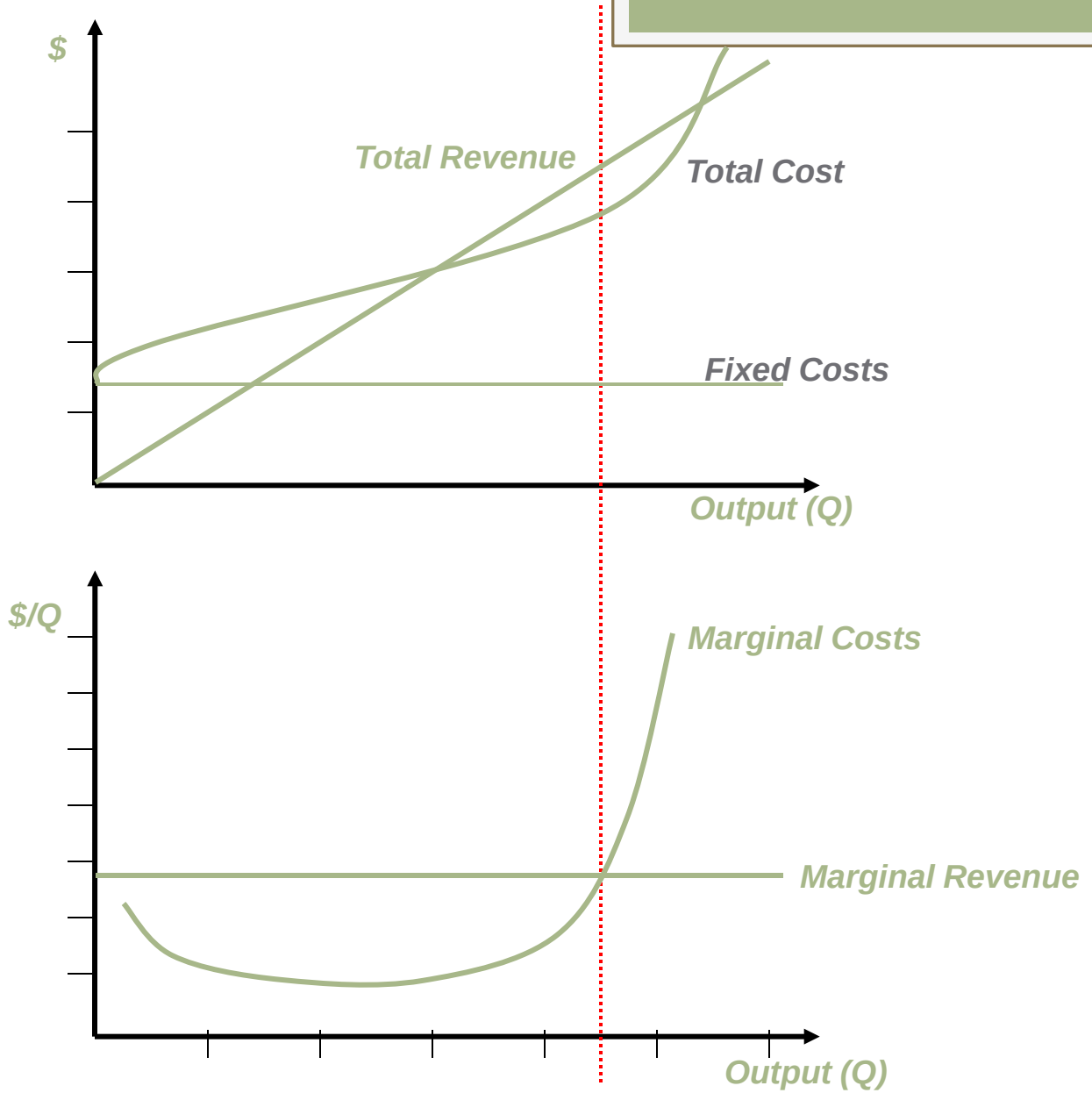

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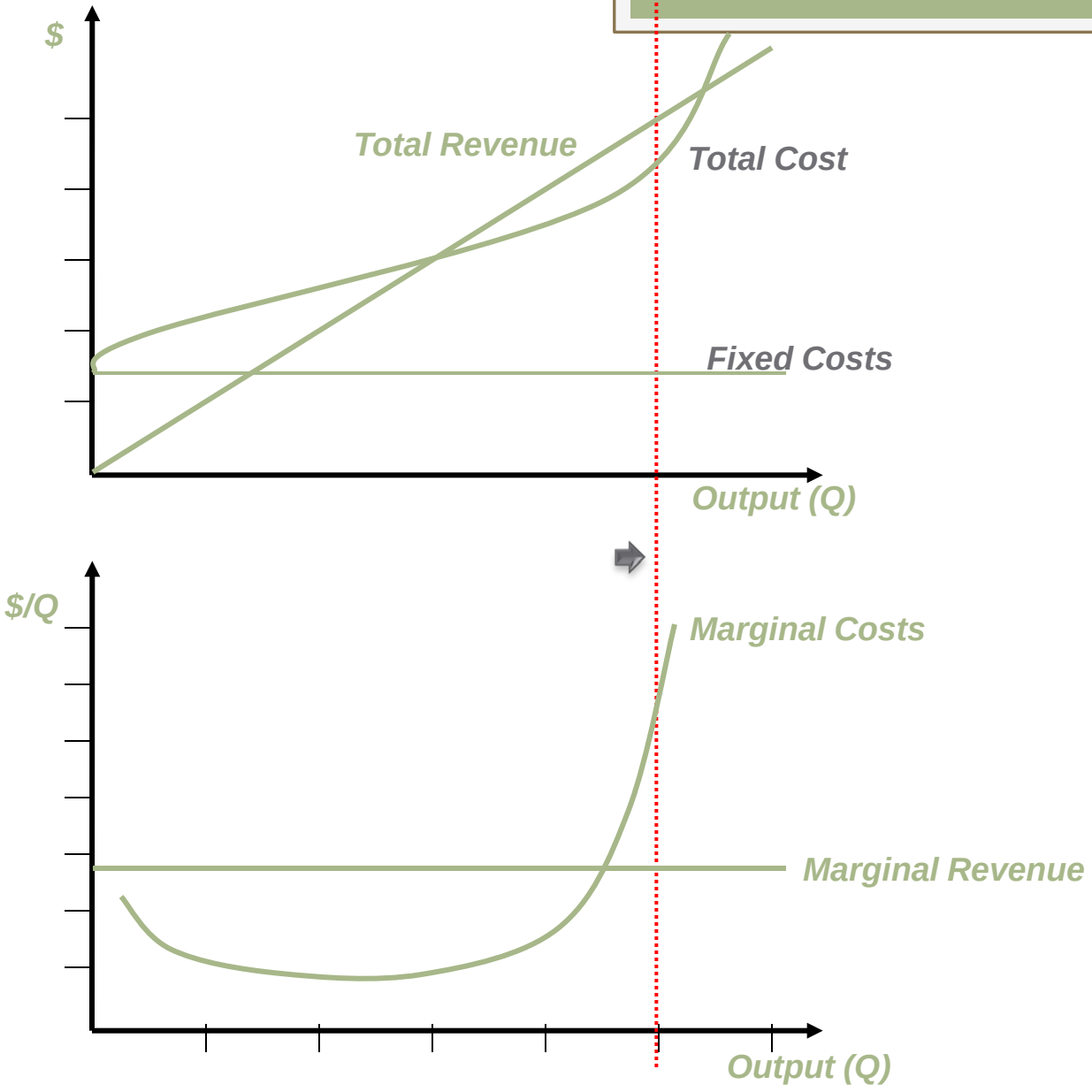

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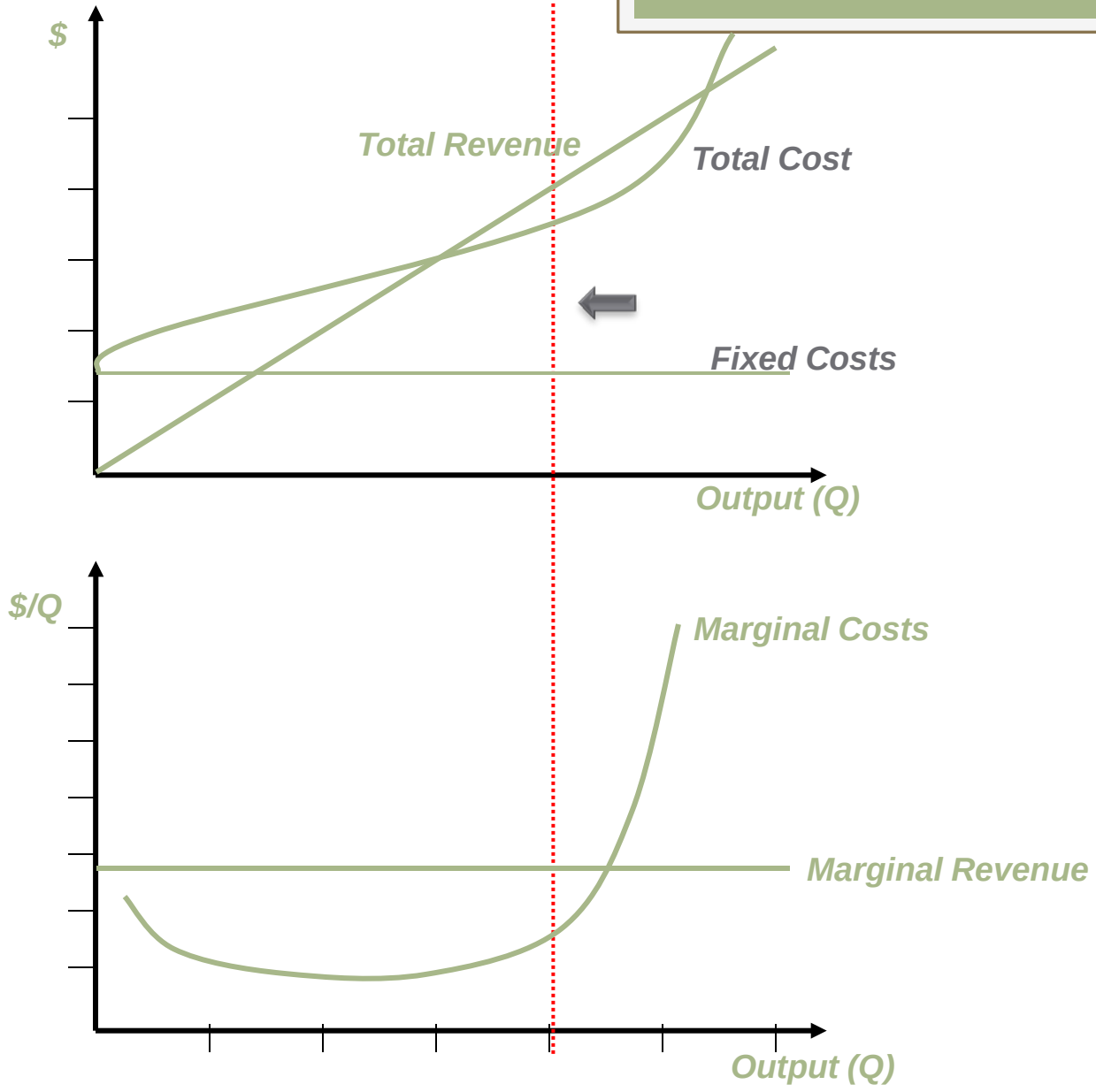
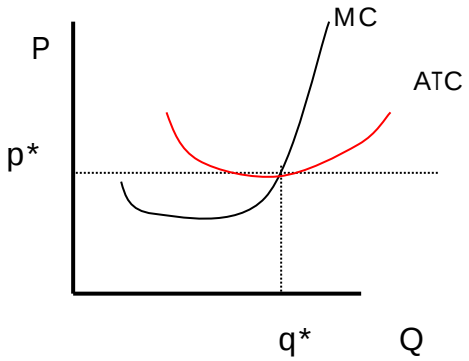
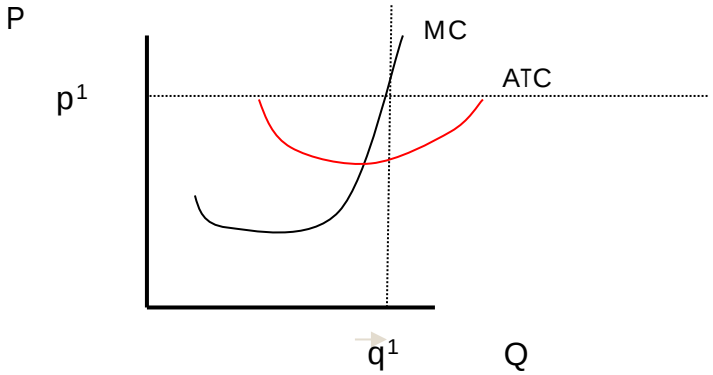


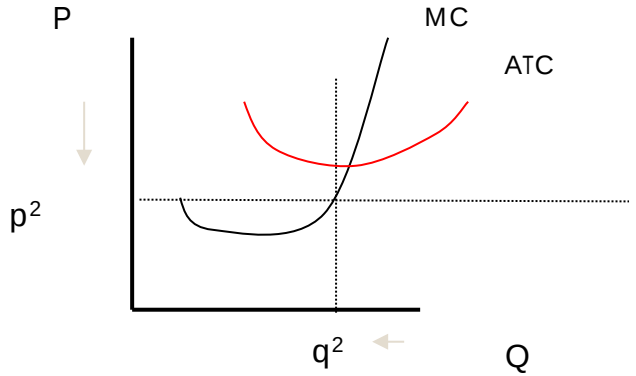
Profit-Maximizing Rule

$$MR = MC$$

Firm equilibrium in perfect competition

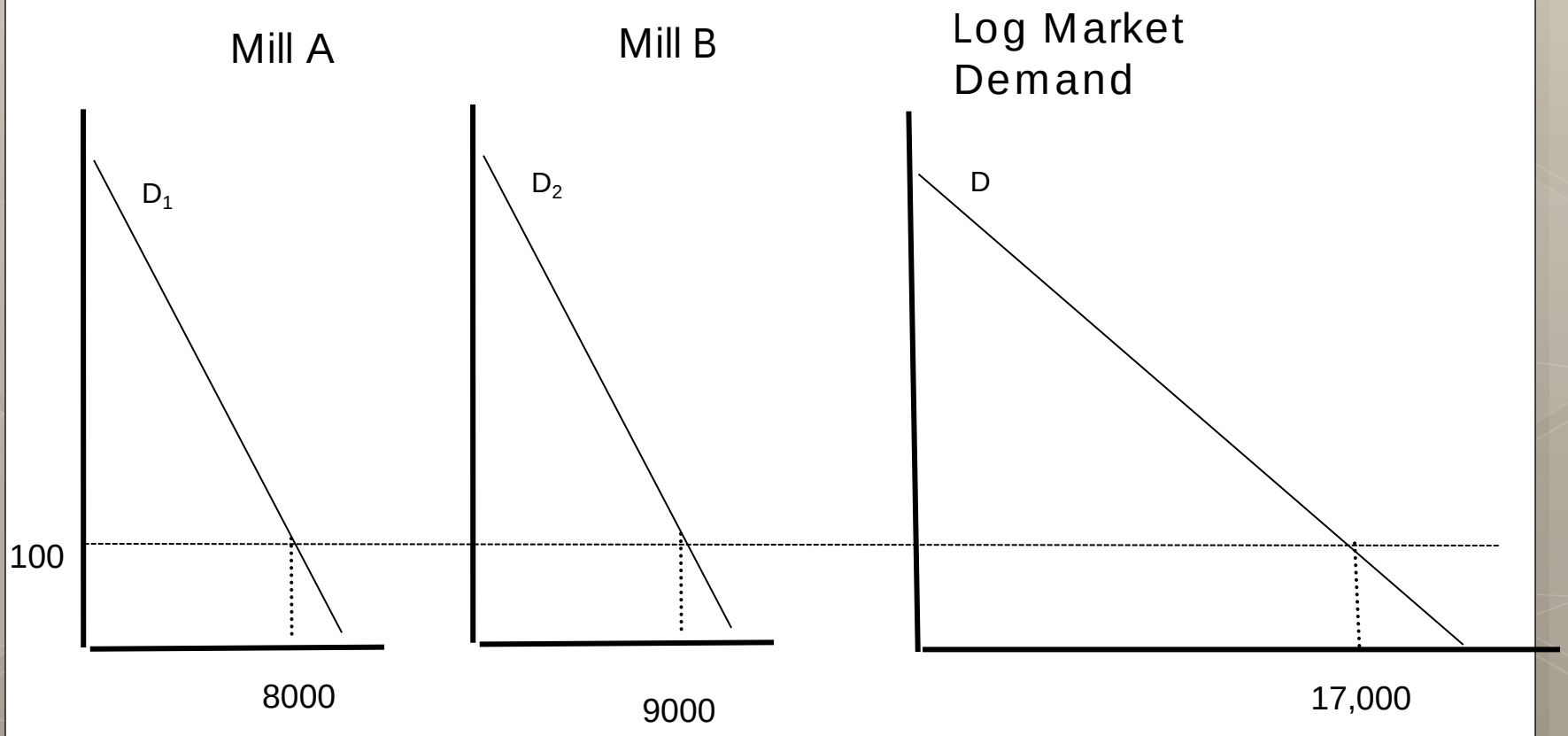






Examples of disequilibrium (in perfect competition) (positive profits or losses)

Market Demand- summation of individual demands



Market Equilibrium

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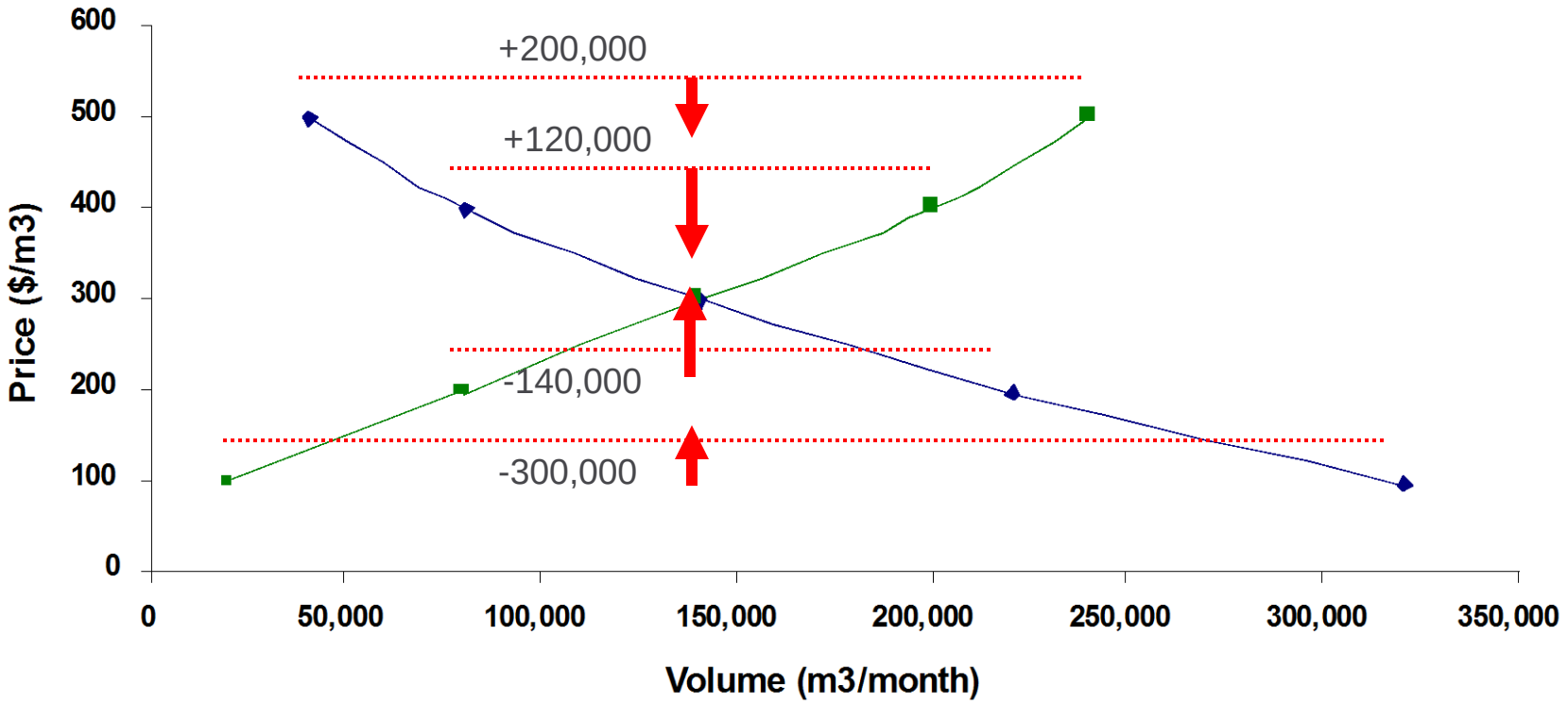
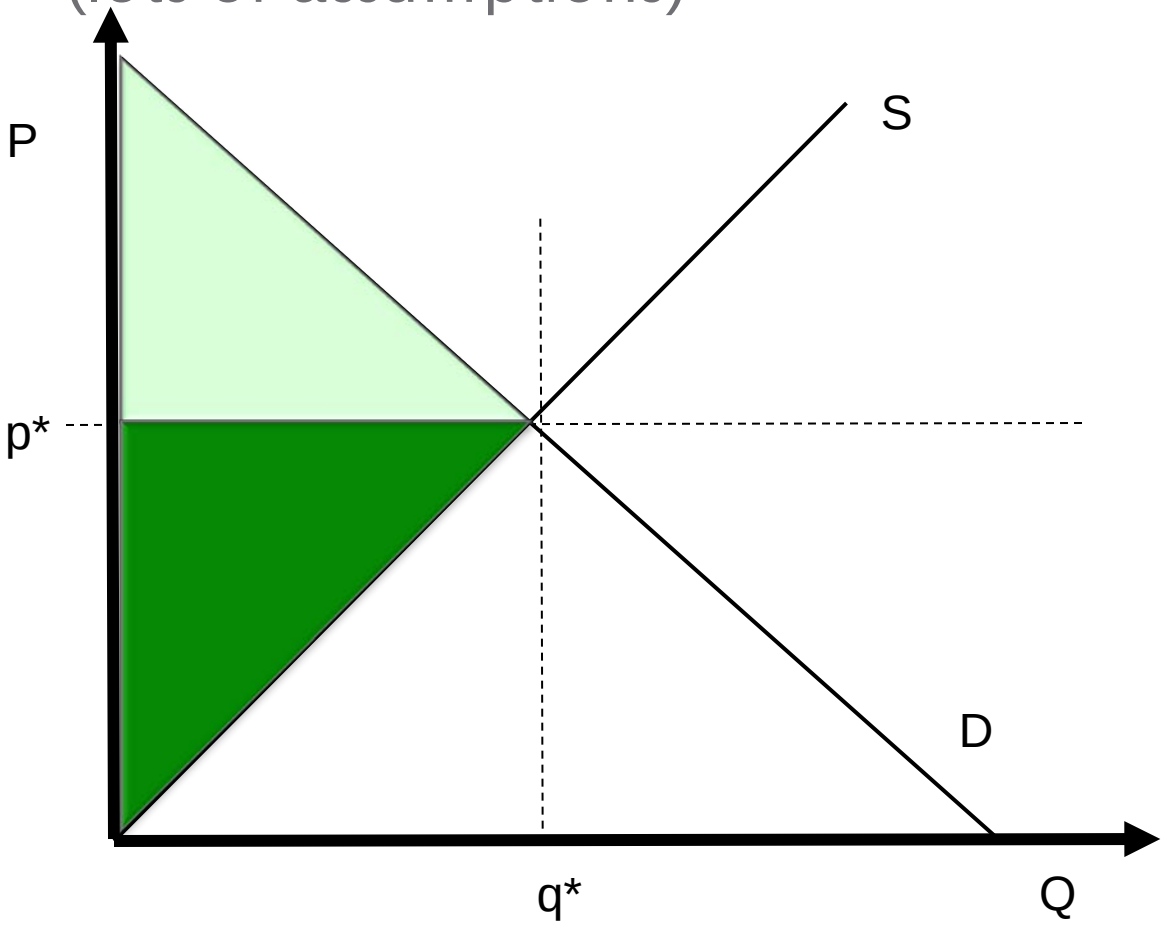


Price ($/m3)	Demand (m3/month)	Supply (m3/month)	Surplus	Price Effect
500	40,000	240,000	+200,000	↓
400	80,000	200,000	+120,000	↓
300	140,000	140,000	0	none
200	220,000	80,000	-140,000	↑
100	320,000	20,000	-300,000	↑

Market Equilibrium maximizing social welfare* (lots of assumptions)



Why is social welfare maximized?

- Marginal revenue product = marginal factor cost
- Marginal social benefit = marginal social cost
- Value of the marginal product = marginal revenue product

MSB=VMP=MR P=MFC=VMF=MSC

Assumptions required for markets to yield social optimum

- Firms and consumers are rational maximizers
- Efficient property rights
- Perfect competition
- Free entry
- Perfect information
- Mobile labour and capital
- No externalities
- All inputs and outputs are priced
- Satisfactory income distribution

Market Adjustments

"Everybody knows umbrellas cost more in the rain..."

-Tom Waits, Bad As Me (2011)

Demand and Supply Shifters

Demand

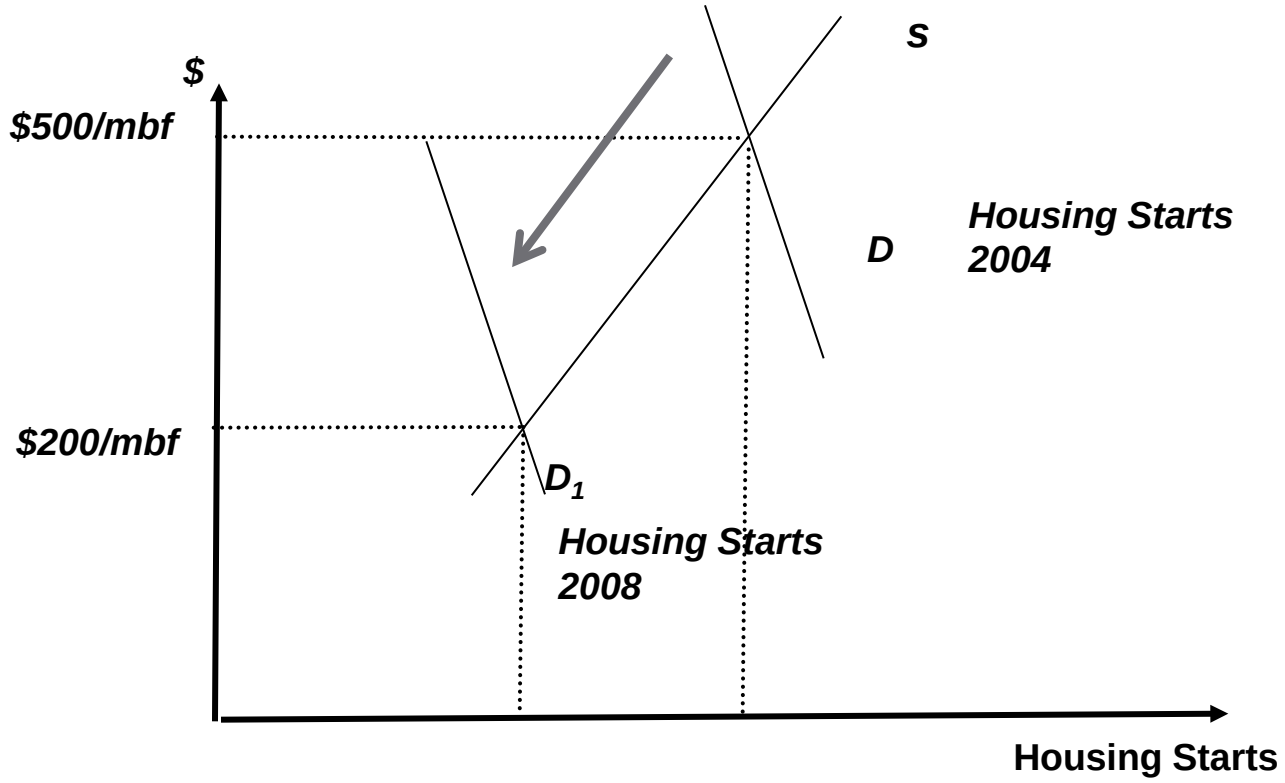
- Change in size of market
  - Number of buyers (certified wood)
  - Population
- Change in tastes
- Change in price of other goods
  - complementary
  - substitutes
- Change in income
- Change in needs- *umbrellas in the rain*

Supply

- Change in price of inputs
- Changes in available technologies
- Profitability of other goods
- Catastrophic events
  - Earthquake, Tsunami
- Policy changes
  - MPB AAC uplift

BUT NOT a change in the price of the good

Shifts in Demand for Lumber



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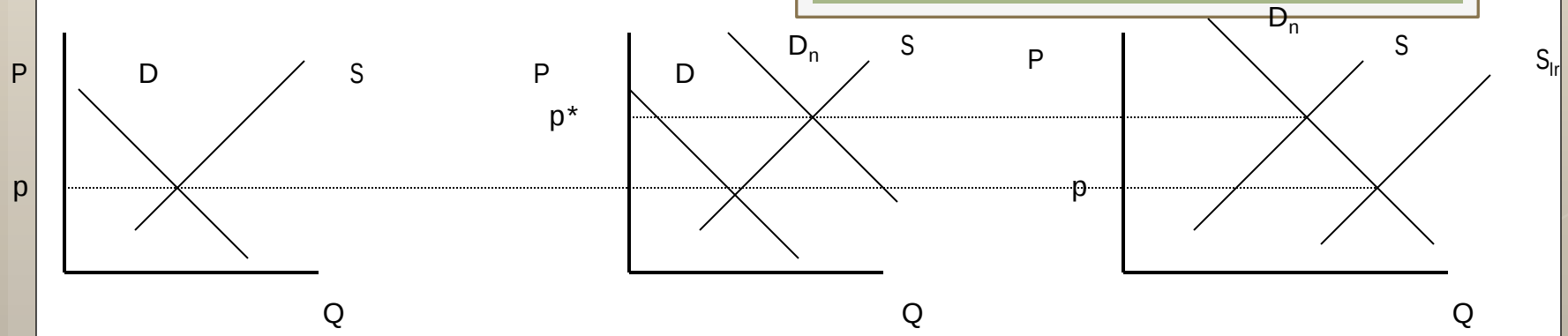
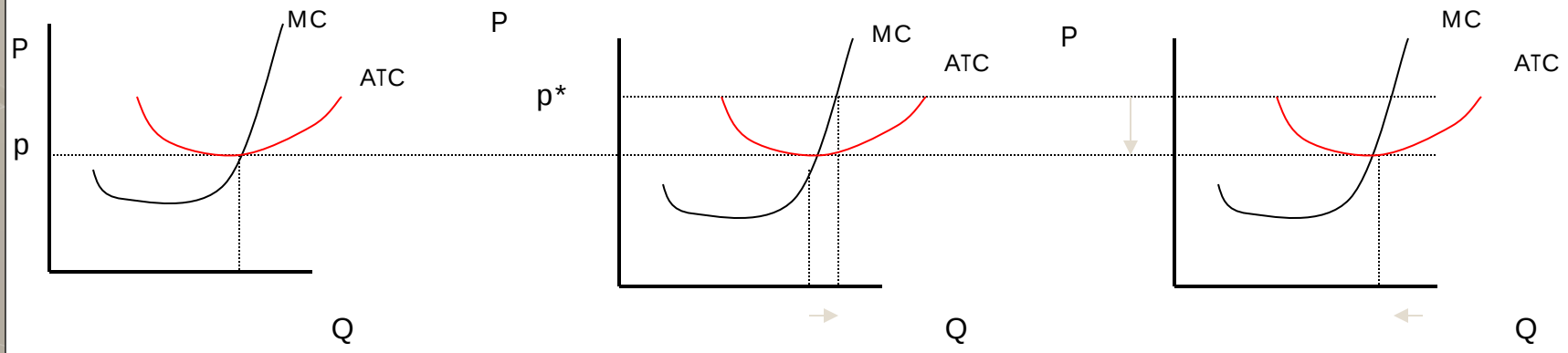
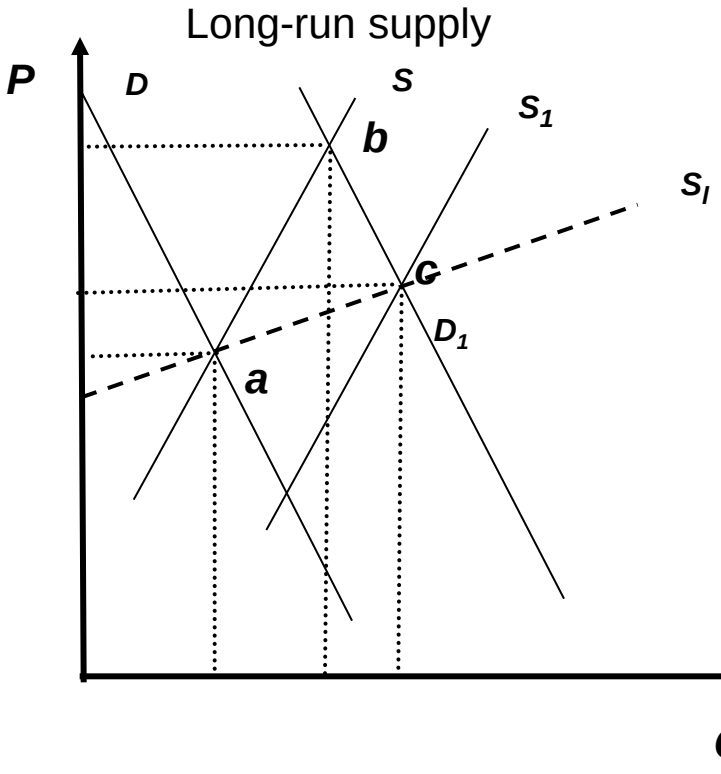


Market equilibrium after an increase in demand



Firm equilibrium after an increase in demand

Long Run versus Short Run



In the short run, an increase in demand from D to D1 causes an increase in price (move from a to b) as you move up along the existing supply curve; In the longer run, suppliers adjust (new ones may enter, new technology may be used) and there is a new supply curve (S1); price then falls (b to c); As demand changes, then a and c trace out the long Run supply curve (imagine the process repeating itself)

Demand Elasticity

- Elasticity refers to the relative changes in demand quantities for a given change in price
  - Elastic means that there is a big change in quantity for a little change in price
  - Inelastic is the opposite-price changes substantially but there is little change in quantity
- It is important because it tells how the market will react to a change in policy, and how costly that change might be

Elastic and Inelastic Demand Curves

- % change quantity demanded in response to % change in price
  - Under 1 is inelastic
  - Over 1 is elastic
  - 1 is unit-elastic (10% change in price would lead to a 10% change in quantity demands)

* The same concept applies to Supply curves

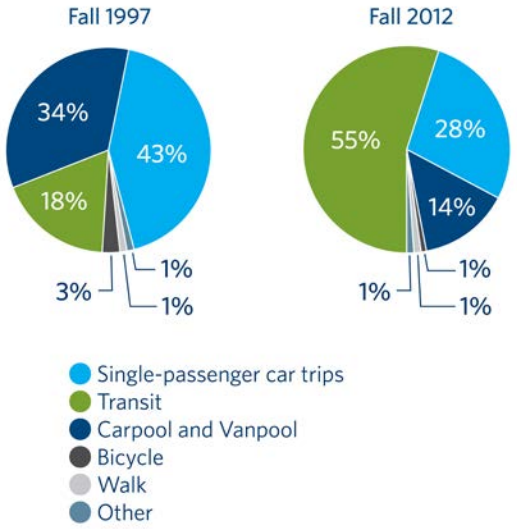
Price Elasticity

$$E_p = \frac{\%\ \text{Change in Quantity}}{\%\ \text{Change in Price}}$$

$$E_p = \frac{\Delta Q}{\Delta P} * \frac{P}{Q} \qquad \text{(arc elasticity)}$$

$$E_p = \frac{dQ}{dP} * \frac{P}{Q} \qquad \text{(point elasticity)}$$

Why is it important to know elasticity?



Additional Supply Curve: Economies of Scale

1. Long run concept:
   - Reductions in unit cost as the size of a facility and the usage levels of other inputs increase
   - A producer's average cost per unit to falls as the scale of output is increased
2. Economies of scale is a practical concept that explains real world phenomena
   - Think "too big to fail"
   - In some industries (notably forestry and mining) companies grow to be very large