Economics 1: Introduction to Economics

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Administrivia

February 10, 2016 8-9 AM
Wheeler Auditorium, U.C. Berkeley
Webtools and Other Matters...

- [http://www.bradford-delong.com/course-syllabus-econ-1-spring-2016-uc-berkeley.html](http://www.bradford-delong.com/course-syllabus-econ-1-spring-2016-uc-berkeley.html) and [https://bcourses.berkeley.edu/courses/1411451/assignments/syllabus](https://bcourses.berkeley.edu/courses/1411451/assignments/syllabus)

- Section exercise answer files...
- Problem Set 2 answers this weekend...
- No Tuesday sections (unless your GSI thinks your class is behind, and needs it)...
- Problem Set 3 due Feb 24/25...
- Paper Assignment: Dasgupta, Slee, Friedman and Friedman, or any two...
  - Details to follow...
Meta-Announcement

• We are moving announcements and administrivia out of lecture time and onto the “announcements” bCourses page...

• That is all...
Except... To Your i>Clickers!

- So far this semester I have had 10 hours of office hours dedicated to Econ 1
- 12 people have showed up, for an average of 15 minutes each
- Question: What fraction of office-hour time is actually being utilized?
  A. All of it
  B. One-half of it
  C. Three-quarters of it
  D. One-third of it
  E. Less than any of the above
Except... To Your i>Clickers!

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To Your i>Clickers: Why?

- My theory is that it is because Evans is located about 100 vertical feet above Bancroft & Telegraph
- Unless you are already over in Chemistry-land or Engineering-land, you already do enough hill climbing
- Question: Should I move my Econ 1 office hours down to Cesar Chavez
  A. Yes
  B. No
  C. Haven’t thought about it
  D. Don’t care what you do
Some Difficulty on Problem Set 2 with the Vertical Supply Curve

• Some more explicit talk about what people are doing on the S&D graph...

• The supply and demand curves tell you combinations of price and quantity for which producers or consumers, respectively, are content —neither ecstatic or unhappy.

• If you are off the supply (or off the demand curve) someone is either ecstatic or unhappy

• How ecstatic of unhappy? Ask at what price they would be willing to buy (or sell) that quantity, and how the current price compares to it
Out of Equilibrium I

- On the supply curve, below and to the left of the demand curve:
  - Producers are happy
  - Consumers are ecstatic: they are buying at prices that, for some reason, are less than they counted on when they decided how much to buy
  - At the margin willingness-to-pay is greater than price
  - Marginal potential purchasers are eager to buy, and are entering the marketplace
Out of Equilibrium II

- On the supply curve, above and to the right of the demand curve:
  - Producers are happy

- Consumers are unhappy. Some are--for whatever reason--buying when the cost they are paying is above their willingness-to-pay
  - Marginal consumers are cutting their purchases, and exiting the marketplace

- The quantity sold is going down, and the price is dropping
Out of Equilibrium III

- On the demand curve, below and to the right of the supply curve:
  - Consumers are happy
  - Producers are unhappy. They are receiving less money than they thought they would when they decided how much to produce.
  - For the marginal producers, price is below opportunity cost
  - Some producers are cutting back production and exiting the market
  - The quantity produced is falling, and the price is going up
Out of Equilibrium IV

• On the demand curve, above and to the left of the supply curve:

  • Consumers are happy

  • Producers are ecstatic: they are selling what they produce for more than they thought they would when they decided how much to produce

  • For marginal producers, price is above opportunity cost

  • New producers would love to enter and produce--if they are allowed to sell, or to compete for the existing market

• If they can do so, the quantity produced and sold is rising, and the price is going down
Accounting

February 8, 2016 8-9 AM
Wheeler Auditorium, U.C. Berkeley
Accounting and Amortization

- Variable costs and fixed costs
- Decentralized producers
- Organized producers
- Increasing returns—economies of scale—non-rivalry
- This word “amortization”: what does it mean
Monopoly: Marginal Revenue and Marginal Cost

• We know what a monopoly does
• And we know what the monopoly’s *operating cash flow* is
• It’s the rectangular wedge between the price line and the opportunity cost of decentralized producers/marginal cost to monopolist line
Monopoly: Fixed Costs

• But is that rectangle the monopolist’s profit?
• Almost surely not
• What’s keeping people from competing with the monopolist?
• Almost surely some up-front cost...
• The monopoly has had to borrow money from investors in order to finance its operations
• Operating surplus has to be large enough to amortize fixed costs or the business will lose money
• If operating surplus is positive the business will keep running—shutdown would be even worse
• But if operating surplus does not cover their share of the fixed costs, investors will be unhappy
What Are the Monopoly’s True Profits? I

• Go to the profit-maximizing point—where marginal/opportunity cost equals marginal revenue
• Take the average opportunity cost—the average variable cost.
• Add to it the per-unit amortization of the fixed costs
  • That will—for pure fixed costs—be a hyperbola
• Multiply by the quantity
• PROFIT! = (P - AOC - AFC) x Q
What Are the Monopoly’s True Profits? II

• Go to the profit-maximizing point—where marginal/opportunity cost equals marginal revenue
• Take the average opportunity cost—the average variable cost.
• \((P - AOC) \times Q = \text{Operating Surplus}\)
Aside: Decentralized Producers

• Decentralized producers make more product up to the point where the supply curve—the MOC line—crosses the demand curve
• Decentralized producers don’t take account of how their expanding production reduces the revenue earned by the other producers
• Since the monopolist is centralized and organized and one entity, it can and does
• As the economy moves down the demand curve to the right of where \( MR = MC \), producers’ net revenue is dropping
What Are the Monopoly’s True Profits? III

- Go to the profit-maximizing point—where marginal/opportunity cost equals marginal revenue
- Take the average opportunity cost—the average variable cost.
- But you have to add to the AOC the per-unit amortization of the fixed costs
  - That will—for pure fixed costs—be a hyperbola
  - AFC = TFC/Q
What Are the Monopoly’s True Profits? IV

- Go to the profit-maximizing point—where marginal/ opportunity cost equals marginal revenue
- Take the average opportunity cost—the average variable cost.
- Add to it the per-unit amortization of the fixed costs
  - That will—for pure fixed costs—be a hyperbola
- Multiply by the quantity
- PROFIT! = (P - AOC - AFC) x Q
The Optimality of the Market Is Here Breaking Down

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• Take the average opportunity cost—the average variable cost.
• Add to it the per-unit amortization of the fixed costs
  • That will—for pure fixed costs—be a hyperbola
• Multiply by the quantity
• PROFIT! = (P - AOC - AFC) x Q
Start with a Monopoly Already Established

• A bunch of alumni of Crony Capitalism University in Old Stick establish a monopoly over latte production in Avicenna...

• We know their decision problem:

  • Demand: \( P = P_{d0} - dQ \)
  • \( MR = P_{d0} - 2dQ \)
  • \( MC = S = P_{s0} + sQ \)
  • \( MR = MC \)
Our Monopoly Example...

• The financiers from CCU have bought up all the coffee shops in Avicenna:
• Now there is a monopoly
• We know its decision problem in general:
  - Demand: $P = P_{d0} - dQ$
  - $MR = P_{d0} - 2dQ$
  - $MC = P_{s0} + sQ$
  - $MR = MC$

• Let’s put some (of our standard) numbers in here
In general the latter monopoly's problem has this structure:

- Demand: \( P = P_{d0} - dQ \)
- \( MR = P_{d0} - 2dQ \)
- \( MC = P_{s0} + sQ \)

Specifically, in this particular case we have:

- Demand: \( P=$10-0.0002Q \)
- \( MR = $10 - 0.0004Q \)
- \( MC = $2 \)
To Your i>Clickers: The Profit-Maximizing Quantity Is...

- Demand: \( P = P_{d0} - dQ \)
- \( MR = P_{d0} - 2dQ \); \( MC = P_{s0} + sQ \)
- Demand: \( P = 10 - 0.0002Q \)
- \( MR = 10 - 0.0004Q \); \( MC = 2 \)

- To your i>Clickers... What is the profit-maximizing quantity the monopolist should produce?
  
  A. 0
  B. 50000
  C. 40000
  D. 20000
  E. 25000
To Your i>Clickers: The Profit-Maximizing Quantity Is...

- Demand: $P = P_{d0} - dQ$
- $MR = P_{d0} - 2dQ; \ MC = P_{s0} + sQ$
- Demand: $P = $10 - 0.0002Q
- $MR = $10 - 0.0004Q; \ MC = $2$

- To your i>Clickers... What is the profit-maximizing quantity the monopolist should produce?
  A. 0
  B. 50000
  C. 40000
  D. **20000**
  E. 25000
Calculating What the Profit-Maximizing Monopolist Does...

- Either “it’s where the MR curve crosses the MC curve”, or...

- Demand: \( P = P_{d0} - dQ \)
- \( MR = P_{d0} - 2dQ; \ MC = P_{s0} + sQ \)

- \( P_{d0} - 2dQ = P_{s0} + sQ \)
- \( (P_{d0} - P_{s0}) = (s + 2d)Q \)
- \( Q_m = (P_{d0} - P_{s0})/(s + 2d) \)
  - The monopolist restricts supply and reduces the quantity

- Either “it’s where the MR curve crosses the MC curve”, or...

- Demand: \( P = $10-0.0002Q \)
- \( MR = $10-0.0004Q; \ MC=$2 \)

- \$10 - 0.0004Q = $2 \)
- \$8 = 0.0004Q \)
- \( Q_m = 20000—\text{the monopolist restricts supply and reduces the quantity} \)
Calculating What the Profit-Maximizing Monopolist Does... II

- Demand: $P = P_{d0} - dQ$
- $MR = P_{d0} - 2dQ; MC = P_{s0} + sQ$

- $P_{d0} - 2dQ = P_{s0} + sQ$
- $(P_{d0} - P_{s0}) = (s + 2d)Q$
- $Q_m = (P_{d0} - P_{s0})/(s + 2d)$
  - The monopolist restricts supply and reduces the quantity

- Why restrict the quantity?
- In order to raise the price--and raise the price by more than enough to offset reduced quantity:
  - $P_m = P_{d0} - dP_{d0}/(s+2d) + dP_{s0}/(s+2d)$
  - $P_m = [(s+d)/(s+2d)]P_{d0} + [d/(s+2d)]P_{s0}$

- Demand: $P = $10 - 0.0002Q
- $MR = $10 - 0.0004Q; MC = $2

- $10 - 0.0004Q = $2
- $8 = 0.0004Q$
- $Q_m = 20000$
  - The monopolist restricts supply and reduces the quantity

- Why restrict the quantity?
- In order to raise the price
- And to raise the price by more than enough to offset reduced quantity in its effect on profits:
  - $P_m=$10-.0002($10)/.0004+.0002($2)/.0004
  - $P_m = [1/2]($10) + [1/2]($2) = $6
Calculating Consumer and Producer Surplus Under Monopoly

- $\text{MR} = P_{d0} - 2dQ$
- $\text{MC} = P_{s0} + sQ$
- $Q_m = (P_{d0} - P_{s0})/(s + 2d)$
- $P_m = [(s+d)/(s + 2d)]P_{d0} + [d/(s + 2d)]P_{s0}$

- **Consumer Surplus:**
  - $CS = (\text{AWTP} - P_m) \times Q_m$
  - $\text{AWTP} = (P_{d0} + P_m)/2$

- **Producer Surplus:**
  - $PS = (P_m - AC) \times Q_m$
  - $AC = P_{s0} + sQ_m/2$
Calculating Consumer and Producer Surplus Under Monopoly II

- **Consumer Surplus:**
  - \( CS = (\text{AWTP} - P_m) \times Q_m \)
  - \( \text{AWTP} = (P_{d0} + P_m)/2 \)

- Consumer Surplus is certainly not going to be greater than in a competitive market
  - Can you think of an example in which it is the same?
Calculating Consumer and Producer Surplus Under Monopoly III

• Producer Surplus:
  • \( PS = (P_m - AC) \times Q_m \)
  • \( AC = P_{s0} + sQ_m/2 \)

• Producer Surplus is certainly not going to be less than in a competitive market
  • Can you think of an example in which it is the same?
The Deadweight Loss from Monopoly

- The monopolist stops producing when there is still a wedge between the willingness-to-pay of the next potential purchaser and society’s opportunity cost...
  - A wedge equal to $d \times Q_m$
  - The average surplus foregone per transaction not made?
  - That is half of this wedge
The Deadweight Loss from Monopoly II

• The monopolist stops producing when there is still a wedge between the willingness-to-pay of the next potential purchaser and society’s opportunity cost...
  • A wedge equal to $dQ_m$
  • The average surplus foregone per transaction not made?
  • That is half of that wedge

• The number of win-win transactions not made is simply $Q^* - Q_m$

• Hence: $\text{DWL} = dQ_m (Q^*-Q_m)/2$

• There are other formulas—but they are not terribly illuminating
To Your i>Clickers: The Deadweight Loss from Monopoly

• In our example, we had:
  • Demand: \( P = $10 - 0.0002Q \)
  • “Supply”: MOC = $2
  • \( Q^* = 40000 \)
  • \( Q_m = 20000 \)
  • \( \text{DWL} = dQ_m(Q^*-Q_m)/2 \)

• To your i>Clickers: what is the deadweight loss from monopoly here?
  A. $160000
  B. $80000
  C. $40000
  D. $250000
  E. I don’t have enough information
To Your i>Clickers: The Deadweight Loss from Monopoly

- In our example, we had:
  - Demand: $P = $10 - 0.0002Q$
  - $Q^* = 40000$
  - $Q_m = 20000$
  - $DWL = dQ_m(Q^*-Q_m)/2$

- To your i>Clickers: what is the deadweight loss from monopoly here?
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  C. $40000 <<$
  D. $250000$
  E. I don’t have enough information
The Deadweight Loss from Monopoly: Our Example III

- In our example, we had:
  - Demand: \( P = P_d - d \times Q \)
  - Demand: \( P = 10 - 0.0002Q \)
  - \( Q^* = 40000 \)
  - \( Q_m = 20000 \)
  - \( \text{DWL} = dQ_m(Q^* - Q_m)/2 \)
  - In this example, \( \text{DWL} = 40000 \)

- Consumer surplus is cut by \( 3/4 \), from $160000 in our competitive free-market case to $40000 in the monopoly case: this is a rather large cost to consumers

- Producer surplus—monopoly profit—is $80000
The Deadweight Loss from Monopoly: Our Example IV

• In the words of Mel Brooks: “It is good to be the monopolist!”

• Formal monopoly, and informal collusion:
  • In the words of Adam Smith: “People of the same trade seldom meet together, even for merriment and diversion, but the conversation ends in a conspiracy against the public... or in some contrivance to raise prices.”
Origins and Persistence of Monopolies

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How Is It That Monopolies Arise and Persist?

1. The government establishes them
   • For bad reasons (the rent-seeking society)
   • For good reasons (encourage invention and innovation)

2. They don’t persist—competitors enter and erode them over time

3. Successful strategic game-playing by the monopolist to discourage entry

4. “Natural” monopolies

5. "Network externality" monopolies
   • "21 Jump Street"
   • "The Han Solo Origin Story"