Wednesday, October 10 Handout: Monopoly and Efficiency

Profit Maximization: Marginal Revenue and Marginal Cost

<table>
<thead>
<tr>
<th>Marginal Revenue (MR)</th>
<th>Marginal Cost (MC)</th>
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<tbody>
<tr>
<td>↓</td>
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<tr>
<td>Change in a firm’s total revenue resulting from a one unit change in production</td>
<td>Change in a firm’s total cost resulting from a one unit change in production</td>
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<tr>
<td>MR &gt; MC</td>
<td>MR = MC</td>
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<tr>
<td>More production increases profit</td>
<td>Profits maximized</td>
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<tr>
<td>MR &lt; MC</td>
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<tr>
<td>Less production increases profit</td>
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Perfect Competition, Monopoly, and Marginal Revenue

<table>
<thead>
<tr>
<th>Perfectly Competitive Industry</th>
<th>Monopoly</th>
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<tbody>
<tr>
<td>↓</td>
<td>↓</td>
</tr>
<tr>
<td>A large number of small firms</td>
<td>One large firm</td>
</tr>
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<td>↓</td>
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<tr>
<td>A single firm’s production decision does not significantly affect the price.</td>
<td>The monopoly firm decides not only on how much to produce, but also on the price to charge.</td>
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<td>↓</td>
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<tr>
<td>The firm can only decide on how much output to produce</td>
<td></td>
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<td>↓</td>
<td></td>
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<tr>
<td>A firm takes the price as given, as a constant</td>
<td></td>
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<td>↓</td>
<td></td>
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<tr>
<td>MR curve horizontal: MR = Price</td>
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Marginal Cost

<table>
<thead>
<tr>
<th>Increasing Marginal Cost</th>
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<tr>
<td>↓</td>
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<tr>
<td>MC curve upward sloping</td>
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<tr>
<td>↓</td>
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<tr>
<td>Increasing marginal cost and decreasing marginal productivity are two equivalent ways to describe the same phenomenon.</td>
</tr>
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</table>

Preview

- Monopoly produces a quantity and charges a price that lies on the market demand curve.
- Monopoly’s marginal revenue curve lies beneath the market demand curve: MR < Price.
Monopoly: An Example

For practical purposes, Apple had a monopoly in the personal computer market in 1980. Suppose that the diagram to the right depicts the market demand curve for personal computers. If the price were

- $3,500, 250 would be purchased per day.
- $3,000, 500 would be purchased per day.
- $2,500, 750 would be purchased per day.
- $2,000, 1,000 would be purchased per day.
- etc.

Classroom Exercise: Marginal Revenue for a Monopoly

Claim: A profit maximizing monopoly will always produce a quantity and charge a price that lies on the market demand curve.

1. To justify the claim consider the following two questions:
   a. Would Apple have been content to operate below the demand curve; for example, would Apple have been content with producing 500 computers per day and selling them for $2,000?
   b. Would Apple have been content to operate above the demand curve; for example, would Apple have been content with producing 750 computers per day and selling them for $3,000?

To determine which particular quantity and price Apple chooses, we shall consider marginal revenue and marginal cost. First, marginal revenue:

2. Suppose that on October 10, 1980, the Apple produced 500 computers.
   a. What price would Apple charge?
   b. What was Apple’s total revenue on October 10?

3. Define the term marginal revenue.
4. What is the slope of the market demand curve?

5. Suppose that Apple, as an experiment, wishes to sell 501 computers on October 11.
   a. What price would allow Apple to do this? (Hint: What is the slope of the market demand curve)

   b. What would Apple's total revenue equal on October 11?

6. Compare your answers to questions 2b and 5b. What is Apple's marginal revenue?

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Price</th>
<th>Total Revenue = Price x Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>October 11: 501</td>
<td>$____</td>
<td>$____________________________</td>
</tr>
<tr>
<td>October 10: 500</td>
<td>$____</td>
<td>$____________________________</td>
</tr>
</tbody>
</table>

   Marginal Revenue: $____

7. To understand what is going on here, fill in the following blanks:

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Price</th>
<th>Total Revenue = Price x Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>October 11: 501</td>
<td>$____</td>
<td>_____ x 501</td>
</tr>
<tr>
<td>October 10: 500</td>
<td>$____</td>
<td>_____ x 500</td>
</tr>
</tbody>
</table>

   | Marginal Revenue: | $____ + (_______) x 500 |

   When Apple sells an additional computer on October 11 total revenue is affected in two ways:

   TR tends to ______ by $________, TR tends to ______ by _______

   the ________, as a consequence of $________, as a consequence of _______

   the ________, effect the ________, effect

   As a consequence of the ____________ effect, marginal revenue for a monopoly is __________ the price.

   **Question:** As a monopoly produces more, would the lower price effect become larger or smaller? Why?
Monopoly: Profit Maximizing Quantity and Price

Marginal Revenue Curve:
- A monopoly produces a quantity and charges a price that lies on the market demand curve.
- The marginal revenue curve lies below the market demand curve. \( MR < Price \)

Marginal Cost Curve: Upward sloping. The marginal cost curve is upward sloping as a consequence of decreasing marginal productivity.

What is Apple’s profit maximizing quantity? _________ Why?

What price will Apple charge? ______ Why?

Summary

Perfect Competition, Monopoly, and Profit Maximization

<table>
<thead>
<tr>
<th>Perfect Competition</th>
<th>Monopoly</th>
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<tbody>
<tr>
<td>A single firm’s production decisions cannot affect the price significantly.</td>
<td>A monopoly produces a quantity and charges a price that lies on the market demand curve.</td>
</tr>
<tr>
<td>( MR = Price ) or ( Price = MR )</td>
<td>( MR &lt; Price ) or ( Price &gt; MR )</td>
</tr>
<tr>
<td>( MR = MC )</td>
<td>( MR = MC )</td>
</tr>
<tr>
<td>( Price = MR = MC )</td>
<td>( Price &gt; MR = MC )</td>
</tr>
<tr>
<td>Price ___ MC</td>
<td>Price ___ MC</td>
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Preview Question for Our Next Class: Why is the relationship between price and marginal cost important?
Getting to Know You: Apple and the Government’s Trustbusters
By Ashby Jones

Once upon a time, like 10 years ago, Apple was the scrappy underdog of the computer world. That’s all. It made computers fringed in colors like tangerine and blueberry which crashed from time to time, just like all the others.

But then came a new operating system, a stream of better computers, and all the “i’s” — the iPod, the iPhone, iTunes, etc., etc., etc. Ten years later, Apple’s a top dog, and top dogs get hard looks from antitrust regulators.

And that brings us to this story in Wednesday’s New York Times. According to the piece, antitrust lawyers in the Justice Department are examining Apple’s tactics in the market for digital music.

According to the NYT, the inquiry is in the early stages. But investigators have reportedly looked into recent allegations that Apple used its dominant market position to persuade music labels to refuse to give the online retailer Amazon.com exclusive access to music.

In San Jose, an Antitrust Case Against Apple Moves Forward
By Ashby Jones

It’s almost axiomatic at this point: the larger, wealthier and more powerful a company grows, the more its products enter the stream of commerce and, in turn, the more it becomes viewed as a deep pocket. In short, the larger a company grows, the more it’s forced to contend with lawsuits. It’s happened in the tech sector for years (think Google and Microsoft and, years ago, IBM). And now it’s happening to Apple. Last Thursday, the company (among others) was sued by patent holding company NTP; NTP claims Apple is infringing patented technology that connects cellphones to email. That same day, a federal judge in San Jose, Calif., certified a class of all iPhone purchasers in an antitrust suit against Apple and AT&T Mobility. …

The suit, which alleges monopolistic behavior, consolidates several filed by iPhone buyers starting in late 2007, a few months after Apple’s iPhone went on sale.

A 2008 amended complaint alleges that that Apple and AT&T conspired to monopolize the voice and data services by forcing class members to use AT&T’s service and denying them the ability to switch carriers. The lawsuit also says Apple secretly made AT&T its exclusive US iPhone partner for five years. The suit says consumers agree to two-year contracts but are in effect locked into a five-year relationship with AT&T.

Apple won summary judgment on several claims. But Judge Ware said parts of the suit that deal with antitrust law can continue as a class action. The class includes anyone who bought an iPhone with a two-year AT&T contract.
Pricing of E-Books Draws Increased Antitrust Scrutiny
By Jeffrey A. Trachtenberg and Chad Bray

Just when publishers and sellers of digital books had made peace over how to price electronic titles, the market is attracting antitrust scrutiny.

On Tuesday, Connecticut Attorney General Richard Blumenthal disclosed a preliminary review of the pricing agreements between five of the country's largest book publishers and two leading digital retailers: Apple Inc. and Amazon.com Inc.

The probe comes on the heels of a similar examination opened in June by the attorney general of Texas.

Mr. Blumenthal said he has sent letters to Amazon and Apple asking them to "meet with his office" to address his concerns that agreements in place may restrict rivals from offering cheaper e-books. For instance, he said, "both Amazon and Apple have reached agreements with the largest e-book publishers that ensure both will receive the best prices for e-books over any competitors."

Apple, Amazon and five publishers also have agreed to an "agency pricing" model. Under the agency model, publishers set their own retail prices. They receive 70% of the consumer price, with the retailers taking 30%.

"These agreements among publishers, Amazon and Apple appear to have already resulted in uniform prices for many of the most popular e-books—potentially depriving consumers of competitive prices," said Mr. Blumenthal in a prepared statement.

Both the Federal Trade Commission and the Justice Department have been conducting separate inquiries into whether some of Apple's business practices—including its music business and its mobile-device applications—are anticompetitive, according to people familiar with the matter. The Justice Department's antitrust review of Apple also extends to its deals in the book publishing industry, according to a person familiar with the matter. Amazon's deals are also being examined as part of that inquiry, the person said.

**Question:** What themes emerge from these articles?
What is “bad” about a monopoly and “good” about perfect competition?

It is commonly believed that a monopoly is bad; a monopoly is typically viewed as a big firm that bullies others. On the other hand, convention wisdom suggests that an industry composed of a large number of small firms is good perhaps even virtuous. Is this view justified on economic grounds? We shall consider two economic arguments that are frequently cited about evil of monopolies:

- monopolies earn obscenely high profits;
- monopolies create inefficiency.

Excess Profits - The Popular Notion

**Popular View:** “Monopolies exploit the public by making obscenely high profits.”

Based on the information we have, can we determine the sign of profits? _____

If not, what additional information do we need?

Could a monopoly be earning positive profits? _____ Explain.

Could a monopoly be earning negative profits? ____ Explain.

Could a monopoly be earning zero profits? _____ Explain.

Pareto’s Efficiency Question: Are we getting the most from our economy’s finite resources?

**Pareto’s Query:** Given the state of affairs in question, is it possible to make one individual better off without hurting anyone else?

Yes

↓

Is the state of affairs getting the most from the economy’s resources? _____

↓

State of affairs is ____________

No

↓

Is the state of affairs getting the most from the economy’s resources? _____

↓

State of affairs is ____________
Classroom Exercise: Monopoly and Efficiency

Mary owns a McDonald’s franchise that is the only fast food restaurant in her rural community; that is, in her community, Mary enjoys a monopoly in the fast food industry. The following diagram depicts the market demand curve for hamburgers, Mary’s marginal revenue curve, and Mary’s marginal cost curve:

1. Mary seeks to maximize profits.
   a. How many hamburgers will she produce? _____.
   b. What price will she charge? $______.
   c. What does her marginal cost equal? $_____.

   **State of Affairs:** Quantity = ______ Price = $_______ Marginal Cost = $______

**Critical Question:** Is this state of affairs efficient; that is, does efficiency result when the monopolist Mary maximizes her profit?

To address this question consider a consumer, Joe, who does not choose to buy a hamburger at the profit maximizing price, but who would buy a hamburger if the price were $1.40.

2. How do we know that a person like Joe actually exists?

Consider the following special secret deal in which Mary produces another hamburger and sells it to Joe for $______.

3. Would the special secret deal make Joe better off? _____ Why?

4. Would the special secret deal make Mary better off? _____ Why?

5. Would the special secret deal affect anyone else? ______

**Revisit the Critical Question:** Is the state of affairs in which the monopolist Mary maximizes her profits efficient? _____