Course information

• Midterm here on Wednesday during class time

• Bring pencils and calculator

• Office hours tomorrow 2:30 – 4:30

• Chapters on midterm – consumer choice (equilibrium) and demand and production/cost
Shape of the budget line

$Y = 10 - 5P_x\quad P_y = 1\quad P_x = 2$
Review questions: explaining shapes

- Shape of the indifference curve

\[ \text{MRS} = \frac{\mu_x}{\mu_y} \]
Consumer equilibrium (best affordable point)
Shape of the total and marginal product curve
Shape of marginal and average product and cost curves
Shape of LRAC curve

Eco of scale

Cost

SAC

SAC2

CRS

Disecon
Back to profit maximization

• Two methods

• Using TR and TC

• Using MR and MC
Finding maximum profit with TR and TC

– Profit is maximized at the **output** level at which TR revenue exceeds TC by the largest amount.

– Have TR: now need to add TC. We have seen the shape of this in the previous chapter, so nothing new here!
TR, TC and profit graphically
Total revenue and total cost (dollars per day)

<table>
<thead>
<tr>
<th>Quantity (Q) (cans per day)</th>
<th>Total revenue (TR)</th>
<th>Total cost (TC)</th>
<th>Economic profit (TR - TC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>15</td>
<td>-15</td>
</tr>
<tr>
<td>1</td>
<td>8</td>
<td>22</td>
<td>-14</td>
</tr>
<tr>
<td>2</td>
<td>16</td>
<td>27</td>
<td>-11</td>
</tr>
<tr>
<td>3</td>
<td>24</td>
<td>30</td>
<td>-6</td>
</tr>
<tr>
<td>4</td>
<td>32</td>
<td>32</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>40</td>
<td>33</td>
<td>7</td>
</tr>
<tr>
<td>6</td>
<td>48</td>
<td>34</td>
<td>14</td>
</tr>
<tr>
<td>7</td>
<td>56</td>
<td>36</td>
<td>20</td>
</tr>
<tr>
<td>8</td>
<td>64</td>
<td>39</td>
<td>25</td>
</tr>
<tr>
<td>9</td>
<td>72</td>
<td>44</td>
<td>28</td>
</tr>
<tr>
<td>10</td>
<td>80</td>
<td>51</td>
<td>29</td>
</tr>
<tr>
<td>11</td>
<td>88</td>
<td>60</td>
<td>28</td>
</tr>
<tr>
<td>12</td>
<td>96</td>
<td>76</td>
<td>20</td>
</tr>
<tr>
<td>13</td>
<td>104</td>
<td>104</td>
<td>0</td>
</tr>
<tr>
<td>14</td>
<td>112</td>
<td>144</td>
<td>-32</td>
</tr>
</tbody>
</table>

(a) Revenue and cost

(b) Economic profit and loss
Second approach: Profit maximization through MR and MC rather than TR and TC

- If $MR > MC$, the extra revenue from selling one more unit exceeds the extra cost incurred to produce it.

- Economic profit increases if output increases.

- The opposite holds if $MC > MR$. 
Profit maximizing level of output

- Put MC and MR together

- Have from perfect competition and the market price the MR curve (horizontal)

- And have the MC curve shape from the previous chapter
MR, MC and profit maximization graphically
Marginal revenue and marginal cost (dollars per can)

<table>
<thead>
<tr>
<th>Quantity (Q) (cans per day)</th>
<th>Total revenue (TR) (dollars per day)</th>
<th>Marginal revenue (MR) (dollars per can)</th>
<th>Total cost (TC) (dollars per day)</th>
<th>Marginal cost (MC) (dollars per can)</th>
<th>Economic profit (TR – TC) (dollars per day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>64</td>
<td>8</td>
<td>39</td>
<td>5</td>
<td>25</td>
</tr>
<tr>
<td>9</td>
<td>72</td>
<td>8</td>
<td>44</td>
<td>7</td>
<td>28</td>
</tr>
<tr>
<td>10</td>
<td>80</td>
<td>8</td>
<td>51</td>
<td>9</td>
<td>29</td>
</tr>
<tr>
<td>11</td>
<td>88</td>
<td>8</td>
<td>60</td>
<td>16</td>
<td>28</td>
</tr>
<tr>
<td>12</td>
<td>96</td>
<td>8</td>
<td>76</td>
<td>16</td>
<td>20</td>
</tr>
</tbody>
</table>
First decision: find the profit maximizing output

This is the best the firm can do.

But, is it good enough?

What is profit at this profit maximizing point?
At the shutdown point, the loss = total fixed cost.
Short run supply curve

Increase the market price from $\text{MR}_0$

Get a new profit maximizing output.

The new black dot in part (b) is another point of the firm’s supply curve.

The blue curve in part (b) is the firm’s supply curve.
(a) Syrup market

(b) Dave's syrup
A loss making firm
Case of a loss in the short run

Dave incurs an economic loss shown by the red rectangle.

(a) Syrup market

(b) Dave's syrup
The second decision: stay open or shut down

• Temporary Shutdown Decisions
  – If a firm is incurring an economic loss that it believes is temporary, it will remain in the market, and it might produce some output or temporarily shut down.
Why fixed and variable costs are important

1. If the firm shuts down temporarily, it incurs an economic loss = TFC.

2. If the firm produces some output, it incurs an economic loss equal to TFC + TVC – TR.

3. If TR > TVC, the firm’s economic loss is less than TFC.

4. So it pays the firm to produce and incur an economic loss. It can pay some of TFC even if not all.
Decision rule for shutting down

So the firm produces some output if \( P > AVC \)

but shuts down temporarily if \( AVC > P \)

Because by producing any output at all it increases its losses.
What if economic profit $> 0$?

Happens because $P > ATC$ at level of output where $P (MR) = MC$.

What does this signal to other potential firms?

How does this lead to economic profit in competition always $= 0$?
Moving to the long run, when firms and enter or exit the market

Part (a) illustrates the firm in long-run equilibrium.
Entry and exit keep economic profit = 0 in long run

If supply increases, the price falls below $5 a can and Dave incurs an economic loss. Exit decreases supply to $S$ and the price rises to $5$ a can.
Role of entry and exit

– The immediate effect of the decision to enter or exit is to shift the market supply curve.
– If more firms enter a market, supply increases and the market supply curve shifts rightward.
– If firms exit a market, supply decreases and the market supply curve shifts leftward.
Demand also plays a role

– A decrease in demand triggers a similar response, except in the opposite direction.
– The decrease in demand brings a lower price, economic loss, and some firms exit.
– Exit decreases market supply and eventually raises the price to its original level.
The role of technology

– Two forces are at work in a market undergoing technological change.
– 1. Firms that adopt the new technology make an economic profit.
– So new-technology firms have an incentive to enter.
– 2. Firms that stick with the old technology incur economic losses.
– These firms either exit the market or switch to the new technology.