Robert Ackerman
- rkackerm@live.unc.edu
- Office Hours: 2:00-3:00PM T/Th
- Office: PA202 (Phillips Hall Annex)
Today

• Questions/concerns
• Administrative
• Wrap up Consumer Choice
• Begin The Producer’s Choice
• Writing assignment one
Making use of the archives page

- On the Sakai website
- Click Syllabus
- Click Econ 101 Archives
- Slides from class post-lecture
- Last year’s midterm is located here as well
- Reminder: Review session 9/23 7-9PM
  - Carroll 111
- Reminder: Exam 9/24 in class
Consumer Choice important concepts

- Law of Demand
- Utility
- Budget Set
- Optimal Purchase rule
- Marginal Utility
- Indifference Curves
- Consumer surplus
- Price elasticity of demand
- Substitutes/complements
Clarifying a few things from last time

- Consumer surplus
- Optimal purchase rule & marginal utility
Consumer Surplus

**Net marginal (monetary) utility for 2nd pizza:** 8 - 5 = 3

**Consumer Surplus:**
\[
\frac{1}{2} (B \times H) = \frac{1}{2} (5 \times 5) = 12.5
\]
Optimal Purchase Rule

Book (one good):
Marginal Monetary Utility (MMU) = price

Class (two goods):
Marginal Utility\(_1\)/$spent = Marginal Utility\(_2\)/$spent
New concept:

• Price elasticity of demand
• Substitutes/complements
Price elasticity of demand

Price elasticity of demand: percent change in quantity divided by the percent change in price:

Percent change in quantity: $\frac{\Delta q}{q}$
Percent change in price: $\frac{\Delta p}{p}$
$\Delta = \text{“delta”} = q_1 - q_2 = \Delta q$

Price elasticity of demand: $\frac{\Delta q}{q} ÷ \frac{\Delta p}{p}$
Price elasticity of demand
When the percent reduction in quantity demanded is greater than the percent increase in price, then:
There is **elastic demand**
The **price elasticity of demand** is greater than one.

When the percent reduction in quantity demanded is less than the percent increase in price, then:
There is **inelastic demand**
The **price elasticity of demand** is less than one.
Price elasticity of demand Example
Sweet Tea at Festifall:
Booth (Monday): price $1.00, sold 1000 cups
Booth (Tuesday): price $1.10, sold 800 cups
Q: What is the price elasticity of demand?
\[ \frac{\Delta q}{q} \div \frac{\Delta p}{p} = \]

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Price elasticity of demand Example
Sweet Tea at Festifall:
Monday: price $1.00, sold 1000 cups
Tuesday: price $1.10, sold 800 cups
Q: What is the price elasticity of demand?
Δq/Δp/p = 20%/10% = 2

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Q: Is this an example of elastic or inelastic demand?
Price elasticity of demand Example
Sweet Tea at PNC:
Monday: price $1.00, sold 1000 cups
Tuesday: price $1.10, sold 950 cups
Q: What is the price elasticity of demand?
\[
\frac{\Delta q}{q} \div \frac{\Delta p}{p} = \frac{5\%}{10\%} = \frac{1}{2} < 1
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Price elasticity of demand Example
Sweet Tea at PNC:
Monday: price $1.00, sold 1000 cups
Tuesday: price $1.10, sold 950 cups

Q: What is the price elasticity of demand? 
\[ \frac{\Delta q}{q} / \frac{\Delta p}{p} = \frac{5\%}{10\%} = \frac{1}{2} < 1 \]
Substitutes/complements

Substitute: Good x is a substitute for good y if when good x’s price goes up, demand for good y goes up.
Example: Gatorade/Powerade

Complement: Good x is a complement for good y if when good x’s price goes up, demand for good y goes down.
Example: Left/Right shoes
The Producer’s Choice important concepts

- Law of Supply
- Maximizing Profits
- Fixed and variable costs
- Perfectly competitive
- Marginal vs. average cost
- Accounting Profit/Economic Profit
- Price-taking firm and optimal supply rule
- Marginal revenue
The Producer’s Choice

• Law of Supply: If the price of a good rises, the quantity supplied to the market will rise.

• What is the goal of the producer (or firm)?

• To maximize profits (just like the consumer was maximizing utility through the optimal purchase rule).
Two definitions of profit:

- **Accounting profit**: net earnings of a firm in a given period of time. It is total revenue a firm receives from the sale of its product minus all explicit costs incurred in producing it.

- **Economic profit**: total revenue a firm receives from the sale of its product minus all costs (explicit and implicit) incurred in producing it.

- When we talk about maximizing profit, which definition are we using?
Some more definitions

• Factor of production: an input used in the production of a good or service.

• Short run: a period of time sufficiently short that at least some of the firm’s cost commitments will not have ended.

• Long run: a period of time of sufficient length that all the firm’s current cost commitments to come to an end.
Some more definitions

- **fixed cost**: the cost of an input whose quantity does not rise when output goes up.

- **variable costs**: the sum of all payments made in this period to the variable factors of production.

- The variable costs make up the marginal cost of the supplier: the change in total cost of production for a one-unit change in the quantity supplied.

- **average cost**: total cost divided by quantity produced.
Optimal Supply Rule

The here are two different rules for these firms: one for perfectly competitive firms, and another for imperfectly competitive firms.

Let’s focus on the rule for perfectly competitive firms (or price takers) – firms that have no influence over the price at which they sell their product.

The optimal supply rule (for perfectly competitive firms): continue to supply your product so long as the price is greater than (or equal to) your marginal cost.
The Producer’s Choice in action, an example

• Sunrise Biscuit Kitchen, is a local competitor for Time Out CCCBs
• While both serve excellent CCCBs, consumers are unable to tell the difference (they are both price takers).
Sunrise Biscuit Kitchen details

Price per CCCB: $4.99

Fixed costs per week: $500
Rent for space
Accounting/back office/advertising
Servicing loan for equipment
Owner's time and effort

Variable costs per week:
Chicken/cheddar cheese/flour: $3.20 per CCCB
Workers: $7.25 per hour
Open 8 hours, 7 days a week 56 hours as benchmark
Sunrise Biscuit Kitchen details

- Fixed costs: $500
- Variable costs:
  - materials: $3.20 per CCCB
  - workers: $7.25 per hour

### Economics 101

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**Step One: Calculate wages and Variable Cost**
Sunrise Biscuit Kitchen details

Fixed costs: $500
Variable costs:
- materials: $3.20 per CCCB
- workers: $7.25 per hour

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Step Two: Calculate Total Cost and Profits
Sunrise Biscuit Kitchen details

**Fixed costs:** $500

**Variable costs:**
- materials: $3.20 per CCCB
- workers: $7.25 per hour

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**Step Three: Calculate Marginal Cost and Average Cost**
### Sunrise Biscuit Kitchen details

**Fixed costs:** $500  
**Variable costs:**  
- materials: $3.20 per CCCB  
- workers: $7.25 per hour

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**Step Four:** What should Sunrise Biscuit Kitchen do if it follows the optimal supply rule for perfectly competitive firms?
Q: What property can we see in this graph?
A: Diminishing marginal physical product (or diminishing marginal productivity since in our case, we’re looking at workers).
Sunrise Biscuit Kitchen details in graphs

**A:** Diminishing marginal physical product (or diminishing marginal productivity since in our case, we’re looking at workers).
A: What can this graph tell us about Sunrise Biscuit Kitchen’s optimal supply rule?
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A: What can this graph tell us about Sunrise Biscuit Kitchen’s optimal supply rule?
How does our example relate to this graph from your homework?
Returns to scale
How much does output expand if all inputs are increased simultaneously by the same percentage?
Returns to scale

Increasing returns to scale: when input quantities all increase by X percent, the quantity of output rises by more than X percent.

Constant returns to scale: when input quantities all increase by X percent, the quantity of output also rises by X percent.

Decreasing returns to scale: when input quantities all increase by X percent, the quantity of output rises by less than X percent.
Where do we see Increasing returns to scale? Constant? Decreasing?
Writing Assignment One

• Due September 19 11:00AM
• See announcement on Sakai
• Submit via Sakai under “Assignments” on left hand side of the class page
• Content: (1) summarize the key messages of the article and (2) analyze the content and conclusions of the article in terms of the concepts you have learned in class
• For (2), first focus on fully examining the article through the lens of one concept, and then briefly do so with at least one or two other concepts
For the rest of the week

• Turn in Writing assignment by Thursday September 19th at 11:00AM
• Complete Aplia assignments for the week
• Read Chapter 35
• Take a look at last year’s midterm