

Chapter 1 The Five Fundamentals of Economics.

Economics

- The study of how people allocate their limited resources to satisfy their nearly unlimited wants.
- Scarcity - refers to the limited nature of society's resources, given society's unlimited wants and needs.
 - Free-market Capitalism is the most efficient for scarcity.

Microeconomics

- Concerned with the decisions of individuals, households, and firms.

The Five Fundamentals of Economics

- 1 - Incentives Matter.
 - factors that motivate you to act or exert effort.
 - People respond positively or negatively to these incentives.
 - Positive Incentives - Tax refunds, pay raise, salary bonus
 - Negative Incentives - Taxes, jail, fees, fines, fine.
- 2 - Trade Offs.
 - With scarcity, decisions incur costs
 - Should I study or play games?
 - Doing one thing means you won't have the resources to do the other.
 - Government Trade-Offs - Tax revenue on education or healthcare?
- 3 - Opportunity Cost
 - Is the highest valued alternative that must be sacrificed in order to get something.
 - Not all alternatives, just the next best choice.
 - The cost of something is what you give up to get it.
 - Scarcity \rightarrow Choice \rightarrow opportunity cost.
 - Uni vs. Full Time Job \rightarrow Opportunity cost = loss of income.

• 4- Marginal Thinking.

- Systematically evaluating a course of action.
- Evaluate available opportunity to make the best decisions
- Evaluate whether the benefit of one more unit of something is greater than the cost.

• 5- Trade Creates Value

- To have trade you need markets.
- Bring buyers and sellers together to exchange goods and services.
- The voluntary exchange of goods and services between two or more parties.

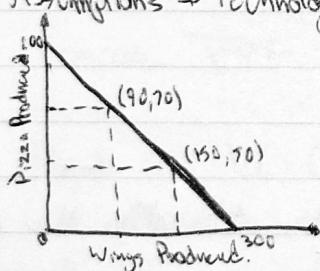
Chapter 2 Production Possibilities frontier.

Definitions

- Positive Statement - A claim that can be tested to be true or false.
- Statement of opinion ; cannot be tested to be true or false - Normative Statement
 - (we should do this/that etc.)
- Ceteris Paribus - latin for "other things being equal"
 - Assumption in which we examine a change in one variable, but hold all other variables constant.

Production Possibilities frontier

- Depicts the max production combination in economy.
- Combinations of outputs that a society can produce production= output.
full of its resources are being used efficiently.
- Assumptions \rightarrow Technology is fixed; Resources are fixed; Simplified - Two good analysis
 - Pizza Vs Wing graph shows the 2 things being produced.



- Why is the PPF downward sloping?
 - Man must give up one good to increase production of another (Trade-Offs).

PPF and Opportunity Cost.

- Highest Value Alternative
- What we give up as a result of an action.
- Opportunity cost is the best alternative forgone.
- Measured in units of the forgone good.
- Opportunity cost in this case is the slope of the PPF
- Opportunity Cost = $\frac{\text{Give Up}}{\text{Get}}$.

Straight Line PPF

- Homogeneous Resources (one alike)
- Resources are all equally useful in all activities.
- Slope is constant \Rightarrow Opportunity Cost is constant.
- Downward slope signifies scarcity.
- Utilizing maximum production combinations
- Economy produces maximums ($\frac{12}{10}$ pizzas, wings or $\frac{10}{8}$ pizzas, wings)
- Opportunity Cost of One Wing = $\left| \frac{\text{Give Up}}{\text{Cost}} \right|$
 $= \left| \frac{12}{10} \right|$
 $= 1.2 \text{ pizzas.}$

Opportunity Cost
are inversely related.

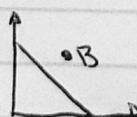
- Opportunity Cost of One Pizza = $1 \frac{10}{12}$
 $= 0.833^{\circ}$ wings.
- Opportunity Cost of 6 Pizzas = $6 \cdot (0.833^{\circ})$
 $\approx 5.$

Attainable Points



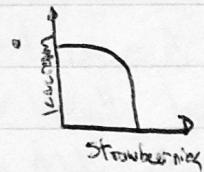
- Point A is attainable.
- Scale back resources to attainable the point inside the PPF
- Inefficient use of resources
- If you move from point A to the PPF the opportunity cost is zero.

Unattainable Points



- Point B is unattainable
- This is because Technology is fixed, and resources are fixed
- This point is outside the PPF
- Insufficient resources
- Unable to produce B with given state & technology

Non-Linear PPC

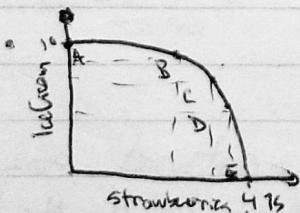


- This is concave to the origin.

- These nonlinear curves happen when the resources are non-linear
- Resources are not equally useful in all activities.
- Slope differs at each point along the curve.
- Concave to Origin
 - Opportunity costs increase as we increase the production of either good.
 - Costs increase as resources best suited for a good's production are used up.

Plot Concave PPF.

Point	Ice Cream	Strawberries
A	10	0
B	9	300
C	7	400
D	3	450
E	0	475



- If only ice cream is produced, 10 kgs is produced.
- If only strawberries is produced, 475 baskets are produced.

Moving Along PPF

- Moving from point A to B.
- # of baskets increases from 0 to 300
- # of kgs of icecream decreases from 10 to 9.
- OC of Strawberries = $1 \frac{1}{300}$
= 0.00333 kg

- Moving from B to C
- OC of Strawberries = $\frac{2}{100}$
= 0.02 kg.

On Medium
check which

- When dealing with non-linear curves you take the secant line.

way you're moving Nonlinear PPF

- The Slope is not constant so the opportunity cost will not be either

Law of Increasing Relative Cost

- Refers to the increasing OC of production that occurs as you move along the PPF
- As we produce more of good A we have to give up increasingly larger amounts of good B.

Shift in the PPF

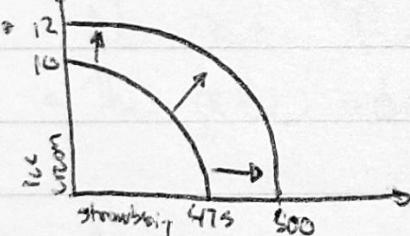
- If the PPF were to expand outward, some previously unattainable good combinations would now be possible to produce.

Economic Growth

- Increased capability of an economy to produce
- Usually brought about by some technological change
- Able to produce more of all commodities.

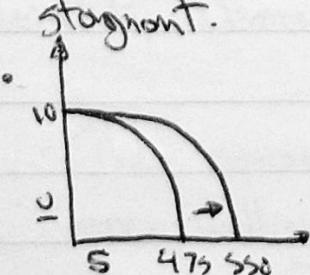
PPF Shift

- Cause PPF to shift outward (Economic Growth)
- Increase in resources
- Population increase.



Rotation of the PPF

- Suppose irrigation method developed for strawberries
- PPF rotates outward.
- Rotation happens when 1 variable changes while the other is stagnant.



Make sure
to include
strawberries in mid-term.

Chapter 3 The Market at Work: Supply and Demand

Market Economy

- Resources are allocated among households and firms with little or no government interference
- Prices are determined by the forces of supply and demand

Competitive Markets

- Many buyers and sellers
- No one firm has influence over the price
- The price is determined by the entire market.

Demand

- Exists when an individual or group wants something badly enough to pay or trade for it.
- How much is bought depends on the price.

Quantity Demand

- The amount of a good or service that buyers are willing and able to purchase at the current price.

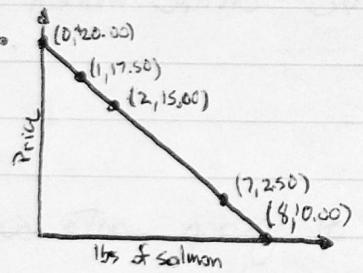
Law of Demand

- All other things being equal, quantity demand falls when the price rises and rises when the price falls
- Move in opposite ~~standard~~ direction
- Inversely proportional.

Demand Schedule

Price of Salmon (per lb)	Pounds of Salmon Demanded (per month)
\$ 20.00	0
\$ 17.50	1
\$ 15.00	2
\$ 12.50	3
⋮	⋮
\$ 2.50.	7
\$ 0.00	8

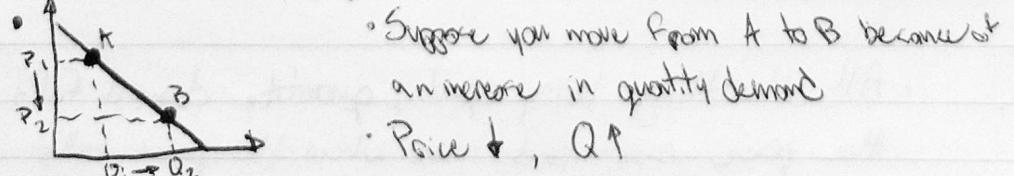
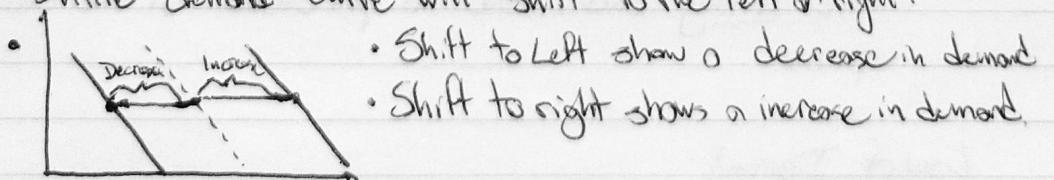
Demand Curve



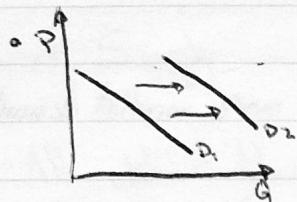
- Demand curve may be called the willingness to pay curve
- Only a change in price can cause movement along the demand curve
- Change in price results in quantity demanded, not demand.

Shifts in Demand

- Change caused by non-price factors
- Entire demand curve will shift to the left or right.



- Decrease in Quantity Demanded shows the opposite.



- Suppose the curve shifts because of an increase in demand
- Willingness to buy more product at any price ↑

- A decrease in demand shows the opposite (willingness to buy less)

Demand Shifters

1- Changes in Income

- Normal good is a good in which we buy more of when we get more income (Normal goods - steak, housing, designer clothing).
- Income increases, demand for normal good increases.
- An inferior good is one we buy less of when our income increases (Inferior goods - concert ticket, second-hand clothes).
- Income increases, demand for inferior good decreases.

2- Price of Related Goods.

- Complements are two goods used together (milk and cereal, printer toner)
- The price of X increases, and the demand of Y decreases.
- Also includes Substitute goods (coca-cola, butter/margarine)
- Goods used in place of one another.
- Price of good X ↑, price demand of good Y ↑

3- Changes in Taste and Preferences

- A good may become more fashionable
- New style becomes popular
- Demand increases (Shift right).

4- Future Expectation

- Our consumption today may depend on what we think the price may be tomorrow
- Demand increases today if we think price will be higher tomorrow.

- 5- Number of buyers

- More individual buyers means more market demand

factors that shift the Demand Curve Left

- Income falls, normal good demand falls
- Income rises, inferior good demand falls
- Price of a substitute good falls.
- Price of a complementary good rises
- Good goes out of style
- Belief that future price will decline
- Number of buyers falls.

factors that Shift the Demand Curve Right.

- Income rises, normal good demand rises
- Income falls, inferior good demand rises
- Price of a substitute good rises
- Price of a complementary good falls
- Good comes into style
- Belief that future price will rise
- Number of buyers increases.

Supply

- Quantity Supplied

- The amount of good or service that producers are able and willing to sell at the current price.

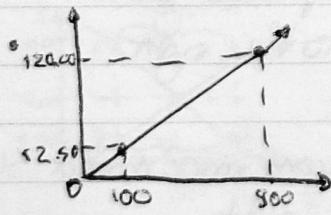
Law of Supply

- All other things equal, there is a direct relationship between price and quantity supplied
- Direct means two variable move in the same direction.

Supply Schedule

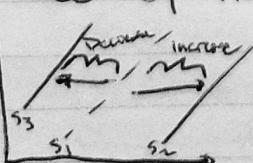
Price of Salmon (per lb)	Pounds of Salmon Supplied (per month)
0	0
\$2.50	100
\$5.00	200
⋮	⋮
\$20.00	800

Supply Curve



- Movement along supply curve is caused by a change in price of the good.
- Direct relationship between price and quantity supplied.

Shifts in Supply Curve

- When a variable other than the price changes the entire supply curve shifts
- Caused by non-price factors.
-  Increase in supply shifts to the right.
Decrease in supply shifts to the left.

Supply Shifters

- 1 - Cost of Inputs
 - Inputs are resources used in the production process;
 - Raise inputs cost cause a decrease in supply
 - Supply curve shifts to the left.
- 2 - Change in Technology
 - Technology is knowledge that producers have about how to produce a product.
 - Improved technology, increase in supply, supply curve shifts to the right.
- 3 - Taxes and Subsidies
 - Tax is paid by the producer, it is an added cost of production
 - Supply curve shifts to the left.
 - Subsidy is the opposite of a tax
 - Government pays sellers to produce goods
 - Subsidy shifts the curve to the right.
- 4 - Number of Sellers
 - More individual sellers means more market supply
 - Supply curve shift to the right.
- 5 - Price Expectations
 - Higher price expected tomorrow? If so, delay sales to future if possible
 - Inverse relationship between tomorrow's price and today's supply.

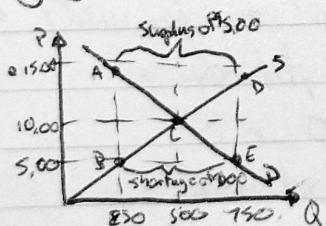
Factors that Shift the Supply Curve to the Left

- The cost of an input rises
- Business taxes increase, or subsidies decrease
- The number of sellers decreases
- The price of a product is anticipated to rise in the future.

Factors that Shift the Supply Curve to the Right

- Cost of input falls
- Number of sellers increases
- The price of the product is expected to fall
- The business use more efficient technology.

Bringing Supply and Demand Together



Shortages and Surpluses

- Shortage
 - Where quantity demand > quantity supplied
 - Occurs at any price below equilibrium
 - Price will rise over time toward equilibrium
- Surplus
 - Surplus occurs when quantity supplied > quantity demand
 - Occurs at any price above equilibrium
 - Price will fall over time toward equilibrium.

Equating Supply and Demand

- Demand Curve for on Econ Text = $Q^D = 1000 - 2P$
- Supply Curve " " " " " = $Q^S = 350 + 3P$
- $Q^D = Q^S$
 $1000 - 2P = 350 + 3P$
 $270 = P^*$
- You can then sub in the equilibrium price to achieve your equilibrium demand/supply.
- You can then ^{draw} graph your graph with the equilibrium price and quantity.

} When supply and demand are in equilibrium.

Chapter 4 Elasticity.

Price Elasticity of Demand

- Elasticity - Responsiveness of buyers and sellers to changes in market conditions
- Price Elasticity of Demand - A measure of the responsiveness to quantity demanded to a change in price
 - This gives us the sensitivity of the relationship between the two variables.
- Demand is elastic if ...
 - Quantity demanded changes ~~sensitively~~ significantly as the result of the price change.
 - Elastic = "sensitive" or "responsive"
- Demand is "inelastic" if
 - Quantity demanded changes a small amount as a result of a price change
 - Inelastic = "insensitive" or "unresponsive"

Computing the Price Elasticity of Demand

- Elasticity answers questions like:
 - Lower or raise prices?
 - Placing taxes on something etc?
- $E_d = \frac{\% \Delta Q_d}{\% \Delta P}$
- Include in positive and negative signs to show changes.

Midpoint Method.

- The Midpoint Method is an alternative way to find elasticity

$$E_d = \frac{\frac{Q_2 - Q_1}{\text{Average } Q_d}}{\frac{P_2 - P_1}{\text{Average } P}} = \frac{\frac{Q_2 - Q_1}{\frac{Q_1 + Q_2}{2}}}{\frac{P_2 - P_1}{\frac{P_1 + P_2}{2}}}$$

Example

Price	Q _d	Price increases from 5 → 6
6	3	Q _d decreases from 5 → 3
5	4	
4	5	
3	6	$E_d = \frac{\left(\frac{3-4}{\frac{5+3}{2}}\right)}{\left(\frac{6-5}{\frac{5+6}{2}}\right)} = 1.5$ $E_d > 1$, so it is elastic

Absolute Value

- Always use absolute value in price elasticity of demand

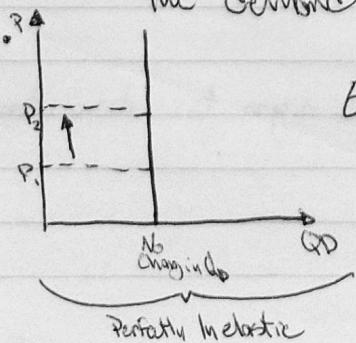
Graphing Price Elasticity

- If demand is relatively elastic

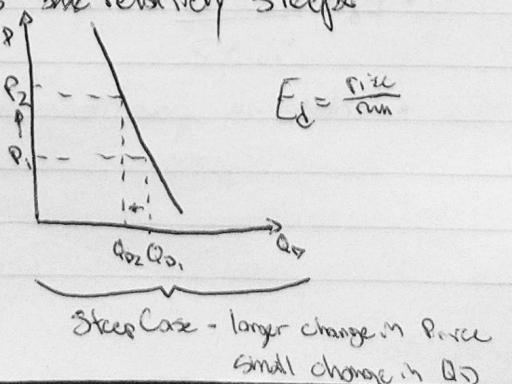
- We are relatively sensitive to price changes
- The demand curve is relatively flatter

- If demand is relatively inelastic

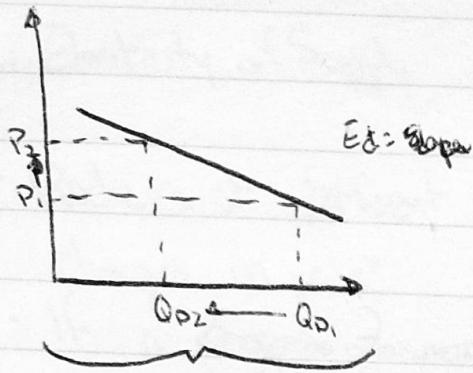
- We are relatively insensitive to price changes
- The demand curve is relatively steeper



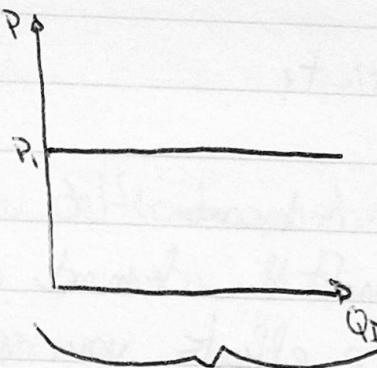
$$E_d = 0$$



$$E_d = \frac{\text{Price}}{\text{Quantity}}$$



Flatter Curve - Small change in P
Large change in Q_D .



Perfectly Elastic - Any change in price
seizes quantity demanded.

- Elasticity and slope are related but not equal to each other.

Demand Elasticity and Total Revenue.

- Demand elasticity changes along a linear demand function
- Total Revenue = Price \times Quantity Sold
 $= P Q$
- Graphically, we can also observe trade-offs when a firm changes the price of a good
 - $\uparrow P, \downarrow Q_D$
 - $\downarrow P, \uparrow Q_D$
- In an elastic region, when \downarrow price decreases, total revenue increases
- When elasticity = 1, a price change will yield the same total revenue.
- In an inelastic region, when price decreases, the total revenue decreases.
- Total revenue increases, peaks, and then decreases as you move down the demand curve.

Income Elasticity

- Changes in Income
 - Shift the demand curve
 - Also effects your consumption of a good
- Income elasticity
 - Responsiveness of the change in quantity purchased as a result of change in income.
- $E_I = \frac{\% \Delta Q_d}{\% \Delta I}$
- Recall: Normal and Inferior Goods
- Normal Goods have 2 categories
 - Luxuries - Purchase lot more when income rises
 - Necessities - Purchase a little more when income rises.
- $E_I > 0 \rightarrow$ normal good
 - $> 1 \rightarrow$ income elastic \rightarrow Luxury good.
 - $< 1 \rightarrow$ income inelastic \rightarrow necessity good
 - $< 0 \rightarrow$ inferior good.

Cross-Price Elasticity

- Measures responsiveness of the quantity demanded of one good to a change in the price of another good
- $E_C = \frac{\% \Delta Q_d^A}{\% \Delta P^B}$
- $E_C(a,b) > 0 \rightarrow$ the goods are substitutes.
 $E_C(a,b) < 0 \rightarrow$ the goods are complements.
 $E_C(a,b) = 0 \rightarrow$ No relationship between goods

Price Elasticity of Supply

- Producers of different goods have different sensitivities to changes in price
- If a price of a good increases
 - will a firm produce a lot more of that good?
 - will production increase at all?
- Price elasticity of Supply
 - Measure of the responsiveness of the quantity supplied to a change in price.

Chapter 5 Price Controls.

What are Price Controls?

- Attempt to set, or manipulate prices through government involvement in the market.

Price Ceiling

- Legally established maximum price for a good or service

Price Floor

- Legally established minimum price for a good or service

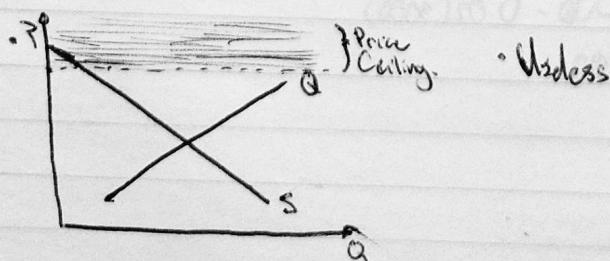
Price Controls

- Disrupt the normal functions of the market.
- Prevent the market from clearing.

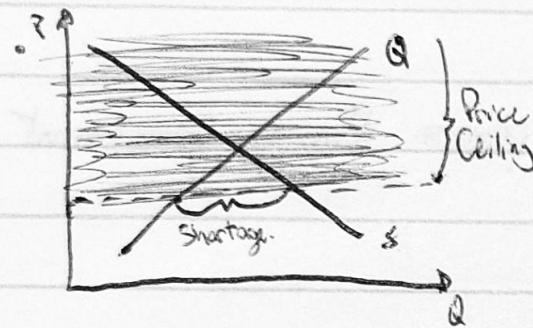
Black Market

- Illegal markets that arise when price controls are in place
- Max price willing to pay for the last unit.

Non-Binding Price Ceiling



Binding Price Ceiling



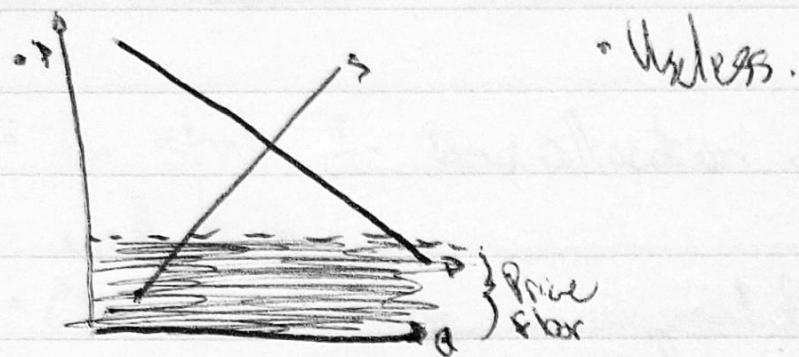
Case Studies on Price Ceilings.

- Rent Control - Price ceiling on apartments or housing
- Good - Help low-income renters find affordable places to live.

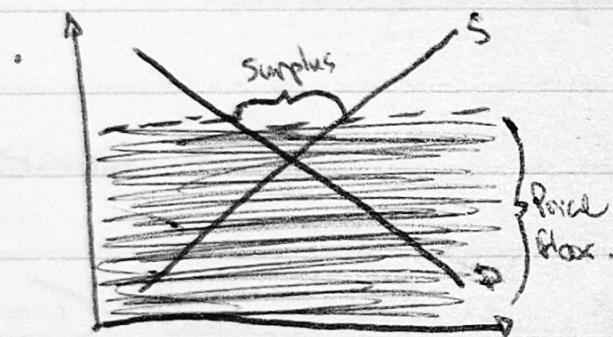
Price Ceiling Example

- Legislated price of \$200 when equilibrium is \$300
 - $P = 100 + 0.02Q_s$ - There is greater quantity supplied with out the legislation.
 $200 = 100 + 0.02Q_s$
 $100 = 0.02Q_s$
 $5000 = Q_s$
 - $P = 500 - 0.02Q_d$ - There is greater quantity demanded with legislation.
 $200 = 500 - 0.02Q_d$
 $300 = 0.02Q_d$
 $15000 = Q_d$
- Shortage = $Q_d - Q_s$
 - = $15000 - 5000$
= 10,000
- Black Market Price = $500 - 0.02(10000)$
 - = $500 - 0.02(10000)$
= \$400

Non-Binding Price Floor



Binding Price Floor



Minimum Wage.

- The lowest hourly wage rate that firms may legally pay their workers; it functions as a price floor.

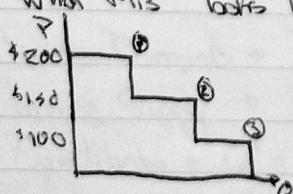
Chapter 6 The Efficiency of Markets and the Cost of Taxation

Welfare Economics.

- The study of how allocation of resources affects economic well being.
- Economic welfare is composed of two measures of market value
 - Consumer Surplus
 - Producer Surplus

Consumer Surplus

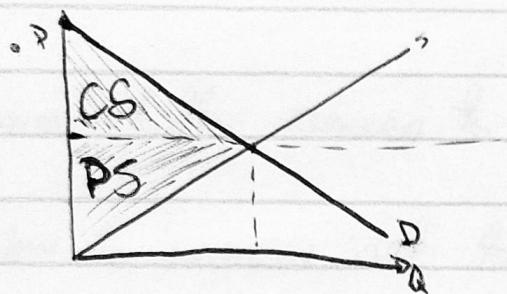
- Difference between willingness to pay for a good and the price actually paid to get the good.
 - Consumer Willingness to pay
- | | |
|---|-------|
| 1 | \$200 |
| 2 | \$150 |
| 3 | \$100 |
- When consumer 1 buys the \$150 book he has a consumer surplus of \$50
 - What this looks like on a demand curve.



Producer Surplus

- Difference between willingness to sell a good and the price actually received for said good
- When a producer wants to supply services for \$15 when the price is \$10 they have a surplus of \$5

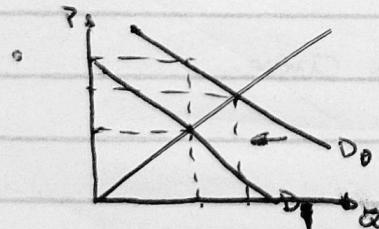
CS and PS for a Gallon of Milk.



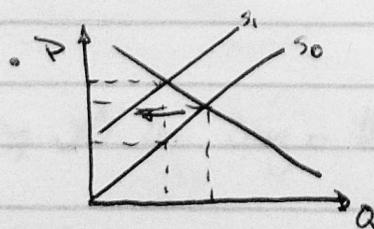
Taxation, Welfare, and Deadweight Loss

- Why do we pay taxes?
 - Pay for public goods.
- Types of taxes?
 - Income, payroll, corporate, sales
- Excise Tax
 - A tax on a specific good (tobacco etc).
- Tax incidence.
 - Refers to the party who bears the tax burden.

Tax on Buyers.



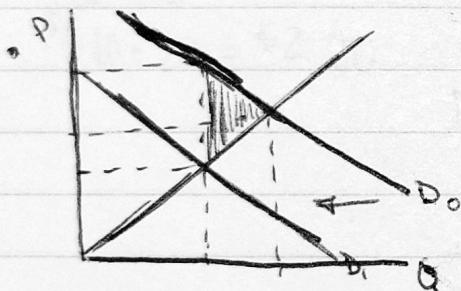
Tax on Sellers



Deadweight Loss

- On the previous graphs, the tax had a price and quantity effects
 - Prices increased
 - Quantity traded increased
- Deadweight loss - A cost to society in the form of less economic welfare resulting from the tax.
 - Caused by a decrease in the amount of trade that is occurring.

Deadweight Loss Graphically



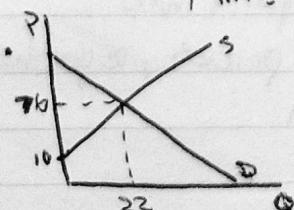
- Top part of shaded area = Deadweight loss of consumer
- Bottom part of shaded area = Deadweight loss of producer.

Example

- Inverse Demand $\rightarrow P = 120 - 2Q_d$
- Inverse Supply $\rightarrow P = 10 + 3Q_s$
- Equilibrium $= Q^* = 22$
 $P^* = 76$.

$$\begin{aligned} \text{Demand} - X\text{-int} &= 60 \\ -Y\text{-int} &= 120 \end{aligned}$$

$$\begin{aligned} \text{Supply} - X\text{-int} &= 3.33 \\ -Y\text{-int} &= 10 \end{aligned}$$



Taxes

- Excise tax is a fixed \$ per unit of good.
- Ad valorem tax is a fixed % of value of good.

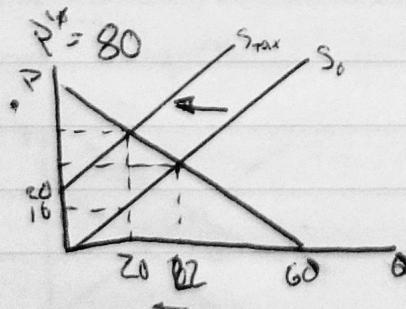
Tax on Producer

- Costs increase
- Supply decreases supply curve shifts leftward by the vertical distance of tax.

Tax on Sellers

- $10^{\$}$ excise
- $\bar{P} = 20 + 3Q_s \Rightarrow X\text{-int} = 6.67$
 $\Rightarrow Y\text{-int} = 20$.

- Equilibrium = $Q^* = 20$.
- $\bar{P} = 20 + 3(20)$



Incidence of Tax

- The burden of taxation on the party who pays the tax through higher prices, regardless of whom the tax is actually levied on.

Consumers Burden of the Tax.

- $P^* - P_0 = 80 - 76 = 4 \text{ \$/unit}$
- $\$0.04 \cdot 20 = \0.80 .

Sellers Tax

- $P_0 - P_s = 76 - 70 = 6 \text{ \$/unit}$
- $\$0.06 \cdot 20 = \1.20 .

Government Revenue.

- $\text{Tax} \cdot Q$
- $\$0.10 \cdot 20 = \2.00 .

Chapter 8 Business Costs and Production

Short Run

- At least one fixed input
- One variable input.

Long Run

- All inputs are variable
- Change Machinery, change plant size, change technology etc.

Technological Efficiency

- Fewest inputs per unit of output.
- No waste of resources.

Economic Efficiency

- Lowest cost per unit of output.
- A method may be technologically efficient without being economically efficient.
- If a method is ~~not~~ ^{different} economically efficient it must be technologically efficient.

Calculating Profits and Losses

- Total Revenue (TR) - The amount a firm receives from the sale of goods and services
- Total Costs (TC) - The amount a firm spends in order to produce the goods and services.
- Profit (or loss) = $TR - TC$
- Profit when $TR > TC$, Loss when $TR < TC$

Explicit and Implicit Costs

- Explicit Costs - Wages, insurance, food ingredients
- Implicit Costs - Opportunity cost of capital.
 - Opportunity cost of owner's time above salary paid.

Profits

- Accounting Profits - Does not take into account implicit costs of doing business
 - Accounting Profit = Revenue - Explicit Costs
- Economic Profit - Considers all costs = (Explicit Costs + Implicit Costs)
 - Economic Profit = Revenue - All Costs

Production

- Input - Resources used in the production process
 - Labour (L), Capital (K), materials (M)
- Output - the product that the firm creates.

Short Run Production Function

- Production Function - The relationship between inputs and outputs
 - To create output, the owner needs to decide how many inputs to employ
 - $Q = f(K, L)$
 - Quantity as a function of capital and labour

Total Product (Output)

- Given a fixed input
- Combinations of a variable input
- Maximum output product.

Marginal Product.

- Change in output divided by the change in input
- Marginal Product of Labour (MPL)
- Marginal Product of Capital (MPK)
- Is slope of the TP curve (Total Product).
- $MPL = \frac{\Delta Q}{\Delta L}$ $MPK = \frac{\Delta Q}{\Delta K}$

Average Product

- Total Product or output divided by the variable input (labour)
- $\frac{TP}{L}$ or $\frac{Q}{L} = AP$

Diminishing Marginal Product

- Successive increase in an input eventually concurupt to increase at a slower rate.
- Assuming cap.td (K) is fixed, we eventually get to a point where a new worker (L) adds less output than the previous worker

Why does this happen?

- Think about the fixed amount of capital
- "Too many cooks in the kitchen!"

Diminishing Marginal Returns

- Is a short run concept
- When more of a variable is added to at least 1 unit of a fixed input, the marginal product of the variable input gradually diminishes.

Costs in the Short Run.

- Variable Costs (VC)
 - Costs that are directly related to the level of output
 - Worker wages, electric bill.
- Fixed Costs (FC)
 - Costs that do not vary with output
 - Costs that exist even if output is zero
 - Building rent, insurance
- Total Costs (TC)
 - Sum of all variable and fixed costs.
- Average Total Cost (ATC)
 - Total Cost divided by the number of units produced
- Analogously
 - AVC and AFC
- Marginal Cost (MC)
 - The increase in total cost that occurs from producing additional output.
 - Change in total cost divided by change in output.

- $TC = TVC + TFC$

$$ATC = \frac{TC}{Q}, \quad AFC + AVC$$

$$AFC = \frac{TFC}{Q}$$

$$AVC = \frac{TVC}{Q}$$

$$MC = \frac{\Delta TC}{\Delta Q}$$

Point of Efficiency and Shutdown Point.

- Point of efficiency is the minimum of ATC curve
- MC intersects ATC at its minimum point
- Shut down point is minimum of AVC curve
- MC intersects AVC at its minimum points.

Why U-shaped curves?

- Is there a mathematical relationship between input productivity and output costs?
- $MC = \frac{w}{MP_L}$, where w is wage rate.

Long Run Costs

- Scale - Size of the production process

- Efficient Scale - the level of output in which ATC is minimized
 - Note that the MC curve passes through the minimum of the ATC curve.

Economics of Scale (Long Run Concept)

Economics of Scale

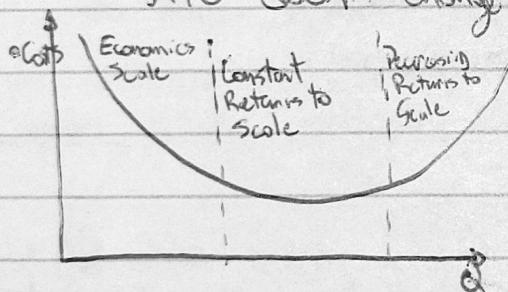
- ATC falls when production expands
- Larger firms more efficient than smaller firms

Diseconomies of Scale

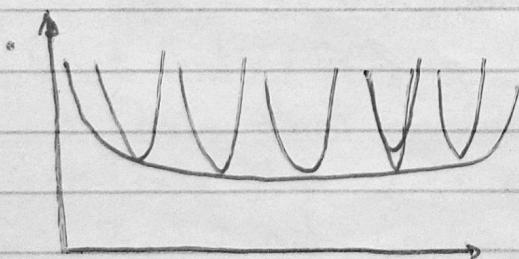
- ATC rises when production expands
- Very large firm has to deal with additional management, coordination, logistic expenses

Constant returns to scale

- ATC doesn't change when production expands



SRAC vs LRAC



- The short run cost curve and the long run cost curve are both U-shaped
- SRAC - U-Shaped because of diminishing marginal product
 - MRL falls, MC rises, and ATC follow MC.
- LRAC - U-shaped because economies and diseconomies of scale
 - Smaller firms lower costs by growing.

Chapter 9 Firms in a Competitive Markets

Competitive Market or Perfect Competition

• Perfect Competition

- Many buyers and sellers
- Similar if not identical products
- Free entry and exit
- Firms are price takers.

• Price Taker

- Has no control over market price
- "Takes" market price as given.

Production and Profits for the Firm

• Goal of a firm

- Maximize profits
- This is true whether the firm is competitive or not
- A profit maximizing firm needs to consider
 - Revenues, Costs

Profit Maximizing Rule

- Q - Quantity
- P - Price
- TR - Total Revenue = PQ
- TC - Total Cost
- π - Profit = TR - TC
- MR - Marginal Revenue = $\Delta TR / \Delta Q$. (Perfectly Competitive, $MR=P$)
- MC - Marginal Cost = $MC = \Delta C / \Delta Q$ (Additional cost of producing additional units).

- Profit Maximizing Rule.
 - To maximize profits, the firm should use a marginal analysis
 - Profit is maximized by choosing the level of output such that, $MR = MC$.
- If $MR > MC$, the firm can increase profit by producing more Q.
- If $MR < MC$, the firm has produced "too much" Q, and profits are not maximized.
- The perfect competitive firm is a price taker
- Cannot set their own price etc.
- Recall:
 - Cost curves (ATC , AVC , and MC)
 - $P = MR$ etc.

Calculating Profit.

- To find profit, we need to know revenues and costs
- Profit = $(P - ATC)$, where P is price.

The Decision to Shut Down in the Short Run

- Firms don't always make profit
- Shutting down
 - Firms will shut down if it cannot cover variable costs
 - Shutting down is not the same as going out of business

Profit and Loss in Short Run

- $P > ATC \Rightarrow$ Profit
- $ATC > P > AVC \Rightarrow$ Firm operates to minimize costs.
- $AVC > P \Rightarrow$ Temporary Shutdown

Long Run Shutdown Criteria

- $P > ATC \Rightarrow \text{Profit}$
- $P < ATC \Rightarrow \text{Shutdown}$.

Long Run Point of Efficiency of Capacity of the Firm

- Since the long run, the perfectly competitive firm will produce at a quantity where $P = (\min)ATC = MC$
- This is called point of efficiency or capacity of the firm.

$$D = MR = AR = P$$

- In perfect comp., $P = AR = MR = \text{Demand}$.

Economic Profits

- Economic Profits
 - Include opportunity cost
 - Zero economic profits means that your opportunity costs are the same as your accounting profits, also referred to as Normal profits.

Recall that for Competitive Industry

- If firms are making positive profits, then new firms will enter
- profits are a signal for the entry of new firms, the industry will expand
- Market supply shifts right \rightarrow and price will fall until profits are zero.

- If firms are making negative profits then existing firms will exit.
- Losses are a signal for the exiting of firms, the industry will contract.
- Market supply shifts left & and price will increase until profits are at zero.

Summary

- As long as firms are entering and exiting, we are not in long run equilibrium
- In perfect competition, we move toward zero economic profits over time, or normal profits.
- For perfect competition to exist two factors must be in place
 - A competitive market
 - Easy entry and exit from the market.
- A price taker has no control over the price it's pays, or receives, in the market
- A firm that maximizes profits will expand output (Q) until $MR = MC = P$.
- The perfectly competitive firm produces where $P = MR = MC$
- In the long-run, the firm produces where $P = (min)ATC = MC$.
- This is called the point of ~~efficiency~~ efficiency or capacity
- At this point the firm is earning zero economic profits / normal profits
- The shut-down point in the short run is where $P = (min)AVC = MC$.

Chapter 10 Monopoly

Monopoly

- Single seller who produces a good
- Firm is the industry
- No close substitutes
- Barriers to entry.

Local Monopolies

- Restricted by location
- Ex. gas, water, electricity.

Global Monopolies

- Technological barrier to entry
- Ex Microsoft, google.

Barriers to Entry

- Legal
- Natural
- They serve to protect the firm from competition

Legal Monopoly

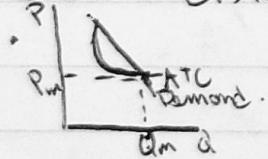
- Restrict competition and entry
- Exclusive right granted to firm to supply good or service.

Natural Barrier of Entry

- Control of Resources
 - If a monopoly controls all of a resource (input) necessary for production, competitors cannot enter.
- Inability of potential competitors to raise enough capital

Natural Monopoly

- One firm can supply the entire market at a lower ATC than 2 or more firms could.
 - Economies of scale exist over the entire length of ATC
 - As ATC decreases, Q increases
- Ex: Gas distributor, hydro.



Perfect Competition

- Perfectly competitive firms
- Price takers, cannot affect the price
- Each firm faces horizontal demand.

The Monopolist's Pricing and Output decision

- Price maker sets the price by choosing output level
- faces the downward sloping demand curve for the entire industry.

Profit Maximizing Rule for Monopoly

- In perfect competition, $P = MR$
- In monopoly, $P > MR$
- To increase output, monopoly must lower the price whereas competitive firms can sell as much as they want at market price.

Marginal Revenue Curve

- Is below the demand curve at each output level
- $P (= D = AR) > MR$
- MR is downward sloping like the demand curve
- MR bisects the demand curve.

Monopoly

- MR is below demand
- Profit Maximize where $MR = MC$.
- Restricts output
- Demand ($= AR$) determines price
- monopoly price $> MC$
- Economic profit, normal profit or loss can exist in the short run
- Positive economic profits can exist in the long run.

Deciding How Much to Produce

- For a Monopoly, we can use the same three step process to determine profits that we used for a competitive firm
 - -① find the profit maximizing point: $MR = MC$
 - -② find output (Q) at this point (point on x-axis)
 - -③ The monopolist will charge a price (P) equal to the height of the demand curve at that quantity.

The Monopolist's Profit

- $\text{Profit} = (P - ATC)Q$.

The Problem with Monopoly

- Monopolies can make societies worse off
- Restricting output and charging higher prices compared to competitive markets
- Operate inefficiently (deadweight loss), this is referred to as market failure
- Less choice for consumers.

Monopoly

- Is inefficient ($P > MC$)
- Price higher, Output lower, Consumer Surplus ↓, Producer Surplus ↑,
- Loss of some consumer surplus is gained by monopoly
- Creates a dead weight loss (DWL)

Deadweight Loss

- Is the decrease in economic activity caused by market distortions.
- Reduction in consumer and producer surpluses resulting from a redistribution of output in monopoly
- Monopoly produces output below point where $P = MC = \min ATC$
- $P > MR$, $\cancel{P} > MC$.
- Monopoly operates where $MR = MC$
- Reduces Q , and consumer surplus, DWL arises, etc
- Consumer losses are always greater than monopoly gains
- DWL makes monopolies inefficient and imposes costs on society.

How to Calculate Deadweight Loss?

- Monopoly Demand Curve: $P = 30 - 0.2Q$
- Monopoly Marginal Cost Curve: $MC = 6 + 0.6Q$
- Monopoly Marginal Revenue Curve: $MR = 30 - 0.4Q$.
- Find $MR = MC$

$$30 - 0.4Q = 6 + 0.6Q$$

$$24 = Q.$$

② Sub Q into demand curve

$$P = 30 - 0.2(24)$$

$$Q = 25.20.$$

• What if there was perfect comp?

- $P = MR$

$$30 - 0.2Q = 6 + 0.6Q$$

$$30 = Q$$

$$P = 30 - 0.2(30)$$

$$Q = 24.$$

- Consumer Surplus when perfectly Competitive

- $P=30 = MC \quad (Q=0)$

- Area of Triangle = $\frac{1}{2}bh$
 $= \frac{1}{2}(30)(30-24)$
 $= \underline{\underline{3}}90$

- DWL in Consumer Surplus

- $A = \frac{1}{2}bh$
 $= \frac{1}{2}(30-24)(25.2 - 24)$
 $= \underline{\underline{4}}3.60$

- This will be on the Final (GRAPHING INCL.).

Chapter 14 The Demand and Supply of all Resources.

The Factors of Production

- Inputs used in the production of goods and services
- Land - Physical location
- Labour - Employees
- Capital - Equipment, buildings, machinery.

Elasticity, Output
on workers
Final

Derived Demand

- Demand for inputs is derived from the demand for the output those inputs produce.
- Demand for labour will increase if the demand for the good of the labour producer increases.

Demand for Labour

- Individuals are suppliers of labour
- Firms are demanders of labour
- The price of labour is wage rate

Marginal Product of Labour

- The change in output associated with hiring one additional worker
- MP of labour will eventually be diminishing.

Marginal Revenue Product (MRP) or Value of Marginal Product (VMP)

- Value of the Marginal Product
 - MP of labour multiplied by the price of the output it produces.
 - Think of this as the total revenue generated by the workers.

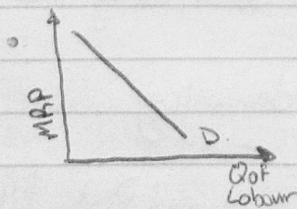
MRP or VMP

- Marginal Revenue Product of Labour is change in total revenue from employing one more unit of labour.
- $$MRP = \frac{\Delta TR}{\Delta L} \text{ or } MR \cdot MP \text{ of Labour.}$$

In a perfectly competitive market

- Profit maximize where $W(\text{wage rate}) = MRP \text{ of Labour}$
- Hire labour until $W = MRP \text{ of Labour}$.
- Hire labour so that the marginal cost of labour is equal to the marginal revenue it generates.
- $$MC \text{ of Labour} = \frac{\Delta TC}{\Delta L}$$
- $MC \text{ of Labour} = W = \text{Price of Labour} = MRP \text{ of Labour} = VMP \text{ of Labour.}$
- The derived demand for labour curve is derived from the MRP of labour (VMP) at each quantity of labour hired.
- The firm is in perfect competition and sets profit maximizing output where $P = MC$.
- Firm hires labour where $W = MRP \text{ of Labour} = VMP \text{ of Labour}$

Derived Demand Curve of MRP of Labour



- VMP of Labour decreases since MP of Labour diminishes.

Summary Slide

$$\begin{aligned} \bullet TR &= P \cdot Q & \bullet MP \text{ of Labour} &= \frac{\Delta Q}{\Delta L} & \bullet MRP \text{ of Labour} &= MP \text{ of Labour} \cdot MR \\ \bullet MR &= \frac{\Delta R}{\Delta Q} & \bullet MRP \text{ of Labour} &= \frac{\Delta TR}{\Delta L} \end{aligned}$$

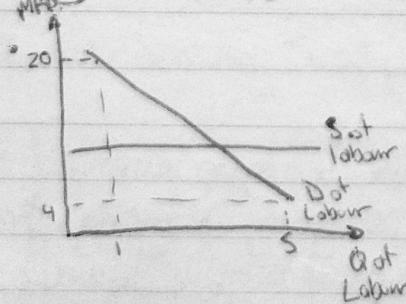
Perfectly Competitive Labour Market

- Each firm faces a perfectly elastic (horizontal) supply of labour curve
- Individual firms are too small to influence the wage rate, must pay the market wage rate
- Each firm hires labour at the going market wage rate.

Example

- A perfectly competitive firm sells bottled water for \$4 per bottle
- Their employees earn \$8/hr.

Labour	Output	MP of Labour	TR	MR _{FO}	MR _{RP}
0	0	-	0	4	-
1	5	5	20	4	20
2	9	4	36	4	16
3	12	3	48	4	12
4	14	2	56	4	8
5	15	1	60	4	4



- $W = \$8 = MRP \text{ at } L = 4$
- $L = 4, Q = 14$

Market Activity is:

- Supplying labour to the labour market.

Nonmarket Activity is:

- Leisure Time.

Wages

- Induce households to supply labour
- Wage Rate = Value placed on lost hour spent in nonmarket activities.

Reservation Wage.

- Lowest wage at which households will supply labour to market.

Supply Curve of Labour

- The labour supply curve shows the relationship between the price of labour (wage rate) and the quantity supplied of labour.

Labour-Leisure Trade Off

- The opportunity cost of working is giving up leisure
- The opportunity cost of leisure is giving up earnings from work
- However, income is often required to enjoy leisure.

Labour-Leisure Trade-Off Substitution Effect

- If Wages rise, what happens?
- People might be willing to work more hours
- The OC of leisure is now higher
- This is called the substitution effect, when wages increase, you sub in labour, and sub out leisure.

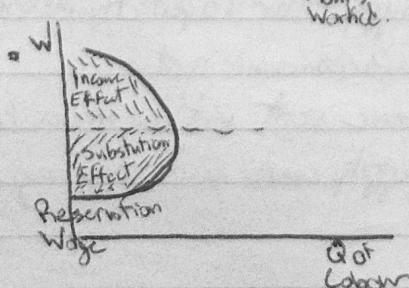
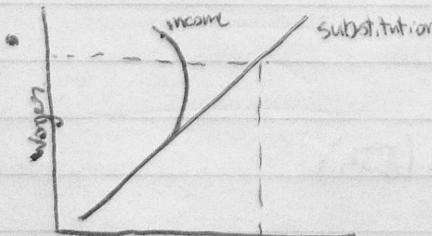
Labour-Leisure Trade Off Income Effect

- People may be willing to work less hours
- Suppose you need \$1000 a week to be satisfied, with a pay raise you could achieve this with less hours
- This is called income effect, use extra income to purchase more leisure.

Labour Leisure Trade Off

- What is the slope of the supply curve of labour?
- At lower wages
 - The substitution effect usually dominates
 - Higher wages lead to more working hours as leisure becomes more costly
- At higher wages
 - The income effect may dominate
 - This can lead to a backward-bending labour supply curve (May not happen with most people / wages).

Backward-Bending Supply of Labour



- Substitution and income work in opposite directions
- If $W >$ leave reservation wages, substitution.
- If W increase further, income effect
- Leisure time more valuable
- Labour curve bends back on itself.

Total Income

- Economic Rent
- Transfer Earnings

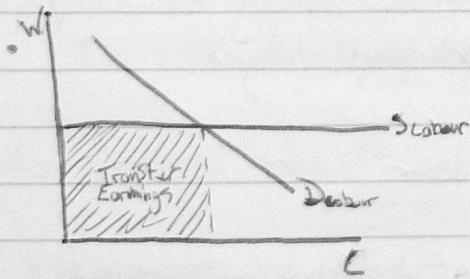
Transfer Earnings

- Income earnings required to induce the supply of a resource

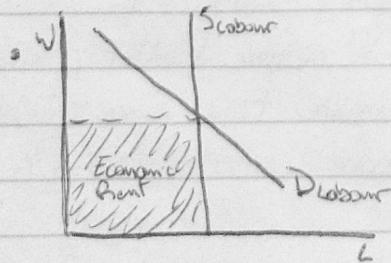
Economic Rent.

- Income received by an owner of a resource over and above the amount required ~~to~~ to induce the owner to offer the resource for use (transfer earnings)

All Income is Transfer Earnings (TE).



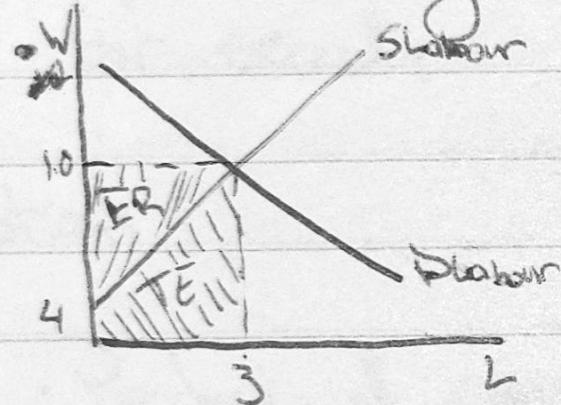
All Income is Economic Rent (ER).



- When supply labour is perfectly inelastic, all income is economic rent
- Economic rent is the area between the supply curve and the wage rate

Upward Sloping Supply Curve

- Some resources income is Economic Rent and some is Transfer Earnings.



$$\begin{aligned} \text{Total Income} &= L \cdot W \\ &= 3 \cdot 10 \\ &= 30 \end{aligned}$$

$$\begin{aligned} ER &= \frac{1}{2}bh \\ &= \frac{1}{2}(3)(10-4) \\ &= \$9 \end{aligned} \quad \begin{aligned} TE &= 30 - 9 \\ &= 21 \end{aligned}$$

Chapter 2 Grains from International Trade.

Specialization and Trade

- Specialization and trade can also create gains for society.

Options

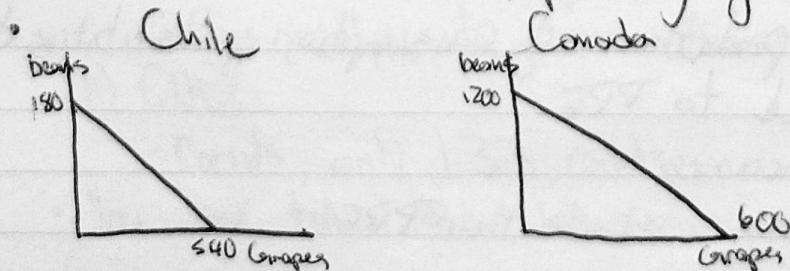
- Produce all consumption goods yourself
- Or specialize in one or a few goods and trade.

Absolute Advantage

- A country (person) has an absolute advantage in all goods if it has greater productivity than another country in the production of all goods.

Production Possibilities Frontier

- For Canada and Chile, producing grapes and beans



- Canada has a higher rate of productivity, more of all goods, and more output (Canada has an absolute advantage).

Comparative Advantage

- A country (person) has a comparative advantage in producing a good if it can produce said good at a lower opportunity cost than any other country.
- No one country is better at producing everything.
- Differing opportunity costs arise from differing abilities, characteristics of resources.

PPF

- Slope measures OC.

Without Trade

- A country's production and consumption possibilities are identical.

Without International Trade

- A country's production and consumption possibilities differ
- Production limited to PPF
- Consumption increases
- Countries consume outside their PPF

Gains from Trade

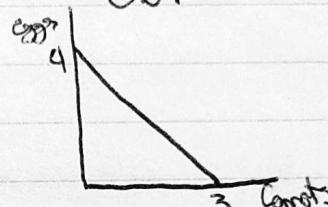
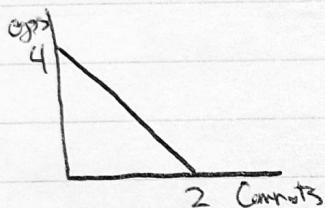
- Each country specializes
- Produces only that good in which it has a comparative advantage (lower opportunity cost)
- Both countries benefit or gain by trading with each other

Problem

- Suppose that the US and Canada have the output figures shown in the following table.

Average Product Per Worker

- US	4 kg	2 bunches
- CAN	4 kg	3 bunches
- US		CAN



a) OC of eggs in US?

$$OC = \frac{\text{Give up}}{\text{Get}} \\ = \frac{2}{4}$$

= 0.5 bunches of carrots

b) Carrots in US?

$$OC = \frac{\text{Give up}}{\text{Get}} \\ = \frac{4}{2}$$

= 2 eggs.

c) OC of eggs in CAN?

$$OC = \frac{3}{4}$$

OC = 0.75 bunches of carrots

d) Carrots in CAN?

$$OC = \frac{4}{3}$$

= 1.33 eggs.

e) Where does the US have Comparative Advantage?

- Eggs, only has to give us 0.5 carrots.

f) CAN?

- Carrots, only 1.33 carrots.

• You can take the labour force in account as well.

With Specialization

- End point solution
- Each country produces only that good in which it has a Comparative advantage in.