ECON 120 Game Theory If π(coop) > π(mixed), there is a coop equilibrium. **Cheat Sheet Test 4 Optimization** $\frac{MUx}{Px} = \frac{MUy}{Py}$ Ρv

Things have helpful value. For suppliers, units of **product**. For consumers, units of **utility**. Optimize the marginal product/utility per dollar.

Accounting profit = econoimc profit minus economic (implicit) costs opportunity costs incurred from not doing things. Specifically: cost of people's time, cost of money's time (interest/risk)

Profit maximizing for factors is the same process with marginal product

Supply and Demand

 $S \rightarrow P+0 S+ \rightarrow P-0+$ Sum of individual $D+ \rightarrow P+Q+$ $D- \rightarrow P-Q$ curves. Individual S+D+ \rightarrow P?Q+ S-D- \rightarrow P?Q- from indifference $S>D \rightarrow P+Q? D>S \rightarrow P-Q?$ / budget curves

Consumer Behaviour

Two effects when price goes down: **substitution** (always up) income (depends on elasticity)



Inferior Good

Inferior demand curve *can* slope up.



Giffen aoods are super essentials. Conspicuous consumption goods are super luxurv aoods.

PPFs

Opp. cost = dA/dB. Unemployment moves point inwards, not PPF

Linear PPF Perfectly efficient resource re-allocation.



Bowed Out PPF Inefficient. Opportunity cost increases with production.



PPF Expands Tech advancement, population increase.

PPF Contracts Resource loss, population decrease.

If π (cheat) > π (mixed), there is a cheat equilibrium.



Factor Markets

Measure factors of production with human/physical capital (stock) which produce cash flow. MRP = MR × MP (revenue gained per extra unit of production) acts as a **demand**, apply normal supply/demand graph stuff.

Factor mobility is how easily factors are repurposed to another industry and erodes temporary differentials.

Equilibrium differentials don't change. Intrinsic (features) vs acquired (invest) vs compensating (non-monetary diffs). e.g. hazard pay or wage discrimination

Labour Markets

Monopsonies are monopolies but upside-down, with one seller buyer. Set MC=MRP and charge AC.

Minimum wages create unemployment.

Unions collectively bargain to get higher wages, offset surplus by featherbedding rate and investment instead of price (hiring useless workers) or advertising.



(opportunity cost of using factor) + economic rent (extra cost)

High η = more transfer earnings

Capital Markets

excess burden. Laffer curve shows diminishing direct burden.

Interest is the "price" of capital.

Apply supply/demand with **interest** and quantity

Percent of people

Taxation and Inequality Taxes shift supply. Less elastic curve absorbs more tax burden. Revenue = direct burden and DWL =



Line of complete income equality Percent of income $\eta S > \eta D$ $\eta D > \eta S$ Inequality measured by Lorenz

curve between people and income (area = Gini coefficient).

Taxes change inequality if marginal rate \neq average rate.

Progressive marginal > avg **Proportional** marginal = avg **Regressive** marginal < avg Worst is **poll tax**, constant for everyone. Taxes aim to be equitable and efficient.

Income Elasticity Cross-Elasticity 0 1 0 1 **n** inferior goods necessities luxuries complements substitutes normal goods

Good X's demand over good Y's price Complements are goods that are used together.

Calculate the same but instead of price use income Inferior goods are those people buy less when rich Substitutes are good sthat can replace each other. Necessities are staples that everyone needs

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Supply Define time scales based on how many things are variable – in the **short run** some factors are variable. In the **long run**, all factors are variable. In the **very long run**, the method of prooduction itself is variable.

Short Run

A supplier's costs can be variable or fixed, so: **TC = TFC + TVC**.

Express wrt quantity: ATC = AFC + AVC



These are minimized when they cross the marginal cost curve ($\Delta TC/\Delta Q$).

Firms must pay FC no matter what, so if MC < AVC, there's no point in staying open so the firm shuts down (distinct from exiting when long-term is unviable)

Very Long Run

Changing the LR-ATC's shape is possible. Technological advancements can move the curve downwards, reducing costs for every possible production level.

Perfect Competition

Firms are small wrt market, so can sell infinite product at market price. Products are homogenous; easy enter/exit.



Produce where MC = MR = P.

Profit/Loss = Q×(MC-ATC) at (P, Q)

In the long run, since firms can easily exit and enter, *supply always tends to the equilibrium price*.

LRS = min(LRATC), exit if P < LRS

Market is allocatively and productiely efficient

Firm graph is only externally affected by price and costs

Monopolistic Competition

Firms that have monopoly on a differentiated product.

Acts like a monopoly in short run, perfect competition in long run since firms freely enter and exit until profit is zero.



Firms always produce less than "efficient" scale in the long run (i.e. with excess capacity) because demand is downward sloping and LRATC slope = demand slope.

Differentiation (through adverts) makes demand less elastic, increasing profits.

Impossible to know efficiency because of differentiation

Price Discrimination

Long Run

All possible short-run cost curves' respective minimum points create a **long-run average total cost curve**. Minimized point where marginal products per dollar are equal.

LR-ATC decreases → MC (lowest SR-ATC point) decreases → returns to scale increase. LR-ATC decreases → MC (lowest Allocative Efficiency Economy/market is allocative

Productive Efficiency

A **firm** is **productively efficient** if it is producing at minimal cost (P = SRATC = LRATC).

A **market** is productively efficient if all firms have the same MC and is producing **on the PPF**.

Monopolistic competition has indeterminate efficiency because of differentiation. **Monopoly**

Pm

Pc

Ρ

Surplus



Allocative Efficiency Economy/market is allocatively efficient if P = MC and no DWL. Competition > Oligopoly > Monopoly





Profit/Loss = Q×(P-ATC)



MR=MC

DWL

4s

Any change creates **price** and **output** effects: total revenue goes up when output > price

Not allocatively efficient always productively efficient

Set price where MR = MC. **Natural** with utilities / specific manufacturing / economies of scale, or **created** through gvmt action / IP rights / trade groups.

MCI

Governments can allocatively optimize with **P** = **MC** but this causes losses and monopolists exit the industry. Or set **P** = **ATC** but that is not allocatively efficient and halts investment. **Two-part tarrifs** = fixed price + marginal price.

Oligopoly

Monopoly in short term, perfect competition in long term.

Balance between more production = more profit and over monopoly quantity = less for everyone. **Explicit collusion** is illegal, usually termed **cartels**. Implicit or **tacit collusion** is not. **Oligopolies are defined as 4-firm concentration > 40%**

It's most efficient to **perfectly price discriminate** by selling to everyone at demand so entire ∫ D−ATC is profit.

That's usually impossible (except for airlines etc.) so **imperfect price discrimination** buckets customers. More elastic demand gets lower price.

Putting effort into moving between buckets is **hurdle pricing** so people with more marginal utility put in effort.