EC 120 Final Cheat Sheet

completed version 1.0

Optimization $\frac{MUx}{Px} = \frac{MUy}{Py}$

Profit maximize: product (suppliers) / utility (consumers). Optimize marginal per dollar.

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

Supply / Demand

S+ → P- Q+ read as supply up → price down/quantity up

S+	→ P- Q+	S-	→ P+ Q-
D+	→ P+ Q+	D-	→ P- Q-
S+ D+	→ P? Q+	S- D-	→ P? Q-
S > D	→ P+ Q?	D > S	→ P- Q?

Market is sum of individual curves. Individual curves from indifference / budget curves.

Game Theory

20/20	25/5	30/30	25/5	30/30	25/5
5/25	0/0	5/25	0/0	5/25	8/8
Eq: 0/0 (cheat)		Eq: 30/30 (coop)		Eq: 8/8, 30/30	

Firms can cooperate (tacitly or explicitly) to achieve the best outcome in **cooperative equilibria**.

Sometimes in non-cooperative games, one **dominant strategy** always finds the best outcome. These tend to a **Nash equilibrium**.

If π(coop) > π(mixed), there's coop equilibrium.

If π(cheat) > π(mixed), cheat equilibrium.

CPFs/PPFs

Opportunity cost = dA/dB.

Unemployment moves point inwards, not PPF.

Feasible inside PPF, efficient on PPF

Linear PPF

Perfectly efficient resource re-allocation.

Bowed Out PPF

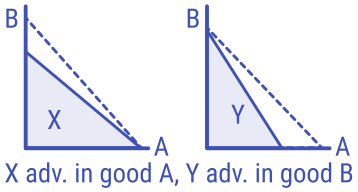
Inefficient. Opportunity cost increases with production.

PPF Expands

Tech advancement, population increase.

PPF Contracts

Resource loss, population decrease.



X adv. in good A, Y adv. in good B

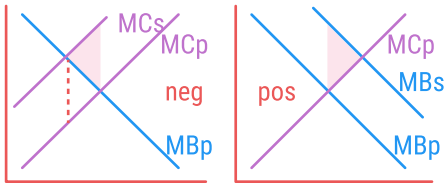
Market Failure

DWL > 0. When not allocatively efficient, requires intervention to fix. Negative surplus can exist on right of equilibrium.

Monopolies/oligopolies/monopolistic competition all cause failure. Non-rival or non-excludable goods always inefficient.

Hiding **asymmetric info** in a transaction: **Moral hazard** hiding afterwards (skydiving after buying insurance), **adverse selection** hiding before (insider trading).

Markets are efficient when ΣMC = ΣMB for all affected people. **Externalities** are differences between **private** (market forces) and **societal** (everyone else affected) costs or benefits.



Taxation

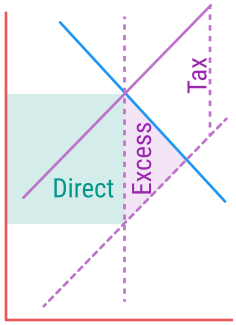
Aim for **equity** and **efficiency**. Less elastic pays more tax. Revenue = **direct burden** and DWL = **excess burden**. The **Laffer curve** between rates and revenues shows diminishing direct burden.

Inequality measured by **Lorenz curve** between people and income (area = **Gini coefficient**).

If marginal rate ≠ avg rate, tax changes inequality.

Progressive MR > AR
Proportional MR = AR
Regressive MR < AR

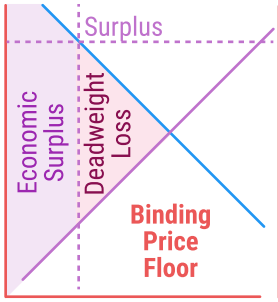
Worst is **poll tax**, a constant for everyone.

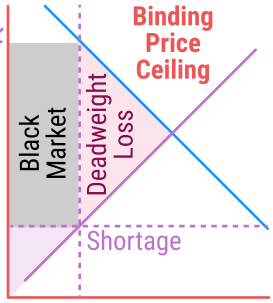


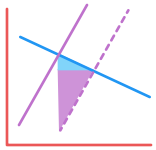
Intervention

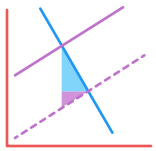
Government functions: monopolizing the **use of force** and protecting **property rights**. Broader social goals of **reducing inequality**, **public provision**, **protection** (**paternalism**), and **social responsibility** with public provision, redistribution, regulation. Consider indirect costs of **production**, **compliance**, and **rent-seeking** (corruption).

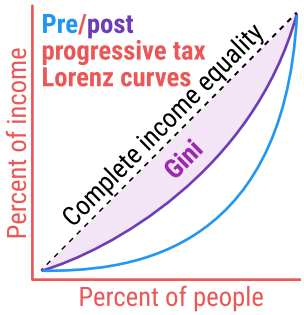
Floors bind above equilibrium, ceilings bind. Quotas act like price floors.







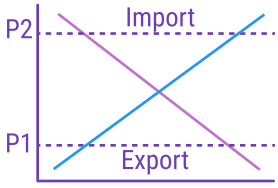


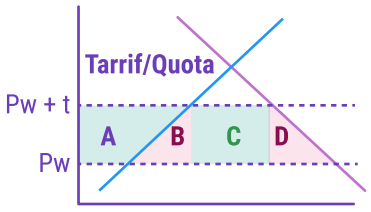


Trade Markets

Terms of trade = exports ÷ imports. Changes to ToT = CPF rotates. The **law of one price** says world price is constant except for shipping costs. Countries engage in **protectionism** to promote diversification, protect interest groups (infant industries), improve ToT, or just make more money. No trade = **autarky**.

If domestic S > D, export diff. If domestic D > S, import. **Tariffs** / **import quotas** have same effect. Consumers lose **A+B+C+D**. **C** is revenue for tarrifs but DWL for quotas. A **voluntary export restriction** (VER) is just another quota. **Countervailing duties** are tarrifs specifically for going no u to foreign subsidies. **Dumping** is flooding of foreign market at low price.





Advantages: **comparative** (lower opp. cost) or **absolute** (lower absolute cost) given some other resource. **Specialization** in producing goods with advs creates gains from trade, economies of scale, and **learning by doing**.

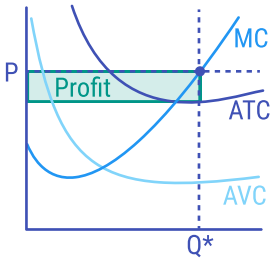
Comparative advantage can come from **factor endowments** (forests, oil, ...), climate, human capital, acquired skill (*learning by doing*), etc.

When trade opens between countries, CPF rotates away from origin around advantage point (since the other good is imported from the second country)

Market Structures

Perfect Competition
Firms small wrt market, sell infinite product at market price. This gives a horizontal/infinitely elastic ***firm demand curve*** (while market remains downwards sloping).

Products are homogenous. No big barriers to entry or exit.



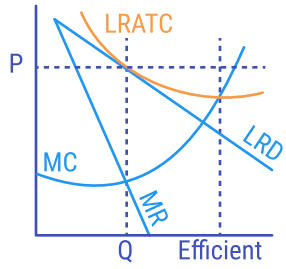
Produce where MC = MR = P.

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.

Monopolistic Competition
Monopolies on a differentiated product. Act like monopoly in short run, PC in long run since firms can enter/exit until zero profit.

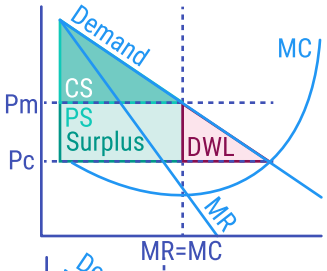


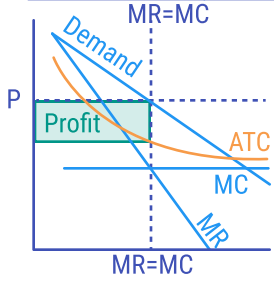
Leads to long run equilibrium with P = LRATC tangent to demand

Always produce under "efficient" scale (i.e. excess capacity). Differentiation (through adverts) decreases elasticity, increasing profits. **Cannot know efficiency** because of differentiation

Oligopoly/Cartel
Monopoly in short term, perfect competition in long term.

Balance between firm production and market quantity. **Explicit collusion** is illegal, usually termed **cartels**. Cartels must prevent new entrants and restrict output. Implicit or **tacit collusion** is not. Usually **4-firm concentration > 40%.**





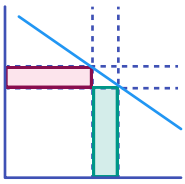
Monopoly
Set price where MR = MC. Come about **naturally** with utilities / manufacturing / economies of scale / one firm supplies entire industry, or **created** by government / IP rights / trade groups.

Not **allocatively efficient** always productively efficient. Governments try to fix by setting **P = MC** but causes losses and firms exit the industry. Or set **P = ATC** but that is not allocatively efficient and halts investment.

Two-part tarrifs = fixed price + marginal price.

← Recall profit = Q×(P-ATC).

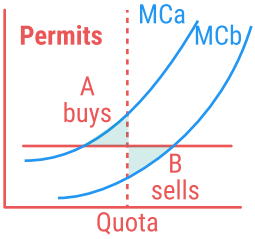
Any change in quantity produced creates **price** and **output** effects: total revenue goes up when **output > price**.



Price Discrimination
Monopolies/oligopolies optimize with **perfect price discrimination** by selling to everyone at demand so entire area between D and ATC is profit.

Usually impossible (except for airlines etc.) so bucket customers with **imperfect price discrimination - more elastic demand gets lower price.** Allowing movement between buckets is **hurdle pricing** so more marginal utility = effort = discount.

Pollution



Total pollution = size of economy (**GDP**) × **energy use** × **pollution from energy**. If small, estimate composition of percentages with addition.

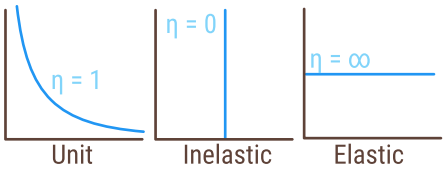
Direct control usually inefficient because firms have diff costs. Mostly useful for 100% removal of specific pollutant. Let market forces do the hard work instead.

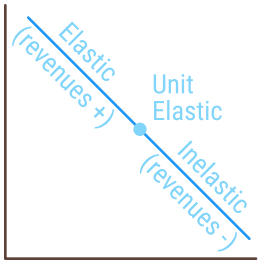
Add tangible cost to pollution: **direct taxes** (know P, unknown Q) on units or distribute **permits** (unknown P, know Q) for sale. Graph as P/Q of **abatement** (reduction).

With fixed number of permits, firms trade until price of permit = MC of abatement for all firms.

Elasticity of demand

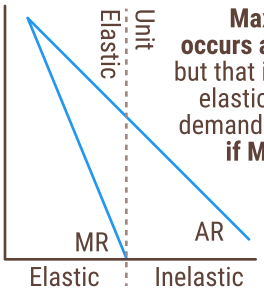
$$\eta = \frac{(\Delta Q/Q)}{(\Delta P/P)}$$





Inelastic (η < 1) means responsive to quantity, elastic (η > 1) to price.

Unit elastic gives maximum revenue / total expenditure, so moving closer to that point (e.g. inelastic + raised price or elastic + higher quantity) raises revenue. Lines have parabolic elasticity so one unit elastic "best" point.



Max revenue occurs at MR = 0, but that is the unit elastic point, so demand is **elastic if MR > 0** and **inelastic if MR < 0**.

Cross-Elasticity

Good X's demand over good Y's price
Complements are goods that are used together.
Substitutes are goods that can replace each other.
Same sign as term in demand equation.

Income Elasticity

Calculate the same but instead of price use income
Inferior goods are those people buy less when rich
Necessities are staples that everyone needs

Consumer Behaviour

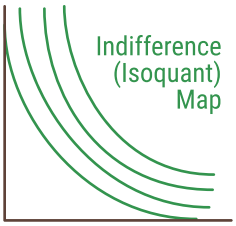
Two effects when price goes down: **substitution** (always up) **income** (depends on elasticity)

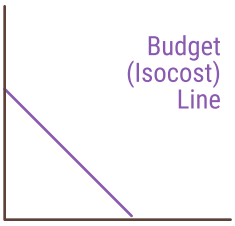
All goods can be **excludable** (limited by action) or **rival** (limited by use).

Inferior demand curve can slope up. **Giffen goods** are super essentials. **Conspicuous consumption** goods are super luxury goods.

	Non-Excludable	*Excludable*
Non-Rival	**Public** *ex. health, empty highway.* Pos externalities, typically provided by government.	**Club** *ex. toll roads, museums.* MCs = 0 so P = 0, typically monopoly or government.
Rival	**Common** *ex. fishing, busy highway.* Positive externalities, no allocative eff. **Tragedy of the commons** from overexploiting until MB = 0.	**Private** *ex. food.* Most goods/markets. Consider negative externalities.

Making a Supply/Demand Curve

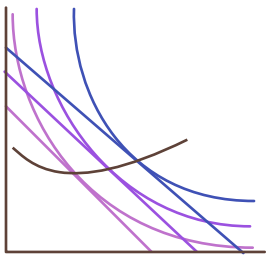




Imagine a curve of all points with equal benefit (utility or product) from two inputs: **indifference** or **isoquant** curves.

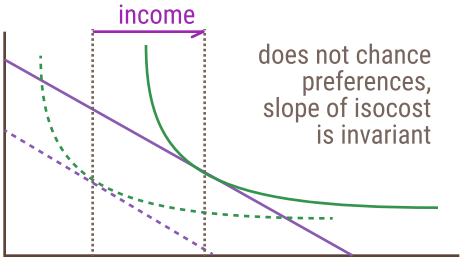
Draw the PPF-style line for fixed cost of goods/inputs. This is the **budget** or **isocost** line.

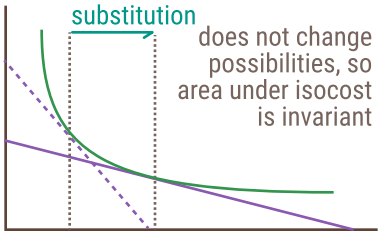
The optimal isoquant is tangent to the budget line. As the **budget line changes**, different isoquants give different optimal points, creating the **demand and long-run supply curves**.



Income effect changes quantity by switching the **isoquant** line as real income (purchasing power) goes up.

Substitution effect is the change of the the **isocost** line sliding down isoquant when relative costs change.

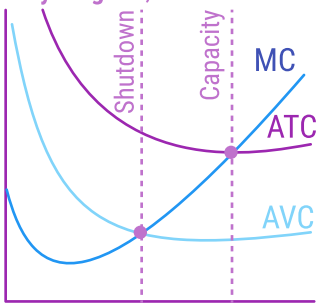




This gives the supply/demand curve of one individual in the market. Don't forget that the actual curve is a sum of everyone in the market.

Supply

Short run, some variable
Long run, all factors variable
Very long run, tech variable



Short Run

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

Express wrt quantity: **ATC = AFC + AVC**

Minimized when they cross the **marginal cost** curve (ΔTC/ΔQ).

Firms always pay FC, so if MC < AVC, no point in staying open and firm temporarily **shuts down** (distinct from exiting when long-term is unviable)

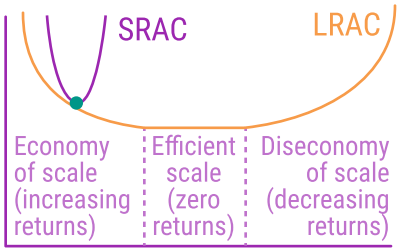
Long Run

All possible short-run cost curves' respective minimum points create a long-run average total cost curve. Minimized where marginal products per dollar are equal. **Break even** at P = LRAC.

LRAC down → MC down → returns to scale up.

Very Long Run

Changing the LRAC's shape is possible. Tech changes move the curve downwards, reducing costs for every possible production level.



Productive Efficiency

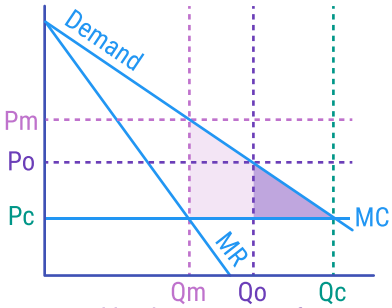
A **firm** is productively efficient if it is **producing at minimal cost** (P = SRATC = LRATC).

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

Allocative Efficiency

Economy/**market** is allocatively efficient if **P = MC** and **no DWL**. Measure failure by size of DWL:

Perfect competition > Oligopoly > Monopoly



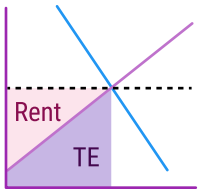
Factor Markets

Human/physical capital (stock) which produces cash flow. MRP = MR×MP acts as demand, do normal S/D.

Equilibrium differentials don't change. Intrinsic (features) vs acquired (invest) vs compensating (non-monetary diffs) e.g. hazard pay or wage discrimination. **Factor mobility** is ease in reuse in new industry, erodes **temporary differentials**.

Gains = **transfer earnings** (opp cost) + **economic rent** (extra). More elastic → transfer earnings.

Labour Monopsonies are monopolies but upside-down, with one ~~seller~~ buyer. **Minimum wages** →unemployment. **Unions** collectively bargain for better wages. This creates a labour surplus, which is fixed by **featherbedding** (useless hiring) and **advertising**.

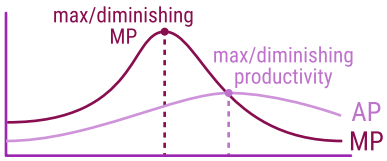


Kapital Markets

Interest is the "price" of capital. Do supply and demand with interest rate and investment instead of price and quantity.

Total production depends on tech of labour and capital: **TP = f(K,L)**.

MP acts like the opposite of MC: **MP crosses AP at maximum**



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