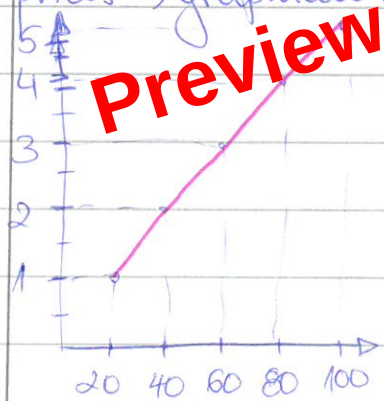
→ Determinants of Demand: tastes & preferences, prices of related goods & services, income, # of consumers; expectations for future prices & income
→ Market demand: horizontal summation of individual consumer demand curves.

→ Supply: r/ship that exists between the price of a good and the quantity supplied in a given time period, when all other determinants of supply are held constant (ceteris paribus)
→ Quantity Supplied: total amount of goods & services offered by potential sellers for sale over some time period @ a given price.
→ Law of Supply: When the price of a good rises, and all other factors remain the same, the quantity of the good supplied will rise.
→ Supply Schedule: a list showing the quantities of a good/service firms would choose to produce and sell at different prices, ceteris paribus.
→ Supply Curve: a curve showing the quantity of a good supplied @ various prices → graphical representation of supply schedule.



→ Movement along the Supply Curve: a rise in price cause a rightward movement along the supply curve, and a fall in price causes leftward movement along the supply curve.
→ Shifts in the Supply Curve: when one of the determinants of supply, other than price, change.
→ Factors that Shift the Supply Curve:
- Changes in Input Prices - a fall (rise) in an input price cause an increase (decrease) in supply, shifting supply curve to the right (left)
- Changes in Price of Related Goods: when price of an alternate good rises (falls), supply curve of current good shifts to the left (right); the alternate good could be provided with the same resources
- Changes in Technology: cost-saving technological advances shift

the supply curve to the right.
- Changes in # of Firms: increase (decrease) in the # of firms/sellers shifts the supply curve to the right (left)
- An expectation for future price increase (decrease) shifts the current supply curve to the left (right).

→ Market Supply Curve: the horizontal summation of the supply curves of individual firms.

→ Determinants of Supply: price of resources (input), technology and productivity, expectations of producers, # of producers, prices of related goods (relation in production!)

III. Market Equilibrium and Elasticity.

→ Competitive market: a market in which there are many buyers and sellers so that each has a negligible impact on the market price
↳ invisible hand concept: the [illegible] market guides & controls the self seeking activities of individuals to maximize the wealth of the nation.

→ Perfect Competition: a market in which the products are the same, there are numerous buyers & sellers so each has no influence over price ⇒ they are all just price takers.

→ Monopoly: one seller who controls the price.

→ Oligopoly: few sellers and NOT always aggressive competition.

→ Monopolistic Competition: many sellers, slightly differentiated products, each seller may set the price for his product.

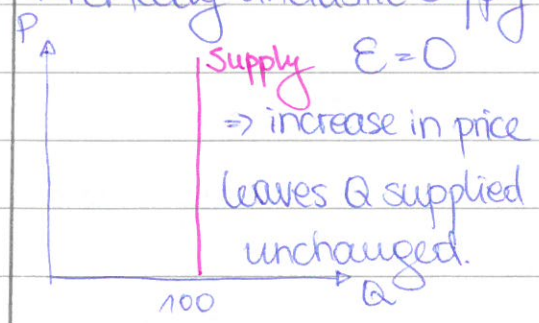
→ Reservation Price: highest price that a person will accept and still buy the good or service ⇒ indifferent between purchasing or not purchasing

→ Equilibrium: Demand & Supply Together ⇒ opposing dynamic forces cancel each other; when a market is in equilibrium:
- both price of good & quantity of good bought & sold have settled into a state of rest.

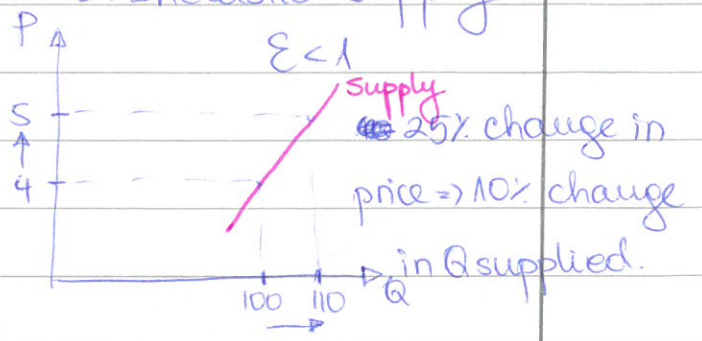
→ Price Elasticity of Supply: How much the quantity of goods supplied responds to a change in the price of that good

$$\text{Price Elasticity of Supply} = \frac{\% \text{ change in Q supplied}}{\% \text{ change in Price}}$$

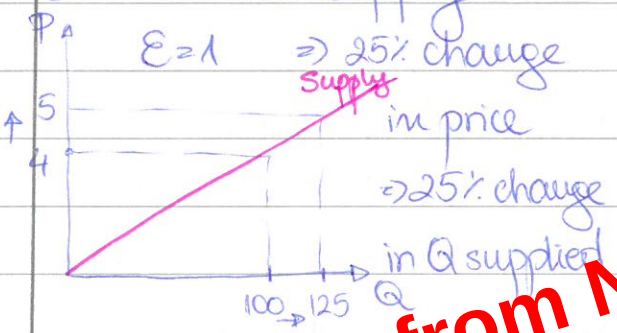
1. Perfectly Unelastic Supply



2. Inelastic Supply

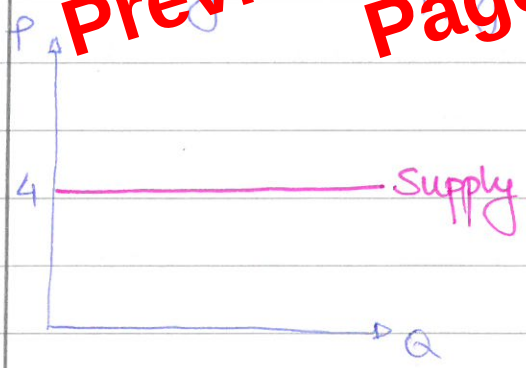


3. Unit Elastic Supply



4. Elastic Supply ε > 1

5. Perfectly Elastic Supply ⇒ ε = ∞



P > 4€ ⇒ quantity supplied is infinite

P < 4€ ⇒ Q supplied = 0

P = 4€ ⇒ producers will supply any quantity.

IV. Preferences & Utility

→ Homo Economicus - acts in his own interest only, is assumed to be rational (trying to maximize the own well-being @ least cost), forms rational expectations and maximizes so-called expected utility.

→ Preferences: What does the consumer like? How much does the

$\Rightarrow x^* = (a/(a+b))\, m/p_x$

$y^* = (b/(a+b))\, m/p_y$

Since $a/b = 4/6$ ∴ $p_x/p_y = 2/3$ $(a/b = p_x/p_y)$

$\lambda = a/p_x > 0$

$\Rightarrow$ ael x ∴ y shall satisfy $m = p_x x + p_y y \Rightarrow 120 = 2x + 3y$.

→ Changes in Income Affect the Consumer's Choice: An increase in income shifts the budget line outward ⇒ the consumer is able to choose a better combination of goods on a higher indifference level.

→ Normal good: the good that the buyer buys more of when income increases.

→ Inferior good: when income rises, consumer buys less of that good.

→ Changes in Price Affect Consumer's Choices: A fall in the price of any good rotates the budget constraint outward and changes the slope of the budget constraint.

→ Demand curves can sometimes slope upward when a consumer buys more of a good when its price rises

→ Giffen Goods: a good that violates the law of demand ⇒ goods for which an increase in the price raises the quantity demanded.

⇒ their demand curves that slope upwards

VI Expenditure Minimization, Welfare ∴ the Efficiency of Markets

→ Indirect Utility Function: which is the maximum utility that the individual will obtain if he has income m ∴ prices p_x ∴ p_y

↳ $V(p_x, p_y, m)$ ⇒ Substitution of Marshallian demand function in the utility function

↳ Optimal level of utility will depend directly on prices and income

⇒ Individuals objective:

1. maximize utility = $U(x_1, x_2) = U(x, y) = x^\alpha y^\beta$
   ↳ [α, β - weight factors or how important a good is for an individual in relation to the other good]
2. ... subject to the budget coustraint: $m = p_x \cdot x + p_y \cdot y$
   ↳ [in max. utility: spend all money for consumption, no saving]

⇒ To maximize utility set up the Laugraugian

Langraugian Rule = Utility Function + λ * Budget Constraint.

⇒ 1st Order Conditions: $\partial L / \partial x = \alpha \cdot x^{\alpha-1} y^\beta - \lambda p_x = 0$

$\partial L / \partial y = \beta x^\alpha y^{\beta-1} - \lambda p_y = 0$

$\Rightarrow \alpha y / \beta x = p_x / p_y$

$\Rightarrow p_y = (\beta x / \alpha y) * p_x$

⇒ General Form of Tangency Condition: $\frac{\partial U / \partial x_i}{\partial U / \partial x_j} = \frac{p_i}{p_j}$

⇒ Substitute p_y into budget coustraint $\Rightarrow m = ((\alpha+\beta)/\alpha) p_x x$

⇒ $x^* = (\alpha/(\alpha+\beta)) m / p_x$

$y^* = (\beta/(\alpha+\beta)) m / p_y$

↳ the % of his income that the individual dedicates to each good is fixed & given by α & β

→ Expenditure Minimization: minimize necessary budget to obtain a given level of utility

↳ Minimal expenditures: $E(p_x, p_y, u)$

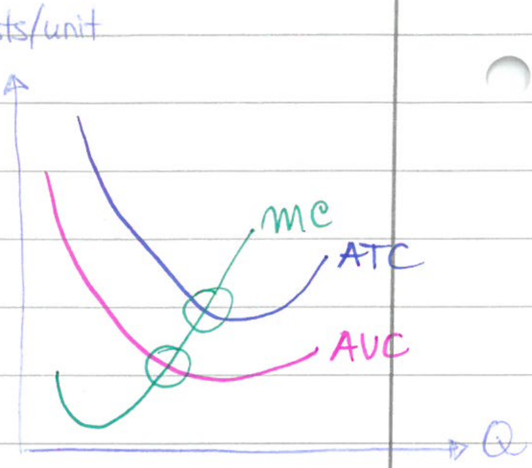
⇒ individual has to choose x, y such as to minimize the total expenditures / costs: $m = p_x x + p_y y$

⇒ Same steps like in utility maximization, but the result of Langrangian is replaced in utility function & not budget constraint.

→ Marshallian Demand Function: max utility subject to budget constraint $\begin{cases} x^*_m = x(p_x, p_y, m) \\ y^*_m = y(p_x, p_y, m) \end{cases}$

→ R/ship Between MC & ATC/AVC

- If $MC > ATC \Rightarrow ATC$ is rising
- $MC > AVC \Rightarrow AVC$ is rising
- $MC < ATC \Rightarrow ATC$ is falling
- $MC < AVC \Rightarrow AVC$ is falling
- If $MC = AVC$ and $MC = ATC$, then AVC & ATC are @ their minimums



VIII. Profit Maximization & Cost Minimization

→ Profit-maximizing firm – chooses both inputs & outputs with the only goal to maximize economic profit

$$\pi = py - (w_1x_1 + w_2x_2)$$

- x_1, x_2 → quantity of input
- w_1, w_2 → price of input
- y → quantity of output
- p → price of output (selling price)

→ Isoprofit Line: along a given isoprofit line, the profit is fixed; as profit ↑ (↓) the line shifts up (down)

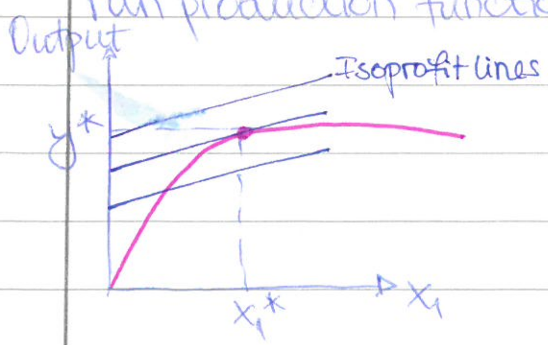
→ Short-Run Profit Maximization

$$\bar{\pi} = py - w_1x_1 - w_2\bar{x}_2 \Rightarrow y = \frac{\bar{\pi}}{p} + \frac{w_2\bar{x}_2}{p} + \frac{w_1x_1}{p}$$

$$\Rightarrow MP_1 = \frac{w_1}{p} \Leftrightarrow p * MP_1 = w_1$$

- MP_1: Marginal Product of x_1 = slope of production f-n
- w_1/p – slope of isoprofit lines

→ Short-Run Profit Maximizing Plan: slopes of the short-run production function & the maximal isoprofit are equal.



*) $p * MP_1$ = marginal revenue product of input 1 (MRP_1)

Consumer Surplus = Value to Buyers − amount paid by Buyers

Producer Surplus = Amount received by sellers − Cost to Sellers

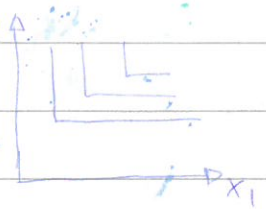
Total Surplus = Consumer Surplus + Producer Surplus.

Marginal Rate of Technical Substitution

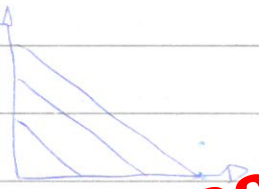
$f(x_1, x_2) = x_1^{\Theta} x_2^{1-\Theta}$ → production function

$MRTS_{x_1,x_2} = -\frac{MPx_2}{MPx_1} = -\frac{(1-\Theta)}{(\Theta)}$

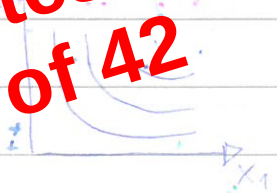
Leantief production function → Fixed Proportions



Perfect Substitutes



Cobb-Douglas Production Function



Total Costs ⇒ TC = VC + FC

Average Fixed Costs ⇒ AFC = FC/Q

Average Variable Costs ⇒ AVC = VC/Q

Average Total Cost ATC = AFC + AVC

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

Profit $\pi = p \cdot y - (w_1 x_1 + w_2 x_2)$

- p - price output
- y - Q output
- w_2, w_1 - price inputs
- x_1, x_2 - Q inputs

Short Run Profit Maximization: $MP_1 = \frac{w_1}{p}$

↳ marginal product