2 Book Notes

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Cost, Demand, and Profit Maximization

Cost, Its Determinants, and Marginal Cost

$C(q)$ = firm cost

$C = C(q; w, r, z)$ → cost of q units depends on q, wage rate (w), capital costs (r), and other factors (z)

Marginal cost = cost of making one more unit

$MC = dC/dq$ d = change (derivative)

4 ways to approximate cost:

$C(q) = f + cq \rightarrow c > 0, f \geq 0, MC = c$

$C(q) = f + cq^d \rightarrow c > 0, d > 0, f \geq 0, MC = cdq^{d-1}$

$C(q) = f + aq + bq^2 \rightarrow a > 0, b > 0, f \geq 0, MC = a + 2bq$

$C(q) = f + aq + bq^2 + cq^3 \rightarrow a > 0, b < 0, c > 0, f \geq 0, MC = a + 2bq + 3cq^2$

Demand and its Determinants, Inverse Demand

$q = q(p)$

m = income

Price of substitutes (p_s) and complements (p_c)

n = market size

z = other variables

$q = q(p, m, p_s, p_c, n, z)$

↳ implies that q depends on p

$p = p(q, m, p_s, p_c, n, z)$

$p = p(q)$

Measuring the Sensitivity of Quantity Demanded to Price

Elasticity is a percentage

Elasticity of demand = η (eta) = $\%\Delta q / \%\Delta p = \Delta q/q / \Delta p/p$

η not constant over demand

Demand Approximations

Linear Demand Approximations

ε = random error

$q_D = A - Bp$

$p = \frac{A}{B} - \frac{1}{B}q$

Log Linear (constant elasticity) Demand Approximations

$q = Ap^{-B}$

$\ln(q) = \ln(A) - B\ln(p)$

$dq/dp = -BAp^{-B-1}$

η w/ respect to independents are constant and equal to that variable's coefficient

Revenue and Marginal Revenue

Revenue = price · quantity

firms have **market power** if they have a non-negligible effect on market price

Marginal revenue = gain in revenue from one unit sold

$MR = P + \frac{dP}{dq}q$

Marginal Revenue and Elasticity

$dR/dq = P\left(1 + \frac{1}{\eta}\right)$

Profit Maximization

q^* = profit maximizing q

↳ π^*

$P = \left(\eta/(1+\eta)\right) MC$