Intermediate Microeconomics

Part A: Supply and Demand

Demand and Supply Elasticity

$$\text{price elasticity of demand} = \epsilon = \frac{\text{percentage change in quantity demanded}}{\text{percentage change in price}} = \frac{\Delta Q/Q_1}{\Delta p/p_1} = \frac{\Delta Q p_1}{\Delta p Q_1} = b\frac{p}{Q}$$

Where b is the gradient of the demand function if it is linear and expressed with Q as the subject

$$\text{price elasticity of supply} = \eta = \frac{\text{percentage change in quantity supplied}}{\text{percentage change in price}} = \frac{\Delta Q/Q}{\Delta p/p} = \frac{\Delta Q p}{\Delta p Q} = b\frac{p}{Q}$$

Where b is the gradient of the supply function if it is linear and expressed with Q as the subject

$$\text{income elasticity of demand} = \xi = \frac{\text{percentage change in quantity demanded}}{\text{percentage change in income}} = \frac{\Delta Q/Q}{\Delta Y/Y} = \frac{\Delta Q \times Y}{\Delta Y \times Q}$$

$$\text{cross price elasticity of demand} = \frac{\text{percentage change in quantity demanded}}{\text{percentage change in price of other good}} = \frac{\Delta Q/Q}{\Delta p_o/p_o} = \frac{\Delta Q \times p_o}{\Delta p_o \times Q}$$

Specific Taxes

In response to a specific tax:

$$\Delta p = \left(\frac{\eta}{\eta - \epsilon}\right)\Delta\tau$$

Where τ is the size of the specific tax (note that ϵ will usually be negative)

Tax Incidence

$$\text{tax incidence on consumers} = \frac{\Delta p}{\Delta \tau} = \frac{\eta}{\eta - \epsilon}$$

Part B: Consumer Theory

Basic Concepts

Marginal Rate of Substitution

$$\text{Marginal rate of substitution (of y for x)} = \text{slope of indifference curve} = MRS = \frac{\Delta y}{\Delta x} = -\frac{MU_x}{MU_y}$$

Budget Constraint

Assume that a consumer has preferences over goods B and Z, where B is plotted in the y-axis

$$m = Y = p_B B + p_Z Z$$
$$Y - p_z Z = p_B B$$
$$B = \frac{Y - p_z Z}{p_B}$$

$$B = \frac{Y}{p_B} - \frac{p_Z}{p_B} Z$$

Marginal Rate of Transformation

$$\text{Marginal rate of transformation} = \text{slope of budget constraint} = MRT = -\frac{p_Z}{p_B}$$

At Consumer Equilibrium

$$MRS = MRT = -\frac{MU_Z}{MU_B} = -\frac{p_Z}{p_B} = \frac{\Delta B}{\Delta Z}$$

Special Cases of Indifference Curves

Perfect substitutes: straight diagonal line joining two axes

Perfect complements: must be used in one-to-one ratio, series of points and straight lines

Useless goods: vertical or horizontal lines

Substitution and Income Effects

Income and Substitution Effects

$$\text{Substitution effect} = \text{Q}^* - \text{Q}_1$$

Where Q_1 is the original quantity consumed and Q^* is the quantity consumed at the new prices but on the old indifference curve

$$\text{Income effect} = \text{Q}_2 - \text{Q}^*$$

Where Q_2 is the new quantity consumed and Q^* is the quantity consumed at the new prices but on the old indifference curve

$$\text{Total effect} = \text{substitution effect} + \text{income effect}$$

Types of Goods

$$\text{Income effect} < 0 = Inferior\ good$$

$$\text{Income effect} > 0 = normal\ good$$

$$\text{Income effect} + \text{Substitution effect} < 0 = Giffen\ good$$

Types of Curves

Price consumption curve: downward sloping = substitutes, upward sloping = complements

Demand curve: usually downward sloping, upward sloping only for giffen goods

Income consumption curve: upward sloping = normal good, downward sloping = inferior good

Engel curve: upward sloping = normal good, downward sloping = inferior good

Own-Price Slutsky Equation

The slutsky equation shows that the elasticity of demand for a good (ϵ) is the sum of the substitution elasticity of demand (ϵ^*) and the income elasticity of demand (ξ)

$$\text{Total effect} = \text{substitution effect} + \text{income effect}$$
$$\frac{\Delta q}{\Delta p} = \left(\frac{\Delta q}{\Delta p}\right)_{\text{U=}constant} - q\frac{\Delta q}{\Delta Y}$$
$$\frac{\Delta q}{\Delta p}\frac{p}{q} = \left(\frac{\Delta q}{\Delta p}\frac{p}{q}\right)_{\text{U=}constant} - q\frac{\Delta q}{\Delta Y}\frac{p}{q}\frac{Y}{Y}$$
$$\frac{\Delta q}{\Delta p}\frac{p}{q} = \left(\frac{\Delta q}{\Delta p}\frac{p}{q}\right)_{\text{U=}constant} - \frac{qp}{Y}\times\frac{\Delta q}{\Delta Y}\frac{Y}{q}$$
$$\epsilon = \epsilon^* - s\xi$$

Where s is the budget share of the good

Cross-Price Slutsky Equation

$$\frac{\Delta q_1}{\Delta p_2} = \left(\frac{\Delta q_1}{\Delta p_2}\right)_{\text{U=}constant} - q_2\frac{\Delta q_1}{\Delta Y}$$
$$\frac{\Delta q_1}{\Delta p_2}\frac{p_2}{q_1} = \left(\frac{\Delta q_1}{\Delta p_2}\frac{p_2}{q_1}\right)_{\text{U=}constant} - \frac{q_2p_2}{Y}\times\frac{\Delta q_1}{\Delta Y}\frac{Y}{q_1}$$
$$\epsilon_1^2 = \epsilon_1^{2^*} - s_2\xi_1$$

Where ϵ_1^2 is the cross-price elasticity for good 1 associated with a price change in good 2

Applications of Consumer Theory

Labour Budget Constraint

$$pC = wH + G$$

Where G is non-labour income, C is consumption of goods and services, and H is hours of work

Time Constraint

$$H = T - L$$

Cash v. In-Kind Transfers

$$If\ Q_1 \geq G \text{ then indifferent between cash and gift}$$
$$If\ Q_1 < G \text{ then probably prefer cash}$$

Where G is the amount of good 1 given as an in-kind gift

Decision Making Under Uncertainty

Weak Axiom of Revealed Preference

If (x_1, x_2) is revealed preferred to (y_1, y_2) and the bundles are not identical, then it cannot be true that (y_1, y_2) is also revealed preferred to (x_1, x_2)

Non-transitive preferences are not ruled out by the weak axiom

Expected Utility

$$u = \pi_1 u(c_1) + \pi_2 u(c_2)$$

Where π is the probability of the relevant event occurring c_i is the payoff from that event. Note that we assume independence in the utility between these two events.

Risk Premium

$$Risk\ Premium = Expected\ Wealth\ (from\ gamble) - Certainty\ Equivalent\ Wealth$$
$$R^* = EW - CEW$$

The certainty-equivalent wealth (CEW) is the level of certain wealth that provides the same amount of utility as the expected utility of the gamble

For a risk-loving individual, the risk premium will be negative

Expected Insurance Profits

$$E(\pi) = p(R_S - L) + (1-p)R_S = R_S - pL$$

Where R_S is the size of the insurance premium, L is the size of the loss and p is the probability of the loss

Viable Insurance Market

A viable insurance market exists if the following is satisfied

$$pL \leq R \leq R^*$$

Where R is the actual premium and R^* is the maximum premium the individual will pay

Segregated Market

$$E(\pi) = R_S - (s_L p_L + s_H p_H)L$$

Where S is the proportion of low/high risk personas and p is their respective probabilities of incurring loss L

Competition will force profits to zero, such that $R_S = (s_L p_L + s_H p_H)L$

Part C: Production and Costs

Basic Concepts

Marginal Rate of Technical Substitution

$$\text{marginal rate of technical substitution} = \text{slope of isoquant} = -\frac{\text{MP}_\text{L}}{\text{MP}_\text{K}}$$

Note that this applies if capital is graphed on the y-axis

Marginal Cost Formulae

Assume that capital is fixed

$$MC = \frac{dVC}{dQ} = \frac{d(wL)}{dQ} = w\left(\frac{dL}{dQ}\right) = w\frac{1}{MP_L} = \frac{w}{MP_L}$$

Iso-Cost Line

The following is based on the assumption that K is plotted on the y-axis

$$TC = wL + rK$$
$$TC - wL = rK$$
$$K = \frac{TC - wL}{r}$$

$$K = \frac{TC}{r} - \frac{w}{r}L$$

Marginal Rate of Technical Transformation

This is the slope of Iso-Cost Line

$$\frac{\Delta K}{\Delta L} = -\frac{w}{r}$$

At Producer Equilibrium

The firm selects a desired level of output, and then selects that bundle of inputs that produces this output at the lowest cost

$$\frac{\Delta K}{\Delta L} = -\frac{w}{r} = -\frac{\mathrm{MP_L}}{\mathrm{MP_K}} = MRTS$$

Finding Industry Characteristics

Find Supply Curve

The supply curve for a single competitive firm can be found by differentiating the total cost function, equating MC with price, and then rearranging the resulting equation so price is the subject. Industry supply can be found by multiplying this supply curve by the number of firms. Always given with p as the subject, same as the demand curve.

Output Expansion Path

If K is on the y-axis, the output expansion path with be in the form K = f(L). If relative prices are not known, they must be included as variables in the equation. Note that the following are the conditions that the output expansion path must satisfy

$$\frac{\Delta K}{\Delta L} = -\frac{w}{r} = -\frac{\mathrm{MP_L}}{\mathrm{MP_K}} = MRTS$$

Cost-Minimising Bundles

These can be calculated by writing L and K as a function of q, substituting out the other one (K or L)

Also, $MP_L \times p_x = w$, where x is the good being produced (same holds for capital in LR)

Total Cost Function

This will be found by substituting the optimal bundles of K and L (relative to q) into equation TC = wL + rK

Other Formulae

Residual Demand

$$D_R = D - S_o$$

Where S_o is the total quantity supplied of all other firms

Elasticity of Residual Demand

Note that the following only applies when all firms are identical

$$\epsilon_{RD} = N\epsilon_D - (N-1)\eta S_o$$

Where N is the number of firms. As $N \rightarrow$ infinity , the residual demand curve becomes perfectly elastic

Link Between Production and Profits

$$\pi(\max) \; when \; \mathrm{MP_L} \times \mathrm{p} = \mathrm{MC_L}$$

Calculating Profits

$$\pi = q(p - AVC) - FC$$

Part D: General Equilibrium

Endowment Economy Equilibrium

Note that A subscripts refer to consumer A, and B subscripts to consumer B. Similarly, this is an economy of two goods x and y. M refers to the value of the initial bundle.

$$MRS_A = -\frac{p_y}{p_x} = MRS_B$$

$$m_A = x_A p_x + y_A p_y$$

$$m_B = x_B p_x + y_B p_y$$

Production Possibility Frontier

Will always be in the form $Y = f(X)$, where Y is the good on the vertical axis and X on the horizontal axis

Full Competitive Equilibrium

Under equilibrium with perfect competition, both of the following will be satisfied:

$$MRS_1 = -\frac{MU_{z_1}}{MU_{B_1}} = -\frac{p_z}{p_B} = -\frac{MU_{z_2}}{MU_{B_2}} = MRS_2$$

$$MRTS_1 = -\frac{\mathrm{MP_{L_1}}}{\mathrm{MP_{K_1}}} = -\frac{w}{r} = -\frac{\mathrm{MP_{L_2}}}{\mathrm{MP_{K_2}}} = MRTS_2$$

$$MRS = MRT$$

Note that Competitive Equilibria don't have to be points of pareto efficiency, something that occurs if there is a tax on one firm but not the other and so they face different prices.

Also note that when calculating general equilibrium, check whether it is production, consumption or both

Part E: Market Structure

Generalities

Market Parameters

1. Many or few firms?
2. Short or long run?
3. Marginal costs the same or different?
4. Homogenous goods?

5. Set price or quantity?
6. Sequential or simultaneous?

Marginal Revenue

Note that if MC differs across firms, must recalculate TR for each firm separately

This is useful when demand curve not given

$$MR = p \times \left[1 + \frac{s_i}{\epsilon_D}\right]$$

Note that s_i indicates market share as a number between one and zero

For a linear demand curve, the formula for marginal revenue will be the same as the formula for the demand curve, but with twice the gradient

Residual Demand

$$q_1 = Q - q_2$$

Price Markup

$$\frac{p - MC}{p} = -\frac{1}{N\epsilon_D}$$

Where N is the number of firms in the market

Types of Markets

Perfect Competition

In the Short-Run: $p = MC \neq AVC, \therefore \pi > 0$

In the Long-Run: $p = MC = \min(AVC)$

Note that the demand curve in a PC market is the MC curve above AVC: firm will shut down when p < AVC

Monopoly

If two firms collude to act as a joint monopolist, the firm with lower marginal costs will produce everything

$$MR = MC$$
$$MR = \frac{d(PQ)}{dQ} = \text{twice gradient of demand curve}$$

If the firms have different marginal costs, these can be combined (taking the lowest value) to form a new cost function as if the two firms were a single monopolist.

Cournot Oligopoly

To calculate the optimum levels of output for each firm, we derive a function for profits and then differentiate it to find the maximum value.

$$\pi_A = Pq_A - MCq_A$$

Bertrand Oligopoly

Note that when firms set output by price, the best response function must always be written with p as the subject. The easiest way to solve these is to write a formula for profits, differentiate it and equate to zero to get maximum value.

Best Response for Firm 1:

$$RF_1(p_2) = \begin{cases} p_m & \text{if } p_2 > p_m \\ p_2 - \varepsilon & \text{if MC} < p_2 \leq p_m \\ \text{MC} & \text{if } p_2 < \text{MC} \end{cases}$$

Best Response for Firm 2:

$$RF_2(p_1) = \begin{cases} p_m & \text{if } p_1 > p_m \\ p_1 - \varepsilon & \text{if MC} < p_1 \leq p_m \\ \text{MC} & \text{if } p_1 < \text{MC} \end{cases}$$

Where p_m is the monopoly price, ϵ is an increment, and MC is marginal cost

Stackelburg Oligopoly

First calculate the best response function of the follower relative to the output of the leader, and then substitute this into the leader's *demand function* in order to solve for its optimal output. Note that when calculating a Cournot oligopoly we must independently calculate each firm's residual demand and then best response curves, and only substitute one into the other after we have derived each independently. For a firm with a first mover advantage, however, it can act before the other firm, and so totally internalise its actions into its own residual demand and best response function. This is why for a Stackelburg Oligopoly we substitute the best response function of the follower firm directly in the residual demand of the leader.

Monopolistic Competition

In the short run, problem is just like monopolist expect that we use residual demand instead of market demand: $p > AC > MR_R = MC$

In the long run ATC = P, so profits = 0. Owing to fixed costs and consequent barriers to entry, however, p > MC: $p = AC > MR_R = MC$

Taxes and Prices

- constant-cost: price rises by full amount of the tax
- increasing cost: price rises by less than increase in tax—but lower input prices

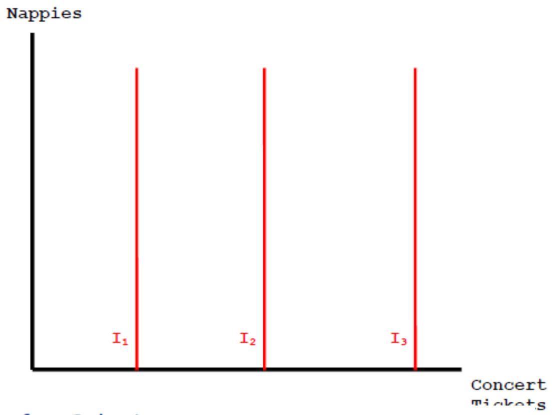
Graphs and Diagrams

Consumer Theory

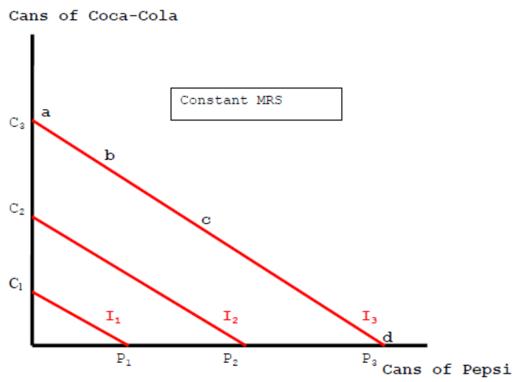
Special Indifference Curves

Lecture 3, slide 19

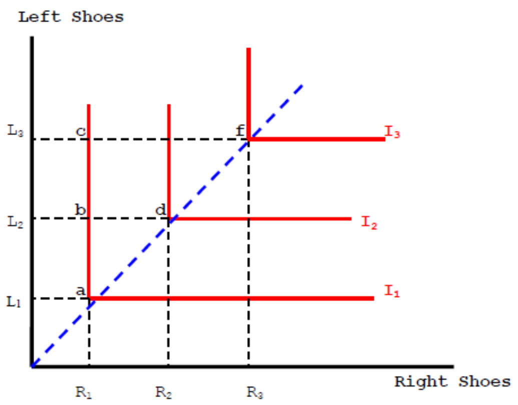
A Useless Good?



Perfect Substitutes

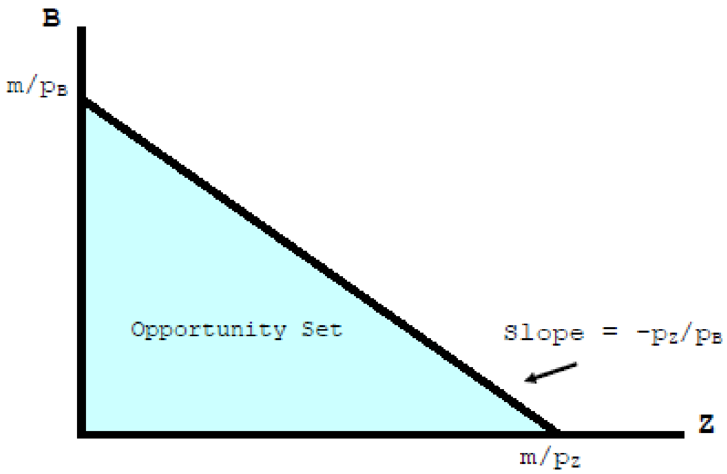


Perfect Complements



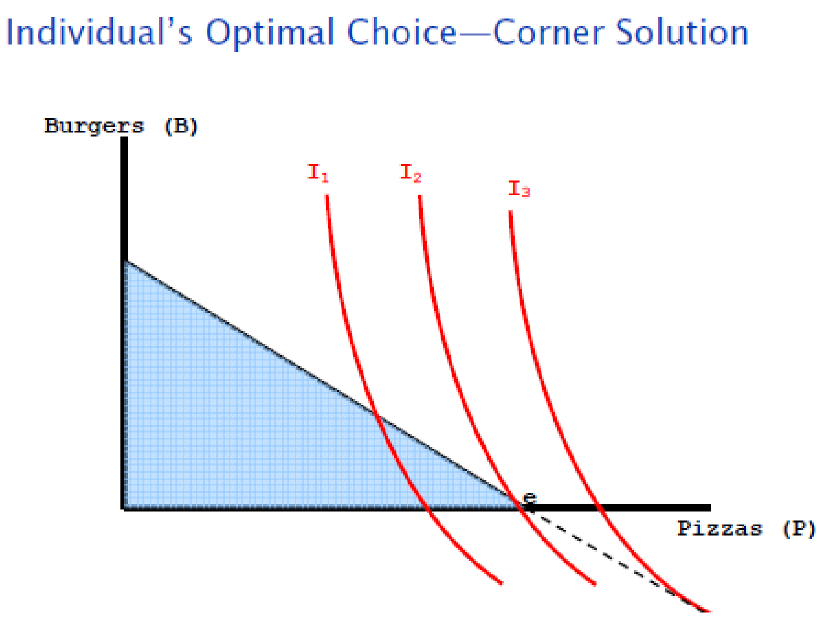
Budget Constraint

Lecture 4, slide 11



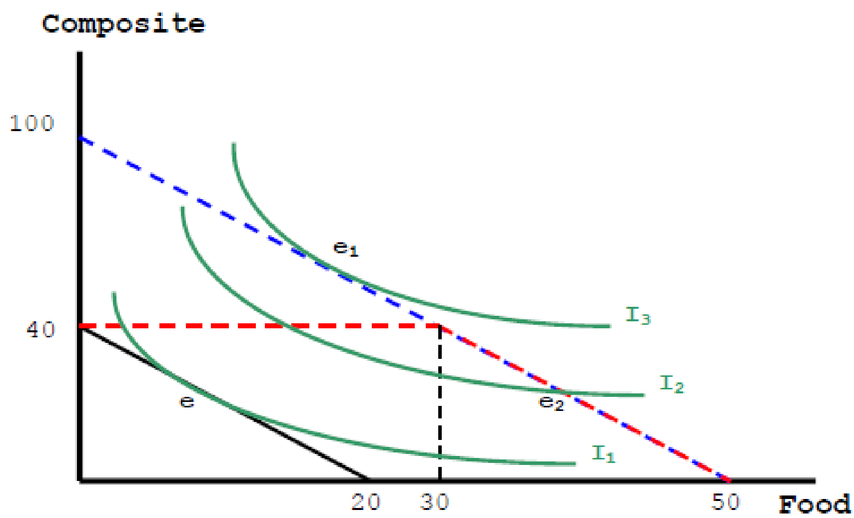
Corner Solution

Lecture 4, slide 19



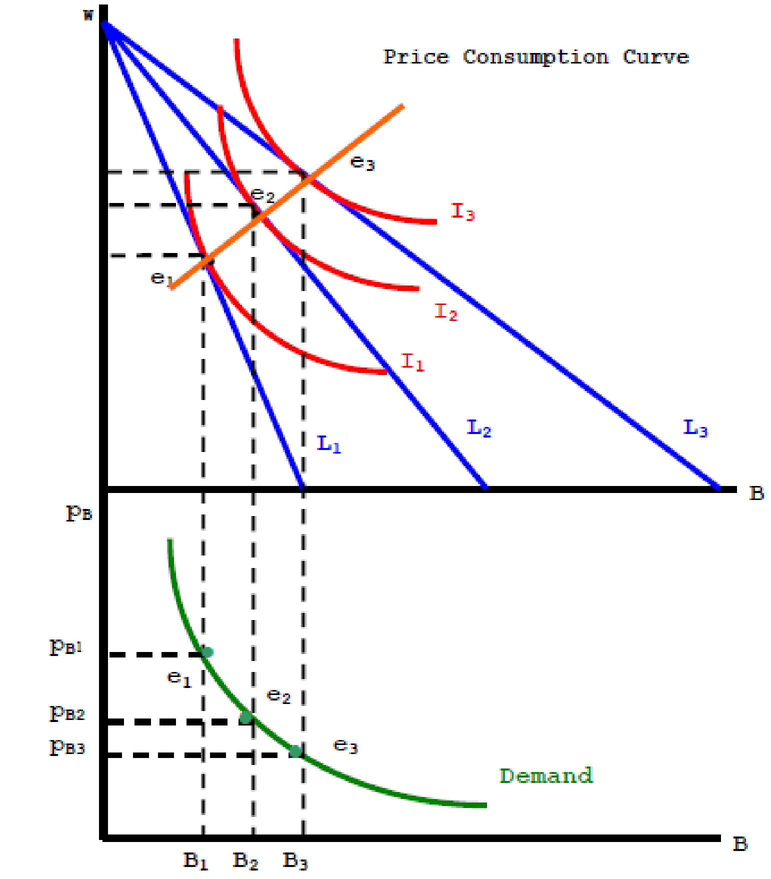
Cash Versus in Kind Transfers

Lecture 4, slide 24



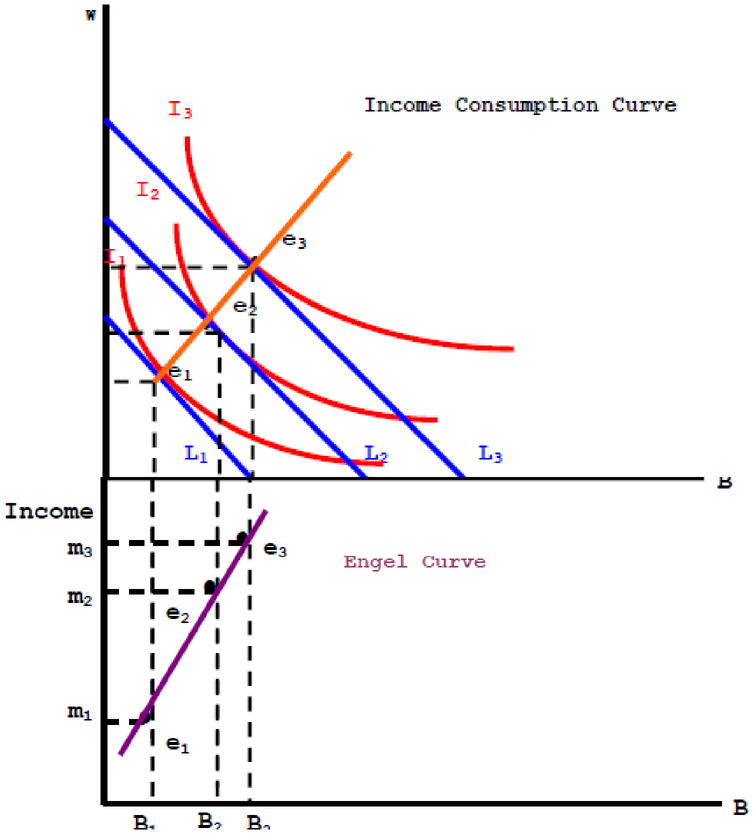
Price-Consumption and Demand Curve

Lecture 5, slide 6



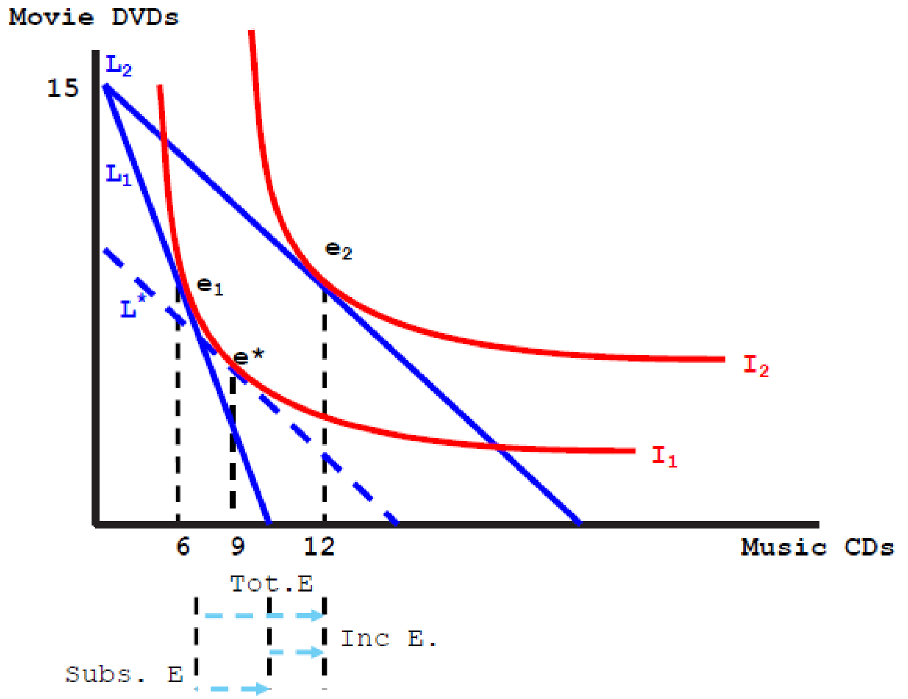
Income-Consumption and Engel Curve

Lecture 5, slides 8 & 10



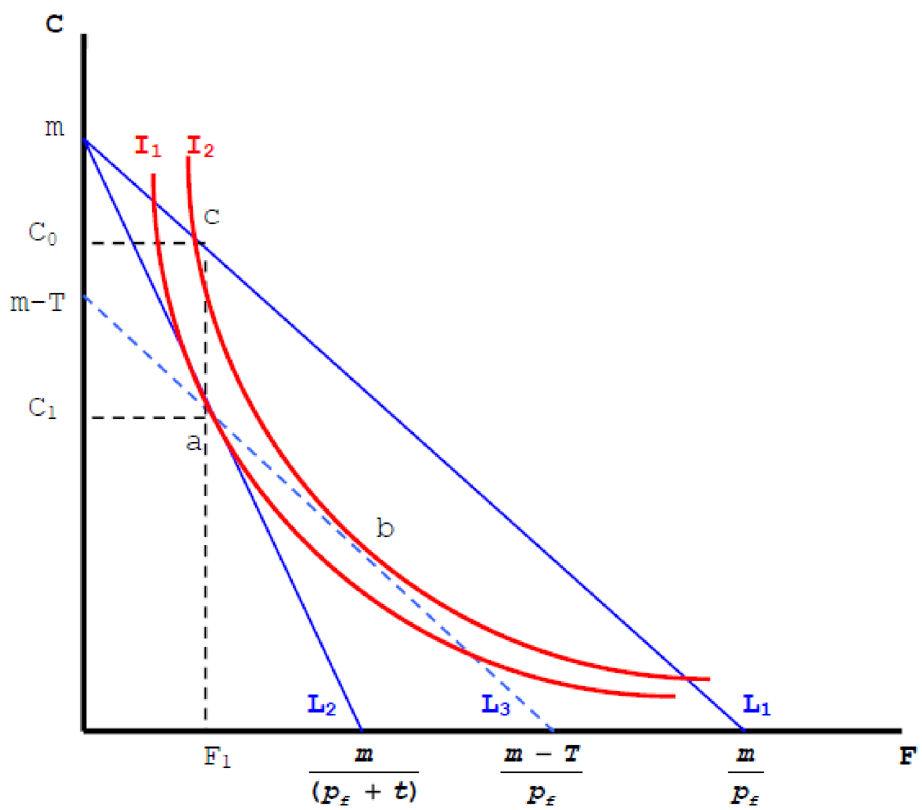
Income and Substitution Effects

Lecture 5, slide 17



Fully Labelled Indifference Curve

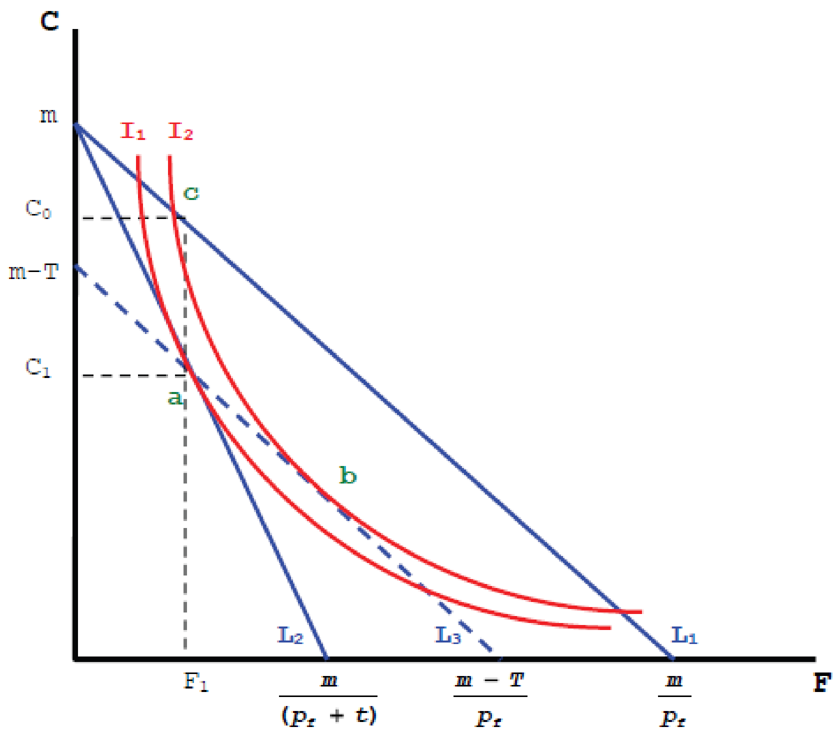
Lecture 6, slide 11, note that F stands for food



Applications of Consumer Theory

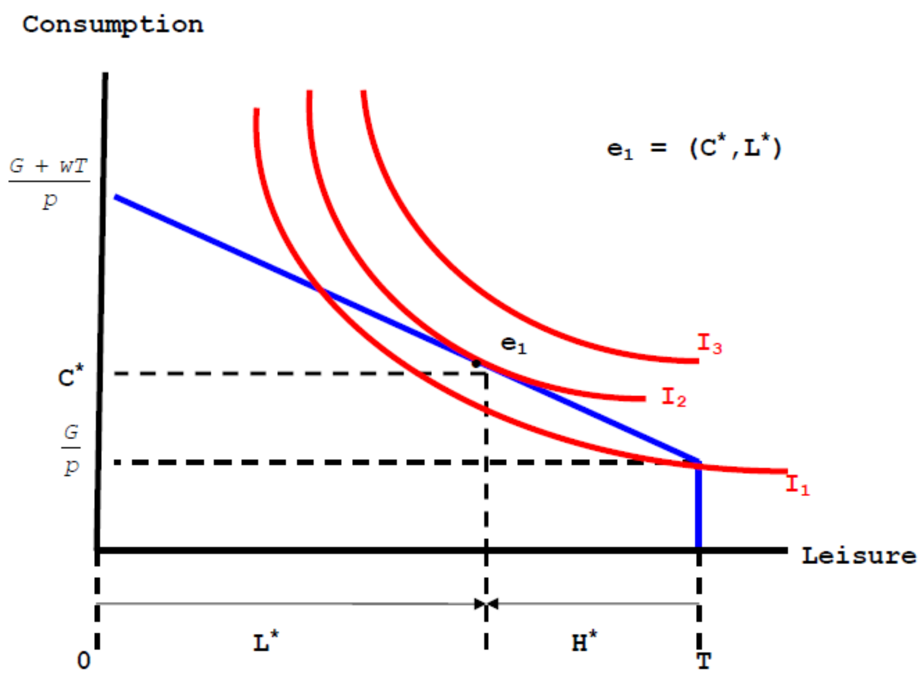
Per Unit or Lump Sum Tax

Exam 2009, B-1



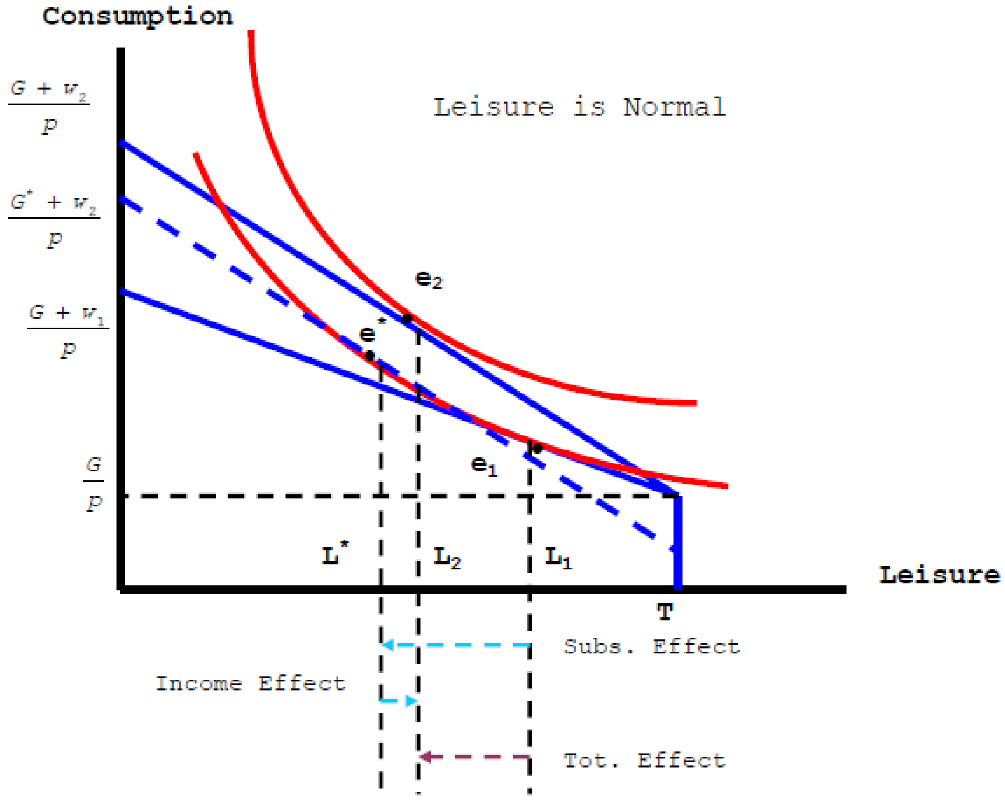
Labour-Leisure Market

Lecture 7, slide 9



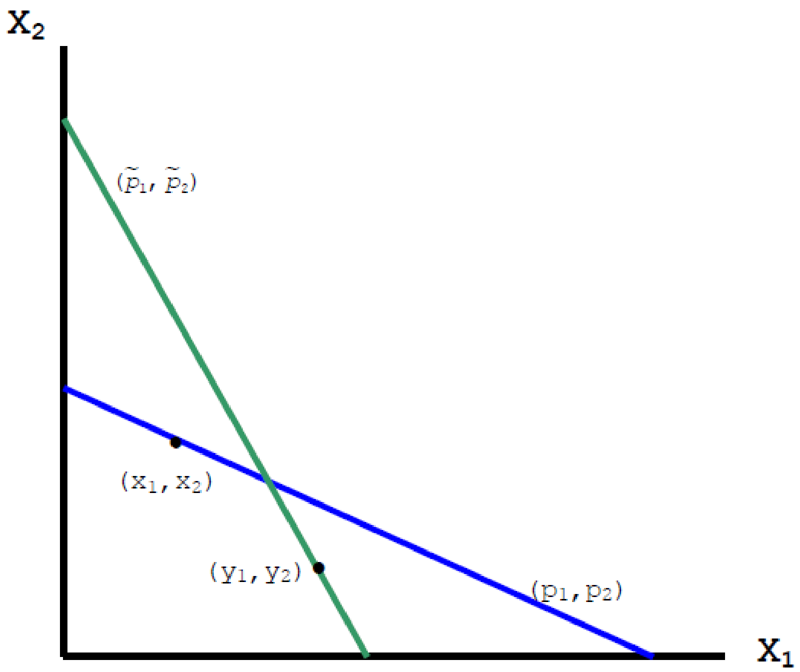
Leisure Normal

Lecture 7, slide 15



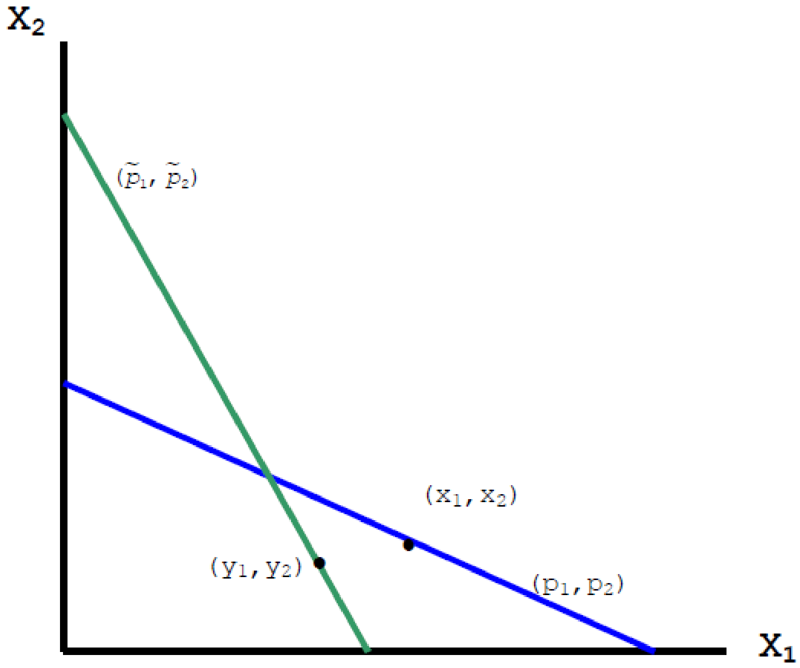
Inconsistent with WARP

Lecture 8, slide 6



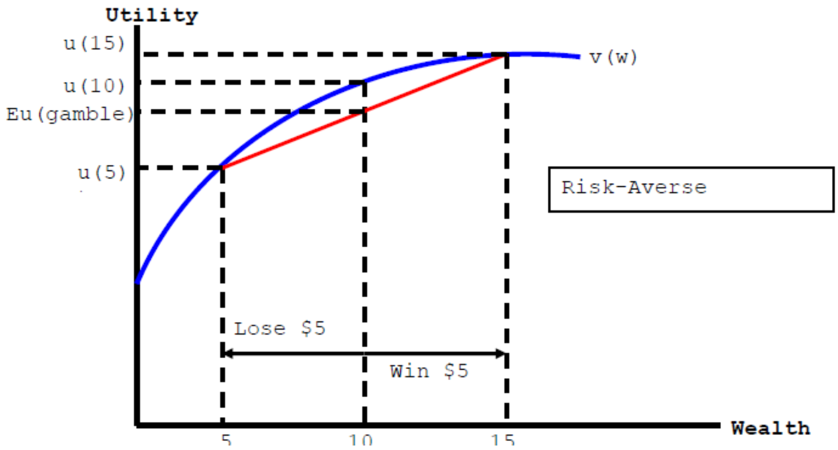
Consistent with WARP

Lecture 8, slide 9



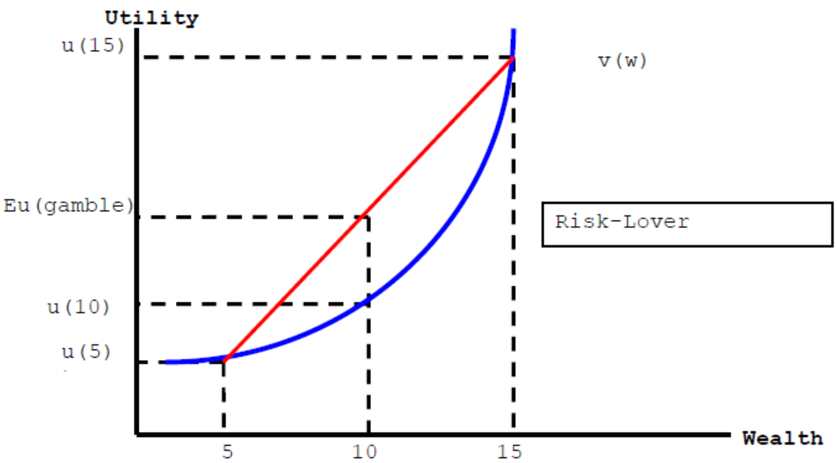
Risk Averse Individual

Lecture 8, slide 26



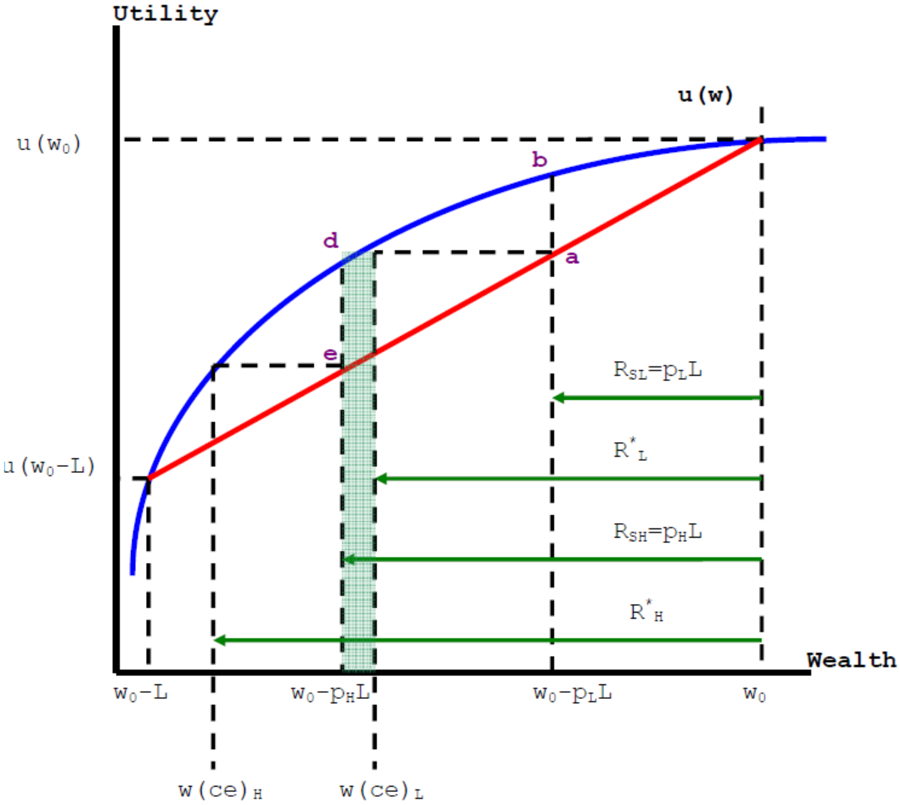
Risk Loving Individual

Lecture 8, slide 27



Insurance Market

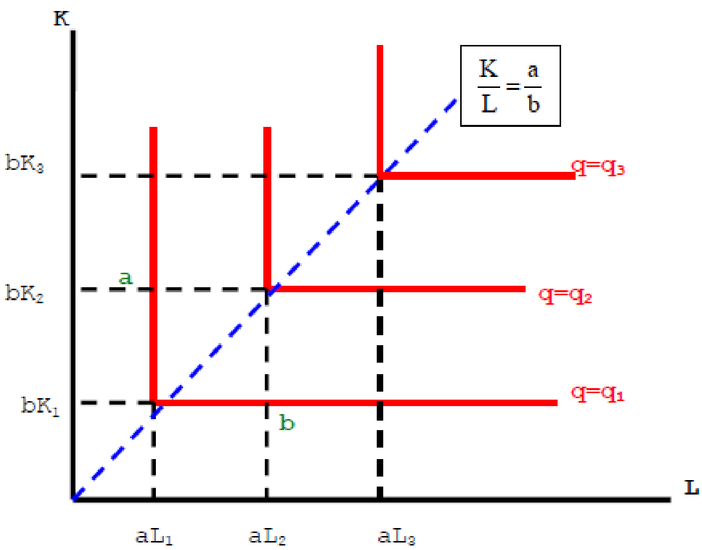
Lecture 9, slide 9



Production and Costs

Fixed Proportions Production Function

Lecture 10, slide 23 and Tutorial Solutions 5



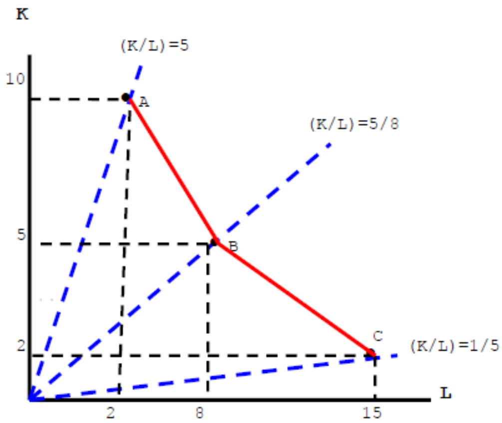
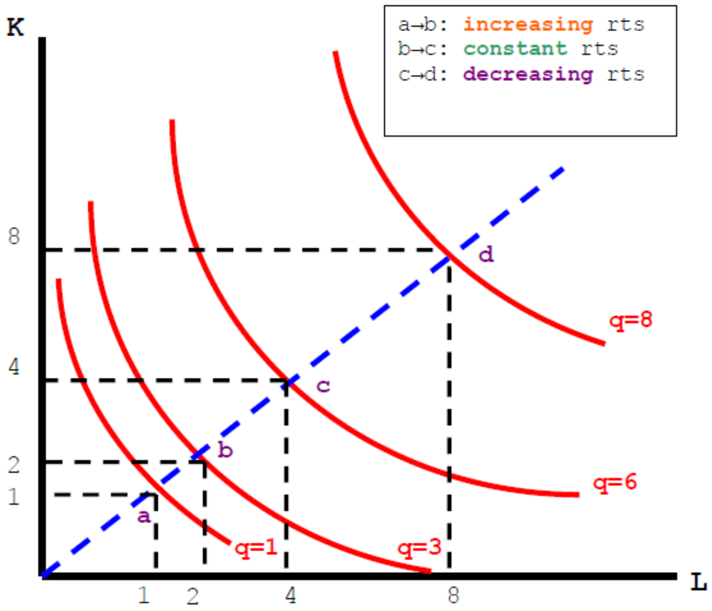


Figure 2: Question 2 (d)

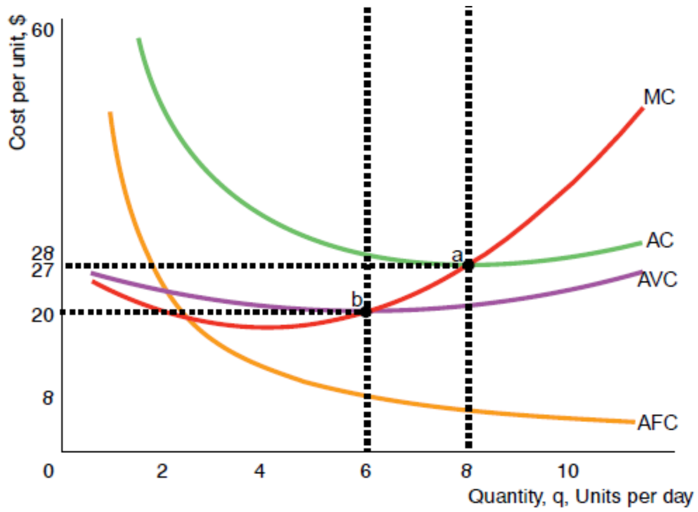
Varying Returns to Scale

Lecture 11, slide 8



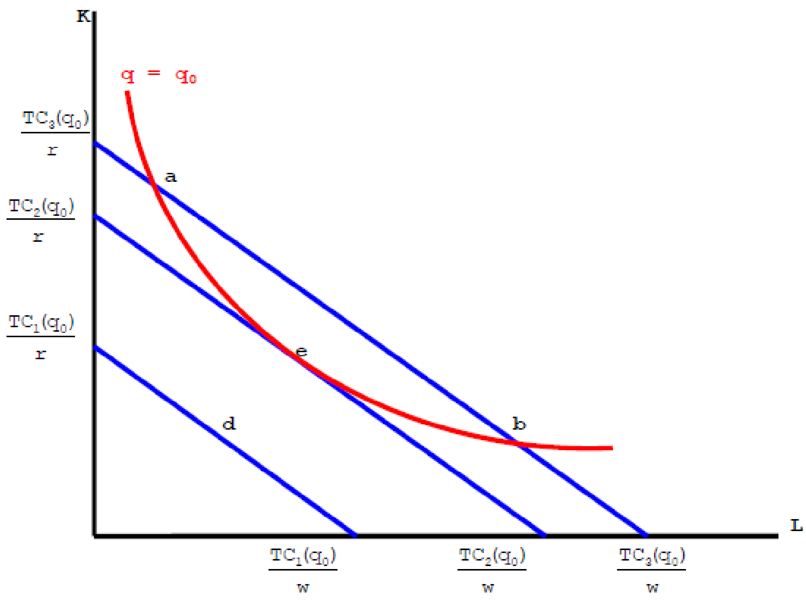
Short-Run Costs

Lecture 11, slide 18



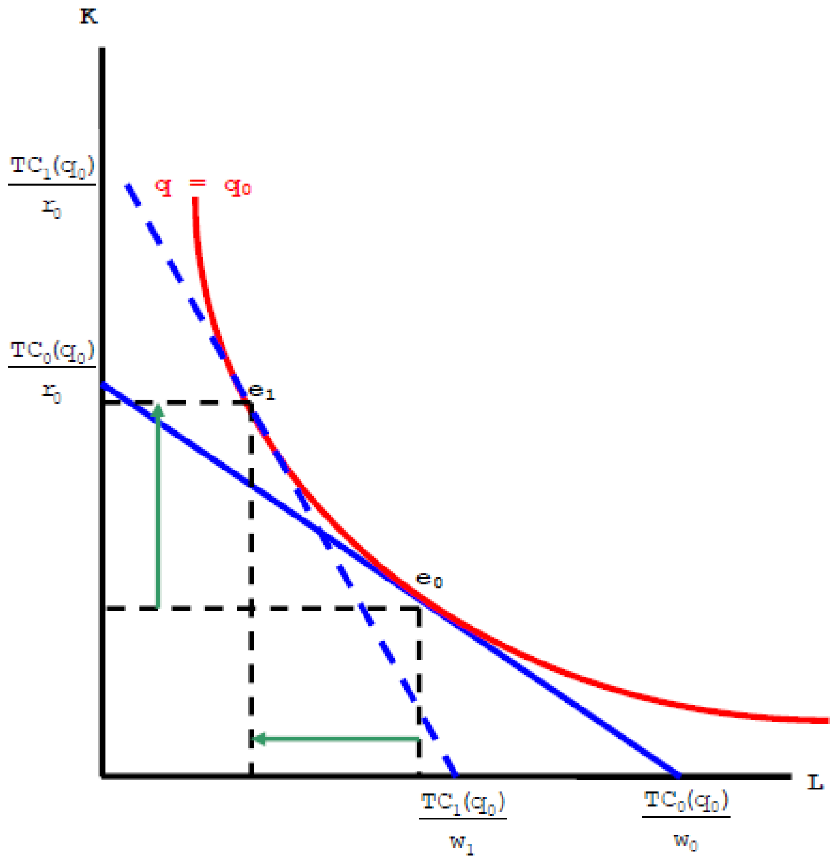
Cost Minimizing Input Bundles

Lecture 12, slide 14



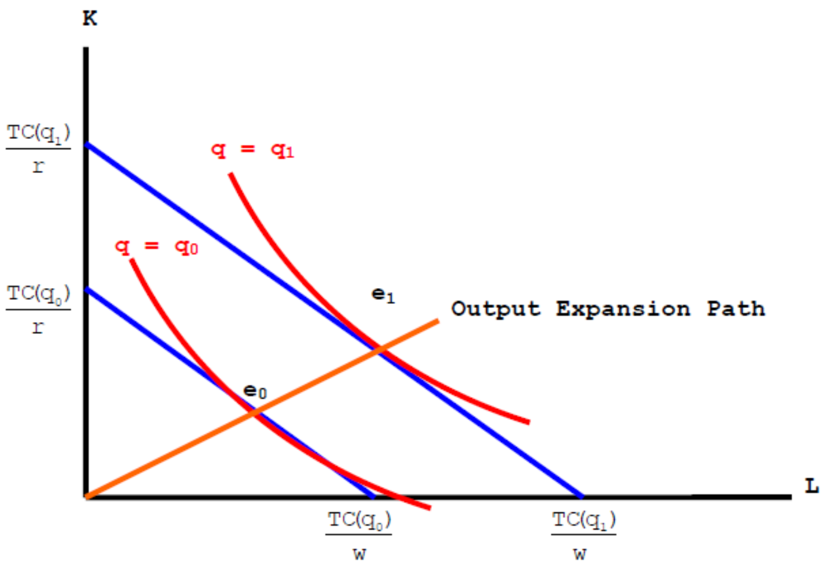
Change in Input Prices

Lecture 12, slide 28



Output Expansion Path

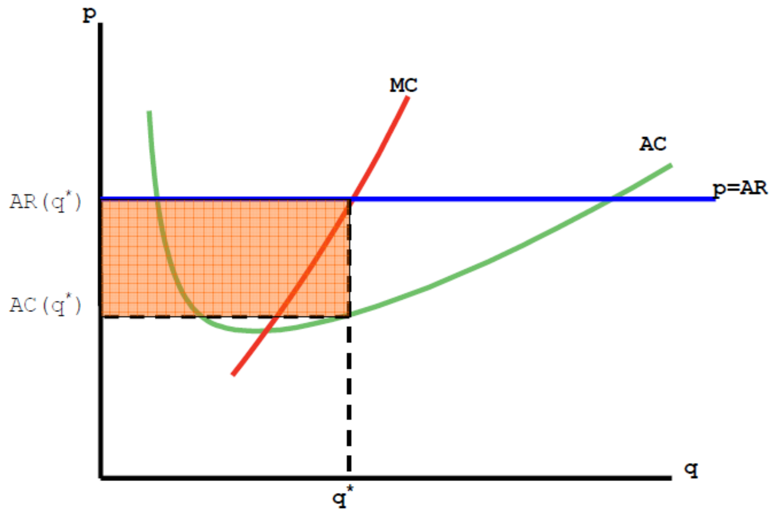
Lecture 12, slide 20



Perfect Competition

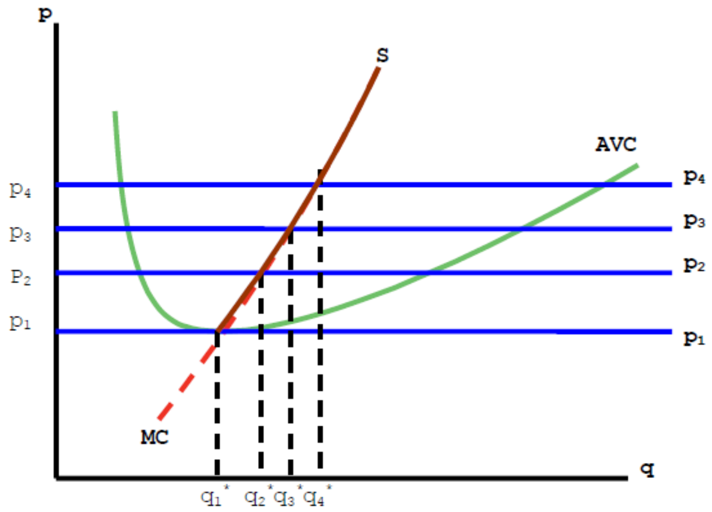
Short-Run Equilibrium

Lecture 13, slide 12



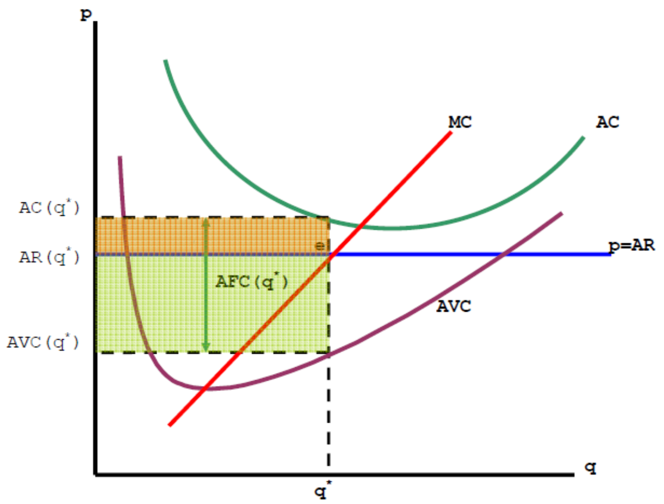
Short Run Supply Curve

Lecture 13, slide 19



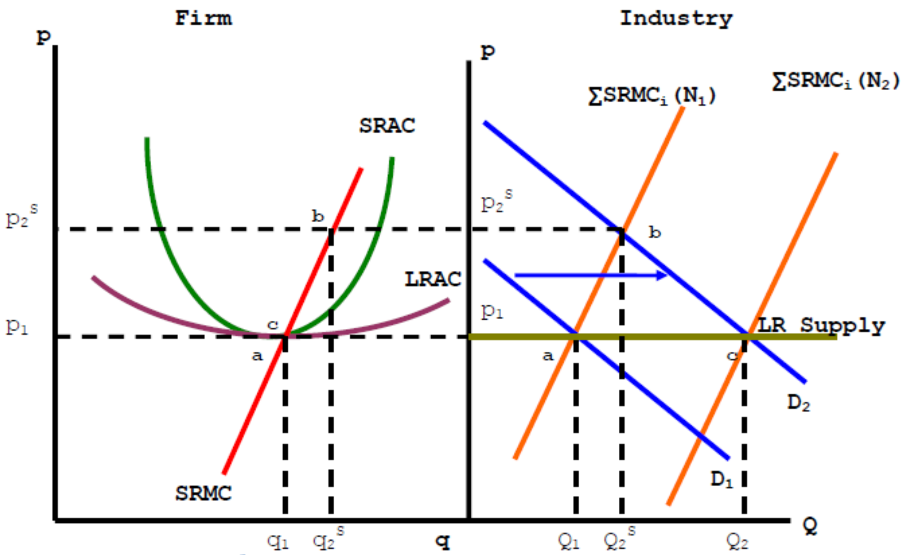
Making Losses

Lecture 13, slide 16



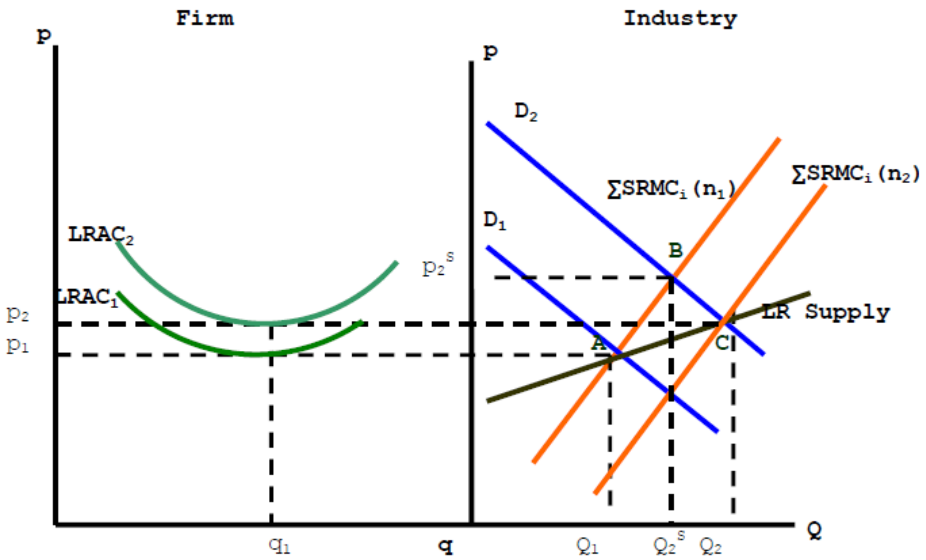
Constant-Cost Industry

Lecture 14, slide 8



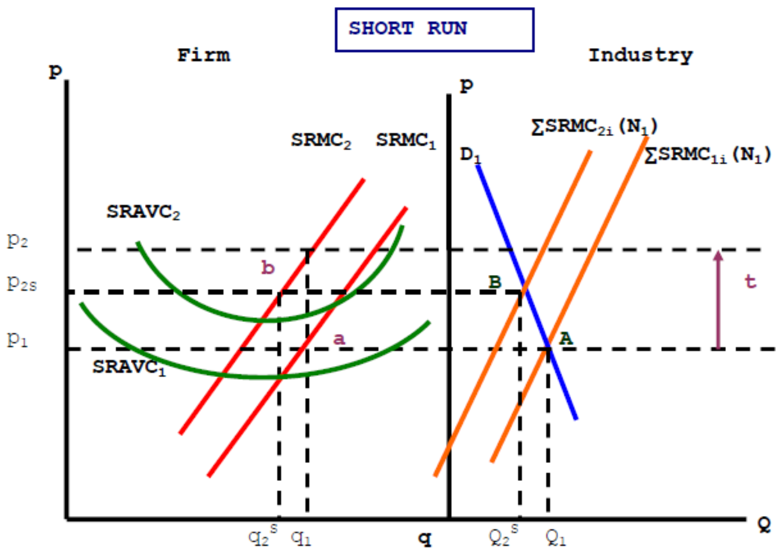
Increasing-Cost Industry

Lecture 14, slide 13



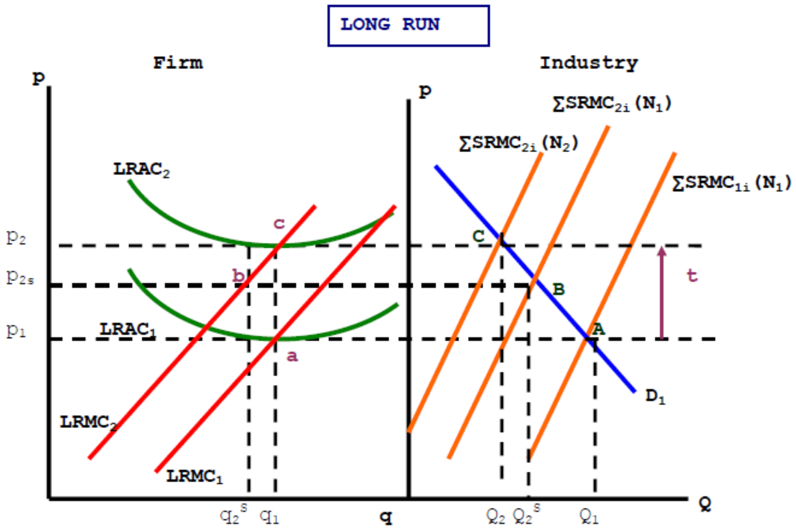
Short-Run Taxes

Lecture 14, slide 16



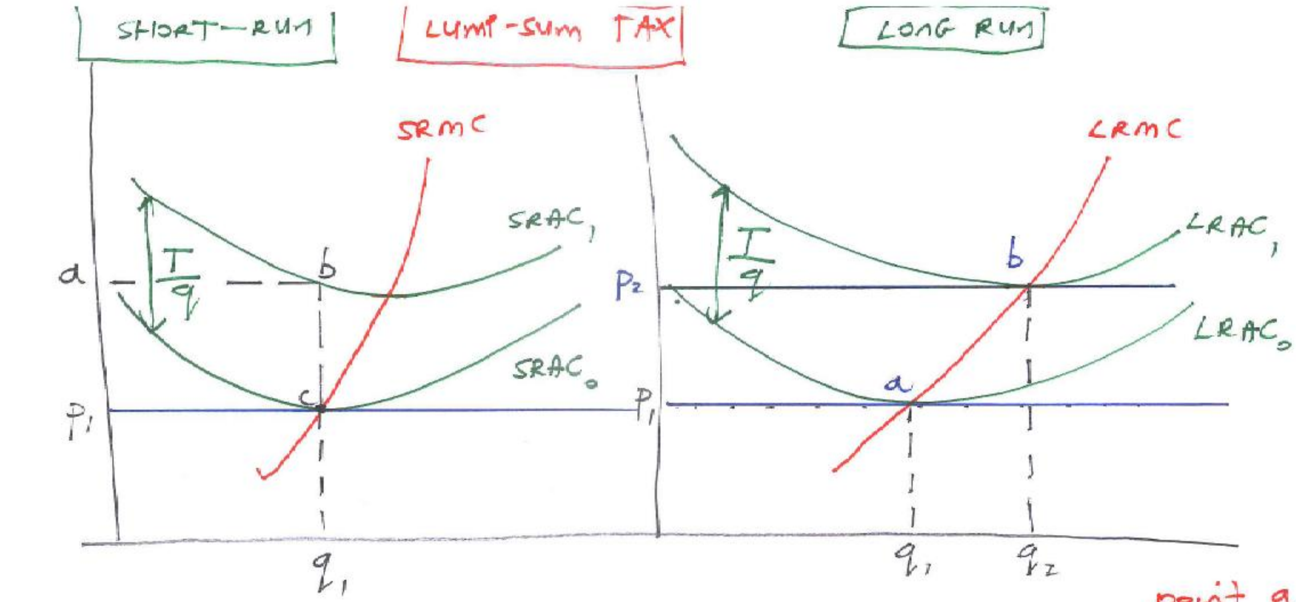
Long-Run Taxes

Lecture 14, slide 16



Lump Sum Taxes

Additional Notes



initially q_1: $p_1 = SRMC(q_1)$ point c

$p_1 = SRAC_0$

$\pi = 0$

now: $p_1 = SRMC(q_1)$

but $p_1 < SRAC_1 \longrightarrow$ Loss $= p_1abc$

EXIT

initially q_1: $p_1 = LRMC(q_1) = LRAC_0(q_1)$ point a

$\pi = 0$

SR losses induce exit until b

$p_2 = LRMC(q_2) = LRAC_1(q_2)$

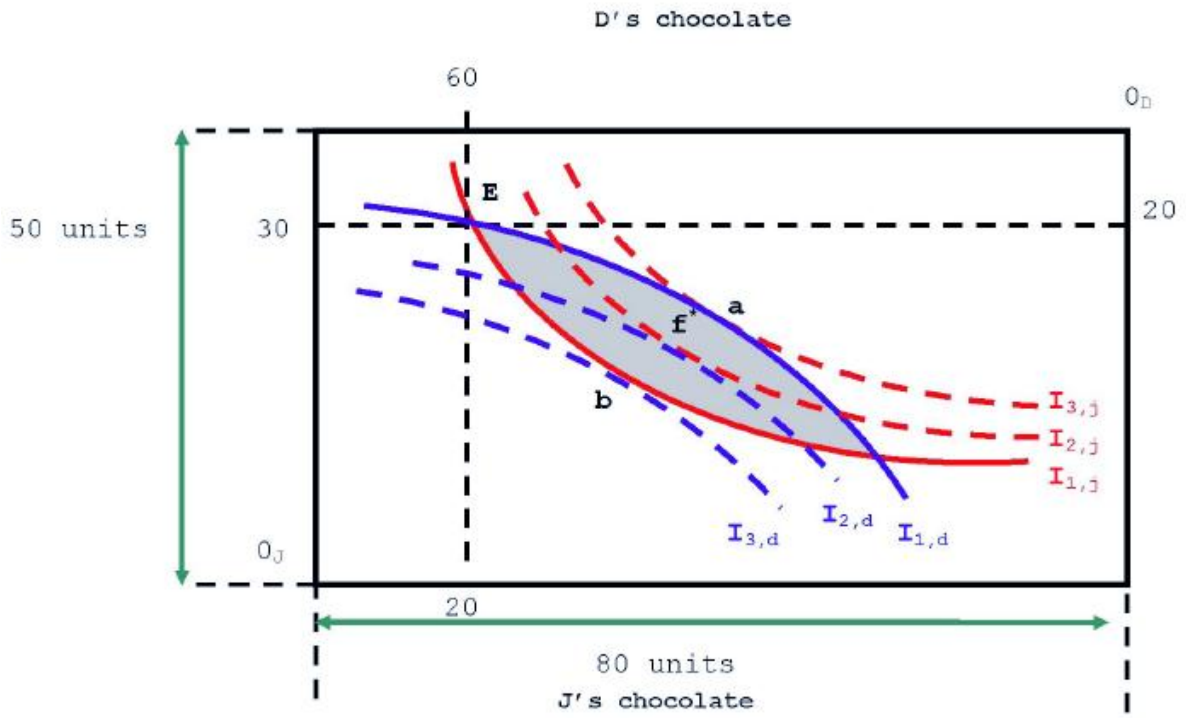
each firm produces more

industry output falls

General Equilibrium

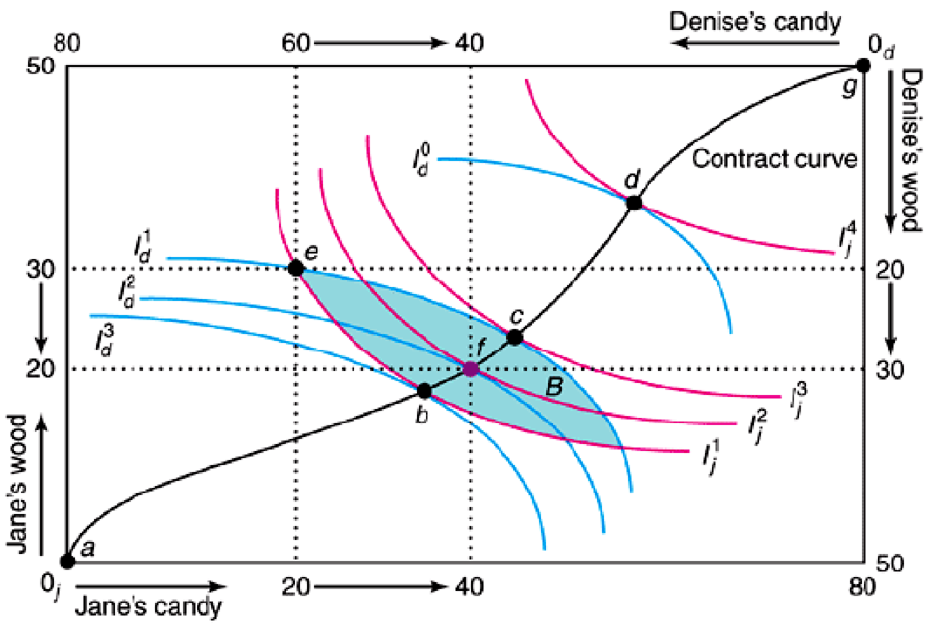
Endowments Market

Lecture 15, slide 15



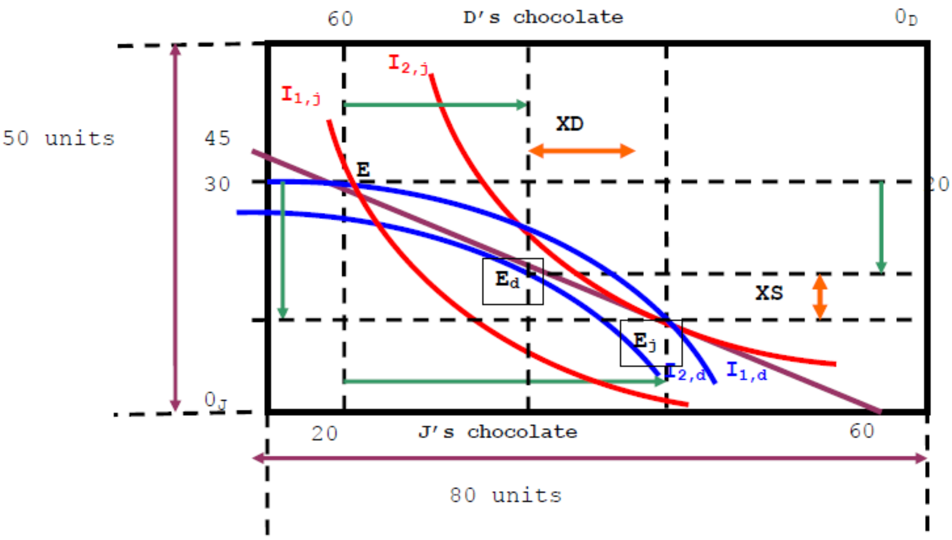
Contract Curve

Lecture 15, slide 20



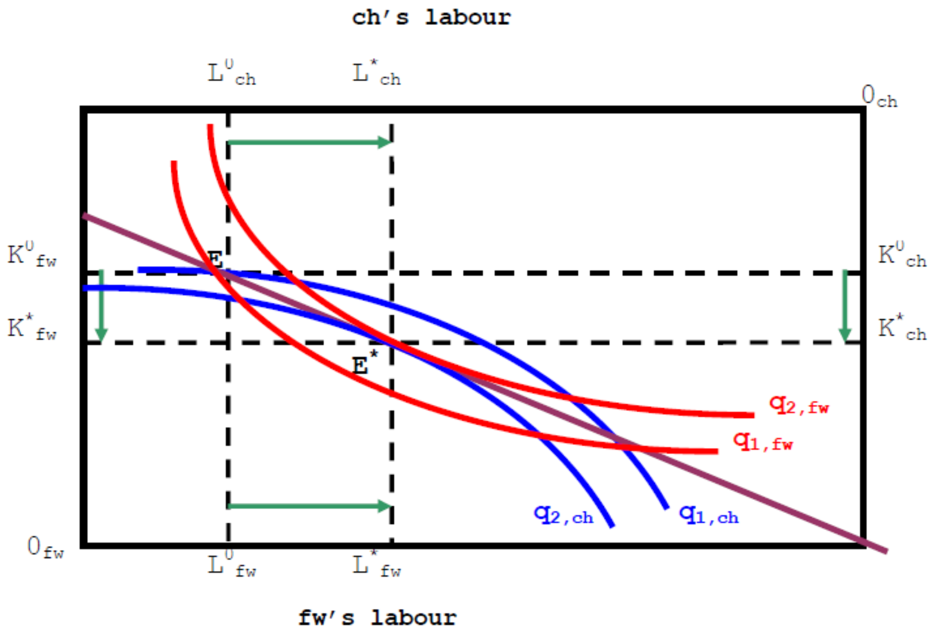
Non-Equilibrium

Lecture 15, slide 26



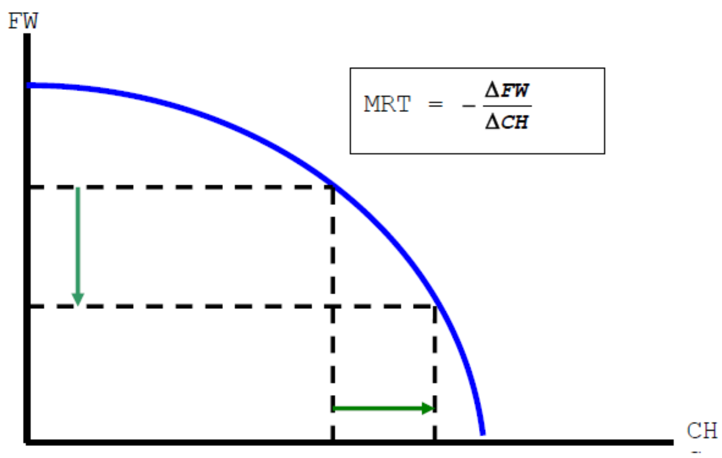
Production Equilibrium

Lecture 16, slide 12

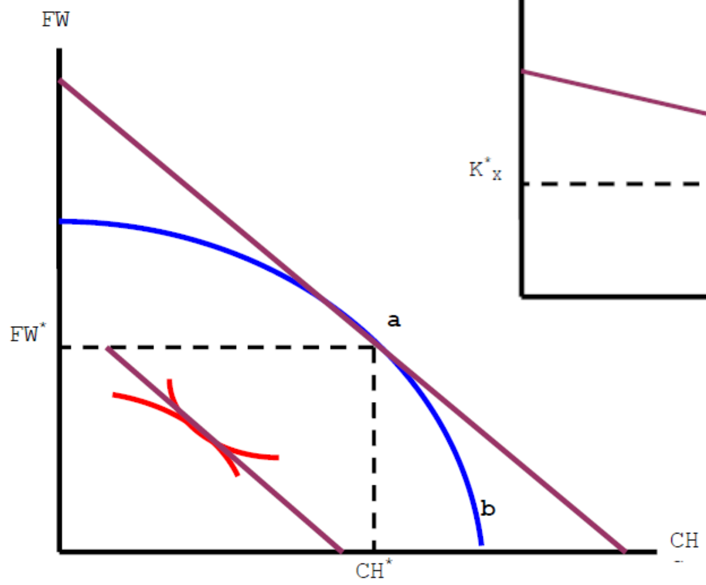


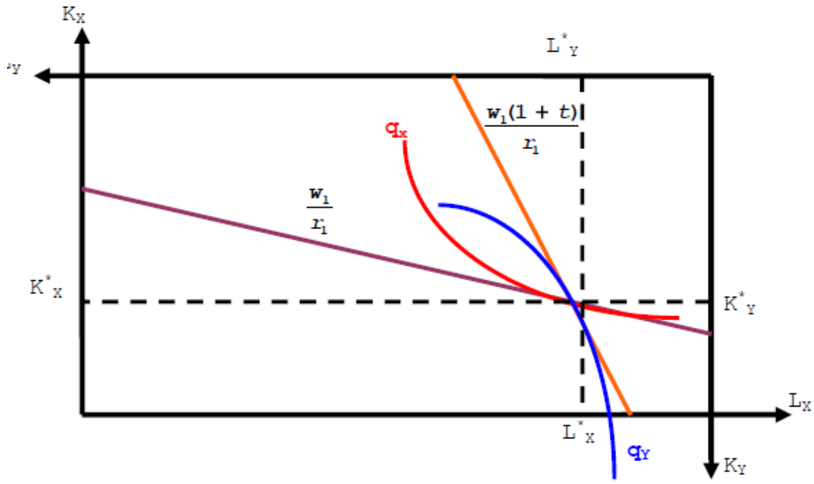
Production Possibilities Frontier

Lecture 16, slide 16



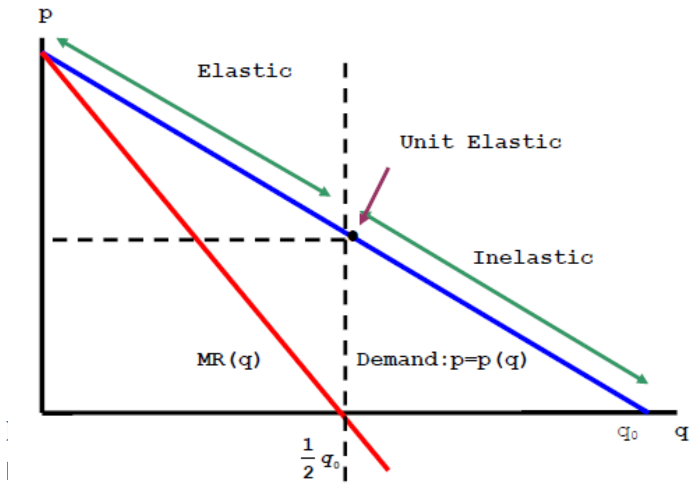
Efficient Product Mix
Lecture 16, slide 20

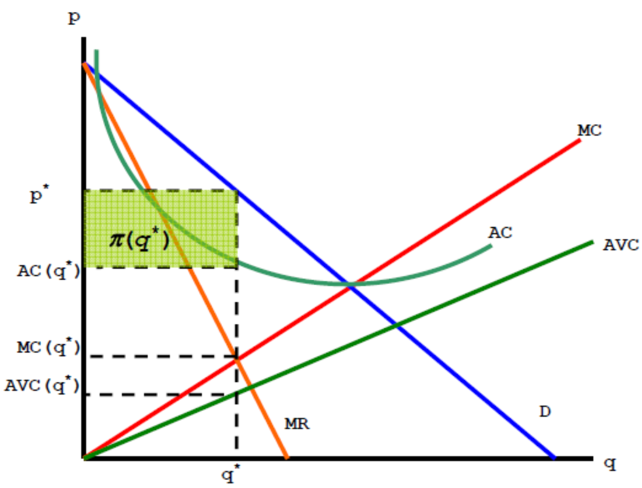




Market Structure

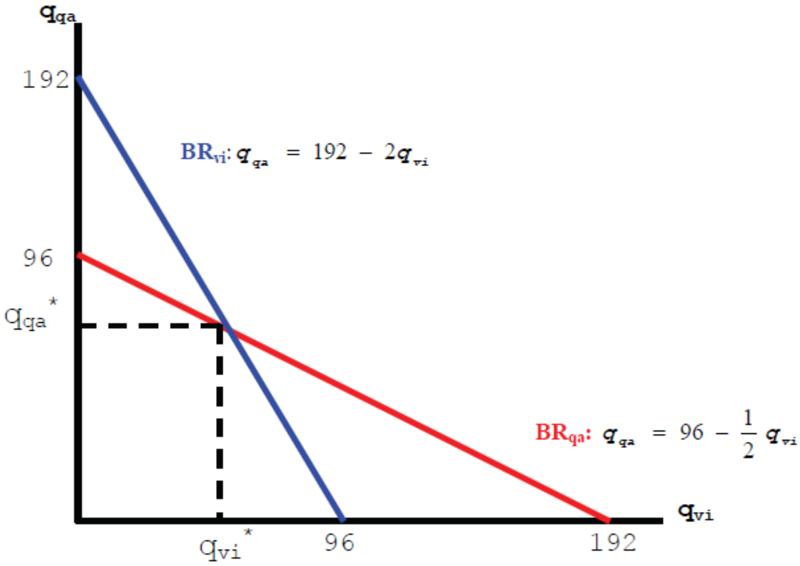
Monopoly Linear Demand Curve
Lecture 17, slide 10





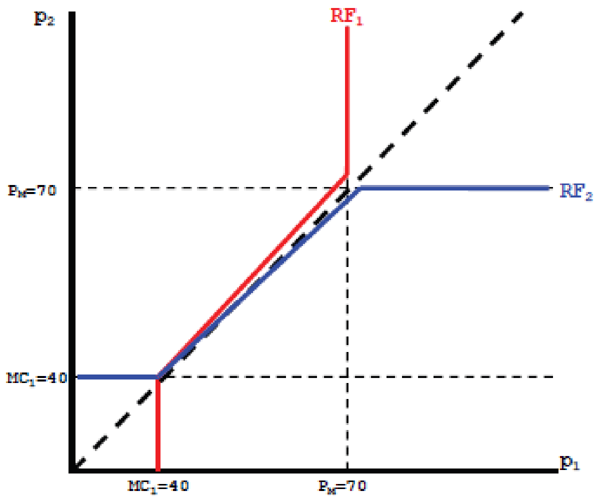
Cournot Duopoly

Lecture 19, slide 15



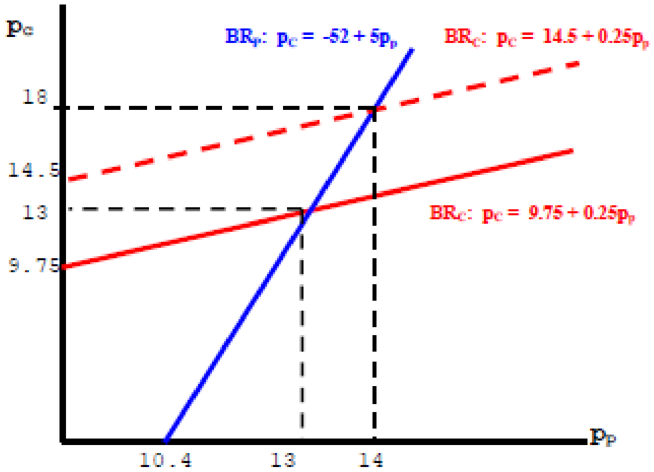
Bertrand Homogenous Products

Lecture 20, slide 12



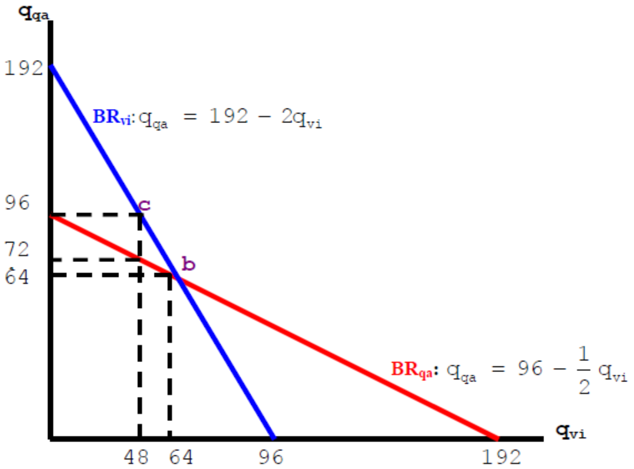
Bertrand Differentiated Products

Lecture 20, slide 17



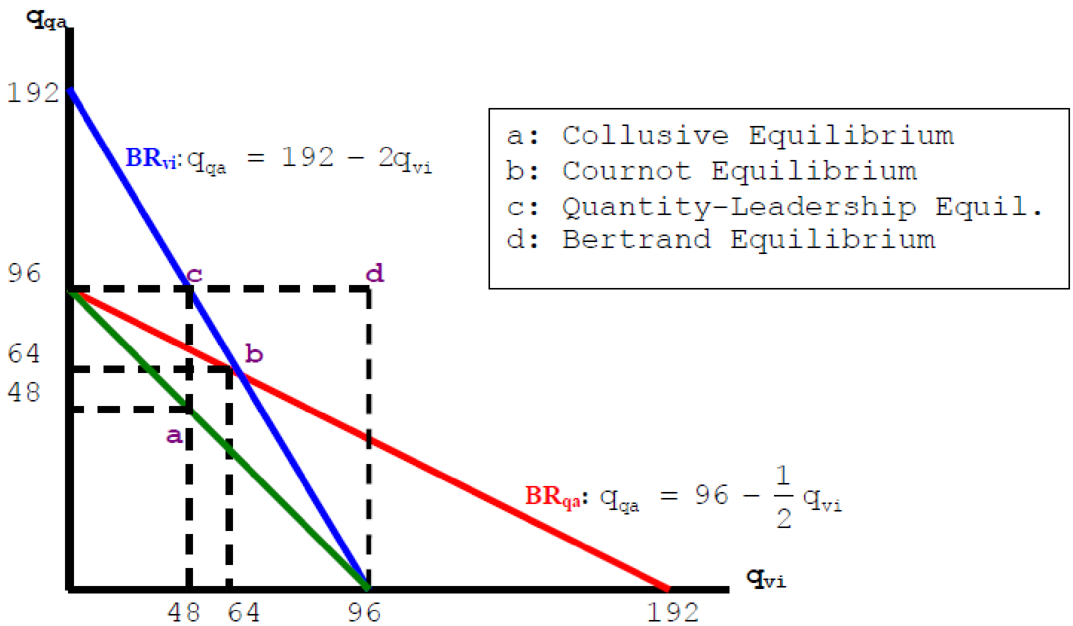
Stackelburg Sequential

Lecture 21, slide 12



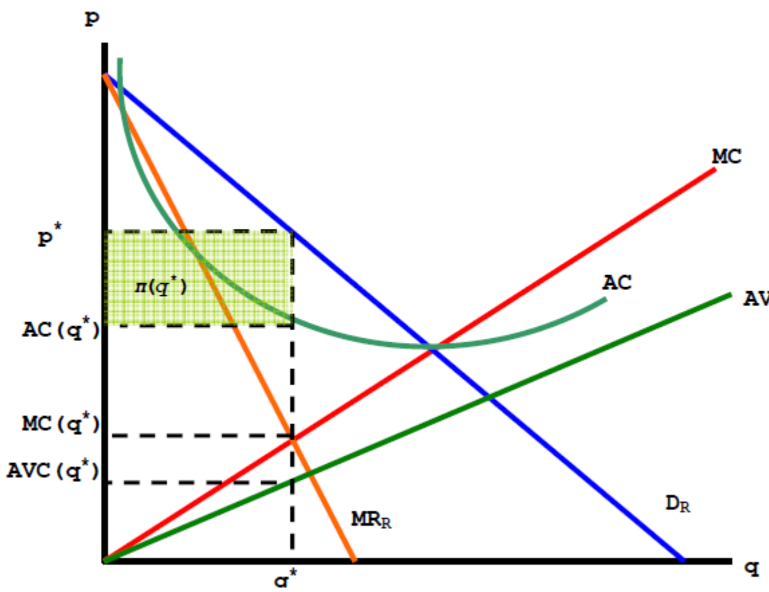
Comparing Models

Lecture 21, slide 14



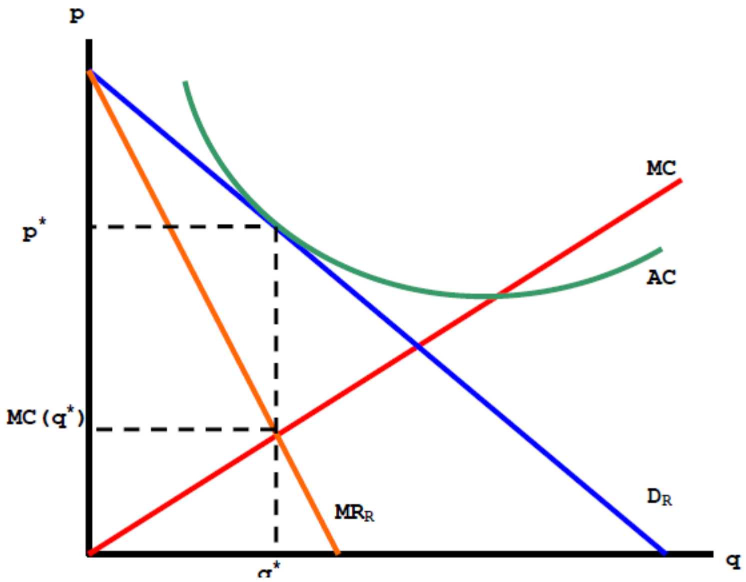
Monopolistic Short-Run Equilibrium

Lecture 22, slide 6



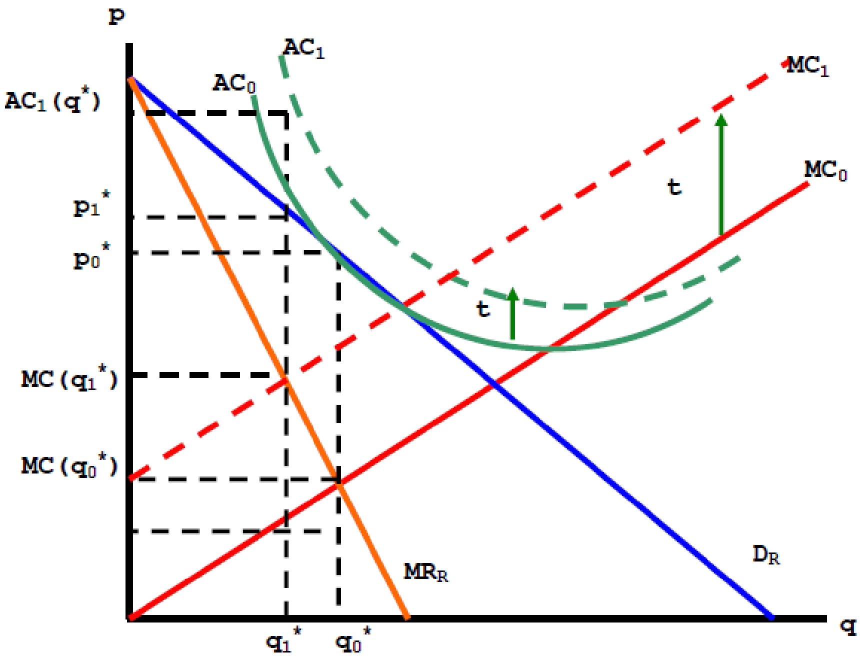
Monopolistic Long-Run Equilibrium

Lecture 22, slide 10



Monopolistic SR Taxes

Lecture 22, slide 16



Exam Tips and Notes

Tricky Questions

- Pink 2:3, Pink 3:3, Blue 4:3b, Pink 4:3, Pink 5:1c, Pink 5:2, Blue 6:2b, Pink 6:2 & 3, Pink 7:3, Pink 8, Blue 8, Pink 10, Blue 11:1 & 2, Pink 11:1

Types of Calculations

Part A: Supply and Demand

- Basic market equilibrium
- Effect of taxes on equilibrium

Part B: Consumer Theory

- Draw indifference curves and calculate MRS
- Write equation for and draw graph of budget constraint (including with non-constant price)
- Calculate if utility maximisation is satisfied
- Calculate consumer equilibrium and changes with taxes
- Plot income-consumption curve
- Plot Engel curve
- Calculate income elasticity
- Calculate and graph income and substitution effects
- Calculate and graph optimum consumption bundles with changing prices
- Plot wage leisure diagram
- Analyse effects of wage and tax changes on workforce participation
- Show tax revenue on wage diagram

Part C: Decision Making Under Uncertainty

- Construct bundle table to check consistency with WARP
- Calculate expected utility
- Model an insurance market
- Calculate preference for or against insurance

Part D: Production and Costs

- ** Mixing production methods
- Derive expressions for cost functions
- Derive expression for expansion path
- Determine the cost-minimizing labour and capital inputs
- Find equilibrium prices, outputs and supply curves for competitive firms
- Find equilibrium in short and long run

Part E: General Equilibrium

- Determine point of consumption efficiency in pure endowment economy
- Determine equilibrium of pure endowment economy
- Calculate formula for production possibility frontier
- Determine point of production efficiency in production economy

Part F: Market Structure

- Calculate profit-maximising output for monopoly, including with changes with taxes
- Calculate optimum responses and profit levels for collusive and Cournot oligopolies
- Fully model Bertrand strategic competition
- Fully model Stackelburg competition
- Fully model monopolistic competition

The Essential Formulae

$$\epsilon = \frac{\text{percentage change in quantity demanded}}{\text{percentage change in price}} = \frac{\Delta Q/Q_1}{\Delta p/p_1} = \frac{\Delta Q p_1}{\Delta p Q_1} = b\frac{p}{Q}$$

$$\text{tax incidence on consumers} = \frac{\Delta p}{\Delta \tau} = \frac{\eta}{\eta - \epsilon}$$

$$\text{If } \epsilon \text{ is constant, then with tax } \tau\text{: } Q_2 = \frac{p_1}{(tax\ incidence \times \tau\ ) + p_1} \times Q_1$$

$$\text{MRS of good } y \text{ for good } x = \frac{MU_x}{MU_y}$$

$$\frac{\Delta K}{\Delta L} = -\frac{w}{r} = -\frac{\text{MP}_\text{L}}{\text{MP}_\text{K}} = MRTS$$

$$TC = Lw + rK$$

$$MRS_A = -\frac{p_x}{p_y} = MRS_B$$

$$Risk\ Premium = Expected\ Wealth\ (from\ gamble) - Certainty\ Equivalent\ Wealth$$
$$R^* = EW - CEW$$

$$m_A = x_A p_x + y_A p_y$$

$$m_B = x_B p_x + y_B p_y$$

$$MRS_1 = -\frac{MU_{z_1}}{MU_{B_1}} = -\frac{p_z}{p_B} = -\frac{MU_{z_2}}{MU_{B_2}} = MRS_2$$

$$MRTS_1 = -\frac{\text{MP}_{\text{L}_1}}{\text{MP}_{\text{K}_1}} = -\frac{w}{r} = -\frac{\text{MP}_{\text{L}_2}}{\text{MP}_{\text{K}_2}} = MRTS_2$$

$$MRS = MRT$$

$$\text{price markup} = \frac{p - MC}{p} = -\frac{1}{N\epsilon_D}$$

$$MR = p \times \left[1 + \frac{s_i}{\epsilon_D}\right]$$

$$MR = \frac{dTR}{dq}$$

Points to Note

- Always look carefully at all multiple choice options
- Read the question very carefully
- Do math slowly and check over it
- Its called an iso-cost line, same output for lower cost!
- If collusive firms have different costs, pick the one with lowest MC – ignore fixed costs
- When calculating expected utility, probabilities always go outside the brackets of the function for calculating utility
- For calculating optimal dispersion of investments, incorporate return on safe asset into both good and bad scenarios before differentiating
- When calculating revealed preference, be sure to use the original prices for different bundles; best to put prices in the rows, bundles in the columns
- When doing a calculation using two different methods of production, sum the contributions of this input by each of the two production methods being used, weighted according to x, which is the proportion produced using the first production method
- If a firm sets is price, then to calculate marginal revenue its residual demand curve must be rearranged so that q is the subject, whereas if it sets quantity, it must be rearranged so that p is the subject (as these are the unknowns)
- For a market with dominant and fringe firms, first calculate the supply function for the competitive firms on the basis that their p = MC, and then substitute this into residual demand of dominant firm
- Gross effects refer to the situation as a whole, price and substitution effects both included, whereas net effects refer only to the substitution effect, with the income effect controlled for