I. Welfare

Producer Surplus: Area above S-curve (MC) & below p\*-line ʃq\*[p-MC(q)]dq = pq\*-VC(q\*)

Social Value: CS+PS=SV (max at competitive eq.) = ʃQ[D-1(Q)-S-1(Q)]dq = ʃQ[MB(q)-MC(q)] dq

DWL: loss of SV (result of restrictions that prevent attainment of CE i.e. Quota, required output, Price floor/ Ceiling, Tariff, etc.)

II. General Equilibrium

Edgeworth Box: 1)IC’s are tangent 2)Here there are no further gains from trade 3)Pareto Optimum: can’t make anyone better off with hurting someone else MRSA(C\*)=MRSB(C\*)=Px/Py (Contract Curve)

Autarky (no trade) optimum at MRS=MRT (FOC)

Steps for finding optimum production, consumption, and trade: 1)Find comparative adv. (MRTSA~MRTSB) 2)pick Q=(qa,qb) to max I=a+pb (I is an intercept) 3)Solve as usual (MRS=Pa/Pb and substitute into Budget line eq.)

III. Market Power

Operates either at Equilibrium of MC(q)=MR(q) (p\* determined by D-Curve) or q=0 (shutdown)

To find MR take D-1(q), multiply by q, take FOC; MC= FOC of C(q). Often produces DWL

Sources of Market Power: Sole owner of good (rare earth), Gov’t patent/licensing, Barriers to entry (Natural: industrial economies of scale, network externalities, scarce input)

Policy to deal w/ monopoly: remove barriers to entry, drop quotas &license hassles, set price ceilings

IIII. Factor Markets

Case 1) Perf. Competition: w=pMPL(q) where MRPL=pMPL, Solve for SR Demand for L(w) by finding MRPL, setting equal to w, and solving for L.

Case 2) Monopoly: MR=p(1+1/ԑ), substitute MR for p in all MRP expressions and proceed as before

Case 3) Monopsony: equilibrium where ME=D-curve (p\* determined by S-Curve); MEL=w(L)+L(dw/dL) (can also be found my multiplying S-curve by Q & taking der w.r.t Q),Max π at MRPL=ME

IV. Intertemporal Choice

-Slope of IC=MRS=1+MRTP (# of extra units of C1 to compensate for reducing C0 by a unit)

-Slope of PPF=MRT=1+MROI where marginal rate of Investment =f’(x)-1

-Slope of budget line= P0/P1= 1+r, where r=real interest rate; C0 1+rC1  (called borrowing when ∆C0>0, Lending when <0)

w=PV of C(c0,c1)=C0+C1/(1+r); C0-intercept of budget line through C

Pick Q to max w(x)=PV(q)…where r=MROI at optimal investment level x (interior solution)

Rule: Invest to max PV; PV increases (decreases) when MROI>r (<)

Fisher Separation Thm: Pick C to max U, r=MRTP at optimal interior consumption C (or borrowing b)

Rule: increase borrowing when r<MRTP (decrease)(>), at every optimum MRTP=r following sufficient borrowing/lending

Comparative statistics: r\* is increased by increased productive opportunities ( MROI) & increased impatience ( MRTP)

V. Externalities

Def: Cost or benefits to people not included in in a market transactions, A wedge between private &social cost or benefit MSC>(<)MPC or MSB<(>)MPB

Efficiency at MSC=MSB, self-interest eq. at MPC=MPB, can create DWL as people act in self-interest

Remedies: 1)Social Norms 2)Fines or Taxes 3)Privatize property 4)Quotas & regulations 5) Coase Thm (connected to #

I. Supply & Demand

Elasticity of y wrt x= (x/y)(∂y/∂x) or in log form (∂lny/∂lnx), range for D: (-∞, 0] S: [0,∞)

Demand Elasticity: **ξ**<-1 elastic, **ξ**=-1 unitary, 0> **ξ**>-1 inelastic; Supply Elasticity: 0< **ξ**<1 inelastic, **ξ**=1 unitary, **ξ**>1 elastic

Comparative Statics: dp/da = (-∂S/∂a)/(∂S/∂p+│∂D/∂p│) for supply shift, similarly for demand shift, then ∆p\* = (dp/da)∆a & ∆Q\*=(∂D/∂p)∆p\*

Determinants of D: Price of related goods, income, # of consumers, future expectations, tastes/preferences

Determinants of S: resource/price availability, government actions (taxes/regulations, subsidies), technology/productivity, # of firms, future expectations

Tax incidence: On consumers = ξS /( ξS - ξD) on suppliers = ξD /( ξS - ξD) \*multiply by tax size, t.

II. Consumer Choice & Demand

MRS = Slope of IC = -MU1/MU2 ;Marginal Utility = MUi= ∂U/∂qi Budget line slope = -p1 / p2

Constrained Optimization: maxq1 , q2 L = U(q1 ,q2) + λ( Y-p1q1-p2q2) take FOC’s and solve for q1 ,q2

Income Elasticity of demand: **ξ** = (∂Q/ ∂Y)(Y/ Q)

Consumer Surplus = CS = area below demand curve above price line.

For quasilinear utility, CS = u(q1\*) - p1q1\*; First-orderapprox: -∆CS = ∆p[q1] + [(∆p∆q) / 2]

III. Production, Cost & Supply

Returns to Scale for CES prod fn: q = (Kp + Lp)a/p IRS if a>1 CRS if a=1 DRS if a<1

MRTS = Slope of Isoquant = -MPL / MPK ; Slope of Isocost line = -w / r

Elasticity of Substitution: [%∆ K / L] / [%∆│MRTS│] = [∂ln(K/L)] / [∂ln(│MRTS│)]

Total C = FC + VC(q) MC = ∂C/∂q AVC = [VC(q)] / q] AC = C / q SRMC = w / MPL

Tangency condition: MPL / MPK = w/r = -MRTS i.e. slope of isocost = slope of isoquant; **min cost pt.**

λ= r /MPK = w / MPL = MC “equal bang for the $”

FC = sunk costs + avoidable costs ; in long-run, there are no fixed costs

Supply in SR = MC where it is upward-sloping above AVC ; with economic profit above AC

Supply in LR is perfectly elastic at min AC (unless industry-wide effects cause IRS or DRS).

Profit max at MC(q\*) = p (= MR(q\*) for competitive firms); Profit: π = R – C = R(q) – VC(q) – FC;

Avg Profit: π/q = P-AC

Expenditure avg Income Elasticity: **θ1** ξ1 + **θ2** ξ2 = 1

Important Characteristics of Competitive Markets: 1) Low barriers to entry 2) Homogenous products 3) Low transaction costs

Residual Demand: Dr(p) = D(p) – So(p) where Dr(p) : residual quantity demanded ,D(p): Total quantity demanded by market, So(p): Supply of other firms

Market elasticity: εi = ηε – (η – 1)η0 where η: number of identical firms, η0: elasticity of supply of each of the other firms

Profit: π = R – C → π(q) = R(q) – C(q) → π(q) = R(q) – VC(q) – FC

Avg Profit: π/q = P-AC

Total Output (in Long Run): Q = nq where n: number of firms, q: quantity firms supply