**PUBLIC ECONOMICS** ECS304G

- Prescribed material
  - Black, Calitz and Steenekamp 2011 (5th edition)
  - Study guide
    - note the chapters + sections of textbook demarcated for STUDY in study guide
    - additional study material in SG (eg sections 3.1 and 4.4 – see p7 of TL101)

- Approach to learning (see SG pxi)
  - The guide is the manual
    - in each SU: (1) read introduction to each section
    - (2) study the prescribed section in textbook indicated under STUDY
    - (3) test your knowledge using ACTIVITY
    - (4) repeat (1) to (3) … practice drawing diagrams
    - go to next section
  - Diagrams are very important
    - indifference curves and budget lines (axes measure 2 goods or services)
    - isoquants and isocost lines (axes measure capital and labour)
    - demand and supply curves (axes measure price and quantity of 1 good or service)
      - price elastic curves
      - price inelastic curves

EXAM PAPER 2014(1)

- FILL-IN PAPER (return to invigilator)
  - lines provided indicate “how much” to write – rough work at end of paper can also be used

- COMPULSORY SECTION A (3 questions = 40 marks) – covers whole syllabus
  - Question 1
    - = 5 questions x 1-3 marks each (define, describe, list, explain)
  - Questions 2 & 3 – SU 2 and 9
    - 15 marks each (discuss, explain)

- ELECTIVE SECTION B (3 from 5 = 20 marks each)
  - all questions have two sub questions

DIAGRAMS NB!

IMPORTANT ECONOMISTS: Pareto, Pigou, Coase, Niskanen, Bergson, Baumol, Wagner, Meltzer & Richard, Peacock & Wiseman, Musgrave & Rostow, Brown & Jackson, Tiebout, Laffer, Corlett & Hague, Ramsey

MODULE OUTLINE

- Section 1: **The role of government**

  - Benchmark model (su 1; ch 2)
  - Market failure
    - Public goods and externalities (su 2; ch3)
    - Imperfect competition (su 3; ch 4)
    - Equity and social welfare (su 4; ch 5)
  - Public choice and government failure (interest groups and rent seeking) (su 5; ch 6)

- Section 2: P**ublic expenditure**
  - Public expenditure growth (macro and micro explanations) (su 6; ch 7)
  - Poverty and income distribution (subsidies) (su 7; ch 8)

- Section 3: **The economics of taxation**

  - Tax equity (tax shifting and incidence) (su 8; ch 10)
  - Tax efficiency (excess burden) (su 9; ch 11)
  - Income taxation (work effort) (su 10; ch12)

- Section 4: **Fiscal federalism** (decentralisation and intergovernmental grants) (su 11; ch 17)

# CHAPTER 2 (STUDY UNIT 1)
# THE BENCHMARK MODEL

- In a perfect world - a limited role for government ("order functions").
- In the real world - a more comprehensive role for government. Why? In solving the economic problem the market fails in terms of
  - efficiency (Ch 2, 3 & 4)
  - equity (Ch 5)

- Allocative efficiency (a normative approach)
  - measure is Pareto norm - where it is impossible to increase utility/output of one person/sector without reducing that of another,ie, utility (of consumers) is maximised and output (of producers) is maximised
  - it occurs where three conditions hold
  - ➢ efficiency in consumption ($MRS^{a}_{xy} = MRS^{b}_{xy} = P_x/P_y$)
  - ➢ efficiency in production ($MRPT_{xy} = MCx/MCy = P_x/P_y$)
  - ➢ simultaneous (market) equilibrium, ie, where $MRS^{a}_{xy} = MRS^{b}_{xy} = MRPT_{xy} = P_x/P_y$

[perfect competition ensures conditions are met]

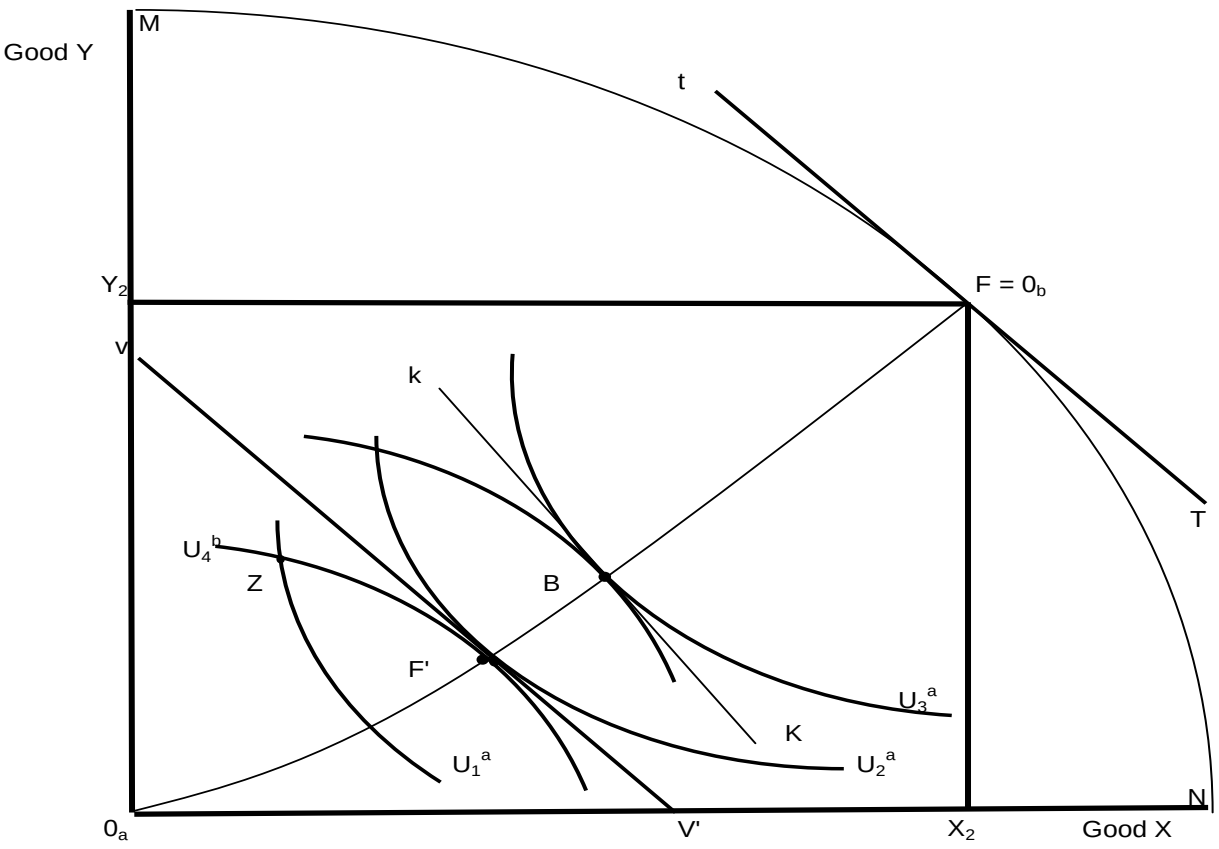
What should you be able to do?:

1. state 3 conditions and describe … eg. Condition (1): efficiency in consumption is where $MRS^{a}_{xy} = MRS^{b}_{xy}$ implying it is impossible to increase utility of person A without decreasing the utility of B
2. illustrate & explain simultaneous equilibrium… see fig 2.4

SIMULTANEOUS (MARKET) EQUILIBRIUM (fig 2.4)

- slope of tangent to PPC (Tt) indicates MRPTxy = MCx/MCy = **Px/Py** … see eq (2.5)
- slope of tangent to indiff curves (Vv) indicates $MRS^{a}_{xy} = MRS^{b}_{xy}$ = **Px/Py** ….see eq (2.6)
- since relative price ratio is = in both equations $MRPT_{xy}$ = MCx/MCy = **Px/Py** = $MRS^{a}_{xy} = MRS^{b}_{xy}$… see eq (2.7)

- allocative efficiency (points F and F')
  - requires productive efficiency and consumption efficiency (ie slopes of Vv and Tt =)… point B?... gains from exchange possible until MRPT = MRS
  - occurs at different distributions of income

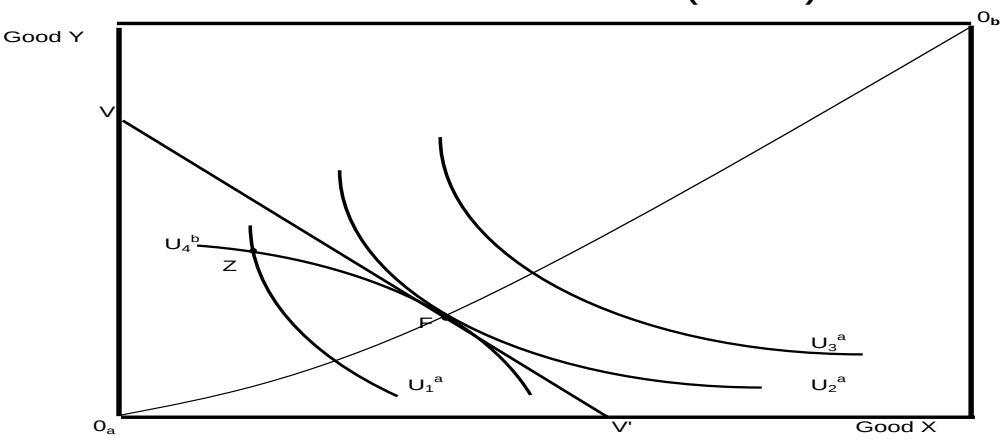

Good Y
M
t
$Y_2$
$F = 0_b$
V
k
T
$U_4^b$
Z
B
F'
$U_3^a$
K
$U_1^a$
$U_2^a$
N
$0_a$
V'
$X_2$
Good X

# The theory behind fig 2.4 (“read”)

1 EQUILIBRIUM (or efficiency) IN **CONSUMPTION**

Use Edgeworth Box (2 goods, 2 individuals) and indifference curves to show that perfect competition ensures efficiency (see consumption box inside fig 2.4) – **utility functions** are plotted inside box:

- individual max utility (highest indiff curve)
  - ➢ slope of indiff curve = MRSxy
- minimises costs (budget constraint)
  - ➢ slope of budget line = -Px/Py …slope is “rise over run” … ( $\frac{\frac{I}{Py}}{\frac{I}{Px}}$ ) = price line v’v
- where slope of indiff curve = slope of budget line individual max utility i.e. MRSxy = Px/Py
- consumers face same Px/Py under perfect competition
- if Px/Py differs between consumers they can increase utility through exchange… point Z to F
- at point F indiff curves are tangent… cannot increase utility of one person… $MRS^{a}xy = MRS^{b}xy =$ **Px/Py** ……(1)
- contract curve is derived (0a0b)



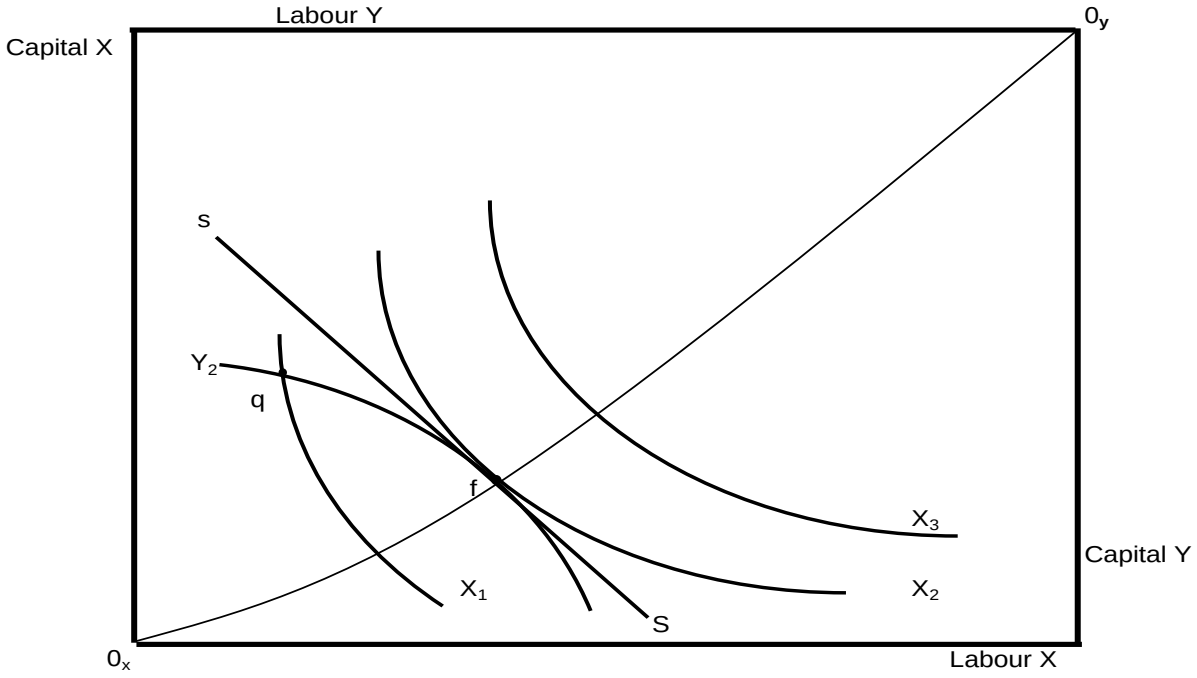
2 EQUILIBRIUM IN PRODUCTION

**Step 1**----- derive contract curve

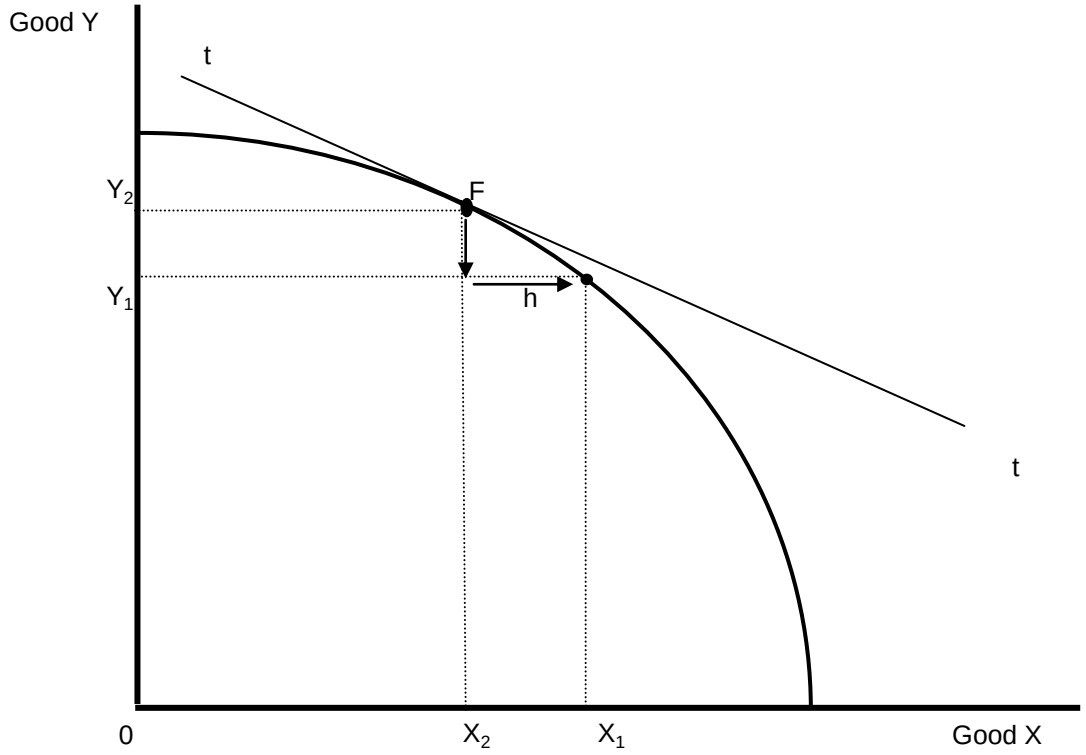
Use Edgeworth Box (2 goods, 2 factors) to show that perfect competition ensures Pareto efficiency (fig 2.2) – **production functions** plotted inside box:

- firm X maximise output (highest isoquant)
  - slope of equal "output" curve = $MRTS_{lk}$
- firms minimise cost (lowest isocost curve)
  - slope of equal cost curve = w/r (relative factor price ratio... wage/implicit rental value of capital)
- where isocost curve is tangent to isoquant firm produces and $MRTS^{x}_{lk}$ =w/r
- producers of X and Y face same w/r under perfect competition
- if w/r differs between producers they can increase production… eg point q to f
- at point f isoquants are tangent (slopes =) … production is Pareto optimal… cannot increase output…$MRTS^{x}_{lk} = MRTS^{y}_{lk} = w/r$

- contract curve is derived (0x0y)



**Step 2**----- derive PPC from contract curve... (fig 2.3)




**Step 3**----- derive equilibrium condition for production

- using PPC fig 2.3 assume change from F to h
- if output of X increases ($\Delta X$) by 1 unit, the extra cost or resources used is the distance $Y_2Y_1$ denoted as MCy… or $\Delta X$ = MCy……(2)
- similarly if Y increases ($\Delta Y$) by 1 unit the extra cost is $X_2X_1$ … or $\Delta Y$ = MCx.....…(3)
- we know MRPT = slope of PPC and slope is the "rise over run", that is ($\Delta Y/\Delta X$).....(4)
- thus from (3) and (2) $\Delta Y/\Delta X$ = MCx/MCy…… (5)
- then $\Delta Y/\Delta X$=MRPTxy=MCx/MCy.....(6)
- under perfect comp MCx = Px and MCy = Py thus

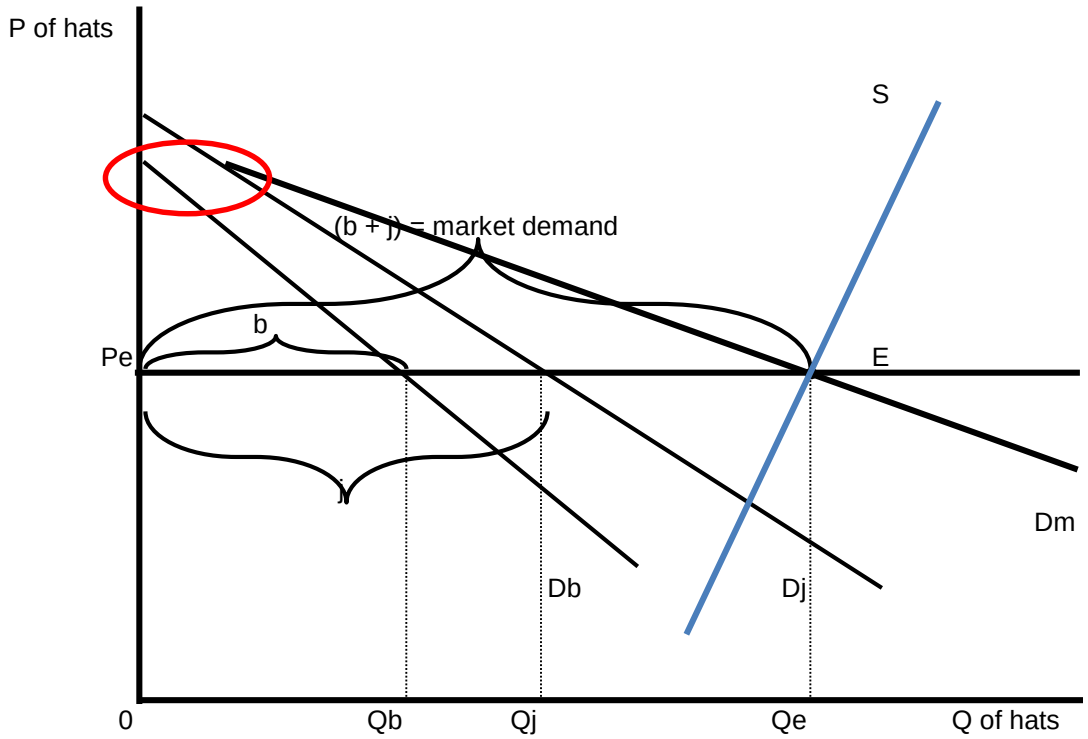
MRPTxy=MCx/MCy=**Px/Py**.....(7)

# CHAPTER 3 (STUDY UNIT 2)
# PUBLIC GOODS AND EXTERNALITIES

## THE MARKET FOR PRIVATE GOODS

Characteristics:

- supply of goods and services depends on revealed preferences of consumers (demand)... signal to suppliers what they want
- rivalry in consumption (reduces availability)
- excludability (ownership)
- market demand
  - consumers are price takers/quantity adjusters
  - sum of quantities = market demand (horizontal addition) see fig 3.1
- at equilibrium (efficiency rule)
  - condition for provision: MUb = MUj = MC (area under demand curve measures utility)
  - efficient pricing rule: P = MC

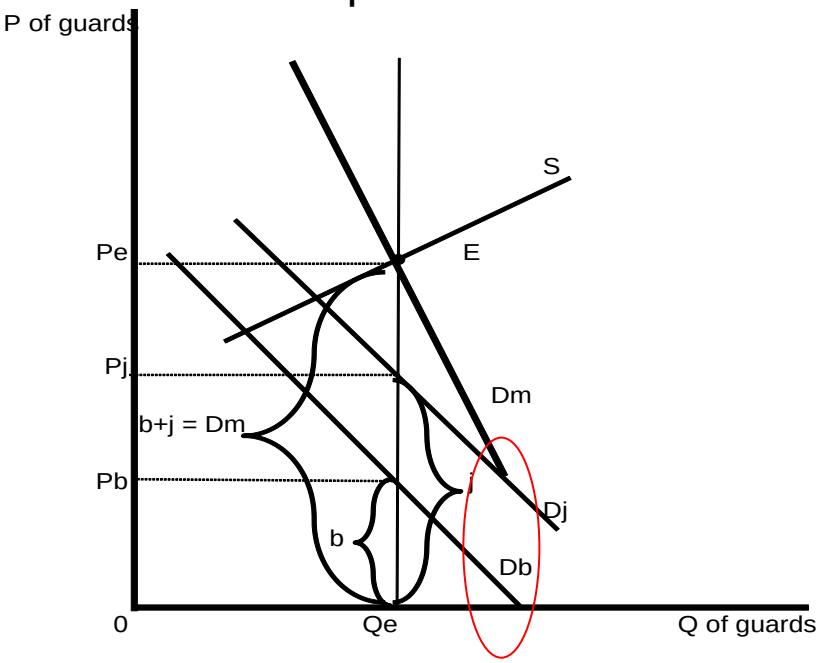



THE MARKET FOR PUBLIC GOODS

Characteristics:

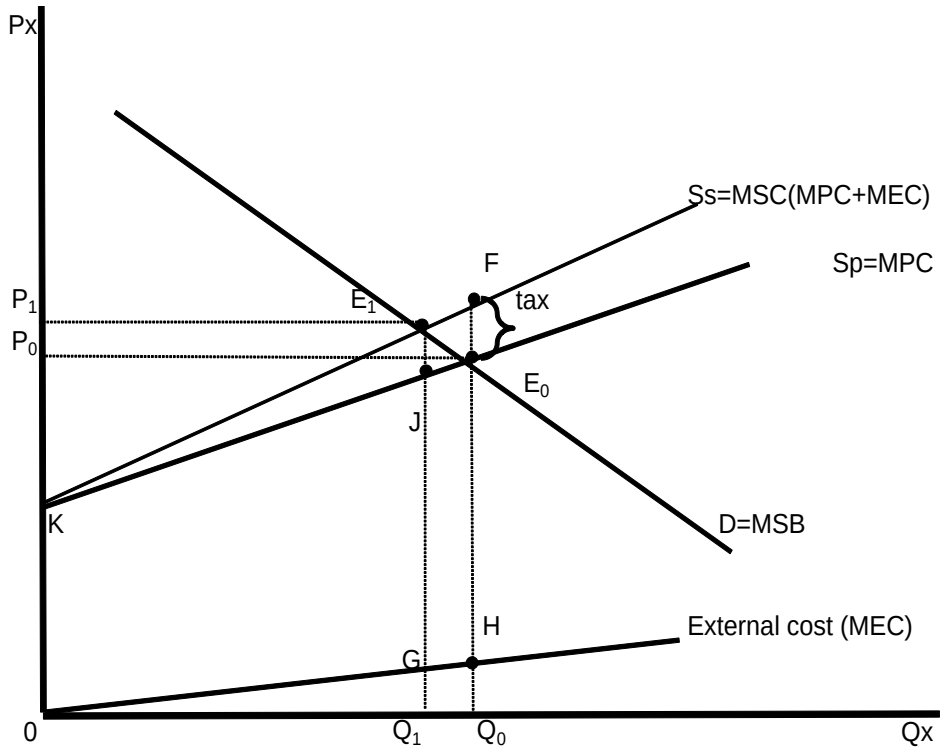
- Supply depends on revealed preferences of consumers (pseudo demand)... signal to suppliers what they want
- non-rivalry (does not reduce availability ...MC = 0 ... Pareto inefficient to exclude)
- non-excludability (ownership rights cannot be assigned... incentive for free riding)
- market demand
  - consumers are price adjusters/quantity takers
  - sum of prices = market demand (vertical addition) see fig 3.2
- at equilibrium (efficiency rule)
  - condition for provision: MUb + MUj = MC (area under demand curve measures utility)
  - efficient pricing rule: Pb + Pj = MC
- market provision?

- impossible to determine price (P = MC = 0)
- incentive to free ride (non-exclusion) … underprovision



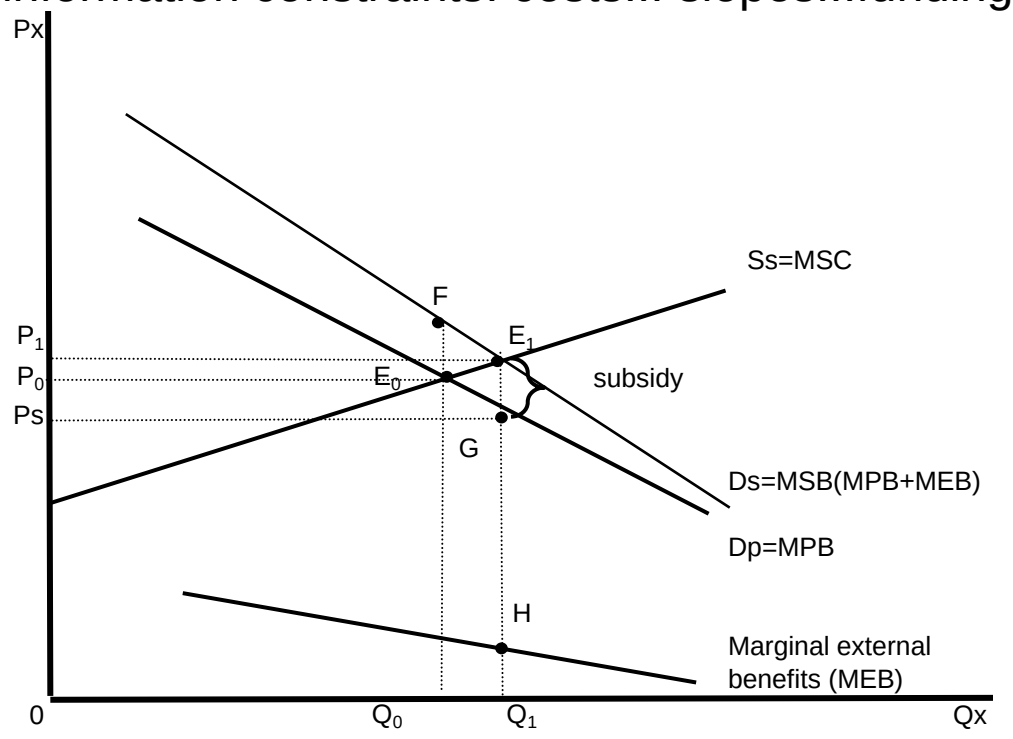

## NEGATIVE PRODUCTION EXTERNALITIES

- What? (eg pollution, cigarette smoke)
  - private equilibrium at $E_o$ ... MPCosts (supply) = MPBenefits (demand)
  - causes external costs (MEC) = area $KE_oF$
  - MSC = MPC + MEC .... MSC > MPC
  - social equilibrium at $E_1$ ...external costs = $KJE_1$
  - private equilibrium inefficient (over-provision and under-pricing)
- Role of government?
  - regulation, Pigouvian tax, property rights, sell permits… **supply (cost) curve** shifts
  - levy tax = MEC eg (= $E_0F$) …at output of $Q_o$ MPC + tax > benefits or demand (ie average revenue) and production/consumption is reduced to $Q_1$
  - information constraints! costs... size... slopes


Px
Ss=MSC(MPC+MEC)
F
Sp=MPC
P1
E1
tax
P0
E0
J
K
D=MSB
H
External cost (MEC)
G
0
Q1
Q0
Qx

# POSITIVE CONSUMPTION EXTERNALITIES

- What? (eg primary education, polio inoculations, research)
  - causes external benefits (MEB) … sum vertically
  - private equilibrium at $E_o$ ... MSCosts (supply) = MPBenefits (demand)
  - MSB = MPB + MEB .... at $Q_0$ the MSB > MPB
  - social equilibrium at $E_1$
  - private equilibrium inefficient (under-provision and under-pricing)
- Role of government?
  - Pigouvian <u>subsidy</u>...**demand (benefit) curve** shifts
  - levy subsidy = MEB at social optimum level (= $GE_1$)... (= $E_oF$ at private optimum ... means at output of $Q_o$ ... MSB > MSC and consumption is increased to $Q_1$)
  - information constraints! costs... slopes...funding



# CHAPTER 4 (STUDY UNIT 3)
# IMPERFECT COMPETITION

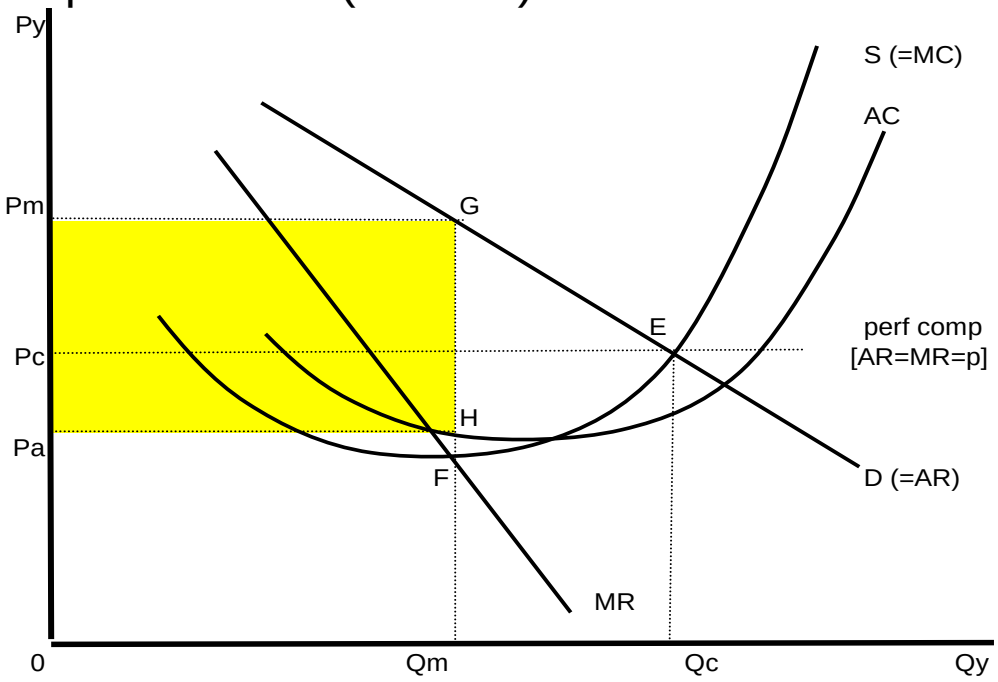
## ARTIFICIAL MONOPOLY

What? Government (patents, licenses), professional bodies, firms... limit entry

- Compared to perfect competitive model... Pm > Pc and Qm < Qc (see fig 4.1)
  Px.... Px = MCx in case of perf comp
- MRPTxy >—
  Py .... Py > MCy in case of monopoly
- inefficiency… waste, fewer resources used

Role of government? (see Study guide! p23)

- deregulation (remove barriers to entry)
- do nothing (long term... D curve becomes flatter)… markets are contestable
- tax policy
  - income tax - no allocation effect.... (profits)
  - unit tax - shift AC and MC up... Q↓ & p↑
  - lump-sum tax - AC shift up no alloc effect
- price control (P = MC)



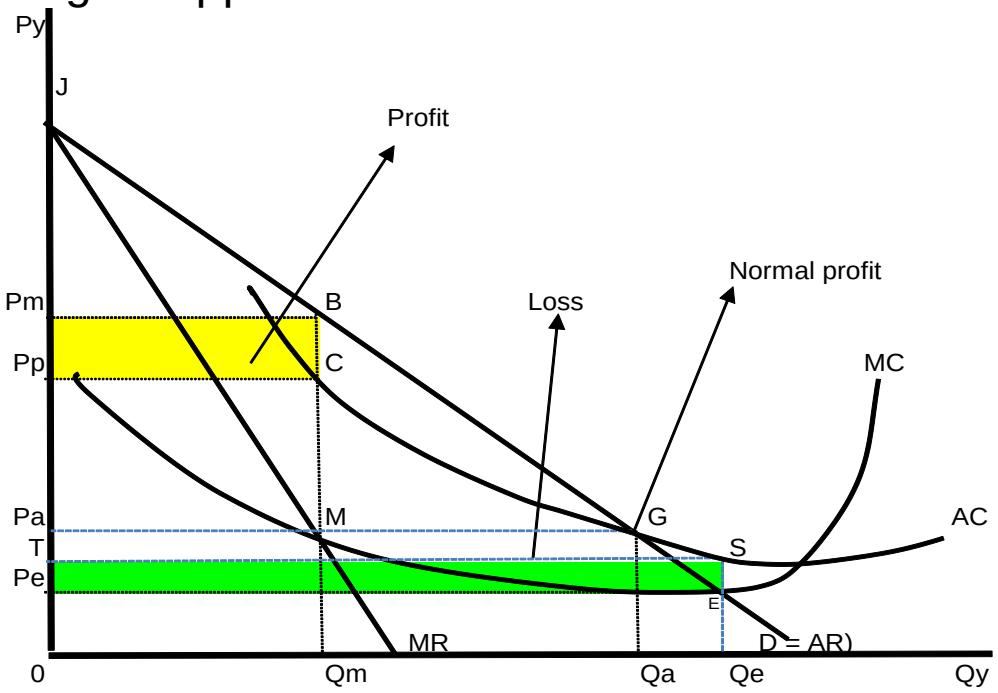
# NATURAL MONOPOLY

What?... Large capital outlays, economies of scale... demand satisfied by one firm... bulk water, electricity (see fig 4.3 on decreasing cost case)

- MC lies below AC over output range
- perfect comp (social optimum) where MC = P
  - Pe and Qe
  - consumer surplus = JEPe
  - at Pe a loss is made = TSEPe
  - natural monopoly emerges
- natural monopoly equilibrium where MC = MR
  - Pm higher and Qm lower
  - consumer surplus = JBPm < JEPe
  - profit = PmBCPa

Role of government? (using partial framework)

- regulate or nationalise + unit subsidy (= loss)
- average cost pricing (=normal profit)
- privatisation of public corporations? See study guide pp15-17



# CHAPTER 5 (STUDY UNIT 4)
# EQUITY AND SOCIAL WELFARE

## PARETO CRITERIA

- all allocative efficient points on PPC are at different distributions of income... market economy outcome may not necessarily be a fair outcome
- movement from one point to another... inefficient... increase one person's income relative to another's
- assumes $Utility_a = f(Y_a)$... own income only... redistribution would be inefficient
- redistribution Pareto justified
  - if external effects are reduced (poverty...crime)
  - if insurance benefits result (taxes insures against sickness, unemployment)
  - a net increase in utility is experienced (altruistic behaviour... feels good if beggar's income improves... $U_a = f[Y_a, U_b(Y_b)]$ )

## NOZICK'S ENTITLEMENT THEORY

Redistribution is justified if certain **conditions** are met

- Principle of justice in acquisition (entitled to acquire capital & property but not labour income)
- Principle of justice in transfer (voluntary and just means used)
- Principle of rectification of injustice in holdings (if one or both above principles were violated)

## BERGSON CRITERION

Redistribution is justified even if one person is made worse-off... two types of social (utility) welfare functions can be used (additive and generalised) to explain

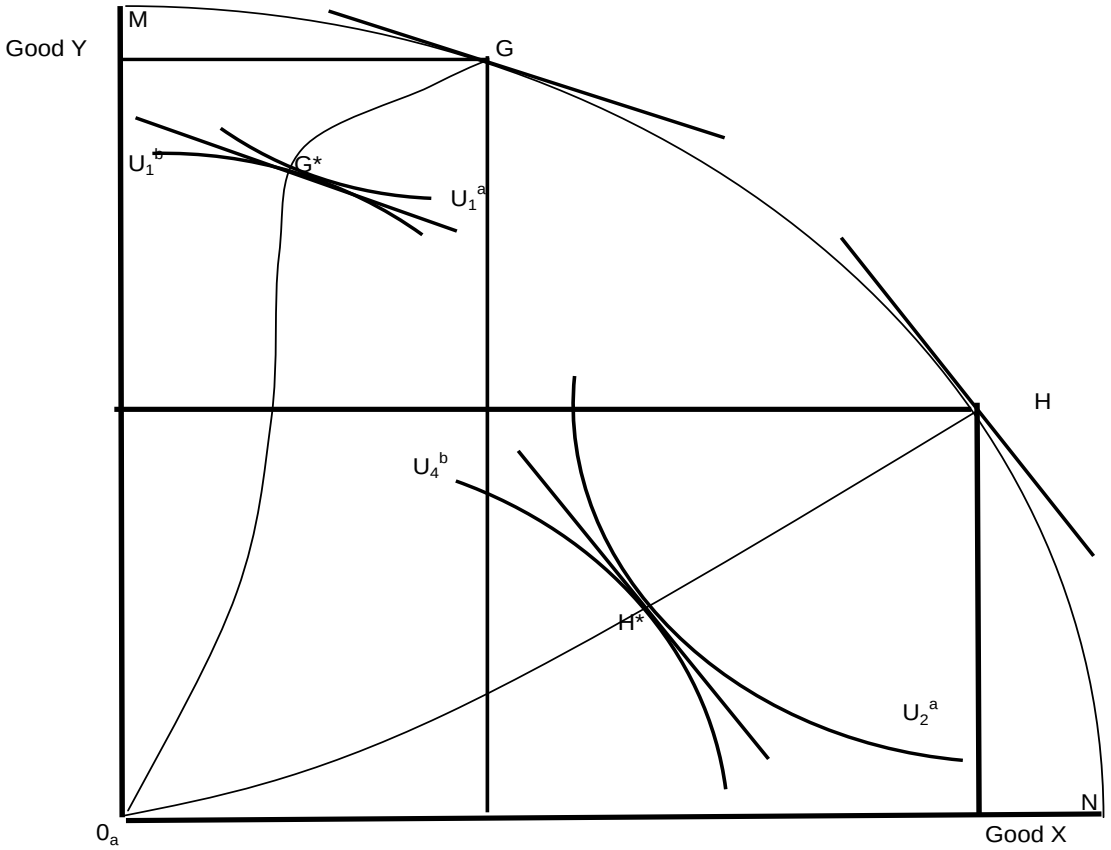
- **Additive** welfare function (cardinal)
  - Welfare = f ($U_a$ + $U_b$ +...) ... net effect
  - Assumes (1) utility measurable
    (2) individuals have same utility functions ...income only
    (3) MU ↓ as income increases
    (4) total income is fixed
  - requires an equal distribution of income (see SG pp20-21) ... diagram... assumptions?
- **Generalised** welfare function (ordinal) ..
  - [using individual indifference curves (order individual utility) and a budget constraint we can show where the individual will max welfare]
  - similarly using community indifference curves (order society's utility) and a utility possibility curve we can show where society will max welfare…… TWO STEPS to derive fig 5.2

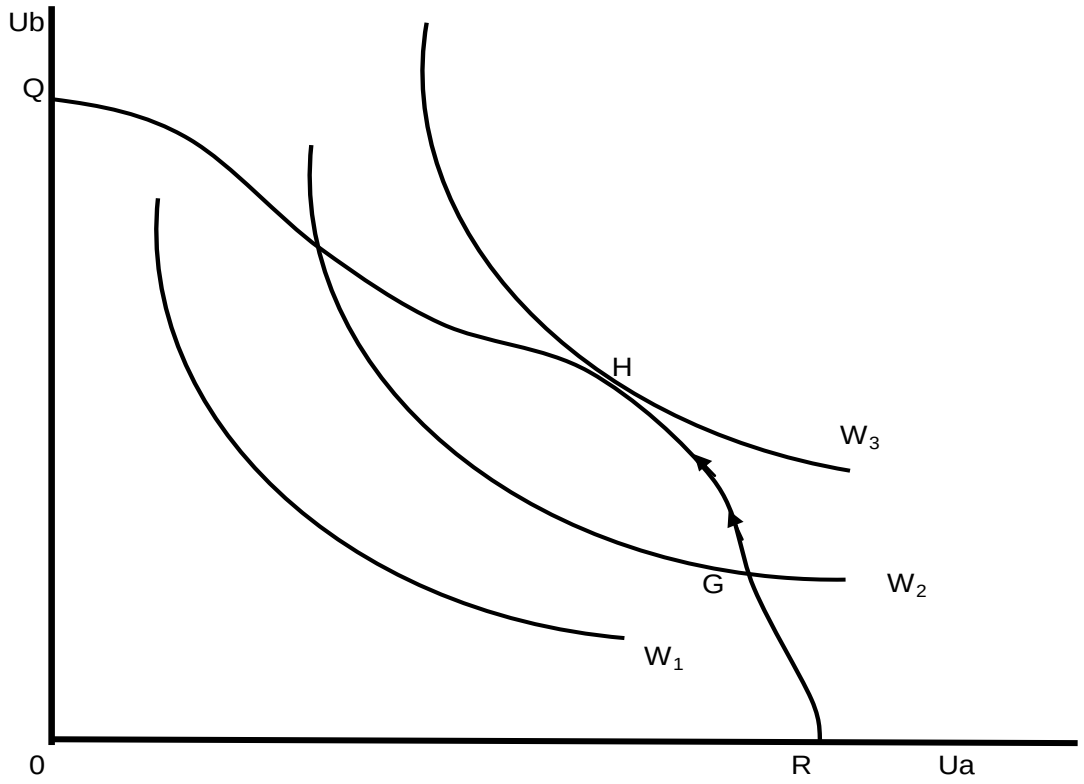
(1) derive community indifference curves (CICs)

- use a welfare function of the type W = f($U_a$,$U_b$) and <u>assume</u> community indifference curves can be derived and ordered (ranked).. $W_1$,$W_2$ ,$W_3$ ... map out combinations where social welfare (utility) is the same

(2) derive grand utility possibility curve

- for each point on PPC (MN) an Edgeworth box can be drawn and a Pareto efficient consumption point be found where MRS = MRT
- transfer such points (G* and H*) to a utility possibility curve (UPC) (QR in fig 5.2)
- points trace-out grand UPC... shows utility combinations of one consumer relative to another which are also allocative efficient






But which point is best?

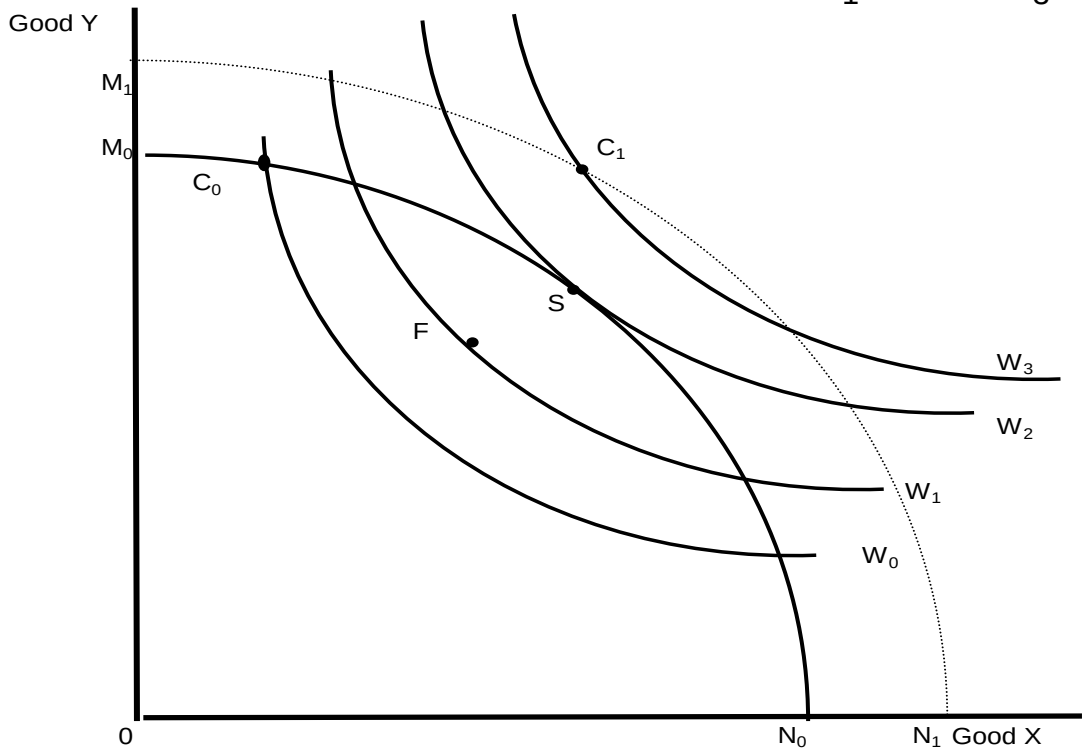
- where community indifference curve is tangent to grand UPC the “bliss point” is reached - Pareto efficiency & max welfare (H)
- if market produces a point such as G... **role for state** to redistribute to obtain point H
  - tax person A and/or subsidise person B
  - tax one sector (Y) and/or subsidise other sector (X)

## EFFICIENCY IMPLICATIONS OF REDISTRIBUTION

Use PPC and superimpose social indifference curves to show:

- Equity ≠ efficiency ($C_0$ vs S in fig 5.5 where $C_0$ is allocative efficient point)
- Redistribution improves equity but at cost of efficiency (ie trade-off)

  - Sub-optimal allocation inside PPC (point F)… how is S reached?... subsidies, taxes but redistribution effects efficiency via **incentive to work** … income & substitution effects... point F... inefficient but level of welfare ↑ ($W_1$ vs $W_{0)}$
  - Restraint on dynamic efficiency (allocation outside PPC) (point $C_1$)… **incentive to save and invest**…. without tax distortion... PPC shifts and $C_1$ is on $W_3$

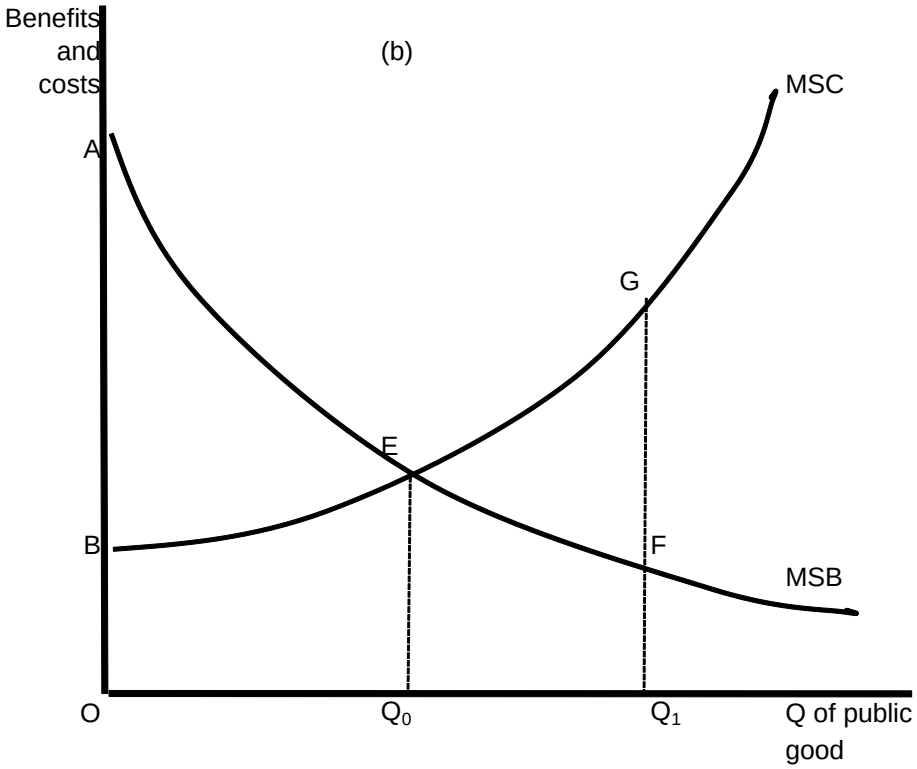


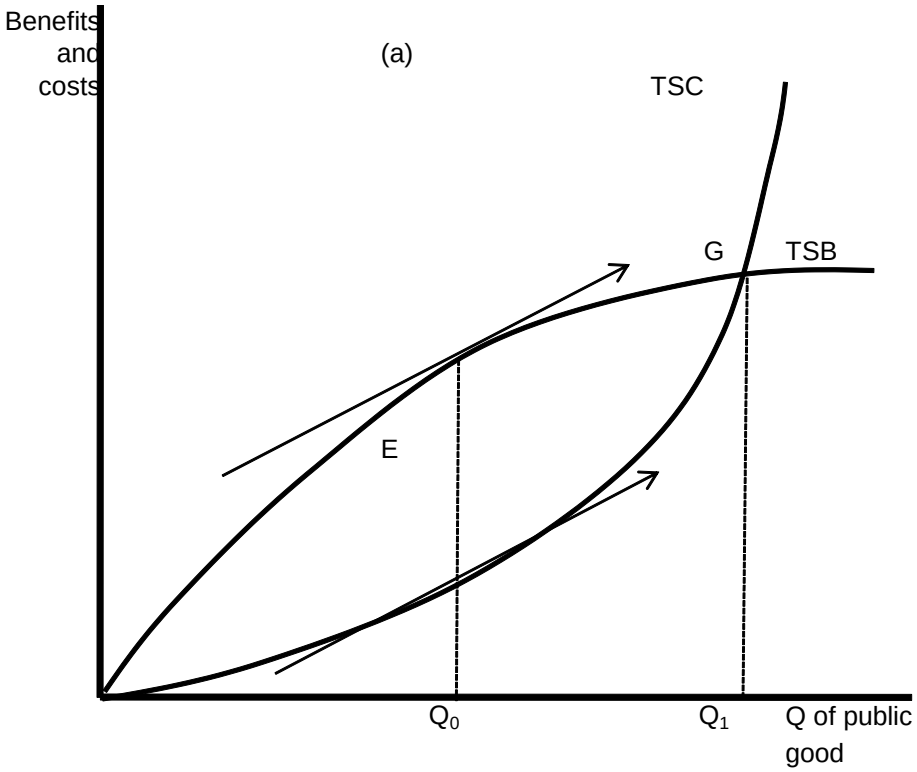
CHAPTER 6 (STUDY UNIT 5)
GOVERNMENT FAILURE

SOURCES OF GOVERNMENT FAILURE

- POLITICIANS (maximise votes)
  - understate costs of programmes
  - know voters have insufficient information
  - need not please all voters
  - result: **oversupply of public goods** and legislation favouring special interest groups

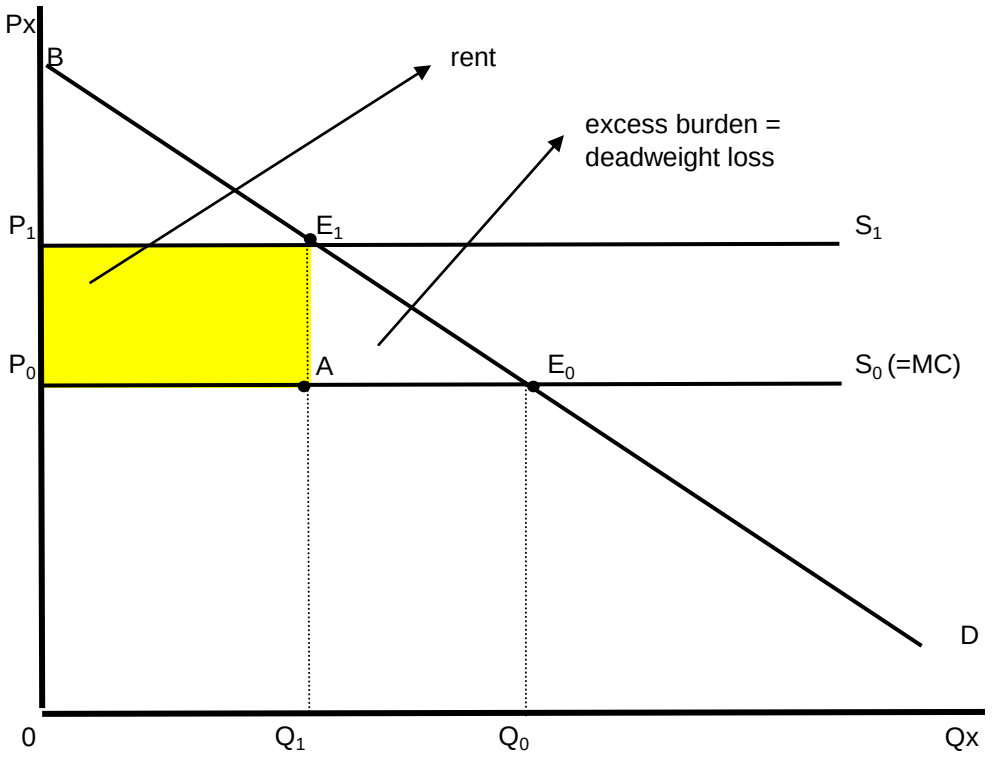
- BUREAUCRATS (maximise budgets) (fig 6.2 NB)
  - **principal** (voters) has less incentive to lobby for reduced taxes than **agent** (bureaucrats) has to increase budget
  - bureaucrats supply public goods where **total** social costs = total social benefits (see fig 6.2a)
  - society prefers quantity to be determined where **marginal** social costs = marginal social benefits (see fig 6.2b)
  - supply > demand ...net welfare loss = EGF (see fig 6.2b)
    - Note the slope of the tangent to TSB and TSC measures marginal benefits and costs
    - Is Niskanen's model plausible?... salaries not linked to size of budgets


Benefits and costs
(b)
MSC
A
G
E
B
F
MSB
O
$Q_0$
$Q_1$
Q of public good


Benefits and costs
(a)
TSC
G
TSB
E
$Q_0$
$Q_1$
Q of public good

RENT-SEEKING (inefficient wealth transfers)

- What is rent? similar to monopoly profits
- government creates it (licences, professions)
- assume constant returns (=$S_0$) and demand (=DB) - see fig 6.3
- government restricts output to $OQ_1$... P↑ to $P_1$
- consumer surplus ↓ (= $P_0E_0E_1P_1$ transferred to producers = artificial rent = $P_0AE_1P_1$ AND deadweight loss = $E_1E_0A$)...understates loss
- What is rent-seeking?... producers will incur costs to capture rent (lobby)
- causes MC to shift to maximum of $S_1$
- costs are internal to them (decreases share of rent)
- rent-seeking costs would be internal costs (ie lobbying costs) + deadweight loss



CHAPTER 7 (STUDY UNIT 6)
PUBLIC EXPENDITURE AND ITS GROWTH

- **Measuring the size of national government and trends**

| | |
|---|---|
| G/GDP… expenditure | 1960 = 16.7% |
| | 2009/10 = 34.1% |
| T/GDP… revenue | 1960 = 15.0% |
| | 2009/10 = 24.1% |

- **Macro theories of growth in G expenditure**
  - Wagner, Musgrave's and Rostow's development approach
    - ➢ stages... (1) infrastructure required (2) private investment increases (causes market failures) (3) education/health/social security programmes increases
    - ➢ Wagner's Law …rising expenditure inevitable in developing countries because of…
      - order functions (protection)
      - cultural and welfare exp… (eg education) have income elasticity > 1…. % increase on exp higher than % increase in income
      - market failures (monopolies)

  - Peacock and Wiseman's displacement effect
    - ➢ social upheavals …displace certain private and public expenditure
    - ➢ tax resistance decreases
    - ➢ after crisis… tax and expenditure levels remain at post-war levels

- Meltzer and Richard's median voter model
    - if median voter's income < average income …demand for income redistribution increases
    - extension of franchise (SA?)

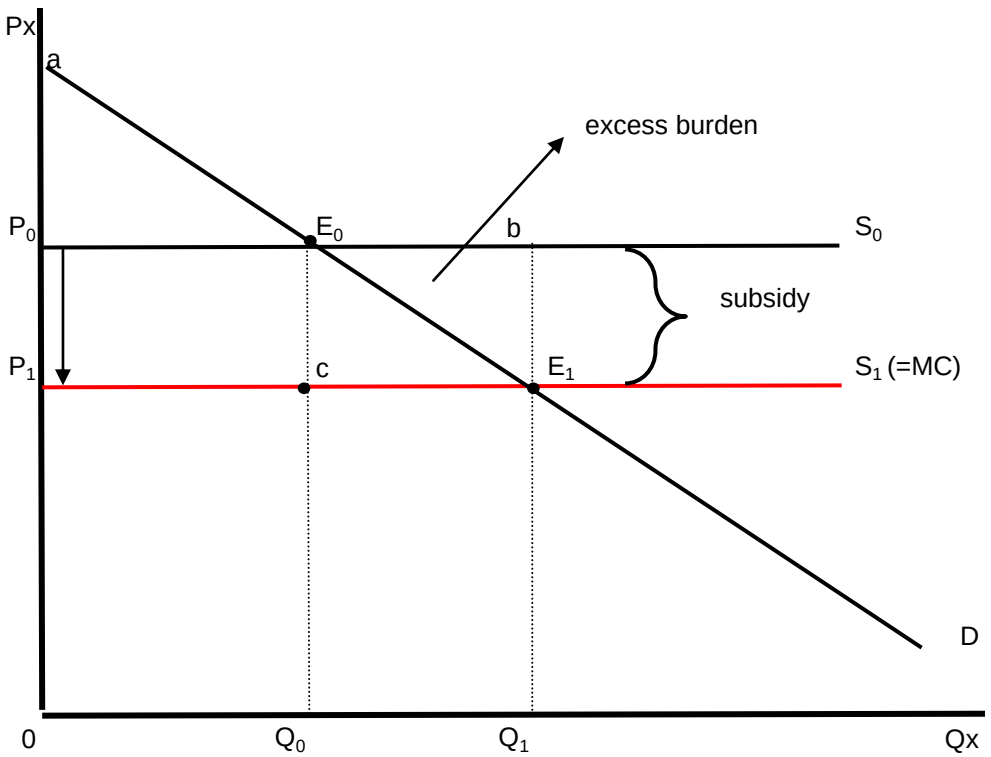
**Micro theories of growth in G expenditure**

- Baumol's unbalanced productivity theory
    - Progressive (private) and non-progressive (public) sectors
    - technology➔ productivity➔ salaries➔
    - public sector competes with private sector by raising salaries without productivity changes (eg cannot raise pupil:teacher ratio too high)
- Interest groups (bureaucrats, politicians, lobbyists) have incentives to increase budgets, expenditures in favour of voters and special interest programmes
- Brown & Jackson …changes in micro factors affect levels of publicly provided goods and services:
    - service environment… crime levels
    - population growth…urbanisation
    - quality of goods demanded

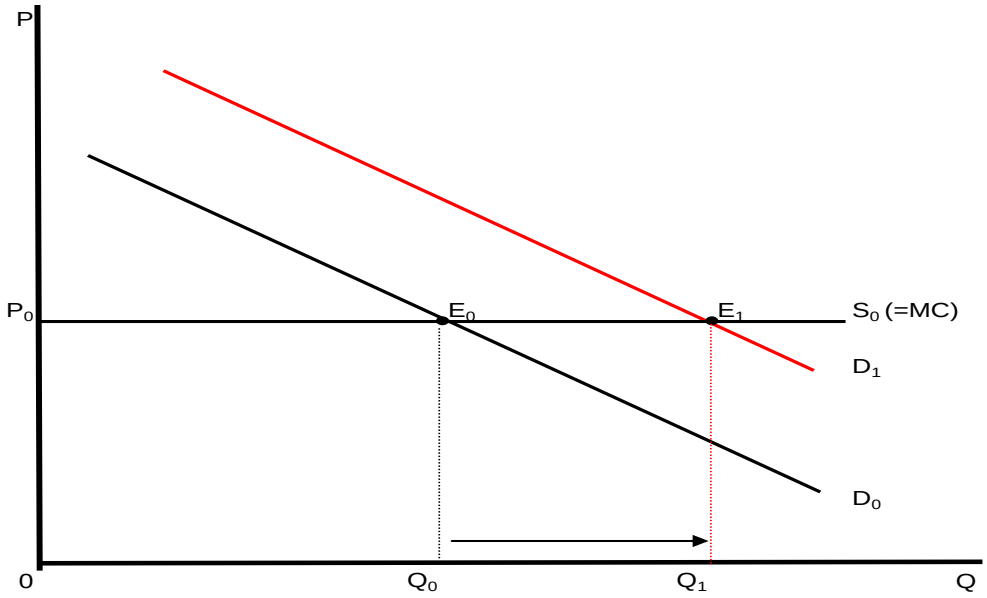
CHAPTER 8 (STUDY UNIT 7)
POVERTY AND FISCAL RESPONSES

- Budget is the prime redistributive instrument... tax & expenditure programmes
- Expenditure items: income transfers, subsidised goods and services (health, housing, education)
  - price subsidy (fig 8.2)
  - income transfer/subsidy (fig 8.6)

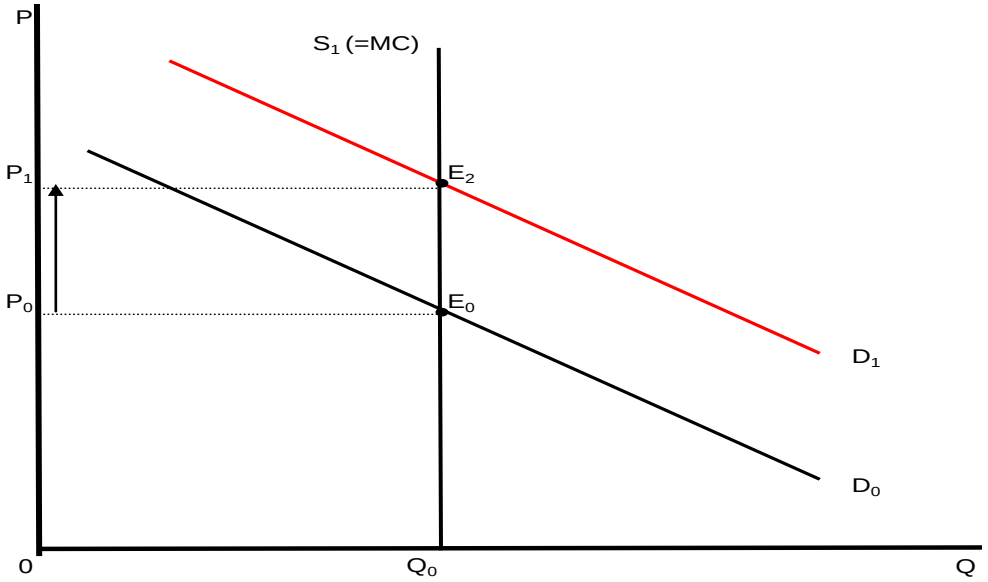
- Economic efficiency of producer (price) subsidies
  - constant-cost industry (supply horizontal)
  - producer subsidy lowers price (...compare to tax) and quantity supplied/demanded increases to $Q_1$
  - consumer surplus increases by $P_0E_0E_1P_1$
    - due to lower price = $P_0E_0cP_1$
    - due to extra Q purchased = $E_0E_1c$
  - cost of subsidy = $P_0bE_1P_1$
  - excess burden = $E_0bE_1$



- Economic impact of (housing) income transfer to consumer
  - if supply is perfectly elastic (horizontal)…long run
    - demand curve shift ($D_0$ to $D_1$)
    - price unaffected… no shifting of benefit




  - if supply is perfectly inelastic (vertical)…short run
    - demand curve shift ($D_0$ to $D_1$)
    - price increases… shifting of benefit to existing homeowners (capital gains)



# CHAPTER 10 (STUDY UNIT 8)
# TAXATION AND TAX EQUITY

- CLASSIFICATION OF TAXES
  - tax bases (income, consumption, wealth, persons)
  - rate structure
    - proportional/regressive/progressive...
    - tax ÷ size or rand value of base = average rate
    - tax ÷ size of income base = average rate
    - if average rate increases as base increases➔progressive
  - types
    - general & selective... relative prices
    - specific (unit) & ad valorem (%)
    - direct & indirect …tax shifting

- Properties of a “good” tax

  - equity (incidence...)
  - economic efficiency (excess burden...)
  - administrative efficiency (simplicity and compliance...)
  - flexibility (macro stability...)

STRUCTURE OF TAX BASE (proportional, progressive, regressive) – calculate average tax rate

## Monetary (R) value of base or expenditure base

| | | | Case(a) TAX | Case(b) TAX |
|---|---|---|---|---|
| TV (1) | = | R1 000 | R100 | R100 |
| TV (2) | = | R20 000 | R2 000 | R4 000 |

Average rate:

| | | |
|---|---|---|
| 100/1000 | 10% | 10% |
| 2000/20000 | 10% | 20% |

Structure? (proportional) (progressive)

## Income base

Person A = R2 000 pm
Person B = R50 000 pm

Both purchase TV (1) thus tax = R100

Average rate:

| | | |
|---|---|---|
| 100/2000 | = | 5% |
| 100/50000 | = | 0.2% |

Structure? (proportional, progressive or regressive)

TAX EQUITY

- principles
  - benefits received... MUST be excludable and no distributional objectives
  - ability to pay... horizontal and vertical

TAX INCIDENCE

- statutory versus economic (shifting forwards…consumers and backwards... workers)
- luxuries vs necessities...unskilled vs skilled labor
- **general equilibrium analysis** (secondary impact)
  - assume food is lab intensive & shoes are cap intensive and tax is levied selectively on food
  - uses (consumption) side effect

- tax on food...Pf ↑... demand for food ↓... demand for shoes ↑... Ps ↑
  - sources (production) side effect

- if demand for food ↓... supply of labour ↑... P labour ↓
  - factor used most intensively also bears burden
  - a general tax cannot be shifted

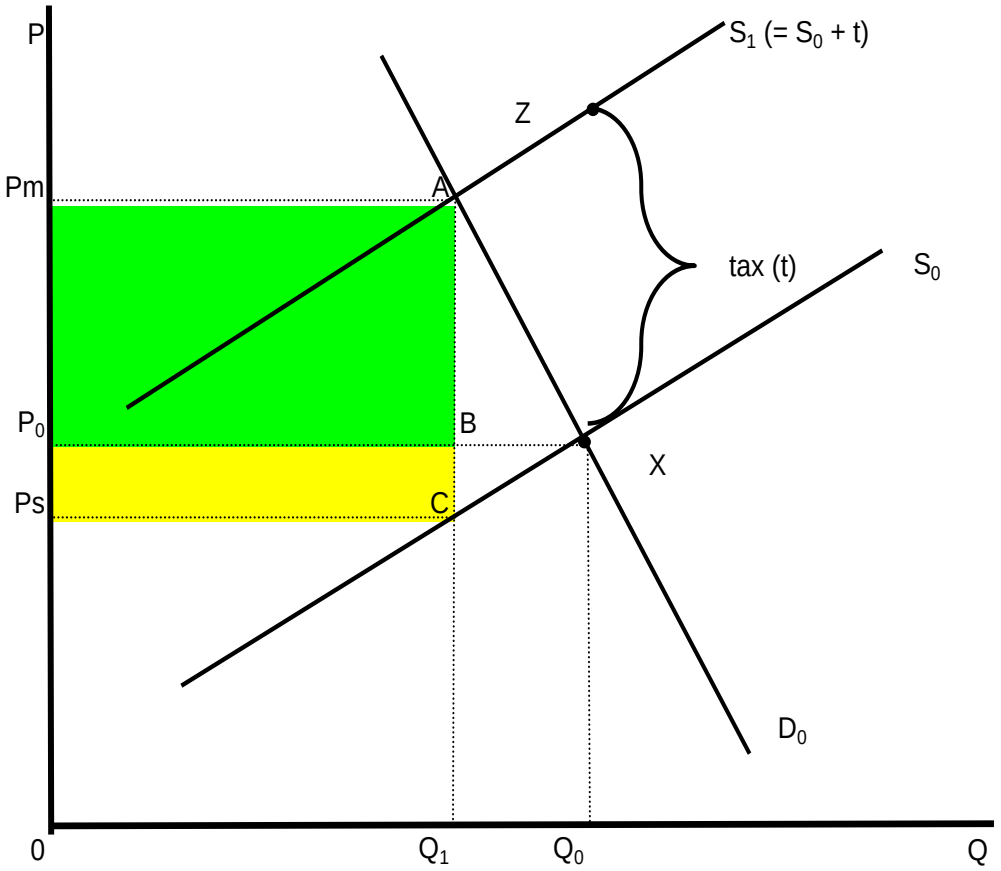
- **partial equilibrium analysis** (little impact)
  - assume other prices remain unchanged

Factors impacting on shifting

- incidence = when imposed on seller (supply curve shift) or buyer (demand curve shift)
- elasticities (fig 10.1 and 10.4)

- market structure … perfect comp vs monopoly
- type of tax …unit tax vs ad valorem

## INCIDENCE OF UNIT TAX ON SUPPLIERS




Impose unit tax on **suppliers** at $P_0$ and $Q_0$

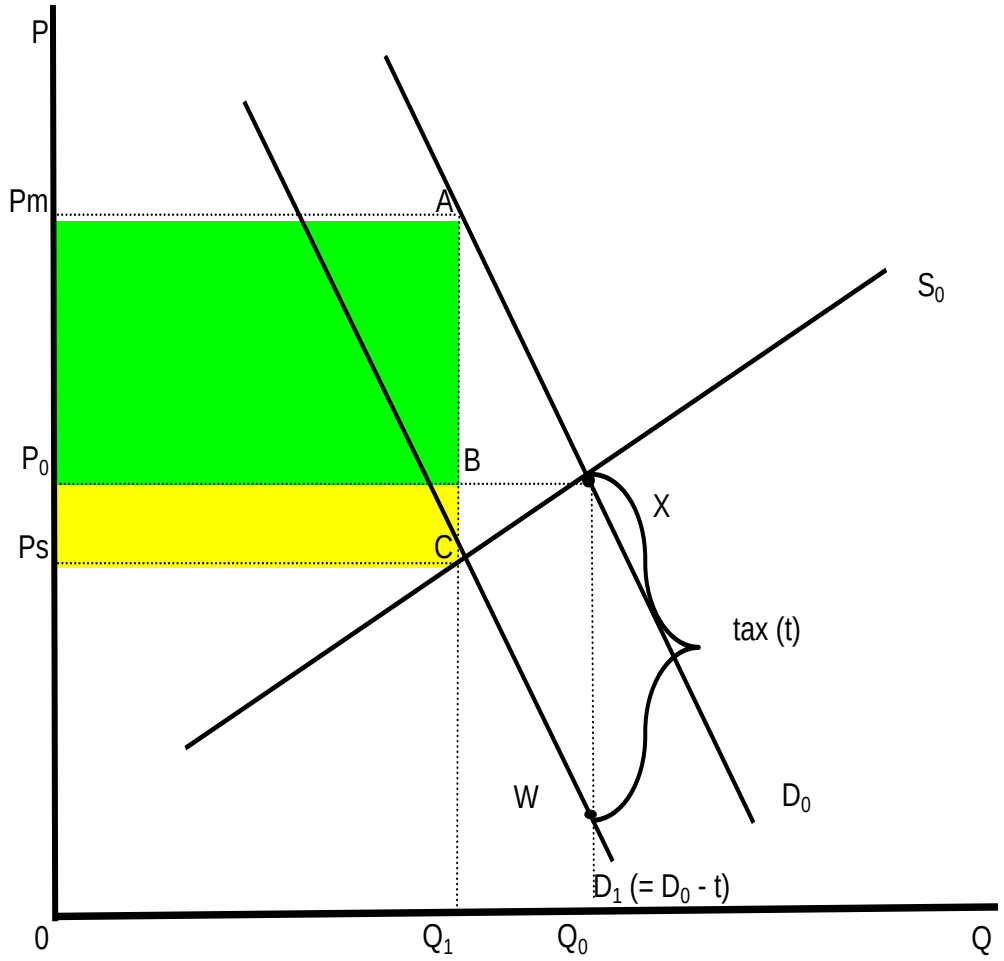
1 Sellers add tax at each quantity
eg at $Q_0$ ...$P_0$ + tax... point Z on new supply curve
2 Effective **supply curve shifts parallel** ($S_0$ to $S_1$)
3 At new equilibrium A ($P_m$ and $Q_1$):
price paid by buyers = $P_m$ = market price
price received by sellers = $P_m$ - tax
= $P_s$

total tax burden (revenue) = $P_mACP_s$

share of buyers... $P_0$ to $P_m$ = $P_mABP_0$

share of seller... $P_0$ to $P_s$ = $P_0BCP_s$

INCIDENCE OF UNIT TAX ON BUYERS




Impose unit tax on **buyers** at $P_0$ and $Q_0$

1 Buyers subtract tax at each quantity
eg at $Q_0$ ...$P_0$ - tax... point W on new demand curve

2 Effective demand curve shifts ($D_0$ to $D_1$)

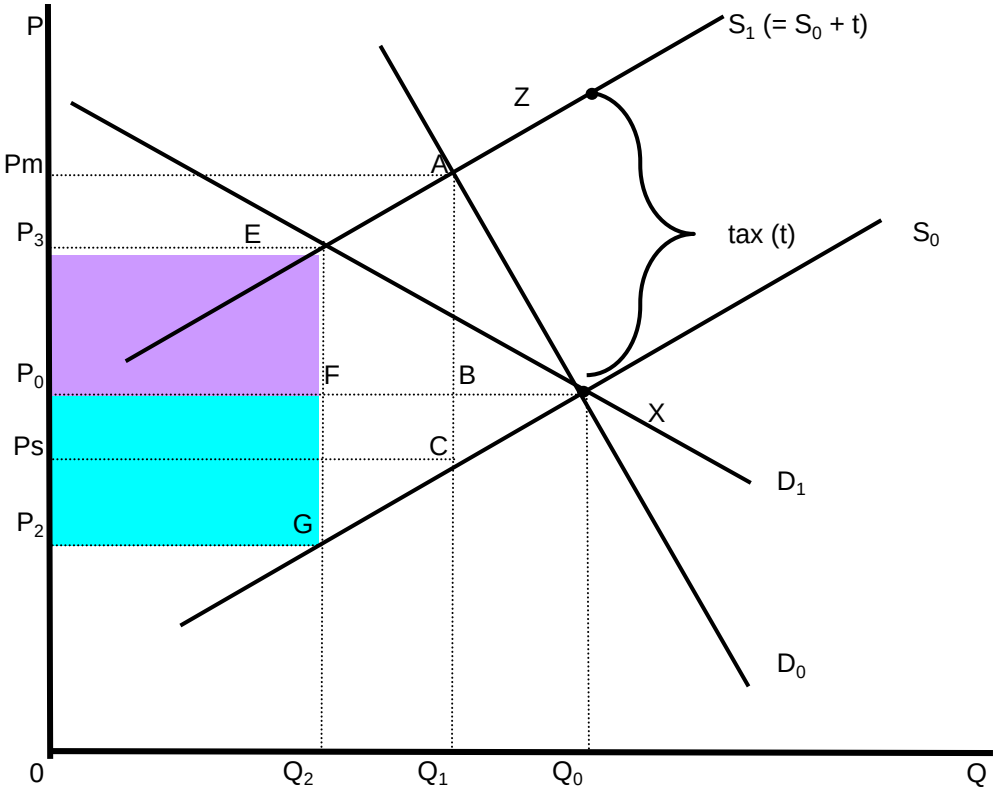
3 At new equilibrium C ($P_s$ and $Q_1$):
price paid by buyers = $P_m$ = market price
price received by sellers = $P_m$ - tax
= $P_s$

total tax burden (revenue) = $P_mACP_s$

share of buyer... $P_0$ to $P_m$ = $P_mABP_0$

share of seller... $P_0$ to $P_s$ = $P_0BCP_s$

# INVERSE ELASTICITY RULE




Incidence of price elasticity of demand:

1 use two or more demand curves with different elasticities intersecting at X with supply curve $D_1$ (relatively elastic)... $D_0$ (inelastic)...
2 let the supply curve shift (impose tax on sellers)... $S_0$ to $S_1$
3 as demand becomes more elastic (flatter demand curve) ...share of tax burden of suppliers increases... $P_0FGP_2$ compared to $P_0BCP_s$ … eg luxuries

NOTE: could be repeated for price elasticity of supply:

3 as supply becomes more elastic (flatter supply curve... share of tax burden of buyers increases… eg employers of **skilled** labour (elastic supply)

CHAPTER 11 (STUDY UNIT 9)
TAXATION AND TAX EFFICIENCY

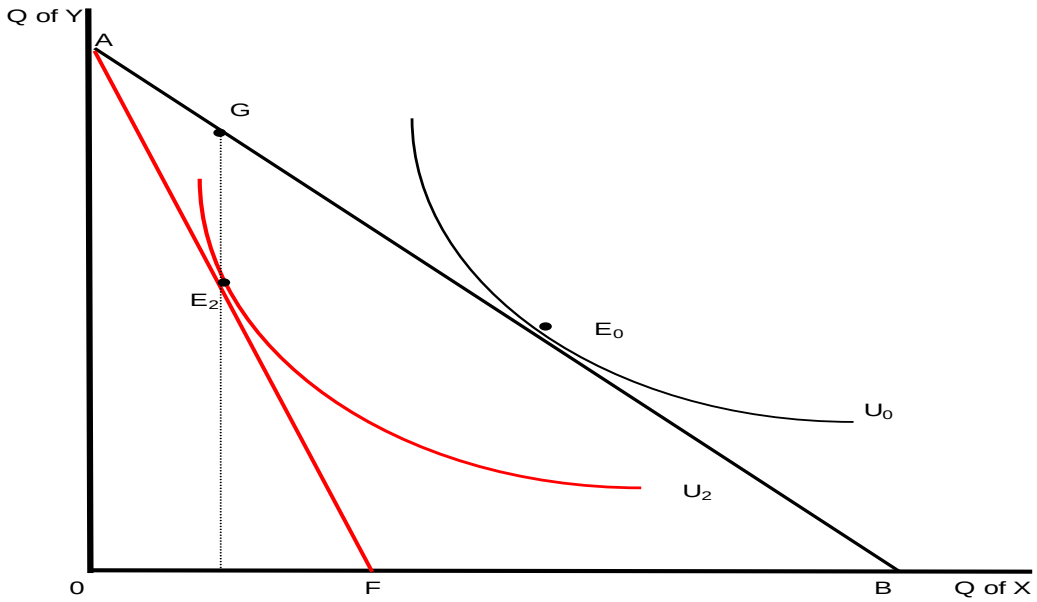
Benchmark model... efficiency... MRPT = MRS = Px/Py

- most taxes distort relative prices... Px (1+t)/Py
- actors change behaviour (excl. head tax)
- w*elfare loss in addition to the normal burden of a tax and a loss in excess of what is necessary to generate a certain amount of tax revenue*
- eg tax on X... consumption = zero... no tax burden but loss in welfare [= if tax causes loss of jobs it has excess burden - the unemployed are worse off and G gained no tax from them (cost of tax > tax amount)]
- aim is to minimise excess burden

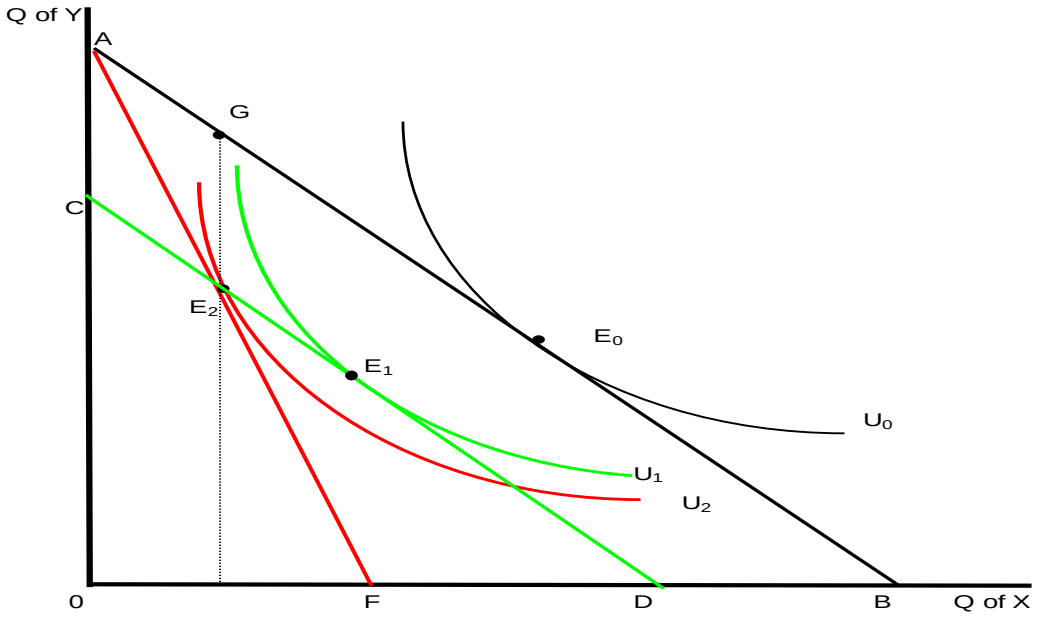
What must you be able to do?

1 Explain what an excess burden is using indifference curves
2 Explain excess burden using consumer surplus approach and use this approach to measure the X-burden and explain two tax efficiency rules
   (i) inverse elasticity rule (Ramsey rule)
   (ii) low tax rates on a broad base

- INDIFFERENCE CURVE ANALYSIS (fig 11.1)
  - selective tax on X... distorts relative prices... budget line swivels (AB to AF)




  - compare a neutral tax to selective tax which generates same tax revenue ($GE_2$)... excess burden is shown by welfare/utility differences ($U_1$ versus $U_2$)
  - lump-sum tax (general tax on X and Y)... parallel shift of budget line (AB to CD)



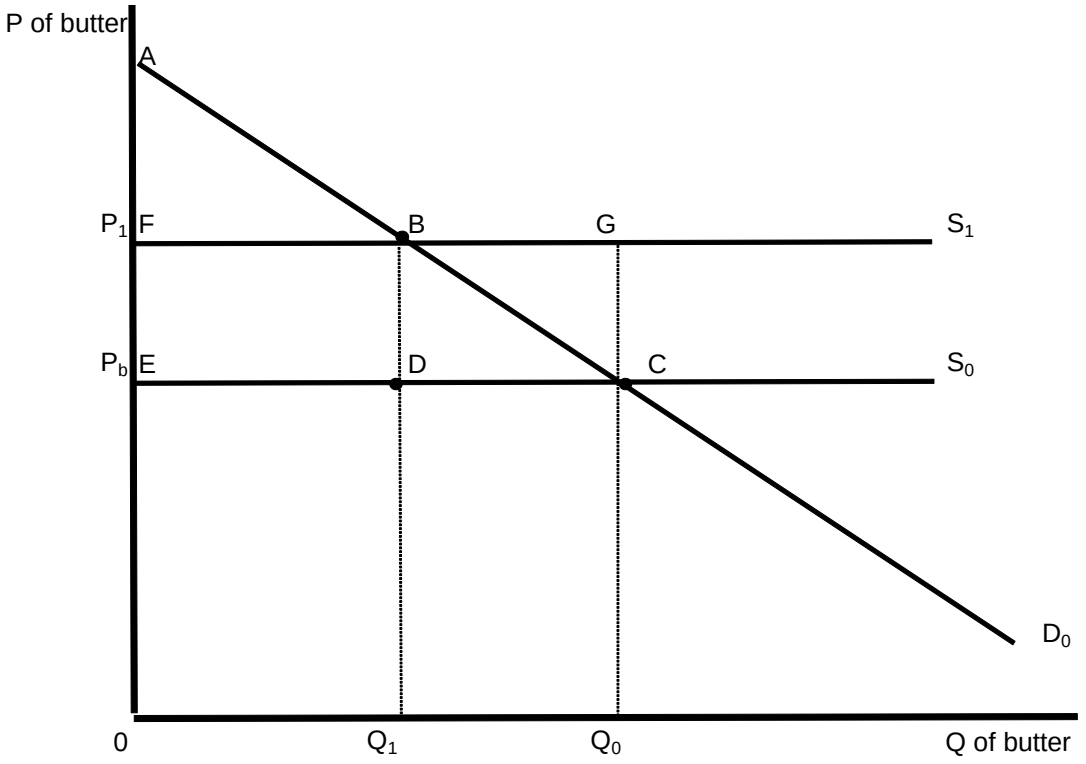
CONSUMER SURPLUS APPROACH

Consumer surplus... area below demand curve and above market price

Producer surplus... area above supply curve and below market price - increasing-cost industry (positive slope)
- constant-cost industry (horizontal supply)

Learning objectives:

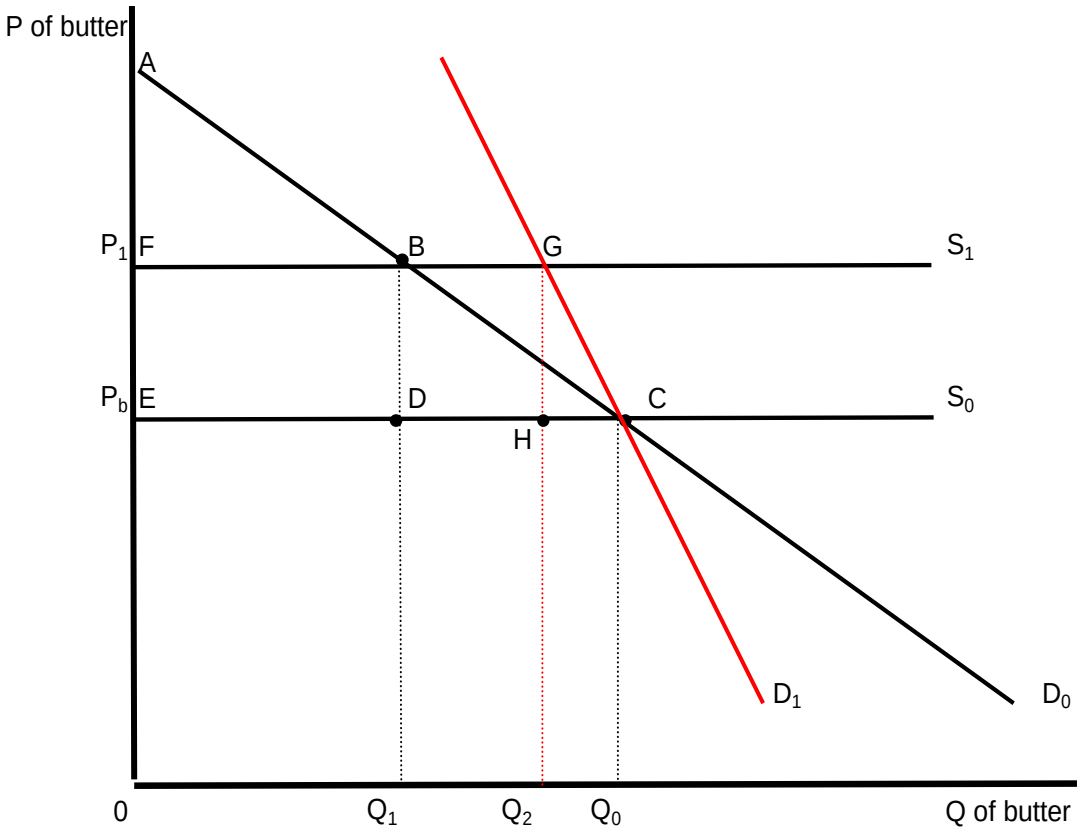
- measure excess burden... (fig 11.2)
- derive rules for optimal taxation




- loss in net surplus = FBCE – tax revenue (FBDE) = x-burden = BCD
- $E_b$ = ½ tP$\Delta$Q... (1/2 BD x DC)
- $E_b$ as % of tax revenue = efficiency-loss ratio ... between 13 and 45 cents per $1

- size of excess burden is effected by
  - ➢ price elasticities ($E_d$)... Ramsey rule (inverse elasticity rule)... tax revenue? (fig 11.3)
  - ➢ tax rate (low rate on a broad base)... excess burden quadruples as rate doubles... revenue does not double (fig 11.4)

INVERSE ELASTICITY RULE

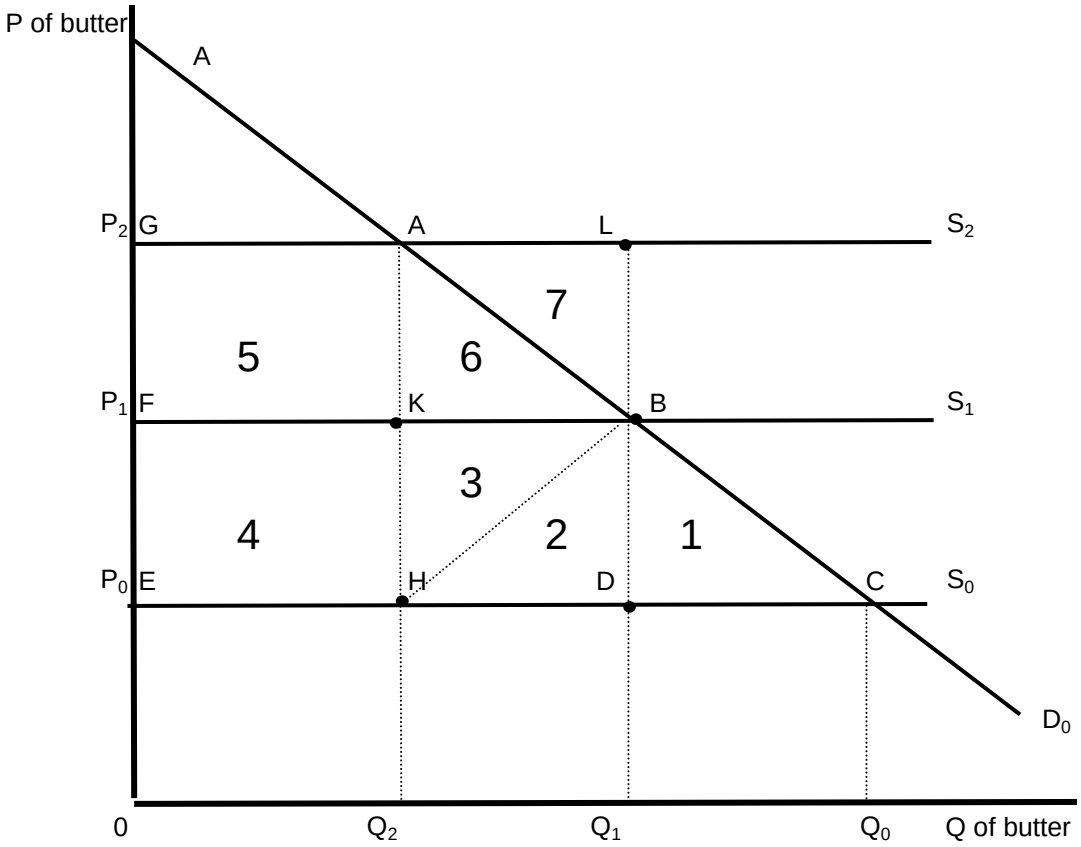



Elasticities $E_d$:

| | | | |
|---|---|---|---|
| cigarettes | -0.3 | ie < 1 | eg $D_0$ (inelastic) |
| beef | -1.6 | ie > 1 | eg $D_1$ (elastic) |
| movies | | | |
| adults | -2.0 | | |

| | |
|---|---|
| teens | -0.2 |
| insulin | -0.02 |

## TAX RATE AND EXCESS BURDEN




- tax rate (low rate on a broad base)... excess burden quadruples as rate doubles... revenue does not double (fig 11.4)

| PRICE | TAX REVENUE | EXCESS BURDEN |
|---|---|---|
| $P_1$ (=$P_0$ + tax) | 2 + 3 + 4 | 1 |
| $P_2$ [=($P_0$ + 2(tax)] | 4 + 5 | 1 + (2 + 3 + 6) |

CHAPTER 12 (STUDY UNIT 10)
INCOME TAXATION AND CAPITAL GAINS

Economic effects of personal income tax

- EQUITY (progressive tax)

- EFFICIENCY (excess burden?)
  - general tax (=head tax) …no excess burden if leisure can be taxed…Corlett-Hague rule… complements to leisure eg golf balls
  - selective tax on income... inefficient tax… three steps to explain and illustrate

Step (1)

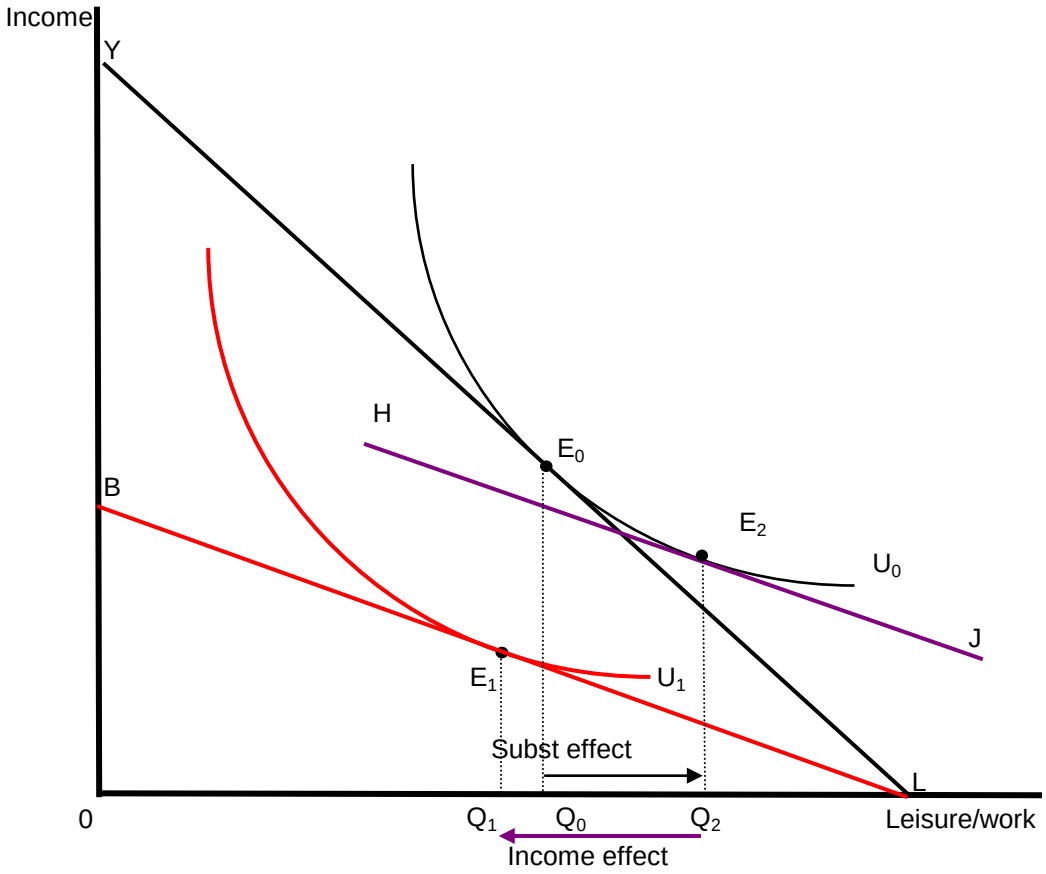
- explain what happens to supply of labour (in words)
  - income effect (increases labour supply)

    [work more to compensate for loss in income]
  - substitution effect (decreases labour supply)

    [choice between work and leisure… price of leisure = wage (w)… income tax reduces net wage (leisure becomes cheaper)… "buy" more leisure…. work effort reduced]

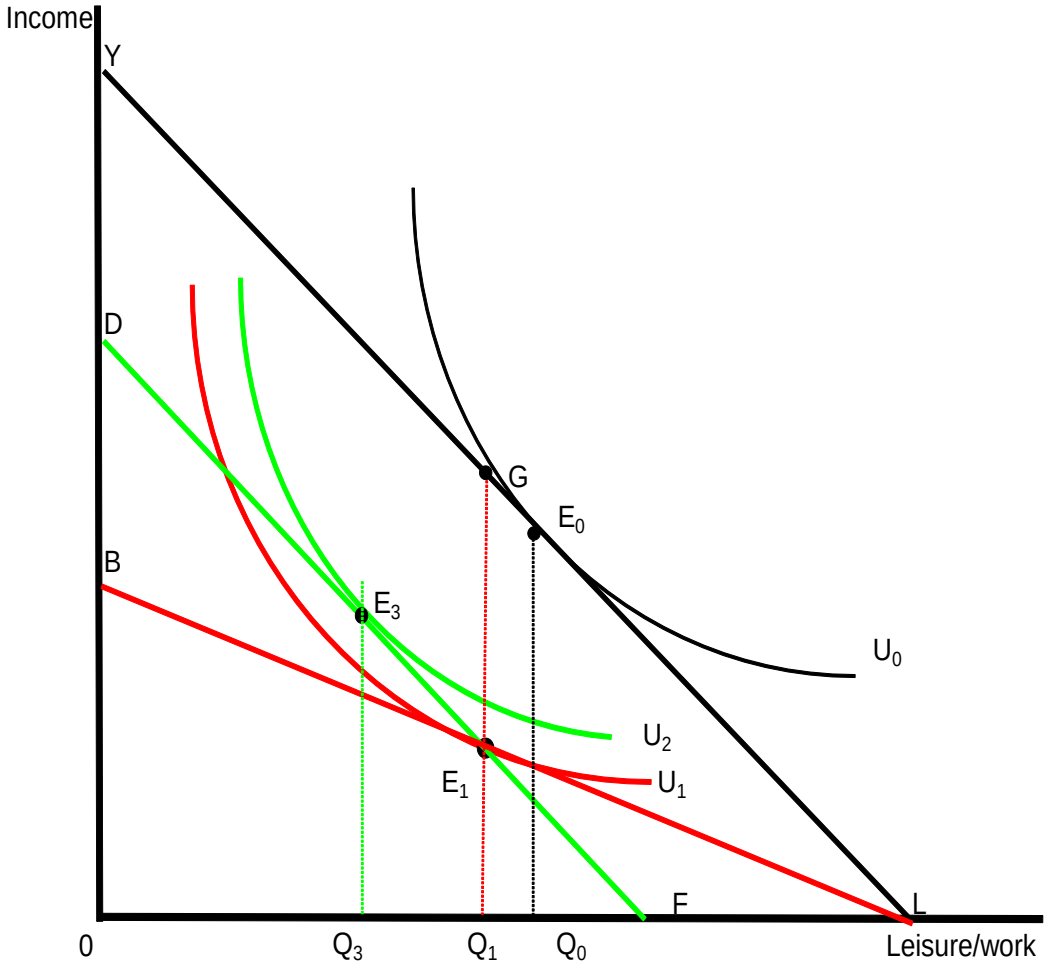
Step (2)

- explain and illustrate (fig 12.1) income effect and substitution effects by decomposing movement from $E_0$ to $E_1$ into
  - ➢ income effect ($E_2$ to $E_1$)… compensate worker to make him feel just as well off as before tax… (work increases from $LQ_2$ to $LQ_1$)
  - ➢ substitution effect ($E_0$ to $E_2$) … cause hours of work to decrease from $LQ_0$ to $LQ_2$)
  - ➢ empirical evidence?



Step (3)
compare proportional income tax (budget line pivots) to head tax (budget line shifts parallel) to show that selective tax is inefficient (fig 12.2)

- selective tax on income causes excess burden (welfare at $U_1$ compared to $U_2$)
- work effort less ($LQ_1$ versus $LQ_3$)



# Quotes on taxing the rich

"You cannot help the poor by destroying the rich.
You cannot strengthen the weak by weakening the strong.
You cannot bring about prosperity by discouraging thrift.
You cannot lift the wage earner up by pulling the wage payer down.
You cannot further the brotherhood of man by inciting class hatred.
You cannot build character and courage by taking away people's initiative and independence.
You cannot help people permanently by doing for them, what they could and should do for themselves."

- Abraham Lincoln

"The problem with socialism is that eventually you run out of other people's money [to spend]."

"Go to any third world nation and there are wealthy people there stifling the economy. Go to any growing nation and there are wealthy people there growing the economy. Wealthy people are like any other income level. Just as you have millions abusing the welfare and disability system, you have some wealthy abusing the freedoms that come with wealth. That is why regulation is absolutely a must but, using tax rates to control an economy or an income level makes no sense."

"When you tax the wealthy, you hurt job creation and that hurts the working class too. Now, the wealthy will pay taxes and pay more than most to a certain point and then they will change how they invest or they will move their wealth into trusts and foundations that are tax exempt or overseas or they will move themselves as we have seen some doing."

# CHAPTER 17 ( STUDY UNIT 12)
# INTERGOVERNMENTAL FISCAL RELATIONS

- economic rationale for different levels of government (note the Tiebout model and its shortcomings)
  - allocative efficiency (preferences revealed through voting with one's feet)
  - competing local authorities limit revenue-maximising behaviour
  - local public goods (park)

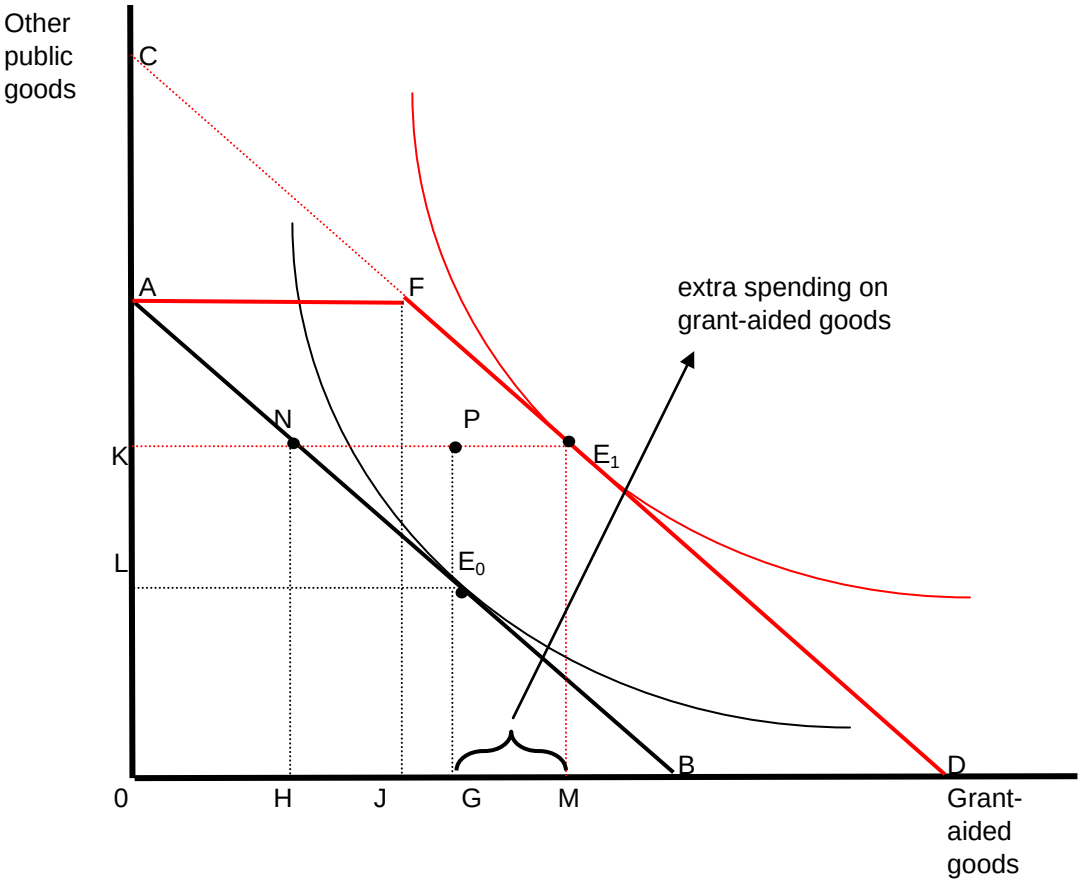
- fiscal centralisation
  - economies of scale
  - spatial externalities (spillovers eg pollution oversupplied and education undersupplied)

- assignment of expenditure functions
  - stabilisation (central)
  - allocation (central and provincial and local – public goods… national or local)
  - redistributive (central)

- assignment of taxes (Musgrave)
  - residence-based (exise) – prov
  - immobile bases (property) – local
  - distributional (income) – central
  - stabilisation (VAT, PIT) – central
  - user charges (tolls) – all levels
  - unequal bases (mines) - central

- grant types (note that a trade-off is often made between grant-aided public goods and other public goods) – focus on what happens to the **budget lines** in each case
  - unconditional (fig 17.1) – parallel shift
  - conditional
    - non-matching (fig 17.2) – kinked budget line
    - matching open-ended (fig 17.3) – budget line pivots
    - matching closed-ended (fig 17.4) – budget line pivots and is kinked

# CONDITIONAL NON-MATCHING GRANT (fig 17.2)




- grant = AF (or HM = $NE_1$)
- new budget line AFD
- spending on grant-aided public goods
  - before grant = 0G
  - after grant = 0M
  - extra spending = GM (=$PE_1$)
- spending on other public goods
  - before grant = 0L
  - after grant = 0K
  - extra spending = LK
- part of grant is used on other public goods