Tutorial letter 201/1/2015

Public Economics

ECS3704

Semester 1

Department of Economics

IMPORTANT INFORMATION:

This tutorial letter contains important information about your module.

BAR CODE

Dear Student

This tutorial letter contains the following:

- comments on Assignment 01 (first semester only)
- comments on Assignment 02 (first semester only) (to be provided after due date)
- past examination results for ECS3704
- format of the May/June 2015 examination
- the November 2012 examination paper and answers

1. COMMENTS ON ASSIGNMENT 01

1.11 The correct option is [3].

a Incorrect. The production process is characterised by economies of scale.
b Incorrect. The benchmark model is applicable to an ideal world.
c Incorrect. Consumers maximise utility while producers maximise profits.
d Correct. See assumption 5 in Box 2.1 of BCS.

1.12 The correct option is [1].

a Correct. See BCS, section 2.2.
b Correct. If factor price ratios differ (eg wages are higher in sector X), it would be beneficial for labour in sector Y to move to sector X. This will eventually result in wage equalisation (strictly according to the benchmark module, these adjustments take place instantaneously!).
c Incorrect. Point Q is equivalent to point q in figure 2.2 which is a technically inefficient point. By using resources more efficiently (eliminating X-inefficiency) or by reallocating resources away from sector Y to sector X, more of good X can be produced without a loss of production of Y – in figure 2.2 production of good y remains at Y2 but production of good X increases to X2

1.13 The correct option is [4].

a Incorrect. Consumers can be in equilibrium at any point on the contract curve but for the top-level Pareto equilibrium condition to be met, that point must be consistent with equation [2.7] in BCS. In figure 2.4 only point F' meets this requirement.
b Correct. If person B possesses most of the resources the wishes (preferences) of person B will determine the exact position on the PPC.
c Correct. See BCS, section 2.2, Condition 3.

1.14 The correct option is [5]

[1] Incorrect. The characteristics of a public good are non-rivalry and non-excludability. The non-racial impact of the broadcast does not qualify it as a public good.
[2] Incorrect. Per definition, a free-to-air broadcast is not subject to excludability through methods such as the rental of a decoder and a contract with the broadcaster; it can be received by anyone. Neither is the service limited in any other way; more users can be added without any rivalry.
[3] Incorrect. See the comment at [1] above; the same applies to the cost of the good. Diamonds are also very expensive and per definition scarce, but that does not make them public goods.
[4] Incorrect. Again, see the comment at [1] above. Public goods are also not free to produce, and are eventually 'paid' for in a different way – through taxes.
[5] Correct, as all the other options are incorrect.

1.15 The correct option is [3]

a Correct. See section 3.7.1 in BCS.
b Incorrect. Tobacco smoking causes negative externalities. The smoker does not consider health-related costs imposed on society in general (see Box 3.2). Secondary smoking is a cost to non-smokers which smokers sometimes do not account for.
c Correct. See section 3.7.1 in BCS.
d Incorrect. The social optimum level of production is at an output of $0Q_1$.
e Correct. From society's point of view, at the private optimum level of production there is overproduction and underpricing of the product/service.

1.16 The correct option is [1]

[1] Correct. See BCS, section 3.1.
[2] Incorrect. Private goods are rival in consumption.
[3] Incorrect. The market demand curves for private goods are obtained by adding quantities horizontally.
[4] Incorrect. Private goods are rival and excludable.

1.17 The correct option is [3].

a Incorrect. The market demand is obtained by vertical addition of individual demand curves.
b Incorrect. Consumption of public goods is non-rival but such consumers are price-makers and quantity-takers.
c Correct. The marginal cost of distributing a public good to additional users is zero. Note, however, that the marginal cost of producing additional units is not zero. Another SAAB-Grippen fighter certainly does not cost nothing!
d Incorrect. Both Bongani and Joan have an incentive to free-ride hoping that the other would fund the required public good. But what is more important is that even if Joan were to voluntarily contribute her tax price, the efficient number of street lights would not be provided because it would be underfunded.

1.18 The correct option is [1]

a. Correct. See SG, section 3.1.
b. Correct. See BCS, section 4.1 and figure 4.1.
c. Correct. See BCS, section 4.1, equation 4.2.
d. Correct. See figure 4.1 in BCS. Compare Pm and Qm (artificial or statutory monopoly price and output) to Pc and Qc (price and output of perfectly competitive firm).

1.19 The correct option is [3]

a Correct. See BCS, section 5.3, p 75.
b Incorrect. See section 4.4.1 in SG. If income is taken away from Jack and given to Zini, the total utility of Zini will increase by more than the decline in Jack's total utility.
c Correct. In our simplified two person and two factors of production model, income would be the return on labour and capital. Put differently, these two factors of production are the resources available in the economy and if they are distributed unequally (e.g. one person has more capital and skills than the other), so too would the distribution of income be unequal. The market economy would solve the economic problem efficiently given this resource distribution. See also BCS, introduction on p 72 and section 5.1.

1.20 The correct option is [5]

a Correct. See BCS, section 5.2, especially Principles 1 and 2. The preconditions for the application of Principle 3 exists in the stipulated scenario.
b Correct. See BCS, section 5.3. This possibility is described mathematically in equation 5.1 on p75 of BCS.
c Correct. In contrast to additive welfare functions, ordinal welfare functions simply rank a set of, for example, social indifference curves. See BCS, p77.
d Correct. Consider figure 5.5 in BCS. If welfare is initially at point C_0 on the PPC and income is redistributed to person A who we assume has a preference for consumption of good X, more of good X would be produced but the economy may end up at a point such as F. At this point welfare is higher (W_2) but a combination off the PPC is produced which is not Pareto efficient. We have thus achieved the equity objective but at the cost of efficiency.

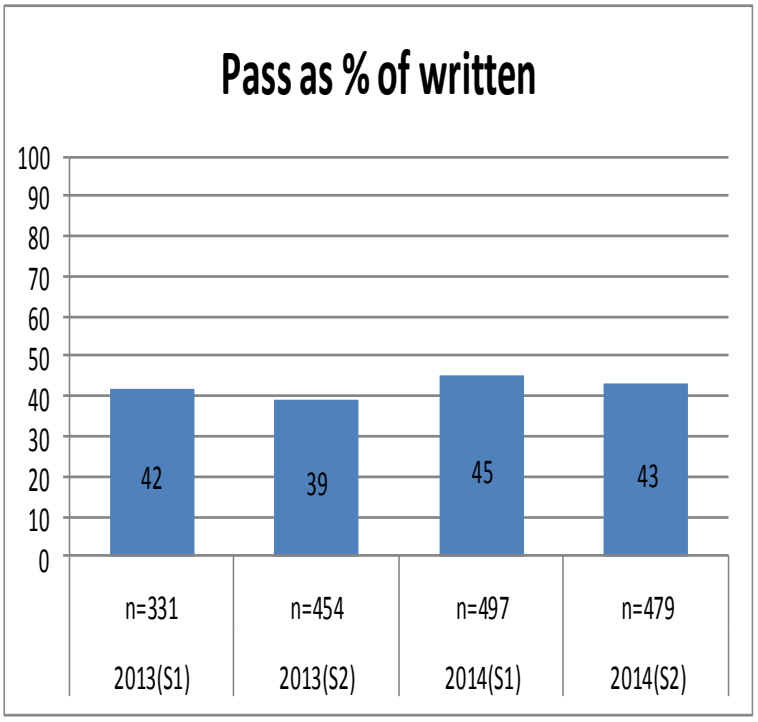
2. COMMENTS TO ASSIGNMENT 02 (to be provided after due date)

3. PAST EXAMINATION RESULTS FOR ECS3704

We are all too aware that Public Economics is a challenge to a number of our students. It is an applied microeconomics discipline and we notice that many students battle because their knowledge and comprehension of second-year microeconomics is rusty or simply inadequate. Public Economics cannot be learned off by heart – it must be understood. There is also much progression in mastering the study material. If you missed out understanding a concept or tool found early in the syllabus, it will haunt you later on. We therefore urge you to work systematically and diligently through the different study units.

We wish to emphasise that ECS3704 was developed as a 120 notional hours (study hours) module. It means that in a semester you have to spend approximately 15 eight-hour working days on this module to be successful. Alternatively you have to study Public Economics for at least 8 hours per week for 15 weeks on end. It should be clear that cramming for a weekend or week before the examination will be futile. Even if you manage to scrape through, you will just become another 50% student. There are many such students. Employers work through many CVs and need to be able to “discriminate” between good, average and poor candidates. Don’t become a 50% statistic. Rather put in a concerted effort and pass well. If you argue that you have too many other commitments such as family responsibilities, work pressure and other modules to study for, try to manage what is within your control. One controllable factor may be the number of modules you register for. It is simply not fair to yourself and others (e.g. the taxpayer that funds universities) that you attempt too many courses simultaneously. Calculate the time burden of being registered for 4 or 5 modules simultaneously on the basis of the example above and you will be alarmed at what is expected.

The examination results for the past four exam sessions are provide below. These statistics are worrisome and we think there is room for improvement. Note that these pass marks are for those who wrote the examination. The percentage pass mark for students registered is of course much lower since approximately 28% of students decided not to attempt the examination. There is more than one reason for this drop-out (see for example those mentioned above). What we also notice from the distribution of marks per examination session, is the high percentage of students [25% in 2014(S2)] who scored less than 30% in the examination. This points to too many students who are ill-prepared for the exam. One is tempted to think that such students are wasting their time, the examiner’s time and their employer’s time (and money of course). But please do not despair, there were no fewer than 28 students (6%) who obtained a distinction in the same exam!



4. FORMAT OF THE MAY/JUNE 2015 EXAMINATION

The format of the May/June 2015 examination paper is as follows: The examination paper is a **fill-in paper** (you may not remove the paper from the examination venue). The number of lines provided for answering each question should give an indication of how much you should write (the maximum). If you have a handwriting that deviates from the average (you would know that), take this into account. A few pages for rough work are provided at the end of the script.

There are two sections. Section A is compulsory and **all** the questions in this section must be answered. Section A counts 40 marks. Section B consists of **five questions** of which you have to answer **three**. Section B counts 60 marks.

Note that question 1 in Section A and all the questions in Section B were selected from ALL the study units (see Study Guide). **Questions 2 and 3 in Section A were selected from the following study units (NB: but further questions can be asked from these study units in questions 1 and 4 to 8):**

(a) SG Unit 2
(b) SG Unit 8

Question 1 in Section A has 5 short questions (definitions, brief explanations) each counting 1 to 3 marks. You have a few lines in which to answer each question. You must, therefore, be to the point!

The questions in Section B will often have a sub-question (a) counting 10 (or 15) marks and a sub-question (b) counting 10 (or 5) marks. This obviously increases the number of questions that can be set. **Since the (a) and (b) parts may come from different study units the risks attached to "spotting" increases**.

Diagrams are very important. You must be able draw and label them correctly. Then of course, you must be able to explain the dynamics of a diagram including appropriate policy responses. Questions 2 and 3 in Section A, and most of the questions in Section B, will usually contain only one sub-question each that requires the drawing and explanation of a diagram. The **other (sub-)questions will require**

written (words) answers only, therefore the prescribed parts of the SG and textbook that consist mainly or fully of text **must also be studied properly.**

Important notes:

(a) Some (sub-) questions asked in the 2014 examination papers **can and will** be asked again in 2015 papers.

(b) Some questions never asked in previous examination papers, but included in the study guide and/or textbook, can be asked in the 2015 papers.

5. OCTOBER/NOVEMBER 2012 EXAMINATION PAPER AND ANSWERS

Note that the November examination paper was a fill-in examination paper. We also provide you with **telegraph-style answers** to the questions. The purpose of the abridged answer/memorandum is to give you an indication of how the questions had to be interpreted and what information had to be included in the answers. We do not normally provide such memoranda to past examination papers since it leads to students simply studying memorandums instead of learning the prescribed study material. We want to emphasise that studying examination papers is putting the cart before the horse. Use the study guide as a manual to the textbook and work through the textbook systematically. At the end of each study unit section you should assess your understanding and progress by attempting the activities in the study guide. Only once you have done that, you should consult examination papers for further exercises.

SECTION A

ALL the questions in this section had to be answered.

QUESTION 1

(a) What is the meaning of administrative tax efficiency? (2)
Answer:

minimising administration costs and compliance costs

b) Provide **only** the mathematical equation that summarises Condition 3 (top-level simultaneous equilibrium) of the benchmark model of resource allocation. (1)
Answer:

$$MRPT_{xy} = \frac{MCx}{MCy} = \frac{Px}{Py} = MRS^{a}{}_{xy} = MRS^{b}{}_{xy}$$

(c) When deriving the demand curve for public goods, individual demand curves are summed (i)..... implying that consumers are (ii) ..... . Underline the correct alternative.
Answer:

(i) vertically / horizontally
(ii) quantity takers / price takers (2)

(d) List two policy options government could use to reduce inefficiencies caused by an "artificial" monopoly. (2)
Answer (any two):

- deregulation (remove barriers to entry)
- do nothing (in long term... D curve becomes flatter)… markets are contestable
- tax policy
  - income tax - no allocation effect.... (profits are reduced)
  - unit tax - shift AC and MC up... Q↓ & p↑… (not really getting closer to social optimum)
  - lump-sum tax - AC shift up no allocation effect (profits are reduced)
- price control (set P = MC)… but can MC be measured?

(e) According to Musgrave's tax assignment guidelines, to which level of government (national, provincial or local) should the following taxes be assigned? (Mark with an X). (3)
Answer:

	National	Provincial	Local
Company tax	X		
A tax on platinum mining in Rustenburg	X		
Business licence fee			X

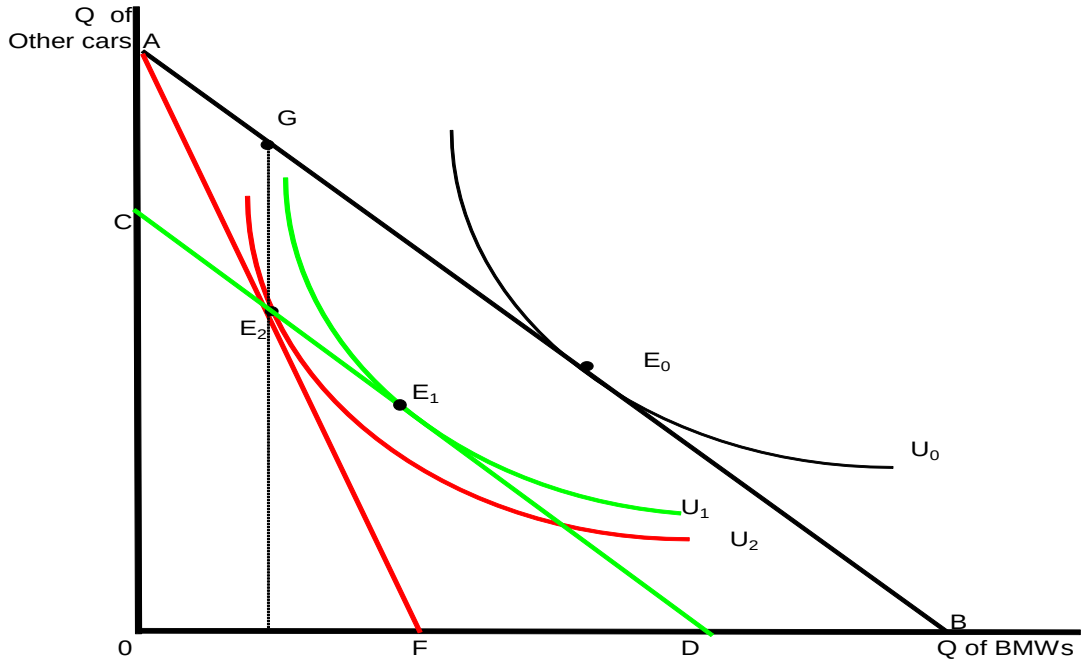
[10]

QUESTION 2

Why are general taxes (e.g. a tax on all motor cars) more efficient than selective taxes (e.g. an excise tax on only BMWs)? Explain your answer using indifference curves. (15)
Answer:

- original equilibrium at E_0
- selective tax on BMWs.. distorts relative prices... budget line pivots (AB to AF)… new equilibrium at E_2
- compare a neutral tax to selective tax which generates same tax revenue (GE_2)
- neutral tax e.g. lump-sum tax (general tax on all motor cars) ... parallel shift of budget line (AB to CD)
- equilibrium at E_1
- excess burden is illustrated by welfare/utility differences (U_1 versus U_2)

Diagram (5 marks) (note that indifference curves cannot intersect and both AF and CD passes through E_2)



QUESTION 3

Explain why it may be necessary for government to intervene in the case of a natural monopoly (e.g. water provision). Use a diagram in your discussion. What are the policy options at the disposal of government to address this problem?

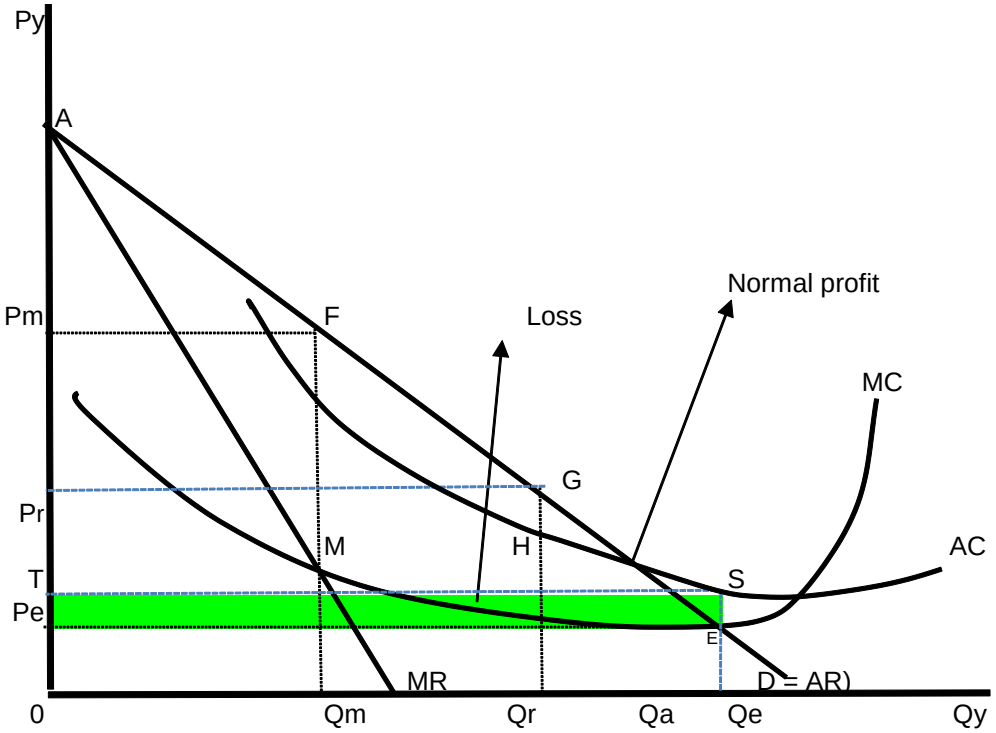
Answer:

- What is a natural monopoly?... Large capital outlays, economies of scale... demand satisfied by one firm... e.g. bulk water supply, (see fig 4.3 on decreasing cost case)
- MC lies below AC over output range for which there is demand
- equilibrium where MC = MR at Pm and Qm
- consumer surplus = AFPm
- perfect competitive equilibrium (social optimum) where MC = P
- Pe lower and Qe greater
- consumer surplus = AEPe > JBPm
- at Pe a loss is made = TSEPe

Role of government? (using partial framework)

- nationalise + unit subsidy (= loss = ES)
- privatisation of public corporations? still requires regulation
- regulate (price capping = point G) profit = GH per unit

Diagram (5 marks)



SECTION B

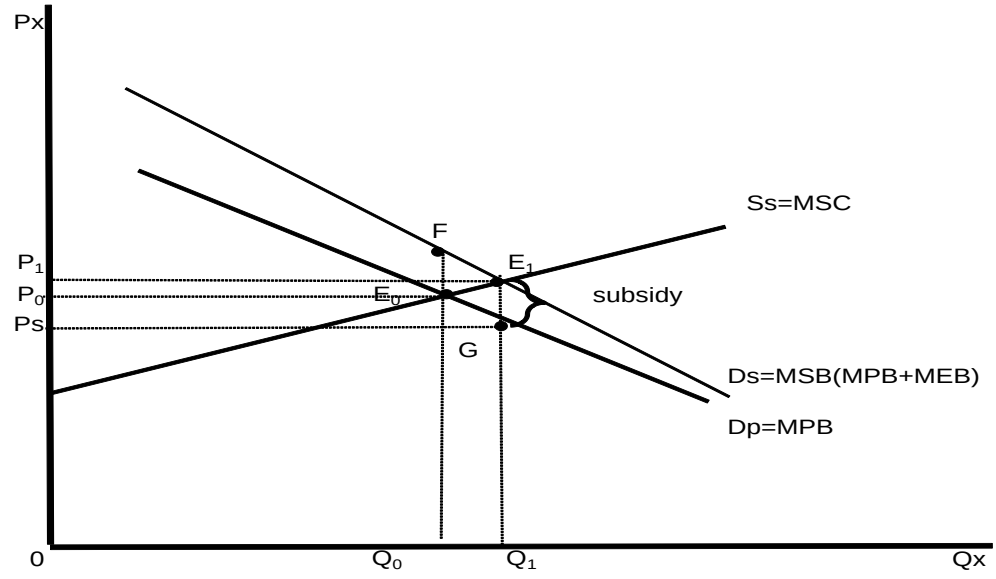
Answer any **THREE** of the following five questions.

QUESTION 4

(a) Analyse, with the aid of a diagram, why government should intervene when a positive externality occurs. Use the same diagram to show how government can internalise the externality. (15)

Answer:

Diagram (5 marks)



- positive externality causes external benefits (MEB)

- private equilibrium at E_o at price P_0 and quantity Q_0... MSCosts (supply) = MPBenefits (demand)
- at Q_0 the MSB > MPB
- social equilibrium at E_1 at P_1 and quantity Q_1 where MSB = MPB + MEB
- private equilibrium inefficient (under-provisioning and under-pricing)
- Pigouvian subsidy = GE_1 = external benefit at social optimum output
- price paid by consumer after subsidy = Ps
- price received by producer after subsidy = P_1

(b) Discuss briefly Peacock and Wiseman's displacement effect as an explanation for the growth in the share of government in the economy. (5)

Answer:

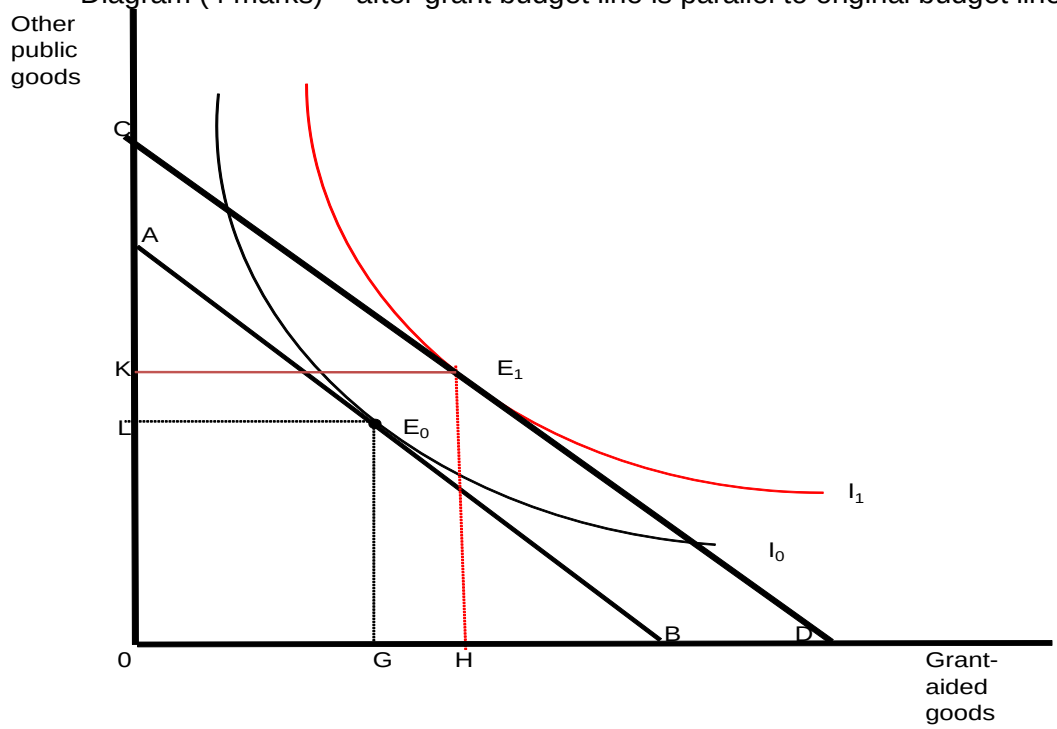
- political theory – influence of social events on public expenditure
- individuals in democracy usually not prepared to finance increased G through higher taxes / normally G only increases when absolutely necessary
- social upheavals e.g. war may change public's attitude
- government expenditure increases rapidly and convince taxpayers higher taxes necessary to prevent national disaster
- certain private and public expenditures are displaced due to the social event
- after crisis it is expected G and tax decrease to pre-crisis levels but tax and expenditure levels remain at new post-crisis levels
- taxpayers become used to higher levels of taxation and accept them as a way of life

QUESTION 5

(a) Evaluate the impact of an intergovernmental unconditional non-matching grant with the aid of a diagram. What would the rationale be for such an intergovernmental transfer? (10)

Answer:

Diagram (4 marks) – after-grant budget line is parallel to original budget line



- budget line AB government's constraint before grant
- CD new constraint after grant (=BD)
- new equilibrium at E_1 and at higher indifference curve I_1
- increase in grant-aided expenditure = GH

- increase less than grant (GH is less than BD)
- unconditional grant also spent on other goods or tax breaks (= KL)
- useful to address fiscal imbalances between sub-national governments known as revenue sharing

(b) Discuss the economic impact of a tax on personal income (**do not** use a diagram). Refer to the following in your answer: (a) work effort and empirical evidence (b) excess burden of the tax. (10)

Answer:

- tax has income and substitution effect
    - income effect – increase in tax rate causes lower after-tax income
    - work effort increases to compensate for losses
    - substitution effect – opportunity cost of leisure = wage
    - tax causes after tax income to decrease, i.e., opportunity cost of leisure decreases
    - consume more leisure at lower price
    - work effort decreases
- combined effect important
- elasticity of supply of males less sensitive than elasticity of supply of married women
- relative prices are distorted (price of earning income vs. price of leisure)
- has excess burden

QUESTION 6

(a) Use a table to compare the key characteristics of public and private goods. (10)

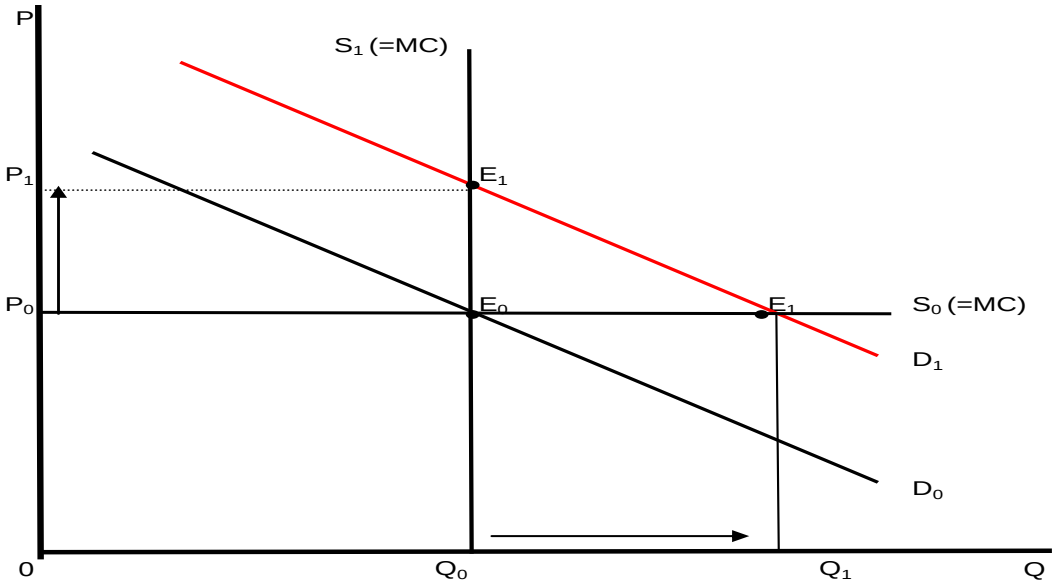
Answer:

Criteria	Public	Private
Property rights	Non-excludable	Excludable
Consumption	Non-rival	Rival
Aggregate demand curve	Vertical addition of P	Horizontal addition of Q
Equilibrium	∑MU =MC	MU = MC
Pricing rule	∑P = MC	P =MC

(b) Use a diagram to explain the potential benefits of a government housing subsidy for poor buyers if housing supply is (i) inelastic and (ii) elastic. (10)

Answer:

Diagram (4 marks)



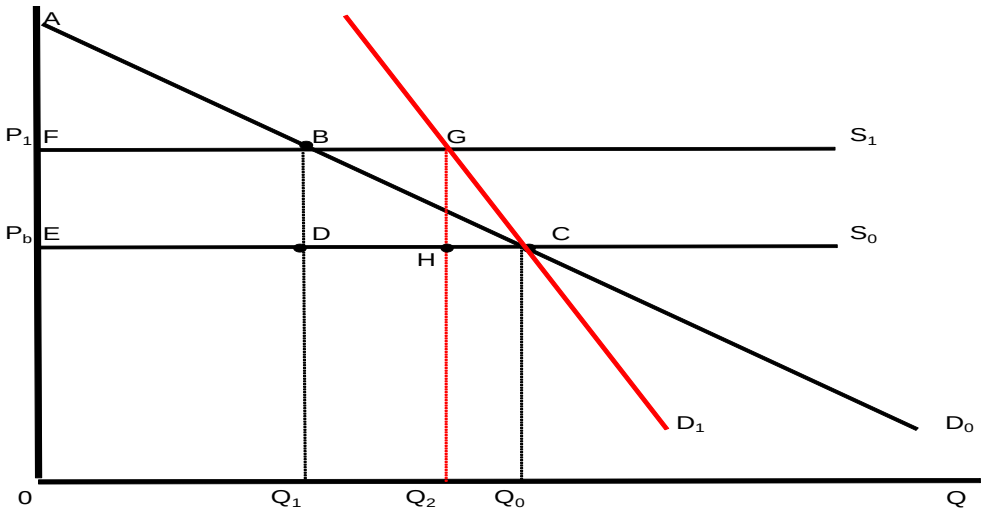
- if supply is perfectly inelastic (vertical) – short run case
  - purchasing power increases
  - demand curve shift (D_0 to D_1)
  - prices of houses increase (P_0 to P_1)
  - benefit of subsidy shifted to existing homeowners (capital gains)
- if supply is perfectly elastic (horizontal) – long run case
  - demand curve shift (D_0 to D_1)
  - quantity supplied increases ($0Q_0$ to $0Q_1$)
  - price unaffected
  - no shifting of benefit – new owners get the benefit of subsidy

QUESTION 7

(a) Explain with the aid of a diagram why it would be efficient to rather tax goods with price-inelastic demands instead of price elastic goods (assume a horizontal supply curve). What are the implications for tax revenue and equity of this elasticity rule? (14)

Answer:

Diagram (5 marks)



- demand D_0 is more elastic than D_1

- assuming constant returns the supply is S_0
- impose selective tax and supply shifts to S_1
- in the case of (price) sensitive demand curve D_0 quantity demanded decreases to Q_1 and for the (more) insensitive demand curve D_1 it decreases to Q_2
- the excess burdens are BCD (for D_0) and GCH (for D_1)
- where demand is inelastic the excess burden is less for the same tax rate change – (economically) more efficient
- the government revenue for D_0 is FBDE and for D_1 it is FGHE
- from revenue perspective it is again better to tax price inelastic commodities

BUT, there are equity implications:

- price elasticity of demand for necessities tends to be low compared to luxury goods
- elasticity tax rule implies that high tax rate on (e.g.) bread would be efficient (excess burden is small)
- but expenditure on bread is major proportion of income of poor people – tax therefore regressive and inequitable

(b) Distinguish briefly between pure public goods, mixed goods and merit goods. Name one example of each. (6)
Answer:

- pure public good – non-exclusion + non- rival = e.g. defence
- mixed good – exclusion + non-rival or rival + non-exclusion = e.g. roads
- merit good – mixed good or private but politically meritorious = e.g. education

QUESTION 8

(a) Discuss two key tax equity principles. What are the advantages and shortcomings of each? (10)

Answer:

benefit principle

- user pays for benefits
- expenditure linked to revenue
- resource are efficiently allocated (benefit taxes = prices)
- benefits must be excludable
- existing distribution taken for granted

ability-to-pay

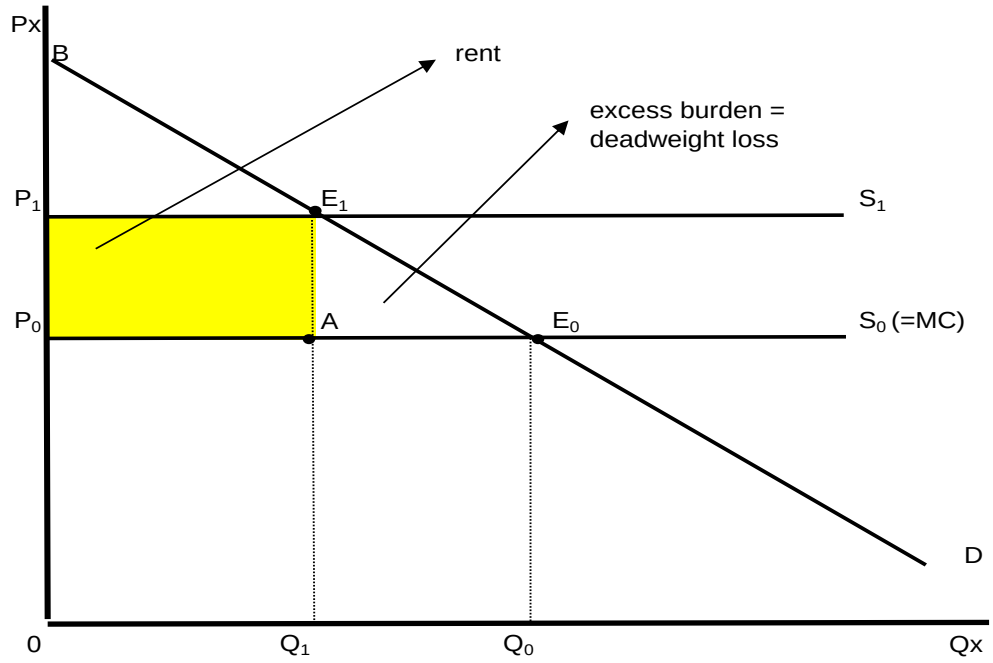
- linked to capacity
- horizontal – persons with same income pay the same tax amount
- vertical – persons with higher income pay higher tax amount
- is income a good measure of ability?
- problem of determining vertical equity and rate structure (how progressive or what?)

(b) Explain with the aid of a diagram why rent-seeking - a form of government failure - could cause inefficiency. (10)
Answer:

- economic rent similar to monopoly profits
- rent is artificially created by government through e.g. licenses and other restrictions
- assume horizontal supply curve S_0; demand curve D
- under perfect competition price P_0 and quantity Q_0 (equilibrium E_0)
- government restricts output to $0Q_0$, price increases to P_1 (new equilibrium E_1)
- consumer surplus decreases by $P_1E_1E_0P_0$ (from BP_0E_0 to BP_1E_1)

- $P_0AE_1P_1$ is wealth (surplus) transfer from consumers to producers = artificial rent
- AE_0E_1 is deadweight welfare loss to society (= inefficiency)
- deadweight area understates loss; producers will incur costs to capture rent for themselves
- if costs (e.g. lobbying) are internal to producers, it will increase MC, up to maximum of S_1 (=MC_1)
- decreases producers' share of profit (artificial rent); at S_1 (=MC_1) they derive no nett benefit
- these lobby costs are an inefficient allocation of resources – from productive to non-productive rent-seeking activities
- social cost of state intervention now = $P_0AE_1P_1$ + AE_0E_1 (i.e. =$P_0P_1E_1E_0$)

Diagram (4 marks)



Wishing you all the best with your studies.

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