

## 3E1 CRIB 2012

1.

a) To define the NE of a game it is convenient to first define the idea of best response. A strategy,  $x$ , is a best response for a player to an opposition strategy if, given that opposition strategy, the strategy  $x$  achieves at least as high a payoff as any other strategy that is available. Then we can say that a NE is a set of strategies, one for each player, such that each player's strategy is a best response to the other players' strategies.

b)

i) Labelling the two people A and B, the normal form for this game is as follows:

		Person B	
		Sit	Stand
Person A	Sit	(1, 1)	(2, 0)
	Stand	(0, 2)	(0, 0)

N.B. The payoffs, utilities representing the preferences given in the question, are shown as (player A, player B).

The Nash Equilibria can then be found using best response analysis:

		Person B	
		Sit	Stand
Person A	Sit	( <u>1</u> , 1)	(2, 0)
	Stand	(0, <u>2</u> )	(0, 0)

In this case (Sit, Sit) is the game's unique Nash Equilibrium.

ii) No, this game is not strictly analogous to the Prisoner's Dilemma (PD). In the PD game, both players have a strictly dominant strategy, as they do here (Sit). The PD game also (therefore) has a unique NE, as here. However in the PD game the unique NE is Pareto inefficient, whereas in this game the NE is Pareto efficient.

c)

Normally, a depreciation of the exchange rate would be expected to improve a country's trade performance as it would make exports more competitive and imports less competitive. But this will depend on a number of factors. First, firms' pricing strategies: how do firms respond to the depreciation. Second, the price elasticities of demand: how do consumers respond to change in relative prices. Third, whether domestic firms have the capacity to produce more exports or import substitutes.

In the short-run there may be a deterioration in trade performance due to the J curve effect: as import prices increase before exports and imports substitutes are produced and sold. In the medium-run, a depreciation may increase competitiveness and aggregate demand. In the long run, a depreciation may not have to have much effect on the economy (if prices and wages have adjusted upwards returning the real exchange rate back to its initial position).

d)

A government or monetary authority can use monetary policy to influence its exchange rate. For instance if it wishes to depreciate its exchange rate it can cut its interest rate, which should cause a monetary outflow and downward pressure on its exchange rate. Additionally it can sell its own currency which should have a similar impact. Candidates may consider the opposite case when country wishes to appreciate its currency. They may also not the difficulties of trying to influence the exchange rate. Candidates may also use a diagram to illustrate their answer.

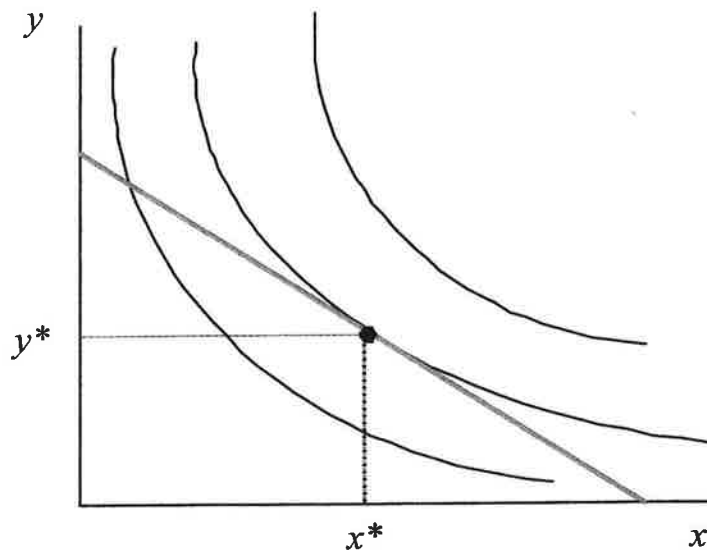
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a) The marginal rate of substitution (MRS) between two goods refers to the rate at which a consumer is just willing to substitute a small amount of one good for another. Graphically it is the slope of an indifference curve.

b) The condition that the MRS between two goods for a consumer equals the ratio of their prices is a characteristic of rational choice (assuming well behaved preferences).

First explain that a consumer's rational choice problem is to choose the consumption bundle that maximises utility subject to the budget constraint. In a two-good (x and y)

setting this problem and its solution can be depicted graphically using indifference curves and a budget line:

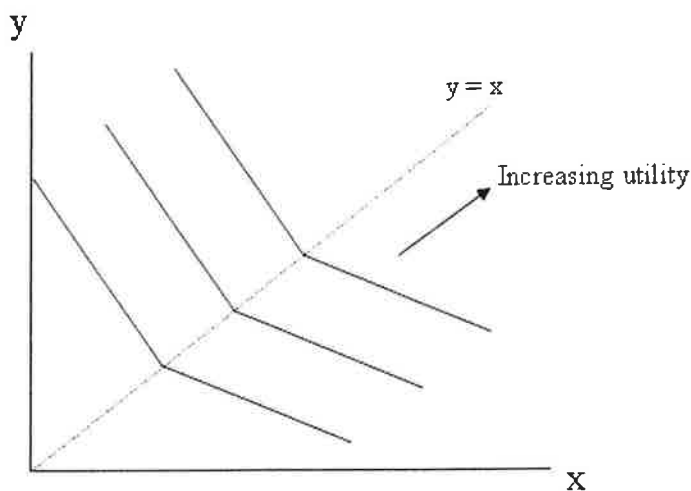


In this setting the consumer's rational choice problem is to find the bundle that lies on or below the budget line (i.e. is affordable) and that lies on the highest available indifference curve.

The solution to this problem, given the well-behaved indifference curves shown in the diagram, is the bundle  $(x^*, y^*)$ . As can be seen, this bundle necessarily lies at a tangency between the budget line and the highest available indifference curve and this tangency is characterised by the condition in the question. The slope of the indifference curve is the consumer's MRS and the slope of the budget line is the price ratio. Hence at the tangency the MRS equals the price ratio.

A very good answer might also note that if preferences are not well-behaved, rational choice might not be characterised by this tangency (e.g. perfect substitutes).

c) The diagram below shows three indifference curves for this utility function.



Each indifference curve is made up of two straight line segments, with these segments meeting along the line  $y=x$ . Above the line  $y=x$  the slope of these straight line segments is  $-2$ , below  $y=x$  their slope is  $-(1/2)$ .

d)

Candidates should consider the arguments for and against joining the Euro. The arguments for joining the Euro include the following. First, it provides price transparency and lower costs as there are reduced foreign exchange transactions. Second, the Euro will support the Single Market which will foster increased competition and efficiency. Third, it will help to deliver low and stable inflation. Fourth, it will be force for political stability.

The arguments for not joining the Euro include the following. First, it reduces policy flexibility as countries have no power over their exchange rate of monetary policy (candidates may discuss the concept of whether Europe is an optimum currency area?). And the UK needs flexibility over such policies to promote growth. Second the lack of flexibility will lead to slow growth and a multiple or two speed Europe which may adversely affect the UK economy. Third, the adoption of the Euro would undermine UK sovereignty.

Candidates may discuss the recent experience of the Euro zone to support their answers. Also, candidates may argue for or against (or be neutral) the UK joining the Euro.

3.

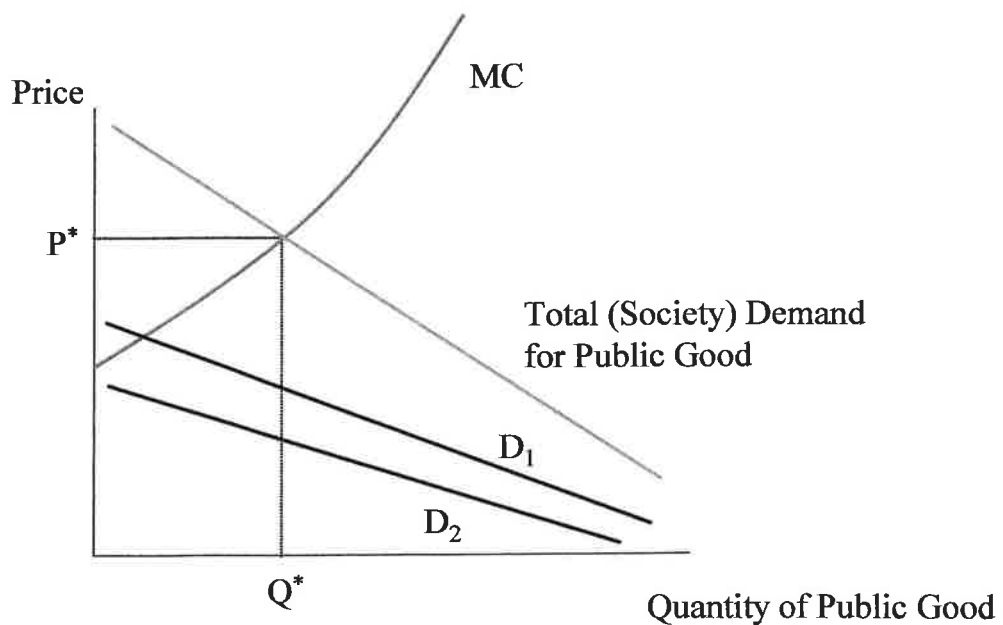
a)

i) Non-rival means that consumption of a good by one person does not reduce the amount of that good available for consumption by any other person (e.g. a radio broadcast).

ii) Non-excludable means that it is impossible (other than at prohibitive cost) to exclude any person from consuming a good once that good has been provided for one person (e.g. national defence).

b) Public goods are both non-rival and non-excludable and as a result of these two properties market provision is likely to result in an inefficient level of provision of the good (i.e. result in market failure). This provides the rationale for government determining the level of provision.

To explain why public goods generate market failure, first characterise the efficient level of provision of a public good. This is most easily done with the following diagram taken from the lecture notes:



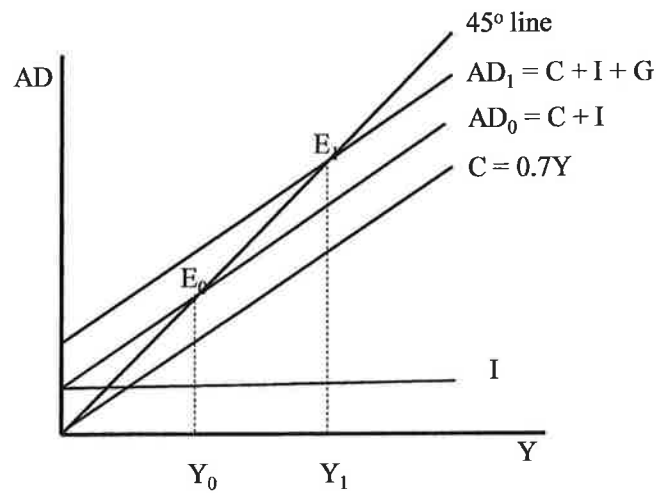
Society's demand curve for a public good is the vertical summation of individual consumer's demand curves (since the non-rival property implies each consumer's marginal willingness to pay (MWP) for the good should be added up to obtain society's MWP for each unit). Efficient provision occurs at  $Q^*$ , where the societal demand curve and the MC curve intersect.

The lectures gave two reasons why provision is unlikely to be  $Q^*$  in a market. First, individuals have an incentive to free-ride and to personally purchase little (if any) of the good knowing that (because of the two properties) they will be able to consume the units purchased by others. If such free-riding is the dominant strategy for all consumers, little of the good is likely to be provided.

Second, even without such free-riding, a private market does not provide a mechanism for aggregating individual consumer's preferences (i.e. their MWP for each unit). In the above diagram, if the supplier acts competitively and supplies along the MC curve, consumer 1 will purchase a small amount of the good and consumer 2 nothing. Yet in order for the efficient level of provision ( $Q^*$ ) to be obtained there needs to be some mechanism for aggregating consumers' preferences, that is, taking into account the fact that both (or all) consumers may consume each unit provided.

c)

Fiscal policy involves the use of tax and spend policy to stimulate or contract aggregate demand. To increase demand, Governments can: increase expenditure or cut taxes. To decrease demand, Government can cut expenditure or increase taxes. Candidates may illustrate their arguments with a diagram – such as the diagram below which illustrates how an increase on Government expenditure increases national income (Y).



d)

Fiscal policy measures may lead to offsetting changes in other components of aggregate demand. For instance, changing taxes to affect consumption spending may be offset by changes in saving. There are difficulties in predicting the effects of fiscal policy: the size of the multiplier is difficult to measure and may fluctuate; induced investment through the accelerator is difficult to predict; multiplier/accelerator interactions even more difficult to predict; problems of time lags.

e)

The balanced budget multiplier explains why an equal increase in Government expenditure and taxes may lead to an increase in aggregate demand. The government increases expenditures (G) balancing it by an increase in taxes (T). Since only part of the money taken away from households would have been spent in the economy, the change in consumption expenditure will be smaller than the change in taxes. Therefore the money which would have been saved by households is instead injected into the economy through Government expenditure.

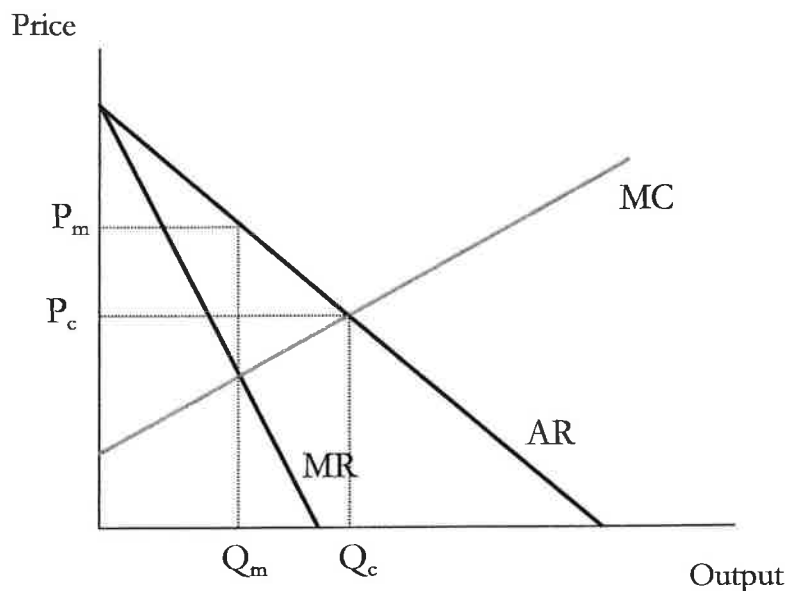
4.



a) A monopoly refers to a situation in which a firm is the sole supplier (and potential supplier) of a particular good or service.

b) There are two distinct (but related) points to explain here, both arising from a monopolist having market power and therefore being able to influence the market price of its product.

The first point is that, everything else being equal, price is likely to be higher (and output lower) under a monopoly than a competitive market. The standard monopoly diagram can be used to illustrate this:



Hence a monopoly is harmful to consumers, with the firm using its market power to charge a higher price ( $P_m$ ) than would be charged under a competitive situation ( $P_c$ ).

The second point is that the monopoly outcome is not Pareto efficient (i.e. it's an example of market failure). The issue here is not the higher price *per se*, but rather the lower level of output for the monopolist ( $Q_m$ ) compared to the competitive situation ( $Q_c$ ). The units that are not exchanged under monopoly but that would be under the competitive situation (those between  $Q_c$  and  $Q_m$ ) are all ones for which the marginal

cost of production (MC) is below consumers' willingness to pay (AR). For each of these units there therefore exists some price (between MC and AR) at which both the firm and a consumer would be made better off by the unit being produced and exchanged. Hence with these units not being exchanged in the monopoly situation the result is Pareto inefficient. The deadweight loss is a numerical measure of the cost to society of this inefficiency.

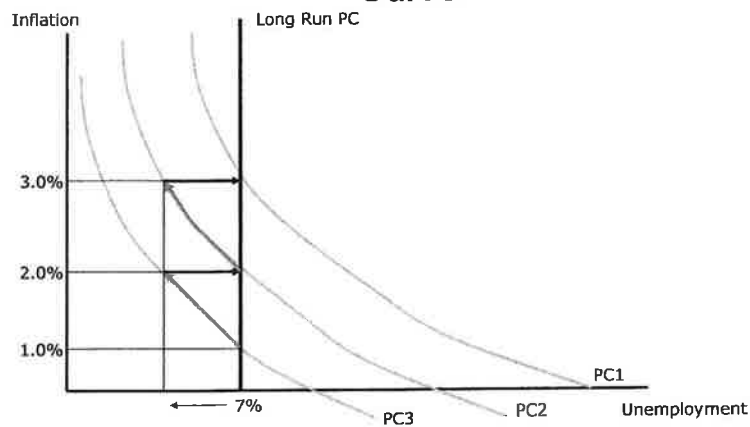
Other points for which credit might be awarded include: i) the idea that in the absence of competitive pressures, monopolists may be prone to being wasteful or not as low cost as they might be; ii) that there may actually be benefits associated with monopolies, such as generating profits that can fund innovation; and iii) the difficulties associated with natural monopolies.

c)

For monetarists, inflation is demand determined – where monetary growth is excessive. Whereas, unemployment will settle at its 'natural rate' in the long-run. The natural rate will be determined by how efficiently the labour market is operating.

Many monetarists use the Expectations-Augmented Phillips Curve (see below) to illustrate their analysis. Where there is an inflation/unemployment trade-off in the short run only but not in the long run. The long-run equilibrium can occur at any rate of inflation, provided that the expected rate of inflation is equal to the actual rate. Attempting to push unemployment below the Equilibrium rate of unemployment will lead to accelerating inflation. Lowering the rate of inflation requires a period of sustained unemployment above the Equilibrium rate until expectations of inflation have been revised downwards. To reduce the equilibrium rate of unemployment requires deregulation of the labour market: such as the reduction of the powers of trade unions.

## The Expectations-Augmented Phillips Curve



d)

One of the key determinants of growth is technology. The key intuition behind endogenous growth models is that technology and growth can be influenced by the economic system. There are various forms of endogenous growth models. Some emphasise the absence of diminishing returns to capital (in contrast to exogenous growth models). Others have retained the notion of diminishing returns to a factor but have stressed the importance of externalities or spill-overs which can lead to endogenous growth. In the exogenous growth model, savings leads to growth temporarily, but diminishing returns to capital force the economy to the steady state growth path that depends on exogenous technological change. In contrast, with endogenous growth, investment can lead to persistent growth. Many endogenous growth models employ a 'broad' notion of capital including knowledge. Endogenous growth models can explain divergences in growth: with fast growth in countries that invest in the key areas (such as: education, skills, R&D and so on); whereas slow growth countries do not invest in the key sectors.

