Faculty of Actuaries **Institute of Actuaries**

EXAMINATIONS

September 2004

Subject 107 — Economics

EXAMINERS' REPORT

Introduction

The attached subject report has been written by the Principal Examiner with the aim of helping candidates. The questions and comments are based around Core Reading as the interpretation of the syllabus to which the examiners are working. They have however given credit for any alternative approach or interpretation which they consider to be reasonable.

M Flaherty
Chairman of the Board of Examiners

23 November 2004

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Q1-26 Multiple Choice

The overall performance of candidates for multiple choice questions was good. Some questions were answered incorrectly more frequently than others. These included questions 16, 18 and 23 (where answer b was the most frequent error).

Q27

Generally well answered. There were minor slips in the construction of the table and some confusion between revenue and profit when calculating the marginal revenue product of labour.

Q28

In some cases the diagram was poorly drawn and therefore unclear. In part (ii) many candidates failed to mention elasticity in their answer.

Q29

Although straightforward, Part (i) was rather poorly answered. In Part (ii) many candidates wrote essay – length answers (generally of a high standard) to a part of the question worth only 2 marks.

Q30

In some cases there was basic confusion between anticipated and unanticipated inflation. Some candidates 'listed' rather than 'explained'. The length of the answers varied considerably and it should be noted that only 2 marks were allocated to each part.

Q31

Generally well answered. In part (ii) some candidates only gave a formula for the multiplier without a full answer to the question.

Q32

Most candidates organised their answer around a discussion of GDP or GNP, however some failed to distinguish between nominal and real measures.

Q33

Although diagrams showing the adjustment loop were reproduced accurately in many cases, candidates were less able to explain the mechanism by which a reduction in the rate of growth of money supply may lead to a reduction in the rate of inflation.

Q34

Well answered. Calculations were straightforward. Some marks were lost due to careless work.

Q35

Part (i) was generally well answered. In part (ii) some candidates incorrectly identified the terms of trade with the trade balance. Others argued that it was a contract drawn up by two countries listing the terms under which they would trade.

Q36

One of the more poorly answered questions on the paper. It was clear that the difference between the short run and the long run was not understood by many candidates. There was little understanding of how marginal product would go down and marginal cost up.

Q37

The essay question was straightforward.

(i) Surprisingly the quality of answers in this part of the question varied greatly in terms of the definitions and number of assumptions discussed. In particular diminishing marginal rate of substitution was not well handled.

(ii) The most common pitfalls included, trying to explain both cases using one diagram (which was unclear and confusing) and the omission of a discussion of income and substitution effects. The most ambitious sought to analyse the effect of a price change considering both a price increase and a price decrease. This was unnecessary.

General Comments

This was a straightforward paper. In several instances handwriting was virtually illegible. Diagrams were often drawn freehand. Clarity would have been enhanced through the simple use of a ruler.

1 D
2 C
3 B
4 D
5 B
6 C
7 D
8 D
9 A
10 C
11 A
12 C
13 B
14 C
15 A
16 D
17 D
18 D
19 A
20 B
21 C
22 B
23 C
24 C
25 B
26 A

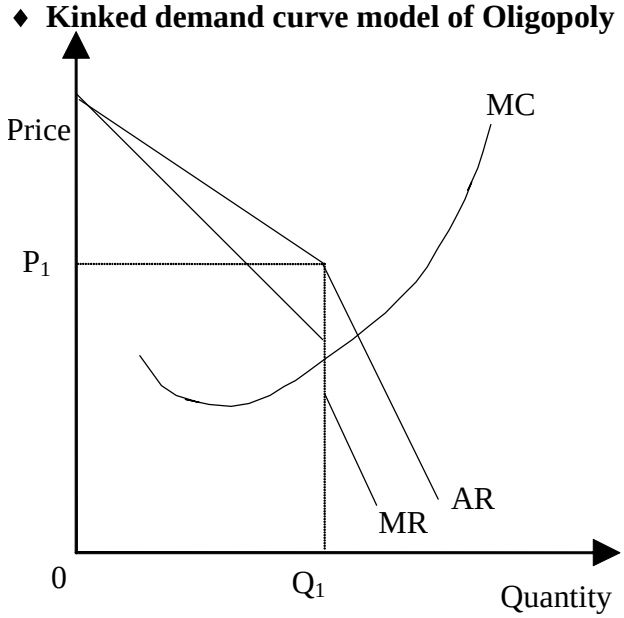
27 (i)

No. of Workers	*APL*	*MPL*	*MRP*
0	—	—	0
1	24	24	240
2	22	20	200
3	19.7	15	150
4	16.8	8	80
5	14.6	6	60
6	12.8	4	40

(ii) 4 workers

28 (i)

♦ **Kinked demand curve model of Oligopoly**



(ii) The demand curve is kinked at the current price because the demand curve is more elastic above the current price and more inelastic below.

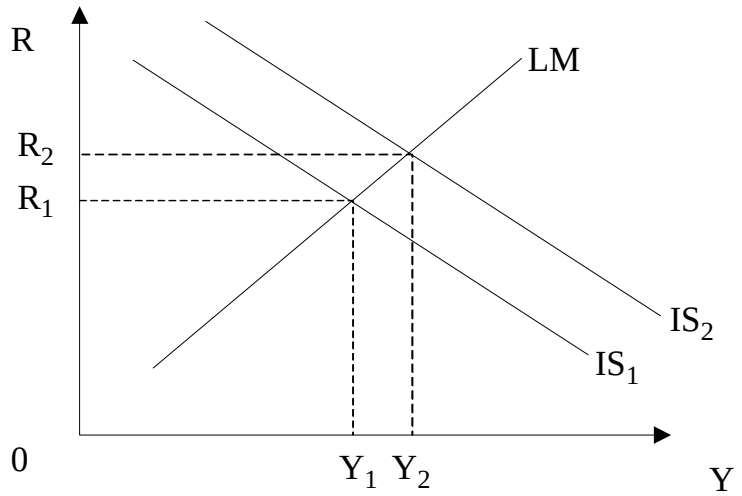
If an oligopolist cuts its price, rivals will follow suit.

If an oligopolist raises its price rivals will not follow.

29 (i) (a) The IS curve shows combinations of interest rates and national income at which investment demand will equal savings.

(b) The LM curve shows combinations of interest rates and national income for which the demand for liquidity equals the supply of money.

(ii)



The increase in government expenditure will move the IS curve to the right (IS_1 to IS_2) and result in an increase in national income (Y_1 to Y_2) and the rate of interest (R_1 to R_2).

30 (i) The potential problems caused by unanticipated inflation are:

Unintended and arbitrary redistribution of wealth from lenders (typically the elderly) to borrowers (typically the young) when inflation is unexpectedly high.

Lenders may require a higher real rate of interest to compensate them for the risk of unexpected inflation. This is sometimes called "inflation risk premium".

People who are due to receive money under any type of fixed price contract or pension arrangement will lose out if inflation is unexpectedly high.

(ii) The potential problems caused by anticipated inflation are:

Money illusion — mistake a difference in prices caused by inflation for a real difference in price.

Menu costs — scarce resources are wasted purely to cope with changes in prices.

Shoe-leather costs — more frequent financial transactions so that more resources are required in the financial services industry; less cash is held which may result in missed opportunities.

High inflation would be a problem if there was a desire to maintain the value of the currency.

The possibility of leading to a situation of hyper-inflation.

31 (i) (a) 2.5
(b) 4

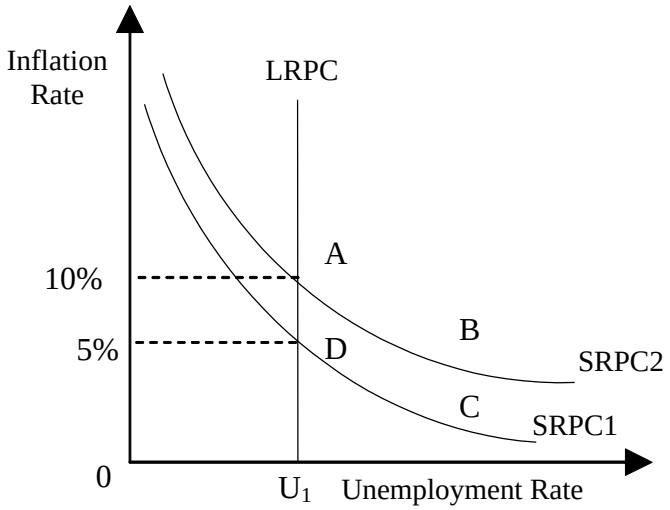
(ii) The introduction of a proportional tax on income will give a further leakage from consumer expenditure as national income rises. This will reduce the marginal propensity to consume out of national income and the value of the multiplier will fall.

32 (i) The term "economic growth" is used to refer to increases in real GNP or GDP. Sometimes, economists will consider GNP (or GDP) per capita, so that economic growth can be used to refer to real growth in GNP per person.

(ii) Economists explain economic growth in terms of increases in the quantity and productivity of the following factors used in production:

Capital — man-made resources.
Labour — all human effort.
Land — all natural resources
Technical knowledge — invention and innovation

33



Starting at point A with LRPC and SRPC2 the natural level of unemployment is U1 and the rate of money supply growth is 10%pa. Thus actual and expected price and wage inflation are all 10% pa as well.

If the government cuts the rate of growth of the nominal money supply to say 5% but inflation remains at a higher level the real money supply will contract. This causes interest rates to rise. Private sector investment and consumption will fall leading to higher unemployment. The economy will move right from A to B down the SRPC2 curve and unemployment will rise.

If the government continues to expand money supply at only 5% workers will eventually come to expect 5% inflation in the long run and the economy will move onto SRPC1 at point C. Wage inflation will be a little lower than 5% and so the real money supply is expanding, eventually taking the economy back to LRPC at point D as interest rates and thus unemployment fall.

34 (i) $C = 425 + 0.8(2400 - 0.15(2400))$
$C = £2057$

(ii) Exports = £230 million
Imports = 0.1(2400) = £240 million
Balance = £10 million (deficit)

(iii) $Y = 425 + 0.8\ (Y - 0.15(Y)) + 265 + 210 + 230 - 0.1(Y)$
$Y = 1130 + 0.58\ (Y)$
$Y = £2690$ million

35 (i) International trade allows the world's resources to be used in a more economically efficient way. In particular, the existence of world trade:

- Allows countries to specialise in the production of the goods which they can produce relatively more efficiently than other countries.
- Increases the scope for benefits from economies of scale by increasing the size of the available markets.
- Increases the range of goods and services which consumers can buy.
- Leads to lower prices through increased competition which benefits consumers rather than producers.

(ii) The terms of trade for a country is the quantity of domestically produced goods that have to be sacrificed in order to obtain a unit of imported goods. In other words, the terms of trade is the opportunity cost of imported goods in terms of the goods that have to be exported to pay for imports.

36 (i) Since capital is fixed in the short run, the amount of capital available to each worker declines as more workers are employed. Consequently diminishing marginal productivity will eventually arise. If we assume that labour is the only variable input, there is a direct inverse relationship between the marginal productivity of labour and short run marginal costs. As more labour is employed to increase output, marginal productivity of labour will eventually fall and short run marginal costs will rise.

(ii) (a) Economies of scale refer to the situation where long run average costs fall as output is increased. This will be the case when an increase in all inputs gives a greater than proportional increase in outputs. This can only happen in the long run when all factor inputs are variable.

(b) Diseconomies of scale refer to the situation when long run average costs rise as output is increased. This is often explained by the problem of efficiently managing large companies.

37 (i) An "indifference curve" joins all the two good consumption bundles of equal utility. The slope of an indifference curve will depend on the consumer's preferences and is equal to the marginal rate of substitution, (the amount of one good that the consumer is prepared to swop for one extra unit of another good).

The key assumptions are:

A consumer can rank any two bundles — and can therefore pick a set of consumption bundles that give the same utility.

Consumers prefer more of a good to less of it — therefore indifference curves slope downwards from left to right and indifference curves further from the origin give higher utility.

Consumer preferences exhibit diminishing marginal rates of substitution and are convex to the origin.

(ii) In answering the question an understanding of the substitution and income effects of a price change is necessary.

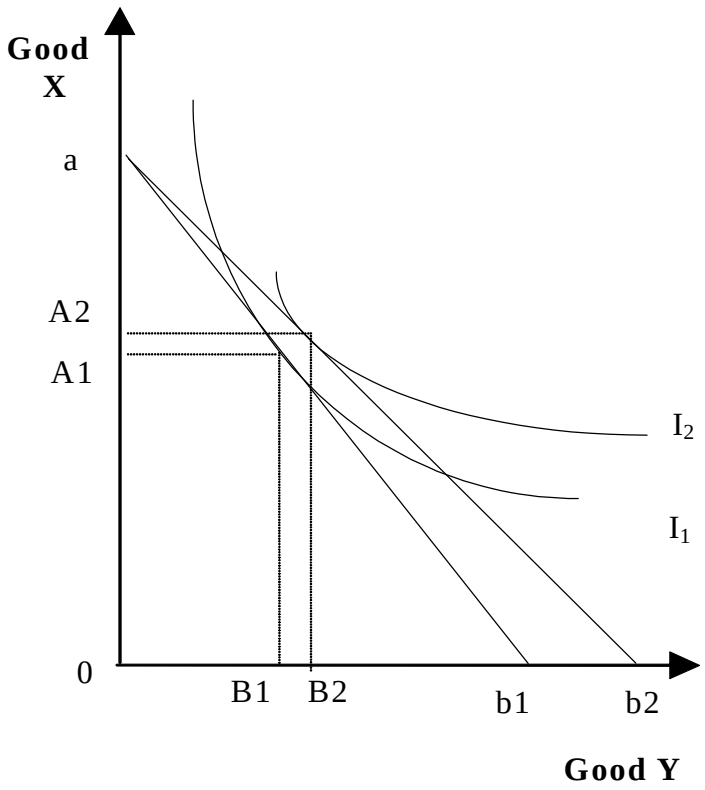
The substitution effect of the price change is the change in demand for the good caused by the change in relative prices, holding the level of utility (or real income) of consumers constant. The substitution effect of a price change is always negative, it is the opposite direction to the change in price.

The income effect of the price change is the change in demand for the good caused by the change in the real income of consumers. It can either be negative (when it is in the opposite direction from the change in price and the good is a normal good), or positive (when it is in the same direction as the change in price and the good is an inferior good or Giffen good).

The examples below relate to example where a consumer has a choice between bundles of good X and Y.

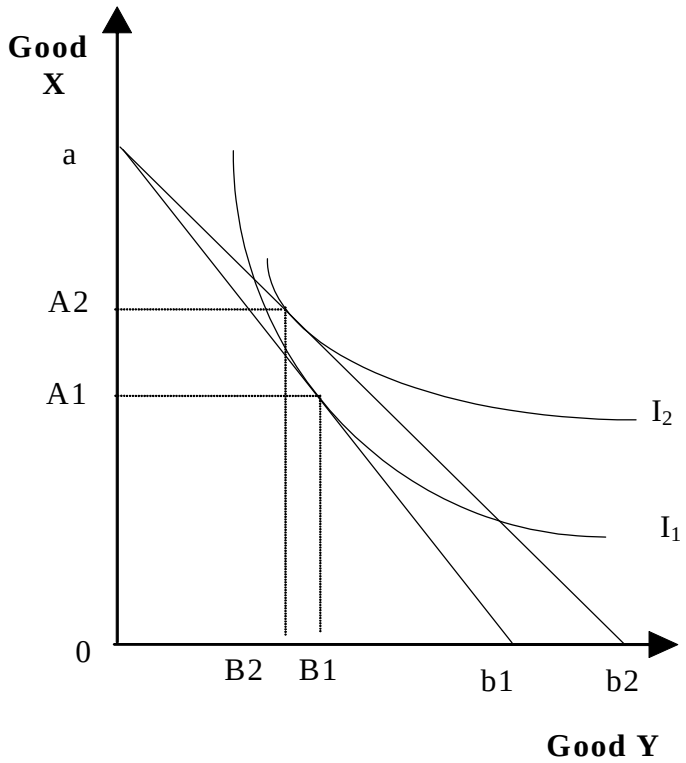
Normal Good:

Consider the case where good Y is a normal good. If the price of good Y falls and the price of good X remains the same the budget line will pivot out from ab1 to ab2. The consumption point changes from A1B1 to A2B2. For a normal good the income and substitution effects will both be negative, (demand will change in the opposite direction to the price change), and reinforce each other. They both involve an increase in the quantity demanded as price falls.



Giffen Good:

Consider the case where good Y is a Giffen good and the price of good Y falls. In terms of the indifference curve diagram the budget line pivots from ab1 to ab2. In the case of a Giffen Good the positive income effect, which reduces demand as price falls, is strong enough to exceed the negative substitution effect, which increases demand as price falls. The overall effect of the fall in the price of good Y is to decrease the quantity of good Y demanded. Before the price fall consumption of good X was A1 and good Y was B1. After the price falls consumption is A2 and B2 for goods X and Y respectively.



In both cases the diagrams can be used to separate out the income and substitution effects of the price fall. This is achieved by drawing a hypothetical budget line, which has the slope of the new budget line and is tangential to the old indifference curve. The movement along the old indifference curve from the old consumption bundle to the "intermediate" bundle with the same utility is the substitution effect. The income effect is the change from the "intermediate" bundle on the old indifference curve to the point where the new budget line is tangential to the new indifference curve.

END OF EXAMINERS' REPORT