

Macroeconomics 2

Time Allowed: 3 hours

Answer **ALL TEN** questions in Section A (3 marks each), **ALL FOUR** questions in Section B (10 marks each) and **ONE** of the **TWO** questions in Section C (30 marks). Answer Section A questions using the Section A Answer Sheet, Section B questions in a separate booklet; and Section C questions in a separate booklet.

Approved pocket calculators are allowed.

Read carefully the instructions on the answer book provided and make sure that the particulars required are entered on each answer book. If you answer more questions than are required and do not indicate which answers should be ignored, we will mark the requisite number of answers in the order in which they appear in the answer book(s): answers beyond that number will not be considered.

Section A: Answer ALL TEN questions using the yellow answer sheet

1. Which of the following statements about the search model of the labour market is not true?
(3 marks)
- (a) Firms are forward looking. Therefore, the decision to hire a worker is based in part on (expectations about) future productivity and wages.
 - (b) In recessions there are unemployed workers, in booms there are vacancies. There can never be both unemployed workers and vacancies at the same time.
 - (c) Workers never quit their job voluntarily.
 - (d) Firms decide whether or not to post a vacancy in order to maximize profits.
 - (e) The value of a vacancy is exactly equal to zero.
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2. The equilibrium of the Diamond-Mortensen-Pissarides model of the labour market can be summarized by the following two equations:

$$S = \frac{y - b}{r + \lambda + \beta p(\theta)} \quad \text{and} \quad k = (1 - \beta)q(\theta)S,$$

where S is total match surplus, y is output per worker, b are unemployment benefits, r is the interest rate, λ is the separation rate, β is a Nash bargaining parameter, θ is labour market tightness, k are vacancy posting costs, and $p(\cdot)$ and $q(\cdot)$ are functions for the job finding and vacancy filling rates. Choose one of the statements below to describe what happens to the equilibrium of this model in response to an exogenous increase in the separation rate, and why. **(3 marks)**

- (a) More jobs are destroyed in each period. Therefore, firms post more vacancies to recreate these jobs.
 - (b) Jobs last less long. Therefore, firms pay higher wages to induce workers to exercise more effort while they are still employed.
 - (c) More jobs are destroyed, whereas the number of jobs that are created does not change. Therefore, the unemployment rate increases.
 - (d) Jobs last less long, which makes them less valuable. Therefore, firms post fewer vacancies.
 - (e) Total match surplus increases, labour market tightness decreases.
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3. Consider the following statements about the Permanent Income Hypothesis (PIH). **(3 marks)**

- I. Under the PIH, a consumer does not adjust her consumption in response to changes in her income if she knew these changes were going to occur.
- II. Under the PIH, a consumer adjusts her consumption in response to announcements about changes in her income in the future.
- III. Under the PIH, the interest rate does not affect consumption, only income does.

- (a) Only statement I is correct.
 - (b) Only statement II is correct.
 - (c) Only statement III is correct.
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(d) Two of the three statements are correct.

(e) All three statements are correct.

4. Consider the following two statements: (3 marks)

I. In the RBC model, the steady state of hours worked is independent of technology.

Outside of steady state, however, technology affects hours worked positively.

II. In business cycle models, it is good practice to calibrate parameters to steady state targets if direct evidence on these parameters is not available.

(a) Both statements are true.

(b) Statement I is true, but statement II is false.

(c) Statement I is false, but statement II is true.

(d) Both statements are false.

(e) It is impossible to say whether these statements are true or false without more information.

5. Which of the following statements about the new Keynesian model is not true? (3 marks)

(a) Prices are sticky.

(b) In the long run, the model behaves a bit like the RBC model, but in the short run, it behaves very differently.

(c) The new Keynesian Phillips curve (NKPC) is derived from the price setting problem of firms.

(d) The equilibrium of the model is determined by the consumption Euler equation (or IS curve), and money market equilibrium (LM curve), and the NKPC. The equilibrium is therefore not affected by what the Central Bank does.

(e) Expectations are important in this model. How expectations are formed affects the form of the NKPC, which in turn affects the predictions of the model.

6. The country called Pancraziland is a net borrower in the international capital market. That means its net international investment position is negative. Which of the following statements is false? **(3 marks)**

- (a) Pancraziland has more international liabilities than assets.
 - (b) Pancraziland necessarily has a negative investment income.
 - (c) Future current account deficits affects the evolution of Pancraziland's NIIP.
 - (d) Pancraziland's trade balance and income balance will affect its current account balance.
 - (e) Pancraziland could have a negative current account balance and a positive trade balance in a given year.
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7. Consider an infinite horizon model in which in each period the country can lend/borrow in the international market. Which of the following statements is false? **(3 marks)**

- (a) If the country starts with a negative net foreign asset position, it cannot run perpetual trade balance deficits.
 - (b) If the country starts with a negative net foreign asset position, and its endowment grows enough, it could potentially run perpetual current account deficits.
 - (c) The no-Ponzi game condition states that the level of assets has to be strictly positive when time goes to infinity.
 - (d) The current account in this economy, at a given time t , is equal also to savings minus investment.
 - (e) The trade balance of the country could be positive in some periods and negative in others.
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8. Which of the following statements is false? In a production economy an increase in the interest rate (everything else equal): **(3 marks)**
- (a) Decreases current consumption.
 - (b) Incentivizes future consumption.
 - (c) Affects differently countries that have an existing positive or negative net asset position.
 - (d) Has an additional positive effects on consumption in both periods because of increased profits.
 - (e) Ameliorates the current account.
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9. Pancraziland is a two-period small open economy that specializes in the production of pizza. Pancraziland is subject to a country risk premium. Pancraziland starts with zero assets. In period 1 researchers discover a new delicious pizza sauce that, however, could only be produced in period 2. How will the interest rate that Pancraziland faces in the international market change in expectations of excellent pizza exports in period 2? **(3 marks)**
- (a) Pancraziland is a small open economy. The interest rate is fixed and exogenous so it will not change.
 - (b) The interest rate increases because Pancraziland wants to save more in response to the creation of the new pizza sauce, and therefore to clear the capital market, the interest rate must increase.
 - (c) The interest rate increases because Pancraziland would like to borrow in response to the creation of the new pizza sauce, and the increased debt causes investors to ask for an interest rate premium
 - (d) The interest rate declines because Pancraziland wants to save more in response to the creation of the new pizza sauce, and therefore to clear the capital market, the interest rate must decrease.
 - (e) None of the above are true.
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10. Recall that “CIRP” is the Covered Interest Rate Parity, and “UIRP” is the Uncovered Interest Rate Parity. Under free capital mobility, which of the following statements is true? **(3 marks)**

- (a) The CIRP can be violated but the UIRP must hold.
- (b) The UIRP can be violated but the CIRP must hold.
- (c) Both the UIRP and the CIRP must hold.
- (d) Both the UIRP and the CIRP can be violated
- (e) When the CIRP holds, then the UIRP is violated

Section B: Answer ALL FOUR Questions.
Please use a separate booklet.

11. Some of the models we have seen (RBC model, search model of the labour market) generate predictions that are not in line with the data. Some researchers have suggested that the reason for this is that in reality wages are rigid, whereas in our models they are not. Is this a good solution to improve the empirical behaviour of these models? **(10 marks)**

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12. Show graphically the effects on inflation and output of a positive temporary demand shock in the case of an adaptive expectations Phillips curve and of a New Keynesian Phillips curve. Explain the difference between the path of inflation in each model, and the implications in terms of monetary policy under an inflation target. **(10 marks)**

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13. Explain what “Ricardian Equivalence” means. Also explain three reasons why Ricardian Equivalence might not hold, as suggested by the data. **(10 marks)**

14. Consider two countries, Chile and Greece. Chile's exchange rate policy is to keep the exchange rate floating. Greece, however, is part of the EU monetary union and its exchange rate is fixed. Assume that a sudden stop occurs in the two countries, which is originated by a sudden increase in the real interest rate. Assume that the sudden stop in the two countries is of the same magnitude. Now, official statistics show that the sudden stop in Chile did not cause any change in the unemployment level, while in Greece unemployment has increased substantially after the sudden stop.

Describe what could explain this difference; carefully explain the theoretical argument; and finally discuss which other data about Chile and Greece you could look at to sustain your thesis. **(10 marks)**

Section C: Answer ONE Question.
Please use a separate booklet.

15. After much discussion in the government, the Central Bank is given the following new mandate: *"The Bank's monetary policy objective is to deliver inflation as low as possible, and to avoid swings of output around its potential growth path"*.
- (a) Write down the loss function that best translates the new mandate of the Central Bank. Explain intuitively what this loss function means and how it is different from the standard loss function that describes its current mandate. **(10 marks)**
 - (b) Find the output bias implied by this central bank and explain its implications for the inflation path, in an environment of adaptive expectations. **(10 marks)**
 - (c) What happens to inflation under this policy? In your opinion, is the new mandate for the Central Bank an improvement? Why (not)? **(10 marks)**

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16. Consider a two-period, two-country, endowment economy. Let one of the countries be the United States, denoted by U , and the other Europe, E . These are the only two countries in the world and they are both large open economies.

Households in the United States have preferences described by the utility function:

$$U^U(C_1^U, C_2^U) = \ln(C_1^U) + \ln(C_2^U),$$

where C_1^U and C_2^U denote consumption of U.S. households in periods 1 and 2, respectively. Europeans have identical preferences, given by:

$$U^E(C_1^E, C_2^E) = \ln(C_1^E) + \ln(C_2^E),$$

where C_1^E and C_2^E denote consumption of European households in periods 1 and 2, respectively.

Let Q_1^U and Q_2^U denote the U.S. endowments of goods in periods 1 and 2, respectively. Similarly, let Q_1^E and Q_2^E denote the European endowments of goods in periods 1 and 2, respectively. Assume further that the endowments are nonstorable, that the U.S. and Europe are of equal size, and that there is free capital mobility between the two economies. The United States starts period 1 with a zero net foreign asset position.

- (a) Assume that Europe and the United States have identical endowments, which are also constant over time. Specifically, assume that $Q_1^U = Q_2^U = Q_1^E = Q_2^E = 10$. Compute the equilibrium world interest rate, the equilibrium current account for the US and the current account for Europe. In two lines, provide an intuition to interpret your results. **(7 marks)**
- (b) Suppose now that period 1 in the model coincides with 2008, when a crisis hit the US but not Europe. In addition, agents expect the crisis to be temporary. This means that you should assume that Q_1^U drops from 10 to 8. All other endowments remain unchanged at 10. This contraction in output has two characteristics: first, it originates in the United States (the European endowments are unchanged); second, it is temporary (the U.S. endowment is expected to return to its normal value of 10 after one period). Calculate the equilibrium interest rate and the current accounts of the United States and Europe in period 1. In two lines, provide an intuition to interpret your results. **(7 marks)**
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- (c) Again suppose that period 1 in the model coincides with 2008, when a crisis hits the US but not Europe. However, now agents expect the crisis to be long-lasting and to be even more severe in the future. This means that you should assume that the U.S. endowment falls from 10 to 8 in the first period and is expected to continue to fall to 6 in the second period ($Q_1^U = 8$ and $Q_2^U = 6$). The endowments in Europe remain unchanged at 10 each period. Like the one described in the previous item, this contraction originates in the United States. However, it differs from the one described in the previous item in that it is more protracted. Calculate again the equilibrium interest rate and the two current accounts in period 1. In two lines point out differences in the effects of the two types of contraction and provide intuition to interpret your results. **(7 marks)**
- (d) At the beginning of the Great Contraction of the US, interest rates fell sharply around the world. In light of the models studied above, how can you explain this interest rate decline? **(3 marks)**
- (e) Now assume that in addition to the decline in expected period-2 endowment (as in part (c)), there is also an increase in US agents' uncertainty about the future realization of output in their country. Explain in words how the Current Account of the US and the world interest rate would change with respect to part (c) **(3 marks)**
- (f) Finally, assume that a similar crisis as described in part (c) happened in a small open economy, such as New Zealand, instead of the United States. Explain in words how the world interest rate would be affected in this case, and how the Current Account of New Zealand would compare to the one of the United States if facing a long-lasting crisis as the one described in part (c). **(3 marks)**
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