

**DIVISION OF MANAGEMENT  
UNIVERSITY OF TORONTO AT SCARBOROUGH  
ECMCO6H3 L01 Topics in Macroeconomic Theory  
Winter 2002  
April 30, 2002**

**FINAL EXAMINATION**

**PART A:** Answer the following 20 multiple choice questions. Cross the answer you think is the correct one. Each question is worth 1 point.

**Question 1:**

According to the neoclassical model of investment, business fixed investment does *not* depend on:

- a. the realized profits of firms.
- b. the marginal product of capital.
- c. the interest rate.
- d. tax rules affecting firms.

**Question 2:**

The cost of capital for investment, in the absence of taxes, may be summarized as the:

- a. nominal interest rate plus the depreciation rate.
- b. real interest rate plus the depreciation rate.
- c. purchase price of a capital good multiplied by the sum of the nominal interest rate plus the depreciation rate.
- d. purchase price of a capital good multiplied by the sum of the real interest rate plus the depreciation rate.

**Question 3:**

If a consumer is a borrower in period one and the interest rate rises, the:

- a. income and substitution effects both tend to make consumption higher in the first period.
- b. income and substitution effects both tend to make consumption lower in the first period.
- c. income effect tends to make consumption higher in the first period and the substitution effect tends to make it lower.
- d. substitution effect tends to make consumption higher in the first period and the income effect tends to make it lower.

**Question 4:**

Milton Friedman argued that, on average, consumption is:

- a. proportional to income.
- b. a fraction of permanent income that rises as permanent income rises.
- c. a fraction of permanent income that falls as permanent income falls.
- d. proportional to permanent income.

**Question 5:**

Franco Modigliani's answer to Simon Kuznets's puzzle regarding long-term constancy of the average propensity to consume is that:

- a. the average propensity to consume depends on the income-wealth ratio, and income and wealth tend to grow together over time.
- b. both rich and poor individuals have the same average propensity to consume.
- c. demographic shifts have acted to just cancel out movements in the average propensity to consume.
- d. every consumer consumes all of his or her income over a lifetime, so the average propensity to consume is constant at one.

**Question 6:**

From the Ricardian point of view, a consumer should not raise his or her consumption when taxes are cut but government spending is not cut because:

- a. the government is going to raise taxes by exactly as much as the cut in the next year.
- b. the government is going to raise taxes by exactly as much as the cut plus interest in the next year.
- c. the government is sure to raise taxes by an amount equal in present value to the debt incurred this year, sometime in the taxpayer's lifetime.
- d. even if the government does not raise enough extra taxes during the taxpayer's lifetime to pay off, in present value, the debt incurred this year, the taxpayer should make provision for the taxes that will be levied on his or her heirs.

**Question 7:**

According to the traditional view of government debt, if taxes are cut without cutting government spending, then the international effect initially will be a capital \_\_\_\_\_ and a trade \_\_\_\_\_.

- a. inflow; deficit
- b. inflow; surplus
- c. outflow; deficit
- d. outflow; surplus

**Question 8:**

Assume that a government has a balanced budget when the economy is at full employment. If the economy then enters a recession, with no change in tax or spending laws, then the budget of the government is most likely to:

- a. remain balanced.
- b. be in deficit.
- c. be in surplus.
- d. be in either deficit or surplus, depending on the severity of the recession.

**Question 9:**

Although real variables such as unemployment and real GDP are the best measures of economic performance, most economists do not advocate manipulating money supply directly to hit a real target because:

- a. they believe a constant growth rate of the money supply is the best way to stabilize real GDP or unemployment.

- b. if the government and the Bank of Canada chose a target that was not natural output or the natural unemployment rate, the result would be accelerating inflation or deflation.
- c. if the government and the Bank of Canada chose a target for the unemployment rate above the natural rate, the result would be accelerating inflation.
- d. if the government and the Bank of Canada chose a target for the unemployment rate below the natural rate, the result would be accelerating deflation.

**Question 10:**

Assume that there is a short-run tradeoff between inflation and unemployment, that the central bank desires both low inflation and low unemployment, and that the central bank follows a fixed rule in conducting monetary policy. Initially, households and firms expect high inflation. Following a credible announcement by the central bank of a low-inflation policy, households and firms will \_\_\_\_\_ the central bank's announcement and \_\_\_\_\_ their expectations of inflation.

- a. believe; lower.
- b. not believe; not change.
- c. believe; not change.
- d. not believe; lower.

**Question 11:**

Conducting fiscal policy so that  $G = T + \beta(u - u^n)$ , where  $G$  is government expenditures,  $T$  is tax revenue,  $u$  is the unemployment rate,  $u^n$  is the natural rate of unemployment, and  $\beta$  is a positive number, is an example of a(n):

- a. active rule.
- b. passive rule.
- c. discretionary policy.
- d. automatic stabilizer.

**Question 12:**

The government can lower inflation with a low sacrifice ratio if the:

- a. money supply is reduced slowly.
- b. public has adaptive expectations.
- c. short-run aggregate supply schedule is relatively flat.
- d. public believes that policymakers are committed to reducing inflation.

**Question 13:**

In the sticky-price model, if no firms have flexible prices, the short-run aggregate supply schedule will:

- a. be vertical.
- b. be steeper than it would be if some firms had flexible prices.
- c. slope upward to the right.
- d. be horizontal.

**Question 14:**

According to the worker-misperception model, workers confuse nominal wage changes with real wage changes, whereas:

- a. in the sticky-wage model, workers also confuse nominal wage changes with real wage changes.
- b. in the sticky-price model, workers also confuse nominal wage changes with real wage changes.
- c. in the sticky-price model, producers confuse changes in the overall price level with changes in relative prices.
- d. in the imperfect-information model, producers confuse changes in the overall price level with changes in relative prices.

**Question 15:**

In the Mundell–Fleming model, if the economy is operating at or below the natural level in the short run, then in the long run the price level will fall, the exchange rate will \_\_\_\_\_, and net exports will \_\_\_\_\_ to restore the economy to its natural rate.

- a. appreciate; increase
- b. appreciate; decrease
- c. depreciate; increase
- d. depreciate; decrease

**Question 16:**

According to the Mundell–Fleming model, under:

- a. floating exchange rates, a monetary expansion raises income whereas a fiscal expansion does not, but under fixed exchange rates, a fiscal expansion raises income whereas a monetary expansion does not.
- b. both floating and fixed exchange rates, a monetary expansion raises income, but a fiscal expansion does not.
- c. both floating and fixed exchange rates, a fiscal expansion raises income, but a monetary expansion does not.
- d. floating exchange rates, a fiscal expansion raises income whereas a monetary expansion does not, but under a fixed exchange rate, a monetary expansion raises income whereas a fiscal expansion does not.

**Question 17:**

A tax cut combined with tight money, as was the case in both the United Kingdom and the United States in the early 1980s, should lead to a:

- a. rise in the real interest rate and a fall in investment.
- b. fall in the real interest rate and a rise in investment.
- c. rise in both the real interest rate and investment.
- d. fall in both the real interest rate and investment.

**Question 18:**

Those economists who believe that monetary policy is more potent than fiscal policy argue that the:

- a. responsiveness of money demand to the interest rate is large.
- b. responsiveness of money demand to the interest rate is small.
- c. *IS* curve is nearly vertical.
- d. *LM* curve is nearly horizontal.

**Question 19:**

According to the quantity equation, if velocity is *not* assumed to be constant and the money supply is held constant, then an increase in the interest rate \_\_\_\_\_ velocity and \_\_\_\_\_ income.

- a. increases; increases
- b. increases; decreases
- c. decreases; decreases
- d. decreases; increases

**Question 20:**

An interpretation of why the *IS* curve slopes downward and to the right is that as income rises, national saving rises, and this increase drives the interest rate:

- a. down, thereby decreasing investment.
- b. down, thereby increasing investment.
- c. up, thereby decreasing investment.
- d. up, thereby increasing investment.

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**PART B:**     **Answer any four of the following six questions. Each question answered is worth 20 points. A separating line between sub-questions indicates that the questions are not related to each other.**

**Question 1:**

Use the intertemporal budget constraint. To make calculations easy, assume that family lives for 5 years with 4 years of work and 1 year of retirement. (A more realistic assumption would be a 50-year horizon with 40 years of work and 10 years of retirement). Consider a family that wishes to consume the same amount each year. Assume earnings of \$25,000 per year and an interest rate of 5 percent. (Assume that the family receives its annual income at the end of the year and that the annual bills are also paid at the end of the year.) Assume initial assets to be zero.

- a) Find the level of consumption such that the assets at the end of 5 years are roughly zero, say within \$100. What is the level of assets at the beginning of retirement? (4)
  - b) Repeat the calculation of consumption, but with initial assets of \$ 1,000. By how much does consumption rise? (4)
  - c) Repeat the calculation of consumption, with initial assets of zero, but with earnings of \$26,000 per year. By how much does consumption rise? Explain why the increase in consumption is larger than in part b. (4)
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- d) Describe algebraically or verbally the effect of the 1987 stock market crash on aggregate consumption
    - (i) in the context of the permanent income hypothesis (4)
    - (ii) in the context of the life-cycle hypothesis. (4)

**Question 2:**

- a) " A deficit during a war can be a good thing. First, the deficit is temporary, so after the war is over the government can go right back to its old level of spending and its old level of taxes. Second, since the evidence supports the Ricardian equivalence

*which is*

proposition, the deficit should help stimulate the economy during wartime, helping to keep the unemployment rate low".

Identify four distinct mistakes in this statement. (6)

Is anything correct in this statement? (2)

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- b) Consider the following data for an economy (all figures are expressed as a percentage of GDP):

Tax revenue/GDP	15%
Expenditures/GDP (including transfers, excluding interest payments)	20%
Nominal interest rate	10%
Annual inflation rate	4%
Annual growth rate of GDP	0%
Debt to GDP ratio (at the beginning of the year)	50%

- (i) What is the official deficit? (2)
- (ii) What is the "inflation adjusted" deficit? (3)
- (iii) What is the primary deficit? (3)
- (iv) By how much will the real national debt increase over the years? (4)

**Question 3:**

- a) The Bank of Canada has set a target band of 1-3 percent for the core inflation rate. The Bank can choose where in the range it wants to be. Also, the Bank will adjust its inflation target, at least temporarily, if some exogenous event (e.g. a supply shock) pushes inflation outside of the range that was previously announced.

- (i) In light of this flexibility, would you interpret inflation targeting as a policy rule? (5)
- (ii) If the bank has this flexibility, what is the purpose of inflation targeting? (4)

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- b) Under what circumstances do you think that the Bank of Canada should shift from targeting the money stock growth rate to targeting the interest rate? (4)

- c) How would the Lucas critique suggest that you should design a policy to try to reduce annual inflation from 10 percent to 2 percent? (7)

**Question 4:**

- a) During the late 1980s and early 1990s the Bank of Canada pursued a contractionary monetary policy (the Bank reduced money supply growth). Suppose that the hysteresis view of the unemployment problem applied to Canada during this period. In this case, what effect would the Bank of Canada's disinflation policy have on the actual and natural rate of unemployment? (6)

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- b) In country A wages adjust slowly to changes in unemployment whereas in country B wages adjust quickly. Show graphically how the difference in the wage adjustment affects the shape of the Phillips curve in both countries. (6)
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c) According to the sticky-price model, a high rate of inflation should make the short-run aggregate supply curve steeper. Why would this be? (Your answer can be given in algebraic or verbal terms) (8)

**Question 5:**

- a) The interest rate in a small open economy is determined by the world interest rate plus a risk premium. Assume that investors come to believe that the Canadian dollar will depreciate. Show graphically how these exchange rate expectations will likely affect
- (i) aggregate income in the short run (5)
  - (ii) aggregate income in the long run (3)

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b) Under a fixed exchange rate, a fear of devaluation can lead to a recession. Explain. (6)

c) Suppose that a formerly closed economy becomes open. What will happen to the effectiveness of fiscal and monetary policy in affecting GDP if the economy operates under flexible exchange rates? Answer separately for fiscal and monetary policy. (6)

**Question 6:**

Assume that instead of  $G$  being exogenous it is given by the formula

$$G = 750 - .1(Y - Y^*)$$

where  $Y^*$  is potential GDP and is equal to \$4,000 billion. Suppose that the other relationships in the economy are given by

$$C = 80 + .63Y$$

$$I = 750 - 2,000r$$

$$M = (.1625Y - 1,000r)P$$

$$NX = 425 - .1Y - 500r$$

where the price level is predetermined at  $P = 1$  and the money supply is 600.

- a) Derive an algebraic expression for the IS-curve for this model. (6)
  - b) Is the IS-curve represented by the equation steeper or flatter than in the case where  $G$  is exogenous? Explain. (4)
  - c) Calculate the effect on GDP of an increase in the money supply of \$10 billion. (6)
  - d) Is the effect larger or smaller than in the case where  $G$  is exogenous? Explain. (4)
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**ANSWER SET TO FINAL EXAMINATION**

**PART A:**

Questions 1, 2, 4 and 5 are not relevant for the exam since we did not cover the corresponding material.

Q. 3 b; 6d; 7a; 8b; 9b; 10a; 11a; 12d; 13d; 14d; 15c; 16a; 17a; 18b; 19a; 20b.

**PART B:**

**To Question 1:**

$$\begin{aligned} \text{a) PV of income equals } & 25,000 \times \frac{1 - (1/1.05)^4}{0.05} \\ & = \$88,648.76 \end{aligned}$$

$$\begin{aligned} \text{PV of consumption} & = X \times \frac{1 - (1/1.05)^5}{0.05} \\ & = X (4.3295) \end{aligned}$$

The level of consumption per year such that assets are zero at the end of year 5

$$0 = \$88,648.76 - X(4.3295) \text{ or } X = \$20,475.52 = C.$$

At the beginning of retirement, i.e. at the beginning of year 5, income if nothing is consumed is

$$\$25,000 (1.05)^3 + 25,000(1.05)^2 + 25,000 (1.05) + 25,000 = 107,753.13$$

The value of C at the end of year 4 is \$88,252.05. From this follows that the level of assets at the beginning of retirement is \$107,753.13 - \$88,252.05 = \$19,501.07.

b) PV of wealth is \$89,648.76.

$$0 = \$89,648.76 - X (4.3295)$$

X = \$20,706.49. Therefore, consumption increases by \$230.97 (20,706.49 - 20,475.52)

c) PV of income equals \$92,194.71. Consumption per year now is equal to \$21,294.54. The increase in consumption is \$819.02.

The extra earnings of \$1,000 per year increases the PV of income by \$3,545.95 while the endowment of wealth increases the PV of income only by \$1,000.

d) is not relevant for the final.

**To Question 2:**

a) The following statements are incorrect or at least questionable:

- Whether or not the Ricardian equivalence is supported by evidence is controversial.
- According to R.E a budget deficit does not stimulate the economy.



- Since the economy is not stimulated, unemployment won't be kept at a low level.
- The deficit is not temporary. The interest payments on the high debt accumulated during the war will keep the deficit high for many years after the war.
- Government spending and taxation cannot be back at the old level, given the higher deficits after the war.

The first statement is correct. A deficit during war time can be a good thing, it is the way to finance the war effort.

- b) (i) The official deficit equals  $iD + G + TR - T = .10(.5) + .20 - .15 = .1$  or 10% of GDP.  
(ii) The inflation adjusted deficit equals  $iD - \pi D + G + TR - T = (i - \pi) D + G + TR - T = rD + G + TR - T = (.10 - .04) (.50) + .20 - .15 = 0.08 = 8\%$   
(iii) The primary deficit is  $.20 - .15 = .05 = 5\%$ .  
(iv) The real debt will increase by the real interest rate which is 6%.

For questions 3 and 4 see home assignment #2.

**To Question 5:**

- a) (i) Depreciation fear raises the risk premium which has the same effect as if the world interest rate would increase. As a result  $r^* > r$ . There will be capital outflow and the currency depreciates. For the answer see figure 12-9 and text on page 343/344 in the textbook. You could then add the modification to the conclusion on page 343/344 provided on pages 354/355.  
(ii) Since investment is a function of  $r^*$ , as  $r^*$  increases investment spending on new plant and equipment declines. The long run implication is that because of lower capital accumulation, there will be lower growth of GDP in the long run. You could also analyse the long run implication by showing the inflationary effect of the rise in  $Y$ . If  $Y > Y^*$  and  $P$  rises,  $M/P$  falls,  $r$  increases so does  $e$ .  
b) see the case study of the Mexican financial crisis on pp. 355 which outlines how the expectation of a devaluation causes a run on the banks resulting in a devaluation.  
c) Fiscal policy has no effect on  $Y$ . Monetary policy increases  $Y$ . See text section 12-2.

**Question 6 was the same question than question 4 in home assignment #1.**

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where  $Y^*$  is potential GDP and is equal to \$4,000 billion. Suppose that the other relationships in the economy are given by

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- d) Is the effect larger or smaller than in the case where G is exogenous? Explain. (4)
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