

## Macroeconomics and the Global Economic Environment (FNCE 613) SAMPLE EXAM 1

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**NAME**

(IN BLOCK LETTERS)

**Class time** (CIRCLE ONE):      9:00 a.m.      10:30 a.m.      1:30 p.m.

**DO NOT OPEN BOOKLET UNTIL TOLD TO BY PROCTOR**

**PLEASE DO NOT TURN THE PAGE UNTIL THE EXAM BEGINS.**

1. This examination consists of 4 major parts. Altogether there are 11 pages (including this page). When the examination begins, **check immediately to make sure that you have all pages.**
2. PRINT your name LEGIBLY - IN BLOCK LETTERS - at the top of EVERY PAGE immediately after the exam begins. The exam pages will be separated after the exam ends, and it is important that your name be printed on every page. **YOU WILL RECEIVE A BONUS OF 1 POINT FOR EVERY PAGE THAT YOU WRITE YOUR NAME ON USING BLOCK LETTERS.**
3. CIRCLE your CLASS TIME at the top of this page. **YOU WILL RECEIVE ONE BONUS POINT FOR CIRCLING YOUR CLASS TIME AT THE TOP OF THIS PAGE.**
4. Answer all questions concisely in the space provided. If you need additional space to answer a question, use the back of the page **on which the question is typed**, and **indicate clearly on the front of the page** that part of the answer is on the back of the page.
5. This examination is a **closed-book, closed-notes exam**, except that you may use **two sheets of paper** (no larger than 8.5 inches by 11 inches) with anything you want to write on the front and back of these sheets.
6. You may use a calculator, but you may **NOT** use a computer or any other device with communication capability.
7. You will have 2 hours to complete this examination. When time is called at the end of the examination, you must **STOP WRITING IMMEDIATELY**. Heavy penalties will be assessed against students who are observed writing after time is called.

**Grading:** There are **264** points possible, plus there are 12 bonus points available for writing your name **IN BLOCK LETTERS** at the top of every page and for circling your section time at the top of this page.

**QUESTION I.** (104 points) Each of the following multiple choice questions is worth 4 points. Be sure to write the letter (a, b, c, d) of your response in the space indicated by “Answer \_\_\_\_\_”.

1. Automatic stabilizers Answer \_\_\_\_\_
  - a. lead to smaller government budget deficits during recessions than without these stabilizers.
  - b. reduce the variance of government budget balances.
  - c. are a step toward creating balanced budgets in recessions and booms.
  - d. lead to larger government budget deficits during recessions than without these stabilizers.
  
2. Which of the following does NOT shift the FE line to the left? Answer \_\_\_\_\_
  - a. a temporary decline in total factor productivity
  - b. a decrease in the future marginal product of capital
  - c. a decline in the labor force participation rate
  - d. a sudden reduction in the physical capital stock
  
3. An increase in foreign income that increases the home country’s net exports at any given levels of output and real interest rate in the home country will Answer \_\_\_\_\_
  - a. shift the home country’s FE line to the right.
  - b. decrease the real interest rate in the home country.
  - c. shift the home country’s IS curve up and to the right.
  - d. shift the IS curve down and to the left in both countries.
  
4. A temporary decline in productivity would \_\_\_\_\_ output, \_\_\_\_\_ the real interest rate, and \_\_\_\_\_ the price level when prices adjust. Answer \_\_\_\_\_
  - a. reduce; reduce; reduce
  - b. reduce; increase; reduce
  - c. reduce; increase; increase
  - d. not affect; reduce; increase
  
5. The IS curve would unambiguously shift down and to the left if there were Answer \_\_\_\_\_
  - a. an increase in the government budget deficit.
  - b. an increase in net exports at any given combination of output and the real interest rate.
  - c. a decrease in both personal taxes and the corporate tax rate.
  - d. an increase in the corporate tax rate and a decrease in the expected future marginal product of capital.

6. An open-market purchase of bonds by the central bank Answer \_\_\_\_\_
- a. initially leads to an excess supply of both money and bonds.
  - b. reduces monetary base.
  - c. reduces the government's budget deficit.
  - d. increases bond prices and reduces the interest rate at the initial level of output.
7. In a Keynesian economy, if banks increase the interest rate they pay on checking accounts, output would \_\_\_\_\_ and the real interest rate on nonmonetary assets would \_\_\_\_\_ in the short run. Answer \_\_\_\_\_
- a. fall; increase
  - b. remain unchanged; increase
  - c. increase; increase
  - d. fall; decrease
8. If the IS/LM intersection is to the right of the FE line, the economy is in a \_\_\_\_\_, the price level will eventually \_\_\_\_\_, and the LM curve will then shift \_\_\_\_\_. Answer \_\_\_\_\_
- a. recession; fall; downward
  - b. recession; rise; upward
  - c. boom; rise; upward
  - d. boom; fall; downward
9. Suppose that the intersection of the IS and LM curves is to the left of the FE line. What would happen to restore general equilibrium in the absence of any monetary or fiscal policy actions? Answer \_\_\_\_\_
- a. Full-employment output would fall, shifting the FE line to the left.
  - b. Wealth would fall, shifting the LM curve upward and to the left.
  - c. The price level would fall, shifting the LM down and to the right.
  - d. The FE line would shift to the left and the IS curve would shift to the right.
10. Which of the following would shift the FE line to the right? Answer \_\_\_\_\_
- a. A rightward shift of the labor supply curve
  - b. An increase in the expected future marginal product of capital
  - c. A credible plan to restore solvency to the Social Security system, which induces people to retire earlier
  - d. A burst of inflation resulting from a sharp increase in the growth rate of money

- 11.** In the classical model with misperceptions, an unanticipated decrease in the money supply would cause output to \_\_\_\_\_ and the price level to \_\_\_\_\_ in the short run. Answer \_\_\_\_\_
- a. remain unchanged; increase
  - b. increase; decrease
  - c. increase; remain unchanged
  - d. decrease; decrease
- 12.** An adverse productivity shock that increases both the expected rate of inflation and the natural rate of unemployment would Answer \_\_\_\_\_
- a. shift the short-run Phillips curve upward and rightward and shift the long-run Phillips curve rightward.
  - b. shift the short-run Phillips curve upward and rightward and leave the long-run Phillips curve unchanged.
  - c. leave both the short-run Phillips curve and long-run Phillips curve unchanged.
  - d. twist the short-run Phillips curve and the leave the long-run Phillips curve unchanged.
- 13.** A high value of the sacrifice ratio indicates that Answer \_\_\_\_\_
- a. the future marginal product is low, so that it takes a large increase in capital investment to increase future output.
  - b. a large part of federal government spending is devoted to the military.
  - c. consumers have a high rate of time preference and hence do not like to defer consumption to the future.
  - d. there is a large cost, in terms of lost output, associated with a reduction in the rate of inflation.
- 14.** Over the period of time from the beginning of a hyperinflation to the end of the hyperinflation Answer \_\_\_\_\_
- a. governments tend to run budget surpluses.
  - b. the average rate of inflation is higher than the average rate of monetary growth.
  - c. the average rate of inflation equals the average of monetary growth.
  - d. the average rate of inflation is somewhat lower than the average rate of monetary growth.

- 15.** From January 2001 to May 2012, the Canadian dollar/euro exchange rate changed from 1.41 Canadian dollars/euro to 1.30 Canadian dollars/euro, while the Japanese yen/euro exchange rate changed from 109.5 yen/euro to 106.1 yen/euro. Thus, Answer \_\_\_\_\_
- the euro appreciated relative to both the Canadian dollar and the yen.
  - the euro appreciated relative to the Canadian dollar, but depreciated relative to the yen.
  - the euro depreciated relative to both the Canadian dollar and the yen.
  - the euro depreciated relative to the Canadian dollar, but appreciated relative to the yen.
- 16.** Over the course of a year, the nominal exchange rate rises by 2%, domestic inflation is 3% per year, and foreign inflation is 1% per year. What is the percentage change in the real exchange rate over the course of the year? Answer \_\_\_\_\_
- 0%
  - 2%
  - 4%
  - 6%
- 17.** In the very short run, before the J curve takes effect, a real depreciation will Answer \_\_\_\_\_
- have no effect on net exports measured in terms of the home good.
  - reduce net exports measured in terms of the home good.
  - reduce exports and reduce net exports measured in terms of the home good.
  - reduce exports and increase imports measured in terms of the foreign good.
- 18.** Since the beginning of the financial crisis in 2008, U.S. monetary base Answer \_\_\_\_\_
- has shrunk by about 50%.
  - has grown steadily by 1% to 3% per year.
  - has been increasingly composed of currency rather than reserve deposits of banks.
  - has roughly tripled in size.
- 19.** According to the Taylor Rule, a 2-percentage-point increase in the inflation rate would lead the Fed to Answer \_\_\_\_\_
- reduce the real Federal Funds rate by 2 percentage points.
  - reduce the rate of monetary growth by 2 percentage points.
  - increase the nominal Federal Funds rate by 3 percentage points.
  - conduct open-market purchases of bonds.

- 20.** The actual deficit is \_\_\_\_\_ than the full-employment deficit at business cycle troughs and \_\_\_\_\_ than the full-employment deficit at business cycle peaks. Answer \_\_\_\_\_
- larger in magnitude; larger in magnitude
  - larger in magnitude; smaller in magnitude
  - smaller in magnitude; larger in magnitude
  - smaller in magnitude; smaller in magnitude
- 21.** A procyclical variable Answer \_\_\_\_\_
- promotes economic well-being by reducing the misery index.
  - has high volatility over the course of a business cycle.
  - increases during booms and decreases during recessions.
  - makes monetary policy more independent of the treasury.
- 22.** The public, including overseas holders of U.S. Treasury securities, holds about \_\_\_\_\_ of U.S. Treasury securities; other agencies of the Federal government hold about \_\_\_\_\_ of U.S. Treasury securities. Answer \_\_\_\_\_
- \$15 billion; \$10 billion
  - \$5 trillion; \$20 trillion
  - \$10 trillion; \$5 trillion
  - \$15 trillion; \$10 trillion
- 23.** For a saver with a zero intertemporal elasticity of substitution, the introduction of IRAs, which increase the after-tax rate of return on saving, will Answer \_\_\_\_\_
- either increase or decrease saving depending on whether the rate of time preference is small or large.
  - unambiguously increase saving because the increase in the after-tax rate of return has a larger effect than the zero elasticity of substitution.
  - have offsetting income and substitution effects so that saving is unchanged.
  - unambiguously reduce saving because the substitution effect is zero and the income effect increases consumption.

- 24.** The introduction of a one-time tax increase of \$1000 per person (regardless of the amount worked) **next year** will Answer \_\_\_\_\_
- a.** have no effect on labor supply in the current year because there is no substitution effect.
  - b.** decrease the amount of labor employed in the current year but increase the real wage rate in the current year.
  - c.** decrease the amount of labor employed in the current year and reduce the real wage rate in the current year.
  - d.** increase the amount of labor employed in the current year and reduce the real wage rate in the current year.
- 25.** In recent years, the United States had \_\_\_\_\_ net factor payments from abroad and a \_\_\_\_\_ net international asset position. Answer \_\_\_\_\_
- a.** positive; positive
  - b.** positive; negative
  - c.** negative; negative
  - d.** negative; positive
- 26.** The current nominal yield on 10-year nominal Treasury bonds is 1.95% per year and the current real yield on 10-year TIPS is -0.33% per year. Therefore, Answer \_\_\_\_\_
- a.** only a foolish investor would hold TIPS.
  - b.** if investors no have aversion to risk or illiquidity, they expect inflation to average about 2.28% per year over the next 10 years.
  - c.** the expected real marginal product of capital is slightly negative.
  - d.** risk-neutral investors expect deflation over the next 10 years.

**QUESTION II** (68 points) Consider the following Keynesian open economy.

Consumption:	$C = 2740 + 0.6(Y - T) - 1000r$
Investment:	$I = 1500 - 3500r$
Government purchases:	$G = 3750$
Taxes:	$T = 2750$
Net exports:	$NX = -0.1Y - 500r + 0.1Y_{For} + 1000r_{For}$
Full-employment output:	$\bar{Y} = 15,000$
Nominal money supply:	$M = 48,000$
Real money demand:	$L = 140 + 0.1Y - 4000(r + \pi^e)$
Expected inflation rate:	$\pi^e = 0$
Foreign income:	$Y_{For} = 12,000$
Foreign real interest rate:	$r_{For} = 0.01$

[Assume that  $NFP = NUT = 0$ .]

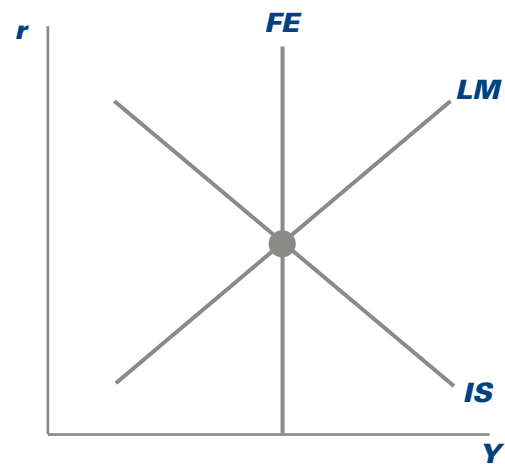
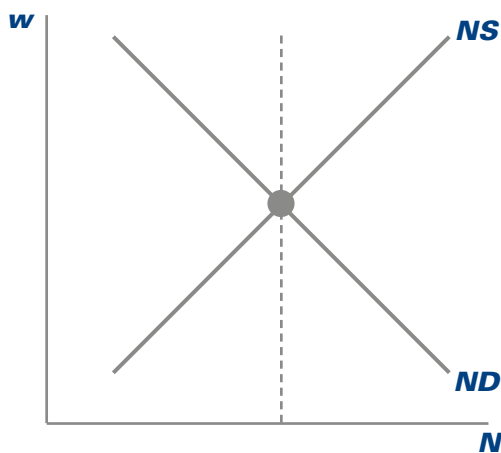
- A.** (5 points) What is the equation of the IS curve?
- B.** (26 points) Suppose that the price level is fixed at  $P = 32$  in the short run.
- (5 points) What is the equation of the LM curve in the short run, while the price level remains fixed?
  - (21 points) What are the short-run equilibrium values of output, the real interest rate, consumption, investment, net exports, national saving, and velocity?
- C.** (16 points) What are the long-run equilibrium values of output, the real interest rate, consumption, investment, net exports, the price level, national saving, and velocity?
- D.** (21 points) Suppose that the government wants choose values for taxes ( $T$ ), government purchases ( $G$ ), and the nominal money supply ( $M$ ) to reach a long-run equilibrium with (a)  $NX = -300$ ; (b) a government budget deficit,  $G - T$ , equal to 630; and (c) a price level  $P = 31$ . This question will guide you through the analysis.
- (5 points) What value of the real interest rate will achieve  $NX = -300$  in general equilibrium?
  - (4 points) What is the value of  $C + G$  in long-run equilibrium with  $NX = -300$ ?
  - (8 points) What values of  $G$  and  $T$  will lead to long-run equilibrium with  $NX = -300$  and  $G - T = 630$ ? [Hint: What value of  $G = T + 630$  will achieve  $C + G$  equal to the value in part D.2?]



4. (4 points) What value of the nominal money supply will achieve a long-run equilibrium with  $P = 31$  when  $NX = -300$  and  $G - T = 630$ ?

**QUESTION III.** (44 points) Consider a classical closed economy that suffers a temporary adverse productivity shock. The government in this economy is committed to adjusting the level of government purchases to maintain employment unchanged. The central bank is committed to maintaining a constant price level.

- A. (12 points) Using the labor supply/labor demand graph below, (1) show the effect of the temporary adverse productivity shock. BE SURE TO IDENTIFY WHICH CURVE (OR CURVE) SHIFTS AND TO EXPLAIN THE SHIFT; (2) show the effect of the change in government purchases that will maintain employment unchanged. BE SURE TO STATE WHETHER GOVERNMENT PURCHASES INCREASE, DECREASE, OR REMAIN UNCHANGED, AND EXPLAIN WHY ANY CURVES SHIFT IN RESPONSE.



- B. (32 points) Use the IS/LM diagram shown above to illustrate the effects of the temporary adverse productivity shock, any change in government purchases to maintain constant employment, and any change in the nominal money supply to maintain a constant price level.
1. (8 points) In the IS/LM diagram above, illustrate any changes in the  $FE$  line resulting from the temporary adverse productivity shock and the changes in government purchases and the nominal money supply needed to maintain constant employment and a constant price level. BE SURE TO EXPLAIN ANY SHIFT OF THE  $FE$  LINE.
  2. (8 points) In the IS/LM diagram on the previous page, illustrate any changes in the  $IS$  curve resulting from the temporary adverse productivity shock and the changes in government purchases and the nominal money supply needed to maintain constant employment and a constant price level. BE SURE TO EXPLAIN ANY SHIFT OF THE  $IS$  CURVE.

3. (8 points) In the IS/LM diagram on the previous page, illustrate any change in the LM curve resulting from the temporary adverse productivity shock and the changes in government purchases and the nominal money supply needed to maintain constant employment and a constant price level. BE SURE TO EXPLAIN ANY SHIFT OF THE LM CURVE AND TO EXPLAIN WHY THE NOMINAL SUPPLY INCREASES, REMAINS CONSTANT, OR DECREASES.
  
4. (8 points) If aggregate economic activity is measured by output, is the nominal money supply procyclical, countercyclical, or acyclical? EXPLAIN.

**QUESTION IV** (48 points) The left-side of the table contains data for 12 variables in a closed economy. Fill in the values of the 12 variables on the right-side of the table, being sure to give both the numerical value (in the column headed “number”) and the units (in the column headed “units”). If there are no units, indicate “none”. The tax function in this economy is  $T = t \times Y$ , where  $T$  is taxes,  $t$  is the tax rate on output, and  $Y$  is *GDP*. Assume that Okun’s Law holds. Also assume that the price level is  $P = 1$ , so that you don’t need to worry about the distinction between real and nominal flows. BE SURE TO SHOW YOUR WORK. [YOU CAN USE THE SPACE AT THE BOTTOM OF THIS PAGE AND THE NEXT PAGE TO SHOW WORK.]

	NUMBER	UNITS		NUMBER	UNITS
Velocity	1.8	Per year	Reserves		
Deposits	6500	Billions of dollars	Money supply		
Currency	1500	Billions of dollars	Money multiplier		
Monetary base	4000	Billions of dollars	GDP		
Average product of labor	80	Thousands of dollars per year per worker	Employment (number of people)		
Natural rate of unemployment	0.08	(none)	Unemployment (number of people)		
Labor force	200	Millions of people	Unemployment rate		
Tax rate, $t$	0.2	(none)	Full-employment GDP		
Interest payments by government	300	Billions of dollars per year	Taxes		
Transfer payments	1200	Billions of dollars per year	Government purchases		
Primary deficit	1000	Billions of dollars per year	Deficit		
Investment	2500	Billions of dollars per year	Full-employment deficit		

**Macroeconomics and the Global Economic Environment (FNCE 613)**  
**SAMPLE EXAM 2**

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**NAME**

*(IN BLOCK LETTERS)*

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**READ THE FOLLOWING DIRECTIONS CAREFULLY.**

**PLEASE DO NOT TURN THE PAGE UNTIL THE EXAM BEGINS.**

1. PRINT your name LEGIBLY IN BLOCK LETTERS at the top of THIS PAGE
2. You will have **90 minutes** to complete this examination. When time is called at the end of the examination, you must **STOP WRITING IMMEDIATELY.**
3. Only short answers are required
4. You can use one double sided sheet of letter-size paper with formulas
5. You may use a calculator, but you may **NOT** use a computer.

**QUESTION I** (24 points)

Argentina pegged its currency against the US dollar since about 1991 until December of 2001. During this period major competitors like Mexico and Brazil devalued their currency substantially.

- A.** What are the consequences of these devaluations by Brazil and Mexico to Argentina's international competitiveness and to its trade deficit?
- B.** Illustrate the effect of these devaluations on the IS/LM model. What is the impact on short term GDP and employment in Argentina?

Argentina fell into a recession in 1999 that produced a drop of almost 10% in GDP between late 1998 and the end of 2001. It became increasingly clear that the only alternative to a currency devaluation was a sharp drop in prices and wages.

- C.** Why would a drop in wages and prices have similar effects to that of a currency devaluation?

Unfortunately given public resistance to significant cuts in wages and public spending foreign investors became increasingly nervous and begun to speculate against the currency.

- D.** What is the effect of this speculation on Argentina's foreign exchange market and on its short-term interest rates?
- E.** What is the effect of this lack of confidence by international investors on GDP and employment in Argentina? Show these effects in the IS/LM model.

Suppose Argentina prohibits capital outflows. Formally the central bank suspends the convertibility of its currency into dollars.

- F.** What is the effect of this policy on their reserve losses and money supply?

**QUESTION II** (18 points)

Suppose a closed economy was operating close to full employment and experiences a sudden collapse in housing prices.

- A.** Show the corresponding **short run** effects on the IS/LM diagram. What are the short run effects of this sudden drop on:
- GDP
  - Employment
  - Output gap
  - Real interest rates
  - Prices
- B.** Show the **long run** effects of persistently low consumer confidence on the same diagram. How does the new **long run** equilibrium compare with the one before the shock in terms of:
- GDP
  - Employment
  - Output gap
  - Real interest rates
  - Prices
- C.** What should the Central Bank do to speed up an economic recovery? Starting from the short run equilibrium in part A show the effects of your policy recommendation on the IS/LM diagram. What would be the effects of this policy on:
- Consumption
  - Investment
  - Interest rates
  - Unemployment rate
  - Potential output

**QUESTION III** (24 points)

Consider an economy characterized by the following equations

$$C = 50 + 0.8(Y - T) - 150r$$

$$I = 100 - 250r$$

$$G = 50$$

$$T = 50$$

$$L = Y - 500r$$

$$M / P = 500$$

Full employment output is 600.

- A.** What is the equation for the IS curve?
- B.** What is the equation of the LM curve?
- C.** What is the equation for the FE line?
- D.** What is the short run equilibrium level of national income and real interest rates for this economy?
- E.** What is the long run value of real interest rates?
- F.** In the long run investment will \_\_\_\_ and consumption will \_\_\_\_ relative to the short-run equilibrium.
- G.** Converging to the long run equilibrium requires that either prices will \_\_\_\_ or that nominal money supply will \_\_\_\_ .
- H.** Converging to the long run equilibrium requires that employment will \_\_\_\_ and that the budget deficit will \_\_\_\_.

**QUESTION IV** (10 points)

Consider an economy where the only source of business cycle fluctuations is the foreign sector. No shocks originate in this economy, but shocks in the rest of the world sometimes increase this country's net exports and sometimes decrease this country's net exports.

- A.** Use an IS-LM diagram to illustrate the short-run effect of an increase in income in the rest of the world that increases this country's net exports. What are the short-run effects on this country's output and real interest rate?
- B.** Briefly explain whether each of the following variables is procyclical (increases during expansions) or countercyclical (increases in recessions).

Employment:

Real interest rate:

Investment:

Saving:

Trade surplus:

**QUESTION V** (12 points)

Consider the following data regarding the monetary statistics of an economy. The currency-deposit ratio (cu) is 0.6 and the reserve-deposit ratio (res) is 0.2. The monetary base in this country is 400 dollars.

- A.** What is the value of the money multiplier in this economy?
- B.** What is the value of the money supply in this economy?
- C.** What are the values of currency and deposits in this economy?

**QUESTION VI** (12 points)

Over the last decade several countries in Europe have begun to reform their labor markets to increase the labor force participation and employment. For the purposes of this question consider only two specific measures: increasing retirement age and reducing unemployment benefits.

- A.** Show graphically the effect of an increase in labor force participation on the labor market equilibrium?
- B.** Show graphically the effect of these policies on the IS/LM/FE diagram
- C.** What are the long run effects of these policies on Europe's GDP and its international competitiveness?
- D.** What are the long run effects of these policies on the government budget deficits?



## Sample Exam 1 Answers FNCE 613

### QUESTION I

- |              |              |
|--------------|--------------|
| <b>1. d</b>  | <b>14. b</b> |
| <b>2. b</b>  | <b>15. c</b> |
| <b>3. c</b>  | <b>16. c</b> |
| <b>4. c</b>  | <b>17. b</b> |
| <b>5. d</b>  | <b>18. d</b> |
| <b>6. d</b>  | <b>19. c</b> |
| <b>7. a</b>  | <b>20. b</b> |
| <b>8. c</b>  | <b>21. c</b> |
| <b>9. c</b>  | <b>22. c</b> |
| <b>10. a</b> | <b>23. d</b> |
| <b>11. d</b> | <b>24. d</b> |
| <b>12. a</b> | <b>25. b</b> |
| <b>13. d</b> | <b>26. b</b> |

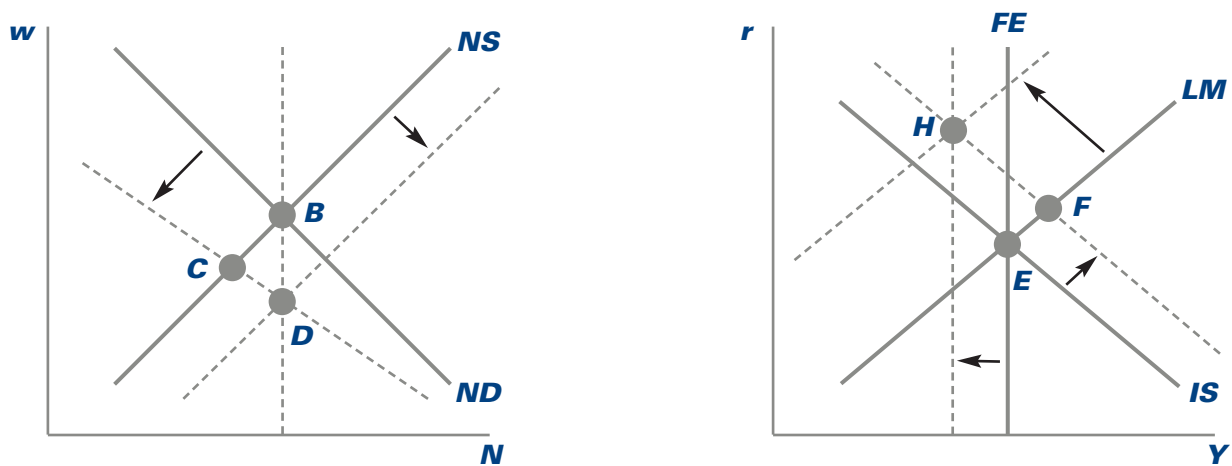
### QUESTION II

- A.**  $Y = C + I + G + NX = [2740 + 0.6(Y - T) - 1000r] + [1500 - 3500r] + 3750 + [-0.1Y - 500r + 0.1Y_{For} + 1000r_{For}] = [2740 + 0.6(Y - 2750) - 1000r] + [1500 - 3500r] + 3750 + [-0.1Y - 500r + 0.1(12,000) + 1000(0.01)]$ , so  $0.5Y = 7550 - 5000r$ . Therefore,  $Y = 15,100 - 10,000r$  or, equivalently,  $r = 1.51 - 0.0001Y$ .
- B. 1.**  $(48,000)/(32) = M/P = L = 140 + 0.1Y - 4000(r + \pi^e) = 140 + 0.1Y - 4000r$ . Therefore,  $1500 = 140 + 0.1Y - 4000r$ , which implies  $1360 = 0.1Y - 4000r$ . Therefore,  $Y = 13,600 + 40,000r$  or, equivalently,  $r = 0.000025Y - 0.34$ .

- B. 2.** IS/LM intersection:  $15,100 - 10,000r = Y = 13,600 + 40,000r$ , which implies  $1500 = 50,000r$ , so  $r = 0.03$ . Substitute  $r = 0.03$  into IS curve:  $Y = 15,100 - 10,000r = 15,100 - (10,000)(0.03)$ , so  $Y = 14,800$ . [check: substitute  $r = 0.03$  into LM curve:  $Y = 13,600 + 40,000r = 13,600 + (40,000)(0.03) = 14,800$ .] Consumption =  $C = 2740 + 0.6(Y - T) - 1000r = 2740 + 0.6(14,800 - 2750) - (1000)(0.03)$ , so  $C = 9940$ . Investment =  $I = 1500 - 3500r = 1500 - (3500)(0.03)$ , so  $I = 1395$ . Net Exports =  $NX = -0.1Y - 500r + 0.1Y_{For} + 1000r_{For} = -0.1(14,800) - 500(0.03) + 0.1(12,000) + 1000(0.01)$ , so  $NX = -285$ . [check:  $14,800 = Y = C + I + G + NX = 9940 + 1395 + 3750 - 285 = 14,800$ .] National Saving =  $S = Y - C - G = 14,800 - 9940 - 3750$ , so **national saving = 1110**.  
[check: with  $NFP = NUT = 0$ ,  $-285 = NX = CA = S - I = 1110 - 1395 = -285$ .] Velocity =  $V = (P)(Y)/M = (32)(14,800)/(48,000)$ , so **velocity = 9.866667**.
- C.** In long-run equilibrium,  $Y = \bar{Y}$ , so  $Y = 15,000$ . Substitute  $Y = 15,000$  into the IS curve to obtain  $r = 1.51 - (0.0001)(15,000)$ , so  $r = 0.01$ . Consumption =  $C = 2740 + 0.6(Y - T) - 1000r = 2740 + 0.6(15,000 - 2750) - (1000)(0.01)$ , so  $C = 10,080$ . Investment =  $I = 1500 - 3500r = 1500 - (3500)(0.01)$ , so  $I = 1465$ . Net Exports =  $NX = -0.1Y - 500r + 0.1Y_{For} + 1000r_{For} = -(0.1)(15,000) - (500)(0.01) + (0.1)(12,000) + (1000)(0.01)$ , so  $NX = -295$ . [check:  $15,000 = Y = C + I + G + NX = 10,080 + 1465 + 3750 - 295 = 15,000$ .]  $P = M/L = (48,000)/(140 + 0.1Y - 4000(r + \pi^e)) = (48,000)/(140 + (0.1)(15,000) - (4000)(0.01 + 0)) = 48,000/1600$ , so  $P = 30$ . National saving =  $S = Y - C - G = 15,000 - 10,080 - 3750$ , so **national saving = 1170**. [check: with  $NFP = NUT = 0$ ,  $-295 = NX = CA = S - I = 1170 - 1465 = -295$ .] Velocity =  $V = (P)(Y)/M = (30)(15,000)/(48,000)$ , so **velocity = 9.375**.
- D. 1.** In general equilibrium,  $Y = \bar{Y} = 15,000$ . Find the value of  $r$  for which  $-300 = NX = -0.1Y - 500r + 0.1Y_{For} + 1000r_{For} = -0.1(15,000) - 500r + 0.1(12,000) + 1000(0.01) = -290 - 500r$ , which implies  $500r = 10$ . Therefore,  $r = 0.02$  will achieve  $NX = -300$  in long-run equilibrium.
- 2.** In long-run equilibrium with  $NX = -300$ ,  $r = 0.02$  (from part D.1), so  $I = 1500 - 3500r = 1500 - 3500(0.02) = 1430$ . Hence, in long-run equilibrium with  $NX = -300$ ,  $Y = \bar{Y} = 15,000$ , and  $I = 1430$ , so  $15,000 = Y = C + I + G + NX = C + 1430 + G - 300$ . Therefore,  $C + G = 13,870$  in long-run equilibrium with  $NX = -300$ .
- 3.** Set  $Y = \bar{Y} = 15,000$ ,  $r = 0.02$ , and  $G = T + 630$  in  $13,870 = C + G = (2740 + 0.6(Y - T) - 1000r) + G = (2740 + 0.6(15,000 - T) - 1000(0.02)) + T + 630$  to obtain  $13,870 = 2740 + 9000 - 0.6T - 20 + T + 630 = 12,350 + 0.4T$ . Therefore,  $1520 = 0.4T$ , so  $T = 3800$ , and  $G = T + 630$  so  $G = 4430$ . [check:  $C = 2740 + 0.6(15,000 - 3800) - 1000(0.02)$ , so  $C = 9440$ . As shown in part D.2,  $I = 1430$ . Therefore,  $NX = Y - (C + I + G) = 15,000 - (9440 + 1430 + 4430) = 15,000 - 15,300 = -300$ .]
- 4.**  $M = (P)(L) = (31)(140 + 0.1Y - 4000(r + \pi^e)) = (31)(140 + 0.1(15,000) - 4000(0.02 + 0)) = (31)(1560)$ , so  $M = 48,360$  will achieve a short-run equilibrium with  $P = 31$ ,  $G - T = 630$ , and  $NX = -300$ .

**QUESTION III.**

- A.** (1) The temporary adverse productivity shock reduces the MPN at every level of employment. Since the labor demand is the MPN curve, the **labor demand curve shifts downward**. The labor supply curve does not change in response to the temporary productivity shock. In the absence of a change in government purchases, the equilibrium moves to point C from point B.
- (2) An **increase in government purchases** will make workers poorer (because of an increase in current or future taxes) and hence workers can afford less leisure and will supply more labor, shifting the labor supply to the right, until it passes through point D, with the same level of employment as in the original equilibrium at point B.



- B. 1.** The FE line is a vertical line at  $Y = \bar{Y} = A \times F(K, \bar{N})$ . The temporary adverse productivity shock is a reduction in  $A$ . In the absence of a change in  $G$ , equilibrium in the labor market would move to point C, with a decline in employment. However, government purchases are increased to maintain  $\bar{N}$  unchanged. So, with  $\bar{N}$  unchanged, the fall in  $A$  implies that  $\bar{Y}$  falls and hence the FE line shifts to the left.
- 2.** The increase in government purchases causes the IS curve to shift upward and to the right (an increase in government purchases causes an excess demand for goods at the initial values of  $Y$  and  $r$ , and this excess demand for goods can be eliminated by an increase in  $Y$  and/or an increase in  $r$ , so the IS curve shifts upward). Neither the temporary productivity shock nor any change in the nominal money supply directly shifts the IS curve.
- 3.** The upward shift of the IS curve moves the IS/LM intersection to point F, which is to the right of the new FE line. Therefore, output at the new IS/LM intersection is higher than the new full-employment level of output, which puts upward on prices. If the nominal money supply were to remain unchanged, the price level would increase, reducing the real money supply  $M/P$ , and shifting the LM curve upward until it passes through the FE/IS intersection at point H. To prevent the price level from rising, **the central bank can reduce the nominal money supply**, which reduces the real money for a given price level, thereby shifting the LM curve upward until it passes through point H.

4. In response to a temporary adverse productivity shock, the economy moves from point E to point H in the IS/LM diagram, so output falls, which means that aggregate economic activity falls, i.e. the economy goes into a recession. As explained in part B.3, the nominal money supply falls in order to keep the price level from rising. Since the nominal money supply falls during recessions, **the nominal money supply is procyclical.**

#### QUESTION IV

	NUMBER	UNITS		NUMBER	UNITS
Velocity	1.8	Per year	Reserves	2500	Billions of dollars
Deposits	6500	Billions of dollars	Money supply	8000	Billions of dollars
Currency	1500	Billions of dollars	Money multiplier	2	None
Monetary base	4000	Billions of dollars	GDP	14,400	Billions of dollars per year
Average product of labor	80	Thousands of dollars per year per worker	Employment (number of people)	180	Millions of people
Natural rate of unemployment	0.08	(none)	Unemployment (number of people)	20	Millions of people
Labor force	200	Millions of people	Unemployment rate	0.10	None
Tax rate, $t$	0.2	(none)	Full-employment GDP	15,000	Billions of dollars per year
Interest payments by government	300	Billions of dollars per year	Taxes	2880	Billions of dollars per year
Transfer payments	1200	Billions of dollars per year	Government purchases	2680	Billions of dollars per year
Primary deficit	1000	Billions of dollars per year	Deficit	1300	Billions of dollars per year
Investment	2500	Billions of dollars per year	Full-employment deficit	1180	Billions of dollars per year

Monetary base = currency plus reserves, so reserves = monetary base – currency = 4000 billions of dollars – 1500 billions of dollars. Therefore, **reserves = 2500 billions of dollars.**

Money supply =  $M$  = currency + deposits = 1500 billions of dollars + 6500 billions of dollars, so  **$M = 8000$  billions of dollars.**

Money multiplier = (money supply)/(monetary base) = (8000 billions of dollars)/(4000 billions of dollars), so **money multiplier = 2.**

Velocity =  $GDP/M$ , so  $GDP = (\text{velocity})(M) = (1.8 \text{ per year})(8000 \text{ billions of dollars})$ . Therefore,  **$GDP = 14,400$  billions of dollars per year.**

APL = average product of labor = GDP/E, where E is number of people employed, so  $E = \text{GDP}/\text{APL} = (14,400 \text{ billions of dollars per year})/(80 \text{ thousands of dollars per year per worker})$ . Therefore, **employment = 180 millions of workers.**

$U = \text{LF} - E = 200 \text{ millions of people} - 180 \text{ millions of people}$ , so **unemployment = 20 millions of people.**

Unemployment rate =  $u = U/\text{LF} = (20 \text{ millions of people})/(200 \text{ millions of people}) = 0.10$ .

*Okun's Law:  $(\bar{Y} - Y)/\bar{Y} = 2(u - \bar{u})$ , so  $1 - \frac{Y}{\bar{Y}} = 2(u - \bar{u})$ , which implies*

$$\bar{Y} = \frac{Y}{1 - 2(u - \bar{u})} = \frac{14,400 \text{ billions of dollars per year}}{1 - 2(0.10 - 0.08)}. \text{ Therefore,}$$

**$\bar{Y} = 15,000 \text{ billions of dollars per year.}$**

Taxes =  $t \times Y = (0.2)(14,400 \text{ billions of dollars per year})$  so **Taxes = 2880 billions of dollars per year.**

Primary deficit =  $G + \text{TR} - T$ , so  $G = \text{primary deficit} - \text{TR} + T = 1000 \text{ billions of dollars per year} - 1200 \text{ billions of dollars per year} + 2880 \text{ billions of dollars per year}$ . Therefore, **G = 2680 billions of dollars per year.**

Deficit = primary deficit + interest payments by government =  $1000 \text{ billions of dollars per year} + 300 \text{ billions of dollars per year}$ . Therefore, **deficit = 1300 billions of dollars per year.**

Full-employment deficit =  $G + \text{TR} + \text{INT} - t \times (\text{Full-employment GDP}) = 2680 \text{ billions of dollars per year} + 1200 \text{ billions of dollars per year} + 300 \text{ billions of dollars per year} - (0.2)(15,000 \text{ billions of dollars per year})$ , so **full-employment deficit = 1180 billions of dollars per year.**

## Sample Exam 2 Answers FNCE 613

### QUESTION I

- A. Argentina's exports become less competitive as the real exchange rate appreciates. This increases the country's trade deficit.
- B. The IS curve shifts down and to the left. This reduces output and employment.
- C. Essentially because it would make Argentina more competitive and boost its net exports. In either case the IS curve would shift up.
- D. The speculation lowers the reserves of the central bank and the money supply. This will push up short term interest rates.
- E. The contraction in the money supply will shift the LM curve up and pushes up short term interest rates. The speculation makes the recession worst by further reducing employment and GDP.
- F. This reduces or eliminates sales of the domestic currency and eliminates the loss of reserves by the central bank. The money supply stops falling and the LM curve no longer shifts up.

### QUESTION II (18 points)

- A.
  - a. GDP Falls
  - b. Employment Falls
  - c. Output gap Rises
  - d. Real interest rates Fall
  - e. Prices No Change
- B.
  - a. GDP Same
  - b. Employment Same
  - c. Output gap Same
  - d. Real interest rates Lower
  - e. Prices Lower
- C.
  - a. Consumption Rises
  - b. Investment Rises
  - c. Interest rates Fall
  - d. Unemployment rate Falls
  - e. Potential output None

### QUESTION III

- A.**  $C+I+G=Y$   
 $0.2Y = 160 - 400r$
- B.**  $M/P = L$   
 $500 = Y - 500r$
- C.**  $Y = 600$
- D.** In the short run we look at the intersection of the IS and LM curves only.  
 $Y = 560, r = 12\%$
- E.** We know output is at  $FE = 600$ .  
 In the long run the LM curve shifts as necessary to meet the IS curve where this curve crosses FE.  
 So we just compute the interest rate by plugging  $Y=600$  in the IS curve.  
 $r = 10\%$
- F.** Rise; Rise  
 Since interest rates fall this will increase consumption and investment.
- G.** Fall; Rise  
 The LM curve must shift down, which implies real money supply ( $M/P$ ) will rise.
- H.** Rise; Fall  
 Output increases so employment must also increase. This will also raise tax revenues and lower any budget deficit.

### QUESTION IV

- A.** The increase in this country's net exports causes the IS curve to shift up and to the right in this country. In the short run, output and the real interest rate both increase.
- B.** Employment: procyclical  
 Real interest rate: procyclical  
 Investment: countercyclical  
 Saving: procyclical  
 Trade surplus: procyclical

The IS-LM diagram shows that output ( $Y$ ) and the real interest rate ( $r$ ) both increase so the real interest rate is procyclical.

In order for output to increase, firms must use more labor so employment increases, and thus is procyclical. The increase in  $r$  implies that investment falls and thus is countercyclical.



Since interest rates and income go up in expansions so does private (and national) saving.

The increase in net exports was the original source of our expansion, so the trade surplus is procyclical.

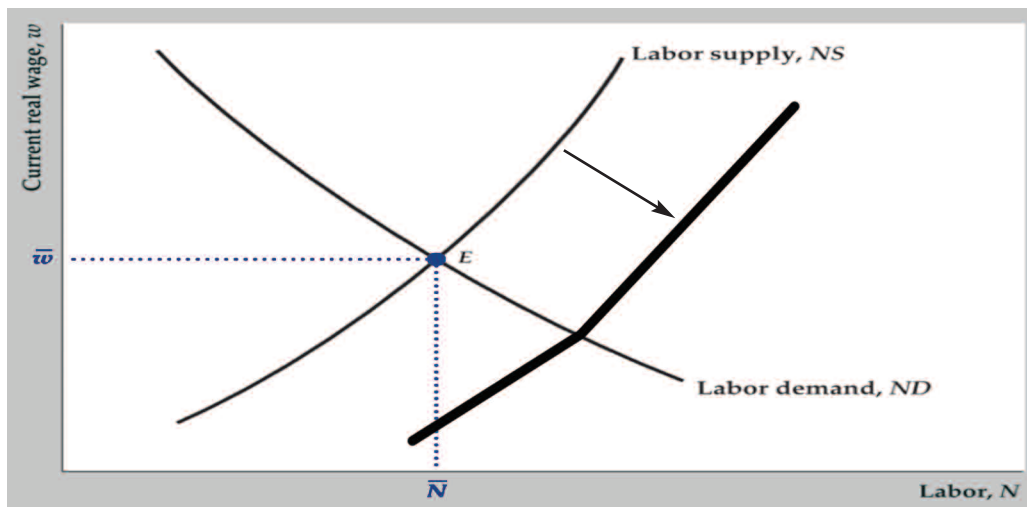
### QUESTION V

- A.**  $mm = (1+cu)/(res+cu) = (1+0.6)/(0.2+0.6) = 1.6/0.8 = 2.$
- B.**  $M = (mm)Base = 2(400 \text{ dollars}) = 800 \text{ dollars.}$
- C.**  $M = CU + DEP.$  Dividing both sides of this equation by DEP yields  $M/DEP = cu + 1$  which implies  $DEP = M/(cu+1) = (800 \text{ dollars})/(0.6+1).$  Therefore,  $DEP = 500$  dollars.  $CU = (cu)(DEP) = 0.6(500 \text{ dollars}) = 300 \text{ dollars.}$   
[check:  $CU + DEP = 300 \text{ dollars} + 500 \text{ dollars} = 800 \text{ dollars} = M.$ ]

### QUESTION VI

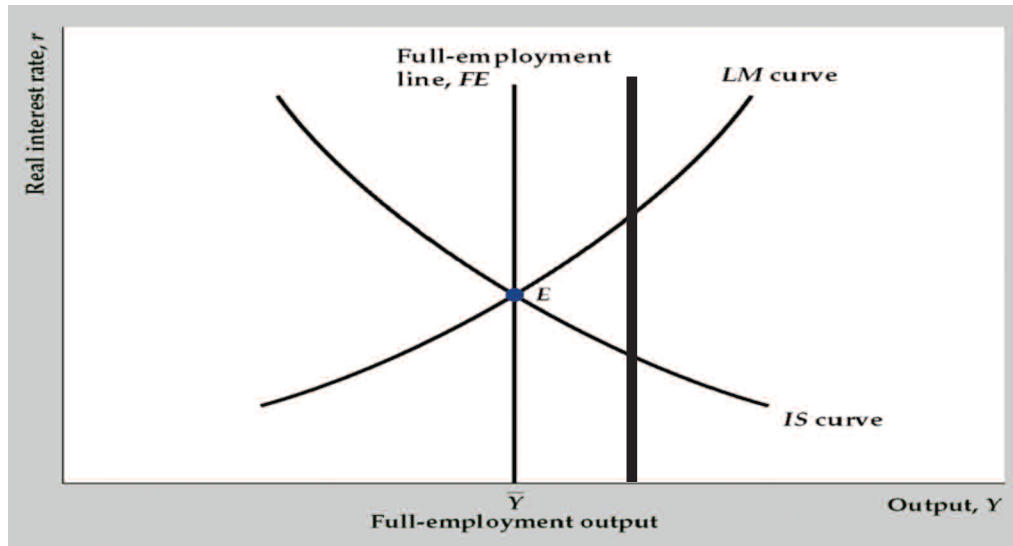
Over the last decade several countries in Europe have begun to reform their labor markets to increase the labor force participation and employment. For the purposes of this question consider only two specific measures: increasing retirement age and reducing unemployment benefits.

- A.** The labor supply curve shifts down and to the right. This increases the equilibrium level of employment – the “full employment.”





- B.** An increase in full employment increases potential GDP. The FE line shifts to the right.



Note: To reach the new long run equilibrium prices will have to fall.

- C.** A reduction in wages and prices will make exports cheaper and improve competitiveness. Long run GDP will be higher as we have seen above.
- D.** Government spending on these programs will fall. In the long run tax revenues will also increase since national income increases. Together they imply a lower budget deficit.