

PART B: Analytic Problems

QUESTION 1 (12 points)

An economy produces cars and wind turbines. The following table lists prices and production for the years 2011-2012.

	2011	2012
Prices		
Cars	8	9
Wind turbines	12	6
Quantities		
Cars	10	10
Wind turbines	2	5

a) What was nominal GDP for the years 2010 and 2011? (2 points)

	2011	2012
Nominal GDP	$8*10+12*2 = 104$	$9*10+6*5 = 120$

b) Calculate two indices for real GDP in 2012 if 2011 is normalized to 1 - one based on 2011 prices, one based on 2012 prices. Mark your results clearly. (4 points)

Index for 2012 using 2011 prices	$2012 \text{ in } 2011 \text{ prices: } 8*10+12*5 = 140$ $\text{Index} = 140/104 = 1.346$
index for 2012 using 2012 prices	$2011 \text{ in } 2012 \text{ prices: } 9*10+6*2 = 102$ $\text{Index} = 120/102 = 1.176$

c) Using (b), calculate the chain-weight index of real GDP in 2012 (if 2011 is normalized to 1) as well as the chain weighted growth rate of real GDP from 2011 to 2012. (2 points)

Chain-weight index of real GDP in 2012	$\text{sqrt}(1.346*1.176) = 1.258$
Chain weighted real GDP growth rate 2011 to 2012	$\ln(1.258) = 0.23 = 23\%$

- d) If the economy continued to grow at the same rate (in real terms), how long (in years) would it take for the economy to double (in real terms)? (2 points)

Time to double at the growth rate found in C.	$\ln(2)/0.23 = 3.01$ years
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- e) Using 2011 as the base year, calculate real GDP in 2012 as well as the value of the GDP deflator. (2 points)

Chain weighted real GDP in 2012 (2011 as base year)	$104 * 1.258 = 130.8$
Chain weighted GDP Deflator in 2012 (2011 as base year)	$120 / 130.8 = 0.917$ (or 91.7)

QUESTION 2 (18 points)

Consider an economy described by the following equations:

$$C = 50 - 6*r + 0.6*(Y - T)$$

$$I_p = 60 - 4*r$$

$$T = 20 + 0.1*Y$$

$$G = 42,$$

$$NX = 120 - 0.04*Y$$

$$(M/P)^d = 0.2*Y - 5*r$$

$$M^s/P = 50$$

- a) Using the above numbers: write on three separate lines the equation showing the relationship of autonomous planned spending to the interest rate; the value of the multiplier; and the equation for the IS curve with all the specific numbers plugged in. (3 points)

Autonomous planned spending	$A_p = C_a - c*T_a + I_p + G + NX_a = 260 - 10*r$
The value of the multiplier	$k = 1 / ((1-c)*(1-t) + t + nx) = 2$
IS curve	The IS curve : $Y = k*A_p = 520 - 20*r$

b) Derive the **LM curve**, using the ingredients listed above. (3 points)

$$M_d/P = M_s/P$$

$$0.2*Y - 5*r = 50 \quad \text{or} \quad Y = 250 + 25*r$$

c) Find the equilibrium values of **income** and **interest rate**. (Hint: if you found equations for income above, then calculate the interest rate by combining the IS and LM curves separately; if you found equations for the interest rate above, then calculate the level of income using the IS and LM curves separately.) (2 points)

$$520 - 20*r = 250 + 25*r$$

$$45*r = 270$$

$$r = 6$$

$$Y = 250 + 25*6 = 400.$$

d) What are the total **leakages** in this economy? (2 points)

The long way: $T = 20 + 0.1*400 = 60$, $C = 50 - 6*6 + 0.6*(400 - 60) = 218$, $S = Y - T - C = 400 - 60 - 218 = 122$

Leakages = $S + T = 122 + 60 = 182$.

The short way, using injections: $I = 60 - 4*6 = 36$, $G = 42$, $NX = 120 - 0.04*400 = 104$.

Injections = $I + NX + G = 36 + 42 + 104 = 182$.

- e) The government decides to increase government spending to $G=64.5$. How will that affect **consumption**? (Hint: G given is the new level of government spending not the increment) (4 points)

The change to $G=64.5$ increases A_p to $A_p = 282.5 - 10*r$, which changes the IS equation to $Y = 2*(282.5 - 10*r)$.

The LM curve equation stays the same $Y = 250 + 25*r$

So the new values of (Y,r) are

$$Y = 425, r = 7$$

Consumption is

$$C = 50 - 6*7 + 0.6*(425 - 20 - 0.1*425) = 225.5$$

- f) The increase in government spending described in (e) caused a change in autonomous planned spending. The central bank wants to get real income back to its previous value by changing the money supply. Should the money supply be **expanded or contracted**? What is the new **real money supply**? (4 points)

$$Y=400$$

$$Y = 2*(282.5 - 10*r)$$

$$r = 8.25$$

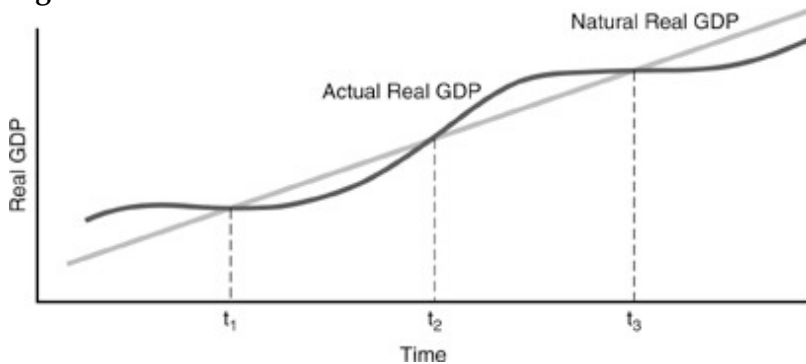
$$(M_s/P) = 0.2*Y - 5*r = 38.75$$

Money supply contracted.

PART A: Multiple Choice Problems

- 1) Among the subjects covered in macroeconomics are the
 - A) causes of the increase in the price of oil relative to other commodities.
 - B) causes of the change in the individual firms' profits.
 - C) unemployment rate for the entire labor force, and the causes of the increase in the overall price level.
 - D) effects of low wages on the laborers' moral.
- 2) The unemployment rate is the number of
 - A) jobless people looking for work divided by the population.
 - B) jobless individuals looking for work divided by those employed and unemployed but actively looking.
 - C) people looking for work divided by the population.
 - D) jobless individuals divided by the total labor force.
- 3) Macroeconomics focuses on a certain set of variables called
 - A) marginals.
 - B) partials.
 - C) aggregates.
 - D) balances.
 - E) micros.

Figure 1-2



- 4) If the government of Country Z is running a budget deficit and net exports are zero, then
 - A) investment is greater than saving.
 - B) saving is greater than investment.
 - C) investment and saving are equal.
 - D) none of the above.
- 5) "Natural" real GDP is defined as the total output
 - A) at business cycle peaks.
 - B) produced when all of our resources are being used to their maximum capacity.
 - C) at business cycle troughs.
 - D) that causes an inflation rate of zero.
 - E) that causes the inflation rate to remain constant.

- 6) Given the path of natural real GDP growth, economists prefer an economy such as _____, in which the real GDP gaps are _____.
- A) Stabilia's, maximized
 - B) Stabilia's, minimized
 - C) Volatilia's, maximized
 - D) Volatilia's, minimized
- 7) From what you have learned in the course so far, which is the most accurate statement:
- A) Nominal household wealth has returned to its 2007 level
 - B) Real household wealth has returned to its 2007 level
 - C) The ratio of household wealth to personal disposable income has returned to its 2007 level
 - D) The ratio of household liabilities to personal disposable income has returned to its 2007 level
- 8) Real income per capita is a measure of the
- A) total well-being of the nation.
 - B) well-being of the average individual in the nation.
 - C) well-being of every individual in the nation.
 - D) well-being of the average employed person in the nation.
- 9) The establishment of an income tax, ceteris paribus, will result in
- A) no change in the size of the multiplier.
 - B) a lower expenditure multiplier.
 - C) a higher expenditure multiplier.
 - D) None of the above.
- 10) Which of the following defines the multiplier for a change in autonomous taxes?
- A) $1/s$
 - B) $1/c$
 - C) $-s/c$
 - D) $-c/s$
- 11) A farmer sells raw milk for 50 cents to a dairy, who sells cheese made from it for \$1.50 to a grocery wholesaler, who sells it for \$1.90 to a supermarket, who sells it to the final consumer for \$2.19. These transactions increase the GDP by
- A) $\$0.50 + \$1.00 + \$0.40 + \$0.29 = \$2.19$.
 - B) $\$0.50 + \$1.00 = \$1.50$.
 - C) $\$2.19 - \$0.50 = \$1.69$.
 - D) $\$0.50 + \$1.00 + \$1.90 + \$2.19 = \$5.59$.
 - E) $\$2.19 - \$1.50 = \$0.69$.
- 12) An increase in real GDP causes the demand for real money balances to
- A) remain unaffected.
 - B) rise.
 - C) rise, fall, or remain unaffected depending on the interest rate at the time.
 - D) fall.
- 13) The course-packet article "A Layoff in the Smith Family" is an illustration of which macroeconomic concept?

- A) Autonomous consumption depends on the interest rate
- B) The demand for money depends on the interest rate
- C) The multiplier
- D) The stimulus to the economy from added government spending

14) We go from personal income to personal disposable income by

- A) subtracting depreciation.
- B) subtracting personal saving.
- C) adding transfer payments.
- D) subtracting undistributed profits.
- E) subtracting personal income taxes.

15) In the last few years Volkswagen has opened a large new auto plant in Chattanooga, Tennessee. We can be sure that this plant

- A) raises German GDP
- B) raises U.S. GDP
- C) raises U.S. GNP relative to U.S. GDP
- D) raises U.S. GDP relative to U.S. GNP
- E) none of the above

16) A variable which is independent of the level of income is

- A) endogenous.
- B) irrelevant to any theory of income determination.
- C) autonomous.
- D) exogenous.

17) Assuming that there are NO income taxes, if both autonomous taxes, and government expenditures were to rise by \$100 million, we would expect equilibrium GDP to

- A) rise by less than \$100 million.
- B) rise by \$100 million.
- C) rise, but by a multiple of \$100 million.
- D) remain unaffected because leakages have changed by the same amount.

18) The slope of the planned expenditure line is

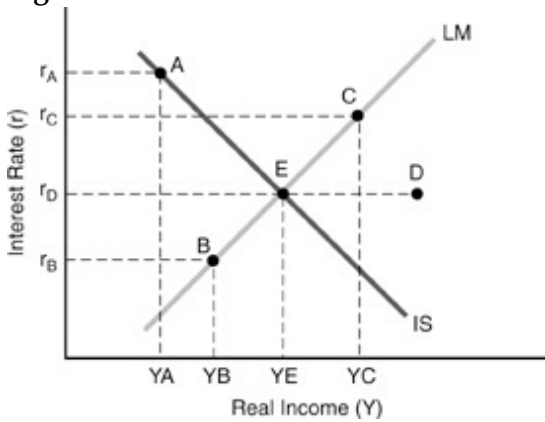
- A) autonomous planned spending.
- B) the marginal propensity to consume.
- C) autonomous consumption.
- D) the marginal propensity to save.

19) Last week's political debate about lifting the "debt ceiling" cited a total federal debt of \$17 trillion, about 100% of GDP. Yet the discussion of the first-day handout showed that the debt/GDP ratio is close to 70%, not 100%. These facts can be reconciled by:

- A) The handout is wrong
- B) The handout counts only debt owned to domestic debt-owners, not foreigners
- C) The handout excludes debt owned by government agencies and the Federal Reserve
- D) The 100% ratio refers to nominal debt and the 70% ratio refers to real debt.

- 20) When planned autonomous spending rises, the planned expenditure line
- A) makes a parallel shift upward.
 - B) pivots upward from the vertical intercept.
 - C) makes a parallel shift downward.
 - D) pivots downward from the vertical intercept.
- 21) The lecture on several occasions has emphasized a particular ratio as the best measure of the slowness of the 2010-13 economic recovery. That ratio is:
- A) federal funds rate to 10-year bond rate
 - B) employment to labor force
 - C) hours worked per employee
 - D) employment to population
 - E) unemployment to labor force
- 22) If business firms are more optimistic during the expansion phase of the business cycle, they
- A) lower their prices and increase investment.
 - B) raise their expected rates of return on projects and investment decreases.
 - C) raise their expected rates of return on projects and investment increases.
 - D) lower their expected rates of return on projects and investment increases.
- 23) The IS curve represents
- A) the determination of the level of income and output.
 - B) the determination of the level of interest rate.
 - C) investment and saving when the commodity markets are in disequilibrium.
 - D) equilibrium in the commodity markets for every combination of interest rates and output level.
- 24) Which of the following statements would be true of an economy that can be characterized as being to the left of the IS curve?
- A) There will be a tendency for the level of output to decrease.
 - B) There is an excess supply of commodities at the existing interest rate.
 - C) There is an excess demand for commodities at the existing interest rate.
 - D) There will be a tendency for interest rates to fall.
- 25) Along a downward-sloping money demand schedule, as the interest rate falls
- A) real income rises.
 - B) the quantity of money demanded falls.
 - C) real income falls.
 - D) the quantity of money demanded rises.
- 26) Since the velocity of money increases as interest rates rise the
- A) IS curve is negatively sloped.
 - B) LM curve is positively sloped.
 - C) LM curve is negatively sloped.
 - D) IS curve is positively sloped.

Figure 4-5



27) In Figure 4-5 above, suppose that real income is Y_B and the money market is in equilibrium. The interest rate at this point is _____ to support commodity market equilibrium, so that involuntary inventory changes are _____.

- A) just right, zero
- B) too high, positive
- C) too high, negative
- D) too low, negative
- E) too low, positive

28) With normally-sloped IS and LM curves, an increase in government spending _____ the interest rate, which _____ autonomous planned expenditure, resulting in a final increase in income _____ than what the government spending increase would have produced in the Chapter 3 model.23) _____

- A) raises, raises, less
- B) raises, raises, greater
- C) lowers, raises, greater
- D) raises, lowers, less
- E) lowers, lowers, greater

29) Suppose the Federal Reserve desires to raise the level of planned investment in the economy. It either has to hope that an improvement in business confidence shifts the rate-of-return line to the _____, or it has to take direct action by _____ the interest rate.

- A) left, raising
- B) left, lowering
- C) right, lowering
- D) right, raising

30) Which of the following has been emphasized in the lectures as responsible for the slow 2010-13 economic recovery?

- A) Dependence of autonomous consumption on the interest rate
- B) Dependence of autonomous consumption on tightness of lending standards
- C) Dependence of planned investment on the interest rate
- D) Dependence of planned investment on the net worth of corporations