

## FINAL EXAMINATION VERSION B

INSTRUCTIONS: This exam is closed-book, closed-notes. Simple calculators are permitted, but graphing calculators or calculators with alphabetical keyboards are NOT permitted. Cell phones or other wireless devices are NOT permitted. Point values for each question are noted in brackets. Points will be subtracted for illegible writing or incorrect rounding. Maximum total points are 200.

**I. Multiple choice:** Circle the one best answer to each question. [1 pt each, 21 pts total]

- (1) "The government should decrease the interest rate" is an example of
- a positive statement.
  - a normative statement.
  - both of the above.
  - none of the above.
- (2) Monetary exchange is more common today than bartering because
- bartering is a lost art.
  - monetary exchanges are subject to less tax.
  - bartering requires a "double coincidence of wants."
  - bartering is often illegal whereas anything can be legally bought and sold with money.
- (3) Efficient well-functioning markets
- generate a variety prices from which buyers and sellers may choose.
  - converge to a price such that consumer surplus equals producer surplus.
  - ensure that every potential buyer and seller makes a trade.
  - obey the "law of one price."
  - all of the above.
- (4) In spring, the price of winter coats decreases and the quantity sold also decreases. This could be caused by a
- rightward shift in the demand for winter coats.
  - rightward shift in the supply of winter coats.
  - leftward shift in the demand for winter coats.
  - leftward shift in the supply of winter coats.
- (5) At the peak of a business cycle, actual GDP is
- above potential GDP.
  - below potential GDP.
  - equal to potential GDP.
  - cannot be determined from information given.
- (6) In the early 1930s, the price level in the United States dropped by about 20%. This is an example of
- reflation.
  - hyperinflation.
  - disinflation.
  - deflation.
- (7) Investment spending in the national accounts does *not* include purchases of
- business software.
  - trucks and heavy equipment.
  - new factories.
  - corporate bonds.
  - new homes.
- (8) Government purchases in the national accounts do *not* include
- pay for members of the armed services.
  - spending for social security benefits.
  - spending on national parks.
  - spending on highway construction.
  - salaries of public school teachers.
- (9) Unemployment caused by a mismatch of worker skills to jobs, or insufficient work incentives, is called
- structural unemployment.
  - frictional unemployment
  - cyclical unemployment.
  - all of the above.
- (10) If the interest rate falls in the United States and remains constant in other countries, imports will decrease and exports will increase because
- foreign importers will be unable to borrow money.
  - the dollar will appreciate against other currencies.
  - the dollar will depreciate against other currencies.
  - consumers will increase their total spending.
  - exporters will be more able to borrow money.

(11) Thomas Malthus believed that in the long run, output per person would

- a. grow at a constant rate indefinitely.
- b. grow at increasing rates indefinitely.
- c. converge to the level of subsistence.
- d. fall at a constant rate.

(12) Assume the required reserve ratio is 0.04 and that banks hold no excess reserves. If people like to hold \$0.20 in currency for every \$1.00 they hold in bank accounts, then the money multiplier equals

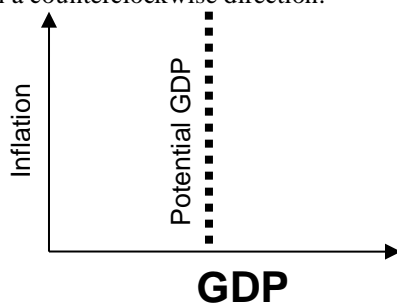
- a. 1.24.
- b. 2.0.
- c. 4.17
- d. 5.0.
- e. 25.0.

(13) Most economists believe that a higher rate of inflation will, in the long run, bring

- a. no change in the rate of unemployment.
- b. a lower rate of unemployment.
- c. a higher rate of unemployment.
- d. cannot be determined from information given.

(14) On a graph like that below, most economic fluctuations cause the economy to

- a. move horizontally left and right.
- b. move vertically up and down.
- c. cycle in a clockwise direction.
- d. cycle in a counterclockwise direction.



(15) According to the "permanent-income hypothesis," which is likely to cause the largest increase in consumption spending *this year*?

- a. A 10 percent tax increase for this year only.
- b. A 10 percent tax increase lasting ten years.
- c. A 10 percent tax cut for this year only.
- d. A 10 percent tax cut lasting ten years.

(16) Suppose the interest rate in the U.S. increases but interest rates in the rest of the world remain unchanged. Then the U.S. dollar will

- a. remain unchanged.
- b. appreciate.
- c. depreciate.
- d. cannot be determined from information given.

(17) Under a monetary policy rule typical of most countries, if inflation rises, the central bank will try to

- a. increase the real interest rate.
- b. increase the money supply.
- c. raise taxes.
- d. reduce the rate at which the government spends money.

(18) If a recession occurs, which will automatically increase without action by Congress or the President?

- a. highway construction spending.
- b. military spending.
- c. income tax payments to the government.
- d. spending on unemployment insurance benefits.
- e. all of the above.
- f. none of the above.

(19) Countries tend to have lower inflation rates in the long run if the heads of their central banks are

- a. under the direct control of elected officials and can be fired at any time.
- b. more independent of elected officials.
- c. directly elected by the people—who after all must live with the consequences of central bank policies.
- d. cannot be determined from information given.

(20) The inflation rate has been lower in Japan than in the United States. In the long run, this should cause the exchange rate (the price of the U.S. dollar in terms of Japanese yen) to

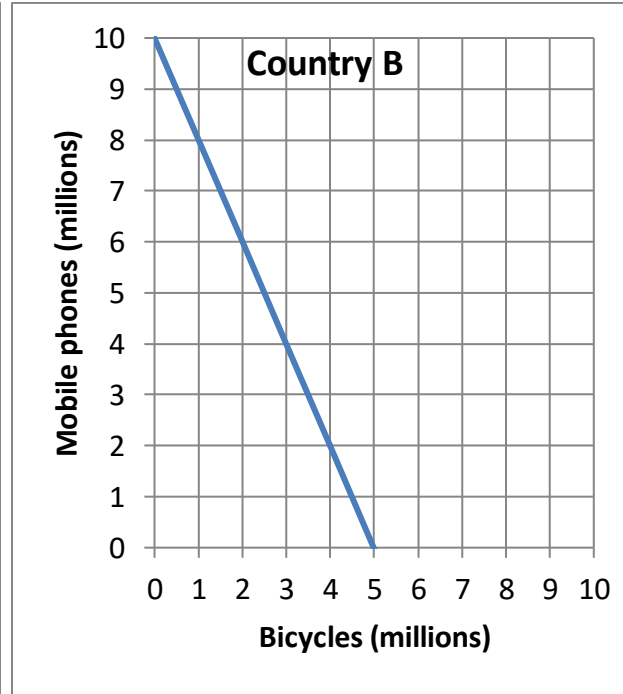
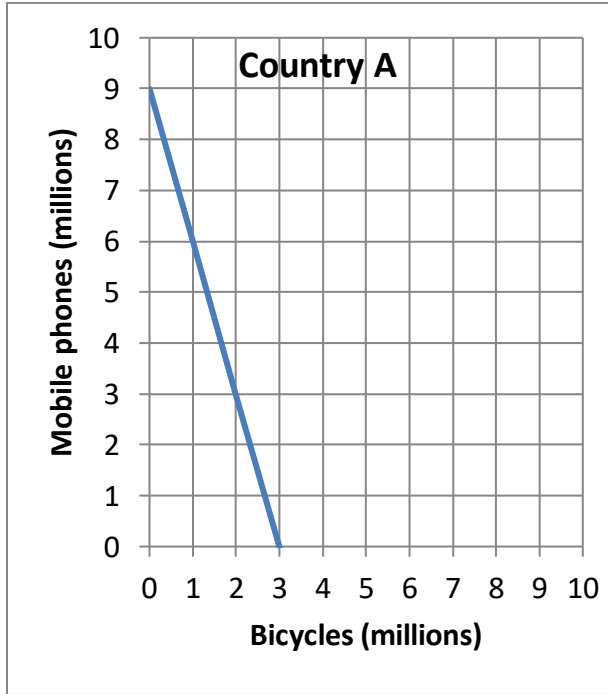
- a. remain unchanged.
- b. rise.
- c. fall.
- d. fluctuate randomly.

(21) A country that fixes its exchange rate can no longer have an independent

- a. trade policy.
- b. industrial policy.
- c. foreign policy.
- d. monetary policy.
- e. fiscal policy.

**II. Problems:** Insert your answer to each question in the box provided. Use graphs and margins for scratch work. Only the answers in the boxes will be graded. Work carefully: partial credit is not normally given for questions in this section.

(1) [Comparative advantage, gains from trade: 17 pts] Country A and Country B each produce mobile phones and bicycles. They each face a tradeoff between these two products because their workforces are limited. Their production possibility curves are shown below.



- a. [2 pts] What is Country A's opportunity cost of producing a mobile phone?
- b. [2 pts] What is Country B's opportunity cost of producing a mobile phone?
- c. [2 pts] What is Country A's opportunity cost of producing a bicycle?
- d. [2 pts] What is Country B's opportunity cost of producing a bicycle?
- e. [2 pts] Which country has a comparative advantage in producing mobile phones?
- f. [2 pts] Which country has a comparative advantage in producing bicycles?

	bicycles
	bicycles
	mobile phones
	mobile phones

g. [3 pts] Fill in the blanks: *Both* countries can consume combinations of mobile phones and bicycles *outside* their individual production possibility curves if \_\_\_\_\_ produces and exports **two million** bicycles to \_\_\_\_\_, which produces and exports \_\_\_\_\_ million mobile phones in return.

h. [2 pts] **Plot** the trade that you propose in part (g) on the graph above. For each country, plot and label the starting point representing **production before trade**, and the ending point representing **consumption after trade**.

(2) [Economic capital: 6 pts] Which of the following are examples of *economic capital*? Answer YES or NO.

- a. Shares of stock in corporations. 

- b. Combine machines (on farms). 

- c. Government bonds. 


- d. Oil-drilling platforms. 

- e. Fiber-optic cable networks. 

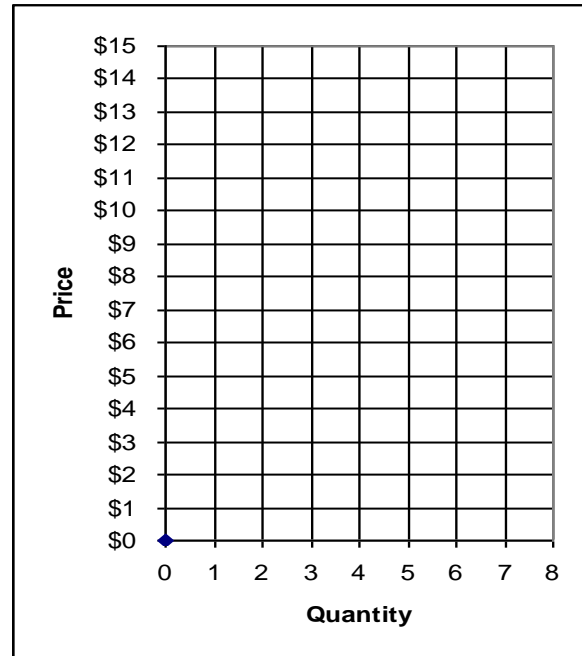
- f. Office buildings. 


(3) [Market equilibrium: 12 pts] Suppose seven buyers and seven sellers engage in a market similar to the activity

we did in class. Each buyer may buy at most one unit and each seller may sell at most one unit, but no one is forced to trade. Assume that buyers and sellers are each trying to maximize their personal earnings (or “gains from trade”). Earnings for each buyer equal the buyer's value of the good minus the price paid. Earnings for each seller equal the price received minus the seller's cost of the good. Earnings of persons who do not trade are zero. Buyers' values and sellers' costs are given in the following table.

Use this graph for scratch work.

<i>Buyer</i>	<i>Value</i>	<i>Seller</i>	<i>Cost</i>
<i>Bob</i>	\$14	<i>Sue</i>	\$ 1
<i>Barb</i>	\$14	<i>Steve</i>	\$ 1
<i>Ben</i>	\$13	<i>Sam</i>	\$ 2
<i>Bailey</i>	\$13	<i>Sven</i>	\$ 2
<i>Brian</i>	\$12	<i>Sarina</i>	\$ 3
<i>Betty</i>	\$ 5	<i>Sean</i>	\$ 3
<i>Bert</i>	\$ 1	<i>Sally</i>	\$10



Suppose with some experience, the market settles on a single price. All trades are made at that price.

- a. Suppose the price were \$11. Would there be *excess demand*, or *excess supply*, or *neither*?
- b. What is the *equilibrium* price likely to be, in whole dollars?
- c. How many units of the good will be sold in this market?
- d. Compute the total revenue received by sellers (which equals the total spending by buyers).
- e. Compute the combined total earnings (or gains from trade) of all buyers and sellers. (Check your answer carefully! No partial credit for being "close"!)
- f. Who enjoys higher earnings in this particular market, the *buyers* or the *sellers*? Or are buyers' total earnings *equal* to sellers' total earnings?

\$
units
\$
\$

(4) [Inflation: 2 pts] According the U.S. Bureau of Labor Statistics, the CPI was 217.330 in December 2009, and was 220.414 in December 2010. Compute the annual rate of inflation over this period to the nearest tenth of a percentage point.

%
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(5) [Components of GDP: 16 pts] The imaginary country of Concrete Land has just four industries: the Raw Concrete Industry, the Building Construction Industry, the Road Construction Industry, and the Birdbath Industry. There are no other goods and no foreign trade. In a recent year:

- The Raw Concrete Industry produced and sold \$150 billion of raw concrete to the Building Industry, \$50 billion to the Road Construction Industry, and \$50 billion to the Birdbath Industry for a total of \$250 billion in sales.
- The Road Construction Industry produced and \$100 billion of roads for the government.
- The Birdbath Industry produced and sold \$500 billion of birdbaths to consumers.
- The Building Industry produced and sold \$50 billion of buildings (a capital good) to each industry (including itself) for a total of \$200 billion in sales.

a. Compute the spending components of Concrete Land's GDP.

Consumption (C)	\$	billion
Investment (I)	\$	billion
Government purchases (G)	\$	billion
Total GDP (Y)	\$	billion

b. Compute value added by each industry in Concrete Land.

Raw Concrete Industry	\$	billion
Building Industry	\$	billion
Road Construction Industry	\$	billion
Birdbath Industry	\$	billion

(6) [Spending components of GDP: 8 pts] The table below shows data for the United States as reported by the Bureau of Economic Analysis. [Hint: Some of the data are extraneous and not needed for solving this problem.]

	2003
National defense	\$0.5 trillion
Exports	\$1.0 trillion
Personal current transfer receipts	\$1.3 trillion
Consumption	\$7.8 trillion
Social Security and other social insurance payments	\$1.3 trillion
Gross investment	\$1.6 trillion
Government purchases	\$2.1 trillion
Imports	\$1.5 trillion

a. Does the U.S. have a trade *surplus* or a trade *deficit* ?

b. Compute net exports (X).

c. Compute GDP.

d. Compute national saving (S).

\$		trillion
\$		trillion
\$		trillion

(7) [Aggregate production function: 5 pts] According to the theory of the aggregate production function, *potential* GDP depends on which of the following? Answer *true* or *false*.

- a. The level of stimulus spending by the federal government.
- b. The level of technology, or "know-how," in the economy.
- c. The money supply.
- d. The number of workers and the average number of hours worked by each of them.
- e. The amount of physical or economic capital available.


(8) [Measuring the labor force: 8 pts] ] The U.S. Bureau of Labor Statistics reported that in October 2008, 144.8 million people were employed, 10.1 million people were unemployed, and 79.7 million working-age people were not in the labor force.

- a. Compute the working-age population to the nearest tenth of a million.
- b. Compute the employment-to-population ratio to the nearest tenth of a percentage point.
- c. Compute the labor force participation rate to the nearest tenth of a percentage point.
- d. Compute the unemployment rate to the nearest tenth of a percentage point.

	million
	%
	%
	%

(9) [Growth of capital stock: 2 pts] The following data (in chained 2005 dollars) were reported by the U.S. Bureau of Economic Analysis.

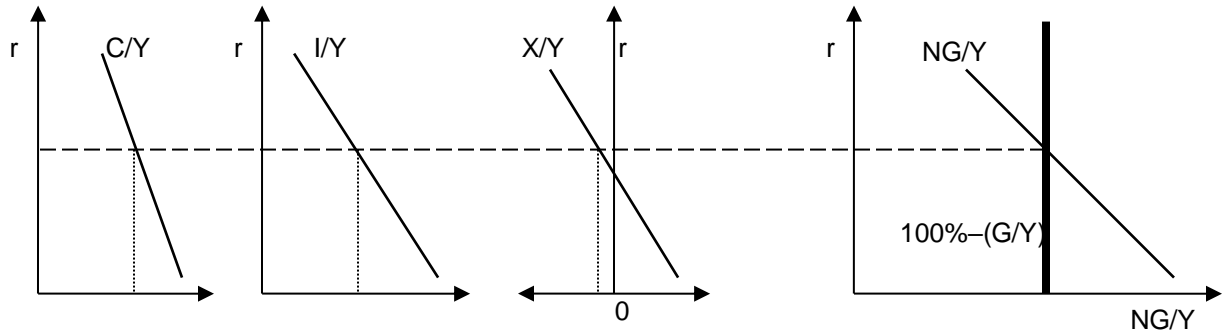
Labor income (compensation of employees) in 2009	\$7,799 billion
Corporate profits in 2009	\$1,342 billion
Depreciation in 2009	\$1,455 billion
Government purchases in 2009	\$2,589 billion
Consumption in 2009	\$9,033 billion
Investment in 2009	\$1,590 billion
Exports in 2009	\$1,499 billion
Private capital stock at end of 2008	\$31,511 billion
Imports in 2009	\$1,854 billion

Compute the private capital stock at the end of 2009. [Hint: Some data are extraneous and not needed for this problem.]

\$		billion
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(10) [Interest rate and GDP shares: 16 pts] Suppose the government purchases share of GDP (that is,  $G/Y$ ) increases. Use the spending allocation model to answer the following questions.

a. [4 points] In the graphs below, draw the shifts in curves (if any) that would result from this change.



- b. [2 pts] Does the long-run real interest rate ( $r$ ) *increase, decrease, or remain constant*?
- c. [2 pts] Does the share of consumption spending ( $C/Y$ ) *increase, decrease, or remain constant*?
- d. [2 pts] Does the share of investment spending ( $I/Y$ ) *increase, decrease, or remain constant*?
- e. [2 pts] Does the share of net exports ( $X/Y$ ) *increase, decrease, or remain constant*?
- f. [2 pts] Does the long-run growth rate of potential GDP *increase, decrease, or remain constant*?
- g. [2 pts] Justify your answer to part (f).


(11) [Technical change: 4 pts] Over the period 1965 to 1990, the annual growth rate of output per worker in France was 2.3% and the annual growth rate of capital per worker was 4.5%. Assume that the share of capital income plus depreciation in national income was about  $(1/3)$ , as it is in the United States.

- a. Compute the contribution of capital to productivity growth, to the nearest tenth of a percentage point.
- b. Contribute the contribution of technology to productivity growth, also called the Solow residual, to the nearest tenth of a percentage point.

	%
	%

(12) [Measuring the money supply: 10 pts] The U.S. government reported the following data for July 2011. [Hint: Some of the data are extraneous and not needed for this problem.]

Currency	\$970 billion
Credit card balances	\$909 billion
Bank reserves	\$793 billion
Savings deposits, small time deposits, money-market mutual funds, and other deposits on which check writing is limited or not allowed	\$7,308 billion
GDP	\$15,076 billion
Federal debt held by the public	\$9,762 billion
Index of industrial production	93.9
Travelers checks, demand deposits, and other checkable deposits	\$1036 billion
Consumer credit outstanding	\$2,454 billion

- a. Compute the money supply measure "M1."
- b. Compute the money supply measure "M2."
- c. Compute the monetary base.
- d. Compute the money multiplier for "M2" to the nearest tenth.
- e. Compute the velocity of money ("M2") to the nearest tenth.

\$	billion
\$	billion
\$	billion

(13) [Quantity equation: 2 pts] Growth rates for various items over the period 1985-1995 are reported below. [Hint: Some of the data are extraneous and not needed for this problem.]

Real GDP (2005 dollars)	2.9 %
Exports (2005 dollars)	9.0 %
Employment	1.5 %
Money supply (M2)	3.8 %
Imports (2005 dollars)	6.1 %

Assuming the velocity of money were constant, what should have been the average annual rate of inflation over this period, according to the quantity equation? Give an answer to the nearest tenth of a percentage point.

	%
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(14) [Consumption function, Keynesian cross, Keynesian multipliers: 8 pts] Suppose the marginal propensity to consume is 0.40 and the marginal propensity to import is 0.025 . Assume no other spending components of GDP are affected by aggregate income.

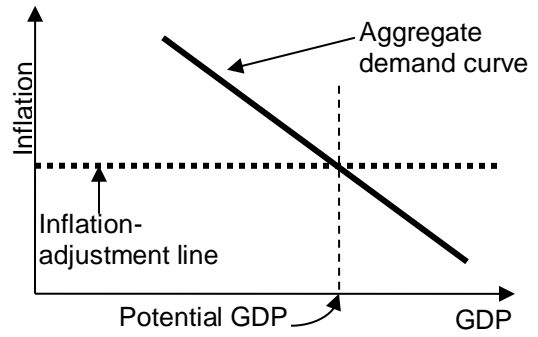
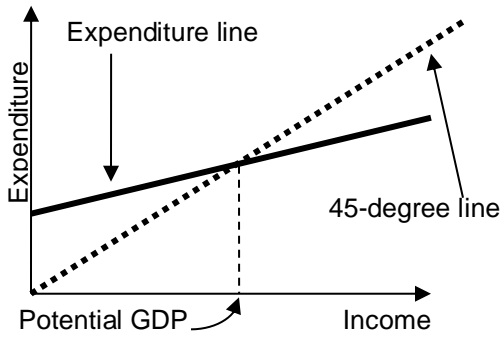
- a. Compute the slope of the consumption function.
- b. Compute the slope of the expenditure line in the Keynesian cross diagram.
- c. Compute the government-purchases multiplier.
- d. By how much does GDP increase in the short run if government purchases (G) increase by \$ 120 billion?
- e. How much of an increase in government purchases is required to raise GDP by \$ 120 billion?
- f. Compute the tax-cut multiplier.
- g. How much of a tax cut is required to raise GDP by \$ 120 billion?
- h. Suppose taxes and government purchases are to be increased simultaneously by exactly the same amount. What amount is required to raise GDP by \$ 120 billion?

\$	billion
\$	billion
\$	billion
\$	billion

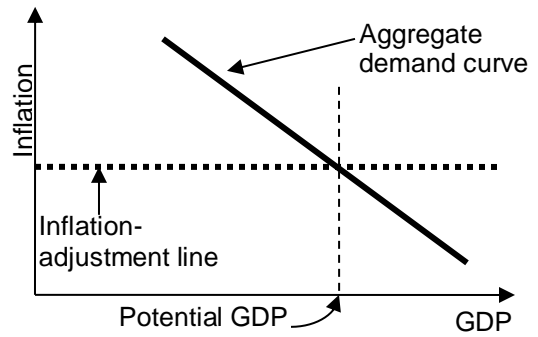
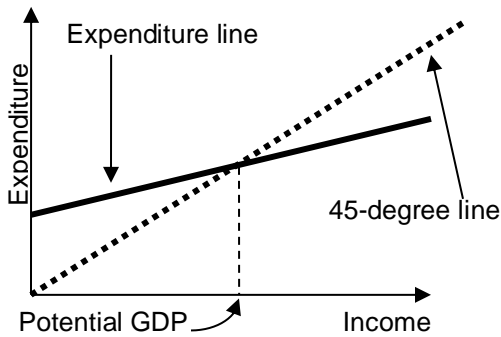
(15) [How business cycles begin: 20 pts] Assume GDP initially equals potential GDP and consider the *short-run* consequences of each scenario in the left column. Indicate whether and how the scenario shifts the expenditure line in the Keynesian cross diagram. Then indicate whether and how it shifts the “aggregate demand” (AD) curve in the diagram used in Taylor’s textbook in the *short run*. Indicate whether the scenario is likely to cause a recession, a boom or neither (assuming GDP was initially equal to potential GDP). **On the next page, on the graphs for each scenario, show the shifts in curves.**

	Expenditure line shifts <i>up, down or unchanged?</i>	AD curve shifts <i>left, right, or unchanged?</i>	Causes <i>recession, boom, or neither?</i>
a. Taxes are decreased.			
b. Government purchases are increased.			
c. Monetary policy is “tightened.”			
d. A sharp drop in the price of houses makes consumers feel poorer.			

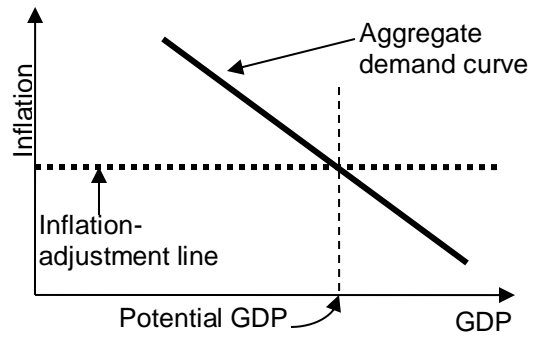
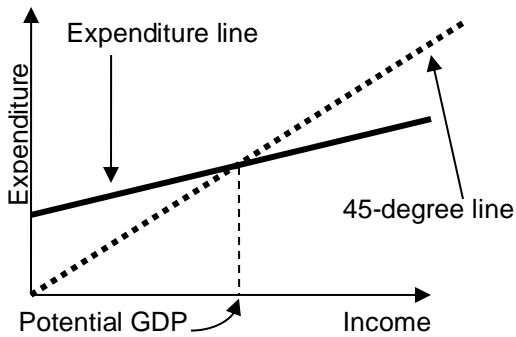
**a. Taxes are decreased.**



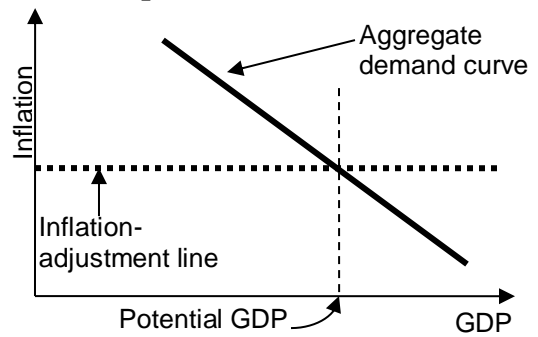
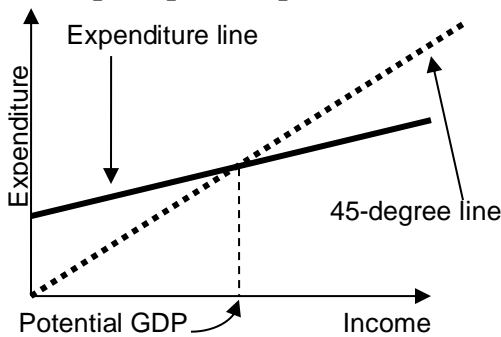
**b. Government purchases are increased.**



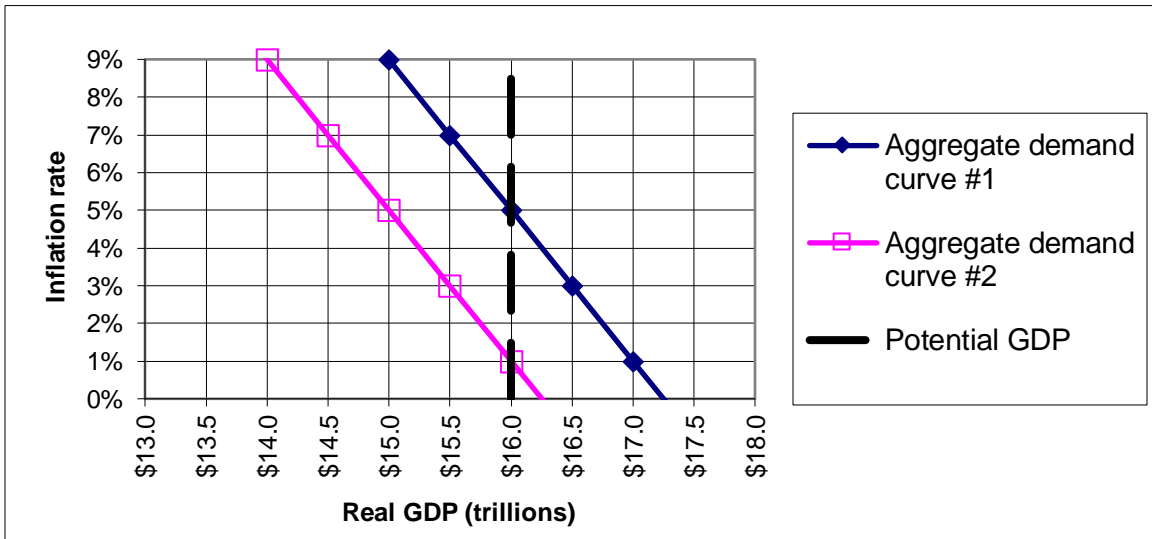
**c. Monetary policy is "tightened."**



**d. A sharp drop in the price of houses makes consumers feel poorer.**



(16) [Inflation adjustment: 16 pts] Consider the following graph of the macroeconomy, similar to those in Taylor’s textbook. Suppose that the aggregate demand curve is currently at "aggregate demand curve #1" and the inflation rate is currently 5%. [Hint: Begin by drawing the “inflation adjustment” line.]



a. What is the current level of real GDP?

\$	trillion

b. Is the unemployment rate currently *greater* than the natural rate, *less* than the natural rate, or *equal* to the natural rate of unemployment?

Now suppose the government passes a large spending decrease and the aggregate demand curve shifts to "aggregate demand curve #2."

c. What is the level of real GDP in the short run?

\$	trillion
	%

d. What is the inflation rate in the short run?

e. Is the unemployment rate *greater* than the natural rate, *less* than the natural rate, or *equal* to the natural rate of unemployment in the short run?

f. What will be the level of real GDP in the long run?

\$	trillion
	%

g. What will be the inflation rate in the long run?

h. Is the unemployment rate *greater* than the natural rate, *less* than the natural rate, or *equal* to the natural rate of unemployment in the long run?

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(17) [Fiscal policy, tax rates: 4 pts] Suppose a single person who has \$15,000 in income owes \$553 in taxes. If the same person had \$16,000 in income, then the person would owe \$653 in taxes.

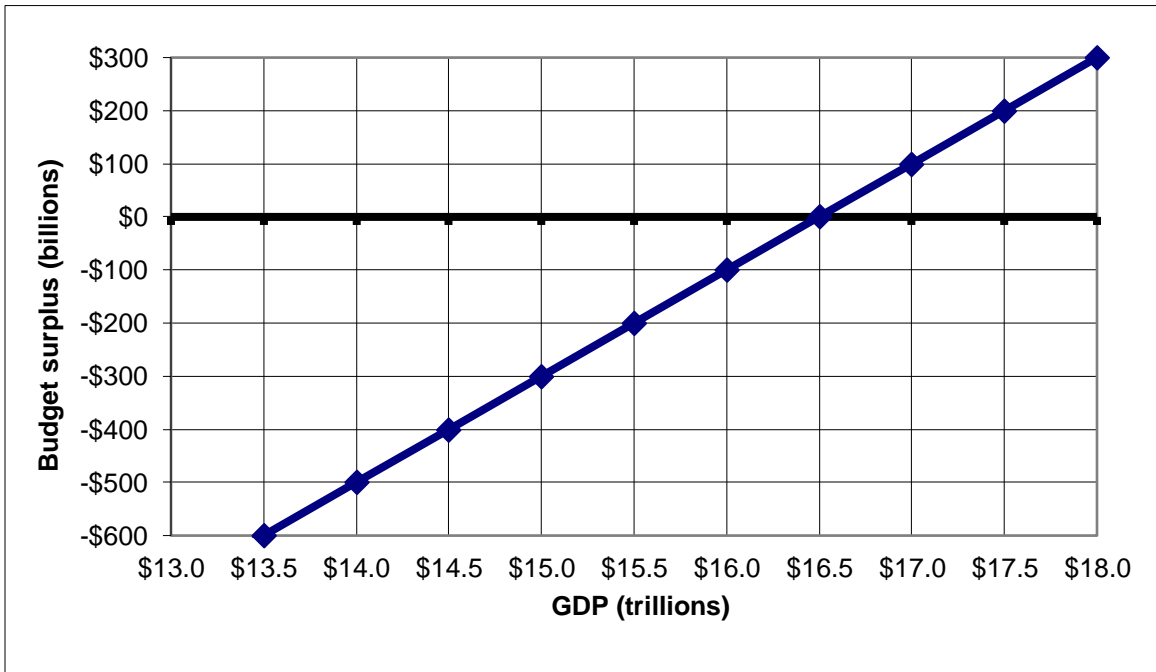
a. Compute this person’s *average tax rate* to the nearest tenth of a percentage point.

	%

b. Compute this person’s *marginal tax rate* to the nearest tenth of a percentage point.

	%

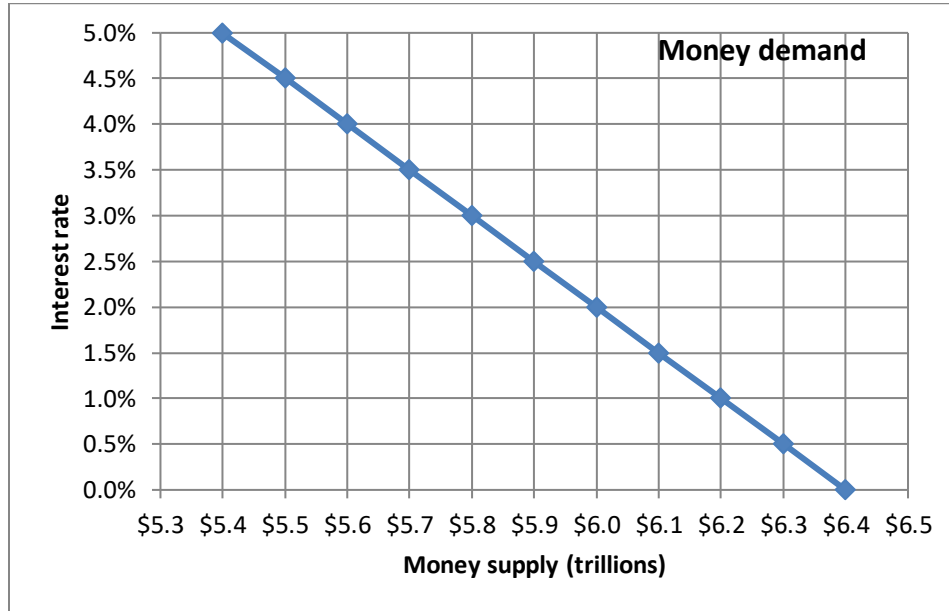
(18) [Fiscal policy: 5 pts] The graph below shows the relationship between the federal budget surplus (or deficit) and the level of GDP. Suppose potential GDP is \$16.0 trillion and actual level of GDP is \$14.5 trillion.



- Is the economy in a *boom*, a *recession*, or *neither*?
- Is there an actual budget *surplus*, an actual budget *deficit*, or an actual *balanced budget*?
- How much?
- Is there a structural budget *surplus*, a structural budget *deficit*, or a structural *balanced budget*?
- How much?

\$                      billion
\$                      billion

(19) [Monetary policy: 8 pts] Suppose the money-demand curve is given by the following graph.



First, suppose the Federal Reserve *decreases* the money supply by **\$ 0.2 trillion** dollars.

- a. Will the interest rate *increase or decrease* in the short run?
- b. By how much--that is, by how many percentage points?

percentage points

Alternatively, suppose that the Federal Reserve wants to *lower* the interest rate by **one-half** percentage point.

- c. Must the Federal Reserve *increase or decrease* the money supply?
- d. By how much?

\$ trillion

(20) [International accounts: 6 pts] The table below shows 2008 data for the United States in billions of dollars. [Hint: Some of the data are extraneous and not needed for solving this problem.]

Exports of goods and services	1843
Current government expenditures	4737
Factor income receipts from foreigners	814
Imports of goods and services	2541
Foreign-owned assets in the United States	22725
Factor income payments to foreigners	667
Net transfers from abroad	-126
Current government tax receipts	2774
U.S.-owned assets abroad	19465

- a. Compute the trade balance (also called “net exports” or “X”).
- b. Compute net factor income from rest of world.
- c. Compute the current account balance.

	\$ billion
	\$ billion
	\$ billion

**III. Critical thinking:** Write a one-paragraph essay answering one question below (your choice). [4 pts]

- (1) Suppose there is a recession in Europe and European GDP decreases. Will this *increase* or *decrease* GDP in the United States? Explain your reasoning.
- (2) The U.S. federal government now runs large budget deficits. Put differently, government saving in the U.S. is negative. Suppose the Congress and the President succeed in reducing the *budget* deficit. Will this likely affect the *trade* deficit? If so, how? Explain your reasoning.

Please circle the question you are answering and write your answer below. Full credit requires correct economic reasoning, legible writing, good grammar including complete sentences, and accurate spelling.

[end of exam]