

FINAL EXAMINATION VERSION C
December 9, 2013

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, 17 pts total]

(1) “The unemployment rate is still above its thirty-year average” is an example of

- a. a positive statement.
- b. a normative statement.
- c. both of the above.
- d. none of the above.

(2) Rational choice implies pursuing an activity until the marginal cost of the last unit

- a. is much greater than its marginal benefit.
- b. begins to exceed its marginal benefit.
- c. begins to fall below its marginal benefit.
- d. is much less than its marginal benefit.

(3) In early summer, the price of swimsuits rises and the quantity sold increases. This could be caused by a

- a. rightward shift in the demand for swimsuits.
- b. rightward shift in the supply of swimsuits.
- c. leftward shift in the demand for swimsuits.
- d. leftward shift in the supply of swimsuits.

(4) During normal times (neither boom nor recession), actual GDP is

- a. above potential GDP.
- b. below potential GDP.
- c. equal to potential GDP.
- d. cannot be determined from information given.

(5) Suppose the interest rate on loans is 6 percent and the inflation rate is expected to be 2 percent. Then the real rate of interest is

- a. 2 percent.
- b. 4 percent.
- c. 6 percent.
- d. 8 percent.
- e. 12 percent.

(6) Investment spending in the national accounts does *not* include purchases of

- a. trucks and heavy equipment.
- b. new factories.
- c. land.
- d. new homes.
- e. business software.

(7) Unemployment caused by a mismatch of worker skills to jobs, or insufficient work incentives, is called

- a. structural unemployment.
- b. frictional unemployment
- c. cyclical unemployment.
- d. all of the above.

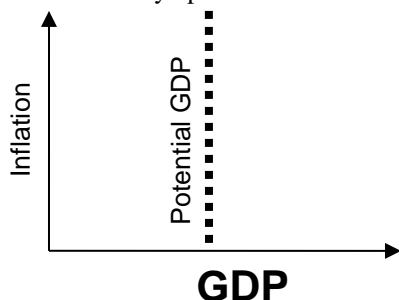
(8) Real GDP grows faster in the long run, the higher the fraction of total spending on

- a. transfer payments.
- b. net exports.
- c. consumption.
- d. investment.
- e. government purchases.

(9) Hyperinflation is caused by excessive

- a. government spending.
- b. growth of the money supply.
- c. consumption spending.
- d. taxes.
- e. government borrowing.

- (10) On a graph like that below, most economic fluctuations cause the economy to
- cycle in a clockwise direction.
 - cycle in a counterclockwise direction.
 - move horizontally left and right.
 - move vertically up and down.



- (11) The “permanent income hypothesis” implies that a permanent tax cut is _____ a temporary tax cut for increasing consumption spending.
- more effective than.
 - less effective than.
 - just as effective as.
 - Cannot be determined from information given.

- (12) Suppose a central bank follows a policy rule of watching both inflation and real GDP. Then if GDP seems to be *less than* potential GDP, that central bank will preemptively
- decrease the money supply.
 - increase the real interest rate.
 - decrease the real interest rate.
 - keep the real interest rate constant to keep the economy on track.

- (13) Simple economic theory predicts that technology and capital should
- flow from more-developed countries to less-developed countries.
 - move in opposite directions.
 - concentrate increasingly in advanced economies.
 - All of the above.

- (14) The inflation rate has been higher in Mexico 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 Mexican pesos) to
- fall.
 - remain unchanged.
 - rise.
 - fluctuate randomly.

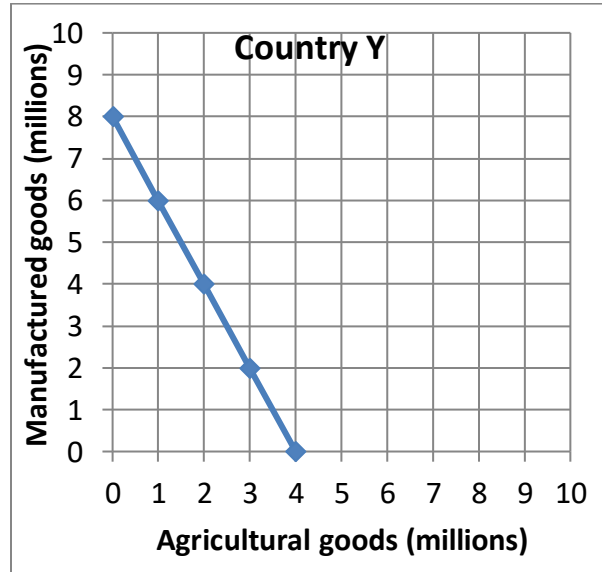
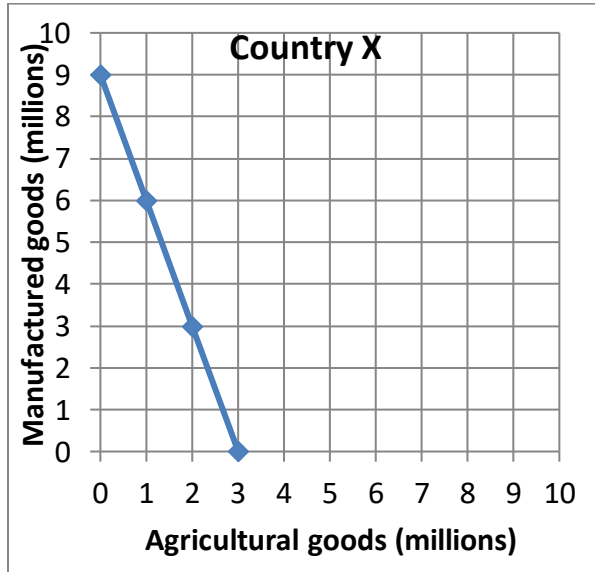
- (15) A country that saves less than it spends on investment will
- import more than it exports.
 - export more than it imports.
 - run a government budget surplus.
 - run a government budget deficit.

- (16) If the interest rate falls in the United States and remains constant in other countries, then in the short run the exchange rate (the price of a dollar in terms of foreign currency) will
- rise.
 - remain constant.
 - fall.
 - cannot be determined from information given.

- (17) A country that fixes its exchange rate can no longer have an independent
- trade policy.
 - industrial policy.
 - foreign policy.
 - monetary policy.
 - 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 X and Country Y each produce agricultural goods and manufactured goods. They each face a tradeoff between these two products because their workforces are limited. Their production possibility curves are shown below.



- [2 pts] What is Country X's opportunity cost of producing a unit of agricultural goods?
- [2 pts] What is Country Y's opportunity cost of producing a unit of agricultural goods?
- [2 pts] What is Country X's opportunity cost of producing a unit of manufactured goods?
- [2 pts] What is Country Y's opportunity cost of producing a unit of manufactured goods?
- [2 pts] Which country has a comparative advantage in producing agricultural goods?
- [2 pts] Which country has a comparative advantage in producing manufactured goods?

	units of manufactured goods
	units of manufactured goods
	units of agricultural goods
	units of agricultural goods

- [3 pts] Fill in the blanks: *Both* countries can consume combinations of agricultural goods and manufactured goods *outside* their individual production possibility curves if _____ produces and exports **five million** units of manufactured goods to _____, which produces and exports _____ million units of agricultural goods in return.
- [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. U.S. Treasury bonds.

d. Shares of stock in large corporations.

b. Cellular phone towers.

e. Forklift trucks.

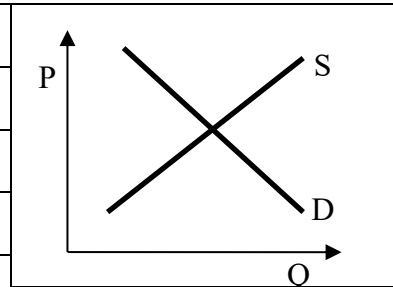
c. Savings accounts.

f. Factories.

(3) [Shifts in demand and supply: 15 pts] Analyze each of the following markets according to the accompanying imaginary scenario.

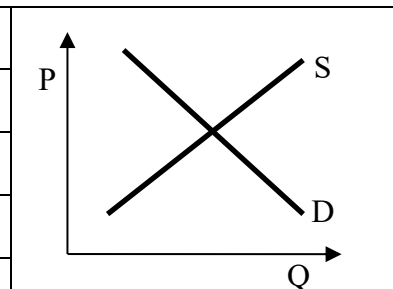
a. Consider the market for **pizza**: The price of mozzarella cheese (an important ingredient in pizza) rises.

Does demand shift *left*, *shift right*, or remain *unchanged*?
 Does supply shift *left*, *shift right*, or remain *unchanged*?
 Does the equilibrium price *increase*, *decrease*, or *cannot be determined*?
 Does the equilibrium quantity *increase*, *decrease*, or *cannot be determined*?
 Sketch a graph of this scenario at right, showing which curve(s) shift(s).



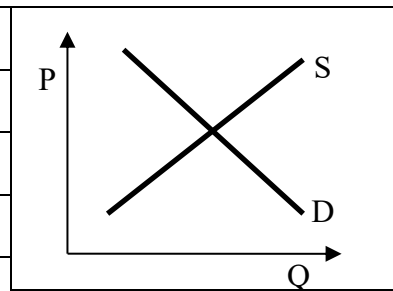
b. Consider the market for **hotel rooms**: An economic recovery raises consumers' incomes.

Does demand shift *left*, *shift right*, or remain *unchanged*?
 Does supply shift *left*, *shift right*, or remain *unchanged*?
 Does the equilibrium price *increase*, *decrease*, or *cannot be determined*?
 Does the equilibrium quantity *increase*, *decrease*, or *cannot be determined*?
 Sketch a graph of this scenario at right, showing which curve(s) shift(s).



c. Consider the market for **coal**: Suppose new safety regulations raise the cost of digging coal. Simultaneously, the price of natural gas falls sharply.

Does demand shift *left*, *shift right*, or remain *unchanged*?
 Does supply shift *left*, *shift right*, or remain *unchanged*?
 Does the equilibrium price *increase*, *decrease*, or *cannot be determined*?
 Does the equilibrium quantity *increase*, *decrease*, or *cannot be determined*?
 Sketch a graph of this scenario at right, showing which curve(s) shift(s).



(4) [Spending approach to GDP: 12 pts] The table below shows data for the United States as reported by the Bureau of Economic Analysis in trillions. [Hint: Some of the data are extraneous and not needed for solving this problem.]

	2012
Consumption of durable goods	\$1.2
Consumption of nondurable goods	\$2.6
Transfer payments	\$2.4
Consumption of services	\$7.4
Business fixed investment	\$2.0
Residential investment	\$0.4
Personal interest income	\$1.2
Change in inventories	\$0.1
Exports	\$2.2
Personal dividend income	\$0.7
Imports	\$2.7
National defense purchases	\$0.8
Depreciation (capital consumption of domestic business)	\$1.6
National nondefense purchases	\$0.5
State and local purchases	\$1.9
Compensation of employees	\$8.6
Corporate profits	\$2.0

- a. Compute consumption (C).
- b. Compute gross investment (I).
- c. Compute net investment.
- d. Compute government purchases (G).
- e. Does the U.S. have a trade surplus or a trade deficit ?
- f. Compute net exports (X).

\$	trillion
\$	trillion
\$	trillion
\$	trillion
\$	trillion

(5) [GDP and real GDP: 8 pts] In an imaginary country, only two final goods are produced, as shown in the following table.

Year	Food		Clothing	
	Price	Quantity	Price	Quantity
2011	\$5	20	\$4	25
2012	\$10	20	\$4	28

- a. Compute the growth rate of *nominal GDP* (also called "current-dollar GDP") from 2011 to 2012.
- b. Compute the growth rate of GDP from 2011 to 2012 *in constant 2011 prices*.
- c. Compute the growth rate of GDP from 2011 to 2012 *in constant 2012 prices*.
- d. Compute the growth rate of *real GDP* from 2011 to 2012, as it would be computed by the U.S. Bureau of Economic Analysis.

	%
	%
	%
	%

(6) [Nominal GDP, real GDP, and inflation: 7 pts] The following table shows data for Brazil, in billions of *reals*, the Brazilian currency.

Year	Nominal GDP	Real GDP	GDP price index or price deflator (to the nearest tenth)	Rate of inflation (to the nearest tenth of a percentage point)
1995	706	706		
1996	844	721		%
1997	939	745		%

a. [2 pts] Which is the base year for real GDP?

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b. [3 pts] Compute the GDP price index for each year, to the nearest tenth, and insert it in the table above. [Hint: The price index should equal 100.0 in the base year.]

c. [2 pts] Compute the rate of inflation for the last two years, to the nearest tenth of a percentage point, and insert in in the table above.

(7) [Aggregate production function: 6 pts] According to the theory of the aggregate production function, *potential* GDP depends on which of the following? Answer *true* or *false*.

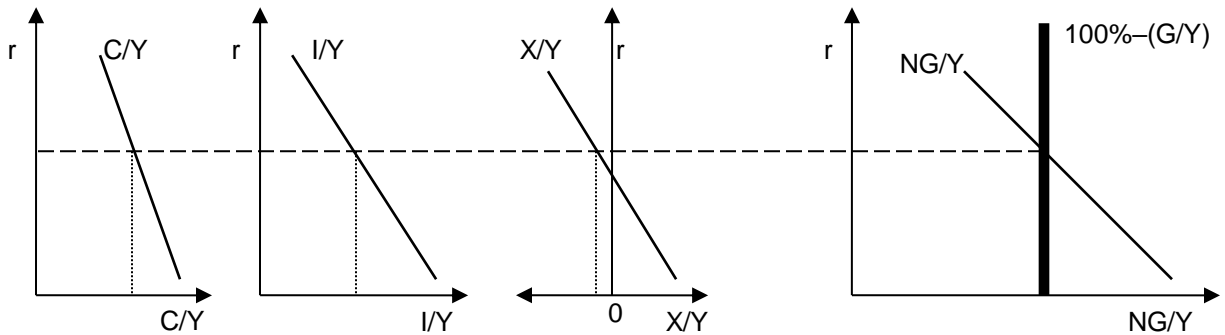
- a. The money supply.
- b. The number of workers and the average number of hours worked by each of them.
- c. The amount of physical or economic capital available.
- d. The level of stimulus spending by the federal government.
- e. The level of technology, or "know-how," in the economy.
- f. Consumer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

(8) [Measuring the labor force: 8 pts]] The U.S. Bureau of Labor Statistics reported that in April 2007, 145.6 million people were employed, 152.4 million people were in the labor force, and 231.3 million people were in the working-age population.

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

	million
	%
	%
	%

(9) [Interest rate and GDP shares:16 pts] Suppose Social Security old-age benefits are decreased. Use the GDP shares model in the graphs below to answer the following questions.



- Does the consumption share (C/Y) curve shift *left*, shift *right*, or remain *unchanged*?
- Does the investment share (I/Y) curve shift *left*, shift *right*, or remain *unchanged*?
- Does the net exports share (X/Y) curve shift *left*, shift *right*, or remain *unchanged*?
- Does the downward-sloping nongovernment share (NG/Y) curve shift *left*, shift *right*, or remain *unchanged*?
- Does the vertical nongovernmental share line (labeled “ $100\%-(G/Y)$ ”) shift *left*, shift *right*, or remain *unchanged*?
- Does the real interest rate (r) *increase*, *decrease*, or remain *unchanged*?
- Does the long-run growth rate of potential GDP *increase*, *decrease*, or remain *constant*?
- Justify your answer to part (g).

(10) [Technical change: 4 pts] In Netherlands over the period 1965 to 1990, the annual growth rate of capital per worker was 3.3% and the annual growth rate of output per worker in was 1.7%. Assume that the share of capital income plus depreciation in national income was about $(1/3)$, as it is in the United States.

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

	%
	%

(11) [Functions of money: 4 pts] For each sentence below, indicate whether money is functioning as a *medium of exchange*, a *store of value*, or a *unit of account*.

- a. I brought money to pay off my Drake account.
- b. The merchandise in that store was worth hundreds of thousands of dollars.
- c. I still have money in my bank account from my job last summer.
- d. You should take money out of the ATM to buy textbooks at the Bookstore.

(12) [Measuring the money supply: 10 pts] In January 2007, the U.S. government reported the following data. [Hint: Some of the data are extraneous and not needed for this problem.]

Travelers checks, demand deposits, and other checkable deposits	\$0.6 trillion
GDP	\$14.1 trillion
Commercial paper outstanding	\$2.0 trillion
Savings deposits, small time deposits, money-market mutual funds, and other deposits on which check writing is limited or not allowed	\$5.7 trillion
Federal debt held by the public	\$4.9 trillion
Consumer credit outstanding	\$2.4 trillion
Index of industrial production	98.3
Currency	\$0.8 trillion
Credit card balances	\$0.9 trillion
Bank reserves	\$0.04 trillion

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

\$	trillion
\$	trillion
\$	trillion

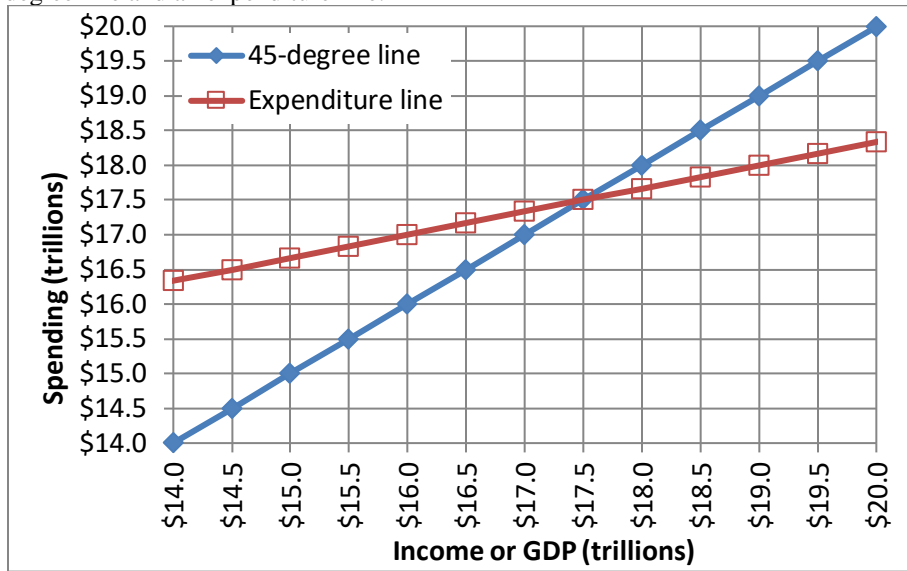
(13) [Quantity equation: 2 pts] Growth rates for various items over the period 2000 to 2010 are reported below. [Hint: Some of the data are extraneous and not needed for this problem.]

Real GDP	1.5 %
Exports	3.4 %
Labor force	0.8 %
Money supply (M2)	6.0 %

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) [Keynesian cross, Keynesian multipliers: 12 pts] The following diagram shows a Keynesian cross diagram, including a 45-degree line and an expenditure line.



a. What is the current level of real GDP—that is, the point of "spending balance"?

\$	trillion
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Suppose government purchases *decrease* by \$ 1.0 trillion.

b. Does the expenditure line shift *up* or *down* in the short run?

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c. By how much (measured vertically)?

\$	trillion
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d. Does GDP *increase* or *decrease* in the short run?

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e. By how much?

\$	trillion
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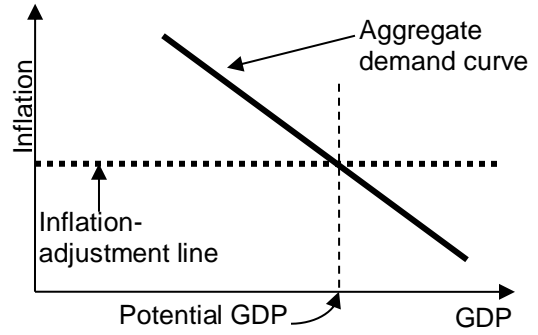
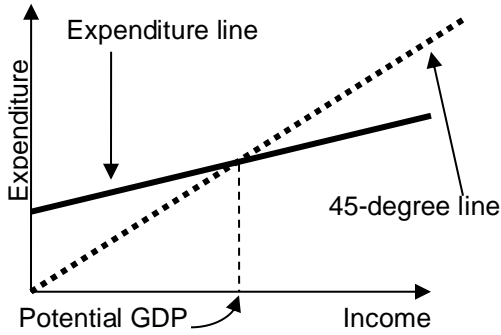
f. Compute the government-purchases multiplier from your previous answers to this problem.

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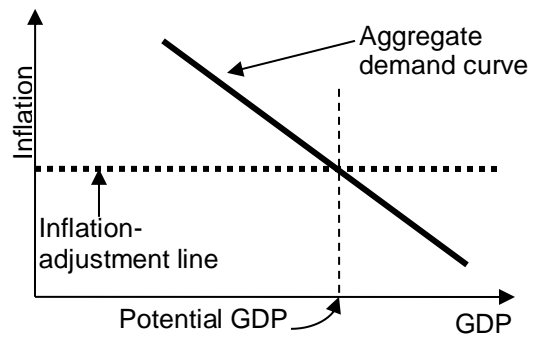
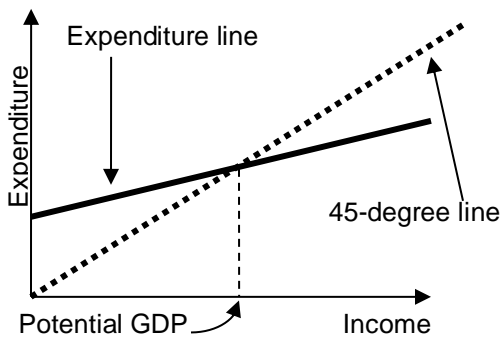
(15) [How business cycles begin: 20 pts] Assume GDP initially equals potential GDP and consider the *short-run* consequences of each scenario in the left column. Indicate whether and how the scenario shifts the expenditure line in the Keynesian cross diagram. Then indicate whether and how it shifts the “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</i> or <i>unchanged</i> ?	AD curve shifts <i>left, right, or unchanged</i> ?	Causes <i>recession, boom, or neither</i> ?
a. The government rapidly increases spending on highways and bridges.			
b. Taxes are decreased.			
c. Monetary policy is “tightened.”			
d. Due to problems in the mortgage market, there is a sudden drop in residential investment (spending on new houses).			

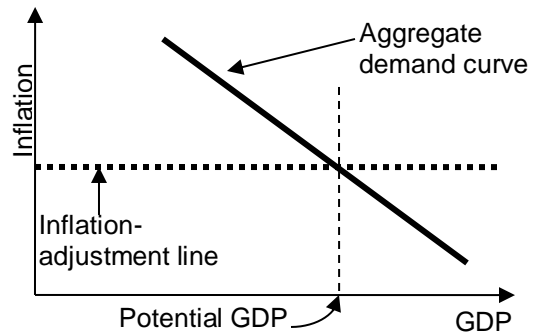
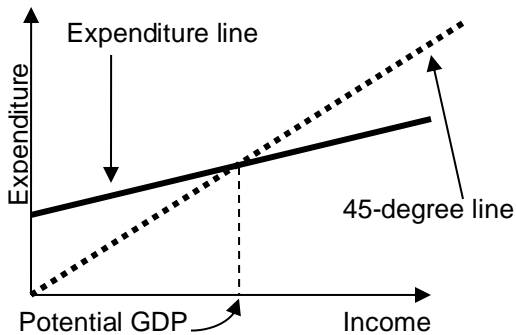
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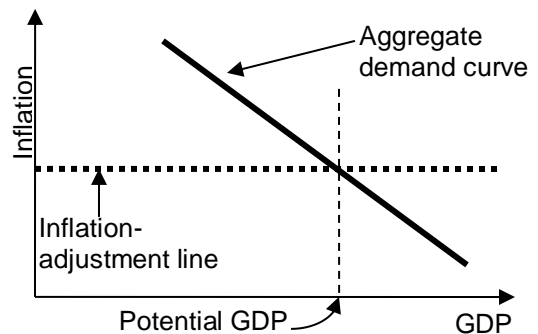
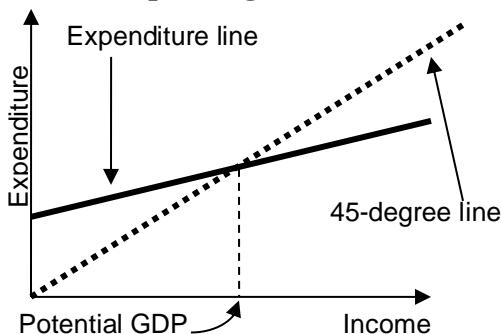
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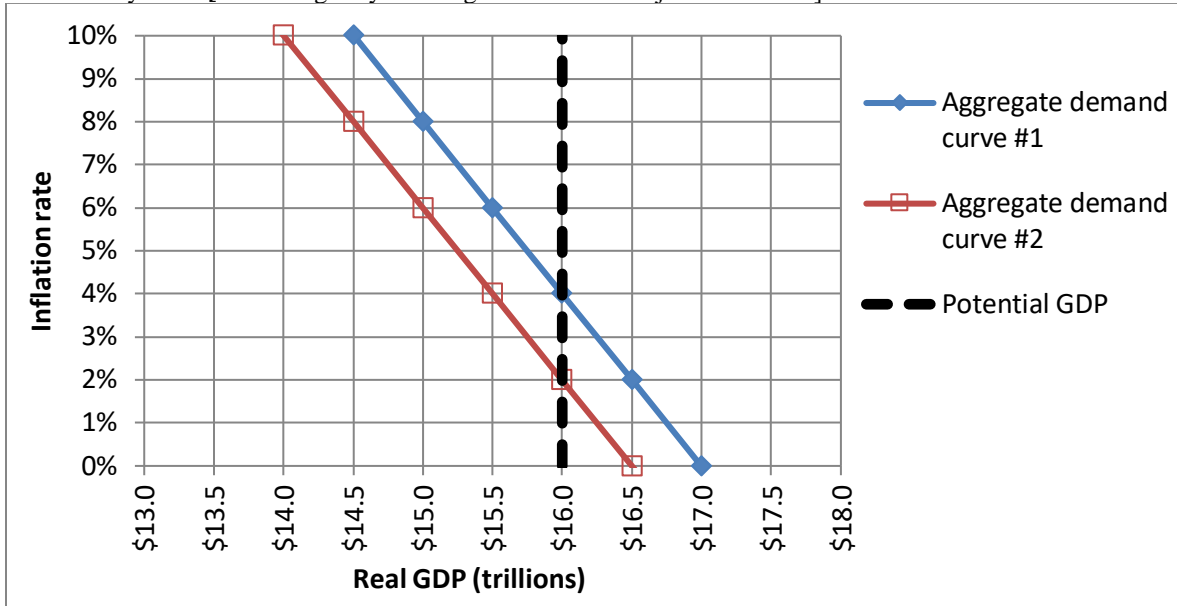
c. Monetary policy is "tightened."



d. Due to problems in the mortgage market, there is a sudden drop in residential investment (spending on new houses).



(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 4%. [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 tax increase 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?

(17) [Monetary policy: 6 pts] According to the *Wall Street Journal*, “one rule of thumb at the Fed is that long-term interest rates fall 0.03 percentage point ... for every \$100 billion of long-term bonds that the central bank purchases.”¹ Use this rule of thumb to answer the following questions.

First, suppose that the Fed **sells \$200 billion** of long-term bonds.

- a. Will the money supply *increase* or *decrease*?
- b. Will interest rates *increase* or *decrease*?
- c. By how much--that is, by how many percentage points?

percentage points

Alternatively, suppose that the Fed wants to **lower interest rates by 0.15** percentage points.

- d. Will the Fed *buy* bonds or *sell* bonds?
- e. How much?
- f. Will the money supply *increase* or *decrease* as a result?

\$ billion

(18) [International accounts: 6 pts] The table below shows 2011 data for the United States. [Hint: Some of the data are extraneous and not needed for solving this problem.]

Increase in U.S.-owned assets abroad	\$ 452 billion
Imports of goods	\$ 2,240 billion
Income receipts from rest of world	\$ 761 billion
Imports of services	\$ 430 billion
Increase in foreign-owned assets in U.S.	\$ 969 billion
Exports of services	\$ 617 billion
Income payments to rest of world	\$ 528 billion
Net transfers from abroad	\$ - 134 billion
Exports of goods	\$ 1,496 billion

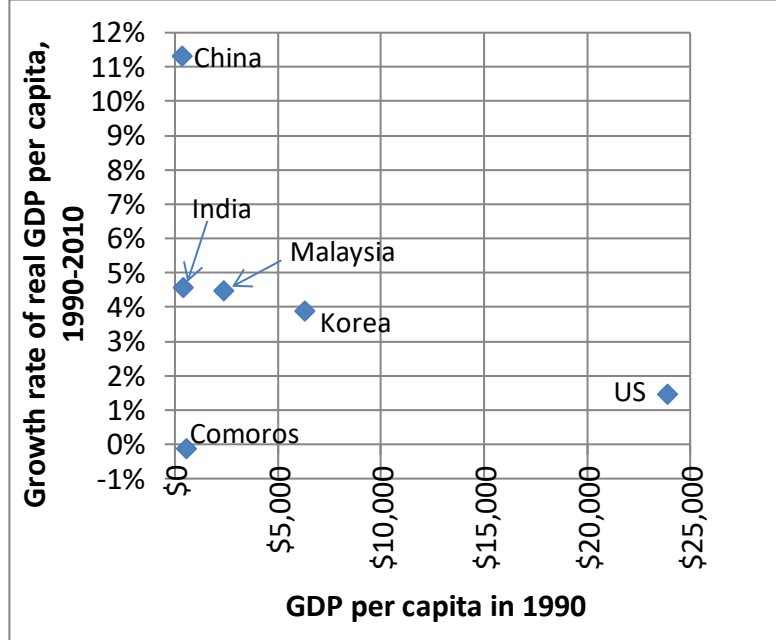
- a. Compute the trade balance (also called “net exports” or “X”).
- b. Compute net income from rest of world.
- c. Compute the current account balance.

\$ billion
\$ billion
\$ billion

¹ *Wall Street Journal*, June 21, 2012, p. A14.

(19) [Economic growth and globalization: 5 pts] The graph at right plots the growth rate of real GDP per capita from 1990 to 2010, against initial real GDP per capita in 1990, for six countries. Which countries' real GDP per capita *converged* toward that of the United States over this period? Answer *YES* or *NO*.

a. China	
b. Comoros	
c. India	
d. Korea	
e. Malaysia	



III. Critical thinking: Write a one-paragraph essay answering the ONE question below (your choice). [3 pts]

- (1) Hong Kong fixes the value of its currency, the Hong Kong dollar, against the U.S. dollar. If the U.S. Federal Reserve raises the federal funds interest rate, what action must the Hong Kong authorities take? If they do not take that action, what would happen to the value of the Hong Kong dollar?
- (2) Suppose the U.S. Constitution were amended to require that the federal budget be exactly balanced every year. Would this make it easier or more difficult to prevent recessions and booms? Why?

Write your answer below. Full credit requires correct economic reasoning, legible writing, good grammar including complete sentences, and accurate spelling.

[end of exam]