

Economics 132.01
Principles of Macroeconomics
Fall 2010

Professor Peter Ireland
First Midterm Exam

This exam has 8 questions on 3 pages; before you begin, please check to make sure your copy has all 8 questions and all 3 pages. Each of the 8 questions will receive equal weight in determining your overall exam score. You can work on the questions in any order, but please be sure to keep your answers to all of the parts of a specific question together in your exam book.

1. In each case, please indicate whether the statement is true or false (you don't need to explain why).
 - a. The law of demand states that the quantity of a good demanded goes up when the price of that good rises.
 - b. The law of supply states that the quantity of a good supplied goes up when the price of that good falls.
 - c. In a microeconomic supply-and-demand diagram, with the quantity of a good on the horizontal (x) axis and the price of that same good on the vertical (y) axis, the law of demand states that the demand curve should slope upward.
 - d. In a microeconomic supply-and-demand diagram, with the quantity of a good on the horizontal (x) axis and the price of that same good on the vertical (y) axis, the law of supply states that the supply curve should slope downward.

2. This question asks you to use microeconomic supply-and-demand analysis to determine the likely effects of technological changes that make it easier for companies to manufacture big screen televisions. Suppose, in particular, that new machinery is invented that allows companies to manufacture large tv screens at a much lower cost.
 - a. In a microeconomic supply-and-demand diagram, with the quantity of big-screen tv's on the horizontal (x) axis and the price of big screen tv's on the vertical (y) axis, will this invention shift the demand curve or the supply curve? (*Note:* here and below, you don't have to actually draw the diagram; just explain with a few words what happens in that diagram).
 - b. In the same diagram, will the curve you mentioned in part (a) above shift to the left or to the right?
 - c. Will the equilibrium quantity of big screen tv's supplied and demanded rise, fall, or stay the same as a result of this invention?
 - d. Will the equilibrium price of big screen tv's rise, fall, or stay the same as a result of this invention?

3. In each case, please indicate whether the statement is true or false (you don't need to explain why).
- GDP (gross domestic product) can be defined as the market value of all final goods and services produced by an economy's citizens in a given period of time.
 - The investment component of GDP includes the value of stocks and bonds traded in US financial markets as well as the value of new machinery and equipment purchased by US businesses.
 - Of the four components of US GDP – consumption, investment, government purchases, and net exports – consumption is the largest.
 - Analysts at the US Department of Commerce estimate the value of volunteer work done in the United States and include that value in their estimate of total GDP.
 - Net exports, as one of the components of GDP, is measured as exports minus imports.
4. As a result of each of the following economic events, please indicate whether US gross domestic product (GDP) rises, falls, or stays unchanged. Please indicate, as well, which if any of the four main components of GDP (consumption, investment, government purchases, and net exports) change and in which direction (rising or falling).
- Ford Motor Company produces a new car in the US, but adds it to its inventory of unsold vehicles instead of selling it to a US consumer right away.
 - The City of Newton, Massachusetts buys textbooks, printed in the US, for students to use in its public schools.
 - The City of Newton, Massachusetts pays its public school teachers.
 - You (as an individual consumer in the United States) buy a new computer, manufactured in Japan.
 - General Electric, a US company, buys a piece of machinery manufactured by another company located in Germany, and installs that machinery in one of its own factories in the US.
5. Consider a simple economy in which only two goods are produced and sold: pizza and beer. The prices and quantities produced of these two goods over a three-year period are shown in the table below.

Year	Price of Pizza	Quantity of Pizza	Price of Beer	Quantity of Beer
2008	\$2	1	\$1	2
2009	\$4	2	\$2	4
2010	\$6	3	\$3	6

- Calculate nominal GDP in 2008, 2009, and 2010.
- Next, using 2008 as your base year, calculate real GDP in 2008, 2009, and 2010.
- Does the GDP deflator rise, fall, or stay the same between 2008 and 2009? (*Note:* You don't have to actually calculate the deflator for this part and the one just below, you only have to say whether it rises or falls).
- Does the GDP deflator rise, fall, or stay the same between 2009 and 2010?

6. Go back to the same example from question 5, just above. Consumers in the economy like two goods: pizza and beer. Prices and quantities consumed are the same as before:

Year	Price of Pizza	Quantity of Pizza	Price of Beer	Quantity of Beer
2008	\$2	1	\$1	2
2009	\$4	2	\$2	4
2010	\$6	3	\$3	6

As a first step in computing the consumer price index (CPI), the Bureau of Labor Statistics surveys consumers to determine the “basket of goods” purchased by a typical consumer. Suppose that the BLS chooses 2008 as its base year and, consistent with the data shown in the table, decides that basket of goods in this economy should consist of one pizzas and two beers.

- a. What is the cost of the basket in each year: 2008, 2009, and 2010?
 - b. Still using 2008 as the base year, what is the CPI in each year: 2008, 2009, and 2010?
7. In each case, please indicate whether the statement is true or false (you don’t need to explain why).
- a. The term “substitution bias” refers to the problem that arises because the CPI holds the basket of goods purchased by the typical American consumer fixed, even though in reality consumers will tend to buy more of those goods with prices that are falling or at least rising less rapidly than most other goods.
 - b. Because of substitution bias, changes in the CPI *overstate* changes in the true cost of living.
 - c. Because analysts at the BLS do not always fully account for quality improvements in the goods that US consumers buy – that is, because of “unmeasured quality change” – changes in the CPI *understate* changes in the true cost of living.
 - d. When the price of an imported good – one that is produced in another country but purchased by a consumer in the US – rises, the CPI rises but the GDP deflator does not.
 - e. When the price of an exported good – one that is produced in the US but purchased by a consumer outside of the US – rises, the CPI rises but the GDP deflator does not.
8. In 1983, the US consumer price index was equal to 100; today, in 2010, the US consumer price index is equal to 220. Use this information to answer the following questions.
- a. A family purchased their house in 1983 for \$100,000. What is the value of that \$100,000 in today’s (2010) dollars?
 - b. A real estate agent tells that family that they could probably sell their house today for \$250,000. After adjusting for inflation, which is higher: the \$100,000 price of the house in 1983 or the \$250,000 price of the house today?

Economics 132.01
Principles of Macroeconomics
Fall 2010

Professor Peter Ireland
Solutions to First Midterm Exam

This exam has 8 questions on 3 pages; before you begin, please check to make sure your copy has all 8 questions and all 3 pages. Each of the 8 questions will receive equal weight in determining your overall exam score. You can work on the questions in any order, but please be sure to keep your answers to all of the parts of a specific question together in your exam book.

1. In each case, please indicate whether the statement is true or false (you don't need to explain why).
 - a. The law of demand states that the quantity of a good demanded goes up when the price of that good rises.

False.

- b. The law of supply states that the quantity of a good supplied goes up when the price of that good falls.

False.

- c. In a microeconomic supply-and-demand diagram, with the quantity of a good on the horizontal (x) axis and the price of that same good on the vertical (y) axis, the law of demand states that the demand curve should slope upward.

False.

- d. In a microeconomic supply-and-demand diagram, with the quantity of a good on the horizontal (x) axis and the price of that same good on the vertical (y) axis, the law of supply states that the supply curve should slope downward.

False.

2. This question asks you to use microeconomic supply-and-demand analysis to determine the likely effects of technological changes that make it easier for companies to manufacture big screen televisions. Suppose, in particular, that new machinery is invented that allows companies to manufacture large tv screens at a much lower cost.

- a. In a microeconomic supply-and-demand diagram, with the quantity of big-screen tv's on the horizontal (x) axis and the price of big screen tv's on the vertical (y) axis, will this invention shift the demand curve or the supply curve? (*Note*: here and below, you don't have to actually draw the diagram; just explain with a few words what happens in that diagram).

It will shift the supply curve.

- b. In the same diagram, will the curve you mentioned in part (a) above shift to the left or to the right?

The supply curve will shift to the right.

- c. Will the equilibrium quantity of big screen tv's supplied and demanded rise, fall, or stay the same as a result of this invention?

It will rise.

- d. Will the equilibrium price of big screen tv's rise, fall, or stay the same as a result of this invention?

It will fall.

3. In each case, please indicate whether the statement is true or false (you don't need to explain why).
- a. GDP (gross domestic product) can be defined as the market value of all final goods and services produced by an economy's citizens in a given period of time.

False.

- b. The investment component of GDP includes the value of stocks and bonds traded in US financial markets as well as the value of new machinery and equipment purchased by US businesses.

False.

- c. Of the four components of US GDP – consumption, investment, government purchases, and net exports – consumption is the largest.

True.

- d. Analysts at the US Department of Commerce estimate the value of volunteer work done in the United States and include that value in their estimate of total GDP.

False.

- e. Net exports, as one of the components of GDP, is measured as exports minus imports.

True.

4. As a result of each of the following economic events, please indicate whether US gross domestic product (GDP) rises, falls, or stays unchanged. Please indicate, as well, which if any of the four main components of GDP (consumption, investment, government purchases, and net exports) change and in which direction (rising or falling).
- a. Ford Motor Company produces a new car in the US, but adds it to its inventory of unsold vehicles instead of selling it to a US consumer right away.

GDP (Y) rises; investment (I) rises.

- b. The City of Newton, Massachusetts buys textbooks, printed in the US, for students to use in its public schools.

GDP (Y) rises; government purchases (G) rises.

- c. The City of Newton, Massachusetts pays its public school teachers.

GDP (Y) rises; government purchases (G) rises.

- d. You (as an individual consumer in the United States) buy a new computer, manufactured in Japan.

GDP (Y) stays unchanged; consumption (C) rises; net exports (NX) falls.

- e. General Electric, a US company, buys a piece of machinery manufactured by another company located in Germany, and installs that machinery in one of its own factories in the US.

GDP (Y) stays unchanged; investment (I) rises; net exports (NX) falls.

5. Consider a simple economy in which only two goods are produced and sold: pizza and beer. The prices and quantities produced of these two goods over a three-year period are shown in the table below.

Year	Price of Pizza	Quantity of Pizza	Price of Beer	Quantity of Beer
2008	\$2	1	\$1	2
2009	\$4	2	\$2	4
2010	\$6	3	\$3	6

- a. Calculate nominal GDP in 2008, 2009, and 2010.

2008: \$2 per pizza x 1 pizza + \$1 per beer x 2 beers = \$4.

2009: \$4 per pizza x 2 pizzas + \$2 per beer x 4 beers = \$16.

2010: \$6 per pizza x 3 pizzas + \$3 per beer x 6 beers = \$36.

- b. Next, using 2008 as your base year, calculate real GDP in 2008, 2009, and 2010.

2008: \$2 per pizza x 1 pizza + \$1 per beer x 2 beers = \$4.

2009: \$2 per pizza x 2 pizzas + \$1 per beer x 4 beers = \$8.

2010: \$2 per pizza x 3 pizzas + \$1 per beer x 6 beers = \$12.

- c. Does the GDP deflator rise, fall, or stay the same between 2008 and 2009? (*Note: You don't have to actually calculate the deflator for this part and the one just below, you only have to say whether it rises or falls.*)

It rises.

- d. Does the GDP deflator rise, fall, or stay the same between 2009 and 2010?

It rises.

6. Go back to the same example from question 5, just above. Consumers in the economy like two goods: pizza and beer. Prices and quantities consumed are the same as before:

Year	Price of Pizza	Quantity of Pizza	Price of Beer	Quantity of Beer
2008	\$2	1	\$1	2
2009	\$4	2	\$2	4
2010	\$6	3	\$3	6

As a first step in computing the consumer price index (CPI), the Bureau of Labor Statistics surveys consumers to determine the "basket of goods" purchased by a typical consumer. Suppose that the BLS chooses 2008 as its base year and, consistent with the data shown in the table, decides that basket of goods in this economy should consist of one pizzas and two beers.

- a. What is the cost of the basket in each year: 2008, 2009, and 2010?

2008: \$2 per pizza x 1 pizza + \$1 per beer x 2 beers = \$4.

2009: \$4 per pizza x 1 pizza + \$2 per beer x 2 beers = \$8.

2010: \$6 per pizza x 1 pizza + \$3 per beer x 2 beers = \$12.

- b. Still using 2008 as the base year, what is the CPI in each year: 2008, 2009, and 2010?

2008: $(\$4/\$4) \times 100 = 100$.

2009: $(\$8/\$4) \times 100 = 200$.

2010: $(\$12/\$4) \times 100 = 300$.

7. In each case, please indicate whether the statement is true or false (you don't need to explain why).

- a. The term “substitution bias” refers to the problem that arises because the CPI holds the basket of goods purchased by the typical American consumer fixed, even though in reality consumers will tend to buy more of those goods with prices that are falling or at least rising less rapidly than most other goods.

True.

- b. Because of substitution bias, changes in the CPI *overstate* changes in the true cost of living.

True.

- c. Because analysts at the BLS do not always fully account for quality improvements in the goods that US consumers buy – that is, because of “unmeasured quality change” – changes in the CPI *understate* changes in the true cost of living.

False.

- d. When the price of an imported good – one that is produced in another country but purchased by a consumer in the US – rises, the CPI rises but the GDP deflator does not.

True.

- e. When the price of an exported good – one that is produced in the US but purchased by a consumer outside of the US – rises, the CPI rises but the GDP deflator does not.

False.

8. In 1983, the US consumer price index was equal to 100; today, in 2010, the US consumer price index is equal to 220. Use this information to answer the following questions.

- a. A family purchased their house in 1983 for \$100,000. What is the value of that \$100,000 in today’s (2010) dollars?

Value in 2010 dollars = \$100,000 x (CPI in 2010)/(CPI in 1983) = \$100,000 x (220/100) = \$220,000.

- b. A real estate agent tells that family that they could probably sell their house today for \$250,000. After adjusting for inflation, which is higher: the \$100,000 price of the house in 1983 or the \$250,000 price of the house today?

Even after adjusting for inflation, \$250,000 today is higher than \$100,000 in 1983.

Economics 132.01
Principles of Macroeconomics
Fall 2010

Professor Peter Ireland
Second Midterm Exam

This exam has 8 questions on 3 pages; before you begin, please check to make sure your copy has all 8 questions and all 3 pages. Each of the 8 questions will receive equal weight in determining your overall exam score. You can work on the questions in any order, but please be sure to keep your answers to all of the parts of a specific question together in your exam book.

1. Macroeconomists often use the story of Robinson Crusoe to help identify and understand the determinants of productivity in the United States. In class, we considered various factors that influence Crusoe's productivity in fishing. Suppose instead that we considered factors that influence Crusoe's productivity in farming.
 - a. If we said that Crusoe's productivity in farming depends partly on how many farm tools he has, what counterpart would we have in mind as to how productivity is determined in more complex economies like the US?
 - b. If we said that Crusoe's productivity in farming depends partly on how much training in farming techniques he has, what counterpart would we have in mind as to how productivity is determined in more complex economies like the US?
 - c. If we said the Crusoe's productivity in farming depends partly on how fertile the soil on his island is and how much access he has to fresh water supplies for irrigation, what counterpart would we have in mind as to how productivity is determined in more complex economies like the US?
 - d. If we said that Crusoe's productivity in farming depends partly on how good he is at inventing new farming techniques, what counterpart would we have in mind as to how productivity is determined in more complex economies like the US?

2. In each case, please indicate whether the statement is true or false (you don't need to explain why).
 - a. When macroeconomists speak of the "catch-up effect," they are referring to the idea that an economy that starts out with a very low level of physical capital per worker can grow quite rapidly when it first begins to accumulate more physical capital.
 - b. When macroeconomists speak of the assumption of "constant returns to scale," they are referring to the idea that technological progress can constantly lead to productivity growth, even if natural resources are limited.

- c. When a Japanese company, such as Honda, opens up a new automobile manufacturing plant in the US, that investment can increase productivity in the US, even if the profits earned from operating the plant go back to the company's owners in Japan.
 - d. When a US company, such as Intel, opens up a new productivity facility in Ireland, that is an example of "foreign portfolio investment" by the US in Ireland.
3. Please indicate, in each case, whether a macroeconomist would classify each activity as "saving," "Investment," "both" (saving and investment)," or "neither" (saving nor investment).
 - a. You (an American consumer) buy a new car, manufactured in the United States.
 - b. You (an American consumer) buy a bond issued by General Electric (a US business).
 - c. You (an American consumer) buy shares of stock in General Electric (a US business).
 - d. General Electric (a US business) borrows money from a US bank and uses that money to build a new factory here in the United States.
 - e. You (an American consumer) borrow money from a US bank and use that money to buy a newly-constructed house here in the United States.
4. Consider a closed economy, in which GDP (Y) equals \$15 trillion, consumption (C) equals \$10 trillion, investment (I) equals \$2 trillion, government purchases (G) equals \$3 trillion, and taxes collected by the government (excluding those collected for the purpose of making "transfer payments") equal \$4 trillion.
 - a. Calculate net exports in this economy.
 - b. Calculate private saving in this economy.
 - c. Calculate public saving for this economy.
 - d. Calculate national saving for this economy.
 - e. Is the government running a budget surplus or a budget deficit in this economy?
5. Although governments generally try to adopt public policies that encourage businesses to enlarge and modernize existing factories and build new factories, sometimes their behavior has exactly the opposite effect. Suppose that uncertainties about future policies regarding the taxation of business income causes some businesses to postpone or cancel their renovation and expansion plans, so that the amount of investment in the US economy falls.
 - a. In the loanable funds diagram, does this shift the supply curve or the demand curve for loanable funds? (*Note*: here and below, you don't have to actually draw the diagram – just say with a few words what happens in that diagram.)
 - b. In the same diagram, does the curve you mentioned in part (a) above shift to the left or to the right?
 - c. What happens to the interest rate as a result of this change: does it rise, fall, or stay unchanged?
 - d. What happens to national saving as a result of this change: does it rise, fall, or stay unchanged?

6. Consider an economy consisting of these eight adults (ages 16 and over):
- One who lost his full-time job a month ago and has been looking for a new full-time job every day since then.
 - One who has been at home taking care of his children for the past five years, but this month started to look for a part-time job.
 - One who works in her own business and is therefore self-employed.
 - One who was laid off temporarily from a full-time job, but was told that she would be called back to work when the plant reopens in a few weeks; consequently, she is not looking for a new job.
 - One who is retired.
 - One who couldn't find a job after graduation one year ago and has given up even looking for a job; he works as a volunteer tutor instead.
 - One who has a full-time job, but is currently on vacation.
 - One who has a part-time job.
- a. How many of these people would be classified by the Bureau of Labor Statistics as being "employed?"
 - b. How many of these people would be classified by the Bureau of Labor Statistics as being "unemployed?"
 - c. How many of these people would be classified by the Bureau of Labor Statistics as being "not in the labor force?"
 - d. What is the unemployment rate in this economy?
 - e. What is the labor force participation rate in this economy?
7. Suppose that businesses in an economy stop paying "efficiency wages."
- a. In a supply-and-demand diagram for labor, does this change shift the demand curve for labor, the supply curve for labor, or does it leave both curves unchanged?
 - b. What happens to the wage rate that workers receive because of this change: does it rise, fall, or stay the same?
 - c. What happens to employment as a result of this change: does it rise, fall, or stay the same?
 - d. What happens to unemployment as a result of this change: does it rise, fall, or stay the same?
8. In each case, please indicate whether the statement is true or false (you don't need to explain why).
- a. Money is the most liquid asset, because it serves as an economy's medium of exchange.
 - b. In addition to serving as a medium of exchange, money also serves as a store of value and a unit of account.
 - c. Traveler's checks are included in the Federal Reserve's definition of M1.
 - d. Money market mutual funds are included in the Federal Reserve's definition of M1.
 - e. Currency is included in the Federal Reserve's definition of M2.

Economics 132.01
Principles of Macroeconomics
Fall 2010

Professor Peter Ireland

Solutions to Second Midterm Exam

This exam has 8 questions on 3 pages; before you begin, please check to make sure your copy has all 8 questions and all 3 pages. Each of the 8 questions will receive equal weight in determining your overall exam score. You can work on the questions in any order, but please be sure to keep your answers to all of the parts of a specific question together in your exam book.

1. Macroeconomists often use the story of Robinson Crusoe to help identify and understand the determinants of productivity in the United States. In class, we considered various factors that influence Crusoe's productivity in fishing. Suppose instead that we considered factors that influence Crusoe's productivity in farming.
 - a. If we said that Crusoe's productivity in farming depends partly on how many farm tools he has, what counterpart would we have in mind as to how productivity is determined in more complex economies like the US?

Physical capital per worker (K/L).

- b. If we said that Crusoe's productivity in farming depends partly on how much training in farming techniques he has, what counterpart would we have in mind as to how productivity is determined in more complex economies like the US?

Human capital per worker (H/L).

- c. If we said the Crusoe's productivity in farming depends partly on how fertile the soil on his island is and how much access he has to fresh water supplies for irrigation, what counterpart would we have in mind as to how productivity is determined in more complex economies like the US?

Natural resources per worker (N/L).

- d. If we said that Crusoe's productivity in farming depends partly on how good he is at inventing new farming techniques, what counterpart would we have in mind as to how productivity is determined in more complex economies like the US?

Technological knowledge (A).

2. In each case, please indicate whether the statement is true or false (you don't need to explain why).

- a. When macroeconomists speak of the "catch-up effect," they are referring to the idea that an economy that starts out with a very low level of physical capital per worker can grow quite rapidly when it first begins to accumulate more physical capital.

True.

- b. When macroeconomists speak of the assumption of "constant returns to scale," they are referring to the idea that technological progress can constantly lead to productivity growth, even if natural resources are limited.

False.

- c. When a Japanese company, such as Honda, opens up a new automobile manufacturing plant in the US, that investment can increase productivity in the US, even if the profits earned from operating the plant go back to the company's owners in Japan.

True.

- d. When a US company, such as Intel, opens up a new productivity facility in Ireland, that is an example of "foreign portfolio investment" by the US in Ireland.

False.

3. Please indicate, in each case, whether a macroeconomist would classify each activity as "saving," "Investment," "both" (saving and investment)," or "neither" (saving nor investment).

- a. You (an American consumer) buy a new car, manufactured in the United States.

Neither.

- b. You (an American consumer) buy a bond issued by General Electric (a US business).

Saving.

- c. You (an American consumer) buy shares of stock in General Electric (a US business).

Saving.

- d. General Electric (a US business) borrows money from a US bank and uses that money to build a new factory here in the United States.

Investment.

- e. You (an American consumer) borrow money from a US bank and use that money to buy a newly-constructed house here in the United States.

Investment.

4. Consider a closed economy, in which GDP (Y) equals \$15 trillion, consumption (C) equals \$10 trillion, investment (I) equals \$2 trillion, government purchases (G) equals \$3 trillion, and taxes collected by the government (excluding those collected for the purpose of making “transfer payments”) equal \$4 trillion.
- a. Calculate net exports in this economy.

$NX = 0$.

- b. Calculate private saving in this economy.

Private Saving = $Y - C - T = \$1$ trillion.

- c. Calculate public saving for this economy.

Public Saving = $T - G = \$1$ trillion.

- d. Calculate national saving for this economy.

$S = \$2$ trillion.

- e. Is the government running a budget surplus or a budget deficit in this economy?

A budget surplus.

5. Although governments generally try to adopt public policies that encourage businesses to enlarge and modernize existing factories and build new factories, sometimes their behavior has exactly the opposite effect. Suppose that uncertainties about future policies regarding the taxation of business income causes some businesses to postpone or cancel their renovation and expansion plans, so that the amount of investment in the US economy falls.
- a. In the loanable funds diagram, does this shift the supply curve or the demand curve for loanable funds? (*Note*: here and below, you don’t have to actually draw the diagram – just say with a few words what happens in that diagram.)

It shifts the demand curve for loanable funds.

- b. In the same diagram, does the curve you mentioned in part (a) above shift to the left or to the right?

If shifts the demand curve to the left.

- c. What happens to the interest rate as a result of this change: does it rise, fall, or stay unchanged?

The interest rate falls.

- d. What happens to national saving as a result of this change: does it rise, fall, or stay unchanged?

National saving falls.

6. Consider an economy consisting of these eight adults (ages 16 and over):

- One who lost his full-time job a month ago and has been looking for a new full-time job every day since then. **Unemployed.**
- One who has been at home taking care of his children for the past five years, but this month started to look for a part-time job. **Unemployed.**
- One who works in her own business and is therefore self-employed. **Employed.**
- One who was laid off temporarily from a full-time job, but was told that she would be called back to work when the plant reopens in a few weeks; consequently, she is not looking for a new job. **Unemployed.**
- One who is retired. **Not in the labor force.**
- One who couldn't find a job after graduation one year ago and has given up even looking for a job; he works as a volunteer tutor instead. **Not in the labor force.**
- One who has a full-time job, but is currently on vacation. **Employed.**
- One who has a part-time job. **Employed.**

- a. How many of these people would be classified by the Bureau of Labor Statistics as being "employed?"

3

- b. How many of these people would be classified by the Bureau of Labor Statistics as being "unemployed?"

3

- c. How many of these people would be classified by the Bureau of Labor Statistics as being "not in the labor force?"

2

- d. What is the unemployment rate in this economy?

Unemployment Rate = Employed/Labor Force x 100 = 3/6 x 100 = 50%.

- e. What is the labor force participation rate in this economy?

Labor Force Participation Rate = Labor Force/Total Adult Population x 100 = 6/8 x 100 = 75%.

7. Suppose that businesses in an economy stop paying “efficiency wages.”
- a. In a supply-and-demand diagram for labor, does this change shift the demand curve for labor, the supply curve for labor, or does it leave both curves unchanged?

This change leaves both curves unchanged.

- b. What happens to the wage rate that workers receive because of this change: does it rise, fall, or stay the same?

The wage workers receive falls.

- c. What happens to employment as a result of this change: does it rise, fall, or stay the same?

Employment rises.

- d. What happens to unemployment as a result of this change: does it rise, fall, or stay the same?

Unemployment falls.

8. In each case, please indicate whether the statement is true or false (you don’t need to explain why).
- a. Money is the most liquid asset, because it serves as an economy’s medium of exchange.

True.

- b. In addition to serving as a medium of exchange, money also serves as a store of value and a unit of account.

True.

- c. Traveler’s checks are included in the Federal Reserve’s definition of M1.

True.

- d. Money market mutual funds are included in the Federal Reserve’s definition of M1.

False.

- e. Currency is included in the Federal Reserve’s definition of M2.

True.

Economics 132.01
Principles of Macroeconomics
Fall 2010

Professor Peter Ireland
Third Midterm Exam

This exam has 8 questions on 5 pages; before you begin, please check to make sure that your copy has all 8 questions and all 5 pages. Each of the 8 questions will receive equal weight in determining your overall exam score. You can work on the questions in any order, but please be sure to keep your answers to all of the parts of a specific question together in your exam book.

1. Suppose that the Federal Reserve conducts an open market operation in which it buys, for \$100, a previously-issued US government bond from a private saver.
 - a. In an economy without banks, what will happen to the money supply because of this open market operation: will it increase, decrease, or stay the same?
 - b. In an economy without banks, by what dollar amount will the money supply change because of this open market operation?
 - c. In an economy with banks, but where banks engage in 100% reserve banking, by what dollar amount will the money supply change because of this open market operation, assuming that the private saver who sells the bond deposits the entire \$100 in his or her bank account?
 - d. In an economy with banks, but where banks engage in 100% reserve banking, by what dollar amount will the money supply change because of this open market operation, assuming that the private saver who sells the bond deposits only \$50 in his or her bank account and holds the remaining \$50 as currency?

2. Consider an economy with banks, in which (a) all banks choose a 50% reserve ratio and (b) all members of the non-bank public (that is, all consumers and nonbank businesses) deposit all of the funds they receive in their bank accounts and therefore hold only deposits and no currency. Suppose that in this economy, the Federal Reserve conducts an open market operation in which it buys, for \$100, a previously-issued US government bond from a private saver. In this fractional reserve banking system, this open market operation will set off a circular process according to which funds get deposited in a bank, the bank lends some of those funds out, the funds get used by the borrower to purchase goods and services, the seller of those goods and services deposits the funds in another bank, and the whole process repeats itself again and again.
 - a. When this process of repeated deposit creation finally ends, what will have happened to the amount of reserves held by the banking system: will it have increased, decreased, or stayed the same? What will have happened to the total money supply: will it have increased, decreased, or stayed the same?
 - b. When this process of repeated deposit creation finally ends, by what dollar amount will the amount of reserves held by the banking system have changed?
 - c. When this process of repeated deposit creation finally ends, by what dollar amount will the total money supply have changed?
 - d. Suppose instead that some members of the nonbank public, that is, some consumers and nonbank businesses, decide not to deposit some of the funds they receive and therefore do hold some currency as well as deposits. Will the change in reserves held by the banking system be larger than, smaller than, or the same as, in dollar terms, the answer you gave in part (b), above?
 - e. Continuing to assume, as in part (d) above, that some members of the nonbank public decide not to deposit some of the funds they receive and therefore do hold some currency as well as deposits, will the change in the total money supply be larger than, smaller than, or the same as, in dollar terms, the answer that you gave in part (c), above?

3. Please indicate whether each of the following statements is true or false (you don't have to explain why).
 - a. In the US economy, banks hold reserves partly to satisfy legal reserve requirements set by the Federal Reserve, but also so that they can cope successfully with deposit outflows, that is, with their depositors' requests for withdrawals.
 - b. When the Federal Reserve raises legal reserve requirements, the money supply falls.
 - c. The interest rate that the Federal Reserve charges when it lends reserves to private banks is called the federal funds rate.
 - d. When the Federal Reserve lends reserves to a private bank and that private bank lends those funds out to a private borrower, the money supply rises.

4. Suppose that the Federal Reserve wants to raise its target for the federal funds rate.
 - a. To make the equilibrium federal funds rate rise along with its target, what does the Federal Reserve need to do: conduct an open market operation in which it buys US government bonds or conduct an open market operation in which it sells US government bonds?
 - b. What happens to the quantity of reserves that the Federal Reserve supplies to the banking system as a result of this open market operation: does it rise, fall, or stay the same?
 - c. What happens to the total money supply as a result of this open market operation: does it rise, fall, or stay the same?

5. Please indicate whether each of the following statements is true or false (again, you don't have to explain why).
 - a. When a Federal Reserve note is held by a consumer or a nonbank business, it gets classified as currency in circulation.
 - b. When a Federal Reserve note is held by a bank instead, it no longer gets classified as currency in circulation.
 - c. Funds that a private bank deposits in its account at the Federal Reserve get included on the asset side of that private bank's balance sheet.
 - d. Funds that a private bank borrows from the Federal Reserve get included on the asset side of that private bank's balance sheet.

6. Consider the following two bank's balance sheets

First National Bank

Assets	Liabilities
Reserves \$10 Loans \$90 Other Assets \$10	Deposits \$100 Shareholders' Equity \$10

Second National Bank

Assets	Liabilities
Reserves \$50 Loans \$90 Other Assets \$10	Deposits \$100 Shareholders' Equity \$50

where, on the asset side, "other assets" just refer to the value of the buildings, office equipment, and other physical assets that the banks need in order to conduct their business.

- a. What happens if some of the First National Bank's borrowers go bankrupt, so that \$40 of the loans it has made will never be repaid: is the bank "illiquid," "insolvent," or neither?
- b. What happens if, instead, the First National Bank experiences a \$40 deposit outflow: is the bank "illiquid," "insolvent," or neither?
- c. What happens if some of the Second National Bank's borrowers go bankrupt, so that \$40 of the loans it has made will never be repaid: is the bank "illiquid," "insolvent," or neither?
- d. What happens if, instead, the Second National Bank experiences a \$40 deposit outflow: is the bank "illiquid," "insolvent," or neither?

7. This question asks you to use microeconomic supply-and-demand analysis applied to the market for money to consider the effects of an increase in the money supply. To answer this question, you don't have to draw the actual diagram; please just answer in words the questions about the diagram that appear below.
- In the diagram, the quantity of money M is measured along the x (horizontal) axis and the "goods price of money" $1/P$ is measured along the y (vertical) axis, where P is the economy-wide price level, that is, the "dollar price of goods." What does the demand curve for money look like in this diagram: is it upward-sloping, downward-sloping, horizontal, or vertical?
 - In the same diagram, if the Federal Reserve initially fixes the money supply at some initial level M^* , what does the supply curve for money look like: it is upward-sloping, downward-sloping, horizontal, or vertical?
 - In the diagram, if the Federal Reserve acts to increase the money supply to a new, higher level M^{**} , will the supply curve for money shift to the left or to the right?
 - According to the diagram, what happens to the goods price of money when the Federal Reserve increases the money supply: does $1/P$ rise, fall, or stay the same?
 - According to the diagram, what happens to the economywide price level when the Federal Reserve increases the money supply: does P rise, fall, or stay the same?
8. Suppose that the money supply (M) equals \$10, the price level (P) equals 2, and real GDP (Y) equals 5.
- What is the velocity of money (V) under these conditions?
 - Assuming that velocity V remains constant and that "money is neutral" in the long run, what will the price level P equal in the long run if the Federal Reserve increases the money supply to \$20?
 - Still assuming that velocity V remains constant and that money is neutral in the long run, what will real GDP equal in the long run if the Federal Reserve increases the money supply to \$20?

Economics 132.01
Principles of Macroeconomics
Fall 2010

Professor Peter Ireland
Solutions to Third Midterm Exam

This exam has 8 questions on 5 pages; before you begin, please check to make sure that your copy has all 8 questions and all 5 pages. Each of the 8 questions will receive equal weight in determining your overall exam score. You can work on the questions in any order, but please be sure to keep your answers to all of the parts of a specific question together in your exam book.

1. Suppose that the Federal Reserve conducts an open market operation in which it buys, for \$100, a previously-issued US government bond from a private saver.
 - a. In an economy without banks, what will happen to the money supply because of this open market operation: will it increase, decrease, or stay the same?

It will increase.

- b. In an economy without banks, by what dollar amount will the money supply change because of this open market operation?

By \$100.

- c. In an economy with banks, but where banks engage in 100% reserve banking, by what dollar amount will the money supply change because of this open market operation, assuming that the private saver who sells the bond deposits the entire \$100 in his or her bank account?

By \$100.

- d. In an economy with banks, but where banks engage in 100% reserve banking, by what dollar amount will the money supply change because of this open market operation, assuming that the private saver who sells the bond deposits only \$50 in his or her bank account and holds the remaining \$50 as currency?

By \$100.

2. Consider an economy with banks, in which (a) all banks choose a 50% reserve ratio and (b) all members of the non-bank public (that is, all consumers and nonbank businesses) deposit all of the funds they receive in their bank accounts and therefore hold only deposits and no currency. Suppose that in this economy, the Federal Reserve conducts an open market operation in which it buys, for \$100, a previously-issued US government bond from a private saver. In this fractional reserve banking system, this open market operation will set off a circular process according to which funds get deposited in a bank, the bank lends some of those funds out, the funds get used by the borrower to purchase goods and services, the seller of those goods and services deposits the funds in another bank, and the whole process repeats itself again and again.
- a. When this process of repeated deposit creation finally ends, what will have happened to the amount of reserves held by the banking system: will it have increased, decreased, or stayed the same? What will have happened to the total money supply: will it have increased, decreased, or stayed the same?

Reserves will have increased; the total money supply will have increased.

- b. When this process of repeated deposit creation finally ends, by what dollar amount will the amount of reserves held by the banking system have changed?

By \$100.

- c. When this process of repeated deposit creation finally ends, by what dollar amount will the total money supply have changed?

By \$200.

- d. Suppose instead that some members of the nonbank public, that is, some consumers and nonbank businesses, decide not to deposit some of the funds they receive and therefore do hold some currency as well as deposits. Will the change in reserves held by the banking system be larger than, smaller than, or the same as, in dollar terms, the answer you gave in part (b), above?

Smaller.

- e. Continuing to assume, as in part (d) above, that some members of the nonbank public decide not to deposit some of the funds they receive and therefore do hold some currency as well as deposits, will the change in the total money supply be larger than, smaller than, or the same as, in dollar terms, the answer that you gave in part (c), above?

Smaller.

3. Please indicate whether each of the following statements is true or false (you don't have to explain why).
- a. In the US economy, banks hold reserves partly to satisfy legal reserve requirements set by the Federal Reserve, but also so that they can cope successfully with deposit outflows, that is, with their depositors' requests for withdrawals.

True.

- b. When the Federal Reserve raises legal reserve requirements, the money supply falls.

True.

- c. The interest rate that the Federal Reserve charges when it lends reserves to private banks is called the federal funds rate.

False.

- d. When the Federal Reserve lends reserves to a private bank and that private bank lends those funds out to a private borrower, the money supply rises.

True.

4. Suppose that the Federal Reserve wants to raise its target for the federal funds rate.
- a. To make the equilibrium federal funds rate rise along with its target, what does the Federal Reserve need to do: conduct an open market operation in which it buys US government bonds or conduct an open market operation in which it sells US government bonds?

Conduct an open market operation in which it sells US government bonds.

- b. What happens to the quantity of reserves that the Federal Reserve supplies to the banking system as a result of this open market operation: does it rise, fall, or stay the same?

It falls.

- c. What happens to the total money supply as a result of this open market operation: does it rise, fall, or stay the same?

It falls.

5. Please indicate whether each of the following statements is true or false (again, you don't have to explain why).

- a. When a Federal Reserve note is held by a consumer or a nonbank business, it gets classified as currency in circulation.

True.

- b. When a Federal Reserve note is held by a bank instead, it no longer gets classified as currency in circulation.

True.

- c. Funds that a private bank deposits in its account at the Federal Reserve get included on the asset side of that private bank's balance sheet.

True.

- d. Funds that a private bank borrows from the Federal Reserve get included on the asset side of that private bank's balance sheet.

False.

6. Consider the following two bank's balance sheets

First National Bank

Assets	Liabilities
Reserves \$10 Loans \$90 Other Assets \$10	Deposits \$100 Shareholders' Equity \$10

Second National Bank

Assets	Liabilities
Reserves \$50 Loans \$90 Other Assets \$10	Deposits \$100 Shareholders' Equity \$50

where, on the asset side, "other assets" just refer to the value of the buildings, office equipment, and other physical assets that the banks need in order to conduct their business.

- a. What happens if some of the First National Bank's borrowers go bankrupt, so that \$40 of the loans it has made will never be repaid: is the bank "illiquid," "insolvent," or neither?

It is insolvent.

- b. What happens if, instead, the First National Bank experiences a \$40 deposit outflow: is the bank "illiquid," "insolvent," or neither?

It is illiquid.

- c. What happens if some of the Second National Bank's borrowers go bankrupt, so that \$40 of the loans it has made will never be repaid: is the bank "illiquid," "insolvent," or neither?

Neither.

- d. What happens if, instead, the Second National Bank experiences a \$40 deposit outflow: is the bank "illiquid," "insolvent," or neither?

Neither.

7. This question asks you to use microeconomic supply-and-demand analysis applied to the market for money to consider the effects of an increase in the money supply. To answer this question, you don't have to draw the actual diagram; please just answer in words the questions about the diagram that appear below.
- a. In the diagram, the quantity of money M is measured along the x (horizontal) axis and the "goods price of money" $1/P$ is measured along the y (vertical) axis, where P is the economy-wide price level, that is, the "dollar price of goods." What does the demand curve for money look like in this diagram: is it upward-sloping, downward-sloping, horizontal, or vertical?

The demand curve is downward-sloping.

- b. In the same diagram, if the Federal Reserve initially fixes the money supply at some initial level M^* , what does the supply curve for money look like: it is upward-sloping, downward-sloping, horizontal, or vertical?

The supply curve is vertical.

- c. In the diagram, if the Federal Reserve acts to increase the money supply to a new, higher level M^{**} , will the supply curve for money shift to the left or to the right?

The supply curve will shift to the right.

- d. According to the diagram, what happens to the goods price of money when the Federal Reserve increases the money supply: does $1/P$ rise, fall, or stay the same?

$1/P$ falls.

- e. According to the diagram, what happens to the economywide price level when the Federal Reserve increases the money supply: does P rise, fall, or stay the same?

P rises.

8. Suppose that the money supply (M) equals \$10, the price level (P) equals 2, and real GDP (Y) equals 5.

a. What is the velocity of money (V) under these conditions?

$$V = PY/M = 10/5 = 2.$$

b. Assuming that velocity V remains constant and that “money is neutral” in the long run, what will the price level P equal in the long run if the Federal Reserve increases the money supply to \$20?

The price level P = 4.

c. Still assuming that velocity V remains constant and that money is neutral in the long run, what will real GDP equal in the long run if the Federal Reserve increases the money supply to \$20?

Real GDP remains unchanged: Y = 5.