Econ 002- INTRO MACRO Prof. Luca Bossi May 06, 2011

SUGGESTED SOLUTIONS

My signature below certifies that I have complied with the University of Pennsylvania's Code of Academic Integrity in completing this examination. In particular, I declare that I have not used a graphing calculator to complete this exam.

Name (printed)     Penn ID

Signature                       Date

INSTRUCTIONS

The exam is closed book. It is composed of 40 multiple choice questions and three exercises. All multiple choice questions are worth 1.5 points (so the total is 60 points for the multiple choice part). The exercises are worth 10 or 15 points each (the total is 40 points for the exercise part). ANSWER ALL QUESTIONS.

TOTAL POINTS = 100. TOTAL TIME = 120 minutes

Provide your answers on the exam sheet directly.
Read all questions very carefully. Write legibly.

EXAM TAKING POLICY
If you need to use the restroom, or you need a pencil or scratch paper, or some other supply that we might have, raise you hand and wait for the proctor to come to you. Only one person can be out of the examination room at a time, and the proctor will hold onto your exam papers while you are out at the restroom.
NO CELL PHONES. NO IPODS OR SIMILAR DEVICES WITH CALCULATOR “APPS”. YOU CANNOT CONNECT TO THE INTERNET. USE ONLY A SCIENTIFIC CALCULATOR. NO BOOKS. NO NOTES. NO HELP SHEETS. NO TALKING TO EACH OTHER. NO ASKING THE PROCTORS ANY QUESTIONS ABOUT THE EXAM. WRITE IN PENCIL OR IN PEN AS YOU LIKE, BUT IF YOU WRITE IN PENCIL THERE IS NO POSSIBILITY TO ASK FOR RE-GRADING.

PLEASE WRITE YOUR NAME ON EVERY SINGLE PAGE OF THE EXAM
PLEASE RETURN THE EXAM SPECIFICALLY TO YOUR TA WHEN YOU ARE DONE
PLEASE DO NOT START THIS EXAM UNTIL INSTRUCTED TO DO SO.

GOOD LUCK!
EXERCISE I

CHOOSE EITHER PART I-A OR I-B AND ANSWER ONE OF THESE QUESTIONS ONLY. BELOW YOU MUST DECLARE EXPLICITLY WHICH QUESTION YOU ARE SOLVING AND WANT TO CONSIDER FOR GRADING. IF YOU SOLVE BOTH I-A AND I-B YOU WILL NOT GET EXTRA CREDITS. IF YOU DO NOT DECLARE WHICH QUESTION YOU ARE SOLVING YOUR WORST QUESTION WILL BE GRADED.

I DECLARE THAT THE QUESTION I WANT TO BE GRADED IS  ➜  

I-A

Suppose that you own an apartment in the Old City.

(a) (5 points) You know that the Real Estate Market in Philadelphia can be either good or bad in 4 years time. You predict that the market will be good with probability 1/3 and bad with probability 2/3. If the market is good in four years, you can sell your apartment for $500,000, but if it’s bad, you can only sell it for 375,000. Assume also that there is only one interest rate in the Economy, which is 5% per year. What is the expected present value of your apartment sale if you sell it in 4 years?

(b) (5 points) Now, forget about the possible states (good or bad) of the market and assume that you can sell the apartment for sure in 4 years for $500,000. During these four years you can rent the apartment. Suppose you manage to rent it each year and you receive the rent of each year at the end of it. The rental price is $9,000 per year. You usually put the rent payments directly into your bank account, which pays an annual interest of 5%. For this part of the exercise and also for the next part assume that the interest rate is compounded monthly. What is the value of your apartment in 4 years including the income flow you get from the rents?

(c) (5 points) Your current tenant offers to pay the 4 years of rent up front (the first day of the first year) if you offer him a discount. What is the lowest price you would be willing to charge him for the 4 years’ worth of rent?

Answers

a. The expected present value is \((1/3)\times$500,000\times(1/(1+0.5)^4)+\(\times375,000\times(1/(1+0.5)^4)=\$342,792.7\)

b. The future value of the rent flow is \(9000\times(1+0.05/12)^{(3\times12)} + 9000\times(1+0.05/12)^{(2\times12)} +9000\times(1+0.05/12)^{(12)}+9000=\$38,858.2\) (the first $9000 are in the bank for 3 years, the next for two years and so on…). Adding this up to the sale price gives us $538,858.2.

c. Suppose that you charge your tenant X dollars today. In 4 years, that’s going to be worth \(X\times(1+0.05/12)^{(4\times12)}\). You would be willing to charge him any \(X\) that, after doing the previously mentioned calculation, gives you at least =$38,858.2. So, solve \(X\times(1+0.05/12)^{(4\times12)}=38,858.2\) to get \(X=\$31,827.6\).
I-B

We have a dice with 6 sides, marked respectively from 1 to 6. The dice is not rigged. So, for each throw, the probability (the chance) of getting any one side is exactly the same. For each side that shows up, you can get a dollar amount that equals to the number marked on the side. For example, if number 2 shows up on the dice, you win 2 dollars.

(a) \(6\) points) First we consider a game in which you can throw the dice once. What is the expected payoff of this game? And what is the variance of the payoff?

The probability of getting any one side is \(1/6\).

Expected payoff: \[ \frac{1}{6} + \frac{2}{6} + \frac{3}{6} + \frac{4}{6} + \frac{5}{6} + \frac{6}{6} = \frac{21}{6} \]

Variance: \[ \sum_{i=1}^{6} \left( \frac{1}{6} \right) \left( i - \frac{21}{6} \right)^2 = \frac{35}{12} \]

(b) \(6\) points) Now consider another game in which you can throw the dice for two times. Now if you get two 6s in a row, you get 10 dollars. If you get first one 6 and then something else, you get 5 dollars. If you get first something else and then one 6, you get 5 dollars as well. You get nothing in all other outcomes. What is the probability of not winning anything?

Probability you get 2 6s in a row = \( \frac{1}{6} \times \frac{1}{6} = \frac{1}{36} \)

Probability you get a 6 and something (but not 2 6s in a row) = \( \frac{1}{6} - \frac{1}{36} = \frac{5}{36} \)

Probability you get something and a 6 (but not 2 6s in a row) = \( \frac{1}{6} - \frac{1}{36} = \frac{5}{36} \)

Probability of not winning = \( 1 - \) Probability of winning = \( 1 - \frac{5}{36} - \frac{5}{36} - \frac{1}{36} = \frac{25}{36} \)

(c) \(3\) points) Now assume you still play the same game as in part (b). What is the expected payoff from the game?

\[ = 5 \times \frac{5}{36} + 5 \times \frac{5}{36} + 10 \times \frac{1}{36} = \frac{60}{36} \]

EXERCISE II

In the following question, be absolutely sure to read all headers of the tables carefully. Additionally, there is space given to show your work. Wrong answers with no work shown will receive zero credit.

In a made up country with a silly name, there are four goods of note: olives, peanuts, maraschinos and baklava. Some of these are produced, some are consumed, some are imported, some are exported. This information, and the quantities and prices of each, are summarized in the table below:

<table>
<thead>
<tr>
<th>Olives</th>
<th>Peanuts</th>
<th>Maraschinos</th>
<th>Baklava</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Produced, Consumed</td>
<td>Produced, Exported</td>
<td>Imported, Consumed</td>
</tr>
<tr>
<td>Price</td>
<td>Quantity</td>
<td>Price</td>
<td>Quantity</td>
</tr>
<tr>
<td>2009</td>
<td>1</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>2010</td>
<td>2</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td>2011</td>
<td>3</td>
<td>15</td>
<td>7</td>
</tr>
</tbody>
</table>
(a) (5 points) Given the table above, fill in the table below. Show any work in the space below the table.

<table>
<thead>
<tr>
<th>Base year: 2010</th>
<th>Nominal GDP</th>
<th>Real GDP</th>
<th>GDP Deflator</th>
<th>Inflation (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>40</td>
<td>40</td>
<td>100</td>
<td>N/A</td>
</tr>
<tr>
<td>2010</td>
<td>65</td>
<td>65</td>
<td>100</td>
<td>0%</td>
</tr>
<tr>
<td>2011</td>
<td>120</td>
<td>96</td>
<td>125</td>
<td>25%</td>
</tr>
</tbody>
</table>

Nom2009 = 1*6+3*2+7*4=40; Real2009 = 6*2+2*4+4*5=40
Nom2010=Real2010=2*10+4*5+5*5=65
Nom2011=3*15+7*9+2*6=120; Real2011= 15*2+9*4+6*5=96
GDPDeflator2011=120/96*100=125

(b) (5 points) Now, demand for money in this economy is given by: Money Demand= (P/100)^2*200. Use P=100 in the base year, and the information in the previous table, to fill out the table below. Show any work in the space below the table.

<table>
<thead>
<tr>
<th>Money Supply</th>
<th>Velocity</th>
<th>% Change in Money Supply</th>
<th>% Change in Velocity</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>200</td>
<td>0.2</td>
<td>N/A</td>
</tr>
<tr>
<td>2010</td>
<td>200</td>
<td>0.325</td>
<td>0%</td>
</tr>
<tr>
<td>2011</td>
<td>312.5</td>
<td>0.384</td>
<td>56.25%</td>
</tr>
</tbody>
</table>

P2009=P2010=100; P2011=125
M2009=M2010=200*1^2=200; M2011=200*1.25^2=312.5
V2009=40/200=0.2; V2010=65/200=0.325; V2011=120/312.5=0.384

(c) (5 points) Now, let’s consider the CPI. The typical consumer basket we will use contains one unit of baklava. The quantities of the other appropriate goods are in the same proportion to baklava as they are in the base year (2010). Given this information, fill out the table below. Show any work in the space below the table.

<table>
<thead>
<tr>
<th>Cost of the Basket</th>
<th>CPI</th>
<th>Inflation (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>12</td>
<td>109.09</td>
</tr>
<tr>
<td>2010</td>
<td>11</td>
<td>-8.33%</td>
</tr>
<tr>
<td>2011</td>
<td>15</td>
<td>36.36%</td>
</tr>
</tbody>
</table>

Basket is 2 olives, 1 maraschinos, 1 baklava.
Cost2009=2*1+1*3+1*7=12
Cost2010=2*2+1*2+1*5=11
Cost2011=2*3+1*7+1*2=15
EXERCISE III

Consider the Solow model we have seen and studied in class. Now tweak the model to account for an open economy. Assume there are only two countries in the whole world, country 1 and country 2. Labor and capital in those countries are perfectly interchangeable. You know that the production function of country 1 is exactly the same as the one in country 2 and is given by \( Y_t = AK_t^\alpha L_t^{1-\alpha} \).

One of the key differences between these two countries consists in the government legislation concerning tax treatment of return on assets. In country 1 this legislation is very favorable. For this very reason, country 1 experiences a capital inflow which is equal to 10% of their GDP in every period. There is no capital outflow from country 1. Most of the parameters for these 2 economies are exactly the same: in particular, in both countries, the depreciation of capital is \( d = 3\% \), the saving rate is \( s = 5\% \), \( \alpha = 0.5 \), and \( A=1 \). The exception is the population growth rate: \( n = 3\% \) in country 1, while \( n = 5\% \) in country 2. For all computations use three decimal places for your calculations if needed. (Hint: you do not have to worry about explicitly modeling taxes on asset returns in the Solow model here, but rather focus on the consequences that these alternative tax treatments have).

(a) (5 points) What is the steady state level of capital per person in country 1?

Let's review once again the 5 fundamental equations of the Solow model:
The five equations are

1) \( Y_t = AK_t^\alpha L_t^{1-\alpha} \)
2) \( S_t = sY_t \)
3) \( I_t = s \)
4) \( K_{t+1} = I_t + (1 - d)K_t \)
5) \( L_{t+1} = (1 + n)L_t \)

However, you know that we are in an open economy now. So equation 3) needs to be modified accordingly. In particular we need to use:

\( I_t + NCO_t = S_t \)

For country 1:

\( NCO_t = CO_t - CI_t = 0 - 0.1 * AK_t^\alpha L_t^{1-\alpha} = -0.1 * AK_t^\alpha L_t^{1-\alpha} \)

The latter expression holds because country 1 has a favorable tax treatment on assets and so is experiencing capital inflow, no capital outflow and so the NCO is negative. So you have to modify the equation of savings/investment in the Solow model accordingly to consider the fact that we are in an open economy.

The equation for accumulation of aggregate physical capital now becomes:

\( K_{t+1} = S_t - NCO_t + (1 - d)K_t \)

\( K_{t+1} = sAK_t^\alpha L_t^{1-\alpha} + 0.1 * AK_t^\alpha L_t^{1-\alpha} + (1 - d)K_t \)

This in per capita terms becomes:

\( \frac{K_{t+1}}{L_{t+1}}(1 + n) = (s + 0.1)A \left( \frac{K_t}{L_t} \right)^\alpha + (1 - d) \left( \frac{K_t}{L_t} \right) \)

with our convention for lower case variables:

\( k_{t+1}(1 + n) = (s + 0.1)A k_t^\alpha + (1 - d)k_t \)

In steady state we have that:

\( k_{t+1} = k_t = \bar{k} \)

So using the law of motion of capital in per capita terms:

\( 0 = (s + 0.1)A\bar{k}^\alpha - (n + d)\bar{k} \)
Hence, for the expression above to hold true we must have:
\[(s + 0.1)A\bar{k}^{\alpha - 1} = (n + d)\bar{k}\]
By dividing both the left hand side and the right hand side by \(\bar{k}\), we can conclude that:
\[
\frac{(s + 0.1)A\bar{k}^{\alpha - 1}}{(s + 0.1)A} = \frac{(n + d)}{(s + 0.1)A} \Rightarrow \bar{k}^{\alpha - 1} = \frac{n + d}{(s + 0.1)A}
\]
\[
\bar{k} = \left(\frac{n + d}{(s + 0.1)A}\right)^{\frac{1}{\alpha - 1}} = \left(\frac{0.03 + 0.03}{(0.05 + 0.1)1}\right)^{\frac{1}{0.5 - 1}} = 6.25
\]

(b) (5 points) Now forget the calculations you did for part (a) of this exercise, this question is independent from part (a).
Assume that country 2 reforms its tax system for the treatment of the return on assets. As a result, country 2 now experiences a positive net capital outflow which is just equal to 1% of their GDP in every period. What is the steady state level of NCO per person in country 2?
The equation for aggregate physical capital is:
\[K_{t+1} = S_t - NCO_t + (1 - d)K_t\]
Country 2 is running a positive NCO equal to 1% of their GDP:
\[NCO_t = +0.01 \times AK_t^\alpha L_t^{1-\alpha}\]
So
\[K_{t+1} = sAK_t^\alpha L_t^{1-\alpha} - 0.01 \times AK_t^\alpha L_t^{1-\alpha} + (1 - d)K_t\]
This in per capita terms becomes:
\[
\frac{K_{t+1}}{L_{t+1}}(1 + n) = (s - 0.01)A\left(\frac{K_t}{L_t}\right)^\alpha + (1 - d)\frac{K_t}{L_t}
\]
with our convention for lower case variables:
\[k_{t+1}(1 + n) = (s - 0.01)Ak_t^\alpha + (1 - d)k_t\]
In steady state we have that:
\[k_{t+1} = k_t = \bar{k}\]
So using the law of motion of capital in per capita terms:
\[0 = (s - 0.01)A\bar{k}^\alpha - (n + d)\bar{k}\]
Hence, for the expression above to hold true we must have:
\[(s - 0.01)A\bar{k}^\alpha = (n + d)\bar{k}\]
By dividing both the left hand side and the right hand side by \(\bar{k}\), we can conclude that:
\[
\frac{(s - 0.01)A\bar{k}^{\alpha - 1}}{(s - 0.01)A} = \frac{(n + d)}{(s - 0.01)A} \Rightarrow \bar{k}^{\alpha - 1} = \frac{n + d}{(s - 0.01)A}
\]
\[
\bar{k} = \left(\frac{n + d}{(s - 0.01)A}\right)^{\frac{1}{\alpha - 1}} = \left(\frac{0.05 + 0.03}{(0.05 - 0.01)1}\right)^{\frac{1}{0.5 - 1}} = (2)^{-2} = 0.25
\]
The steady state level of NCO per person in country 2 is
\[0.01AK_2 = 0.01 \times 1 \times 0.25^0.5 = 0.005\]
MULTIPLE CHOICE QUESTIONS

1) The dictator of Turan has recently begun to arbitrarily seize farms belonging to his political opponents, and he has given the farms to his friends. His friends don't know much about farming. The courts in Turan have ruled that the seizures are illegal, but the dictator has ignored the rulings. Other things equal, we would expect that the growth rate in Turan will
a. fall temporarily, but will return to where it was when the new owners learn how to farm.
b. increase because the total amount of human capital in the country will increase as the new owners learn how to farm.
c. fall and remain lower for a long time.
d. not be affected unless widespread civil disorder or civil war results.

2) Suppose the government deficit increases, but the interest rate remains the same. Which of the following things might have happened simultaneously to keep interest rates the same?
   a. The government reduces the amount that people may put into savings accounts on which the interest is tax exempt.
   b. Because they are optimistic about the future of the economy, firms desire to borrow more to purchase physical capital.
   c. Consumers decide to decrease consumption and work more.
   d. All of the above could explain why the interest rate would be unchanged.

3) Suppose a country imposes new restrictions on how many hours people can work. If these restrictions reduce the total number of hours worked in the economy, but all other factors that determine output are held fixed, then
   a. productivity and output both rise.
   b. productivity rises and output falls.
   c. productivity falls and output rises.
   d. productivity and output fall.

4) An increase in the price level causes the aggregate quantity of goods and services demanded to decrease because
   a. Wealth rises, interest rates rise, and the dollar appreciates.
   b. Wealth rises, interest rates fall, and the dollar depreciates.
   c. Wealth falls, interest rates rise, and the dollar appreciates.
   d. Wealth falls, interest rates fall, and the dollar depreciates.

5) Suppose a fall in stock prices makes people poorer. The decrease in wealth would induce people to
   a. decrease consumption, shown as a movement to the left along a given aggregate demand curve.
   b. decrease consumption, shifting the aggregate demand curve to the left.
   c. increase consumption, shown as a movement to the right along a given aggregate demand curve.
   d. increase consumption, shifting the aggregate demand curve to the right.
YOUR NAME: ______________________________________

YOUR R.I.’s NAME: ______________________________________

Table 1
2009 Labor Data for Wrexington

<table>
<thead>
<tr>
<th>Category</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of adults</td>
<td>20,000</td>
</tr>
<tr>
<td>Number of adults who are paid employees</td>
<td>8,000</td>
</tr>
<tr>
<td>Number of adults who work in their own businesses</td>
<td>1,600</td>
</tr>
<tr>
<td>Number of adults who are unpaid workers in a family member’s business</td>
<td>1,000</td>
</tr>
<tr>
<td>Number of adults who were temporarily absent from their jobs because of an earthquake</td>
<td>400</td>
</tr>
<tr>
<td>Number of adults who were waiting to be recalled to a job from which they had been laid off</td>
<td>200</td>
</tr>
<tr>
<td>Number of adults who do not have a job, are available for work, and have tried to find a job within the past four weeks</td>
<td>1,400</td>
</tr>
<tr>
<td>Number of adults who do not have a job, are available for work, but have not tried to find a job within the past four weeks</td>
<td>780</td>
</tr>
<tr>
<td>Number of adults who are full-time students</td>
<td>3,000</td>
</tr>
<tr>
<td>Number of adults who are homemakers or retirees</td>
<td>3,620</td>
</tr>
</tbody>
</table>

6) Refer to Table 1. How many people were employed in Wrexington in 2009?
   a. 9,600
   b. 10,600
   c. 11,000
   d. 11,200

7) Refer to Table 1. How many people were in Wrexington’s labor force in 2009?
   a. 11,000
   b. 12,600
   c. 13,380
   d. 20,000

8) Refer to Table 1. What was Wrexington’s labor-force participation rate in 2009?
   a. 55 percent
   b. 63 percent
   c. 66.9 percent
   d. 87.3 percent

9) The sticky wage theory of the short-run aggregate supply curve says that when the price level rises more than expected, the real wage
   a. rises, so employment rises.
   b. rises, so employment falls.
   c. falls, so employment rises.
   d. falls, so employment falls.

10) In 1931, President Herbert Hoover was paid a salary of $75,000. Government statistics show a consumer price index of 15.2 for 1931 and 207 for 2007. President Hoover’s 1931 salary was equivalent to a 2007 salary of about
    a. $5507.
    b. $1,021,382.
    c. $1,140,000.
    d. $15,525,000.
11) Which of the following shifts short-run aggregate supply right?
   a. an increase in the price level
   b. an increase in the minimum wage
   c. a decrease in immigration from abroad.
   d. a decrease in the price of oil

12) Suppose the economy is initially in long-run equilibrium and aggregate demand rises. In the long run prices
   a. and output are higher.
   b. and output are lower.
   c. are higher and output is the same.
   d. are the same and output is lower.

13) Which of the following properly describes the interest rate effect?
   a. As the money supply increases, the interest rate falls, so spending rises.
   b. As the money supply increases, the interest rate rises, so spending falls.
   c. As the price level increases, the interest rate falls, so spending rises.
   d. As the price level increases, the interest rate rises, so spending falls.

14) Consider an identical basket of goods in both the U.S. and India. If the nominal exchange rate is unchanged, which of the following will definitely decrease the U.S. real exchange rate with India?
   a. the price of the basket of goods rises in the U.S. and India.
   b. the price of the basket of goods rises in the U.S. and falls in India.
   c. the price of the basket of goods falls in the U.S. and rises in India.
   d. the price of the basket of goods falls in both India and the U.S..

15) (Hard) Assume that banks do not hold excess reserves. The banking system has $50 million in reserves and has a reserve requirement ratio of 10 percent. The public holds $20 million in currency. Then the public decides to withdraw $10 million in currency from the deposits of the banking system. If the Fed wants to keep the money supply stable only by changing the reserve requirement, then what should the new reserve requirement be?
   a. Approx. 11.1 percent
   b. Approx. 10.1 percent
   c. Approx. 9.1 percent
   d. Approx. 8.1 percent

To solve this exercise we need to recall and use appropriately the following formulas:

\[ \text{money multiplier} = \frac{cr + 1}{cr + rr} \]

\[ M = \text{money multiplier} \times B \]

\[ \frac{R}{D} = rr \]

\[ \frac{C}{D} = cr \]

So initially we know that \( R=50 \), \( rr = 0.1 \), \( C=20 \)

Since \( \frac{R}{D} = rr \) then \( \frac{50}{D} = 0.1 \) so that \( D = 500 \). And \( \frac{C}{D} = cr = \frac{20}{500} \)

Then the public decides for some reason to increase \( C \) by 10 and decrease \( D \) by 10.
So, after this event happens, we have $C = 30$, $D = 490$. It follows that:

$$\frac{C}{D} = \frac{30}{490}$$

We know that the FED wants to keep the money supply stable and that the monetary base $B = C + R$ will not be changed by this event. The FED is going to lower $rr$ so that $R$ goes down and $B$ is not changed.

Since $money$ multiplier $= \frac{cr + 1}{cr + rr}$

**Before the event** we would have

$$money\ multiplier = \frac{cr + 1}{cr + rr} = \frac{20}{500} + 1$$

**After the event**

$$money\ multiplier = \frac{cr + 1}{cr + rr} = \frac{30}{490} + rr$$

Since $M = money \ multiplier \times B$ and we want to have $B$ and $M$ the same before and after the event, how much should $rr$ change? We need to solve:

$$\frac{20}{500} + 1 = \frac{30}{490} + 1$$

$$\frac{20}{500} + 0.1 = \frac{30}{490} + rr$$

$$\frac{520}{70} \left( \frac{30}{490} + rr \right) = \frac{520}{490}$$

With the calculator we find that $rr = 0.081$ approx.

So $rr = 8.1\%$

16) If net exports are negative, then

a. net capital outflow is positive, so foreign assets bought by Americans are greater than American assets bought by foreigners.

b. net capital outflow is positive, so American assets bought by foreigners are greater than foreign assets bought by Americans.

c. net capital outflow is negative, so foreign assets bought by Americans are greater than American assets bought by foreigners.

d. net capital outflow is negative, so American assets bought by foreigners are greater than foreign assets bought by Americans.
17) A German citizen buys an automobile produced in the United States by a Japanese company. As a result,
a. U.S. net exports increase, U.S. GNP and GDP are unaffected, Japanese GNP increases, German net exports decrease, and German GDP and GNP are unaffected.
b. U.S. net exports and GDP increase, Japanese GNP increases, German net exports decrease, and German GDP and GNP are unaffected.
c. U.S. net exports, GNP, and GDP increase, Japanese GDP increases, German net exports decrease, and German GDP is unaffected.
d. U.S. net exports, GNP, and GDP are unaffected, Japanese GNP increases, German net exports decrease, and German GDP and GNP fall.

18) In 2011, OPEC succeeds in raising world oil prices by 300 percent. This price increase causes inventors to look at alternative sources of fuel for internal-combustion engines. A hydrogen-powered engine is developed which is cheaper to operate than gasoline engines. Which problem in the construction of the CPI does this situation represent?
a. income bias and substitution bias
b. introduction of new goods and unmeasured quality change
c. unmeasured quality change and new goods.
d. substitution bias and introduction of new goods

19) In the open-economy macroeconomic model, if the supply of loanable funds increases, then the interest rate
a. and the real exchange rate increase.
b. and the real exchange rate decrease.
c. increases and the real exchange rate decreases.
d. decreases and the real exchange rate increases.

20) In 2004, based on concepts similar to those used to estimate U.S. employment figures, the Italian adult (non-institutionalized) population was 45.020 million, the labor force was 24.065 million, and the number of people employed was 22.105 million. According to these numbers, the Italian labor-force participation rate and unemployment rate were about
a. 45.1%, and 8.1%
b. 45.1%, and 4.4%
c. 53.5%, and 8.1%
d. 53.5%, and 4.4%

Recall the formulae: I) Unemployment Rate = (#Unemployed/Labor Force)*100 II) Labor Force = #Unemployed + #Employed III) Labor Force Participation Rate = (Labor Force/Adult Population)*100
From formula III we have: 53.45 = (24.065/45.020)*100
Then, using formula II, we can get that #Unemployed = 24.065-22.105 = 1.96 million
From Formula I we have: 8.1% = (1.96/24.065)*100

21) Suppose that in a closed economy GDP is $11 trillion, consumption is $7 trillion, taxes are $3 trillion and the government runs a surplus of $1 trillion. There are no transfer payments. What are private saving and national saving?
a. $4 trillion and $1 trillion
b. $4 trillion and $5 trillion
c. $1 trillion and $2 trillion
d. $1 trillion and $1 trillion

\[ Y=11, C=7, T=3, T-G=1, \]
\[ \text{Thus } G=T-1=2. \text{ Private saving } = (Y - T - C) = 11-3-7 = 1. \text{ National Saving } = Y-C-G =11-7-2=2. \]
22) In the 1980s, the U.S. budget deficit rose. At the same time the U.S. trade deficit grew larger, the real exchange rate of the dollar appreciated, and U.S. net capital outflow decreased. Which of these events contradicts what the open-economy macroeconomic model predicts will happen, following an increase in the budget deficit?
   a. The U.S. trade deficit grew.
   b. The real exchange rate of the dollar appreciated.
   c. U.S. net capital outflow fell.
   d. None of the above is contrary to the predictions of the model.

23) An increase in the budget deficit
   a. reduces net capital outflow and domestic investment.
   b. reduces net capital outflow and raises domestic investment.
   c. raises net capital outflow and domestic investment.
   d. raises net capital outflow and reduces domestic investment.

24) Over the past 100 years, U.S. real GDP per person has doubled about every 35 years. If it doubles every 25 years for the next 100 years, then in a century the U.S. real GDP per person will be:
   a. 4 times higher than it is now.
   b. 8 times higher than it is now.
   c. 12 times higher than it is now.
   d. 16 times higher than it is now.

25) Imagine two economies that are identical except that for a long time, economy A has had a money supply of $1,000 billion while economy B has had a money supply of $500 billion. It follows that
   a. real GDP and the price level are lower in country B.
   b. real GDP, but not the price level, is lower in country B.
   c. the price level, but not real GDP is lower in country B.
   d. neither the price level or real GDP is lower in country B.

26) When a country's central bank increases the money supply, its
   a. price level rises and its currency appreciates relative to other currencies in the world.
   b. price level rises and its currency depreciates relative to other currencies in the world.
   c. price level falls and its currency appreciates relative to other currencies in the world.
   d. price level falls and its currency depreciates relative to other currencies in the world.

27) Velocity in the country of Lakersland is always stable. In 2002, the money supply was $100 billion, nominal GDP was $500 billion, and the real interest rate was 3 percent. In 2011, the money supply is $105 billion and real GDP did not change from its level in 2002. The nominal interest rate in 2011 is approximately
   a. 3 percent.
   b. 5 percent.
   c. 8 percent.
   d. 11 percent.

For 2002 we know: M=100, PY=500, r=0.03
Since MV=PY and since V is stable, Y is stable then the 5% increase M has increased prices by 5%. Thus we have inflation at 5%.
As real interest rate = nominal interest rate – inflation
And since by the classical dichotomy, money does not affect real variables;
3% = nominal interest rate − 5%
Thus, nominal interest rate = 8%

28) GDP is defined as the market value of all final goods and services produced
a. by the citizens of a country, regardless of where they live, in a given period of time; this
   definition focuses on GDP as a measure of total income.
b. by the citizens of a country, regardless of where they live, in a given period of time; this
   definition focuses on GDP as a measure of total expenditure.
c. within a country in a given period of time; this definition focuses on GDP as a measure of
   total income.
d. within a country in a given period of time; this definition focuses on GDP as a measure of
   total expenditure.

29) An important difference between the GDP deflator and the consumer price index is that
a. the GDP deflator reflects the prices of goods and services bought by producers, whereas the consumer
   price index reflects the prices of goods and services bought by consumers.
b. the GDP deflator reflects the prices of all goods and services bought by producers and consumers,
   whereas the consumer price index reflects the prices of final goods and services bought by consumers.
c. the GDP deflator reflects the prices of all final goods and services produced by a nation's citizens,
   whereas the consumer price index reflects the prices of final goods and services bought by consumers.
d. the GDP deflator reflects the prices of all final goods and services produced domestically, whereas the
   consumer price index reflects the prices of some goods and services bought by consumers.

30) Megasoft wants to finance the purchase of new equipment for developing security software called
Doors, but they have limited internal funds. Megasoft will likely
a. demand loanable funds by buying bonds.
b. supply loanable funds by buying bonds.
c. supply loanable funds by selling bonds.
d. demand loanable funds by selling bonds.

31) Suppose that there are diminishing returns to capital. Suppose also that two countries are the same
except one has less capital and so less real GDP per person. Suppose that both increase their saving rate
from 3 percent to 4 percent. In the long run
a. both countries will have permanently higher growth rates of real GDP per person, and the
   growth rate will be higher in the country with more capital.
b. both countries will have permanently higher growth rates of real GDP per person, and the
   growth rate will be higher in the country with less capital.
c. both countries will have higher levels of real GDP per person, and the temporary increase
   in growth in the level of real GDP per person will have been greater in the country with
   more capital.
d. both countries will have higher levels of real GDP per person, and the temporary increase
   in growth in the level of real GDP per person will have been greater in the country with
   less capital.

32) In which case can we be sure aggregate demand shifts left overall?
a. people want to save more for retirement and the government raises taxes
b. people want to save more for retirement and the government cuts taxes
c. people want to save less for retirement and the government raises taxes
d. people want to save less for retirement and the government cuts taxes
33) Suppose the economy of Theforcebewithyouland has the following monetary situation.
M1 = 1000$
Required reserve ratio = 1/4
Currency to deposit ratio = 1/4
If the Central Bank buys 600$ worth of treasury bills (i.e. bonds):

a. The money multiplier is 5/2 and the deposits are 600.
b. The reserves are 100 and the monetary base is 400
c. Both a and b are correct.
d. The change in the money supply is $1,500

Recall that 

\[
money\ multiplier = \frac{cr + 1}{cr + rr} = \frac{1 + 1}{1 + \frac{1}{4}} = \frac{5}{2}
\]

Therefore the initial level of 

\[
B = \frac{2}{5} * M = \frac{2}{5} * 1000 = 400
\]

If the fed buys 600$ worth of treasury bills, then the new level of B is 400+600=1000

Therefore the new M is 

\[
M = \frac{cr + 1}{cr + rr} * B = \frac{5}{2} * 1000 = 2500
\]

It thus follows that the change in the money supply is new M-old M=2500-1000=1500$

34) Suppose the real exchange rate is such that the market for foreign-currency exchange has a surplus.
This surplus will lead to

a. an appreciation of the dollar, an increase in U.S. net exports, and so an increase in the quantity of dollars demanded in the foreign exchange market.
b. an appreciation of the dollar, a decrease in U.S. net exports, and so a decrease in the quantity of dollars demanded in the foreign exchange market.
c. a depreciation of the dollar, an increase in U.S. net exports, and so an increase in the quantity of dollars demanded in the foreign exchange market.
d. a depreciation of the dollar, a decrease in U.S. net exports, and so a decrease in the quantity of dollars demanded in the foreign exchange market.

Table 2 The information in this table pertains to an imaginary economy.

<table>
<thead>
<tr>
<th>Type of Money</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large time deposits</td>
<td>$80 billion</td>
</tr>
<tr>
<td>Small time deposits</td>
<td>$75 billion</td>
</tr>
<tr>
<td>Demand deposits</td>
<td>$75 billion</td>
</tr>
<tr>
<td>Other checkable deposits</td>
<td>$40 billion</td>
</tr>
<tr>
<td>Savings deposits</td>
<td>$10 billion</td>
</tr>
<tr>
<td>Travelers’ checks</td>
<td>$1 billion</td>
</tr>
<tr>
<td>Money market mutual funds</td>
<td>$15 billion</td>
</tr>
<tr>
<td>Currency</td>
<td>$110 billion</td>
</tr>
<tr>
<td>Credit card balances</td>
<td>$10 billion</td>
</tr>
<tr>
<td>Miscellaneous categories of M2</td>
<td>$25 billion</td>
</tr>
</tbody>
</table>

35) Refer to Table 2. What is the M1 money supply?
36) Suppose that in some tax year you earned a nominal interest rate of 4 percent. During the time you held these funds inflation was 1 percent. You compute that you made a real after-tax interest rate of 2 percent. What was your tax rate?

a. 50 percent
b. 33.3 percent
c. 25 percent
d. None of the above are correct.

37) In one year, you meet 52 people who are each unemployed for one week and eight people who are each unemployed for the whole year. What percentage of the unemployment spells you encountered was short-term, and what percentage of the unemployment you encountered was long-term?

a. 52 percent and 13.3 percent
b. 52 percent and 88.9 percent
c. 86.7 percent and 13.3 percent
d. 86.7 percent and 88.9 percent

52 people out of 60 = 86.7% create short term unemployment.
Total unemployment in weeks = 52 + 8*52 = 468
52*8 = 416 is long term 416/468 = 88.9%

38) Which of the following would be U.S. foreign direct investment?

a. A Polish company opens a shipbuilding plant in the United States.
c. A U.S. furniture maker opens a plant in Mexico.
d. A U.S. bank buys Bolivian corporate bonds.

39) If the economy unexpectedly went from inflation to deflation,

a. both debtors and creditors would all have reduced real wealth.
b. both debtors and creditors would all have increased real wealth.
c. debtors would gain at the expense of creditors.
d. creditors would gain at the expense of debtors.

40) If goods in the United States cost the same number of dollars as German goods cost euros, the real exchange rate would be computed as how many German goods per U.S. goods?

a. one
b. the price of the U.S. goods
c. the amount of German currency that can be bought with one unit of U.S. currency
d. None of the above is correct.