

TOTAL SCORE _____

EXE 1 _____

EXE 2 _____

EXE 3 _____

MC _____

Econ 002- INTRO MACRO Prof. Luca Bossi May 03, 2016
FINAL EXAM –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, nor notes and any material.

Student Name (printed)

PennID

Signature

Your TA Name (printed)

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 (total is 60 points for the multiple choice part). You can detach the answer sheet for the MC part at the end of the exam if this is more comfortable for you. If that is the case, be sure to put your name on it and to tell your TA to staple it back to the exam when finished. If you do not fill in the MC part on time and request extra time at the end of the exam to write the answers up, a proctor will take your name and you will receive a penalty of 5 points.

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, raise your 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.

FOR THE DURATION OF THE EXAM, AND WITH THE EXCEPTION OF YOUR ALLOWED SCIENTIFIC CALCULATOR, YOU HAVE TO TURN OFF EVERYTHING ELSE THAT HAS A POWER BUTTON. NO CELL PHONES. NO BOOKS. NO NOTES. NO HELP SHEETS. NO TALKING TO EACH OTHER. YOU CANNOT CONNECT TO THE INTERNET.

NO ASKING THE PROCTORS ANY QUESTION OR HELP TO SOLVE THE EXAM.

WRITE IN PENCIL OR IN PEN AS YOU LIKE, BUT IF YOU WRITE IN PENCIL THERE IS NO POSSIBILITY FOR RE-GRADING. PLEASE WRITE YOUR NAME ON THE FIRST PAGE OF THE EXAM AND ON THE MC BUBBLE PAGE. PLEASE FOLLOW THE INSTRUCTIONS AS TO HOW TO SUBMIT YOUR EXAM AT THE END OF THE 2 HOURS.

PLEASE DO NOT START THIS EXAM UNTIL INSTRUCTED TO DO SO.

GOOD LUCK!

EXERCISE I (12 points total)

Consider the following data for USA and Australia:

Year	USA		AUSTRALIA	
	Minimum Wage (dollars per hour)	CPI	Minimum Wage (Australian dollars (AUD) per hour)	CPI
1957	\$1	27	0.19 AUD	10
2010	\$7	215	8.86 AUD	128

a) (4 POINTS) Calculate the real minimum wages in both U.S and Australia in these two years. Use 2 decimal digits precision for your computations.

b) (4 POINTS) Suppose the law of one price (Purchasing Power Parity) always holds true between U.S. and Australia. Did the US dollar appreciate or depreciate with respect to the Australian dollar between 1957 and 2010? Make sure to label the nominal exchange rates numerator and denominator precisely. Use 2 decimal digits precision for your computations.

c) (4 POINTS) Consider now the following economic data for US in 2011. Suppose the output gap for US in 2011 is -1. Also, the level of output in 2011 is only 90 percent the natural rate of output; the FED inflation target is 2%, CPI in the US in 2011 is 236.5, the natural (real) interest rate is 2%, and $\alpha = 0.25$, and $\beta = 0.75$. According to the Taylor's rule, what is the nominal interest rate set by the FED in this economy if we assume that agents form their expectations on prices following this process $E(\pi_{t+1}) = \frac{1}{2}\pi_t + \frac{1}{2}\pi_t^T$?

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Answer:

a.

Formula: Real wage = Nominal Wage/CPI * 100

U.S.A.

Year	CPI	Nominal Minimum Wage (\$ per hour)	Real Minimum Wage
1957	27	\$1	1/27 *100= 3.70
2010	215	\$7	7/215*100 = 3.26

Australia			
Year	CPI	Nominal Minimum Wage (AUD per hour)	Real Minimum Wage
1957	10	0.19 AUD	0.19/10*100 = 1.90
2010	128	8.86 AUD	8.86/128*100 = 6.92

b. If PPP holds always true then the real exchange rate is always equal to one.

E =1. The general formula for the real exchange rate is

$$E = \frac{P * e}{P^F}$$

If E = 1 then the nominal exchange rate is given by the ration between the foreign price level and the domestic price level.

$$E = 1 = \frac{P * e}{P^F}$$

$$e = \frac{P^F}{P}$$

Since we are considering this from the perspective of US, then the domestic price level is the US CPI, and the foreign price level is the Australian CPI.

In 1957:

$$e = \frac{10}{27} = 0.37 \frac{AUD}{1\$}$$

In 2010:

$$e = \frac{128}{215} = 0.60 \frac{AUD}{1\$}$$

1 US \$ buys more AUD in 2010 than in 1957 so the dollar got stronger or appreciated between 1957 and 2010.

c.

Recall that the Taylor's rule is given by the following equation:

$$i_t = E(\pi_{t+1}) + \hat{r} + \alpha(\pi_t - \pi^T) + \beta \left(\frac{Y_t - Y_{t,N}}{Y_{t,N}} \right)$$

Where:

π_t = actual inflation at time t

$E(\pi_{t+1})$ = inflation expectations at time t for period t+1

Y_t = actual level of output at time t.

π_t^T = the central bank's target for inflation

\hat{r} = the natural real interest rate.

We know that in 2011:

$$Y_t - Y_{t,N} = -1$$

Also we know that in 2011

$$Y_t = 0.9 * Y_{t,N}$$

$$\text{So } 0.9 * Y_{t,N} - Y_{t,N} = -1$$

$$-0.1 * Y_{t,N} = -1$$

$$Y_{t,N} = 10$$

To compute US inflation in 2011, we need to use the CPI for 2011 and the one for 2010 appropriately:

$$\pi_t = 100 * \frac{CPI_{2011} - CPI_{2010}}{CPI_{2010}} = 100 * \frac{236.5 - 215}{215} = 10\%$$

Expected inflation is then:

$$E(\pi_{t+1}) = \frac{1}{2} \pi_t + \frac{1}{2} \pi_t^T = 0.5 * 0.1 + 0.5 * 0.02 = 0.06$$

Plugging all those numbers we have inside the equation for the Taylor's rule:

$$i_t = 0.06 + 0.02 + 0.25 * (0.1 - 0.02) + 0.75 * \left(\frac{-1}{10} \right) = 0.08 + 0.02 - 0.075 = 0.025$$

EXERCISE II (16 points total)

(Note: Part a) and b) of this exercise are identical to exercise 1 in Final exam of FA 2015.)

Consider the money multiplier model we have seen and studied in class.

The monetary base, B , is 1,500. The reserve requirement, rr , is $\frac{1}{8}$, and the currency to deposit ratio, cr , is $\frac{1}{7}$.

a) (5 POINTS) Find the money multiplier and the money supply. Leave your answers for this part expressed in terms of fractions if needs be.

b) (5 POINTS) Find the level of currency, deposits, and reserves.

Completely disregard the numbers used in part a) and b) above for the remaining part of this exercise.

c) (3 POINTS) Currently there is a lively public discussion in the US about “breaking up” or reigning in the power of big commercial banks. Let’s study one proposal to decrease the power commercial banks have. In particular, a portion of the economic plan of 2016 US presidential candidate Hillary Clinton is to “tax commercial banks’ liabilities” to achieve this result. Assume the following:

- ✓ Under her plan the tax rate on banks’ liabilities were to be set at the rate $0 < \tau < 0.9$.
- ✓ For simplicity banks do not hold excess reserves nor stocks or bonds in their balance sheets.
- ✓ Required reserves are computed before the tax is imposed.
- ✓ The government tax revenues collected from this policy are completely redistributed back to households in the form of cash.
- ✓ Households only hold on to the cash amount they receive from this government program (no more, no less).

Using the money multiplier model we have seen in class, if the reserve requirement (rr) is equal to 0.1, would the money supply increase or decrease under this proposal when compared to a zero tax? Would bank profits increase or decrease under this proposal (think of this in terms of loans commercial bank can give out to make profits)? Show your work.

d) (3 POINTS) Now analyze the effect that Hillary Clinton’s proposal would have on inflation in the long run. Assume her tax plan does not change money demand. Draw the graph for the money market in the long run. Appropriately and clearly label both axes and all the curves you introduce in the graph. Graphically show the effect that introducing a tax on commercial banks’ liabilities would have on inflation when compared to a situation where the tax on liabilities is not present. Show your work.

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a) Money multiplier is $\frac{cr+1}{cr+rr} = \frac{\frac{1}{7}+1}{\frac{1}{7}+\frac{1}{8}} = \frac{64}{15}$

Money Supply => M = $\frac{cr+1}{cr+rr} * B = \frac{64}{15} * 1,500 = 6,400$

b) From the currency to deposit ratio, you know that:

$$cr = \frac{C}{D} = \frac{1}{7} \rightarrow D = 7C$$

But also you know that by the definition of money supply:

$$M = C + D \text{ so } M = C + 7C$$

Hence,

$$6,400 = 8C \text{ and } C = 800$$

$$D = 7 * 800 = 5,600$$

Lastly, from the reserve requirement you know that

$$rr = \frac{R}{D} = \frac{1}{8} \rightarrow R = \frac{D}{8} = \frac{5,600}{8} = 700$$

c) Banks receive deposits D and since deposits are liabilities, they will be taxed for an amount equal to $\tau * D$. These taxes become cash/currency. So $C = \tau * D$

$$cr = \frac{C}{D} = \frac{\tau * D}{D} = \tau$$

Furthermore, the banks are required to keep the following reserve requirement (required reserves are computed before the tax is imposed on deposits):

$$rr = \frac{R}{D} = 0.1$$

so $R = 0.1 * D$.

Recall that

$$B = C + R = \tau * D + 0.1 * D = (\tau + 0.1) * D$$

And from the formula for the money multiplier:

$$M = \frac{cr+1}{cr+rr} * B \rightarrow M = \frac{\tau+1}{\tau+0.1} * (\tau + 0.1) * D \rightarrow M = (\tau + 1) * D$$

Clearly from the formula above we can see that money supply increases with taxes.

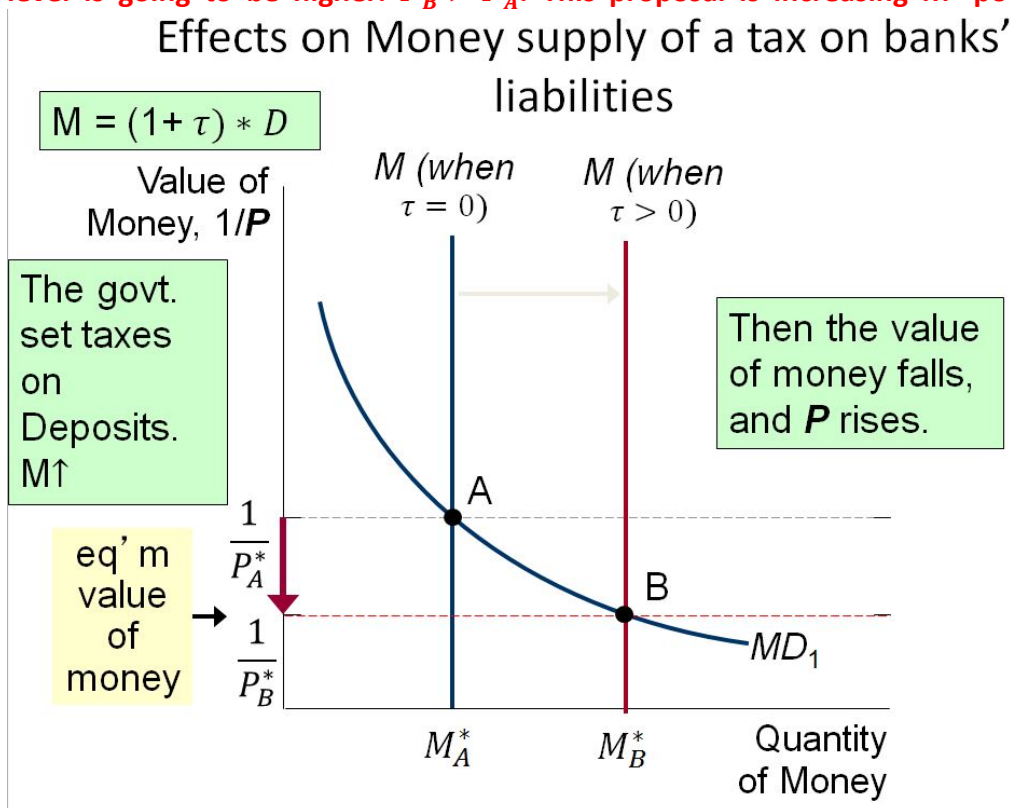
The loans that banks can give out are equal to $L = D - \text{taxes} - R =$

$$= D - \tau * D - 0.1 * D = (1 - 0.1 - \tau) * D = (0.9 - \tau) * D$$

Banks will be able to make less loans and hence less profits in the presence of this policy.

d) Recall from part c) that money supply is $M = (\tau + 1) * D$

The picture below compare the money supply in the long run when there are no taxes on banks' deposits (vertical blue line when $\tau = 0$ and $M = D$) to the money supply in the long run when there are taxes on deposits (vertical red line when $\tau > 0$ and $M = (1 + \tau) * D$). The blue line intersects with the money demand at a lower equilibrium value of money in the presence of the tax. Hence, the equilibrium price level is going to be higher. $P_B^* > P_A^*$. This proposal is increasing M^s potentially generating inflation.



EXERCISE III (12 points total)

(Note: This is very similar to exercise 3 in Final exam of SP 2014: it is also similar to one exercise you had in recitation 5 and recitation 9).

We now want to introduce a government in the Solow model. In particular, we assume all the production/income in the economy is taxed at a certain constant tax rate τ in each period. Assume that the government not only taxes, but also offers productive government spending that enhances total production in the economy. Think of this as the services coming from general infrastructures, public schools, police, firemen, army etc.. This being the case, the new production function for our economy now is:

$$Y_t = A * F(K_t, L_t, G_t) = A[\alpha K_t^\rho + \beta L_t^\rho + (1 - \alpha - \beta)G_t^\rho]^{\frac{1}{\rho}}$$

Where $A > 0$ is TFP, L_t is labor at period t and K_t is physical capital at period t . And where G_t is government spending. Suppose that the government is running a balanced budget every period and that there are no transfers.

a) (6 POINTS) Set $K_t = 25, L_t = 16, A = 1, \alpha = 0.3, \beta = 0.6, \tau = 0.25, \rho = 0.5$. What is the numerical value for G_t ? Show your work. Use 4 decimal digits precision for your computations.

b) (6 POINTS) Now set $\tau = G_t = 0, \beta = 1 - \alpha = 0.7, A = 1, \rho = 0.5, \alpha = 0.3, s = 0.1, d = 0.09, n = 0.01$. Find the numerical value for the steady state level of physical capital per person. Show your work. Use 4 decimal digits precision for your computations (if needs be).

Answers

a) You know that:

$$1) Y_t = A[\alpha K_t^\rho + \beta L_t^\rho + (1 - \alpha - \beta)G_t^\rho]^{\frac{1}{\rho}}$$

We also need to consider the equation for the balanced budget equation:

$$6) G_t = T_t = \tau Y_t$$

Substitute 6) into 1):

$$Y_t = A[\alpha K_t^\rho + \beta L_t^\rho + (1 - \alpha - \beta)(\tau Y_t)^\rho]^{\frac{1}{\rho}}$$

Solve for Y_t :

$$\begin{aligned} Y_t^\rho &= A^\rho[\alpha K_t^\rho + \beta L_t^\rho + (1 - \alpha - \beta)\tau^\rho Y_t^\rho] \\ Y_t^\rho(1 - A^\rho(1 - \alpha - \beta)\tau^\rho) &= A^\rho[\alpha K_t^\rho + \beta L_t^\rho] \\ Y_t^\rho &= \frac{A^\rho[\alpha K_t^\rho + \beta L_t^\rho]}{(1 - A^\rho(1 - \alpha - \beta)\tau^\rho)} \end{aligned}$$

$$Y_t = \left\{ \frac{A^\rho[\alpha K_t^\rho + \beta L_t^\rho]}{(1 - A^\rho(1 - \alpha - \beta)\tau^\rho)} \right\}^{\frac{1}{\rho}}$$

Plugging inside $K_t = 25, L_t = 16, A = 1, \rho = 0.5, \alpha = 0.3, \beta = 0.6, \tau = 0.25$:

$$Y_t = \left\{ \frac{1 * [0.3 * 25^{0.5} + 0.6 * 16^{0.5}]}{(1 - 1(1 - 0.3 - 0.6) * 0.25^{0.5})} \right\}^2 = \left\{ \frac{[0.3 * 5 + 0.6 * 4]}{(1 - 0.1 * 0.5)} \right\}^2 = 16.8532$$

$$G_t = \tau Y_t = 0.25 * 16.8532 = 4.2133$$

b) The five equations that define the Solow model now are

$$1) Y_t = A[\alpha K_t^\rho + (1 - \alpha)L_t^\rho]^{\frac{1}{\rho}}$$

$$2) S_t = sY_t$$

$$\begin{aligned}
& 3) I_t = S_t \\
& 4) K_{t+1} = I_t + (1 - d)K_t \\
& 5) L_{t+1} = (1 + n)L_t
\end{aligned}$$

Output per person in this case is:

$$\begin{aligned}
\frac{Y_t}{L_t} &= \frac{A[\alpha K_t^\rho + (1 - \alpha)L_t^\rho]^{\frac{1}{\rho}}}{L_t} \\
Y_t &= A[\alpha K_t^\rho + (1 - \alpha)L_t^\rho]^{\frac{1}{\rho}}
\end{aligned}$$

So

$$\begin{aligned}
Y_t^\rho &= A[\alpha K_t^\rho + (1 - \alpha)L_t^\rho] \\
\frac{Y_t^\rho}{L_t^\rho} &= \frac{A[\alpha K_t^\rho + (1 - \alpha)L_t^\rho]}{L_t^\rho} \\
\left(\frac{Y_t}{L_t}\right)^\rho &= A\left[\alpha\left(\frac{K_t}{L_t}\right)^\rho + (1 - \alpha) * 1\right]
\end{aligned}$$

And output per person in this case is:

$$\frac{Y_t}{L_t} = A\left[\alpha\left(\frac{K_t}{L_t}\right)^\rho + (1 - \alpha) * 1\right]^{\frac{1}{\rho}}$$

With the small caps convention to denote per capita variables, the expression above becomes:

$$y_t = A[\alpha(k_t)^\rho + (1 - \alpha)]^{\frac{1}{\rho}}$$

Using the expression of output per capita you can derive with the usual procedure the fundamental equation with the small caps convention that represent per capita variables :

$$k_{t+1}(1 + n) = sA[\alpha(k_t)^\rho + (1 - \alpha)]^{\frac{1}{\rho}} + (1 - d)k_t$$

In steady state we know that:

$$k_{t+1} = k_t = \bar{k}$$

Plug this into the fundamental equation to obtain:

$$0 = sA[\alpha(\bar{k})^\rho + (1 - \alpha)]^{\frac{1}{\rho}} - (n + d)\bar{k}$$

Solving for \bar{k}

$$\begin{aligned}
sA[\alpha(\bar{k})^\rho + (1 - \alpha)]^{\frac{1}{\rho}} &= (n + d)\bar{k} \\
s^\rho A^\rho [\alpha(\bar{k})^\rho + (1 - \alpha)] &= (n + d)^\rho \bar{k}^\rho \\
((n + d)^\rho - s^\rho A^\rho \alpha)\bar{k}^\rho &= s^\rho A^\rho (1 - \alpha) \\
\bar{k} &= \left(\frac{s^\rho A^\rho (1 - \alpha)}{((n + d)^\rho - s^\rho A^\rho \alpha)}\right)^{\frac{1}{\rho}} = \left(\frac{0.1^{0.5} * 1 * (1 - 0.3)}{((0.1)^{0.5} - 0.1^{0.5} * 1 * 0.3)}\right)^2 = 1
\end{aligned}$$

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MULTIPLE CHOICE QUESTIONS

Identify the letter of the choice that best completes the statement or answers the question. Fill in the bubble with your answer in the answer sheet for the MC provided on the last page of the exam.

Scenario 1. Assume the following information for an imaginary, closed economy.

GDP = \$200,000; consumption = \$120,000; government purchases = \$35,000; and taxes = \$25,000; transfers = 0.

1) Refer to Scenario 1. For this economy, investment amounts to

- a. \$25,000.
- b. \$30,000.
- c. \$35,000.
- d. **\$45,000.**

2) Refer to Scenario 1. For this economy, public saving is equal to

- a. **-\$10,000 and the government is running a budget deficit of \$10,000.**
- b. -\$10,000 and the government is running a budget surplus of \$10,000.
- c. \$10,000 and the government is running a budget deficit of \$10,000.
- d. \$10,000 and the government is running a budget surplus of \$10,000.

3) Refer to Scenario 1. For this economy, private saving is equal to

- a. \$40,000.
- b. \$50,000.
- c. **\$55,000.**
- d. \$60,000.

4) Refer to Scenario 1. For this economy, national saving is equal to

- a. **\$45,000.**
- b. \$35,000.
- c. \$30,000.
- d. \$60,000.

5) Refer to Scenario 1. Suppose, for this economy, the relationship between the real interest rate, r , and investment, I , is given by the equation $I = 69,000 - 3,000r$. (If, for example, $r = 10$, this means that the real interest rate is 10 percent.) The equilibrium real interest rate for this economy is

- a. 6 percent.
- b. **8 percent.**
- c. 7 percent.
- d. 9 percent.

6) Mary has just graduated from college with a degree in marketing and is looking for her first job. She is:

- a. Structurally unemployed
- b. **Frictionally unemployed**
- c. Seasonally unemployed
- d. Cyclically unemployed

Frictional unemployment is the temporary unemployment that occurs as people enter the labor market or change jobs.

7) Robert has worked as a dishwasher for 15 years but has been fired because it has become cheaper to use a dishwashing machine. The only jobs available are in computer programming. Robert is:

- a. **Structurally unemployed**
- b. Seasonally unemployed
- c. Frictionally unemployed
- d. Cyclically unemployed

Structural unemployment occurs because people do not possess the skills that are required for the jobs available. This is associated with a lack of education, a change in the structure of the economy that makes some skills obsolete, or the job seeker being in a location different from the available jobs.

8) Budget surplus this period is 15, the real interest rate is 5%, and inflation is 5%. The steady state level of debt is going to be:

- a. -250
- b. +250
- c. -150
- d. **+150**

Table 1 - The table below contains data for the closed economy of Batterland, which produces only waffles and pancakes. The base year is 2009.

Year	Price of Waffles	Quantity of Waffles	Price of Pancakes	Quantity of Pancakes
2008	\$2.00	100	\$1.00	100
2009	\$2.00	120	\$2.00	150
2010	\$2.00	150	\$3.00	200
2011	\$4.00	180	\$3.00	220

9) Refer to Table 1. In 2009, this country's real GDP was

- a. \$100.
- b. \$390.
- c. \$400.
- d. **\$540.**

10) Refer to Table 1. In 2008, this country's nominal GDP was

- a. **\$300.**
- b. \$390.
- c. \$400.
- d. \$540.

11) Refer to Table 1. In 2011, this country's GDP deflator was

- a. 58.0.
- b. 100.
- c. 148.1.
- d. **172.5.**

12) Refer to Table 1. Using the GDP deflator, this country's inflation rate from 2010 to 2011 was

- a. 15.2%.
- b. 25.4%.
- c. **34.1%.**
- d. 43.9%.

13) Last year the imaginary country of Bahkan had a population of 10,000, 6,000 people worked 8 hours a day and produced a real GDP of \$30,000,000. The imaginary country of San Andreo had a population of 15,000, 8,000 people worked 7 hours a day and produced a real GDP of \$33,000,000. Which of the following is correct?

- a. Bahkan had the higher productivity and the higher real GDP per person.
- b. San Andreo had the higher productivity and the higher real GDP per person.
- c. Bahkan had the higher productivity while San Andreo had the higher real GDP per person.
- d. San Andreo had the higher productivity while Bahkan had the higher real GDP per person.

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) If U.S. citizens decide to purchase more foreign assets at each interest rate, the U.S. real interest rate

- a. increases, the real exchange rate of the dollar appreciates, and U.S. net capital outflow decreases.
- b. increases, the real exchange rate of the dollar depreciates, and U.S. net capital outflow increases.
- c. decreases, the real exchange rate of the dollar depreciates, and U.S. net capital outflow decreases.
- d. decreases, the real exchange rate of the dollar appreciates, and U.S. net capital outflow increases.

16) Which of the following would *both* raise the U.S. exchange rate?

- a. capital flight from other countries to the U.S. occurs and the U.S. moves from budget surplus to budget deficit
- b. capital flight from other countries to the U.S. occurs and the U.S. moves from budget deficit to budget surplus
- c. capital flight from the U.S. to other countries occurs, the U.S. moves from budget surplus to budget deficit
- d. capital flight from U.S. to other countries occurs, the U.S. moves from budget deficit to budget surplus

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 GNP and GDP 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) Last year Panglossia had real GDP of 27.0 billion. This year it had real GDP of 31.5 billion. Which of the following changes in population is consistent with a 5 percent growth rate of real GDP per person over the last year?

- a. The population decreased from 88 million to 84 million.
- b. The population decreased from 75 million to 73 million.
- c. The population increased from 45 million to 50 million.
- d. The population increased from 60 million to 62 million.

19) If U.S. citizens decide to save a larger fraction of their incomes, the real interest rate

- a. decreases, the real exchange rate of the dollar depreciates, and U.S. net capital outflow increases.
- b. decreases, the real exchange rate of the dollar appreciates, and U.S. net capital outflow decreases.
- c. increases, the real exchange rate of the dollar appreciates, and U.S. net capital outflow decreases.

d. increases, the real exchange rate of the dollar depreciates, and U.S. net capital outflow 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. 53.5%, and 8.1%
- c. 45.1%, and 4.4%
- d. 53.5%, and 4.4%

Recall the formulae: I) $\text{Unemployment Rate} = (\# \text{Unemployed} / \text{Labor Force}) * 100$ II) $\text{Labor Force} = \# \text{Unemployed} + \# \text{Employed}$ III) $\text{Labor Force Participation Rate} = (\text{Labor Force} / \text{Adult Population}) * 100$

From formula III we have: $53.45 = (24.065 / 45.020) * 100$

Then, using formula II, we can get that $\# \text{Unemployed} = 24.065 - 22.105 = 1.96 \text{ million}$

From Formula I we have: $8.1\% = (1.96 / 24.065) * 100$

21) Whip-It manufactures blenders. In 2009 it had \$50,000 of blenders in inventory. In 2010 it sold \$300,000 of blenders to consumers and had \$40,000 of blenders in inventory. How much did blenders produced by Whip-it add to GDP in 2010?

- a. \$340,000
- b. \$310,000
- c. \$300,000
- d. \$290,000

22) In a closed economy, one bag of flour is sold for \$1.00 to a bakery, which uses the flour to bake bread that is sold for \$3.00 to consumers. A second bag of flour is sold for \$1 to a grocery store who sells it to a consumer for \$2.00. Taking these four transactions into account, what is the effect on GDP?

- a. GDP increases by \$3.00.
- b. GDP increases by \$5.00.
- c. GDP increases by \$6.00.
- d. GDP increases by \$7.00.

23) Quality Motors is a Japanese-owned company that produces automobiles; all of its automobiles are produced in American plants. In 2010 Quality Motors produced \$30 million worth of automobiles, with \$17 million in sales to Americans, \$9 million in sales to Canadians, and \$4 million worth of automobiles added to Quality Motors' inventory. The transactions just described contribute how much to U.S. GDP for 2010?

- a. \$17 million
- b. \$21 million
- c. \$26 million
- d. \$30 million

24) Tom and Lilly rented a house for \$12,000 last year. At the start of the year they bought the house they had been renting directly from the owner for \$250,000. This year, they believe they could rent the house out for \$12,000, but decide not to and live in it instead. How much does Tom and Lilly's decision to buy the house change GDP?

- a. it reduces GDP by \$12,000
- b. it does not change GDP
- c. it raises GDP by \$238,000
- d. it raises GDP by \$250,000

25) Suppose banks decide to hold fewer excess reserves relative to deposits. Other things the same, this action will cause the

- a. money supply to fall. To reduce the impact of this the Fed could sell Treasury bonds.
- b. money supply to fall. To reduce the impact of this the Fed could buy Treasury bonds.
- c. **money supply to rise. To reduce the impact of this the Fed could sell Treasury bonds.**
- d. money supply to rise. To reduce the impact of this the Fed could buy Treasury bonds.

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. Real GDP and the real interest rate did not change from their 2002 levels. The nominal interest rate in 2011 is approximately

- a. 3 percent.
- b. 5 percent.
- c. **8 percent.**
- d. 11 percent.

For 2002 we know: $M=100$, $PY=500$ $r=0.03$

For 2011 we know: $M=105$, $Y(2011)=Y(2002)$,

Since $MV=PY$ and since V is stable, and since Y is stable then the 5% increase M has increased prices by 5% in 2011.

Thus we have inflation at 5%.

As real interest rate = nominal interest rate – inflation

And since in the long run, money does not affect real GDP in 2011:

$3\% = \text{nominal interest rate} - 5\%$

Thus, nominal interest rate = 8%

Table 2 2010 Labor Data for Adults (age 16 and older) in Meditor

Males not in labor force	45 million
Females not in labor force	35 million
Males unemployed	5 million
Females unemployed	5 million
Males employed	85 million
Females employed	65 million

28) Refer to Table 2. What is the adult male unemployment rate in Meditor?

- a. 3.7 percent
- b. **5.6 percent**
- c. 6 percent
- d. 7 percent

29) Refer to Table 2. What is the adult male labor-force participation rate in Meditor?

- a. 37 percent
- b. **66.7 percent**
- c. 73 percent

d. 96.3 percent

30) Refer to Table 2. What is the adult female population in Meditor?

- a. 40 million
- b. 70 million
- c. 100 million
- d. 105 million

31) Refer to Table 2. What is the adult female labor force in Meditor?

- a. 40 million
- b. 65 million
- c. 70 million
- d. 100 million

32) Most spells of unemployment are

- a. short, but most unemployment observed at any given time is long term.
- b. short, and most unemployment observed at any given time is short term.
- c. long, and most unemployment observed at any given time is long term.
- d. long, but most unemployment observed at any given time is short term.

33) Suppose one year ago the price index was 120 and Maria purchased \$20,000 worth of bonds. One year later the price index is 126. Maria redeems her bonds for \$22,250 and is in a 40 percent tax bracket. What is Maria's real after-tax rate of interest to the nearest tenth of a percent?

- a. 1.8 percent
- b. 3.1 percent
- c. 4.3 percent
- d. 1.2 percent

34) During the last tax year you lent money at a nominal rate of 6 percent. Actual inflation was 1.5 percent, but people had been expecting 1 percent. This difference between actual and expected inflation

- a. transferred wealth from the borrower to you and caused your after-tax real interest rate to be 0.5 percentage points higher than what you had expected.
- b. transferred wealth from the borrower to you and caused your after-tax real interest rate to be more than 0.5 percentage points higher than what you had expected.
- c. transferred wealth from you to the borrower and caused your after-tax real interest rate to be 0.5 percentage points lower than what you had expected.
- d. transferred wealth from you to the borrower and caused your after-tax real interest rate to be more than 0.5 percentage points lower than what you had expected.

35) Which of the following is a store of value?

- a. cash and stocks
- b. cash but not stocks
- c. stocks but not cash
- d. neither cash nor stocks

36) 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.

37) In 2002, the United States placed higher tariffs on imports of steel. According to the open-economy macroeconomic model this policy should have

- a. reduced imports into the United States and made U.S. net exports rise.
- b. reduced imports into the United States and made the net supply of dollars in the foreign exchange market shift right.
- c. reduced imports of steel into the United States, but reduced U.S. exports of other goods by an equal amount.
- d. reduced imports of steel into the United States and increased U.S. exports of other goods by an equal amount.

Table 3 Use the information in this table to answer the following questions.

Country	Currency	Currency per U.S. Dollar	U.S. Price Index	Country Price Index
Bolivia	Boliviano	8.00	200	1600
Japan	Yen	80.00	200	20,000
Morocco	Dinar	10.00	200	2,000
Norwegian	Kroner	6.5	200	1,500
Thailand	Baht	40.00	200	7,000

38) Refer to Table 3. Which currency(ies) is(are) less valuable than predicted by the doctrine of purchasing-power parity?

- a. boliviano and dinar
- b. yen and kroner
- c. baht and kroner
- d. baht

39) Refer to Table 3. In real terms, U.S. goods are more expensive than goods in which country(ies)?

- a. Bolivia and Morocco
- b. Japan, Norway, and Thailand
- c. Japan and Norway
- d. Thailand

40) Refer to Table 3. In real terms, U.S. goods are less expensive than goods in which country(ies)?

- a. Bolivia and Morocco
- b. Japan, Norway, and Thailand
- c. Japan and Norway
- d. Thailand

YOUR NAME: _____ YOUR TA's NAME: _____

FILL IN THE BUBBLE WITH THE LETTER OF YOUR CHOICE FOR THE MULTIPLE CHOICE QUESTIONS

ONLY THIS PAGE WILL BE GRADED FOR THE MC PART.

- | | | | | |
|-----|-----|-----|-----|-----|
| 1. | (A) | (B) | (C) | (D) |
| 2. | (A) | (B) | (C) | (D) |
| 3. | (A) | (B) | (C) | (D) |
| 4. | (A) | (B) | (C) | (D) |
| 5. | (A) | (B) | (C) | (D) |
| 6. | (A) | (B) | (C) | (D) |
| 7. | (A) | (B) | (C) | (D) |
| 8. | (A) | (B) | (C) | (D) |
| 9. | (A) | (B) | (C) | (D) |
| 10. | (A) | (B) | (C) | (D) |
| 11. | (A) | (B) | (C) | (D) |
| 12. | (A) | (B) | (C) | (D) |
| 13. | (A) | (B) | (C) | (D) |
| 14. | (A) | (B) | (C) | (D) |
| 15. | (A) | (B) | (C) | (D) |
| 16. | (A) | (B) | (C) | (D) |
| 17. | (A) | (B) | (C) | (D) |
| 18. | (A) | (B) | (C) | (D) |
| 19. | (A) | (B) | (C) | (D) |
| 20. | (A) | (B) | (C) | (D) |
| 21. | (A) | (B) | (C) | (D) |
| 22. | (A) | (B) | (C) | (D) |
| 23. | (A) | (B) | (C) | (D) |
| 24. | (A) | (B) | (C) | (D) |
| 25. | (A) | (B) | (C) | (D) |
| 26. | (A) | (B) | (C) | (D) |
| 27. | (A) | (B) | (C) | (D) |
| 28. | (A) | (B) | (C) | (D) |
| 29. | (A) | (B) | (C) | (D) |
| 30. | (A) | (B) | (C) | (D) |
| 31. | (A) | (B) | (C) | (D) |
| 32. | (A) | (B) | (C) | (D) |
| 33. | (A) | (B) | (C) | (D) |
| 34. | (A) | (B) | (C) | (D) |
| 35. | (A) | (B) | (C) | (D) |
| 36. | (A) | (B) | (C) | (D) |
| 37. | (A) | (B) | (C) | (D) |
| 38. | (A) | (B) | (C) | (D) |
| 39. | (A) | (B) | (C) | (D) |
| 40. | (A) | (B) | (C) | (D) |