Econ 002- INTRO MACRO Prof. Luca Bossi   April 29, 2013
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.

_____   **_____**
       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). 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 TO ASK FOR RE-GRADING. PLEASE WRITE YOUR NAME ON EVERY SINGLE PAGE OF THE EXAM.
PLEASE FOLLOW THE INSTRUCTIONS AS TO HOW TO SUBMIT YOUR EXAM AT THE END OF THE 60 MINUTES.

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

GOOD LUCK!

YOUR NAME: _____

YOUR R.I.'s NAME:_____

EXERCISE I (15 points)

Refer to the following table of employment data for a fictitious economy to answer the questions below.

	Number of people
Total Adults	50,000
Last sought work more than 8 weeks ago	10,000
Last sought work 5-8 weeks ago	5,000
Last sought work 2-4 weeks ago	0
Last sought work within last 2 weeks	2,500
Working part-time while also seeking work	2,000
Paid employees	11,500
Unpaid in a family business	1,000
Self-employed	18,000

a. **(6 POINTS)** What is the total number of employed adults in this economy? What is the labor force? And what is the employment rate? Round to the nearest tenth of a percent.
Number of employed adults = Paid employees + Working part-time while also seeking work + Unpaid in a family business + Self-employed =
11,500 + 2,000 + 1,000 + 18,000 = 32,500
Labor force = Adults who are employed + Adults who sought work within the past 4 weeks who are not actively employed
Labor force = 32,500 + 2,500 = 35,000
Employment rate = (Number employed / Labor force) * 100 = 92.9%

b. **(4 POINTS)** What is the total number of unemployed adults and what is the unemployment rate? Round to the nearest tenth of a percent.
Unemployed = Adults who have sought work within the past 4 weeks who are not actively employed
Number of unemployed adults = 2,500
Unemployment rate = (Number unemployed / Labor force) * 100 = 7.1%

c. **(5 POINTS)** If 1,000 of the adults who last sought a job 5-8 weeks ago begin to search for work again today, does this affect the unemployment rate? If not, why not? If so, what is the new unemployment rate and does this give an accurate impression of the state of unemployment in the economy?
Yes, this affects the unemployment rate. These adults were previously not part of the labor force because they did not seek work within the past 4 weeks, but now they are considered unemployed. The new unemployment rate is:
(New number of unemployed / New labor force) * 100
= [(1,000 + 2,500) / (1,000 + 35,000)] * 100 = 9.7%
This does NOT give an accurate impression of the state of unemployment in the economy because it gives the impression that things are worse when they are not.

PAPER FOR YOUR USE

YOUR NAME: _____

YOUR R.I.'s NAME:_____

EXERCISE II (12 points)
Consider the market for loanable funds, where supply and demand are given by:

$Q_S = 5r + 1$
$Q_D = -2r + 22$

In this open economy, net capital outflow is given by:

$NCO = 20 - 2r$

Additionally, it is known that the demand for dollars in the currency exchange market is:

$NX = 50 - 3e$

where e designates the real exchange rate.

a) (2 POINTS) Find the equilibrium in the loanable funds market. What is the prevailing interest rate?
b) (2 POINTS) At the equilibrium interest rate determined in part (a), what is the equilibrium level of Net Capital Outflow?
c) (2 POINTS) Is this nation running a trade surplus, running a trade deficit, or experiencing balanced trade in equilibrium?
d) (2 POINTS) What is the real exchange rate in equilibrium?
e) (4 POINTS) What is Saving and Investment in equilibrium?

Answers:
a) Equilibrium is found where supply equals demand:

5r + 1 = -2r + 22
7r = 21
r = 3
Q = 16

b) Merely plug our new interest rate (r = 3) into the provided equation:

NCO = 20 – 2r
NCO = 20 – 2(3) = 20 – 6
NCO = 14

c) NCO = NX, so NX = 14. The nation is running a trade surplus.

d) NCO determines the quantity of dollars supplied – i.e., 14. Demand has been provided: 50-3e. Equate and solve.

50 - 3e = 14

36 = 3e

e = 12

e) We have seen from part a) that the quantity of loanable funds of equilibrium is 16, so this is saving. From part b), instead we know that the NCO of equilibrium is 14. Since S = I + NCO then I = 2.

PAPER FOR YOUR USE

YOUR NAME: _____

YOUR R.I.'s NAME: _____

EXERCISE III (13 POINTS)
We have seen in class that commercial banks especially lately hold on to excess reserves. Let bank reserves be defined as:

$$R = rr * D + ER$$

Where R is (total) bank reserves, D is deposits, ER > 0 is excess reserves and rr is the reserve requirement. Furthermore, assume:

$$ER = (-0.1 * r + 0.2 * dr) * D$$

where r is the market interest rate, dr is the central bank's discount rate.

   a) (5 POINTS) Derive an expression of the money supply M as a function of the currency to deposit ratio (cr), the market interest rate (r), the reserve requirement (rr), the discount rate (dr) and B (the Monetary Base), and briefly explain how r and dr would affect M. (**Hint:** appropriately manipulate the two equations that define the Money Supply and the Monetary Base to solve for this).
   b) (5 POINTS) Now assume that rr = r = dr = 0.1, D = 0.03*Y, cr = 0.3. Derive B and M as a function of Y. Y is RGDP. <u>Round to 2 decimals for your answer.</u>
   c) (3 POINTS) Now assume that in this economy monetary policy can affect RGDP, but not inflation in the short run. If the Central Bank wants to reach a RGDP target of $16 trillion, what should the money supply be set equal to then? <u>Round to 2 decimals for your answer.</u>

Answer:
   a) we know that
M=C+D and
B = C+R = C + rr*D + ER = C + rr*D + (-0.1*r + 0.2*dr)*D = C + (rr - 0.1*r + 0.2*dr)*D, then

$$\frac{M}{B} = \frac{C + D}{C + (rr - 0.1 * r + 0.2 * dr) * D}$$

If we divide the numerator and the denominator of the left hand side by Deposit as we did in our standard model, we get:

$$\frac{M}{B} = \frac{\dfrac{C + D}{D}}{\dfrac{C + (rr - 0.1 * r + 0.2 * dr) * D}{D}} = \frac{cr + 1}{cr + rr - 0.1 * r + 0.2 * dr}$$

Clearly, if r increases ER decrease and M increases, and if dr increases, then ER increase, so M decreases. Intuition: if r increases, the opportunity cost for holding reserves is larger, then commercial banks will decrease the amount of reserves they hold and inject more loans into the economy (the revenue from loaning is higher now), which will increase the money supply.

   b) You did not necessarily need to have part a) right to get this part right. With the given information, we can get that:
M = C + D = (cr + 1)*D = (0.3 + 1)*0.03*Y = 0.04*Y
B = C+R = C + rr*D + ER = C + 0.1*D + (-0.1*0.1 + 0.2*0.1)*D = C + (0.1 - 0.1*0.1 + 0.2*0.1)*D =
(cr +(0.1 - 0.1*0.1 + 0.2*0.1))*D = (0.3 + 0.1 – 0.01 + 0.02)*0.03*Y = 0.41*0.03*Y = 0.01*Y

   c) Since M = 0.04*Y then if Y = $16 trillions, it follows that M = 0.04*16 = $0.64 trillion.

MULTIPLE CHOICE QUESTIONS
Identify the letter of the choice that best completes the statement or answers the question. Write your answer in the answer sheet for the MC provided on the last page of the exam.

The Stock Market Boom of 2015
Imagine that in 2015 the economy is initially in long-run equilibrium. Then stock prices rise more than expected and stay high for some time.

1) Refer to Stock Market Boom 2015. Which curve shifts and in which direction?
a.   aggregate demand shifts right
b.   aggregate demand shifts left
c.   aggregate supply shifts right
d.   aggregate supply shifts left.

2) Refer to Stock Market Boom 2015. In the short run what happens to the price level and real GDP?
a.   both the price level and real GDP rise.
b.   both the price level and real GDP fall.
c.   the price level rises and real GDP falls.
d.   the price level falls and real GDP rises.

3) Refer to Stock Market Boom 2015. What happens to the expected price level and what impact does this have on wage bargaining?
a.   The expected price level falls. Bargains are struck for higher wages.
b.   The expected price level falls. Bargains are struck for lower wages.
c.   The expected price level rises. Bargains are struck for higher wages.
d.   The expected price level rises. Bargains are struck for lower wages.

4) Refer to Stock Market Boom 2015. In the long run, the change in price expectations created by the stock market boom shifts
a.   long-run aggregate supply right.
b.   long-run aggregate supply left.
c.   short-run aggregate supply right.
d.   short-run aggregate supply left.

5) Refer to Stock Market Boom 2015. How is the new long-run equilibrium different from the original one?
a.   the price level and real GDP are higher
b.   the price level and real GDP are lower.
c.   the price level is higher and real GDP is the same.
d.   the price level is the same and real GDP is higher.

6) Which of the following would do the most to reduce a trade deficit?
a.   increase domestic saving
b.   increase domestic political stability and respect of property rights
c.   other countries reduce their trade restrictions

d.   raise tariffs

7) 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

8) The country of Frequencia is politically very stable and has a long tradition of respecting property rights. If several other countries suddenly became politically unstable, we would expect Frequencia's
a.   real interest rate to rise.
b.   real exchange rate to fall.
c.   net exports to fall.
d.   None of the above is likely.

9) In 2002, the United States imposed restrictions on the importation of steel into the United States. The open-economy macroeconomic model shows that such a policy would
a.   lower the real exchange rate and increase net exports.
b.   lower the real exchange rate and have no effect on net exports.
c.   raise the real exchange rate and decrease net exports.
d.   raise the real exchange rate and have no effect on net exports.

10) On behalf of your firm, you make frequent trips to Singapore. You notice that you always have to pay more dollars to get enough local currency to get your nails manicured than you have to pay to get manicured in the United States. This is
a.   inconsistent with purchasing-power parity, but might be explained by limited opportunities for arbitrage in manicuring across international borders.
b.   consistent with purchasing-power parity if prices in Hong Kong are rising more rapidly than prices in the United States.
c.   consistent with purchasing-power parity if prices in Hong Kong are rising less rapidly than prices in the United States.
d.   None of the above is correct.

11) A depreciation of the U.S. real exchange rate induces U.S. consumers to buy
a.   fewer domestic goods and fewer foreign goods.
b.   more domestic goods and fewer foreign goods.
c.   fewer domestic goods and more foreign goods.
d.   more domestic goods and more foreign goods.

12) During a presidential campaign, the incumbent argues that he should be reelected because nominal GDP grew by 12 percent during his 4-year term in office. You know that population grew by 4 percent over the period and that the GDP deflator increased by 6 percent during the past 4 years. You should conclude that real GDP per person
a.   grew by more than 12 percent.
b.   grew, but by less than 12 percent.
c.   was unchanged.
d.   decreased.

13) Social Security payments are indexed for inflation using the CPI. A recent newspaper editorial claimed that Social Security recipients are harmed by years of low inflation because they do not receive as large an increase in their payments as they do in years of high inflation. Which of the following statements is correct?

a.   The newspaper editorial is correct under all circumstances.

b.   The newspaper editorial is correct if the market basket consumed by Social Security recipients is the same as the market basket used to compute the CPI.

c.   The newspaper editorial could be correct if the prices of the goods consumed by Social Security recipients change at a different rate than the prices of the goods in the typical basket used to compute the CPI

d.   The newspaper editorial is incorrect under all circumstances.

14) A U.S. based company sells semiconductors to an Italian firm. The U.S. company uses all of the revenues from this sale to purchase automobiles from Italian firms. These transactions

a.   increase both U.S. net exports and U.S. net capital outflow.

b.   decrease both U.S. net exports and U.S. net capital outflow.

c.   increase U.S. net exports and do not affect U.S. net capital outflow.

d.   None of the above is correct.

15) 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.

16) When inflation rises, the nominal interest rate

a.   rises, and people desire to hold more money.

b.   rises, and people desire to hold less money.

c.   falls, and people desire to hold more money.

d.   falls, and people desire to hold less money

17) If V and M are constant and Y doubles, the quantity equation implies that the price level

a.   falls to half its original level.

b.   does not change.

c.   doubles.

d.   more than doubles.

18) The supply of money increases when

a.   the value of money increases.

b.   the interest rate increases.

c.   the Fed makes open-market purchases.

d.   None of the above is correct.

19) If the federal funds rate were above the level the Federal Reserve had targeted, the Fed could move the rate back towards its target by

a.   buying bonds. This buying would reduce reserves.

b.   buying bonds. This buying would increase reserves.

c.   selling bonds. This selling would reduce reserves.

d.   selling bonds. This selling would increase reserves.

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) During the recent financial crisis velocity decreased. This means that the rate at which money changed hands
a.   decreased. Other things the same, a decrease in velocity decreases the price level.
b.   decreased. Other things the same, a decrease in velocity increases the price level.
c.   increased. Other things the same, an increase in velocity decreases the price level.
d.   increased. Other things the same, an increase in velocity increases the price level.

22) Which of the following is *not* included in either M1 or M2?
a.   U.S. Treasury bills
b.   small time deposits
c.   demand deposits
d.   money market mutual funds

23) Suppose there are only two firms in an economy: Cowhide, Inc. produces leather and sells it to Couches, Inc., which produces and sells leather furniture. With each $1,000 of leather that it buys from Cowhide, Inc., Couches, Inc. produces a couch and sells it for $3,000. Neither firm had any inventory at the beginning of 2009. During that year, Cowhide produced enough leather for 20 couches. Couches, Inc. bought 80% of that leather for $16,000 and promised to buy the remaining 20% for $4,000 in 2010. Couches, Inc. produced 16 couches during 2009 and sold each one during that year for $3,000. What was the economy's GDP for 2009?
a. $48,000
b. $52,000
c. $64,000
d. $68,000

24) Sheri, a U.S. citizen, works only in Germany. The value she adds to production in Germany is included
a.   in both German GDP and U.S. GDP.
b.   in German GDP, but is not included in U.S. GDP.
c.   in U.S. GDP, but is not included in German GDP.
d.   in neither German GDP nor U.S. GDP.

25) John buys a used car for $5,400 and spends $600 on new parts, made in the U.S., to fix the car. The end result of these two transactions is
a.   U.S. consumption purchases increase by $5,400 and U.S. GDP increases by $5,400.

b.   U.S. consumption purchases increase by $6,000 and U.S. GDP increases by $6,000.
c.   U.S. consumption purchases increase by $600 and U.S. GDP increases by $600.
d.   U.S. consumption purchases increase by $600 and U.S. GDP increases by $6,000.

26) For an imaginary economy, the consumer price index was 62.50 in 2004, 100.00 in 2005, and 160.00 in 2006. Which of the following statements is correct?
a.   If the basket of goods that is used to calculate the CPI cost $80 in 2004, then that basket of goods cost $128 in 2005.
b.   If the basket of goods that is used to calculate the CPI cost $90 in 2005, then that basket of goods cost $150 in 2006.
c.   The overall level of prices increased by 97.5 percent between 2004 and 2006.
d.   All of the above are correct.

27) Which of the following is *not* a widely acknowledged problem with using the CPI as a measure of the cost of living?
a.   substitution bias
b.   introduction of new goods
c.   unmeasured quality change
d.   unmeasured price change

28) 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.

29) Suppose a country has a consumption tax that is similar to a state sales tax. If its government were to eliminate the consumption tax and replace it (i.e. raise same revenue) with an income tax that includes an income tax on interest from savings, what would happen?
a.   There would be no change in the interest rate or saving.
b.   The interest rate would decrease and saving would increase.
c.   The interest rate would increase and saving would decrease.
d.   None of the above is correct.

30) In the fourteenth century it is estimated that deaths resulting from the bubonic plague reduced the population by about a third. Assuming diminishing returns, the decrease in population should have
a.   increased productivity and real GDP per person.
b.   increased productivity but decreased real GDP per person.
c.   increased real GDP per person, but decreased productivity.
d.   decreased productivity and real GDP per person.

31) Suppose that a country increased its saving rate. In the long run it would have
a.   higher productivity, and another unit of capital would increase output by more than before.
b.   higher productivity, but another unit of capital would increase output by less than before.

c.   lower productivity, and another unit of capital would increase output by more than before.
d.   lower productivity, but another unit of capital would increase output by less than before.

32) Braden says that $400 saved for one year at 4 percent interest has a smaller future value than $400 saved for two years at 2 percent interest. Lefty says that the present value of $400 to be received one year from today if the interest rate is 4 percent exceeds the present value of $400 to be received two years from today if the interest rate is 2 percent.
a.   Braden and Lefty are both correct.
b.   Braden and Lefty are both incorrect.
c.   Only Braden is correct.
d.   Only Lefty is correct.

33) Al, Ralph, and Stan are all intending to retire. Each currently has $1 million in assets. Al will earn 16% interest and retire in two years. Ralph will earn 8% interest and retire in four years. Stan will earn 4% interest and retire in eight years. Who will have the largest sum when he retires?
a.   Al
b.   Ralph
c.   Stan
d.   They all retire with the same amount.

34) If people decide to hold more currency relative to deposits, the money supply
a.   falls. The larger the reserve ratio is, the more the money supply falls.
b.   falls. The larger the reserve ratio is, the less the money supply falls.
c.   rises. The larger the reserve ratio is, the more the money supply rises.
d.   rises. The larger the reserve ratio is, the less the money supply rises.

35) Which of the following is *not* a reason that paying efficiency wages may increase a firm's profit?
a.   Efficiency wages increase worker health and therefore increase worker productivity.
b.   Efficiency wages decrease worker turnover and therefore decrease hiring and training costs.
c.   Efficiency wages decrease worker shirking and therefore increase worker productivity.
d.   Efficiency wages decrease a country's natural rate of unemployment and therefore increase its standard of living.

36) In a closed economy, if Y remained the same, but G rose, T rose by the same amount as G, and C fell but by less than the increase in T, what would happen to private saving and overall national saving?
a.   national saving would fall and private saving would rise
b.   national saving would rise and private saving would fall
c.   both national saving and private saving would fall
d.   None of the above is correct.

37) Workland has a population of 10,000, of whom 7,000 work 8 hours a day to produce a total of 224,000 final goods. Laborland has a population of 5,000, of whom 4,000 work 12 hours a day to produce a total of 120,000 final goods.
a.   Workland has higher productivity and higher real GDP per person than Laborland.
b.   Workland has higher productivity but lower real GDP per person than Laborland.
c.   Workland has lower productivity but higher real GDP per person than Laborland.
d.   Workland has lower productivity and lower real GDP per person than Laborland.

38) Which of the following is human capital?
a.   a student loan
b.   understanding how to use a company's accounting software
c.   training videos for new corporate employees
d.   All of the above are correct.

39) The steps involved in calculating the consumer price index and the inflation rate, in order, are as follows:
a.   Choose a base year, update the basket, find the prices, estimate the basket's cost, compute the index, and compute the inflation rate.
b.   Choose a base year, fix the basket, find the prices, compute the inflation rate, compute the basket's cost, and compute the index.
c.   Fix the basket, find the prices, compute the basket's cost, choose a base year and compute the index, and compute the inflation rate.
d.   Fix the basket, find the prices, compute the inflation rate, compute the basket's cost, and choose a base year and compute the index.

40) In an imaginary economy, consumers buy only razors and cologne. The fixed basket consists of 6 razors and 4 bottles of cologne. A razor cost $20 in 2009 and $25 in 2010. A bottle of cologne cost $30 in 2009 and $40 in 2010. Using 2009 as the base year, which of the following statements is correct?
a.   For the typical consumer, the number of dollars spent on razors is equal to the number of dollars spent on cologne in each of the two years.
b.   The consumer price index is 310 in 2010.
c.   The rate of inflation is 29.17% in 2010.
d.   None of the above is correct.

YOUR NAME: _____

YOUR R.I.'s NAME:_____

WRITE THE LETTER OF YOUR CHOICE FOR THE MULTIPLE CHOICE QUESTIONS HERE;
ONLY THIS PAGE WILL BE GRADED FOR THE MC PART.

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

YOUR NAME: _____

YOUR R.I.'s NAME:_____