Barreto, Spring 2014, DePauw University

NAME: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Econ 390: Macro Topics

# Final Exam: The Keynesian Model and Short Run Fluctuations—SUGGESTED ANSWERS

*20 questions worth 5 points each.*

Open the Excel workbook Exam3S2014.xls. It is the only file you are allowed to have open. Do not cheat. If you have any questions, raise your hand and I will help you. I am using DyKnow to monitor you.

**Immediately Save As to your I drive folder.** You don’t have to change

the name of the file, but it has to be in your I drive folder so I can access it.

**Charting and Other Basics (4 questions)**

1. I used FRED to download gdpc1 in column A and unrate in column C of the *Chart* sheet. For the unemployment rate, I got the change from one time period to the next and for Real GDP, I got the compounded annual percentage change. Create a scatter plot of %RealGDP = f(U).

Note: the axes matter—put the change in unrate on the x axis.

See Exam3S2014Answers.xls.

**Save your workbook now.**

1. Add a trendline to the scatter plot and display the equation. Below, explain what this equation and scatter plot tells you about the relationship between unemployment and real GDP.

Its downward orientation means that a rise in the unemployment rate (a positive change in U) is associated with a fall in the % change in Real GDP so, as expected, output and unemployment are inversely related.

More technically (and not required in your answer), the intercept of 3.5% says that when the unemployment rate does not change, Real GDP grows at 3.5%. This equation is known more formally as Okun’s Law—where “law” is more like “rough, empirical regularity.”

1. As usual in the last part of the course, we downloaded Real GDP instead of Real GDP *per person*, as we took great pains to do in the first part of the course. Why are we ignoring population now? Add a graph to help you explain why population mattered before and does not matter now.

Y/pop

Because before we were working on the long run and now we’re focused on

fluctuations in the short run where changes in population don’t matter very much.

So, on the graph, we’re interested in a single frame of the movie or point

on the squiggly line, not the long run path of the economy.

time

1. Below your chart, enter a formula in a cell that computes the average compounded annual percentage change in Real GDP. In a text box, answer this question: Can we conclude that the US economy did spectacularly well over this time period since average growth in Real GDP is much greater than 2%, the magic number for excellent growth for a developed economy? Why or why not?

See Exam3S2014Answers.xls.

**Mechanics of the Keynesian Model (8 questions)**

1. Multipliers are a critical part of Keynesian macroeconomics. What exactly is a multiplier? Describe what it tells us and how it can be used.

A multiplier is a number that tells you the impact on output from a particular shock. So if the G multiplier is 4, then a $1 increase in G leads to a $4 increase in output.



1. Copy the *ISLMCS* sheet and rename it *2*. Increase G to $4 trillion and note that the G multiplier is 3.33. Now, click the  button and increase the L\_Y\_slope to 0.4 (from 0.2). Now click the  button and increase G to $4 trillion again. Note that the G multiplier falls to 2.5. Explain in a text box why the G multiplier has decreased as the L\_Y\_slope has increased, explicitly referring to the term *crowding out*.

See Exam3S2014Answers.xls.

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1. In your answer to question 2, you shifted money demand in the money market. Did it shift right or up? Explain why.

Money demand shifted right because it is a function of the interest rate which is being graphed on the y axis. Given an interest rate (and level of Y), we know how much money is demanded. The exogenous (independent) variable is on the y axis. Thus, when the relationship shifts, the entire schedule moves to the left or right.

1. Copy the *ISLMCS* sheet and rename it *4*. Make investment demand extremely elastic. It is easy to see that IS becomes very flat, but what happens to AD?

“Bert,” you say, “you forgot to show AD below ISLM.” No, I didn’t forget. I want you to derive the AD curve in this situation and figure out whether it is flat or steep. Show your work below. You may use your *4* sheet to help you puzzle out what is going on. Please explain your procedure and logic below.

A flatter IS will produce a flatter AD. This is because as P changes and real balances change, shifting LM, you will get a greater response from Y, like this:

LM(P2)

r

LM(P1)

LM(P0)

IS

Y

P

P2

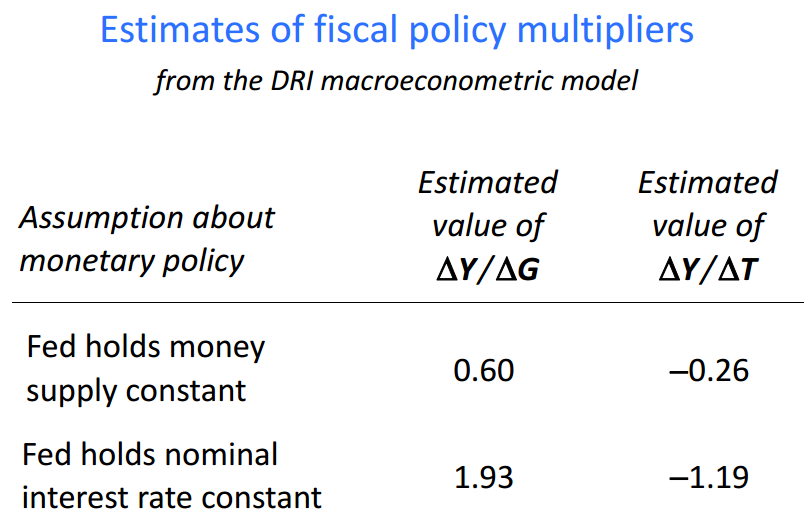
AD

P1

P0

Y

Use the table below to answer questions 5, 6, 7, and 8:



Source: <http://gatton.uky.edu/faculty/kim/ECO402/Ch%2011%20%20lecture.pdf> visited 6 May 2014.

1. Copy the *ISLMCS* sheet and rename it *5*. What can you do to the model in Excel to produce a G multiplier of roughly 0.6? In a text box on the sheet, briefly describe your procedure in answering this question.

Note: Remember that the  button can be used to set the base set of parameters.

See Exam3S2014Answers.xls.

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1. Copy the *ISLMCS* sheet and rename it *6*. From the initial equilibrium position ($17 trillion and 2.8%), suppose we apply a $1 trillion increase in G. The Fed can either do nothing (the first row in the table above) or it can change the money supply to hold the interest rate constant (the second row). In your sheet, increase G by $1 trillion and note that the G multiplier is 3.33 and then use Solver to find the value of the money supply needed to maintain the interest rate constant at 2.8%. (I will check your Solver dialog box to make sure you used Solver.) In a text box on the sheet, put the value of this “G & Ms combined” multiplier.

**Save your workbook now.**

1. The table and your Excel work in question 6 show that if the Fed attempts to hold interest rates constant in the face of a fiscal stimulus, the value of Y/G rises. Explain below why this happens.

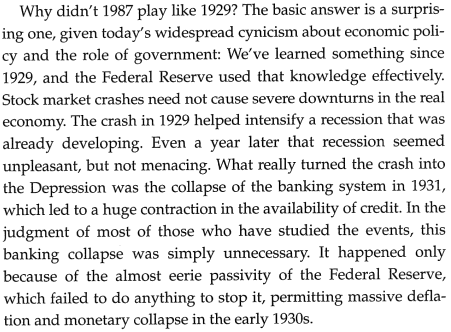
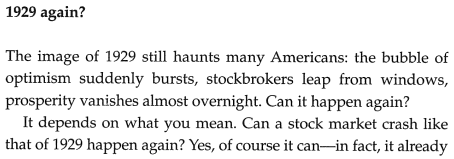
Because the G increase is going to push up interest rates (as IS shifts right), to hold interest rates constant, the Fed is going to have to expand the money supply (shifting LM down) and this is going to further increase Y. It’s almost like the Fed is breaking the Y 🡪 Md feedback mechanism by not allowing interest rate increases to crowd out G.

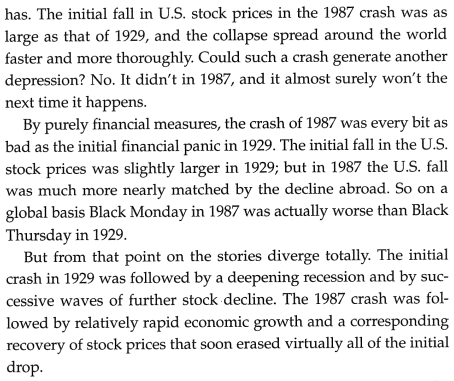
1. The tax multiplier is smaller (in absolute value) than the G multiplier in the table above. Is this some kind of law of Keynesian models or can the tax multiplier ever be bigger than the G multiplier? Explain.

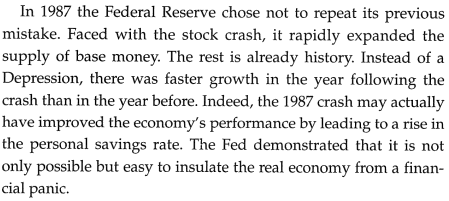
Yes, it’s guaranteed because T always works through C while G has a direct effect on C + I + G. So, when you do the repeated rounds of spending that produce the multiplier effect, T always has a missing initial round. The rest of the rounds are the same (assuming the two policy moves share the same MPC) so G will always be more powerful than T.

**Applying the ISLMADAS Model (8 questions)**

Carefully read the excerpt below. Note the date when it was written, 1997.

Paul Krugman, *The Age of Diminished Expectations* (1997, 3rd. ed), pp. 213-215:





October 19, 1987

Let’s interpret individual pieces of the excerpt via the ISLMADAS model.

1. When the stock market crashes, how is it reflected in the ISLMADAS model? Why?

As a shift in PE and IS in the goods market via decreases in C and/or I. The idea is that consumers spend based on income, which is partly derived from stock market returns and capital gains (although we don’t have this in our Excel model). Firm investment decisions are also affected by stock market performance so it stands to reason that a crash will affect expectations and depress “animal spirits.”

1. Why would “the almost eerie passivity of the Federal Reserve” during the Great Depression produce “massive deflation”? Draw a single graph that supports your answer.

Y

P

Since price is mentioned, the graph has to be ADAS. This question gets

SRAS

at the long run behavior of the model. After a decrease in AD, the model

SRASn

will return to full employment via shifts in SRAS. It’s unclear how long

this will take, but eventually we’ll get back to Yf denoted by the dashed

AD

line. Notice how prices are falling throughout this process. That’s the

ADnew

“massive deflation” we would see.

1. Krugman states that, in 1987, the Fed “rapidly expanded the supply of base money,” but he doesn’t provide any graphs to show how this rescued the economy. Use the graphs provided below to explain how monetary policy worked in this case. Start the economy already sliding into recession from the stock market crash and label everything carefully. I am looking for correct shifting and placement of all curves. Please indicate with the parentheses style what is going on. For example, a G increase (which does *not* apply in this case) would shift IS from IS(G0, T0) to IS(G1, T0). Draw arrows (correctly up/down or right/left) to indicate shifts.

r

Y

Y

P

P0

M1/P1

M0/P0

r

LM(M0,P0)

LM(M1,P1)

L(Yf)

IS

L(Y0)

$

SRAS

P1

AD(M0)

AD(M1)

Yf

Y0

The Fed’s increase in the money supply is first incorporated as a shift right in AD. This is the final answer. We then show the effect in ISLM as a downward shift in LM composed of two shocks, the increase in M and the increase in P, where M outweighs P and LM shifts down. The money market is last. It will have a rightward shift in both supply and demand with supply increasing because M outweighs P and L shifting because Y increased.

1. Proceed to the *FedFunds* sheet. I used FRED to get the federal funds rate (this will be our measure of the interest rate in the ISLMADAS model you drew above). Does the fed funds data support Krugman’s claim that the Fed took swift, decisive action during the October 1987 stock market crash? Why or why not?

Yes, it does. You can see a 0.6% point drop in the fed funds rate in the monthly data in November of 1987. This is evidence that the Fed stimulated the economy by increasing the money supply and lowering interest rates that month. It’s not a very big drop, but it does support the claim that Fed did something during this stock market crash, as opposed to the 1929 crash.

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1. Using just the ISLM model (i.e., P is fixed), if the Fed increased the money supply and we had an asset market equilibration process, does the graph below show how we would reach the new equilibrium? Explain.

r

Y

LM

No, this is wrong. We would move directly down to the LM’ curve,

LM’

clearing the money market first, then crawl up the LM curve until

we hit the intersection of LM’ and IS.

Asset market equilibration means we are always in equilibrium

in the money market and that diagonal arrow does not reflect

IS

being in equilibrium in the money market until it hits the new

equilibrium solution.

1. Suppose that after the October crash, the SRAS became very steep as shown below. The Fed is obviously going to have trouble stimulating AD to get to Yf, but what is happening in the ISLM graph when the Fed increases the money supply? Draw what is happening to IS and LM on the right and explain what is going on.

P

P1

SRAS

LM(M0,P0)

r

Y

IS

LRAS

P0

LM(M1,P1)

AD(M1)

AD(M0)

Y0

Yf

Y

Since SRAS is so steep, an increase in M will trigger a huge increase in P (in ADAS graph) which almost completely offsets the increase in M so the LM shifts down only a little and Y barely rises. This is a hard question because you have to connect the big increase in P to the small total shift in LM.

1. Focusing on just the ADAS graph, if the Lucas critique had been operating in 1987, then how and why would the economy not have recovered?

Note: It makes sense to start the analysis supposing that the economy is in recession and the Fed announces a policy of stimulating AD by lowering interest rates.

Because when the Fed announced it was stimulating the economy, agents would anticipate inflation and price expectations would shift the SRAS curve back, cancelling the effect of the stimulus on Y and producing inflation.

1. It would be interesting to know if Krugman regrets the last sentence, but for this exam, let’s focus on why it wasn’t easy to insulate the real economy from a financial panic in 2008. I am not looking for wild speculation on your part, but an answer that shows you know something about what the Fed did during the Great Recession and why it did not work like in 1987.

The Fed massively increased the money supply and drove interest rates to almost zero and it was still not enough to stimulate AD because the housing and stock market collapses were so big. Once they hit the zero lower bound, the Fed was forced to resort to creative new ways to try to stimulate AD. These new policies, such as TARP and QE I and II, are not as effective at managing AD as decreasing interest rates. The news last month was quite encouraging, however.