

FINAL EXAM (Solutions)

Answer the following questions True, False, or Uncertain. Briefly explain your answers. No credit without explanation. (8 points each).

1. The Bank of Canada controls the money supply.

FALSE/UNCERTAIN. The Bank of Canada controls the *monetary base*. Usually, the money supply is defined as currency in circulation plus checkable deposits. This kind of broader measure of the money supply is a *multiple* of the monetary base. If M is the money supply and H is the monetary base, we have

$$M = \mu H$$

where μ is the money multiple $\mu = (1 + cu)/(rr + cu)$, where the currency/deposit ratio and reserve/deposit ratio are determined by the portfolio decisions of households and banks.

2. Reducing inflation causes the unemployment rate to rise.

UNCERTAIN. It depends on whether the disinflation is *credible* (ie., expected). Credible disinflations need not increase unemployment. (For full credit, they should mention the “expectations-augmented Phillips Curve”).

3. According to the Mundell-Fleming model, output is more stable under flexible exchange rates than under fixed exchange rates.

UNCERTAIN. It depends on what kind of shock is more important. Flexible rates lead to more stability when shocks are real (i.e., shift the IS curve). Fixed exchange rates lead to more stability when shocks are to the financial markets (ie., shift the LM curve). (For full credit, they should show the graphs. See pgs. 12-13 in the slides for lecture 16).

4. Real Business Cycle models predict that output growth is uncorrelated with money growth.

FALSE/UNCERTAIN. RBC models generally predict money is neutral. However, it is *possible* that output and money are positively correlated due to *reverse causation*. For example, if the central banks stabilized the price level, the changes in output (due to a productivity shock) cause the central bank to increase the money supply in the same direction). (See pg 8 in the slides for lecture 18).

5. Inflation targeting will de-stabilize output when there are supply shocks.

TRUE. (See the graph on pg 5 of the slides for lecture 22A).

The following questions are short answer. Briefly explain your answer. Clarity will be rewarded.

6. (20 points). The U.S. economy is currently in a recession. At the same time, inflation has been falling.
- (a) Use the AD-AS model to describe what must be happening in the U.S. economy. What sort of shock must have occurred? Do you think this is more supportive of the Keynesian or Classical approach to business cycles? Why?
 - (b) Use the IS-LM model to describe two reasons why this may have occurred.
 - (c) Briefly discuss two policy responses to the recession. How do they differ? Suppose no policy response is taken. What would happen over time? Would the economy stay in recession? Why or why not?

PART (A): The combination of declining output and falling inflation suggests a downward shift in the AD curve. (For full credit, they should show the graph). This is probably more supportive of a Keynesian approach. In the simplest RBC models (with vertical AS curve), falling output should be accompanied by a *rising* price level and inflation rate. To explain the combination of falling output and inflation, the Classical approach would need to appeal to the Lucas supply curve (or ‘misperception model’). This also generates an upward sloping AS curve, and can therefore explain why declines in AD might produce declines in output. However, this approach has a hard time explaining *persistence*, since it attributes the output response to expectational errors, which should be rapidly corrected. (According to the NBER, the U.S. economy has already been in a recession for nearly a year!).

PART (B): The AD curve can shift down either because: (1) The IS curve shifts left, or (2) the LM curve shifts left. The IS curve might shift left if firms lower their expectations about the profitability of future investment projects (expected decline in future MPK). The LM curve might shift left if households and firms lose confidence in the financial system and decide to hold more money (and fewer interest-bearing assets). Increases in money demand shift LM to the left. They also can produce a decline in the money multiplier, which also shifts LM to the left. (Note: Please read through the answers carefully, since there could be other possibilities).

PART (C): In principle, either an expansionary monetary or fiscal policy could be used to respond to the recession. Monetary policy works by lowering interest rates, and thereby encouraging investment and consumption. A potential problem can occur if interest rates get very low, since nominal rates are bounded at zero. At this point, real rates can remain high if there is significant deflation. Fiscal policy works by directly increasing demand. Potential problems occur if the fiscal expansion takes the form of tax cuts, since households may decide to save the extra income in response to increased uncertainty about future income prospects. At the same time, direct government expenditures may simply crowd out private spending, thus we have Keynes’ (in)famous recommendation that governments should pay people to dig holes and then fill them up again!

Eventually, at least if the recession is caused by a shortfall of AD, the recession will produce enough of a decline in the price level that M/P rises enough so that LM shifts back (and AD shifts out) to intersect output at the FE line. (For full credit, they should show this in a graph).

7. (20 points). China has a fixed exchange rate against the U.S. dollar. Suppose the U.S. economy experiences a severe recession. Would China be better off with a fixed exchange rate, or should it allow its exchange rate to float? Does your answer depend on *why* the U.S. economy experiences a recession? Use the Mundell-Fleming model to illustrate your answer.

ANSWER: It depends on whether the U.S. recession is caused by an LM shift or an IS shift. If the U.S. recession is caused by a left shift of LM (perhaps due to an increased money demand), then this will cause output in China to fall as well (to maintain its fixed exchange rate, China will need to match the U.S. monetary contraction). In this case, China would be better off, at least in terms of avoiding a recession, by having a flexible exchange rate. Its currency would tend to depreciate, and this would restore some of the decline in demand for Chinese goods. (Interestingly, we seem to be seeing this in the data!).

On the other hand, if the U.S. recession is mainly caused by a left shift of IS, then lower U.S. interest rates in the U.S. would require monetary expansion in China, and this would automatically help offset the decline in demand coming from lower U.S. income. With a flexible exchange rate, China's currency would *appreciate* in this case, and this would cause a further decline in demand for Chinese goods.

8. (20 points). Canada has a flexible exchange rate against the U.S. dollar. Suppose the U.S. and Canadian economies are both in a recession. The U.S. authorities can respond to their recession by either cutting interest rates, or by increasing government spending. As a Canadian, which would you prefer? Why? (Hint: Use the Mundell-Fleming model).

ANSWER: Given the flexible exchange rate, and the fact that *both* economies are in recession, Canada should prefer a U.S. *fiscal* expansion. This will tend to strengthen the U.S. dollar (due to higher U.S. interest rates), and this will then cause an expenditure switch toward Canadian goods. If the U.S. were to pursue monetary expansion instead, this would produce the opposite effect. Lower U.S. interest rates would depreciate the U.S. dollar, and this would reduce demand for Canadian goods.