EC290 A/B Mid-Term Examination - February 15th, 2012

February 7, 2012

Student Information

Name: _____

Student Number: _____

Course Section (A or B): _____

Examination Instructions

- The exam length is 80 minutes
- There are 50 points in this exam (10 points for multiple-choice questions, 40 points for short-answers)
- Non-programmable calculators *are* permitted
- Don't be stupid (i.e. keep your eyes on your own exam)

ANSWER KEY

1 Multiple Choice Questions - Circle Your Response (2pts each)

1. The IS curve will shift to the right in direct response to which one of the following shocks:

   (a) An increase in international capital inflows
   (b) A decrease in the income tax rate
   (c) A decrease in government purchases
   (d) An increase in the volume of bank loans (decrease in the reserve ratio)

2. Using the Uncovered Interest Parity Condition, if Canada's rate of interest is 1% and the United States' rate of interest is 0.5%, investors must expect that the Canadian dollar will:

   (a) Depreciate by exactly 0.5%
   (b) Appreciate by approximately 0.5%
   (c) Depreciate by approximately 0.5%
   (d) Appreciate by exactly 0.5%

3. Consider an economy closed to international trade with an exogenous level of government purchases. If the marginal propensity to consume is 0.6, the income tax rate is zero, and the multiplier is 10, what must be the marginal propensity to invest? Ignore feedbacks through the financial markets.

   (a) 0.1
   (b) 0.2
   (c) 0.3
   (d) Insufficient information to answer

4. If the government wishes to increase GDP, lower the interest rate, and increase net exports, what should it do? Assume international capital flows are not perfectly mobile and the country operates a fixed exchange rate regime. Assume the government selects only one policy, not a mix of policies.

   (a) Devalue the domestic currency
   (b) Increase the money supply
   (c) Lower income tax rates
   (d) Eliminate capital gains taxes

5. Consider an economy with fixed exchange rate operating in a world of perfect capital mobility. An increase in the money supply will:

   (a) Not be possible
   (b) Lower the interest rate and increase GDP
   (c) Devalue the currency
   (d) Increase GDP and interest rates will remain unchanged

2 Short Answer Questions

2.1 (10pts) IS-LM Model

Consider a closed economy characterized by the following set of equations

- $C = c_0 + c_1(Y - T)$
- $I = b_0 + b_1 Y - b_2 i$
- $G = \bar{G}$
- $T = tY$
- $M^d = d_1 Y - d_2 i$
- $M^s = \bar{M}/P$

(a) (6pts) Derive the IS and LM curves and clearly identify the expression for the multiplier?

- IS Curve : ① $Y = Z$

② $Z = C + I + G$

$= c_0 + c_1 Y - c_1 t Y + b_0 + b_1 Y - b_2 i + \bar{G}$

$= (c_0 + b_0 - b_2 i + \bar{G}) + (c_1(1-t) + b_1) Y$

① → ② $\Rightarrow$ $Y(1 - c_1(1-t) - b_1) = (c_0 + b_0 - b_2 i + \bar{G})$

$$Y = \left(\frac{1}{1 - c_1(1-t) - b_1}\right)(c_0 + b_0 - b_2 i + \bar{G})$$

multiplier for $\bar{G}$

OR:

$$i = \frac{c_0 + b_0 + \bar{G}}{b_2} - \left(\frac{1 - c_1(1-t) - b_1}{b_2}\right) Y$$

- LM curve : $M^d = M^s$

$\Rightarrow \bar{M}/P = d_1 Y - d_2 i$

$\Rightarrow$

$$Y = \frac{\bar{M}/P + d_2 i}{d_1}$$

OR:

$$i = \left(\frac{d_1}{d_2}\right) Y - \frac{\bar{M}/P}{d_2}$$

- Multiplier :

$$\frac{1}{1 - c_1(1-t) - b_1 + \frac{b_2 d_1}{d_2}}$$

(b) (2pts) If business owners become more optimistic about future economic activity and increase their autonomous investment by Δ, by how much will equilibrium GDP increase by?

$$\Delta Y = \left(\frac{\Delta I}{1 - c_1(1-t) - b_1 + \frac{b_2 d_1}{d_2}} \right)$$

(c) (2pts) How would your answer to part (b) change if $d_1 = \infty$. Use a diagram to support your answer.

$d_1 = \infty \Rightarrow$ LM vertical

$\Rightarrow \Delta Y = 0$.

FROM BOOK, CH 4 Q6

2.2 (10pts) Money and Banking

Suppose the following assumptions hold:

- The public holds no currency.
- The ratio of reserves to deposits is 0.05.
- The demand for money is given by: $M^d = (0.5 - 2i)Y$

Initially, the monetary base is \$250 billion, and nominal income is \$20 trillion.

(a) (2pts) What is the demand for high-powered money?

$$\frac{1}{r} H = M^d$$

$$\Rightarrow H = r M^d$$

$$= 0.05 (0.5 - 2i) Y$$

(b) (3pts) Find the equilibrium interest rate by setting the demand for high-powered money equal to the supply of high-powered money.

$$250 \text{ B} = 0.05 (0.5 - 2i) 20000 \text{ B}$$

$$\Rightarrow 5000 \text{ B} = (0.5 - 2i) 20000 \text{ B}$$

$$\Rightarrow 0.25 = 0.5 - 2i$$

$$\Rightarrow 2i = 0.25$$

$$i = 0.125$$

$$\Rightarrow 12.5\%$$

(c) (2pts) What is the overall supply of money? Is it equal to the overall demand for money at the interest rate you found in (b)?

$$M^s = \frac{1}{r} H = \frac{1}{0.05} 250 \text{ B}$$

$$= 5000 \text{ B} \quad (\text{or } 5\text{T})$$

$$M^d @ i = 0.125 \Rightarrow (0.5 - 2(0.125)) 20000 \text{ B}$$

$$\Rightarrow 5000 \text{ B} \quad (\text{or } 5\text{T})$$

✓ Yup.

(d) (3pts) What is the impact on the interest rate if high-powered money is increased to $500 billion?

if H ↑ to 5 B

then $500 \text{ B} = 0.05 (0.5 - 2i) 20000$

$$\Rightarrow 10000 \text{ B} = (0.5 - 2i) 20000 \text{ B}$$

$$\Rightarrow 0.5 = 0.5 - 2i$$

$$\Rightarrow 2i = 0$$

$$\Rightarrow i^* = 0$$

0%.

2.3 (10pts) IS-LM-BP with Fixed Exchange Rates

Consider an economy with fixed exchange rates characterized by the following set of equations

- $C = 100 + 0.6(Y - T)$
- $I = 0.2Y - 1000i$
- $G = 500$
- $NX = 0.05Y^* + 0.9\varepsilon + 0.8\varepsilon^2 - 0.05\varepsilon Y$
- $T = 0.25Y$
- $M^d = 0.1Y - 10i$
- $M^s = 1000$

(a) (2pts) Derive an expression for the level of income associated with balanced-trade.

$NX = 0$ when $Y = Y_{TB}$

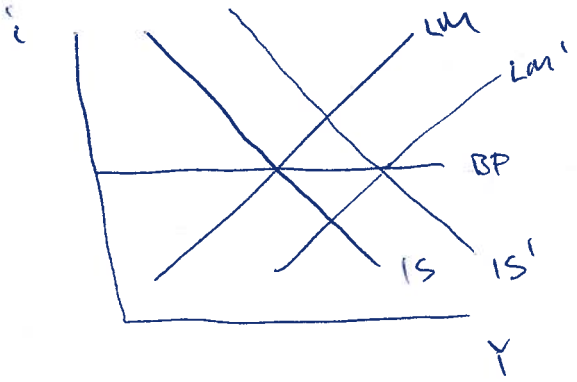
$\Rightarrow 0 = 0.05Y^* + 0.9\varepsilon + 0.8\varepsilon^2 - 0.05\varepsilon Y_{TB}$

$\Rightarrow Y_{TB} = \frac{1}{\varepsilon}Y^* + \frac{0.9}{0.05} + \frac{0.8}{0.05}\varepsilon$

(b) (2pts) Derive the BP-curve if international capital flows are perfectly mobile.

$i = i^*$

(c) (6pts) If capital flows are perfectly mobile, by how much will GDP change if the government increases purchases by 100? Provide detailed diagrams and *point-form* descriptions to defend your answer.



G ↑

$\Rightarrow$ IS to IS'

$\Rightarrow$ BP > 0

$\Rightarrow M^s$ ↑

$\Rightarrow$ LM to LM'

ΔY same as CH3.

$$\text{Multiplier} = \frac{1}{1 - 0.6(1 - 0.25) - 0.2 + 0.05} = 2.5$$

$\therefore \Delta Y = 2.5\,\Delta G$

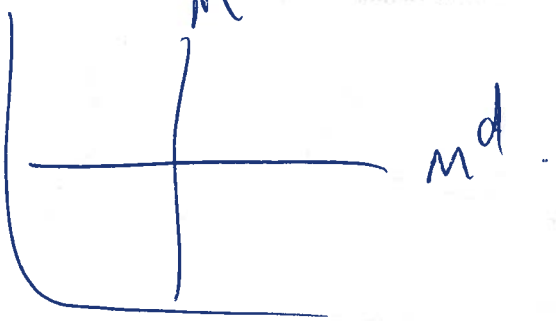
$= 250$

2.4 (10pts) Government Policy in a Liquidity Trap

(a) (2pts) In no more than one sentence, define "liquidity trap." Also, illustrate equilibrium in the financial markets in this situation.

~~[illegible]~~ · Infinitely elastic M^d

· flat M^d.



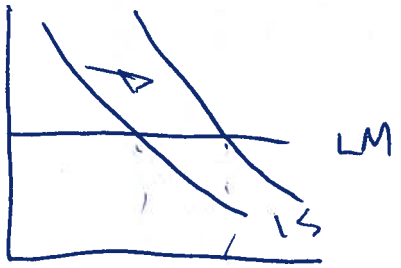
(b) (2pts) In what situation (covered in lecture) might a liquidity trap arise? *Be brief.*

- Low interest rates.

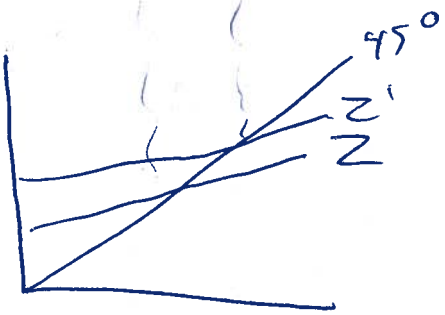
· M^d extremely sensitive to i

· $d_2 \longrightarrow \infty$

(b) (3pts) With the aid of the 3-diagram IS-LM framework, determine the effect on GDP of expansionary fiscal policy in the presence of a liquidity trap. How large is the multiplier relative to what the goods-market-only framework (CH3) would have predicted?



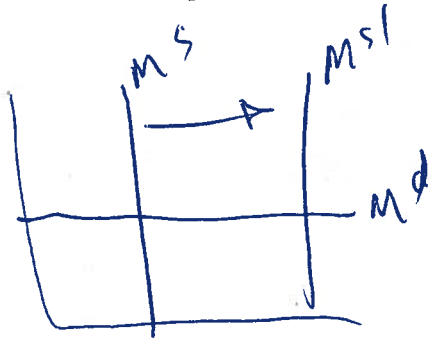
G ↑
⇒ Z ↑
⇒ IS right.

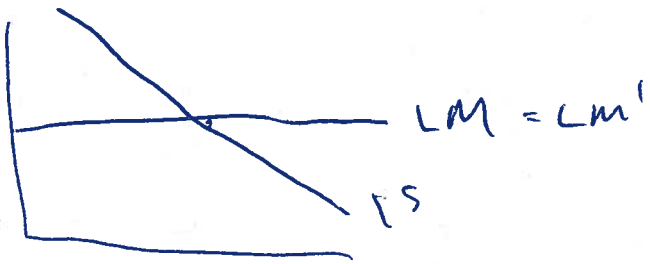


ΔY same as CH3 predicts.

No crowding out.

(c) (3pts) With the aid of the 3-diagram IS-LM framework, determine the effect on GDP of expansionary monetary policy in the presence of a liquidity trap. How large is the multiplier relative to what the standard IS-LM situation would have predicted?

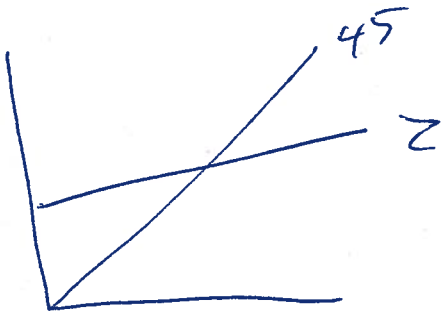




M^S ↑

⋯ LM to LM'

⋯ nothing happens.



$\Delta Y = 0$ < than CH3 predicts.

2.5 (5 pts) Bonus Question

- (3pts) Identify the plot at the bottom of this page. What does it show, what do the different lines represent?

- each line is a post-war recession.
- plots employment relative to peak

- (2pts) Identify the two lines with box-arrows pointing to them. Fill in the blank boxes.