CARLETON UNIVERSITY
Department of Economics
Intermediate macroeconomics -ECON 2102*C

ANSWERS MIDTERM EXAM –TYPE I

Professor F. Demers **October 21, 2013**

This exam has **3 pages.** The duration of the exam is **1hr and 30 min.** The exam has **TWO PARTS**. The weight of each part is indicated next to its title. **Please read the questions carefully. Allocate your time efficiently.**

PART I

MULTIPLE CHOICE QUESTIONS (21pts)

Consider the following table for questions 1 and 2:

	Price (2009, base year)	Quantity (2009, base year)	Price (2012)	Quantity (2012)
Sweatshirts	$ 10	16	$25	14
DVD's	$ 25	4	$12	12

1. Assume that only sweatshirts and DVD's are produced in this economy. According to the Table above, **the GDP deflator** in 2012 was approximately:

a. 112.3
b. 212.5
c. 172.3
d. 103.5

ANSWER: a

2. Assume that the basket of goods consumed by a middle income urban household is made up of sweatshirts and DVD's consumed in 2009. According to the Table above, **the CPI** for 2012 was approximately:

a. 112.3
b. 212.5
c. 172.3
d. 103.5

ANSWER: c

3. If the adult population increases by 3 %, the labor force increases by 5 % and the number of unemployed persons increases by 4 % then

a. the labor force participation rate increases by 2% and unemployment increases by 1%
b. the labour force participation rate falls by 1% and the unemployment rate increases by 1%
c. the labour force participation rate increases by 2% and the unemployment rate falls by 1%
d. the labour force participation rate falls by 2% and the unemployment rate falls by 1%

ANSWER: c

4. The trains produced by Bombardier (a Canadian company) in its factory in northern France _____ in French GDP. The profits distributed to Bombardier's Canadian shareholders _____ in Canadian GNP.

a. count, count
b. count, do not count
c. do not count, count
d. do not count, do not count

ANSWER: a

5. A _____price index like the CPI _____ the change in the cost of living because it _____ take into account that people can substitute less expensive goods for ones that have become more expensive.

a. fixed-weight; underestimates; does not
b. variable-weight; overestimates; does
c. variable-weight; accurately estimates; does
d. fixed-weight; overestimates; does not

ANSWER: d

6. All other things equal, if the price of foreign-made cars rises, then the GDP deflator

a. and the CPI will rise by equal amounts.
b.. will rise and the CPI will remain the same.
c. will remain the same and the CPI will rise.
d. and the CPI will rise by different amounts.

ANSWER: c

7. When bread is baked today, but is put away to be sold later, this is called

a. waste, and GDP falls.
b. saving, and GDP falls.
c. fixed investment, and GDP rises.
d. inventory, and GDP rises

ANSWER: d

PART 2 (79 pts)

Please read the questions carefully. When asked to draw a graph, label the axes, the curves etc. and draw the graph neatly. Whenever appropriate explain in words what your reasoning is.

(28) 8. Consider an economy which is initially in a long-run equilibrium situation.

(14) (a) What is the short-run and long-run impact of an **adverse supply shock**? Explain in words and illustrate with a carefully labeled graph. **Give an example of an adverse supply shock.**

(14) **(b)** Should the Bank of Canada "accommodate" this shock? What are the **advantages and disadvantages** of such a decision on the part of the Bank Canada? **Explain in words.** Draw a graph illustrating the response of the economy when the Bank of Canada fully accommodates the shock.

(Label your graph carefully and explain in words what happens to the price level and to output.)

ANSWER

As in Chapter 9, pp.310-311. See Figures 9-12 and 9-13.

(a) An adverse supply shock causes the price level to rise and the output level to fall in the short run.
If the Bank does not intervene, then as the shock gradually disappears, the price level will gradually fall back to its initial level and the output level will also slowly go back (increase) to its initial level. This takes time and we may suffer a lengthy recession.

Examples of an adverse supply shock could be an increase in the price of oil or an increase in food prices, etc.

b) Full accommodation by the Bank of Canada means that the Bank increases the money supply right after the shock. This move by the Bank has both a benefit and a cost.

The benefit is that it leads to an increase in aggregate demand. The AD curve shifts to the right, and intersects the long-run aggregate supply curve at the initial output level Y_f (full-employment output) which we had before the shock. Hence, output does not fall as a result of the shock, and we avoid a recession.
However, the cost is that now the price level will be permanently higher.
Therefore the Bank faces a dilemma, and must choose between a possibly lengthy recession if it does nothing, and an increase in prices (i.e. inflation) if it accommodates the shock.

This is the full answer. To get full marks, students should provide the graph as in the textbook and label it correctly. Then they should briefly explain why there is a dilemma, what accommodation means and what happens when the Bank accommodates the shock.

(21) **9.** Consider an economy that is initially in long-run equilibrium.

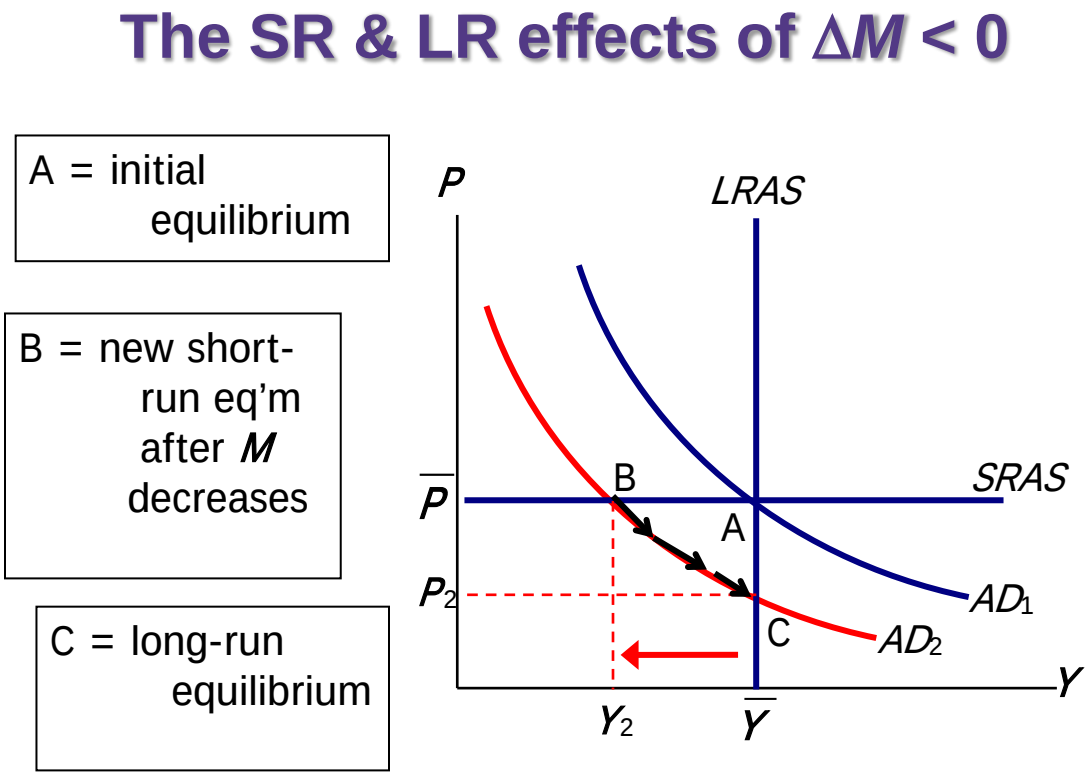
(5) **(a)** Draw a graph of aggregate supply and aggregate demand in this **initial** long-run equilibrium.

(8) **(b)** Now, consider the *short run* impact of an aggregate demand shock such as a **decrease** in the money supply. That is, suppose that the Bank of Canada decreases $\bar{M}$. Use the graph that you drew in question **9(a)** to illustrate this new *short-run* situation.

(8) **(c)** What is the *long-run* impact of the decrease in the money supply? Once the economy adjusts to a new long run equilibrium at the **new** level of $\bar{M}$, what happens to the new long-run values of *P* and *Y*? Explain in words. Illustrate this situation on the graph that you drew in question **9(a).**

Note: You may use a single graph to illustrate (a), (b) and (c). Be sure to **label each equilibrium point clearly and indicate the path of adjustment with arrows.**

ANSWER:



a) The initial equilibrium is at point A.

b) When AD shifts **to the left**, in the short run the price level remains fixed at $\bar{P}$, while output falls to Y_2. The economy is in a recession since output is below the full-employment level.

c) Then gradually, the price level will fall until it reaches P_2 while output returns to the full-employment (or natural rate) level. The long run impact is **a fall in prices.** Output stays the same as in the **initial** long-run situation.

(30) 10. Consider the following short-run model of an economy. The goods market is described by:

$$C = 275 + 0.75\,(Y - \overline{T})$$
$$I = 800 - 60\,r$$
$$\overline{G} = 575$$
$$\overline{T} = 200$$

Planned expenditures are given by $PE = C + I + G$. The goods market is in equilibrium when $Y = PE$.

(7) **(a)** Find the equation of the IS curve in this model. What does the IS equation represent?

(8) **(b)** Let $r = 5$. Calculate the equilibrium level of output Y. What is the government purchases multiplier? Show your work**.**

(5) **(c)** Draw a "Keynesian cross" diagram illustrating the goods market equilibrium for this economy. Label the axes, the intercepts, the curves and the equilibrium point.

(10) (d) Consider an equal **increase** in government expenditures and in taxes of **100** units each so that the budget deficit remains the same as in the initial problem. (Assume that the interest rate stays the same, i.e., $r = 5$.)

(i) **Calculate** the impact of such a fiscal policy mix on output. Is this fiscal policy mix expansionary, contractionary or neutral? (That is, does equilibrium output increase, decrease or remain the same as a result of this fiscal policy mix?) **Explain why.**

(ii) In the "Keynesian cross" diagram you drew for part **(c),** indicate graphically the impact of this policy.

ANSWER:

(a) 7 pts (5 pts. for the derivation, 2 pts for the definition of the IS eq.)

$$PE = C + I + G$$

$$PE = 275 + 0.75(Y - 200) + 800 - 60r + 575$$

$$In\ equilibrium\ Y = PE$$

$$Therefore, Y = [275 + 800 + 575 - (0.75)200] + 0.75Y - 60r$$

$$[1 - 0.75]\mathrm{Y} = 1500 - 60\mathrm{r}$$

Solving for *Y*, we obtain the IS equation:

$$Y = \left[\frac{1}{1 - MPC}\right][1500 - 60r]$$

$$Y = \left[\frac{1}{1 - 0.75}\right][1500 - 60r]$$

$$Y = 6000 - 240r$$

Also correct: Alternatively, the IS equation may also be given by solving for *r* in terms of *Y* from the above equation. That is, defining $\bar{A} = [275 + 800 + 575 - (0.75)200] = 1500$

$$r = \frac{1}{b}\bar{A} - \frac{1 - MPC}{b}Y$$

$$= \frac{1}{60}1500 - \frac{0.25}{60}Y$$

$$or\ r\ = 25 - 0.00417Y$$

Definition: The IS equation represents income (Y) and interest rate (r) combinations such that the goods market is in equilibrium.

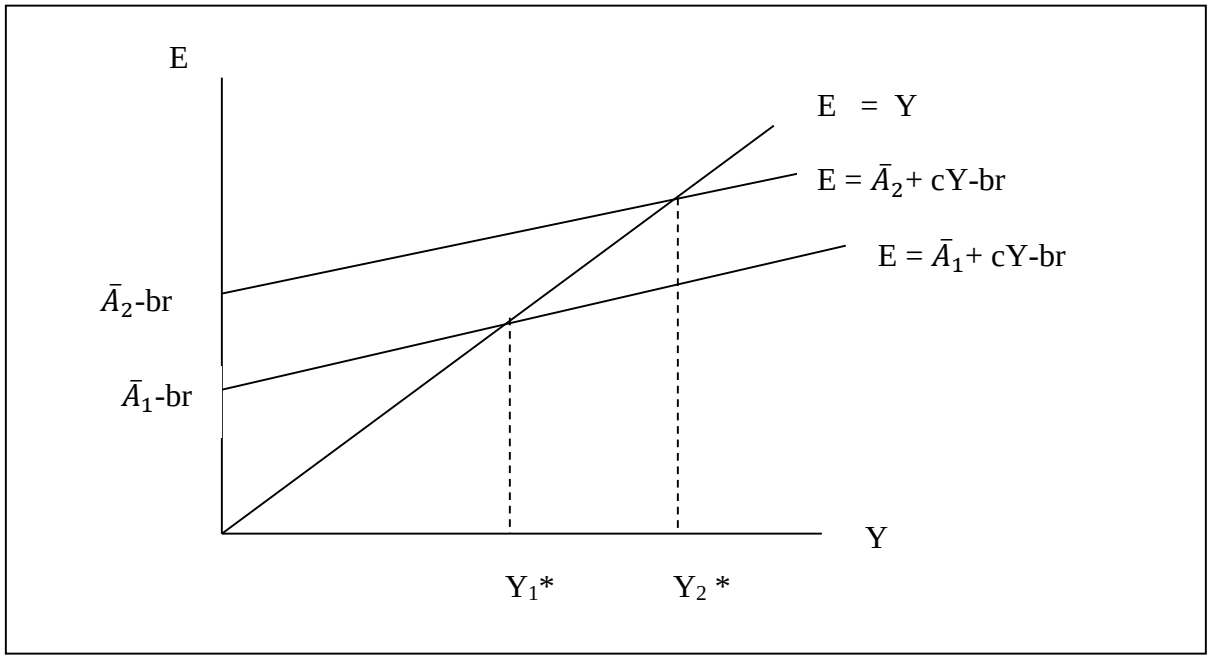
(b) Since $r = 5$, using the IS equation found in part (a) we find

$$Y_1^* = 4800$$

The multiplier is given by

$$\frac{1}{1 - MPC} = \frac{1}{1 - 0.75} = 4$$

(c)



d)) 7 pts for the calculation (<u>one</u> of the calculation methods below), 2pts for indicating whether contractionary or expansionary and 1pt. for indication on the graph.

$$Y = \left[\frac{1}{1-MPC}\right]\{[\bar{C} + \bar{I} + \bar{G} - MPC \cdot \bar{T}] - br\}$$

Hence, with *r* remaining the same at $r = 5$ as before,

$$\Delta Y = \left[\frac{1}{1-MPC}\right][\Delta\bar{G} - MPC \cdot \Delta\bar{T}]$$

$$that\ is,\quad \Delta Y = \left[\frac{1}{1-0.75}\right][\Delta\bar{G} - 0.75 \cdot \Delta\bar{T}]$$

$$\Delta Y = 4\,[(100) - 0.75(100)]$$

$$\Delta Y = 100$$

Output increases by 100 units. Hence this measure is expansionary.

Alternatively, you can calculate what the new level of $\bar{A}$ is with $\overline{G}$ =675 and $\overline{T} = 300$. You find $\bar{A} = 1525$. Then repeat the steps in (a) above, and compare the initial level of output ($Y = 4800$ with the new level ($Y = 4900$).

$$Y_2^* = 4[1525 - 60(5)]$$
$$Y_2^* = 4900$$

Still another way of obtaining the result (letting c denote the *MPC*) is as follows (using the **"balanced budget multiplier"**):

We know that:

$$\Delta\bar{G} = \Delta\bar{T} = 100$$

Therefore, we can substitute for $\Delta\bar{T} = 100$ so that

$$\Delta Y = \left[\frac{1}{1 - MPC}\right][\Delta\bar{G} - MPC \cdot \Delta\bar{G}]$$

$$\Delta Y = \left[\frac{1}{1 - MPC}\right][(1 - MPC) \cdot \Delta\bar{G}]$$

$$\Delta Y = \left[\frac{1 - MPC}{1 - MPC}\right] \cdot \Delta\bar{G}$$

Or,

$$\Delta Y = \Delta\bar{G}$$

That is, the balanced budget multiplier is equal to one.