SOLUTIONS

ECO 209Y
MACROECONOMIC THEORY AND POLICY

Term Test #1

October 26, 2018

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INSTRUCTIONS:

- The total time for this test is ***1 hour and 45 minutes***.
- The only aid allowed is a ***non-programmable*** calculator.
- ***Write your name and identifying information above but keep this test paper closed until the start of the test is announced.***
- There are three parts to the test: ***Part I*** consists of 14 multiple-choice questions (35 points); ***Part II*** consists of one quantitative problem (15 points); and ***Part III*** includes 3 short-answer questions (30 points). The ***total*** point-value of the test is ***80 points***.
- The answers to the 14 multiple-choice questions of ***Part I*** must be recorded in the ***bubble sheet*** provided on **page 10** of this test paper. Only the answers recorded in the bubble sheet will be marked. Cells left blank will receive a zero mark for that question. No deductions will be made for incorrect answers.
- In ***Parts II and III***, write your answers clearly and concisely in the space provided immediately after each question. ***Your entire answer must fit in the designated space.*** No extra space/pages are possible and you cannot use blank space for other questions.
- ***It is best to write in PENCIL and use an ERASER as needed.*** This way you can make sure to fit your final answer in the appropriate space.
- ***Please write legibly.*** If I can't read your handwriting, I can't award you any marks!

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PART I (35 points)

Instructions:
Enter your answer to each of the 14 multiple-choice questions in the ***bubble sheet*** provided on **page 10** below. Each correct answer is worth ***2.5 points***. ***Note that no deduction will be made for incorrect answers.*** Table cells left blank will receive zero points. **Do NOT guess your answers! Manage your time properly!**

1. The photocopy shop at Harbord & Spadina had revenues of $600 thousand and a profit of $60 thousand in 2017. That year, the total expenditures of this shop were $160 thousand in wages and salaries, $50 thousand in rent, $200 thousand in paper and ink, and $100 thousand in taxes. In addition, the depreciation of the capital stock of the shop was $30 thousand. The contribution of this photocopy shop to Canada's GDP in 2017 was

   A) $600 thousand.
   B) $500 thousand.
   C) $400 thousand.
   D) $300 thousand.
   E) none of the above.

2. Suppose that an economy produces only apples, bananas, and oranges, and that prices (in dollars) and quantities (in pounds) are as shown in the following table:

Good	Year 2016		Year 2017	
	Quantity	Price	Quantity	Price
Apples	2,000	$2	3,000	$3
Bananas	4,000	$3	6,000	$2
Oranges	6,000	$4	5,000	$5

   Using the chain method, in 2017 the rate of growth of real GDP was approximately:

   A) 6.5 percent.
   B) 6.8 percent.
   C) 7.1 percent.
   D) 7.5 percent.
   E) None of the above is correct.

3. A Canadian company imported 100 TV sets from Korea for $250 each in 2017. The company sold 80 of them in 2017 for $450 each, and the rest in 2018 for $400 each. How much did these transactions contribute to Canada's GDP in 2017?
   A) $45,000
   B) $36,000
   C) $19,000
   D) $16,000
   E) None of the above is correct.

Use this space for rough work.

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4. Consider an economy without depreciation of the capital stock, without government transfer payments, and where personal income taxes are the only source of government revenues. If GDP is $850 billion, government budget surplus is $20 billion, consumption is $600 billion, government purchases is $180 billion, and net exports is $0 billion, which of the following is true in this economy?
   A) Disposable income is $660 billion.
   B) Investment is $80 billion.
   C) Private savings is $50 billion.
   D) Government revenues is $210 billion.
   E) None of the above is correct.

5. Nominal GDP was $1,575 billion in 2010 and $2,125 billion in 2017. The GDP deflator was 85.0 in 2010 and 105.7 in 2017, where 2015 was the base year. What was the percentage change in real GDP from 2010 to 2017?
   A) 7.8 percent.
   B) 8.2 percent.
   C) 8.5 percent.
   D) 9.1 percent.
   E) None of the above is correct.

6. Suppose that the government has a balanced budget. It collects $40 billion in taxes, purchases $10 billion in goods and services from private companies, pays $10 billion in welfare benefits, pays $2 billion in interest on the national debt, and pays government workers $18 billion in wages. The government contribution to GDP is
   A) $10 billion.
   B) $12 billion.
   C) $18 billion.
   D) $28 billion.
   E) $40 billion.

7. In the *AE* model of a closed economy, if consumer confidence falls and consumers decide to save more, then
   A) consumption and investment will decrease.
   B) consumption will decrease while investment will not change.
   C) consumption will decrease while investment will increase.
   D) consumption and investment will not change.
   E) investment will increase while consumption will not change.

8. The ultimate objective of the so-called “starve the beast” theory is
   A) to eliminate government deficits.
   B) to reduce wasteful expenditures by the government.
   C) to improve efficiency in the economy.
   D) to minimize the size of the government.
   E) none of the above.

Use this space for rough work

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9. In a model where income taxes are the only source of government revenues, which one of the following best describes the impact of an increase in exogenous imports?
    A) Overall aggregate expenditure will increase.
    B) The government budget deficit will increase.
    C) The level of private savings will increase.
    D) The level of consumption will increase.
    E) The trade deficit will decrease.

10. We can expect the *IS* curve to become flatter as
    A) the marginal propensity to save increases.
    B) the marginal propensity to consume increases.
    C) investment becomes less sensitive to income changes.
    D) investment becomes less sensitive to interest rate changes.
    E) the tax rate increases.

11. If investment were very sensitive to changes in the interest rate, which one of the following would be true?
    A) The expenditure multiplier would be relative large.
    B) The *AE* curve corresponding to each interest rate would be relatively flat.
    C) A given change in the interest rate would cause a relatively large shift outward of the *IS* curve.
    D) The slope of the *IS* curve would be relatively steep.
    E) None of the above would be true.

12. Statistics Canada reported that the Canadian economy added 63,300 jobs this past September, decreasing the national unemployment rate to 5.9 percent from 6.0 percent in August. Which one of the following took place in September to explain this outcome?
    A) A significant increase in both part-time and full-time jobs.
    B) A decrease in full-time job and a significant increase in part-time jobs.
    C) A significant increase in full-time jobs with little change in part-time jobs.
    D) A decrease in part-time job and a significant increase in full-time jobs.
    E) A significant increase in part-time jobs and a small increase in full-time jobs.

13. After the previous provincial government raised Ontario's minimum wage from $11.40 to $14 last January, the province's unemployment rate
    A) remained basically unchanged.
    B) increased to its highest level in the last five years.
    C) fell to its lowest level in the last 18 years.
    D) increased by less than it was expected.
    E) increased more or less as it was expected.

14. Statistics Canada reported that last August Canada recorded its first trade surplus in more than 18 months. This was due to
    A) an increase in exports combined with little change in imports.
    B) an increase in exports combined with a decrease in imports.
    C) an increase in imports combined with a much greater increase in exports.
    D) a decrease in imports combined with little change in exports.
    E) a decrease in exports combined with a much greater decrease in imports.

Use this space for rough work.

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PART II (15 points)

Consider a closed economy with fixed price level. This economy is characterized by the following equations (all dollar figures in billions):

$C = 200 + 0.75\ YD$
$I = 275 - 20\ i$
$G = 250$
$TA = 50 + 0.2\ Y$
$TR = 150$
$Y_{fe} = 1750$

a) What is the equation for the *AE* curve? **(2 points)** What is the size of the aggregate expenditure multiplier (α_{AE})? **(1 point)**

1) $AE = C + I + G$

$= (200 + 0.75\ YD) + (275 - 20\ i) + 250$

where $YD = Y + TR - TA = Y + 150 - 50 - 0.2\ Y = 100 + 0.8\ Y$

$= [200 + 0.75 (100 + 0.8\ Y)] + (275 - 20\ i) + 250$

$= 200 + 75 + 275 + 250 - 20\ i + 0.6\ Y$

$= 800 - 20\ i + 0.6\ Y$ **(2 points)**

2) The expenditure multiplier is: $\alpha_{AE} = 1 / (1 - 0.6) = 1 / 0.4 = 2.5$ **(1 point)**

b) What is the equation for the *IS* curve? **(2 points)** If the central bank sets the rate of interest at 8 percent (i.e., $i = 8$), what is the level of equilibrium income (Y^*)? **(1 point)**

1) To find the expression for the *IS* curve, we must equate *Y* and *AE*:

$Y = AE \rightarrow Y = 800 - 20\ i + 0.6\ Y \rightarrow 0.4\ Y = 800 - 20\ i \rightarrow Y = 2000 - 50\ i$

Or: $20\ i = 800 - 0.4\ Y \rightarrow i = 40 - 0.02\ Y$ **(2 points)**

2) If $i = 8$, then $Y^* = 2000 - 50\ (8) = 2000 - 400 = 1600$ **(1 point)**

c) At the equilibrium of part b), what is the size of the government budget surplus (*BS*)? **(1 point)**

$BS = TA - G - TR = 50 + 0.2\ Y - 250 - 150 = -350 + 0.2\ Y = -350 + 320 = -30$ **(1 point)**

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d) You have been hired as an economic advisor to the Minister of Finance. Given the situation of the economy you have described above, what policy would you advise the Minister to implement? Briefly explain. **(4 points)**

The economy is in recession since $Y^* = 1600$ and $Y_{fe} = 1750$, i.e., there is a recessionary gap equal to 150. At the same time, the government is running a $BS = -30$ (i.e., $BD = 30$). The economy is in a recession and, as expected, the government is running a BD due to the low level of Y (and thus of TA). We also notice that if the economy were to be at full employment (i.e., $Y = 1750$), the government would have a balanced budget: $BS = -350 + 0.2\,(1750) = 0$.

Therefore, the government deficit is definitely a cyclical deficit (not a structural one) and thus the main objective of the government should be to reactivate the economy through an increase in AE, for instance, through the implementation of expansionary fiscal policy.

Given that consumer confidence might be low during recessions, it might be advisable to increase G rather than decrease TA. Indeed, during a recession it could be expected that a large fraction of any increase in YD resulting from the decrease in TA will be saved rather than spent. Therefore, since the government wants to increase AE, it might be better to increase G rather than decrease TA.

e) All else equal, how much should government spending on goods and services (G) increase to move the economy to full employment (i.e., to $Y_{fe} = 1750$)? **(2 points)**

The recessionary gap is $\Delta Y = 150$ and, keeping $i = 6$, $\Delta Y = \alpha_{AE}\,\Delta G$, where $\alpha_{AE} = 2.5$. Therefore,

$\Delta G = \Delta Y / \alpha_{AE} = 150 / 2.5 = 60$ **(2 points)**

This means that the IS curve must shift to the right exactly by 60.

f) Go back to the equilibrium of part b) above. If the government decides to achieve full employment through a change in the rate of interest, at what level should the central bank set the rate of interest? **(2 points)**

From part b) we have that the IS curve is: $i = 40 - 0.02\,Y^*$.

Therefore, at $Y^* = 17500$, $i = 40 - 0.02\,(1750) = 40 - 35 = 5$. **(2 points)**

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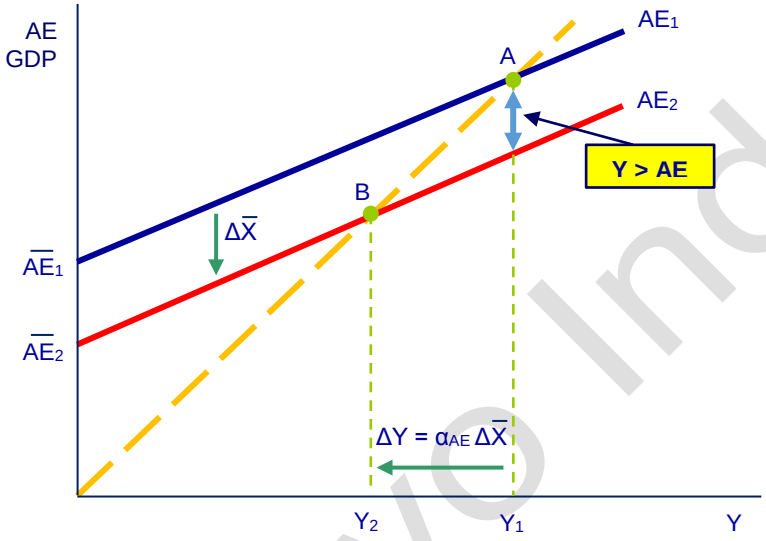
PART III (30 points)

Instructions: Answer the following three questions in the space provided. Each question is worth 10 points.

1. If the U.S. economy were to go into recession, what would be the likely impact on the Canadian economy? **(Show your answer with the help of a diagram and <u>explain</u> the economics. Consider the *AE* model of an open economy.)**



Let's assume that the Canadian economy is initially in equilibrium at point *A*. At the level of income Y_1, economic agents want to purchase (*AE*) exactly what the economy has produced (GDP). Therefore, there is neither an excess demand nor an excess supply in the goods market and firms do not experience any involuntary change in inventories.

If there is now a negative demand shock such as a decrease in autonomous exports due to a fall in American GDP, *AE* decreases and the AE_1 curve shifts downwards to AE_2. Exports are independent of income, which means that they decrease by the same amount at all levels of *Y*. Therefore, the AE_1 curve shifts down exactly by the decrease in autonomous exports (i.e., a parallel shift downward).

The decrease in *AE* creates a situation of excess supply in the goods market (i.e., $Y > AE$) as shown in the diagram by the distance between the AE_2 curve and the 45º line. As a result of the fall in sales, firms start accumulating inventories in a way that was not planned. At some point, therefore, this will give the signal to firms to adjust production downwards and output will start to decrease.

As output (i.e., GDP) decreases, income (*Y*) also decreases by the same amount (since, by assumption, GDP = *Y*). This is shown graphically by a movement down along the 45º line. As *Y* falls, *AE* also decreases along the AE_2 curve. As output falls, the excess supply in the goods market decreases (i.e., the gap between the AE_2 curve and the 45º line is reduced). This process continues until the excess supply is completely eliminated at Y_2. Therefore, Y_2 is the new equilibrium and the total fall in income is equal to $\Delta Y = \alpha_{AE}\, \Delta\bar{X}$.

In short, the decrease in the level of income in the U.S. has a contractionary effect in the Canadian economy. The fall in U.S. income causes their imports of Canadian goods to drop and thus Canadian *AE* decreases and an excess supply arises in the economy. As a result, Canada's income falls until a new lower equilibrium income is achieved.

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2. **Critically evaluate the following statement:** *"To increase the rate of investment and help the economy get out of a recession, the government should implement policies that encourage greater savings."* **(Show your answer with the help of a diagram and <u>explain</u> the economics. Consider the AE model of a closed economy.)**

Investment plays a very important role in the economy — it increases the capital stock of the country and thus it contributes to increasing the productive capacity of the economy. Therefore, there exists a general consensus among economists that high rates of investment are desirable and necessary for an economy to grow rapidly.

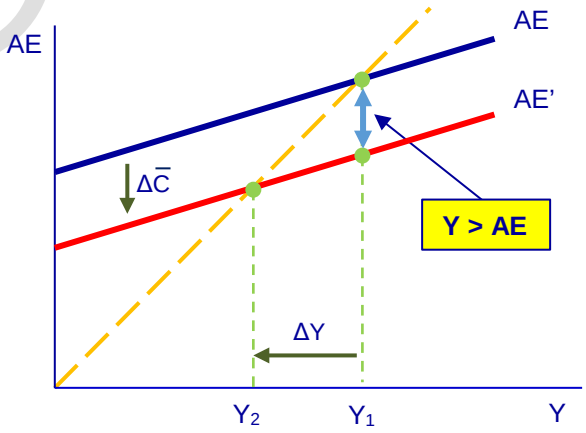
Since, by definition, savings is always equal to *actual* investment and high rates of investment are desirable, can we conclude that high rates of saving are also desirable?

Our *AE* model is static and thus unable to properly address the role of investment in the process of economic growth. Nonetheless, the *AE* model provides us with some important insights to answer the question regarding the desirability of high rates of saving. In this model, the short-run impact of *planned* or *desired* investment expenditure is the same as any other component of aggregate expenditure — i.e., just like planned consumption expenditure, it contributes to create a demand for domestically produced goods. Therefore, *even if there is excess capacity in the economy* when the economy is in recession, higher *planned* investment appears desirable because it increases *AE* and thus contributes to the reduction of the recessionary gap. (Although to assume that planned investment would likely increase during a recession appears perhaps quite unrealistic.)

In any case, higher *planned* investment does not depend on higher saving. Rather, the causation seems to go in the opposite direction: all else equal, higher planned investment determines higher saving. Indeed, higher planned saving implies lower planned consumption expenditure and, therefore, lower *AE*. In turn, lower *AE* results in involuntary accumulation of inventories and thus in higher *actual* investment. But there is nothing desirable in higher actual investment as a result of an involuntary accumulation of inventory since it eventually ends up reducing output and income.

The above result is shown in the diagram below. Initially the economy is in equilibrium at the level of income Y_1. An increase in planned or desired saving causes desired consumption expenditure to decrease and the *AE* curve shifts down to *AE'*. A situation of excess supply arises in the economy and output and income start to fall towards the new equilibrium at Y_2.

The claim that planned saving is desirable because it determines planned investment is thus a fallacy. Moreover, the causation goes in the opposite direction — higher planned investment results in higher levels of planned saving. Indeed, an increase in planned investment raises the level of equilibrium income and, therefore, causes the levels of both planned consumption AND planned saving to rise.



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3. **Critically comment on the following statement:** *"Government budget deficits tend to crowd out private investment. Therefore, the proposition of forcing governments to run balanced budgets makes economic sense."*

There is nothing intrinsically wrong (or right, for that matter) with budget deficits. Along the business cycle, it is reasonable to expect that governments will run deficits during periods of recession (due to the fall in revenues) and surpluses during periods of economic boom (due to the rise in revenues). These are cyclical deficits and surpluses. A cyclical deficit would not crowd out private investment because resources are not fully utilized: there is relatively high unemployment and the economy is operating with excess capacity (i.e., some of the fixed capital remains idle).

The proposition that governments should run balanced budgets at all times would have the effect of deepening the recession by further reducing aggregate demand when the latter is already weak. That is, it would result in the creation of more unemployment and greater excess productive capacity during recessions instead of contributing to their reduction. Similarly, the elimination of a surplus through a decrease in taxes (or an increase in government spending) during a period of economic boom would create further inflationary pressure in the economy.

This proposition has an ideological root and aims to reduce the economic role of the state to its minimum. The claim is that government expenditure should be reduced in period of recession to balance the budget, and taxes should be reduced in periods of boom for the same reason. The long-run result would be to minimize the economic and social role of the government. This proposition is based on the so-called "starving the beast" theory.

Chronic budget deficits — that is, deficits during periods of recession and during periods of economic boom (structural deficits) — are a different story. When the economy is operating at full employment or beyond, then it could be claimed that government deficits would crowd out private investment. If that was the case, then a sensible claim should be that governments should try to run balanced budgets over the business cycle — i.e., the surpluses of the boom years would offset the deficits of the recession years — but not at all times.

In short, a deficit in any one year doesn't say much unless we look at it into the context of the business cycle. A deficit in a year of recession is something to be expected. What we must look at is what the full-employment budget surplus (or deficit) would be. If at the level of potential output we could determine that the government would be running a balanced budget or a small surplus, then the best policy for the government might be to use expansionary fiscal policy (instead of contractionary fiscal policy) when facing a cyclical deficit (even at the cost of increasing the deficit further in the short run).

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