ECO 209Y MACROECONOMIC THEORY AND POLICY

Term Test #1

October 27, 2017

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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 and the Supplement closed until the start of the test is announced.
- There are three parts to the test: *Part I* consists of 12 multiple-choice questions (30 points); *Part II* is one numerical problem (15 points); and *Part III* includes 3 short-answer questions (30 points). The *total* point-value of the test is *75 points*.
- This test includes **8 pages** plus the Supplement. The Supplement contains the multiplechoice questions but you must record your answers to each multiple-choice question in the table provided on the next page. **Anything written on the Supplement will not be graded.** We will only collect the test papers, not the Supplement.
- In Parts II and III, write your answers clearly and concisely in the space provided immediately after each questions. Your entire answer must fit in the designated space. No extra space/pages are possible. You cannot use blank space for other questions nor can you write answers on the Supplement.
- Write in PENCIL and use an ERASER as needed. This way you can make sure to fit your final answer in the appropriate space.

Instructions:

- Enter your answer to each of the 12 multiple-choice questions (see the Supplement) in the table below.
- Each correct answer is worth 2.5 marks.
- Note that a deduction of 0.5 mark will be made for each incorrect answer. Table cells left blank will receive a zero mark (i.e., no deduction).
- Do NOT guess your answers!

1	2	3	4	5	6	7	8	9	10	11	12
Е	С	В	D	В	D	В	D	С	E	Α	Е

Conect answers. $X(2.5) =$

Incorrect answers: _____ x $(-0.5) = ____$

Blank answers: _____ x (0.0) = 0.0

Total:

PART II (15 marks)

Consider a closed economy with no indirect taxes and no depreciation of the capital stock. In this economy the total income is split evenly between two groups of households: high-income households (H) and low-income households (L). Personal income tax is the only tax in this economy, and initially there is a flat (unique) tax rate of 0.2.

This economy is characterized by the following behavioural relationships (where C_H is highincome households' consumption spending and C_L is low-income households' consumption spending):

$C_{H} = 40 + 0.6 \text{ YD}$	l = 80 + 0.15 Y
$C_{L} = 10 + 0.9 \text{ YD}$	G = 720
TA = 0.2 Y	
TR = 0	$Y_{fe} = 3,720$

 a) As a function of Y, what are the expressions for the consumption curves of both high-income and low-income households? (2 marks) What is the expression for the overall consumption curve? (3 marks)

YD = Y - TA = Y - 0.2 Y = 0.8 Y

С_н = 40 + 0.6 YD = 40 + 0.6 (0.8) Y <mark>= 40 + 0.48 Y</mark>

 $C_{L} = 10 + 0.9 \text{ YD} = 10 + 0.9 (0.8) \text{ Y} = 10 + 0.72 \text{ Y}$

If Y = 0, then $C = C_H + C_L = 40 + 10 = 50$

And, since income is split evenly between high- and low-income households, then

 $MPC_{Y} = 0.5 MPC_{Y}^{H} + 0.5 MPC_{Y}^{L} = 0.5 (0.48) + 0.5 (0.72) = 0.24 + 0.36 = 0.6$

Therefore, C = 50 + 0.6 Y

b) What is the expression for the AE curve? (1 mark) What is the value of the expenditure multiplier (α_{AE})? (1 mark) What is the level of equilibrium income in this economy? (1 mark)

AE = C + I + G = (50 + 0.6 Y) + (80 + 0.15 Y) + 720 = 850 + 0.75 Y

And $\alpha_{AE} = 1 / (1 - 0.75) = 1 / 0.25 = 4$

In equilibrium, Y = AE \rightarrow Y = 850 + 0.75 Y \rightarrow 0.25 Y = 850 \rightarrow Y^{*} = 850 / 0.25 = 3400

c) All else equal, by how much should G increase to achieve equilibrium at the level of fullemployment income? (1 mark)

Since Y^{*} = 3400 and Y_{fe} = 3720, Y must increase by Δ Y = 320. That is, Δ Y = $\alpha_{AE} \Delta$ G = 320. And therefore, Δ G = 320 / α_{AE} = 320 / 4 = 80

d) Go back to the initial equilibrium of part c) above. Suppose now that the government increases the tax rate for high-income households to 0.3 and decreases the tax rate for low-income households to 0.1. As a function of Y, what is the expression for the overall consumption curve now? (2 marks) What is the level of equilibrium income? (1 mark)

 $\begin{array}{l} C_{H} = 40 + 0.6 \ YD = 40 + 0.6 \ (Y - 0.3 \ Y) = 40 + 0.6 \ (0.7) \ Y = 40 + 0.42 \ Y \\ \hline C_{L} = 10 + 0.9 \ YD = 10 + 0.9 \ (Y - 0.1 \ Y) = 10 + 0.9 \ (0.9) \ Y = 10 + 0.81 \ Y \\ \hline If \ Y = 0, \ then \ C = C_{H} + C_{L} = 40 + 10 = 50 \\ \hline and \ the \ MPC_{Y} = 0.5 \ MPC_{Y}{}^{H} + 0.5 \ MPC_{Y}{}^{L} = 0.5 \ (0.42) + 0.5 \ (0.81) = 0.21 + 0.405 = 0.615 \\ \hline Therefore, \ C = 50 + 0.615 \ Y \end{array}$

And AE = C + I + G = (50 + 0.615 Y) + (80 + 0.15 Y) + 720 = 850 + 0.765 Y

In equilibrium, Y = AE \rightarrow Y = 850 + 0.765 Y \rightarrow 0.235 Y = 850 \rightarrow Y^{*} = 850 / 0.235 \approx 3617

e) Go back to the initial equilibrium of part c) above. If the government now imposes a total wealth tax of 100 to high-income households and gives a total transfer payment of 100 to low-income households, as a function of Y, what is the expression for the overall consumption curve now? (2 marks) What is the level of equilibrium income? (1 mark)

YD decreases by 100 to high-income households, and thus their autonomous consumption decreases by 60. In turn, YD increases by 100 to low-income households and thus their autonomous consumption increases by 90. Therefore, overall autonomous consumption increases by 30 and thus C = 80 + 0.6 Y.

AE = C + I + G = (80 + 0.6 Y) + (80 + 0.15 Y) + 720 = 880 + 0.75 Y

In equilibrium, Y = AE \rightarrow Y = 880 + 0.75 Y \rightarrow 0.25 Y = 880 \rightarrow Y^{*} = 880 / 0.25 = 3520

PART III (30 marks)

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

1. Critically evaluate the following statement: "Since we should all live within our means, a responsible government should keep a balanced budget at all times."

There is nothing intrinsically wrong (or right, for that matter) with budget deficits. During the business cycle it is expected that governments will run deficits during periods of recession and surpluses during periods of economic boom. Overall, government should run a balanced budget over the business cycle where the surpluses of the boom years would offset the deficits of the recession years.

The conservative proposition that governments should always run balanced budgets would have the effect of exacerbating the impact of recessive periods 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 expenditures) 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 economic 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 what Krugman calls the "starving the beast" theory.

Chronic budget deficits – that is, deficits during periods of recession and also during periods of economic boom – are a different story. Here it could be argued that government deficits could crowd out private investment. If that's the case, then it could be argued that governments should run balanced budgets over the business cycle 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 do is see 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 surplus (or have a balanced budget), then the best policy for the government might be to use expansionary instead of contractionary fiscal policy (even at the cost of increasing the deficit further in the short run).

We must keep in mind that during a recession the main concern should be to reactivate the economy, not the deficit. Once the economy is moving ahead and getting closer to full employment, then we could focus on the deficit. At this point private spending might already be sufficiently strong to allow for a gradual decrease in government spending.

2. Critically evaluate the following statement: "In a closed economy, national saving is equal to actual investment. Therefore, the government should implement policies that encourage greater saving to help the economy get out of a recession." (Show your answer with the help of a diagram and <u>explain</u> the economics. Consider the AE model developed in class.)

This statement is incorrect.

Investment plays a very important economic role in the *long run* — 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, saving is always equal to *actual* investment and high rates of investment are desirable, are high rates of saving also desirable?

Our *AE* model applies to the **short run** and thus it's 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, **planned** or **desired** investment expenditure plays a role in the **short run** as part of overall aggregate expenditure — i.e., just like planned consumption expenditure, it contributes to create a demand for domestically produced goods. Therefore, **when there exists excess capacity in the economy**, higher **planned** investment is also desirable in the short run because it increases *AE* and thus equilibrium income.

However, higher **planned** investment does not depend on higher saving as some economists seem to suggest. Rather, the causation is the other way around: 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 ends up reducing output and income.

The above result is shown in the diagram on the right. 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* — it does not. 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.



3. Critically comment on the following statement: "Since tax cuts boost private sector confidence, a \$100 million decrease in autonomous taxes will have a greater expansionary effect than a \$100 million increase in government purchases." (Show your answer with the help of a diagram and <u>explain</u> the economics. Consider the AE model developed in class.)

First of all, a tax cut will not necessarily translate into an increase in private sector confidence. It could be argued that it might help increasing confidence in the economy to the extent that it might cause the level of economic activity to rise. At the same time, since the tax cut will cause the government budget deficit to increase, it could also be argued that this might contribute to do the opposite: to reduce private sector confidence. So this part of the statement is at best uncertain.

Assuming confidence in the economy unchanged, let's examine next the respective impacts on equilibrium Y of an increase of \$100 million in G and of a decrease of \$100 million in \overline{T} .

On the one hand, an increase of \$100 million in *G* directly increases autonomous *AE* by \$100 million and through the multiplying process causes equilibrium income to increase further by \$100 million times the expenditure multiplier, i.e., $\Delta Y = \alpha_{AE} \Delta G = \alpha_{AE}$ (\$100). This is shown in the diagram below by the shift of the *AE*₁ curve to *AE*₂, and equilibrium income increasing to *Y*₂.

On the other hand, a decrease of \$100 million in autonomous taxes increases autonomous AE only indirectly and by a lesser amount. Indeed, the \$100 million decrease in autonomous taxes directly increases YD by \$100 million at all levels of Y (i.e., $\Delta YD = -\Delta \overline{T}$), but not all of this increase in YD will translate into an increase in C. At all levels of Y, consumers will increase expenditure only by a fraction "c" of the increase in disposable income and thus autonomous expenditure will increase by $\Delta A\overline{E} = c \Delta YD = -c \Delta \overline{T} = -c (-\$100) = c \$100$. For instance, if c = 0.8, then a \$100 million decrease in autonomous taxes will translate into an \$800 thousand increase in autonomous $A\overline{E}$. Therefore, equilibrium income will increase by $\Delta Y = \alpha_{A\overline{E}} \Delta \overline{A\overline{E}} = \alpha_{A\overline{E}}$ (c \$100). This is shown in the diagram below by the shift of the AE_1 curve to AE_3 in this case, and equilibrium income increasing to Y_3 .

Therefore, contrary to the statement, a \$100 million increase in G will have a greater expansionary impact on Y than a \$100 million decrease in autonomous taxes will.



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SUPPLEMENT

INSTRUCTIONS:

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Consider a closed economy producing only two goods: computers and pizzas. The following table shows the prices and quantities produced and consumed of each good in 2015 and 2016. Use this information to answer questions 1 and 2 below.

	20	015	20	016
	Price	Quantity	Price	Quantity
Computers	800	500	700	550
Pizzas	10	8000	12	8500

1. Consider 2015 as the base period. Measured by the GDP deflator, the rate of inflation in 2016 was:

- A) -5.2 percent.
- B) 7.8 percent.
- **C)** 6.2 percent.
- D) -2.1 percent.E) -7.2 percent.
- 2. Using the chain method, the real rate of growth in 2016 was:
 - A) 6.4 percent.
 - **B**) 9.5 percent.
 - C) 9.3 percent.
 - **D)** -3.2 percent.
 - E) 7.6 percent.

Use the following data of a hypothetical economy to answer question 3 below.

Consumption	600
Government expenditure on goods and services	250
Net exports	50
Capital consumption allowance (depreciation)	130
Corporate profits before taxes	150
Indirect taxes	140
Government transfer payments	100
Dividends	80
Corporate income taxes	50
Net investment	70
Personal income taxes	150

- Given the information in the table above, what is the level of net domestic income?A) 950.
 - **B)** 830.
 - **C)** 1100.
 - **D)** 860.
 - E) None of the above is correct.

- 4. Which one of the following is implicitly assumed in the so-called short-run Keynesian model?
 - A) Markets always clear.
 - B) Prices are fixed.
 - **C)** Relative prices are fixed.
 - **D)** Average price is fixed.
 - E) All of the above are assumed.
- **5.** The production approach, the expenditure approach, and the income approach will all give the same measure of GDP assuming
 - A) investment income from abroad is not included.
 - B) there is neither depreciation of the capital stock nor indirect taxes.
 - C) government transfers payments are nil.
 - D) there is no undistributed corporate profits.
 - E) there is no payment of interest on the national debt.
- 6. Consider an economy with a fixed-price level and with both direct and indirect taxes. In this economy, an increase in government infrastructure spending will have the largest impact on the level of income when it is financed by
 - A) increasing sales taxes.
 - **B)** increasing production taxes.
 - C) cutting other expenditure programs.
 - D) raising income taxes to the rich.
 - E) raising income taxes to the middle class.
- 7. The apple juice industry produced \$1 billion worth of apple juice in 2016, using \$300 million worth of apples and \$50 million worth of sugar as material inputs. The apple juice industry also paid \$350 million in wages and salaries, \$50 million in rent, and \$150 million in taxes, thus generating a profit of \$100 million to shareholders. In 2016, the contribution of the apple juice industry to the country's GDP was
 - **A)** \$1.0 billion.
 - B) \$650 million.
 - **C)** \$500 million.
 - **D)** \$400 million.
 - E) none of the above.
- **8.** Which one of the following is **not** included in investment expenditure when using the expenditure approach to measure GDP?
 - A) The purchase of a new coffee-maker by a Starbuck's franchise.
 - **B)** A private contractor building a garage in John's backyard.
 - C) The purchase of a new limousine for the use of the chairman of Magna Corporation.
 - **D)** The construction of a new house for the use of the Prime Minister.
 - E) All of the above are included in investment when measuring GDP.

- 9. Consider the following information about the economy (in millions of dollars): C = 900; S = 150; G = 300; TA = 350; TR = 100; NX = 50; and the government's debt is nil. The value of GDP is
 - **A)** \$1,200 million.
 - **B)** \$1,250 million.
 - **C)** \$1,300 million.
 - **D)** \$1,350 million.
 - **E)** \$1,400 million.
- **10.** Consider the fixed-price level model of the economy. If the economy is initially in equilibrium, inventory investment will increase when
 - A) autonomous expenditure decreases.
 - B) savings exceed desired investment.
 - C) actual investment exceeds desired investment.
 - **D**) firms expect an increase in average sales.
 - E) all of the above occur.
- **11.** Consider a closed economy with a fixed-price level and a balanced government budget at the initial equilibrium income. A reduction in government purchases will cause
 - A) the level of consumption to fall, business inventories to rise, and a government surplus.
 - B) business inventories to rise and a government deficit, but no change in the level of consumption.
 - **C)** business inventories and the level of consumption to fall, but no change in the government budget balance.
 - **D)** both the level of consumption and business inventories to fall, and a government deficit.
 - E) none of the above.
- **12.** The opposition of the business sector to the incoming increase in Ontario's minimum wage appears at odds with the currently prevailing view among most university economists. Which of the following might ultimately explain this difference in views?
 - A) Businesses are concerned about its negative impact on employment.
 - B) Businesses worry about the prospect of higher inflation.
 - C) Businesses consider supply-side issues but not demand-side ones.
 - D) Businesses' bottom-line preoccupation is their short-run profits.
 - E) Both C) and D).