SIMON FRASER UNIVERSITY
Department of Economics

Econ 105 — Instructor: Yaser Sattari
Principles of Macroeconomics — Spring 2021

FINAL EXAM
Out of 100
(April 25th, 7:00 PM–10:00 PM)

1. (**15 Points**) Take an economy where wheat and bread are the only goods being traded in the marketplace. The quantity and price of trade over two years are summarized in the following table. Assume that in every year, half of the wheat is purchased by producers of bread and the other half is purchased by the households for domestic use. All of the bread is purchased by the households. Finally, assume that 2011 is the base year.

	Quantity Produced		Price	
Year	Wheat (kg)	Bread (loaf)	Wheat ($/kg)	Bread ($/loaf)
2011	10	80	2	4
2012	12	100	2.5	4.5

   (a) (**5 Points**) Find the nominal GDP in 2011.

   (b) (**5 Points**) Find the real GDP in 2012.

   (c) (**5 Points**) Find the inflation rate, implied by the GDP deflator between 2011 and 2012. [Hint: recall that the growth rate for a variable X, between periods t and $t+1$ is computed as follows:]

$$\text{Growth Rate} = \left(\frac{X_{t+1} - X_t}{X_t}\right) \times 100$$

2. (**10 Points**) House prices are typically negatively correlated with the mortgage interest rates.

   (a) (**5 Points**) Describe a simple theory that explains this relationship. Write the prediction of this theory in a positive (causal) statement, and briefly explain what assumptions lead to this prediction.

   (b) (**5 Points**) Imagine that the data you collect on mortgage interest rate and house price index show that both variables are rising together (i.e. there is a positive correlation between them). Explain why your theory might still be correct.

3. (**25 Points**) Assume the following about the components of aggregate expenditure:

$$C = 30 - 0.1P + 0.8Y_D,\ I = 60,\ T = 0.25Y$$

$$G = 40,\ X = 20,\ IM = 0.2Y$$

where C is desired consumption, Y_D is the disposable income, I is desired investment, T is the net taxes, G is desired government expenditure, X is desired exports, IM is desired imports, Y is national income/real GDP, and P is the general price level. P is a price index and all other variables are measured in billions of dollars. Finally, assume that the AS curve is as follows:

$$P = 4Y$$

   (a) (**4 Points**) Derive the AD function, denote it by AD_1 and draw it in the (P,Y) environment.

   (b) (**4 Points**) Find the short-run equilibrium (P,Y) and denote it by E_1. Redraw the diagram in part (a), add the AS curve to it, and show the equilibrium. Denote real GDP and price level by Y_1 and P_1 in this equilibrium.

   (c) (**3 Points**) Find the budget deficit of government when the economy is in equilibrium E_1.

   (d) (**4 Points**) Imagine that the government increases its expenditures by 15 billion dollars. Derive the new AD function after this change and find the horizontal shift of AD. [Hint: no need for a diagram in this part, but having one in the background could help.]

   (e) (**5 Points**) Find the fiscal multiplier (defined below), and provide an economic interpretation for it: [Hint: solve for the short-run equilibrium, using the new AD curve and find ΔY]

$$\text{Fiscal Multiplier} = \frac{\Delta Y}{\Delta G}$$

   (f) (**5 Points**) What is the simple multiplier in this economy? Is this simple multiplier greater, equal, or smaller than the fiscal multiplier you found in part (e)? Explain why. [Hint: recall that the simple multiplier is equal to $\frac{1}{1-z}$, where z is the marginal propensity to spend.]

4. (**10 Points**) Imagine that Bank of Canada increases the money supply, which leads to a lower interest rate. After this policy change, real GDP remains unchanged, even in the short-run. You are hired to explain how this could have happened. The only thing you know about macroeconomics is the AD-AS model and the role of money in it.

   (a) (**5 Points**) Describe two distinct scenarios that could have led to the events after this policy change.

(b) (**5 Points**) Imagine that the data shows that the general price level has remain unchanged after the policy change as well. Which one of the above scenarios is more likely to have taken place? Explain why.

5. (**15 Points**) Consider an economy where labour is the only input of production. There are 50 workers in this economy and if employed, each worker can produce 10 units of output. Finally, assume that the AD and AS curves are defined as follows in this economy:

$$P = 1200 - 2Y,\ P = -150 + Y$$

Show your work and explain your reasoning in all parts. You do not need to draw any diagrams for this question, but it might be useful to have it in the background.

(a) (**3 Points**) Find the real GDP and general price level in the short-run equilibrium.

(b) (**6 Points**) What is the unemployment rate in the short-run equilibrium you found in part (a)?

(c) (**6 Points**) Assume that labour productivity increases by 10%. Find the general price level in the long-run equilibrium of this economy.

6. (**10 Points**) You collect data and find a positive relationship between inflation and unemployment rate for a time period. Do you think this economy has experienced AD shocks or AS shocks during this period? Why?

7. (**15 Points**) Imagine that the economy starts in an equilibrium, denoted by E_0.

(a) (**3 Points**) Draw the money market environment (i,M) and the output market (P,Y). Denote the interest rate, money stock, general price level and real GDP by i_0, M_0, P_0, and Y_0 respectively on your diagrams. Show E_0 and its components on your diagrams.

(b) (**7 Points**) Now, assume that due to innovations in the financial sector and payment methods, each unit of money can circulate faster in the economy to facilitate transactions. How does this change affect the money market? Explain and show on your money market diagram. Denote the new equilibrium by E_1, the new interest rate by i_1, and the new money stock by M_1.

(c) (**5 Points**) How does the change in part (b) affect the output market in the short-run? Explain and show it on your output market diagram. Denote the new equilibrium by E_1, the new price by P_1, and the new real GDP by Y_1.