EC 235

Problem Set 1

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INSTRUCTIONS:

Take your time and go through each problem.

Recall that group work is *strongly encouraged.*

Problem 1

Go to the `FRED website` and search for the following macro series:

- `GDPC1` (real Gross Domestic Product);
- `UNRATE` (unemployment rate);
- `CPIAUCSL` (Consumer Price Index for all urban consumers: All items in U.S. city average).

Then, compute the following (show your calculations):

(a) The growth rate of real output between 2019Q4 and 2020Q2;

(b) The growth rate of inflation between Jun 2020 and Aug 2023;

(c) The growth rate of unemployment between Feb 2020 and Apr 2020.

Problem 2

Assume the following information describes the macroeconomy:

$C = 124 + 0.6Y_D$
$I = 200$
$G = 124$
$T = 80$

(a) What is this economy's marginal propensity to save (MPS)? Interpret its result.

(b) Derive an expression for this economy's aggregate demand.

(c) What is the equilibrium level of output?

(d) Using a $(x,y) = (Y,Z)$ plane, graph aggregate output and aggregate demand together, highlighting the equilibrium level of output.

(e) Verify whether the $I = S$ condition holds in equilibrium.

Problem 3

Using the same information from **Problem 2**, now assume that Government expenditures increase by 6 monetary units. Then, answer the following questions:

(a) Derive an expression for aggregat demand.

(b) What is the new level of equilibrium output?

(c) Compute the new level of disposable income.

(d) Compute the new level of aggregate consumption.

(e) Compute the new level of private savings.

(f) Compute the new level of public savings.

Problem 4

Assume the following macroeconomic setting: aggregate investment, government expenditures, and net taxes are exogenous. Aggregate consumption is determined by the standard consumption function. Finally, all government spending is *fully* financed by tax collection.

Show that, in this situation, we have the so-called *balanced-budget* multiplier: an increase in public expenditures financed by an increase in taxes leads to an increase in equilibrium output with a multiplier of 1.

Problem 5

Assume that Government expenditures and net taxes are exogenous, and aggregate consumption is determined by the standard consumption function. However, aggregate investment is now *endogenous* and responds to income: $I = b_0 + b_1 Y$. Lastly, assume $c_1 + b_1 < 1$.

(a) Derive an expression for equilibrium output.

(b) From your answer to part (a), compute the marginal effect of a change in the propensity to invest (b_1) on equilibrium output.

(c) From your answer to part (a), what is the effect of an increase in the marginal propensity to consume (c_1) on equilibrium output?

(d) Assume a change in the marginal propensity to save (call it $s_1 = 1 - c_1$). What is the effect on equilibrium output?