Macroeconomics, Part I
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Supervision 5
IS-LM Model

Short questions (250 words max)

1. Using the IS-LM model, explain whether it matters whether central banks fix the money supply $\bar{M}$ or the nominal interest rate $\bar{\imath}$.

2. If an economy finds itself in a liquidity trap, what implications does this state of affairs have for the conduct of monetary policy? [Tripos 2000]

Problems

3. Consider the following IS-LM model for a closed economy:

$$
\begin{aligned}
Y &= C + I + G \\
C &= C_0 + c\,(Y - T) \\
I &= I_0 - br \\
T &= tY \\
G &= \bar{G} \\
\frac{M}{P} &= \alpha Y - \beta r + \upsilon \\
M &= \bar{M} \\
P &= \bar{P}
\end{aligned}
$$

where Y is national income, C consumption, I investment, G government purchases, T taxes, r interest rate, M money supply and P the price level. In addition, C_0, I_0, $\bar{G}$, $\bar{M}$, $\bar{P}$, α, β, b, c and t are positive constants, with $c < 1$ and $t < 1$, and υ a money demand shock.

(a) Derive the IS equation and the slope of the IS curve. Give an intuitive explanation for the sign of the slope. Explain how the IS curve is affected by (i) an increase in autonomous consumption, and (ii) a reduction in the income tax.

(b) Derive the LM equation and the slope of the LM curve. Give an intuitive explanation for the sign of the slope. Explain how the LM curve is affected by a positive money demand shock.

(c) Explain how the effectiveness of fiscal and monetary policy is affected by the following cases:

i. Investment demand does not depend on the interest rate ($b = 0$).

ii. The demand for real money balances does not depend on the interest rate ($\beta = 0$).

iii. The demand for real money balances does not depend on output ($\alpha = 0$).

4. A closed economy with a fixed price level and zero income tax rate is in a deep recession and its public debt is very high. The government considers three different stimulus packages to help the economy out of the recession. All three packages involve spending public funds, G, but they differ in the way the funds are raised. The three packages are: [Tripos 2013]
   P1 The increase in G is financed by increasing taxes, T.
   P2 The increase in G is financed by selling government bonds to the private sector.
   P3 The increase in G is financed by selling government bonds to the central bank.

   (a) Explain carefully how each package affects GDP, denoted by Y, in the short run, and compare and contrast the effects.

   (b) Suppose that planned consumption, C, is

   $$C = c_0 + c_1 (Y - T)$$

   where $c_0 > 0$ and $c_1 \in (0, 1)$. Planned investment (I) is

   $$I = a + b (T - G)$$

   where a and b are positive constants.

   i. Provide an interpretation of the planned investment function and derive mathematically the government spending multiplier associated with the three packages.
   ii. Which package would be most effective in stimulating the economy? Is it possible that a fiscal contraction can be expansionary? Explain carefully.

Main reading

- Mankiw and Taylor (2014), *Macroeconomics - European Edition*, chapter 10-12.

Supplementary references

- Blanchard and Johnson (2012), *Macroeconomics*, chapter 4-5.
- Harrod (1937), "Mr Keynes and Traditional Theory", *Econometrica* 5(1), January, pp. 74-86.
- Hicks (1937), "Mr Keynes and the Classics: A Suggested Interpretation", *Econometrica* 5(2). April, pp. 147-159.
- Romer (2000), "Keynesian macroeconomics without the LM curve", *Journal of Economic Perspectives* 14(2), 149-169.