

1. Answer the following question?
 - (a) Explain three functions of money.
 - (b) Suppose that currencies are 200 million yen and deposits are 300 million yen and reserves are 100 million yen. Derive a money multiplier in this economy.
 - (c) Explain how the Bank of Japan controls money supply.
2. Assume that population and asset is normalized to be 1. Consider the following aggregate supply and aggregate demand model and answer the following questions.

$$\begin{aligned}
 y &= \phi(h(w)) \\
 w &= \phi'(h(w)) \\
 \rho &= \phi(h(w)) - wh(w) - \delta \\
 y &= c + i + g \\
 \frac{m^s}{P} &= k(\rho)y
 \end{aligned}$$

Suppose that

$$\begin{aligned}
 \phi(h) &= (h)^{1-\alpha}, \\
 k(\rho) &= \frac{k}{\rho},
 \end{aligned}$$

where y is GDP per capita, w is wage rate, ρ is interest rate, $h(w)$ is the amount of labor given w , g is government expenditure, c is consumption, i is investment, m^s is money supply, P is price deflator. We assume that $\alpha = 0.3$ and $k = 0.1$.

- (a) Suppose that government increases government expenditure, g , by 200 billion yen. How much does it affect GDP, the interest rate, wage, investment, consumption and aggregate price? Briefly explain your results.
 - (b) Suppose that Bank of Japan increases money supply, m^s , by 4 %. How much does it affect GDP, the interest rate, the wage, investment, consumption and aggregate price? Briefly explain your results.
3. Answer the following question.
 - (a) Suppose that real interest rate is 2 percent. Currently many Japanese believe that inflation rate is 2 percent. How much is the nominal interest rate?
 - (b) Suppose that Bank of Japan set the growth rate of money supply, M^s , by 2 %. How does it affect GDP, the interest rate, the wage, investment, consumption and aggregate price in the long run? Briefly explain your results.