In Class Assignment #1
Macro Economics

Institute for Financial Management & Research (Batch: 2019-21)

03 October, 2019

Maximum Points: 10 **Duration**: 30 minutes

You learnt about the money multiplier in the class on financial markets. Assume the following: The public holds no currency. The ratio of reserves to deposits is 0.1. The demand for money is given by

$$M_d = Y \cdot (0.8 - 4i)$$

Initially, the monetary base is ₹100 billion, and nominal income is ₹5 trillion.

1. (2 points) What is the demand for central bank money?

> **Solution:** Demand for central bank money, H_d equals the demand for cash CU_d+ the demand for reserves $\theta \cdot R_d$. We know that there is no hard cash in this economy. Therefore, $CU_d = 0$.
> Now, the demand for reserves becomes: $\theta \cdot R_d = \theta \cdot (1 - c)M_d$.
> We know that $M_d = Y \cdot (0.8 - 4i)$, and that $\theta = 0.1$.
> Therefore, $H_d = 0.1 \cdot Y \cdot (0.8 - 4i)$.

2. (2 points) Find the equilibrium interest rate by setting the demand for central bank money equal to the supply of central bank money.

> **Solution:** The demand for central bank money, $H_d = 0.1 \cdot Y \cdot (0.8 - 4i)$.
> The supply of central bank money, $H_s = 100$. Equating the two, we get:
> $0.1 \cdot Y \cdot (0.8 - 4i) = 100$
> $i^* = 0.15$
> ($Y = 5000$) or the interest rate is 15%.

3. (2 points) What is the overall money supply? Is it equal to the overall demand for money at the interest rate you found in question 2?

> **Solution:** Overall money supply M_s will be equal to H_s/θ. (Recall the money multiplier discussion from the class.)
> $M_s = 100/0.1 = 1000$ billion.
> At $i^* = 15\%$, $M_d = Y \cdot (0.8 - 0.6) = 0.2Y = 1000$ billion.

4. (2 points) Compute the change in interest rate when central bank money is increased to ₹300 billion.

> **Solution:** $i_2^* = 5\%$. (Plug numbers into the equation in the first question.)
> $i_2^* - i^* = 5\% - 15\% = -10\%$

5. (2 points) When overall money supply goes up to ₹3,000 billion, compute the change in interest rate.

Solution: $i_2^* = 5\%$. (This flows from $M_s = M_d$.)
$i_2^* - i^* = 5\% - 15\% = -10\%$