

Problem Set 4 Answers

1 Fed and Money Supply

Assume that the Fed issues \$1000 in currency and distributes it to the public. Individuals have preferences regarding the amount of currency and deposits they want to hold. Those preferences are expressed as a ratio of currency to deposits c . Let $c = .20$. Banks are required to keep reserves in, at least, the amount of 30% of total deposits in order to meet possible withdrawals ($r = .30$).

a) Calculate the Money Multiplier m , money supply $M1$, and the equilibrium amount of deposits D , reserves R , and currency C .

Money Multiplier is

$$m = \frac{M1}{M0} = \frac{C + D}{C + R} = \frac{c + 1}{c + r} = \frac{1.2}{0.5} = 2.4$$

Thus, $M1 = \$2400$. Deposits are given by

$$D = \frac{M1}{1 + c} = \frac{2400}{1.2} = 2000.$$

Thus, currency $C = 400$ and reserves $R = 600$.

Questions b)-d) involve modifications to the original environment of the question. That is, do not answer c) by modifying the environment of question b).

b) Suppose banks purchase a \$200 Treasury bond sold by the Fed. What happens to the money multiplier and to $M1$ money supply as a result of the bond's purchase?

*As a result of the open market operation, $M0$ reduces to \$800. The money multiplier does not change, and so $M1 = m * M0 = \$1920$.*

c) Assume that the Fed prints \$50 in extra currency and gives it to an individual. How does $M1$ change?

*Since $M0$ increases by \$50, $M1$ increases by $\$50 * m = \$50 * 2.4 = 120$. $M1$ is therefore \$2520.*

d) Assume that the Fed decreases Reserve Requirements of the banks to $r = .2$. What happens to the Money Multiplier and to M1 in this case?

The money multiplier changes to

$$m = \frac{c + 1}{c + r} = \frac{1.2}{0.4} = 3.$$

Hence, M1 increases to \$3000.