



Problem sets 1: Central banking and money supply process

EE432: Monetary theory and policy

Semester 1/2018

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Due on September 24th, 2018. in class.

1) Discuss about the pros and cons for the central bank independence. How does the modern institutional design of central bank come up with a set of compromised solutions to enhance and ensure the effectiveness of monetary policy?

2) Answer the following questions

2.1) Assume that no banks hold excess reserves, and the public holds no currency. If a bank sells a \$100 security to the Fed, explain what happens to this bank and two additional steps in the deposit expansion process, assuming a 10% reserve requirement. How much do deposits and loans increase for the banking system when the process is completed?

Answer:

Bank A first changes a security for reserves, and then lends the reserves, creating loans. It receives \$100 in reserves from the sale of securities. Since all of these reserve will be excess reserves (there was no change in checkable deposits), the bank will loan out all \$100. The \$100 will then be deposited into Bank B. This bank now has a change in reserves of \$100, of which \$90 is excess reserves. Bank B will loan out this \$90, which will be deposited into Bank C. Bank C now has an increase in reserves of \$90, \$81 of which is excess reserves. Bank C will loan out this \$81 dollars and the process will continue until there are no more excess reserves in the banking system.

For the banking system, both loans and deposits increase by \$1000.

2.2) Explain two reasons why central banks does not have complete control over the level of bank deposits and loans. Explain how a change in either factor affects the deposit expansion process.

Answer:

The Fed does not completely control the level of bank deposits and loans because banks can hold excess reserves and the public can change its currency holdings. A change in either factor changes the deposit expansion process. An increase in either excess reserves or currency reduces the amount by which deposits and loans are increased.

2.3) Does the simple deposit multiplier overstates the true deposit multiplier?

Answer:

The simple model ignores the role banks and their customers play in the creation process. The bank's customers can decide to hold currency and the bank can decide to hold excess reserves. Both of these will restrict the banking system's ability to create deposits. Thus, the true multiplier is less than the prediction of the simple deposit multiplier.

2.4) If the required reserve ratio is 10 percent, currency in circulation is \$1,200 billion, checkable deposits are \$1,600 billion, and excess reserves total \$2,500 billion, calculate the M1 money multiplier. Show your work.

Answer:

From the question given of currency in circulation, checkable deposits and excess reserve, calculated currency ratio and excess reserve ratio :

$$\text{Currency ratio (c)} = 1,200/1,600 = 0.75$$

$$\text{Excess reserve ratio (e)} = 2,500/1,600 = 1.57$$

$$\begin{aligned} \text{Money multiplier} &= \frac{1 + c}{rr + c + e} \\ &= (1 + 0.75)/(0.1 + 0.75 + 1.57) \\ &= 1.75/2.42 \\ &= 0.73 \end{aligned}$$

Therefore the M1 money multiplier equal to 0.73

2.3) Explain the complete formula for the M1 money supply, and explain how changes in required reserves, excess reserves, the currency ratio, the nonborrowed base, and borrowed reserves affect the money supply. Also, discuss about the impact of digital currency and financial innovations on the money supply process.

Answer:

The formula is $M = \frac{1 + c}{rr + c + e} \times (MB_n + BR)$. The formula indicates that the money supply is the product of the multiplier times the base. Increases in any of the multiplier components, required reserves, r ; excess reserves, e ; or the currency ratio, c ; reduce the multiplier and the money supply. Increases in the nonborrowed base and borrowed reserves both increase the base and the money supply.

The digital currency helps facilitating the transaction, moving the economy another step closer to the cashless society. As a result, currency-holding-to-deposit should decrease. This implies that money multiplier should increase.