

Case, Fair and Oster
Chapter 10 Problems
Money Supply and Federal Reserve

Problem 1. Republic of Ragu.

Ragu Treasury sells 5 million worth of bonds to finance a 5 million deficit.

Reserve requirement is 20 percent.

Ragu Central Bank (RCB) buys 500,000 worth of bonds on the open market.

a. The Treasury sale of bonds means that total debt outstanding has increased by 5 million; the RCB purchase means that private debt outstanding went up by 4.5 million.

b. The Treasury sale of bonds has no effect whatever on the money supply – the Treasury receives money in payment for the bonds, then spends the money on roads or aircraft and returns it to circulation. If the Treasury had simply buried the money it received for bonds in the ground, then banks would have lost reserves and the money supply would have contracted, but they are no more likely to do that than you are when you take out a loan.

c. The RCB purchase of bonds on the open market will expand the money supply. If the RCB bought the bonds from banks, it would directly credit their reserves with the RCB and the money multiplier of $1 / .20 = 5$ would mean that the money supply would expand by 2,500,000 as a result of the 500,000 purchase.

If the RCB bought the bonds from the public, the public would deposit the checks they received from the RCB with their banks, and again the bank reserves would increase – so the result would be the same 2,500,000 expansion of the money supply.

Problem 2. Retiring the Federal Debt.

The US federal government budget was in surplus 1920-1930, 1947-48, 1951, 1956-7, 1960, 1999 and 2000.

The 2000 budget surplus was about 1 percent of GDP.

Running a budget surplus means that the government does not need to issue new bonds, and will simply retire old ones – will this increase the money supply?

Answer: NO. The government is providing funds to the financial markets, but the funds are coming from tax revenues, not by new money creation. The repurchase of bonds will mean that interest rates will be less than they otherwise would have been, but it will not have any impact on the money supply.

In contrast, a Fed purchase of bonds does involve the increase of the monetary base (bank reserves), and so will expand the money supply.

Problem 3. Assets and liabilities.

Remember the bank balance sheet outline:

ASSETS

LIABILITITES

Reserves

Vault cash
 Account with Fed

Deposits

Checking accounts (Demand deposits)
 Savings accounts

Loans (Bank Credit)

Commercial
 Mortgage
 Credit card

Loans to the bank

Federal funds (from other banks)
 Fed discount window loans
 Fed loans through Term Auction Facility

Problem 4. Money and POW camps.

Google: Radford POW camp cigarettes

If you add “Salemi” to the search terms, you will get a nice set of questions on Radford by Professor Michael Salemi.

Problem 5. Expanding the money supply.

Basic tools for any central bank:

Changing required reserve ratio (decrease to increase money supply)

Discount rate (decrease to get banks to take more loans from the central bank)

Open market operations (buy securities and pay for them by central bank creation of high powered money)

For more depth, check the websites of central banks for:

what tools they rely on primarily

what their policy measures were in the financial crisis of 2008-10.

Bank of Japan (www.boj.or.jp) “Policy measures in the current financial crisis”

European Central Bank (www.ecb.int) has an especially good section on monetary policy.

(<http://www.ecb.int/mopo/html/index.en.html>)

Bank of England <http://www.bankofengland.co.uk>

For recent emergency measures, see their “Quantitative easing explained” pamphlet at <http://www.bankofengland.co.uk/monetarypolicy/assetpurchases.htm>

Problem 6. Republic of Madison: cutting the reserve ratio.

Initially, bank reserves were 6.24 million and reserve requirement was 12 percent.

Banks were “loaned up” = had no **excess reserves**.

Rearranging the definition $RRR = \text{Reserves} / \text{Deposits}$,

we find that bank deposits were $\text{Reserves} / RRR = 6.24 / 0.12 = 52$ million

Hence, in this problem, bank deposits were the entire money supply (no currency)

Cutting the reserve ratio to 10 percent would enable bank deposits of $6.24 / 0.10 = 62.4$ million, which banks can create by making loans and creating the new checking deposits corresponding to the loans.

Problem 7. US money supply, 2010.

The values for the US M1 money supply (March, 2010) were:

Currency: 872 billion

Traveler's checks: 5 billion

Demand deposits: 449 billion

Other checkable deposits: 394 billion

The last two categories are bank-created, so 843 billion in bank deposits are the target of Fed policy.

If the reserve requirement were 10 percent as the text assumes, this would mean banks would have required reserves of 84.3 billion.

If the reserve requirement were raised to 11 percent, the bank reserves of 84.3 billion would support only $84.3 / 0.11 = 776.4$ billion worth of deposits. The increase in the reserve requirements would contract the money supply by $843 - 776.4 = 77.6$ billion or almost 10 percent.

(Note that in fact banks were keeping huge excess reserves – more than a trillion dollars – in March 2010, so the calculations are pretty hypothetical. Note also that the requirement varies with size of a bank's transaction accounts (= demand + other checkable deposits) – zero if less than 9 million, three percent if less than \$ 44 million, and 10 percent if above, as of Feb. 2008.)

Problem 8. Coin clipping in Medivalia.

The wizard's advice to lighten the gold or silver was often followed in the Middle Ages, and indeed in ancient times. The government is the first beneficiary of the resulting inflation.

Problem 9. M2 more stable than M1.

Since savings accounts (part of M2) are very, very liquid, they are very good substitutes for M1 money. A slight change in interest rates on savings accounts can lead to a very large movement from M1 to savings or vice versa. For an illustration of the M1/GDP and the much greater stability in the M2/GDP ratio, see the class lecture slides based on the FRED database. Neither is as stable as the simple quantity theory would have it, but the M2/GDP ratio does not show the same continuous drop as the M1/GDP ratio.

Problem 10. True or False

It is true that the Treasury issue of bonds to finance the deficit does NOT affect the money supply. The Treasury receives money (transfer of checking account balance) for its bonds, then spends the money on government purchases, returning it to the economy.

It is not true that the money multiplier depends on the marginal propensity to save. It depends on the required reserve ratio (and a more advanced presentation would also note that it depends on the public's wish to hold currency – a greater wish to hold currency would prevent the bank money creation process, which depends on someone redepositing the deposits created along with loans, from working as powerfully as the text suggests)

Problem 11. Leakages reduce the money multiplier.

The money multiplier process in the text assumes that those who get loans spend them (say on a car) and that the auto dealer then deposits the money in her bank account. If this does not take place – if the dealer keeps the money in cash, or in a foreign bank account, the money multiplier process will not work fully.

It is also true that if banks keep excess reserves, the money multiplier process will not work fully.

There is a parallel to the Keynesian multiplier here – if the marginal propensity to save increases, the multiplier decreases. If the propensity to hold currency or reserves increases, then the money multiplier will decrease.

Problem 12. Bank balance sheet exercise.

ASSETS		LIABILITIES	
Reserves	\$ 500	Deposits	\$ 3500
Loans	\$ 3000		

At a 10 percent reserve ratio, required reserves would be \$ 350. This bank therefore has excess reserves of $500 - 350 = \$ 150$, and those excess reserves could support another \$ 1500 in deposits.

The bank would therefore be able to increase loans by \$ 1500, creating \$ 1500 in deposits in the process (when the banker creates a loan, she tells the customer that he has another \$ 1500 in his checking account)

If a depositor were to withdraw \$ 300 from his account, the remaining \$ 200 in reserves would only support \$ 2000 in deposits. The banker is in an embarrassing position, and must come up with another \$ 120 in reserves or reduce deposits by \$ 1200.

ASSETS		LIABILITIES	
Reserves	\$ 200	Deposits	\$ 3200
Loans	\$ 3000		