The Federal Reserve, Private Banks, and the Money Supply

In these notes I review some of the mechanics by which the Federal Reserve and private banks interact to determine the supply of money in the United States.

Recall that M1, the narrowest (and for our purposes, largely sufficient) measure of the money supply, consists of currency plus demand deposits (plus some other second-order types of accounts; I ignore these here.)
Demand deposits $DD$, i.e. checking accounts, are created by banks.

How do banks do this? The basis of money creation is that banks have *reserves*, denoted as $R$.

**Definition:**

A bank’s reserves equal its holding of currency plus its deposits at Federal Reserve Banks.

Reserves are sometimes called *high powered money*. They are the backing that allows banks to make loans and create money.
Example of Money Creation

Following Parkin pg. 242, we can visualize this process as follows.

Suppose an individual has $100,000 in currency and deposits it in the bank. The individual now has $100,000 in demand deposits $DD$. These bank now has $100,000 in new reserves.

The bank can create addition checking accounts using these reserves. Specifically, the bank can make loans based on these reserves.
For the economy as a whole, the *monetary base* is the sum of all banks’ currency and Federal Reserve deposit holdings.

The monetary base underpins the overall supply of money.
By law, a bank needs to maintain a certain percentage of its reserves given its level of demand deposits.

The required reserve ratio, $rr$, describes this requirement.

The level of reserves the bank must hold is called its required reserves, $RR$

**Example:**

Suppose that the $rr$ is 25%. This means that the bank can lend out $75,000 of the initial new reserves.

Think of it this way. The bank issues a loan for $75,000. The borrower gives a check to someone (for a house, say) and the person who receives it deposits in a second bank.
But this is not the end of the story!!

The second bank now receives $75,000 in reserves and has created a second checking account; hence the money supply is now increased by $75,000.

Formula: an increase in reserves of $R$ can increase the money supply by $\frac{R}{rr}$.
Reserves

A bank does not have to make sufficient loans so that the ratio of $DD$ in the bank to $R$ equals $r$. If a bank does not make this level of loans, it possesses excess reserves, $ER$.

Identity

A bank’s reserves equal its required reserves plus its excess reserves, i.e.

$$R = RR + ER$$

High levels of excess reserves are a signal of slack in the economy.
A bank will sometimes need to borrow reserves in order to cover its checking accounts. It can do this from other banks in the Federal Funds market, which makes overnight loans of this type. The interest rate for this market is called the *Federal Funds Rate*, ffr.

Since monitoring M1 is hard (given dependence on private banks), the *ffr* is often used to monitor the state of the money markets.

Note: A bank’s reserves can always be split into *nonborrowed reserves*, NBR, and *borrowed reserves*, BR.
The Federal Reserve and the Money Supply

The Federal Reserve has three basic channels by which it affects the money supply.

**Discount rate (dr).** The Federal Reserve also lends reserves. The rate it charges, \( dr \), can be adjusted to increase or decrease the money supply.

**Required Reserve Ratio.** The Federal Reserve can change the required reserve ratio \( rr \).

**Open Market Operations.** The Federal Reserve buys and sell government bonds. When it buys a bond, it in essence increases the reserves held by a bank at a Federal Reserve bank.