

Money and Banking: *How Money Is Created*

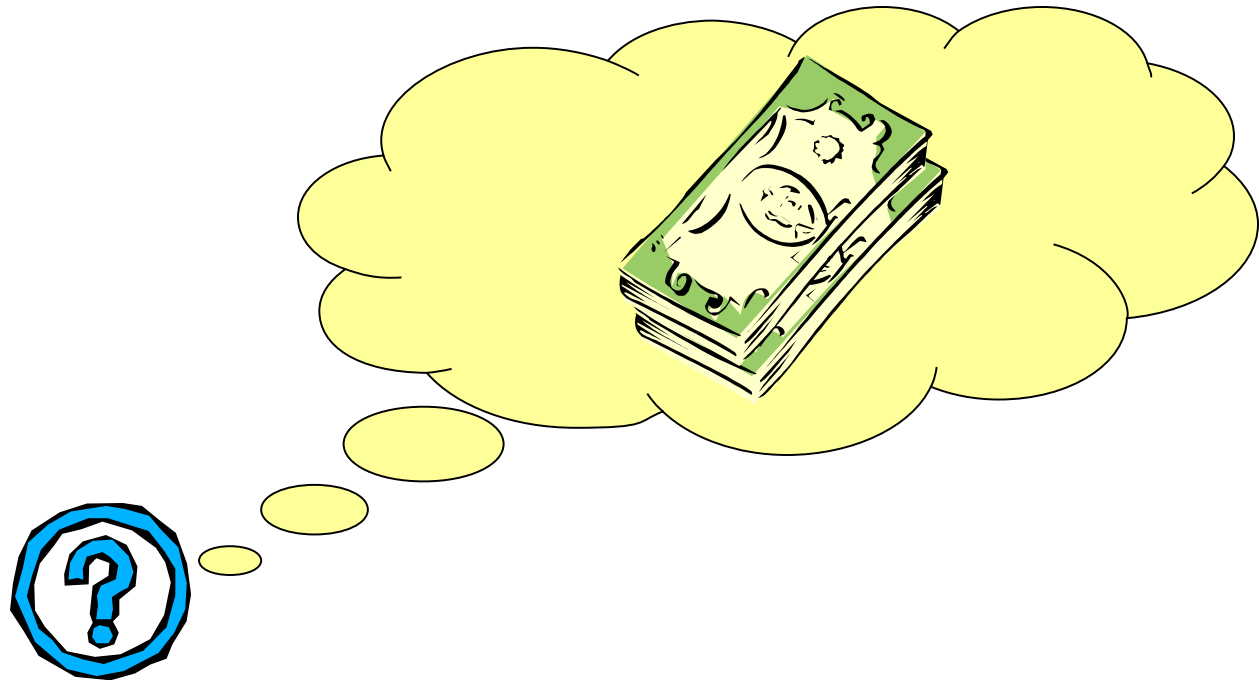
(or Money From Nothing)

How money is created by fractional reserve banking

What Is Money?

Before asking how money is created, we need to be clear about *what is money?* You may at first think the answer should be obvious – it's the coins and paper you have in your pocket that you use to buy things. But when you try to define money, it gets trickier.

Basically money is *anything accepted and commonly used as a means of exchange*. In other words, it's spending power – the ability to buy goods.



Liquid Money: *M1*

The most liquid form of money is what is called M1. M1 is money that can be immediately spent. It can be used to buy goods without any intermediate steps or transactions necessary.

The **currency and coins** that are in your pocket or wallet (or even down between the cushions of your sofa!), **are definitely M1**. They can be spent immediately (and often are in my case, unfortunately) > .

But there's more to M1, than just currency and coins. The money you put in the bank in your **checking account** is also M1. After all, you could go buy something and simply write a check. **Traveler's checks** and money orders are also considered M1.

The quantity of M1 in circulation in an economy is called its *money supply*.

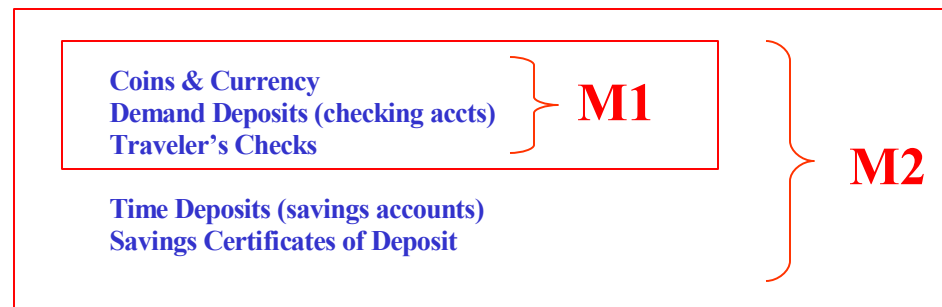
M1 is liquid money

Less Liquid Money: M2

The money deposited into a checking account is considered M1 since it can be easily spent by writing checks. *(by the way, checking accounts are also called demand deposits, since the bank must pay the money upon demand of the depositor)*

The money that deposited in a savings account or certificate of deposit is considered a time deposit. It can be spent, but not as easily as a checking account. First you must either transfer the money into the checking account and then write a check, or you have to withdraw the money from the bank and then spend the cash. Either way, it has an added step. It's not quite as liquid as M1.

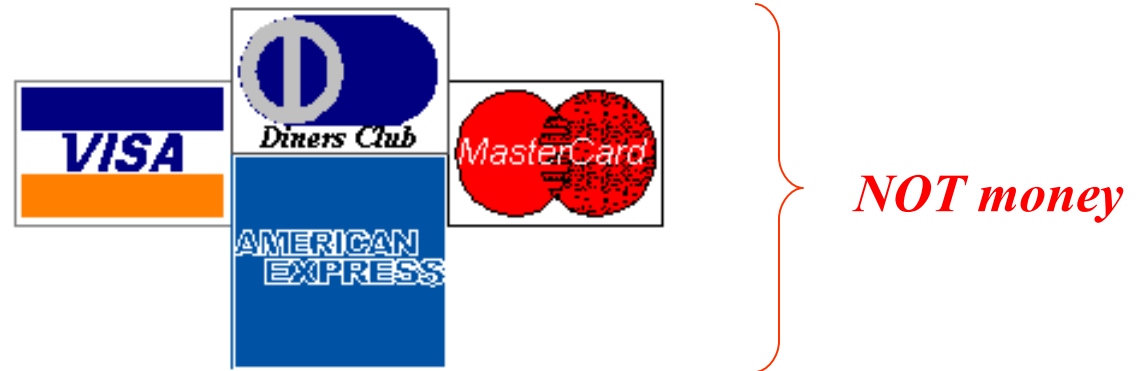
Economists also measure how much slightly-less-liquid money exists. It is called M2. **M2 consists of all of M1 + time deposits.**



What about credit cards? Debit cards?

Debit cards are just a handy way to write an electronic check. The money you use when you use a debit card is the money in your checking account, so it's already included in M1.

Credit cards, however, are NOT MONEY. Credit cards are really handy way to electronically take out a loan from the bank. Using a credit card doesn't really pay for a purchase. It just delays the date when the payment will be made (and adds some interest charges to it). Credit cards are NOT considered part of M1.



Modern Banks are Not Like Your Piggy Bank

Some people use a piggy bank to put money away for safe keeping and future use. In the future, when they want the money, they just open the piggy bank and there the money is. In economist-speak, a piggy bank could be described as “100% reserve bank”. Looked at from the bank’s perspective, the bank is keeping a reserve of cash to pay back the depositor. If the bank keeps all of the money deposited in its reserves, then it is 100% reserve bank.

But, a 100% reserve bank cannot afford to pay interest on the deposits. The piggy bank or coin jar you used as child never paid back more than you deposited.

But modern banks do pay interest on some deposits. They can afford to pay interest on some deposits because they are *fractional-reserve banks*.

Fractional Reserve Banking

A fractional reserve bank keeps only a small fraction of its deposits as cash in the vault. It takes most of the money depositors have deposited and loans the money out to other customers.

The system works because on any given day, customers only want to withdraw a small fraction of the total deposits they have made. As long as the bank has just enough cash on-hand (reserves) to pay these withdrawals, it can use the rest of the deposited money to make loans.

So, suppose a bank had a total of \$1,000,000 in deposits. The bank might only keep \$200 thousand on-hand as cash reserves and will have already loaned-out \$800 thousand to borrowers. On a typical day, the bank will need to pay out somewhere between \$20-50 thousand in withdrawals and it will take in another \$20-50 thousand in new deposits. As long as each day's net withdrawals (withdrawals – new deposits) are less than the cash reserves on-hand, the bank is solvent. Meanwhile, it can charge interest to the borrowers and earn profits that way.

Bank Runs: *Trouble for Fractional Reserve Banks*

What happens if depositors want to withdraw an unusually large (and unexpected by the bank) on a particular day?

As long the bank has enough reserves on-hand, nothing. The bank pays the depositors.

But, if the amount depositors want to withdraw exceeds the amount the bank has on-hand in reserves, then the bank cannot meet all the demands of the depositors. The bank has *failed*. It is now bankrupt and closed.

When depositors begin demanding an unusually large amount of withdrawals, it is called a *bank run*. In the old days, depositors would literally run to the bank to withdraw their money before the bank collapsed.

Bank Accounting

Banks are businesses. And, like businesses, they track their financial position using a *balance sheet statement*. In a balance sheet, *assets* (what is owned) are listed on the left side and *liabilities+equity* is listed on the right. (liabilities are the amounts owed to others). The statement must always balance. The following must be always be true:

$$\text{Total Assets} = \text{Total Liabilities} + \text{Equity}$$

What makes bank balance sheets appear different at first, is that **loans are considered assets and deposits are liabilities**. This is, of course different from how customers view it. But the statements are from the *bank's point of view*.

- **A bank deposit is a liability to the bank – the bank is responsible for paying the money back to the customer**
- **A loan is an asset of the bank – the bank owns the right to collect the money from the borrower.**

Bank Accounting – An Example

Banks essentially have two types of assets: reserves and loans. Reserves are the money the bank keeps on-hand to pay for withdrawals.

Reserves may either take the form of cash on-site in the bank vault or a regular bank may make a deposit at another bank, particularly A Federal Reserve Bank.

Fractional Reserve Banking Creates Money

When a bank makes a loan to a customer, it creates new purchasing power. It creates new M1.

New loans create new M1.

When a loan is made, all previous depositors still have their spending power (the \$ in their checking accounts) but now a new customer, the one receiving the loan, has new spending power. M1 has been created.

Fractional Reserve Banking Creates Money

When a bank accepts a deposit from a customer, no new M1 is created. The form of M1 is simply changed. What had been a \$100 bill in Ed's pocket (currency) now becomes a checking account deposit (demand deposit).

And vice-versa. If a deposit is withdrawn from a checking account, no new M1 is created. Only the form is changed.

But, if a loan is made, then new M1 is created. Only *new loans create add to M1.*

The Banker's Dilemma: Safety? or Profits?

Bankers constantly face a decision: how much of their deposits should they loan out?

In other words, how small should the reserves be as a fraction of the total deposits.

If *reserves are too small*, then the risk increases that an unusual increase in withdrawals will create a bank failure.

If *reserves are too large*, then fewer loans can be made and less interest (profits) can be collected from those loans.

The Federal Reserve Sets a Minimum Reserve Amount

To help protect both the public and bankers, The Federal Reserve sets a minimum Required Reserve Ratio.

The required reserve ratio, which is oftentimes just called the reserve ratio and abbreviated “rr” calculates the minimum amount of \$ a bank must have in reserves given the amount of deposits it has.

Reserve ratios are typically in the 15% to 20% range. The Fed will change the ratio depending upon the health of the overall economy and banking system.

Excess Reserves

If a bank actually has more reserves on-hand than required, then it has excess reserves. Excess reserves can be used to create new loans.

Thus, *excess reserves when loaned out to customers become new M1.*

Too-Little Reserves

If a bank actually has less reserves on-hand than required, then it has failed. It is now insolvent. The Fed will close the bank and try to sell it to a healthier, more solvent bank. If the bank cannot be sold, it is liquidated. What reserves are left are used to pay depositors and close accounts.

Let's Look at An Example

In the following simple example, we have a small economy with five people (Larry, Curly, Moe, Shemp, and Monty Burns). There are also three businesses (GrouchoCorp, The Harpo Store, and ChicoMart).

Initially there is no bank, but soon Monty Burns (the really rich guy) decides to start his own fractional reserve bank called Acme Bank

Each of the following slides will illustrate the effects of a single transaction in the economy. Be sure to pay close attention to how M1 changes and what the excess reserves of the bank are. These numbers are at the bottom of each slide. The amounts that change as a result of the transaction are shown in red on each slide.

Starting Point

Everybody has \$100 in currency in their pocket, except Mr. Burns, who has \$1,550. Nobody has any money in the bank because the bank doesn't exist yet.

Public's Spending Power

	Cash in Pocket: currency + coin	Money on Deposit in Bank
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Larry	100	0
Curly	100	0
Moe	100	0
Shemp	100	0
GrouchoCorp.	100	0
Harpo Store	100	0
Chico Mart	100	0
Monty Burns	1,550	0
Total Public:	2,250	0

Total M1: 2,250

Total M1 = \$2,250, which is the total of cash in circulation with the public and total demand deposits at any banks.

Mr. Burns Starts the Acme Bank

Monty invests 250 in the bank, which creates a cash reserve. AcmeBank deposits this cash reserve at The Federal Reserve Bank for safekeeping (and to comply with regulations).

Public's Spending Power	Cash in Pocket: currency + coin	Money on Deposit in Bank
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Larry	100	0
Curly	100	0
Moe	100	0
Shemp	100	0
GrouchoCorp.	100	0
Harpo Store	100	0
Chico Mart	100	0
Monty Burns	1,300	0
Total Public:	2,000	0

Total M1: 2,000

Acme Bank (owned by Monty Burns)			
Balance Sheet			
Assets	Liabilities + Equity		
Reserves	Equity		
on deposit @ The Fed	250	Monty's original investment	250
Cash in Vault	0	Retained Profits (loss)	0
Total Reserves	250	Total Equity Capital	250
Loans to Customers	Deposits of Customers		
Larry	0	Larry	0
Curly	0	Curly	0
Moe	0	Moe	0
Shemp	0	Shemp	0
GrouchoCorp.	0	GrouchoCorp.	0
Harpo Store	0	Harpo Store	0
Chico Mart	0	Chico Mart	0
Monty Burns	0	Monty Burns	0
Total Loans	0	Total Deposits	0
TOTAL ASSETS (RESERVES + LOANS)	250	TOTAL LIABILITIES + EQUITY	250

Audit OK! Balance Sheet Balances.

Reserves Calculation:	
Fed's Required Reserve Ratio	20.00%
Actual Total Reserves (from above)	250
minus Required Reserves	0
Excess Reserves (avail. to make new loans)	250

Mr. Burns Deposits Money In An Account at AcmeBank

Monty deposits \$1,000. This takes \$1,000 out of currency in circ and into a demand deposit account. It also raises the banks total reserves to \$1,250.

Public's Spending Power	Cash in Pocket: currency + coin	Money on Deposit in Bank
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Larry	100	0
Curly	100	0
Moe	100	0
Shemp	100	0
GrouchoCorp.	100	0
Harpo Store	100	0
Chico Mart	100	0
Monty Burns	300	1,000
Total Public:	1,000	1,000

Total M1: 2,000

Acme Bank (owned by Monty Burns)			
Balance Sheet			
Assets		Liabilities + Equity	
Reserves		Equity	
on deposit @ The Fed	250	Monty's original investment	250
Cash in Vault	1,000	Retained Profits (loss)	0
Total Reserves	1,250	Total Equity Capital	250
Loans to Customers		Deposits of Customers	
Larry	0	Larry	0
Curly	0	Curly	0
Moe	0	Moe	0
Shemp	0	Shemp	0
GrouchoCorp.	0	GrouchoCorp.	0
Harpo Store	0	Harpo Store	0
Chico Mart	0	Chico Mart	0
Monty Burns	0	Monty Burns	1,000
Total Loans	0	Total Deposits	1,000
TOTAL ASSETS (RESERVES + LOANS)	1,250	TOTAL LIABILITIES + EQUITY	1,250

Audit OK! Balance Sheet Balances.

Reserves Calculation:	
Fed's Required Reserve Ratio	20.00%
Actual Total Reserves (from above)	1,250
minus Required Reserves	200
Excess Reserves (avail. to make new loans)	1,050

Groucho Corp. Borrows \$1,000

Groucho borrows \$1,000 from Acme so it has money for future operations. The loan proceeds are deposited into a GrouchoCorp checking account. M1 grows from the loan and the new deposit increases reserves.

Public's Spending Power	Cash in Pocket: currency + coin	Money on Deposit in Bank
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Larry	100	0
Curly	100	0
Moe	100	0
Shemp	100	0
GrouchoCorp.	100	1,000
Harpo Store	100	0
Chico Mart	100	0
Monty Burns	300	1,000
Total Public:	1,000	2,000

Total M1: 3,000

Acme Bank (owned by Monty Burns)

Balance Sheet			
Assets		Liabilities + Equity	
Reserves		Equity	
on deposit @ The Fed	250	Monty's original investment	250
Cash in Vault	1,000	Retained Profits (loss)	0
Total Reserves	1,250	Total Equity Capital	250
Loans to Customers		Deposits of Customers	
Larry	0	Larry	0
Curly	0	Curly	0
Moe	0	Moe	0
Shemp	0	Shemp	0
GrouchoCorp.	1,000	GrouchoCorp.	1,000
Harpo Store	0	Harpo Store	0
Chico Mart	0	Chico Mart	0
Monty Burns	0	Monty Burns	1,000
Total Loans	1,000	Total Deposits	2,000
TOTAL ASSETS (RESERVES + LOANS)		TOTAL LIABILITIES + EQUITY	
2,250		2,250	

Audit OK! Balance Sheet Balances.

Reserves Calculation:	
Fed's Required Reserve Ratio	20.00%
Actual Total Reserves (from above)	1,250
minus Required Reserves	400
Excess Reserves (avail. to make new loans)	850

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Groucho Corp. Pays It's CEO, Larry

Groucho Corp pays Larry \$400 which is direct deposited into Larry's checking acct. The deposit increases reserves. M1 is unchanged.

Public's Spending Power	Cash in Pocket: currency + coin	Money on Deposit in Bank
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Larry	100	400
Curly	100	0
Moe	100	0
Shemp	100	0
GrouchoCorp.	100	600
Harpo Store	100	0
Chico Mart	100	0
Monty Burns	300	1,000
Total Public:	1,000	2,000

Total M1: 3,000

Acme Bank (owned by Monty Burns)			
Balance Sheet			
Assets		Liabilities + Equity	
Reserves		Equity	
on deposit @ The Fed	250	Monty's original investment	250
Cash in Vault	1,000	Retained Profits (loss)	0
Total Reserves	1,250	Total Equity Capital	250
Loans to Customers		Deposits of Customers	
Larry	0	Larry	400
Curly	0	Curly	0
Moe	0	Moe	0
Shemp	0	Shemp	0
GrouchoCorp.	1,000	GrouchoCorp.	600
Harpo Store	0	Harpo Store	0
Chico Mart	0	Chico Mart	0
Monty Burns	0	Monty Burns	1,000
Total Loans	1,000	Total Deposits	2,000
TOTAL ASSETS (RESERVES + LOANS)	2,250	TOTAL LIABILITIES + EQUITY	2,250

Audit OK! Balance Sheet Balances.

Reserves Calculation:	
Fed's Required Reserve Ratio	20.00%
Actual Total Reserves (from above)	1,250
minus Required Reserves	400
Excess Reserves (avail. to make new loans)	850

Larry withdraws \$400

Larry wants some walking around money to flash, so he withdraws \$400 from the bank. The banks reserves drop. M1 is unchanged.

Public's Spending Power	Cash in Pocket: currency + coin	Money on Deposit in Bank
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Larry	500	0
Curly	100	0
Moe	100	0
Shemp	100	0
GrouchoCorp.	100	600
Harpo Store	100	0
Chico Mart	100	0
Monty Burns	300	1,000
Total Public:	1,400	1,600

Total M1: 3,000

Acme Bank (owned by Monty Burns)

Balance Sheet

Assets		Liabilities + Equity	
Reserves		Equity	
on deposit @ The Fed	250	Monty's original investment	250
Cash in Vault	600	Retained Profits (loss)	0
Total Reserves	850	Total Equity Capital	250
Loans to Customers		Deposits of Customers	
Larry	0	Larry	0
Curly	0	Curly	0
Moe	0	Moe	0
Shemp	0	Shemp	0
GrouchoCorp.	1,000	GrouchoCorp.	600
Harpo Store	0	Harpo Store	0
Chico Mart	0	Chico Mart	0
Monty Burns	0	Monty Burns	1,000
Total Loans	1,000	Total Deposits	1,600
TOTAL ASSETS (RESERVES + LOANS)	1,850	TOTAL LIABILITIES + EQUITY	1,850

Audit OK! Balance Sheet Balances.

Reserves Calculation:

Fed's Required Reserve Ratio	20.00%
Actual Total Reserves (from above)	850
minus Required Reserves	320
Excess Reserves (avail. to make new loans)	530

Larry buys something from Harpo Store

Larry buys a new suit from Harpo Store (CEO's have to look good). He pays \$500 cash. No change in M1 or bank reserves.

Public's Spending Power
 Cash in Pocket: currency + coin
 Money on Deposit in Bank

Larry	0	0
Curly	100	0
Moe	100	0
Shemp	100	0
GrouchoCorp.	100	600
Harpo Store	600	0
Chico Mart	100	0
Monty Burns	300	1,000
Total Public:	1,400	1,600

Total M1: 3,000

Acme Bank (owned by Monty Burns)

Balance Sheet			
Assets		Liabilities + Equity	
Reserves		Equity	
on deposit @ The Fed	250	Monty's original investment	250
Cash in Vault	600	Retained Profits (loss)	0
Total Reserves	850	Total Equity Capital	250
Loans to Customers		Deposits of Customers	
Larry	0	Larry	0
Curly	0	Curly	0
Moe	0	Moe	0
Shemp	0	Shemp	0
GrouchoCorp.	1,000	GrouchoCorp.	600
Harpo Store	0	Harpo Store	0
Chico Mart	0	Chico Mart	0
Monty Burns	0	Monty Burns	1,000
Total Loans	1,000	Total Deposits	1,600
TOTAL ASSETS (RESERVES + LOANS)	1,850	TOTAL LIABILITIES + EQUITY	1,850

Audit OK! Balance Sheet Balances.

Reserves Calculation:	
Fed's Required Reserve Ratio	20.00%
Actual Total Reserves (from above)	850
minus Required Reserves	320
Excess Reserves (avail. to make new loans)	530

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Harpo Store makes a deposit

Harpo store makes a \$400 deposit at the bank. Bank reserves increase. M1 is unchanged.

Public's Spending Power
 Cash in Pocket: currency + coin
 Money on Deposit in Bank

Larry	0	0
Curly	100	0
Moe	100	0
Shemp	100	0
GrouchoCorp.	100	600
Harpo Store	200	400
Chico Mart	100	0
Monty Burns	300	1,000
Total Public:	1,000	2,000

Total M1: 3,000

Acme Bank (owned by Monty Burns)

Balance Sheet			
Assets		Liabilities + Equity	
Reserves		Equity	
on deposit @ The Fed	250	Monty's original investment	250
Cash in Vault	1,000	Retained Profits (loss)	0
Total Reserves	1,250	Total Equity Capital	250
Loans to Customers		Deposits of Customers	
Larry	0	Larry	0
Curly	0	Curly	0
Moe	0	Moe	0
Shemp	0	Shemp	0
GrouchoCorp.	1,000	GrouchoCorp.	600
Harpo Store	0	Harpo Store	400
Chico Mart	0	Chico Mart	0
Monty Burns	0	Monty Burns	1,000
Total Loans	1,000	Total Deposits	2,000
TOTAL ASSETS (RESERVES + LOANS)	2,250	TOTAL LIABILITIES + EQUITY	2,250

Audit OK! Balance Sheet Balances.

Reserves Calculation:	
Fed's Required Reserve Ratio	20.00%
Actual Total Reserves (from above)	1,250
minus Required Reserves	400
Excess Reserves (avail. to make new loans)	850

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Acme transfers reserves to The Fed

Acme Bank is nervous keeping so much money in their vault. They transfer part of their reserves to their account at The Federal Reserve bank. Total reserves and M1 are unchanged.

Public's Spending Power
 Cash in Pocket: currency + coin
 Money on Deposit in Bank

Larry	0	0
Curly	100	0
Moe	100	0
Shemp	100	0
GrouchoCorp.	100	600
Harpo Store	200	400
Chico Mart	100	0
Monty Burns	300	1,000
Total Public:	1,000	2,000

Total M1: 3,000

Acme Bank (owned by Monty Burns)

Balance Sheet			
Assets		Liabilities + Equity	
Reserves		Equity	
on deposit @ The Fed	450	Monty's original investment	250
Cash in Vault	800	Retained Profits (loss)	0
Total Reserves	1,250	Total Equity Capital	250
Loans to Customers		Deposits of Customers	
Larry	0	Larry	0
Curly	0	Curly	0
Moe	0	Moe	0
Shemp	0	Shemp	0
GrouchoCorp.	1,000	GrouchoCorp.	600
Harpo Store	0	Harpo Store	400
Chico Mart	0	Chico Mart	0
Monty Burns	0	Monty Burns	1,000
Total Loans	1,000	Total Deposits	2,000
TOTAL ASSETS (RESERVES + LOANS)	2,250	TOTAL LIABILITIES + EQUITY	2,250

Audit OK! Balance Sheet Balances.

Reserves Calculation:	
Fed's Required Reserve Ratio	20.00%
Actual Total Reserves (from above)	1,250
minus Required Reserves	400
Excess Reserves (avail. to make new loans)	850

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Curly borrows money.

Curly anticipates buying some things in the near future. He takes a \$800 loan from the bank and has it deposited into his checking account. The loan increases M1 and the deposit increases bank reserves.

<i>Public's Spending Power</i>	Cash in Pocket: currency + coin	Money on Deposit in Bank
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Larry	0	0
Curly	100	800
Moe	100	0
Shemp	100	0
GrouchoCorp.	100	600
Harpo Store	200	400
Chico Mart	100	0
Monty Burns	300	1,000
Total Public:	1,000	2,800

Total M1: 3,800

Acme Bank (owned by Monty Burns)

<i>Balance Sheet</i>			
<i>Assets</i>		<i>Liabilities + Equity</i>	
Reserves		Equity	
on deposit @ The Fed	450	Monty's original investment	250
Cash in Vault	800	Retained Profits (loss)	0
Total Reserves	1,250	Total Equity Capital	250
Loans to Customers		Deposits of Customers	
Larry	0	Larry	0
Curly	800	Curly	800
Moe	0	Moe	0
Shemp	0	Shemp	0
GrouchoCorp.	1,000	GrouchoCorp.	600
Harpo Store	0	Harpo Store	400
Chico Mart	0	Chico Mart	0
Monty Burns	0	Monty Burns	1,000
Total Loans	1,800	Total Deposits	2,800
TOTAL ASSETS (RESERVES + LOANS)	3,050	TOTAL LIABILITIES + EQUITY	3,050

Audit OK! Balance Sheet Balances.

<i>Reserves Calculation:</i>	
Fed's Required Reserve Ratio	20.00%
Actual Total Reserves (from above)	1,250
minus Required Reserves	560
Excess Reserves (avail. to make new loans)	690

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Moe finances a purchase.

Moe decides to buy a new TV from ChicoMart. He finances the purchase (only 23% interest!). Acme Bank runs the finance program for ChicoMart, so the loan is really from AcmeBank. ChicoMart gets the money immediately in their checking account. M1 increases from the loan and the deposit increases bank reserves.

Public's Spending Power	Cash in Pocket: currency + coin	Money on Deposit in Bank
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Larry	0	0
Curly	100	800
Moe	100	0
Shemp	100	0
GrouchoCorp.	100	600
Harpo Store	200	400
Chico Mart	100	640
Monty Burns	300	1,000
Total Public:	1,000	3,440

Total M1: 4,440

Acme Bank (owned by Monty Burns)			
Balance Sheet			
Assets		Liabilities + Equity	
Reserves		Equity	
on deposit @ The Fed	450	Monty's original investment	250
Cash in Vault	800	Retained Profits (loss)	0
Total Reserves	1,250	Total Equity Capital	250
Loans to Customers		Deposits of Customers	
Larry	0	Larry	0
Curly	800	Curly	800
Moe	640	Moe	0
Shemp	0	Shemp	0
GrouchoCorp.	1,000	GrouchoCorp.	600
Harpo Store	0	Harpo Store	400
Chico Mart	0	Chico Mart	640
Monty Burns	0	Monty Burns	1,000
Total Loans	2,440	Total Deposits	3,440
TOTAL ASSETS (RESERVES + LOANS)	3,690	TOTAL LIABILITIES + EQUITY	3,690

Audit OK! Balance Sheet Balances.

Reserves Calculation:	
Fed's Required Reserve Ratio	20.00%
Actual Total Reserves (from above)	1,250
minus Required Reserves	688
Excess Reserves (avail. to make new loans)	562

Shemp borrows money.

Shemp borrows \$500 from the bank. Instead of having the money immediately deposited to a checking account, Shemp wants it all in currency (he likes dead presidents). M1 is increased from the loan, but paying it cash has reduced the bank's reserves.

Public's Spending Power	Cash in Pocket: currency + coin	Money on Deposit in Bank
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Larry	0	0
Curly	100	800
Moe	100	0
Shemp	600	0
GrouchoCorp.	100	600
Harpo Store	200	400
Chico Mart	100	640
Monty Burns	300	1,000
Total Public:	1,500	3,440

Total M1: 4,940

Acme Bank (owned by Monty Burns)			
Balance Sheet			
Assets		Liabilities + Equity	
Reserves		Equity	
on deposit @ The Fed	450	Monty's original investment	250
Cash in Vault	300	Retained Profits (loss)	0
Total Reserves	750	Total Equity Capital	250
Loans to Customers		Deposits of Customers	
Larry	0	Larry	0
Curly	800	Curly	800
Moe	640	Moe	0
Shemp	500	Shemp	0
GrouchoCorp.	1,000	GrouchoCorp.	600
Harpo Store	0	Harpo Store	400
Chico Mart	0	Chico Mart	640
Monty Burns	0	Monty Burns	1,000
Total Loans	2,940	Total Deposits	3,440
TOTAL ASSETS (RESERVES + LOANS)	3,690	TOTAL LIABILITIES + EQUITY	3,690

Audit OK! Balance Sheet Balances.

Reserves Calculation:	
Fed's Required Reserve Ratio	20.00%
Actual Total Reserves (from above)	750
minus Required Reserves	688
Excess Reserves (avail. to make new loans)	62

Groucho Corp makes a deposit.

Groucho Corp, anticipating rough times ahead, deposits all their petty cash (\$100) into the checking account. No change in M1. Bank reserves go up.

Public's Spending Power
 Cash in Pocket: currency + coin
 Money on Deposit in Bank

Larry	0	0
Curly	100	800
Moe	100	0
Shemp	600	0
GrouchoCorp.	0	700
Harpo Store	200	400
Chico Mart	100	640
Monty Burns	300	1,000
Total Public:	1,400	3,540

Total M1: 4,940

Acme Bank (owned by Monty Burns)

Balance Sheet			
Assets		Liabilities + Equity	
Reserves		Equity	
on deposit @ The Fed	450	Monty's original investment	250
Cash in Vault	400	Retained Profits (loss)	0
Total Reserves	850	Total Equity Capital	250
Loans to Customers		Deposits of Customers	
Larry	0	Larry	0
Curly	800	Curly	800
Moe	640	Moe	0
Shemp	500	Shemp	0
GrouchoCorp.	1,000	GrouchoCorp.	700
Harpo Store	0	Harpo Store	400
Chico Mart	0	Chico Mart	640
Monty Burns	0	Monty Burns	1,000
Total Loans	2,940	Total Deposits	3,540
TOTAL ASSETS (RESERVES + LOANS)	3,790	TOTAL LIABILITIES + EQUITY	3,790

Audit OK! Balance Sheet Balances.

Reserves Calculation:	
Fed's Required Reserve Ratio	20.00%
Actual Total Reserves (from above)	850
minus Required Reserves	708
Excess Reserves (avail. to make new loans)	142

Created: Sept 2007 by Jim Luke.



Groucho pays Moe.

Moe, the Chairman of the Board of Groucho Corp, receives a \$700 payment from Groucho Corp. It is paid as a direct deposit to Moe's checking account. Bank reserves increase from the deposit, but M1 is unchanged.

Public's Spending Power	Cash in Pocket: currency + coin	Money on Deposit in Bank
--------------------------------	---------------------------------	--------------------------

Larry	0	0
Curly	100	800
Moe	100	700
Shemp	600	0
GrouchoCorp.	0	0
Harpo Store	200	400
Chico Mart	100	640
Monty Burns	300	1,000
Total Public:	1,400	3,540

Total M1: 4,940

Acme Bank (owned by Monty Burns)

Balance Sheet			
Assets		Liabilities + Equity	
Reserves		Equity	
on deposit @ The Fed	450	Monty's original investment	250
Cash in Vault	400	Retained Profits (loss)	0
Total Reserves	850	Total Equity Capital	250
Loans to Customers		Deposits of Customers	
Larry	0	Larry	0
Curly	800	Curly	800
Moe	640	Moe	700
Shemp	500	Shemp	0
GrouchoCorp.	1,000	GrouchoCorp.	0
Harpo Store	0	Harpo Store	400
Chico Mart	0	Chico Mart	640
Monty Burns	0	Monty Burns	1,000
Total Loans	2,940	Total Deposits	3,540
TOTAL ASSETS (RESERVES + LOANS)		TOTAL LIABILITIES + EQUITY	
3,790		3,790	

Audit OK! Balance Sheet Balances.

Reserves Calculation:	
Fed's Required Reserve Ratio	20.00%
Actual Total Reserves (from above)	850
minus Required Reserves	708
Excess Reserves (avail. to make new loans)	142

Created: Sept 2007 by Jim Luke.



Groucho Corp goes bankrupt.

The Groucho Corp goes bankrupt (what did you expect? it was run by two stooges and was organized on “Marx-ist” principles). Groucho had no assets (cash or money in bank), so the bankruptcy court wipes out the Groucho debt. Bank must “write-down” the loan: recognize it as a loss and take it off the books. Reserves are the same. M1 is the same.

Public's Spending Power
 Cash in Pocket: currency + coin
 Money on Deposit in Bank

Larry	0	0
Curly	100	800
Moe	100	700
Shemp	600	0
GrouchoCorp.	0	0
Harpo Store	200	400
Chico Mart	100	640
Monty Burns	300	1,000
Total Public:	1,400	3,540

Total M1: 4,940

Acme Bank (owned by Monty Burns)			
Balance Sheet			
Assets		Liabilities + Equity	
Reserves		Equity	
on deposit @ The Fed	450	Monty's original investment	250
Cash in Vault	400	Retained Profits (loss)	-1,000
Total Reserves	850	Total Equity Capital	-750
Loans to Customers		Deposits of Customers	
Larry	0	Larry	0
Curly	800	Curly	800
Moe	640	Moe	700
Shemp	500	Shemp	0
GrouchoCorp.	0	GrouchoCorp.	0
Harpo Store	0	Harpo Store	400
Chico Mart	0	Chico Mart	640
Monty Burns	0	Monty Burns	1,000
Total Loans	1,940	Total Deposits	3,540
TOTAL ASSETS (RESERVES + LOANS)	2,790	TOTAL LIABILITIES + EQUITY	2,790

Audit OK! Balance Sheet Balances.

Reserves Calculation:	
Fed's Required Reserve Ratio	20.00%
Actual Total Reserves (from above)	850
minus Required Reserves	708
Excess Reserves (avail. to make new loans)	142

The Fed is concerned now. Acme Bank now has a negative capitalization. It considers asking Monty Burns to put up more capital investment, but doesn't close the bank since it still has adequate reserves for the deposits.

Curly gets worried – Acme Bank on verge of collapse

Curly worries that the Groucho Corp bankruptcy will hurt the Acme Bank. He decides to withdraw half of his money “just in case”. Acme Bank uses all of its vault cash to pay Curly’s withdrawal. This depletes the bank’s reserves. The bank now has less than the required reserves. The Fed steps in to close Acme Bank.

Public's Spending Power	Cash in Pocket: currency + coin	Money on Deposit in Bank
--------------------------------	---------------------------------	--------------------------

Larry	0	0
Curly	500	400
Moe	100	700
Shemp	600	0
GrouchoCorp.	0	0
Harpo Store	200	400
Chico Mart	100	640
Monty Burns	300	1,000
Total Public:	1,800	3,140

Total M1: 4,940

Acme Bank (owned by Monty Burns)			
Balance Sheet			
Assets		Liabilities + Equity	
Reserves		Equity	
on deposit @ The Fed	450	Monty's original investment	250
Cash in Vault	0	Retained Profits (loss)	-1,000
Total Reserves	450	Total Equity Capital	-750
Loans to Customers		Deposits of Customers	
Larry	0	Larry	0
Curly	800	Curly	400
Moe	640	Moe	700
Shemp	500	Shemp	0
GrouchoCorp.	0	GrouchoCorp.	0
Harpo Store	0	Harpo Store	400
Chico Mart	0	Chico Mart	640
Monty Burns	0	Monty Burns	1,000
Total Loans	1,940	Total Deposits	3,140
TOTAL ASSETS (RESERVES + LOANS)	2,390	TOTAL LIABILITIES + EQUITY	2,390

Audit OK! Balance Sheet Balances.

Reserves Calculation:	
Fed's Required Reserve Ratio	20.00%
Actual Total Reserves (from above)	450
minus Required Reserves	628
Excess Reserves (avail. to make new loans)	-178

The FDIC (Federal Deposit Insurance Corp) has insured all deposits up to \$650 per depositor, so all depositors get all their money back except for Mr. Burns (loses \$350) and Moe (loses \$50).

So Ends the Short Story of Acme Bank

Notice that:

- *M1 only increases if a loan is being made*
- *the bank can only loan if it has excess reserves*
- *new bank deposits help increase the bank's reserves*
- *withdrawals from the bank deplete the bank's reserves*

The Money Multiplier Effect of The Reserve Ratio

Let's assume that a bank starts with \$1000 in excess reserves. It makes the largest loan it can (the amount of the excess reserves) every time. Every loan it makes is immediately deposited into a demand deposit account at the same bank. Thus each new loan creates a new deposit and each new deposit increases reserves. Of course part of each deposit must be held as "required reserve" and the rest of the deposit becomes "excess reserve", enabling another round of loan making. The table below illustrates what happens after 15 rounds of "making a loan and getting a new deposit" when three different required reserve ratios are used.

Notice that in all cases, eventually the ability to make loans decreases and approaches zero. But, the bigger the required reserve ratio, the slower the ability to make loans and grow M1. The lower the required reserve ratio, the faster the growth of M1..

Reserve Ratio	20%	
	Amt of New Loan	M1 after loan is made
make Loan 1	\$1,000.00	\$1,000.00
make Loan 2	\$800.00	\$1,800.00
make Loan 3	\$640.00	\$2,440.00
make Loan 4	\$512.00	\$2,952.00
make Loan 5	\$409.60	\$3,361.60
make Loan 6	\$327.68	\$3,689.28
make Loan 7	\$262.14	\$3,951.42
make Loan 8	\$209.72	\$4,161.14
make Loan 9	\$167.77	\$4,328.91
make Loan 10	\$134.22	\$4,463.13
make Loan 11	\$107.37	\$4,570.50
make Loan 12	\$85.90	\$4,656.40
make Loan 13	\$68.72	\$4,725.12
make Loan 14	\$54.98	\$4,780.10
make Loan 15	\$43.98	\$4,824.08

Reserve Ratio	15%	
	Amt of New Loan	M1 after loan is made
make Loan 1	\$1,000.00	\$1,000.00
make Loan 2	\$850.00	\$1,850.00
make Loan 3	\$722.50	\$2,572.50
make Loan 4	\$614.13	\$3,186.63
make Loan 5	\$522.01	\$3,708.63
make Loan 6	\$443.71	\$4,152.34
make Loan 7	\$377.15	\$4,529.49
make Loan 8	\$320.58	\$4,850.06
make Loan 9	\$272.49	\$5,122.55
make Loan 10	\$231.62	\$5,354.17
make Loan 11	\$196.87	\$5,551.05
make Loan 12	\$167.34	\$5,718.39
make Loan 13	\$142.24	\$5,860.63
make Loan 14	\$120.91	\$5,981.54
make Loan 15	\$102.77	\$6,084.31

Reserve Ratio	10%	
	Amt of New Loan	M1 after loan is made
make Loan 1	\$1,000.00	\$1,000.00
make Loan 2	\$900.00	\$1,900.00
make Loan 3	\$810.00	\$2,710.00
make Loan 4	\$729.00	\$3,439.00
make Loan 5	\$656.10	\$4,095.10
make Loan 6	\$590.49	\$4,685.59
make Loan 7	\$531.44	\$5,217.03
make Loan 8	\$478.30	\$5,695.33
make Loan 9	\$430.47	\$6,125.80
make Loan 10	\$387.42	\$6,513.22
make Loan 11	\$348.68	\$6,861.89
make Loan 12	\$313.81	\$7,175.70
make Loan 13	\$282.43	\$7,458.13
make Loan 14	\$254.19	\$7,712.32
make Loan 15	\$228.77	\$7,941.09

Ultimate Impact On M1 of New Reserves

IF:

- *The Required reserve ratio is “rr”, and*
- *Banks make the maximum amount of new loans possible (amount of excess reserves, and*
- *All new loans become new deposits somewhere in the banking system*
- *Then the banking system will continue to make new loans, but at in decreasing amounts*
- *The eventual, total or ultimate increase in M1 will be:*

Original Starting amount of excess reserves

M1

= increase in

rr