

Today

Federal Reserve System

aka FRS, Fed

M+B 16

Tools of M control

M+B 17

The Federal Reserve System (FRS)

12 Federal Reserve Banks

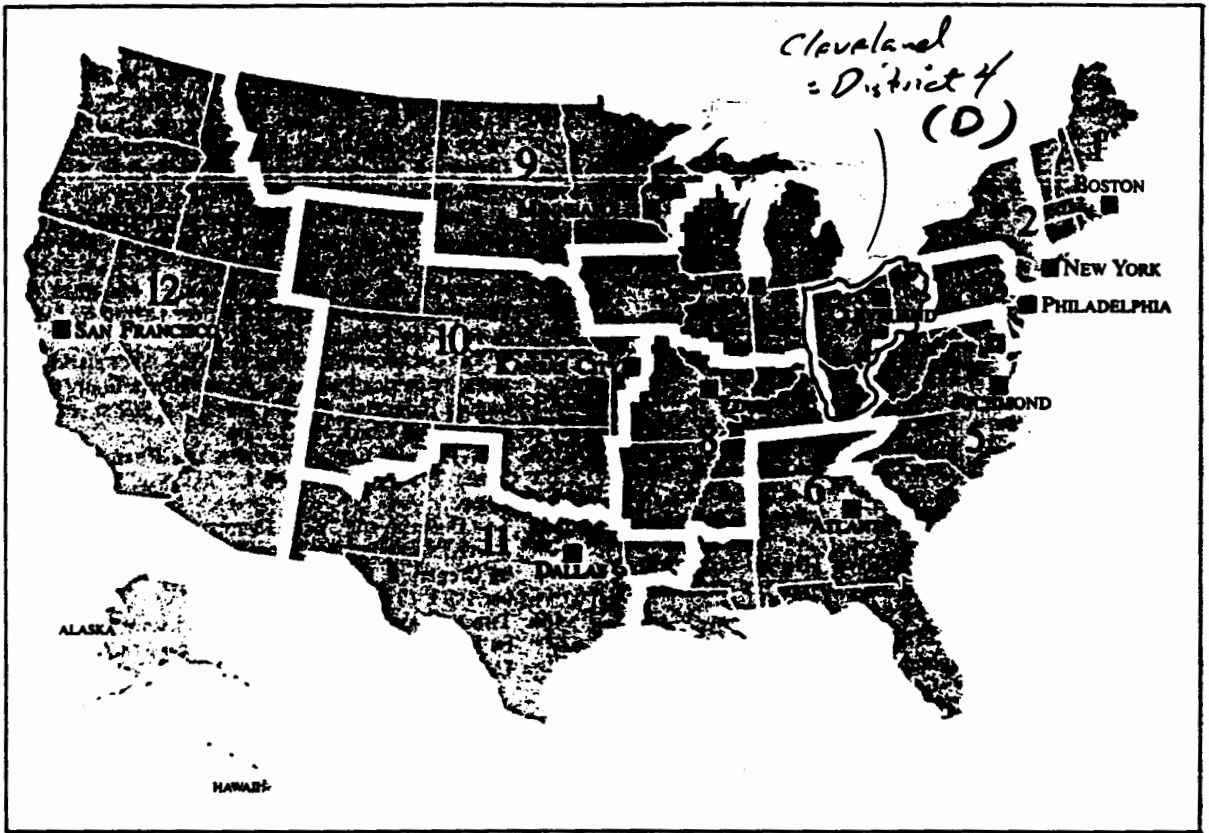
- A: 1. Boston
- B: 2. New York
- C: 3. Philadelphia
- D: 4. Cleveland
- E: 5. Richmond
- F: 6. Atlanta
- G: 7. Chicago
- H: 8. St. Louis
- I: 9. Minneapolis
- J: 10. Kansas City
- K: 11. Dallas
- L: 12. San Francisco

+ Board of Governors (FRB)

Washington, D.C.

the Federal Reserve System

12 F.R. Banks, Districts.



LEGEND

- Federal Reserve Bank city
- Board of Governors of the Federal Reserve System, Washington, D.C.

Figure 2

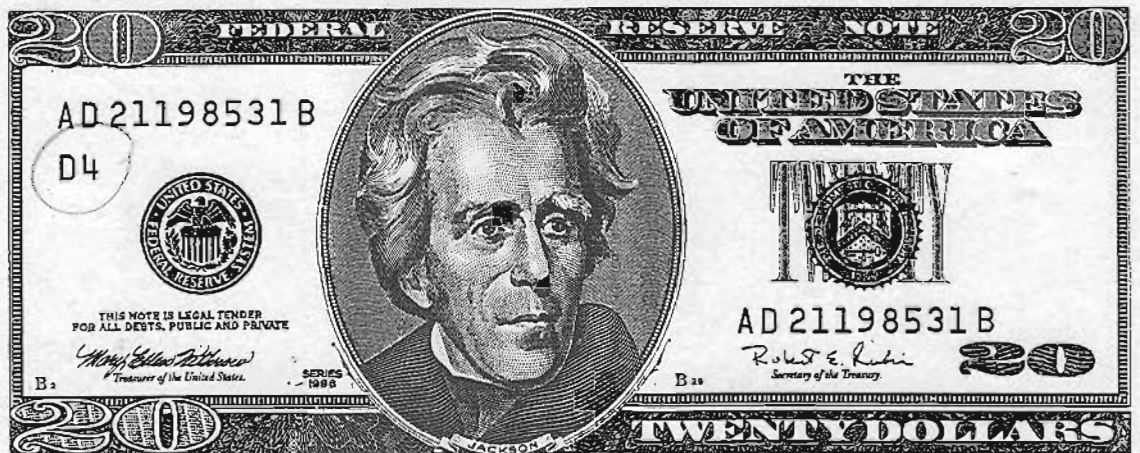
This map is totally irrelevant for the conduct of monetary policy. However, no Money and Banking textbook would seem complete without it.

Source: FR Bulletin, Nov 94

Each FR Note is issued by 1 of the
12 FR Banks:



E = 5 = Richmond, Va.



D = 4 = Cleveland

FR Banks have little Power.

FRB, FOMC more important.

- FRB = FR Board
= Board of Governors = BOG.
- FOMC = Federal Open Market Committee

Board of Governors (BOG)

aka FR Board (FRB)

- 7 Members, 14 yr terms

expire 1/00, 1/02, etc.

- President appoints, Senate confirms.

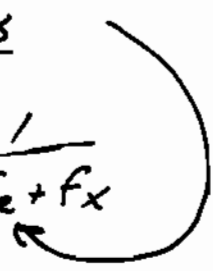
- Governors may not be appointed to

more than 1 full term

⇒ max term = 27.9 yrs.
(eg. Alan Greenspan 18.5 yrs)

- FRB sets f_R within limits set by

Congress

$$1/c = \frac{c+1}{c+f_R+f_X}$$


- FRB comprises 7 of 12 members
of FOMC

Table 1
Board of Governors of the Federal Reserve System

In order by end of term

March 2011

Name	Year Appointed	Term Ends Jan. 31	Theoretical Appointing Admin.	Actual Appointing Admin.
Elizabeth A. Duke	2008	2012	Clinton II	GW Bush II
Vacant since 8/08*	?	2014	Clinton II	??
Sarah Bloom Raskin	2010	2016	GW Bush I	Obama I
Vacant after 3/11**	?	2018	GW Bush I	??
Ben S. Bernanke (Chairman)	2006	2020	GW Bush II	GW Bush II
Daniel K. Tarullo	2009	2022	GW Bush II	Obama I
Janet L. Yellen (Vice Chair)	2010	2024	Obama I	Obama I

Data source: <http://www.federalreserve.gov/>

Note that only 5 of the 7 seats are actually filled, and of these 5, only 2 were filled on the theoretical 14 year cycle. Although President Obama was only guaranteed one position by the date of this table, he in fact had already filled three, and could still fill two more.

* Peter Diamond (subsequently winner of the 2010 Nobel Prize in Economics) was nominated by President Obama for the seat expiring in 2014, but the Senate returned his nomination without action. He has been renominated, but no action has been taken as of 3/23/11.

** Kevin Warsh, who was appointed George W. Bush II in 2006 to the seat expiring in 2018, has announced his intent to resign from the Board at the end of March 2011.

<u>Admin</u>	<u>In Theory</u>	<u>Actual</u>
Clinton I	2	0
GW B I	2	1
GW B II	2	1
Obama	1	3 (or 5?)

Chairman of FR Board

- 4 yr term
from continuation date
- Pres appoints, Senate confirms
- Is 1 of the 7 FRB members.

Table 2

Selected Federal Reserve Board Chairmen

Oct. 2010

Name	Term as Chairman	Appointing President(s)
Marriner S. Eccles	11/4/36 – 4/15/48	FD Roosevelt
Wm. McC. Martin, Jr.	4/2/51 – 1/31/70	Truman, Eisenhower, Kennedy, Johnson
Arthur F. Burns	2/1/70 – 1/31/78	Nixon
G. William Miller	3/8/78 – 8/6/79	Carter
Paul A. Volcker	8/6/79 – 8/11/87	Carter, Reagan
Alan Greenspan	8/11/87 – 1/31/06	Reagan, Bush41, Clinton, Bush43
<u>Ben S. Bernanke</u>	2/1/06 – 1/31/14*	Bush43, Obama

* Second Term as Chairman expires Jan. 31, 2014. Term on Board continues to Jan. 31, 2020.

Source: <<http://www.federalreserve.gov/bios/boardmembership.htm>>.

- Note that Miller, Volcker and Greenspan's terms as Chairman fell out of sync with the expiration of a seat on the Board, but that Bernanke's term is back in sync.

Many are bipartisan appointees.

$$\underline{B = C + R = C_F + C_T + D_R}$$

Table 3

**Consolidated Federal Reserve Balance Sheet
(Traditional)**

July 5, 2007
(billions of dollars)

	Assets		Liabilities + Net Worth	
S	Securities of US Treasury (held outright)	790.5	Federal Reserve Notes C_F	781.4
L	Loans:	27.4	Deposits	
	to dealers as Repos	27.2	Reserve D_R	16.7
	to banks through		Other D_O	36.9
	Discount Window	0.2	US Treasury	4.6
			Foreign Official	32.3
			(incl. Reverse Repos)	
I	International Reserves:	51.5	Misc. Liabilities	11.3
	Gold Certificates	11.0		
	Foreign Currency	38.3	Total Liabilities	846.3
	SDR Certificates	2.2		
	Misc. Assets	9.6	Capital Accounts (NW) NW	34.1
	Total Assets	880.4	Liabilities + NW	880.4

Bulk
of
Base.

Adapted from Federal Reserve Bulletin Statistical Release H4.1.

Manual: Treasury Currency C_T (coin) = \$38.5 B.

7/07:

$$\begin{aligned}
 B &= S + L + I + C_T \\
 &\quad - D_O - NW \\
 &= (790.5) + (27.4) + (51.5) + (38.5) \\
 &\quad - (36.9) - (34.1) \\
 &= \$836.9 \text{ B} \\
 \text{Actual} &= \$829.2 \text{ B}
 \end{aligned}$$

Traditional Base Equation
(pre-2008)

$$M = k \cdot \underline{B}$$

Assets	Liabilities, NW
Securities	C_F FR Currency
Loans	D_R Reserve Dep.
Int'l Res.	D_O Other Dep.
	NW

Balance Sheet Identity $A = L + \overset{\text{liabilities}}{NW}$

$$\Rightarrow S + L + I = \underbrace{(C_F + D_R)}_{\text{Most of } B} + D_O + NW$$

$$C_F + D_R = S + L + I - D_O - NW$$

In fact,

$$B = C + R = C_F + C_T + D_R$$

where C_T = Treasury Currency = Coin.

$$\Rightarrow \boxed{B = \underbrace{S + L + I + C_T}_{\text{Sources of } B} - \underbrace{D_O + NW}_{\text{Drains on } B}},$$

$$\boxed{\Delta B = \Delta S + \Delta L + \Delta I + \Delta C_T - \Delta D_O - \Delta NW}$$

Open Market Operations (OMOs)

Purchases and Sales of
Treasury securities by Fed
= ΔS

Executed by NY Fed for system.

"Open Market Desk"

Decision made by FOMC

- Federal Open Market Committee (FOMC)
 = FRB + 5 FR Bank Presidents,
incl. Pres of NY Fed
 $\Rightarrow 7 + 5 = 12$ Voting members
- Commercial Banks that have "Member" status
 with Fed have say in Pres. of their
FR Bank, but FRB is majority.
- Other 4 Voting members rotate among
 other 11 FR Banks
 - Cleveland, Chicago alternate
 - Other 9 on 3-yr cycle.
- FOMC decides on Open Market Operations
(OMOs)
Most important trad. power of Fed.
Determines B thru "S"
 or Fed Funds rate thru "L"
- Meets 8 times / yr

Fed's OMO's. (ΔS)

$$\underline{S \uparrow}, B \uparrow$$

\rightarrow Bond Prices \uparrow , Yields \downarrow

$$\underline{S \downarrow}, B \downarrow$$

\rightarrow Bond Prices \downarrow , Yields \uparrow

- Fed could set B via S , let
market set bond prices, yields (i)

or

- Fed could set i via bond prices, let
market set S, B

But not both.

Dynamic vs Defensive OMO's

Dynamic - intended to cause ΔB

Defensive - intended to offset ΔB
caused by $\Delta L, \Delta I$, etc.

Eg

$$\Delta I = + \$7B$$

$$\Delta D_0 = + \$1B$$

$$\Delta NW = + \$2B$$

$$\Rightarrow \Delta B = (+7) - (+1) - (+2) = + \$4B$$

$$\text{if } \Delta S = 0$$

$$\Rightarrow \Delta B = 0 \text{ if } \Delta S = -(+4B) = - \$4B$$

ΔL : Net Loans

Mostly thru Repos. (Traditionally)

Repurchase Agreements (Repos)

In effect -

- Loan collateralized by a Treasury security

Operationally -

- Lender buys security from borrower.
- Borrower agrees to repurchase next day (if overnight) for sale price plus 1 day's interest @ repo rate.
- Collateral changes ownership twice.

Bank \leftrightarrow Nonbank

Close substitute for Fed Funds transactions

FF Rate \approx Repo Rate.

Nonbank \leftrightarrow Nonbank

No effect on M, B.

Fed \leftrightarrow Nonbanks (Dealers)

Changes L, B

Coupon Passes

Periodic big OMO (ΔS), offset
by opposite ΔL

Hold L in range \$10 - \$50 B.

\Rightarrow Day-to-day ΔB mostly ΔL

Year-to-year ΔB mostly ΔS

(in Traditional, pre-2008 Fed)

Discount Window

- Loans by Fed directly to Banks, Thrifts
- Fed Charges banks Discount Rate
- Ordinarily very small portion of "L".

→ Since 1/2003

Discount rate set 0.5% above FF target.

⇒ only failing banks borrow perceptible amounts.

→ 1930's - 2003

Access severely limited except for
failing banks.

⇒ borrowings negligible except during crises

→ WWI, 1920's

Very important

→ 2009 -

Discounts up to \$35.9 B

Net Worth "NW"

Who owns Fed?

Member banks own "stock" (NW),
get dividends

But -

Have little control.

Dividends restricted to 6% of par value.
(trivial)

Fed very profitable. (pre-2008)

Most profits → Treasury.

⇒ Effectively a Public Agency.

Seigniorage under Fed

Treasury runs deficit, sells bonds

Fed buys bonds w/ new Base M

- Receives ~~it~~ from Treas.
- Returns ~~it~~ to Treasury.
- Treas gets perpetual i-free loan

Treas may as well have printed M. Poff.

(as with Civil War Greenbacks)

But spending decision separated
from ΔM decision

• (Pre-2008!)

Pre-2008 $R = R_R + R_X$ pays is 0

$$\Rightarrow \underline{S = \frac{\Delta B}{P} = \frac{1}{K} \frac{\Delta M}{P} = \frac{1}{K} \mu \cdot m}$$

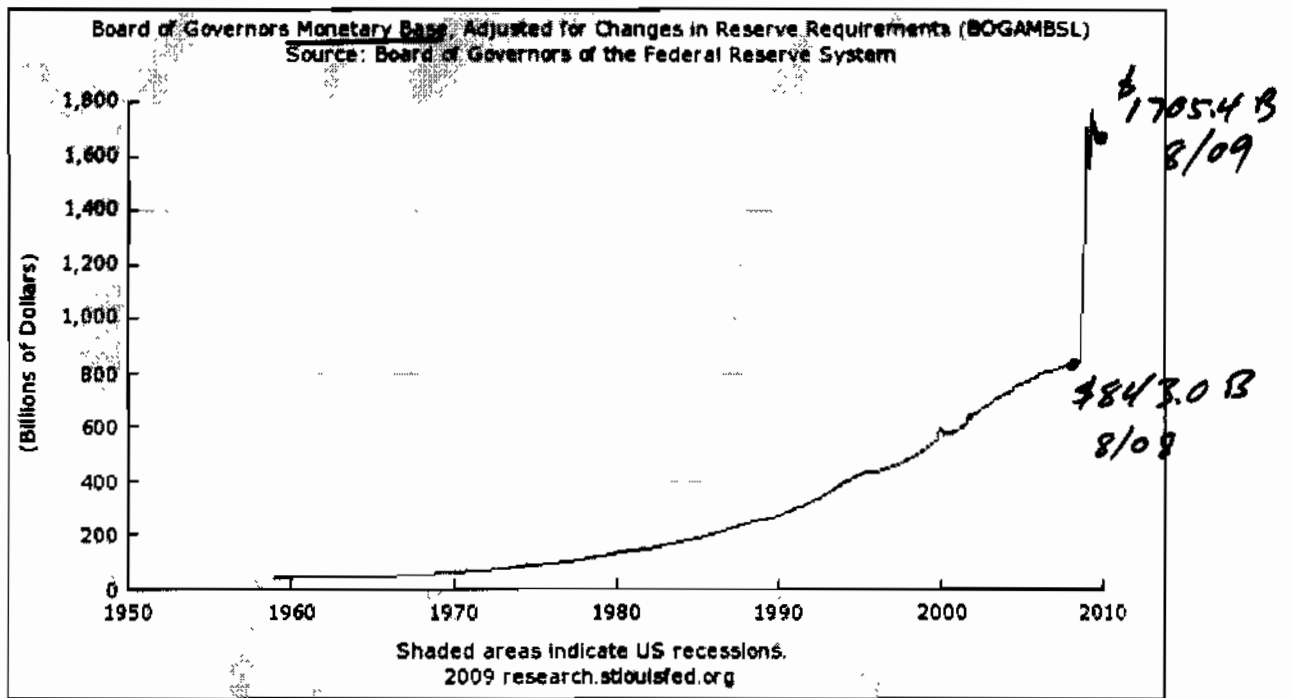
Since 10/08, R_X pays competitive i

$$\Rightarrow \underline{S = \frac{\Delta B^{Net}}{P}},$$

$B^{Net} = C + R_R$ only.

R_X just represents Financial Intermediation
by Fed

The Fed exposed to credit risk, i-risk
on supported portfolio.



Between August 2008 and August 2009, the US Monetary base increased from \$843.0 billion to \$1705.4 billion, a 102% increase in just one year. Will this lead to inflation as the banks find borrowers for these funds?

Table 3B

**Consolidated Federal Reserve Balance Sheet
(Bernanke)**

July 2, 2009
(billions of dollars)

	Assets		Liabilities + Net Worth	
S	Securities of US Treasury (held outright)	657.0	Federal Reserve Notes	871.3 <i>C_F</i>
L	Loans:	318.7	Deposits	
	to dealers as Repos	0.0	Reserve	726.3 <i>D_R</i>
	to banks	318.7	Other	334.8 <i>D_O</i>
	Discount Window	35.9	US Treasury	271.9
	Term Auction Cred.	282.8	Foreign	72.9
			(incl. Reverse Repos)	
I	International Reserves:	202.4	Misc. Liabilities	26.4
	Gold & SDR Certificates	13.2	Total Liabilities	1958.8
	Foreign Currency	73.9		
	Cent. Bank Liq. Swaps	115.3		
J	Junk:	823.8		
	• Fannie Mae & Freddie Mac	559.3		
	• Mort. Backed Secs	462.5		
	• Debt	96.8		
	• Bear Stearns (Maiden Ln. I)	25.9		
	• AIG	78.9		
	• Direct Credit	42.8		
	• Maiden Lane II & III	36.1		
	• Comm. Paper Funding Fac	119.7		
	• MMMF CP Funding Fac	14.9		
	• Term Asset-Backed Securities			
	Lending Facility	25.1		
	Misc. Assets	5.5	Capital Accounts (NW)	48.6 <i>NW</i>
	Total Assets	2,007.4	Liabilities + NW	2,007.4

Adapted from Federal Reserve Bulletin Statistical Release H4.1.

Memo: C_T = 842.4 B

Bernanke
Base Eq'n: B = S + L + I + J + C_T - D_O - NW

Junk Assets J

↳ Risky stuff no one else will buy
- at price Fed pays

↳ Mostly Subprime Mortgage-Related

↳ Now Primary Source of B - \$824 B

Fannie & Freddie \$559.3 B

Debt \$97 B

Mort. Backed Securities \$462 B

Bear Stearns \$26 B

"Maiden Lane I 'LLC"

AIG \$79 B

Direct advance + "Maiden Lane II + III"

CP Funding Facility \$120 B

MMMF CP Funding Fac. \$15 B

Term Asset-Backed Secs Lending Fac \$25 B

Traditional vs Bernanke Fed

Traditional (pre-2008)

Congress decides

- How much to spend, on what,
- Who to spend on,
- How much to borrow.

Fed decides

- How much Treasury Debt to monetize.

Bernanke (since 2008)

Fed decides

- How much to spend, on what
- Who to spend on
F+T, AIG, Bear, but not Lehman.

Invokes Emergency Powers

§ 13(3) of Fed. Res. Act.

No specific Act of Congress required.

Liabilities Side

Reserve Deposits

• 2007 \$ 16.7 B

Paid 0 int.

Mostly Required Reserves

• 2009 \$ 726 B

Mostly Excess Reserves

Paid Interest since 10/08.

⇒ Fed now acts as a Financial Intermediary as well as a traditional Central Bank,

Is exposed to credit risk,
interest rate risk on
corresponding assets.

L side could

Other (non-Reserve) Deposits Do
Drain (-) on Base

• US Treasury

2007 - \$4.6 B

2009 - \$271.9 B

• Mostly unspent TARP \$?

• Offsets ~ \$260 B of Assets (SoT)
for now.

• Will P Base if spent.

Since 12/07

Term Auction Credit Facility

- 28- or 82-day loans to Banks
- Auctioned to highest bidders
- \$282.8 B 7/09
- Makes L major Source of Base

Functions of f_R

1. Tax on D

$$f_R \uparrow \rightarrow k \downarrow \rightarrow s = \frac{1}{k} \mu m \uparrow$$

2. Makes k less sensitive to c .

$\Rightarrow M = k B$ easier to control w/B.

3. Provides banks liquidity

only if R_R may be used
for withdrawals.

If not, banks need R_x for withdrawals.

- 1930's - R_x high even after

$f_R \uparrow$ in 1937.

- late 19th cent. —

Nat'l Banks suspended if $f < f_R$.

\Rightarrow frequent suspensions.

Ban on lending when $f < f_R$ would
make R_R avail. for withdrawals.