Monetary Policy

Focusing on interest rates,
Influencing real growth rates,
affecting inflation rate

Lecture 20

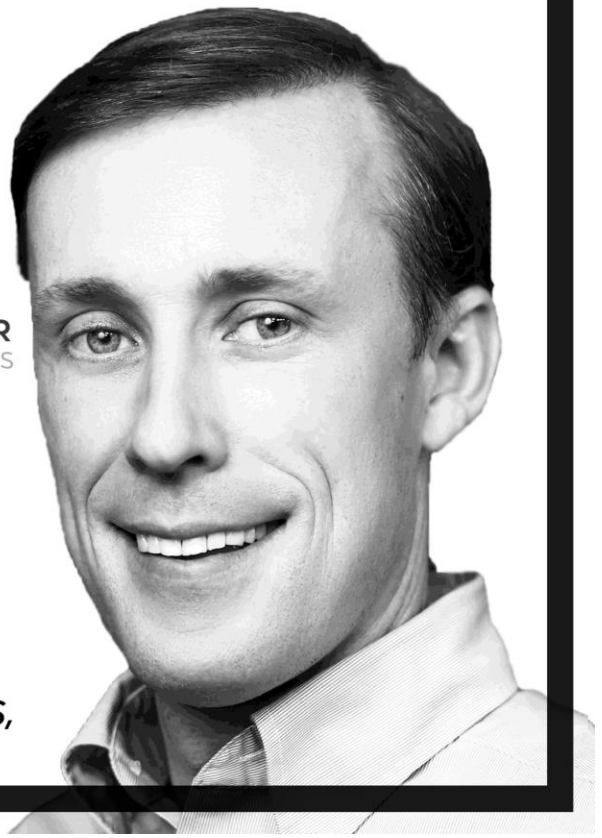
November 8th, 2019

A CONVERSATION WITH...

JAKE SULLIVAN

AMERICA'S ROLE IN THE WORLD

FORMER POLICY ADVISOR TO HILLARY CLINTON'S 2016 CAMPAIGN &
FORMER NATIONAL SECURITY ADVISOR TO VICE PRESIDENT JOE BIDEN



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WED 11/13, 5:15PM
SHAFFER 3

MODERATED BY PROFESSOR HAL BRANDS, JOHNS HOPKINS SAIS

Monetary policy
many ultimate goals…

- Low inflation
- Low unemployment
- Strong real GDP growth
- Secure financial system

Ways to think about Monetary policy:

Metaphorically: step on **the gas** or **the brake**

Mechanically: buy or sell government debt

in order to:

Modulate growth in the **money supply**

Or:

Manipulate money market **interest rates**

Or:

Manipulate the level of your **currency**

Open market operations

Open market operations refers to the buying and selling of Treasury securities by the Federal Reserve

The Fed directs its *trading desk* in New York to *buy* U.S. Treasury securities—Treasury "bills"

when the Fed buys bills, the price goes up

when the price goes up, the yield goes down.

Thus the Fed, by buying and selling treasury bills, controls the level of short term interest rates.

When a central bank buys or sells t-bills, it can do so, with a focus on one of three things:

They can target money supply growth.

They can target interest rates.

They can target the value of theirs Nation's currency.

Connecting money and prices: the **quantity equation**

In the early 20th century, Irving Fisher formalized the relationship between money and prices as *the quantity equation*:

$$M \times V = P \times Y$$

Money supply

velocity of money

real output

price level

Velocity of money: the average number of times each dollar in the money supply is used to purchase goods and services included in GDP.

Rewriting this equation by dividing through by M, we obtain:

$$V = \frac{P \times Y}{M}$$

The Quantity Theory of Money:
Beautiful in its simplicity

- $M \times V = P \times \mathrm{Y}$

- Transform the equation, in DYNAMIC terms:

$$\%\Delta\mathrm{M} + \%\Delta\mathrm{V} = \%\Delta\mathrm{P} + \%\Delta\mathrm{Y}$$

- Fisher asserted velocity was constant
- That means growth rate for money supply

= sum of real growth rate and inflation rate.

“V, The velocity of money”

A slippery concept.

We cannot directly measure V.

We measure Output × Prices

We measure the money supply

Recall that Output × Price= nominal GDP

We divide nominal GDP by the supply of money.

That gives us our value for V

The Quantity Theory and a plan for central banks

- Suppose FRB and ECB agree that 3% real growth + 2% inflation is ideal.

- IF Quantity theory works, what should the central bank do?

- Set %ΔM at 5%, and hope that it splits into:

  3% real growth and 2% inflation.

THE MONETARIST MODEL
MILTON FRIEDMAN AND A RULE

- If the Fed has complete control of the money supply.
- And if 'V' is constant….
- They embrace the Quantity Theory Equation MV=PY
- They set %Δ M = 5%,
- They hope for %Δ Y = 3% and %Δ P = 2%

The Quantity Equation works if %ΔV either ZERO or constant

- $\%\Delta M + \%\Delta V = \%\Delta P + \%\Delta Y$
- Suppose velocity speeds up each year by 1%?
- $\%\Delta M + 1\% = 2\% + 2\%$
- You target 3% growth in the money supply!

Four Problems that make money targeting near impossible:

1. There are several definitions of money. Which do we target?

2. The Fed, via open market operations, **influences** the amount of money in the economy. It does not have complete control.

3. The velocity of money is very volatile, not constant.

4. Changes in the velocity of money are also volatile, not constant.

Problem 1: There are several definitions of money. Which do we target?

M1: $3.9 trillion as of October 2019

52% checking accounts & 48% currency

M2: $15.2 trillion as of September 2019

22% M1 & 62% Savings deposits

& 8% money market funds

& 8% small time deposits

2. The Fed, via open market operations, influences the amount of money in the economy. It does not have complete control.

Open market operations:

The Fed buys a t-bill, providing reserves that it simply creates electronically.

The bank receives the reserves, and can lend them out.

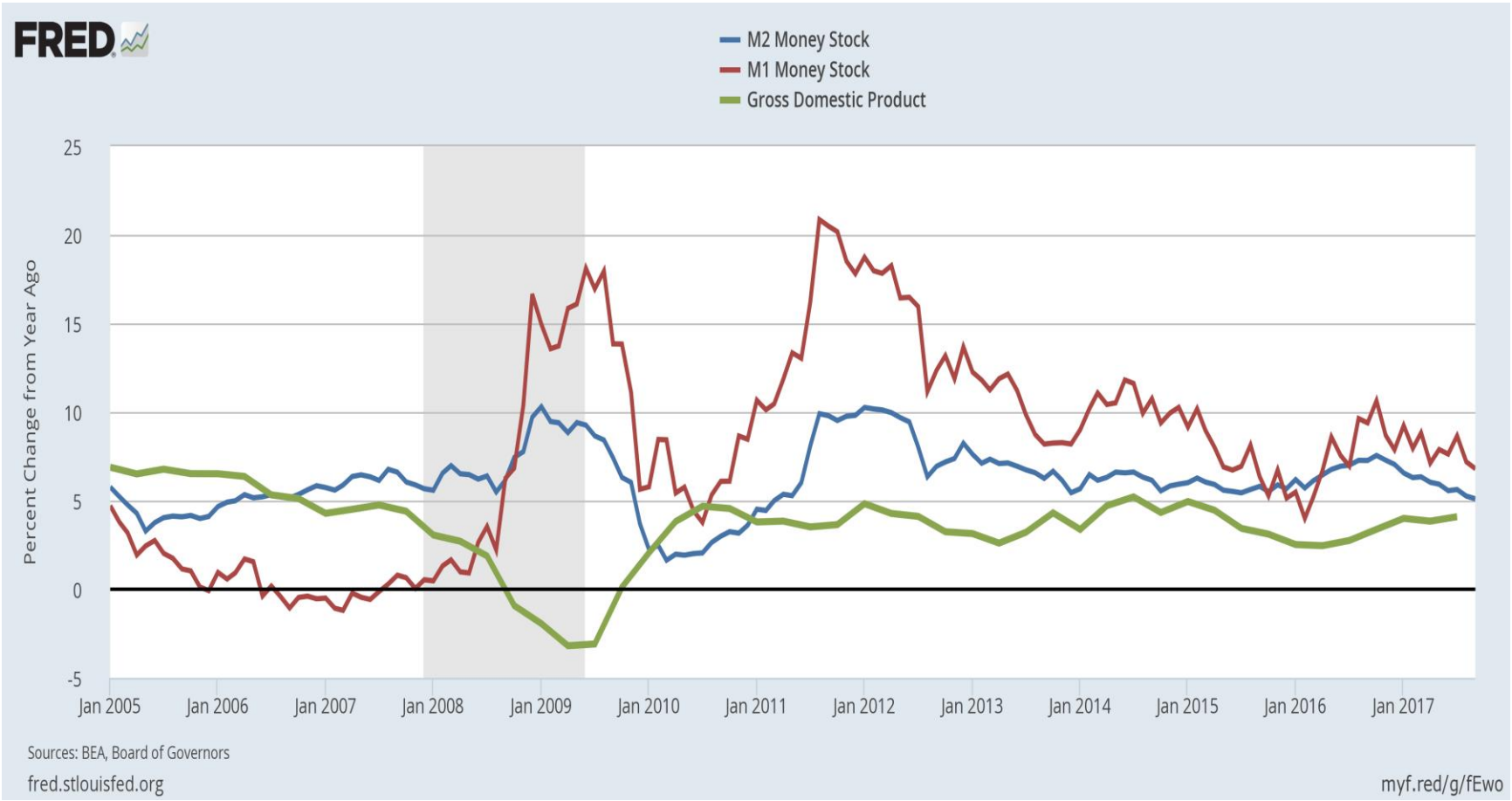
but the bank does not have to lend them out

(moreover the bank can lend money out, without having the money, choosing to borrow it from other banks)

Banks and reserves:

- Required reserves: A bank is legally mandated to keep some reserves on hand, to meet demand for cash.
- Reserves become loans: Banks can lend out the rest of the reserves, creating loans
- Excess Reserves: any funds not lent out are excess reserves

3. The velocity of money is not constant
4. Changes in the velocity of money are volatile



For the U.S.A., Monetary policy operations are conducted so as to influence Interest Rates

- The Fed (in normal times)

  targets short term interest rates:

  (the fed funds rate)

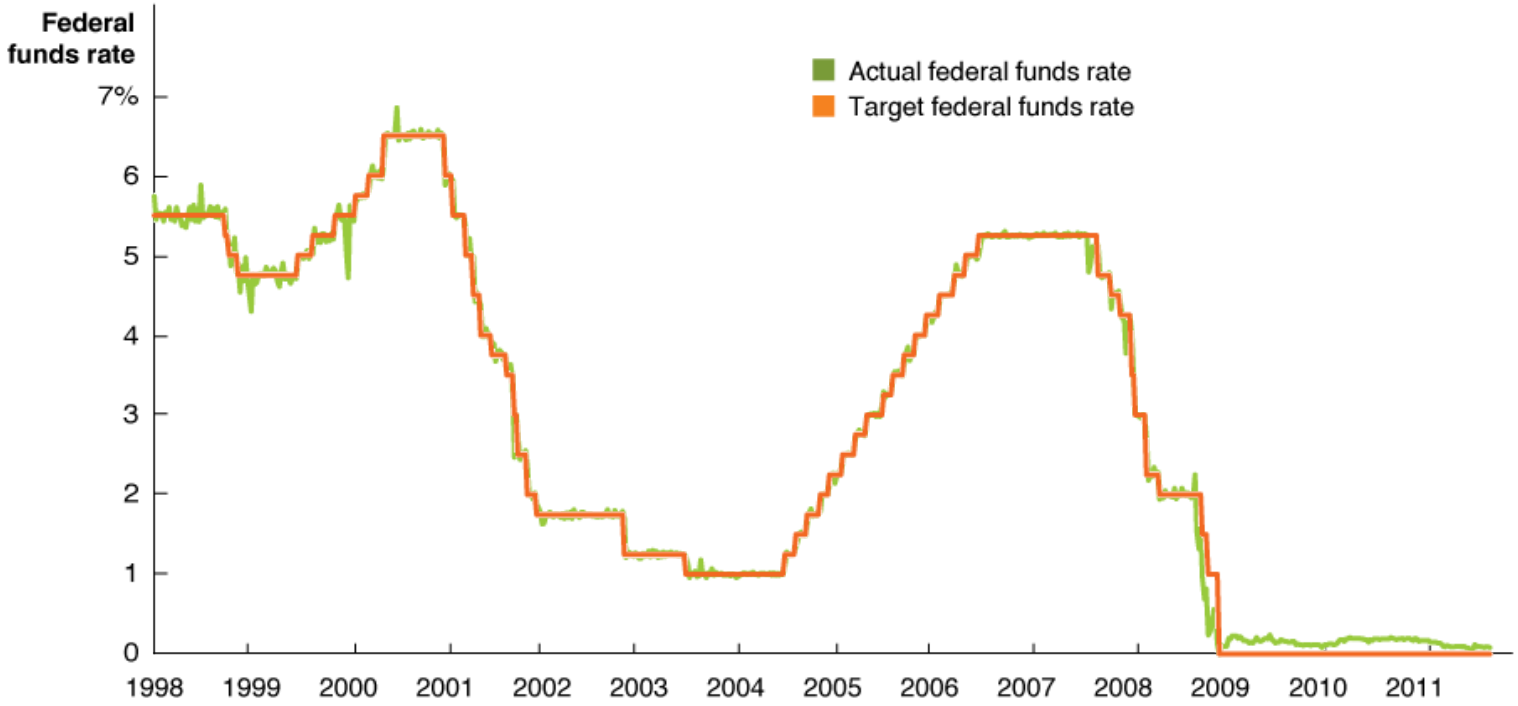
- By adjusting short rates, the Fed influences other important interest rates:

  the auto loan rate

  the fixed mortgage rate

  the corporate borrowing rate

Federal funds rate targeting



The Fed does not directly set the federal funds rate.

The FOMC, each 6 weeks, agrees upon a target for the fed funds rate.

The Fed buys and sells treasury bills, through open market operations.

History reveals, that via open market operations, the Fed, does very well at meeting its target for the federal funds rate.

Changes for key Interest rates: they can alter real economy decisions

- Consumer durables—auto financing interest rate can influence auto buying decisions
- Most homes are 'financed' via a mortgage—the mortgage rate, therefore, can influence home buying decisions
- Factory, office and equipment spending, is oftentimes financed. The corporate borrowing rate influences investment decisions.

Changing real economy circumstances can change inflation's pace.

- By raising interest rates, slowing the economy, and increasing unemployment, the Fed may succeed in pushing inflation lower.

- By lowering interest rates, stimulating faster economic growth, and absorbing economic slack, the Fed may succeed in lifting gains for wages and prices, thus lifting the inflation rate.

Three slippages between Fed policy action and output/inflation reaction:

There's many a slip 'twixt the cup and the lip

1. The Fed may not be able to move the interest rates that matter in the fashion they want.

2. The Fed may move the relevant interest rates, but not produce the real economy effect they expect.

3. Interest rates and the real economy may perform as expected, and INFLATION may refuse to cooperate.

Connecting fed funds targeting to our loanable funds model

- The Fed conducts open market operations in order to establish a fed funds target.
- The shifting fed funds target influences other interest rates.
- Changes in interest rates can change the pace of economic growth.
- Changes in the real growth rate can change the pace of inflation.

A tale of THREE interest rates: Our expanded loanable funds model

The loanable funds model expanded to three interest rates:

r_c the real long term borrowing rate for corporations

- *r_g* the real long-term borrowing rate for the government

Fed monetary policy is tied to a third interest rate:

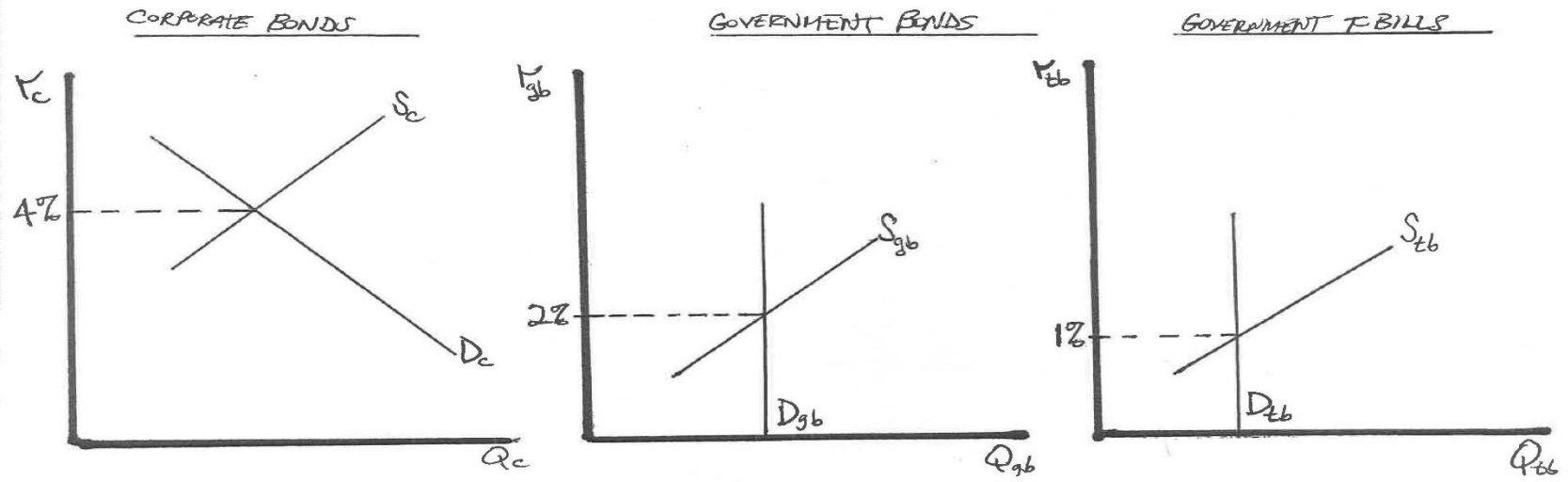
r_f the real short term interest rate: the real fed funds rate.

Fed policy targets the real fed funds rate: r_f

The real fed funds rate influences the real long term government rate r_g

The Fed policy rate and government long rate influence the borrowing rate for corporations: r_c

Our expanded loanable funds model:



The Expanded Loanable Funds Model:

The Four Actors

HOUSEHOLDS

GOVERNMENT

FEDERAL RESERVE

CORPORATIONS

The Expanded Loanable Funds Model:
The Three Interest Rates

$r_f \equiv$ real fed funds rate

$r_b \equiv$ real government bond rate

$r_c \equiv$ real corporate bond rate

(Note: the FRB buys and sells U.S. treasury bills, an instrument issued by the U.S. government that secures the government funds for 30, 60 or 90 days. The federal funds rate—the rate that banks change one another for borrowing funds, is very tightly linked to the 90 day t-bill rate. So we display the supply and demand for funds in the 3-month t-bill market, recognizing that the Fed is attempting to move the federal funds rate up or down, when they buy and sell t-bills)

The Expanded Loanable Funds Model:
The Actions of Key Actors

- Federal Reserve **sales** or **purchases** of treasury bills, shifts **the government's net demand** for household funds in the treasury bill market:

FR_{tb} ≡ Federal Reserve t-bill transactions, add/subtract to net demand for household funds

FR^{p}_{tb} ≡ Federal Reserve purchases t-bills, reducing the net government demand for household funds

FR^{s}_{tb} ≡ Federal Reserve sells t-bills, adding to the net government demand for household loanable funds

The Expanded Loanable Funds Model:
The Actions of Key Actors

- Corporations demand funds in the corporate bond market:

  D_c ≡ demand of Corporations' for funds in the corporate bond market

Government demand for funds: **TOTAL vs. PRIVATE**
The **Federal Reserve Buys and Sells** Government Debt
The Government's Private Demand for funds:
Net of **Federal Reserve Transactions**.

D_g ≡ government demand for loanable funds

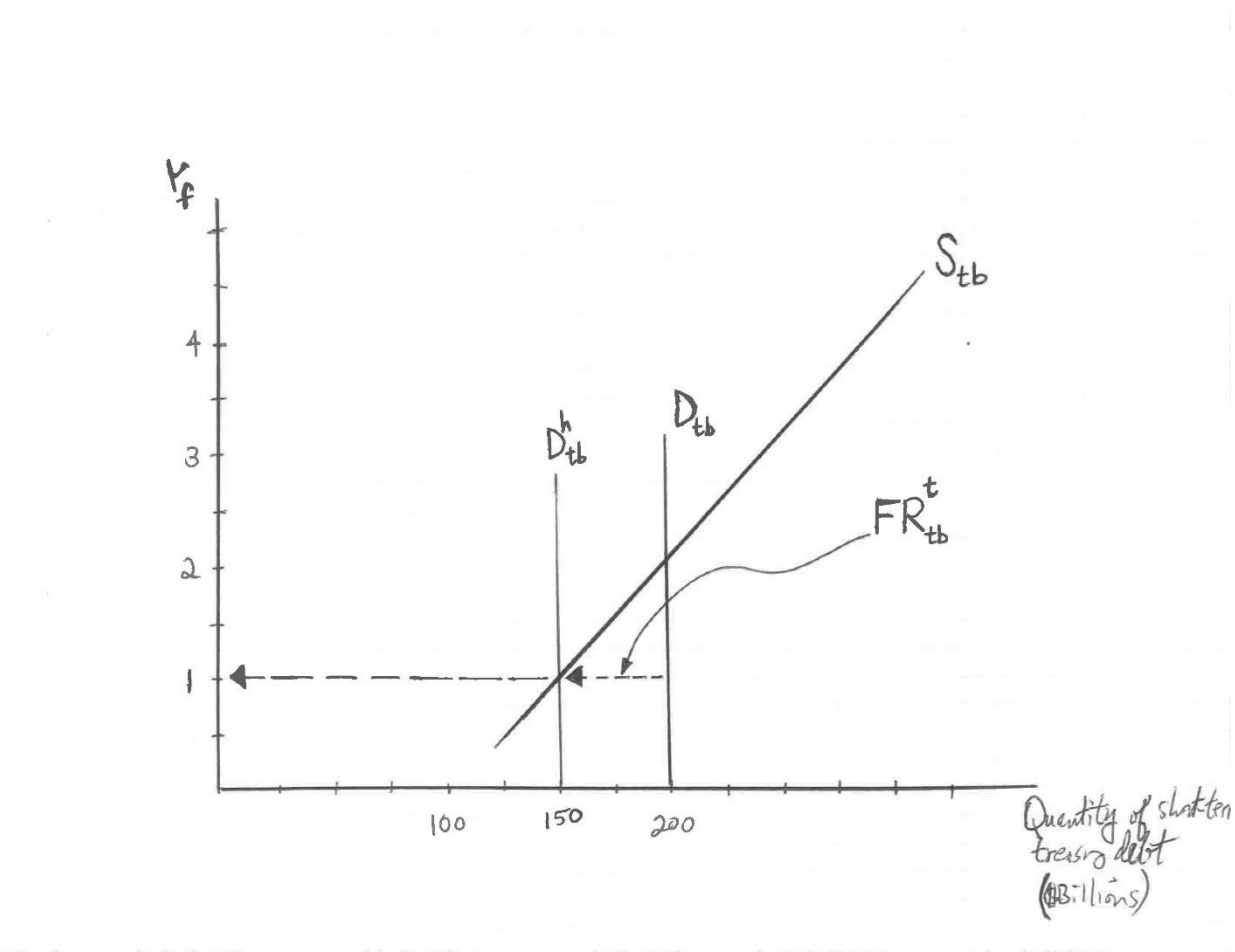
D^h_g ≡ government demand for household funds

FR_{tb} ≡ Federal Reserve net provision of funds

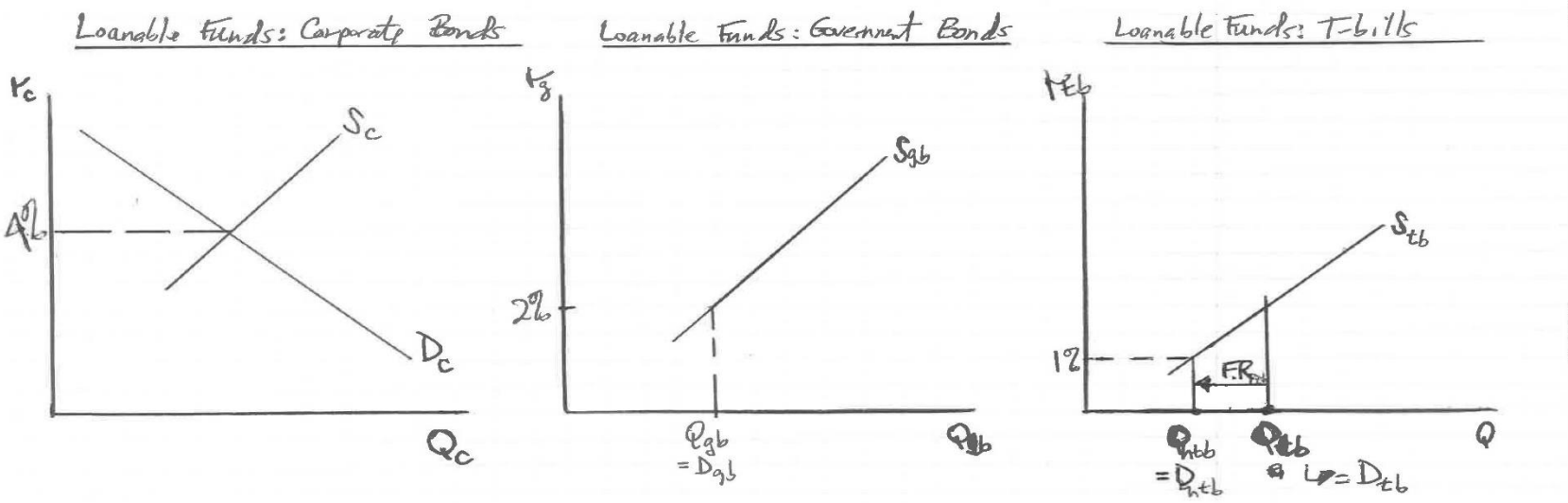
Fed tightens: $D^h_g = D_g + FR^s_g$

Fed Eases: $D^h_g = D_g - FR^p_g$

The Fed buys t-bills and establishes a 1% real fed funds rate.



The Fed sets the short rate. It influences other rates. It attempts to influence output and inflation, by changing interest rates that households and businesses confront.



Tightening by the Fed: as the fed funds rate rises, other rates follow

	1972	1975		1998	2000
fed funds	5%	13%		4.5%	6.5%
10-year	6.4%	8.5%		4.7%	6.7%
Baa bond	8.3%	10.7%		7.1%	9.3%

Rules vs. Discretion

- We know the Fed wants low inflation, high employment, strong growth and safe banks.
- Should they actively pursue these goals?
- Or should we impose a rule on the Fed?

Milton Friedman's monetarist rule.

- Set %Δ M = 4%,
- Hope for %Δ Y = 2% and %Δ P = 2%

- Milton Friedman DID NOT think this kind of rule would allow the economy to avoid recessions.
- Milton Friedman, CORRECTLY, identified that 1960s Keynesians OVERPROMISED!

Fine Tuning is not very fine at all

- The 1960s produced economists who thought they had conquered the business cycle.
- They could steer the economy clear of inflation and unemployment problems.
- Friedman argued they would simply react too late, and make a bad situation worse

The Taylor Rule

- John Taylor, Stanford, came up with a rule, to replace money targeting, BUT STRIP THE FED OF UNWISE AMOUNTS OF DISCRETION:

$$ff = \pi + 0.5 \text{ X } (\pi - \pi^*) + (U^* - U) + r^*$$

What does the rule tell the Fed to do?

- The FRB uses open market operations to set the real fed funds rate.
- If inflation and unemployment are ideal, the Fed puts the fed funds rate to *neutral*.
- If inflation is too high, or if unemployment falls below U*, threatening excesses to come, the Fed targets a *restrictive* fed funds rate.
- If unemployment is high with low inflation the FRB sets an *easy* funds rate.

Analyzing the Taylor Rule

- Let's look at the Equation as Taylor did, in 1993:

- The Fed's target inflation rate is 2%.
- The Fed's target unemployment rate is 5%
- The neutral real short rate is 2%

$$ff = \pi + 0.5 \text{ X } (\pi - \pi^e) + (U^e - U) + r^*$$

$$ff = \pi + 0.5\ (\pi - 2) + 1\ (5 - U) + 2$$

What happens if we are in equilibrium?

$$ff = \pi + 0.5\,(\pi - 2) + (5-U) + 2$$

$$ff = 2 + 0.5\,(2 - 2) + (5-5) + 2$$

$$ff = 2 + 2 = 4$$

- In this world, the neutral fed funds rate is 4%

If the economy is overheating: unemployment = 4% inflation = 3%

$$ff = \pi + 0.5\,(\pi - 2) + (5-U) + 2$$

$$ff = 3 + 0.5(3-2) + 1(5-4) + 2 = 6.5\%$$

Chair Powell, in a speech in August, reminds us that the “Stars” are moving targets.

- Taylor estimated in 1993 that r* = 2%

  The Fed now believes r* is somewhere between 0% and 1%

  U* looks to be around 4%, not 5%