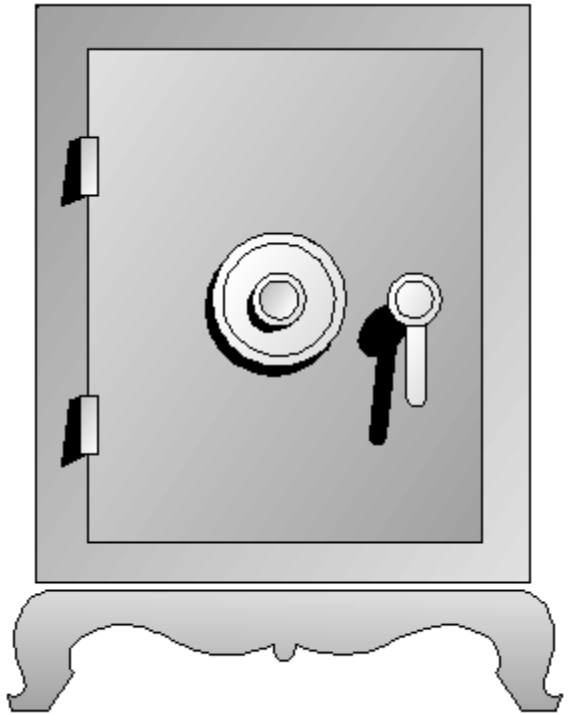
Federal Reserve Policy

Part 1

Money, credit, and its creation

.. introduction to the Federal Reserve System ... and money!



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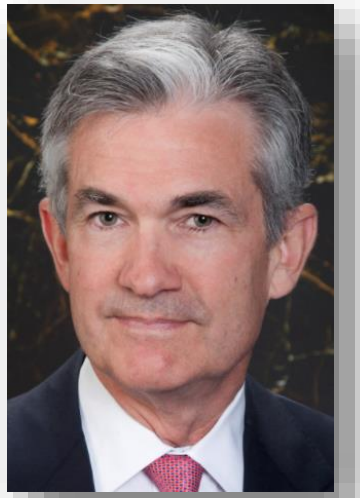
The objective of this multi-part video lecture series

- Structure and Mandate of the Federal Reserve System
- Money, Credit and Velocity (and the connection)
- Open Market Operations [OMOs] (simple)
- Open Market Operations [OMOs] (advanced - 2020)
- OMOs and interest rates and interest rate targets
- Details and complications of 2007 - 2019 FRS policy.
- Current FRS policy (2020)
- The long-term dangers of short-term policy

The Federal Reserve System (FRS)

- The Federal Reserve System is our nation's central banking authority.
- All nations have an equivalent (see http://www.bis.org/cbanks.htm) and the European Union has European Central Bank.
- The present Chair of the FRS is Jerome H. Powell, who replaced Janet Yellen, who replaced Ben S. Bernanke, who replaced Alan Greenspan.
- Primary policy decisions are determined by the **Board of Governors** in Washington, DC.
- The operational branch of the FRS, responsible for controlling the money supply and influencing interest rates, is the **Federal Open Market Committee (FOMC)**, located at the Federal Reserve Bank of New York, one of 12 district banks. They conduct open market operations.
- The FRS has the multiple and sometimes conflicting mandate (explained in a couple of slides)



Jerome Powell, February 2018, 16th chair

FRS organizational chart

Board of Governors (Washington DC)

12 District Banks

Federal Open Market Committee (FOMC - NY)

FRBNY System Account Supervisor

Open Market Trading Desk

The FRS Mandate

from their 1913 charter

- Promote bank and financial institution stability
- Promote price stability (anti-inflation)
- Promote interest rate stability (and low interest rates)
- Promote international financial stability (and stable exchange rates)
- Promote full employment
  - .. save the economy
  - .. save the stock market

… sometime mutually exclusive!!

The FRS toolkit

1. Discount Window lending
   - Used mostly for emergencies now
2. Changing the Reserve Requirement
   - Seldom done
3. OPEN MARKET OPERATIONS
   - Done many times per week throughout year.

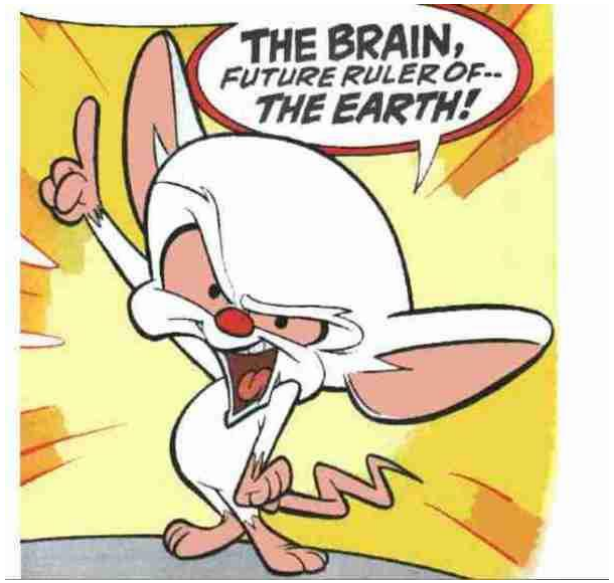
What is money???

Money doesn't exist, really .....

Uncomfortably (comfortably?) close to Bitcoin?

Economics ... is an information science, now that money itself is completing a development arc from matter to bits, stored to computer memory and magnetic strips, world finance coursing through the global nervous system. Even when money seems to be material treasure, heavy in pockets and ships holds and bank vaults, it always was ***information***. Coins and notes, shekels and cowries were all just short-lived technologies for tokenizing information about who owns what.

James Gleick, ***The Information***.



The Brain (from ***Pinky and the Brain***) knows that the ruler of the world will control his empire from a smartphone (running an algo).

The textbook definition of "money"

Any financial asset that can be used as

1. a **stable** medium of exchange
2. a store of value
3. a means to settle debt (through payment)

"Legal tender" refers to circulating money that can be used to pay obligations to the government. In U.S. law, coins are not included.

Most money today is in the form of bookkeeping transactions.

The official money supply, FRS definitions

- **M1:** Sum of currency (Federal Reserve Notes), checking deposits, travelers checks, and other checkable deposits (OCDs)
- **M2:** M1 plus retail MMMF balances, savings deposits (including MMDAs), and small time deposits

Source: Federal Reserve Money Stock and Debt Measures - H.6 release, April 9, 2020.

Money Stock and Debt Measures - H.6 Release

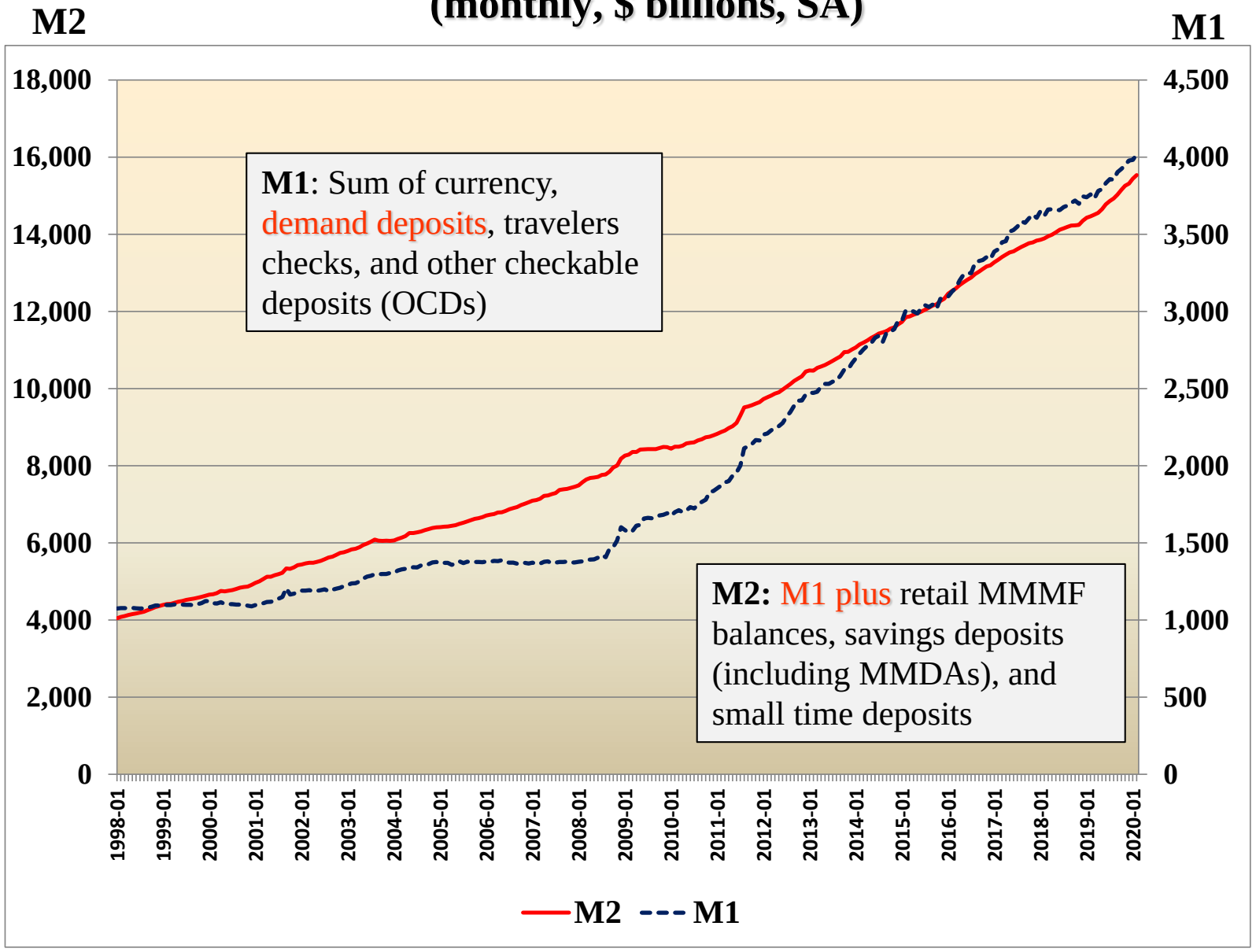
Date	Seasonally adjusted	
	M1 [1]	M2 [2]
Jan. 2019	3,740.5	14,434.6
Feb. 2019	3,759.7	14,464.4
Mar. 2019	3,730.0	14,511.8
Apr. 2019	3,781.0	14,558.3
May 2019	3,792.5	14,653.2
June 2019	3,832.9	14,780.7
July 2019	3,858.3	14,860.9
Aug. 2019	3,853.5	14,933.8
Sept. 2019	3,903.5	15,025.1
Oct. 2019	3,923.5	15,154.7
Nov. 2019	3,948.5	15,259.2
Dec. 2019	3,978.5	15,318.4
Jan. 2020	3,982.3	15,438.7
Feb. 2020	4,019.6	15,536.0

..about $4.02T
(6.8% growth!)

..about $15.5T
(7.4% growth)

Money Stock Measures, 1/1998 – 2/2020

(monthly, $ billions, SA)

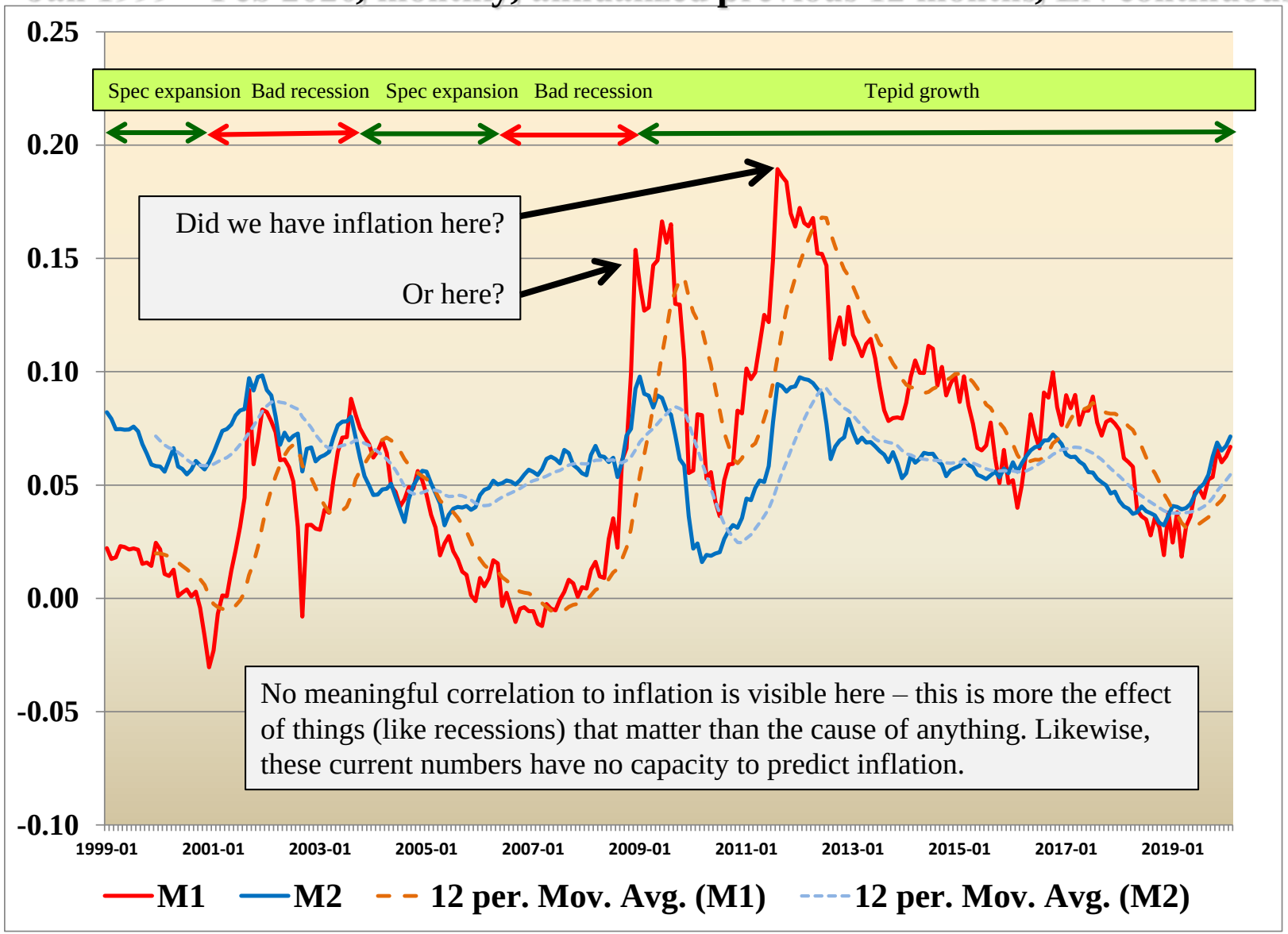


Source: Federal Reserve Statistical Release H.6 Money Stock Measures

Money Supply Growth Rates

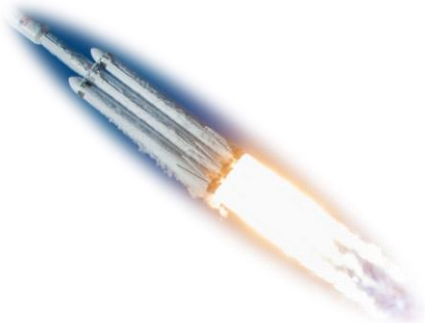
Mudd Economic Policy

Jan 1999 – Feb 2020, monthly, annualized previous 12 months, LN continuous, SA



Source: Federal Reserve Statistical Release H.6 Money Stock Measures

Money Velocity
(The equation of exchange)



MV = PY or V = GDP/M

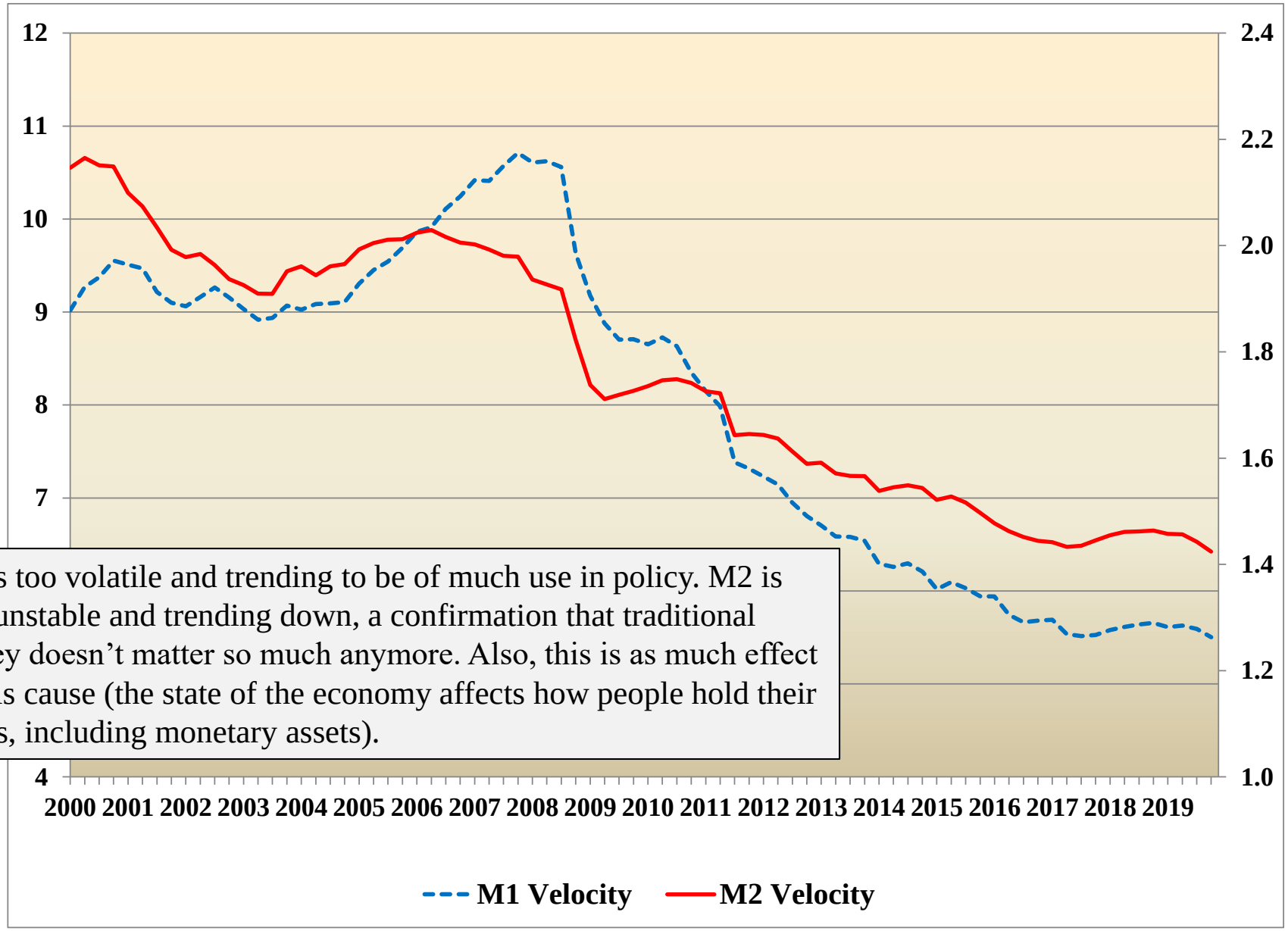
(**M**oney, **V**elocity, **P**rice Level, **Y**= real GDP)

This antiquated (from the classics) but useful concept viewed money as circulating through the economy at a rate of "velocity," which once determined, would determine the level of GDP, or the price level times real national output. Classical monetary theorists argued that if velocity was stable, then to control the rate of nominal economic growth the monetary authorities needed only to control the rate of growth of the "money supply."

But for monetary growth (however money is defined) to be an effective policy instrument to either stimulate the economy or cool inflation, velocity has to be a ***constant***, or if trending, ***stable*** and ***predictable***.

Velocity: relatively unstable and trending

V_1 V_2



M1 is too volatile and trending to be of much use in policy. M2 is also unstable and trending down, a confirmation that traditional money doesn't matter so much anymore. Also, this is as much effect as it is cause (the state of the economy affects how people hold their assets, including monetary assets).

Calculated as the ratio of annualized quarterly GDP divided by M1 and M2 SA for each quarter, 2000Q1 to 2019Q4.

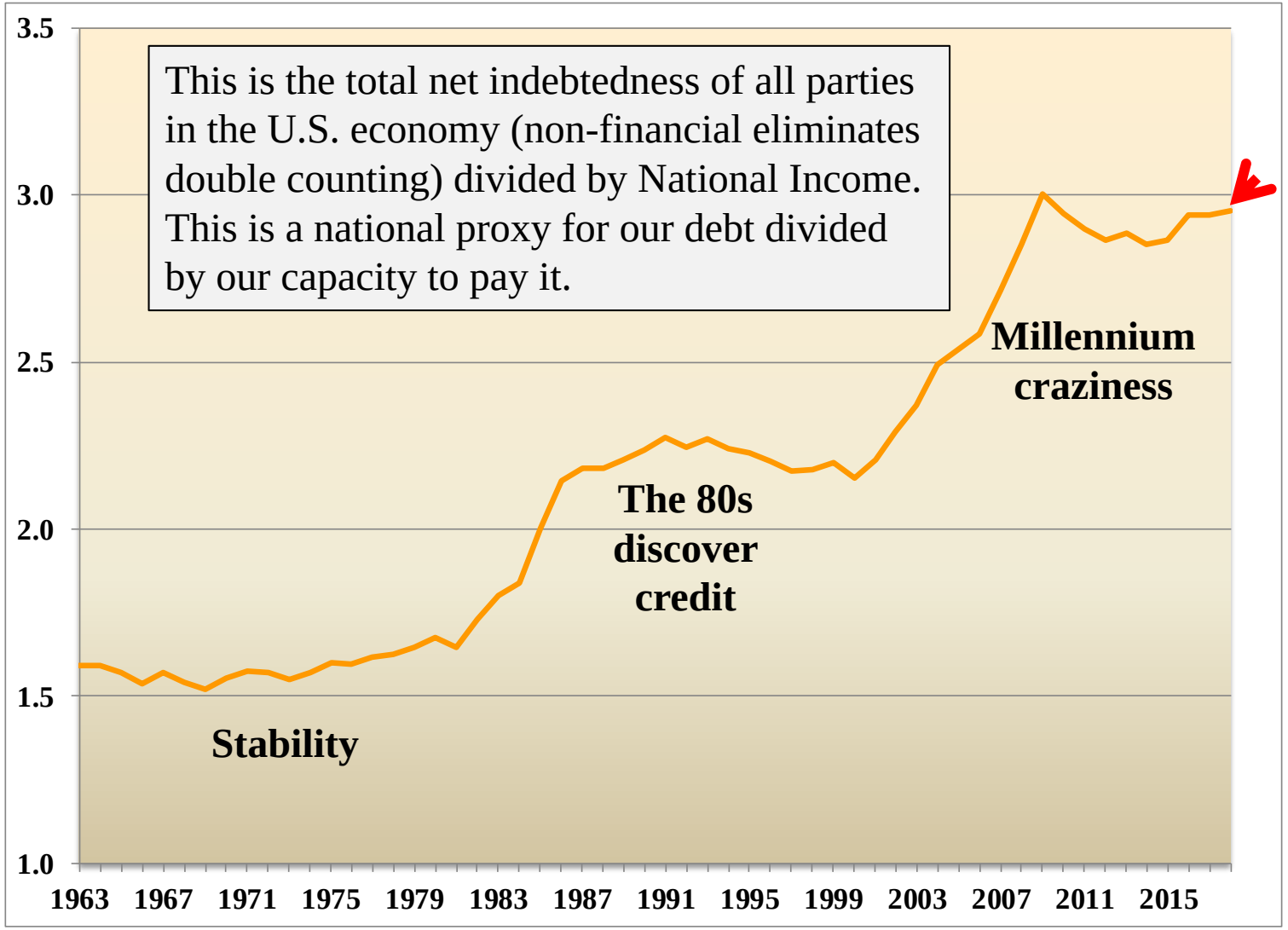
The connection between money, credit, and debt

It has become increasingly apparent in recent years that efforts to control the "money supply" are less and less effective for at least three reasons: (1) it is very hard to define what constitutes money, (2) consumers and businesses rely less and less on their monetary holdings to finance their spending and in fact are reducing their monetary holdings in exchange for non-monetary financial assets and because they can use credit, and related to this, (3) the statistical correlation between money and spending, or deltas in money and spending, has largely vanished.

Increasingly credit and debt are seen as more strongly correlated with consumer and business spending.

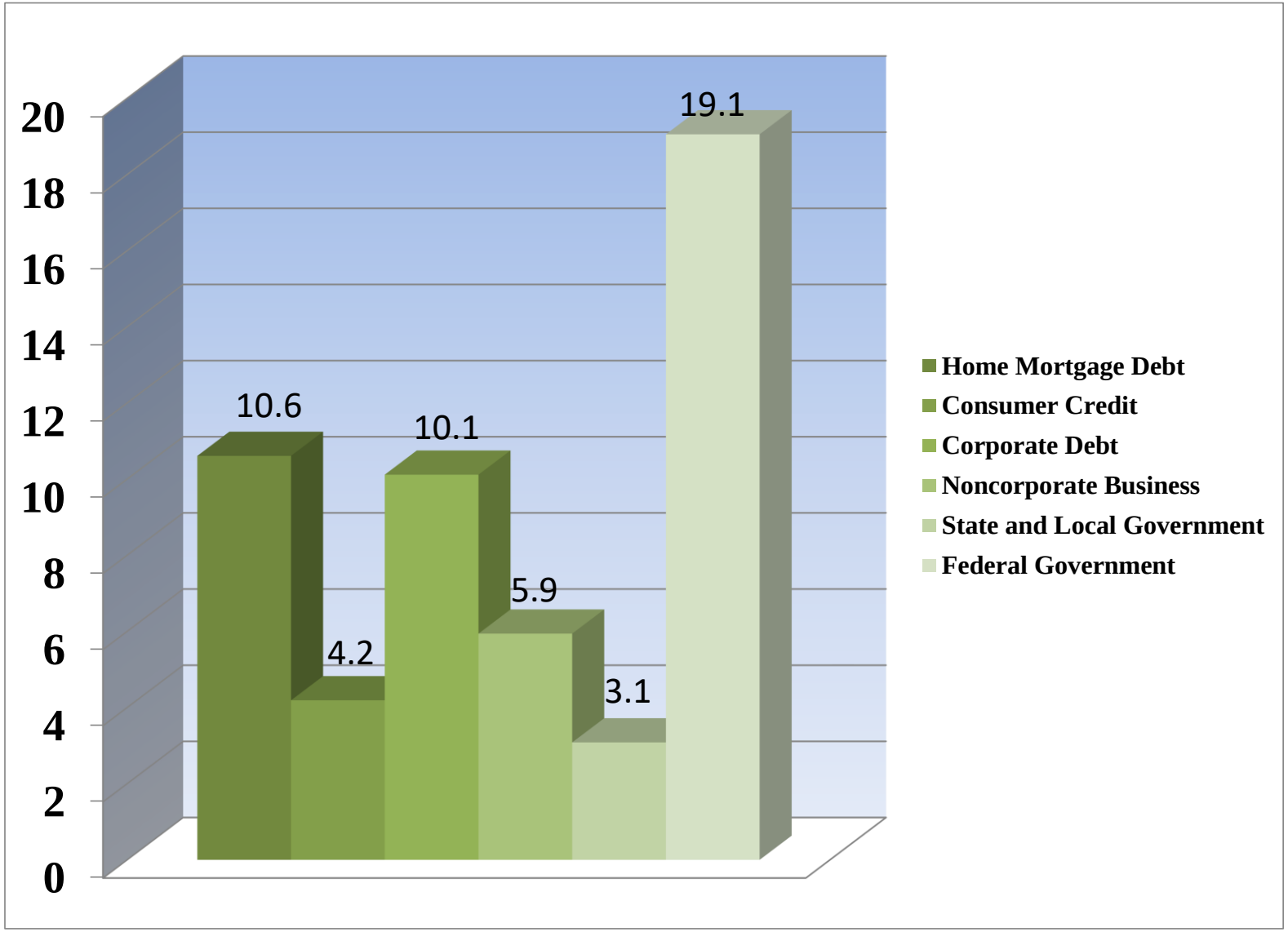
Credit is borrowed money. Credit is a flow variable and **debt** is the stock variable the results from credit accumulating over time. Mathematically, the net delta (change) in debt is equal to credit extended over any time period, such as one month. Debt is the balance, credit is the addition to the balance.

Domestic Non-financial Debt / National Income
1962-2019



Source (debt): *Federal Reserve Flow of Funds Accounts, Z1 statistical release*

Memo: Whom owes what?? (2020 Q4)



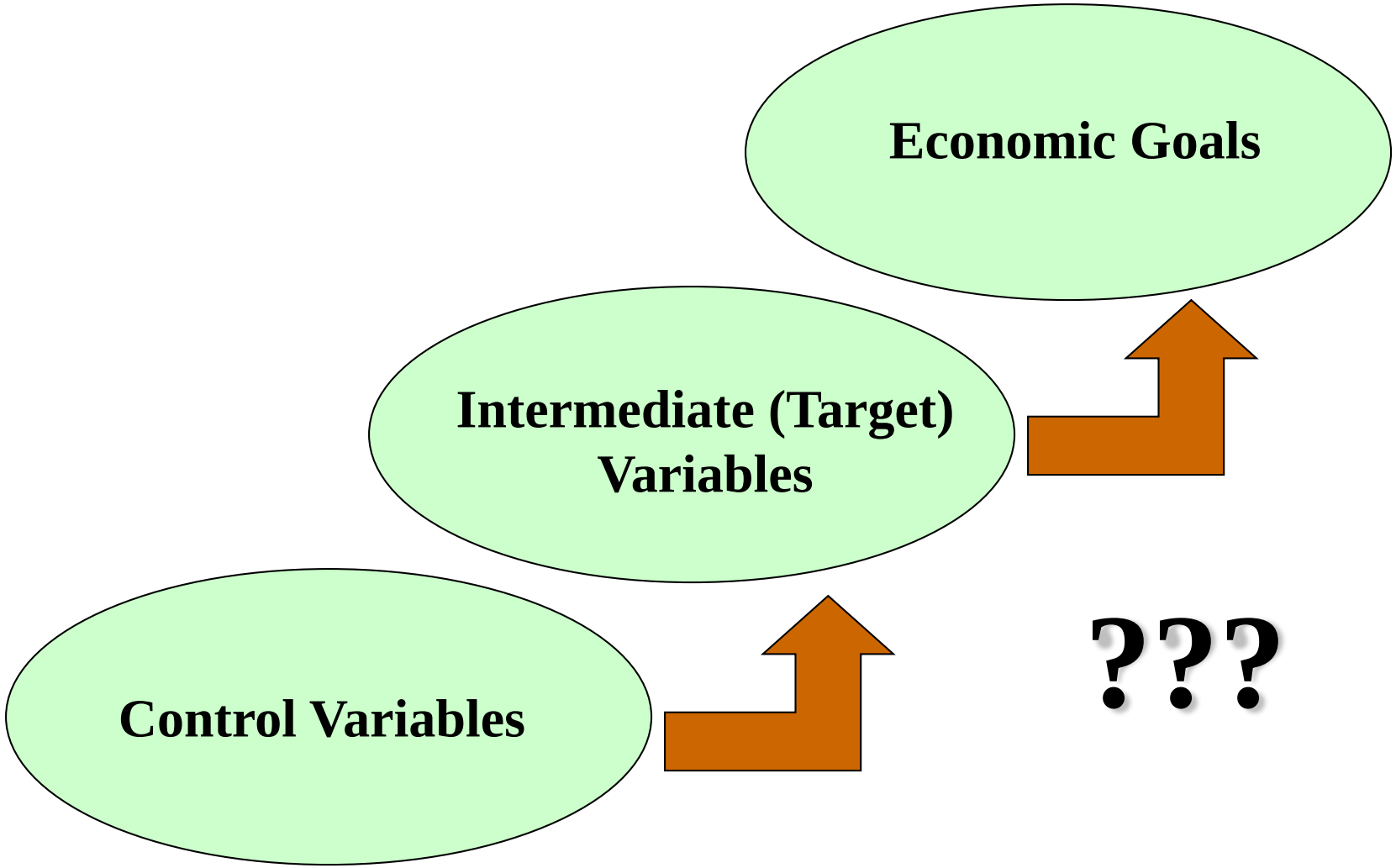
Total: $54.347 Trillion

I want this!!

2020 Koenigsegg Gemera Electric Hybrid

Source: *Federal Reserve Flow of Funds Accounts, Z1 statistical release, Mar 2020*

Indirect controls



Candidate Variables

- **Goal**
  - Price targets
  - Real GDP growth
  - Unemployment
- **Target**
  - Moneys (M1, M2)
  - Credit/Debt Measures
  - Interest rates (FFR)
- **Control**
  - Bank reserves
  - ~~Monetary base~~

This channel is called the "**transmission mechanism**."

Note the multiple target variables.

With goals, the real objective is to prevent or mitigate abnormalities or excesses, like high inflation, recession, or high interest rates.

An enduring question for the FRS: **How strong and reliable are these connections?**

That's it ...

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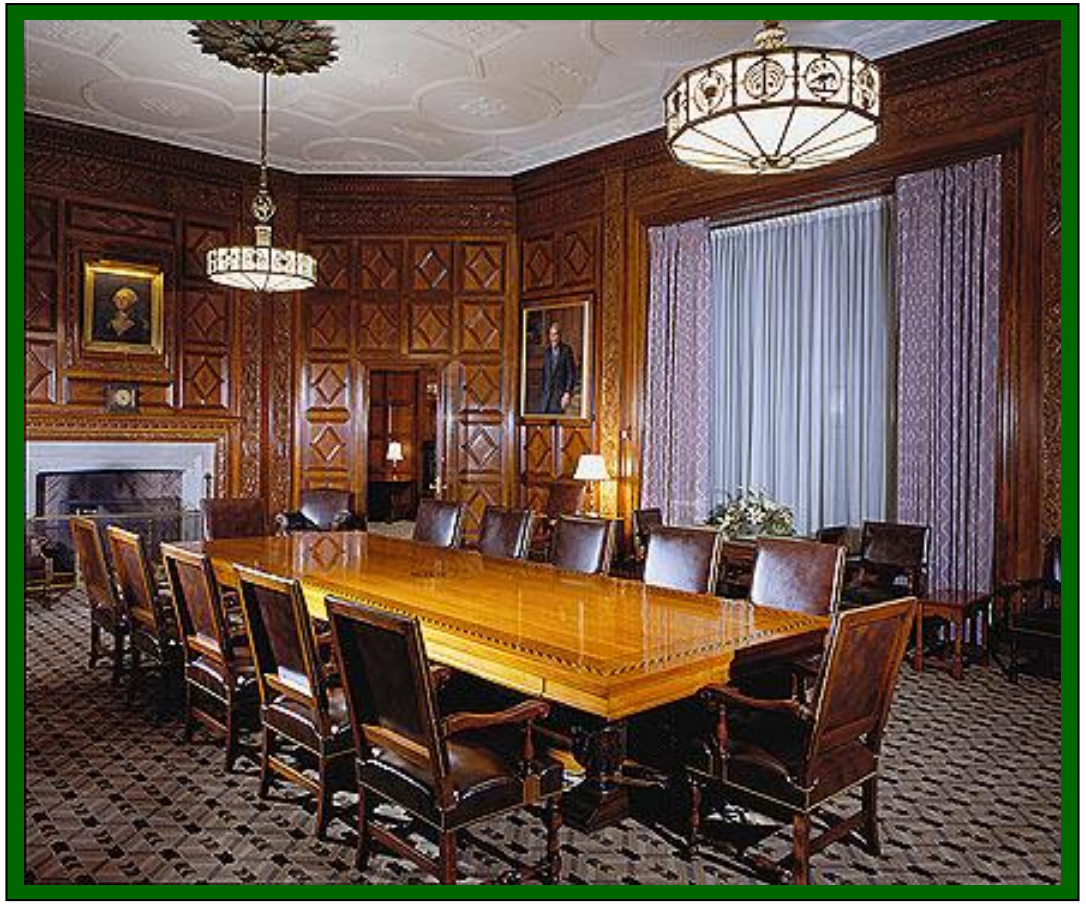
Federal Reserve Policy

Part 2

Open Market Operations (simple)



A boardroom at the Federal Reserve Bank of New York, where **Open Market Operations** are conducted. This photograph is by Oleg March.

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The objective of this lecture is to explain ...

- ... how Open Market Operations are conducted (simple version).
- ... the effect of a successful OMO.
- ... the connection between OMOs and money supply / credit growth rates.

Later lectures will explain:

- ... adding mortgages, REPOs, and other complications.
- ... temporary OMOs (with REPOs), why they are necessary.
- ... the impact of OMOs upon interest rates.
- ... the role played by primary dealers
- ... the changes forced by the 2008-2009 recession
- ... the changes forced by the pandemic of 2020

Some useful background facts ...

- The FRS is supposed to be autonomous from the Congress and the President (FRS is self-funded)
- Monetary policy, including OMO policy, is determined by the Federal Reserve System Board of Governors (BOG) in Washington DC.
- Actual Open Market Operations are conducted by the Open Market Trading Desk of the Federal Reserve Bank of New York
- There are two types of OMOs, ***temporary*** (***seasonal***), which are used largely to help seasonal U.S. Treasury operations (and which use Repurchase Agreements, or REPOs), and ***permanent***, which have a lasting effect. Here we are describing permanent.

This is what the Federal Reserve Bank of New York looks like ...

What is meant by "Open Market"?

Typically two or three times per week throughout the year, the Trading Desk of the FRB New York indirectly* enters the market for U.S. Treasury Securities by making a bid, *in competition with other buyers*, for a given amount of some security, such as a 13-week U.S. Treasury Bill for $10 million. At this point, the FRS is just another player in that market.

They will buy (directly and indirectly*) from any trader making an offer (ask) or accepting their bid, *including but not restricted to*, a private bank. In the example that follows, we will assume that they buy from a private bank, but that is not necessary for the open market operation to have its desired effect.

*this has to be substantially qualified, which happen in a later video.

How Open Market Operations create money and credit

1. FRBNY buys **U.S. Treasury Securities** in the open market
2. … and pays for them with **reserves***
3. … which allows banks on net to increase their lending, which creates **credit**** (**debt**)
4. … which creates new checkable deposits
5. … and new checkable deposits are, by definition, **money*** (included in all definitions)

*... we can't explain what reserves are quite yet, but these are not what people call required Tier1 or Tier2 reserves!

Key take-aways that you *should* understand ...

1. The FRS historical mandate
   - ... especially the two which are at times mutually exclusive
   - ... which you don't yet understand but eventually will

2. The "indirect controls" of the transmission mechanism
   - ... and the connection between the control, target, and goal variables.

3. Why "money" is no longer regarded as an important "target variable"
   - What evidence is there?
   - What is velocity and what role does it play?

Video 1

4. The general importance of Open Market Operations in the FRS toolkit
   - ... which you don't yet understand but eventually will

5. Where the major decisions are made (BOG) but where critical operations and policy execution decisions are made (generally, FRBNY but specifically Federal Open Market Committee (FOMC).

6. The distinction between temporary (seasonal) OMOs and permanent
   - ... which you don't yet understand but eventually will
   - ... and involve REPOs.

That's it ...

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Federal Reserve Policy

Part 3
Doing an Open Market Operation

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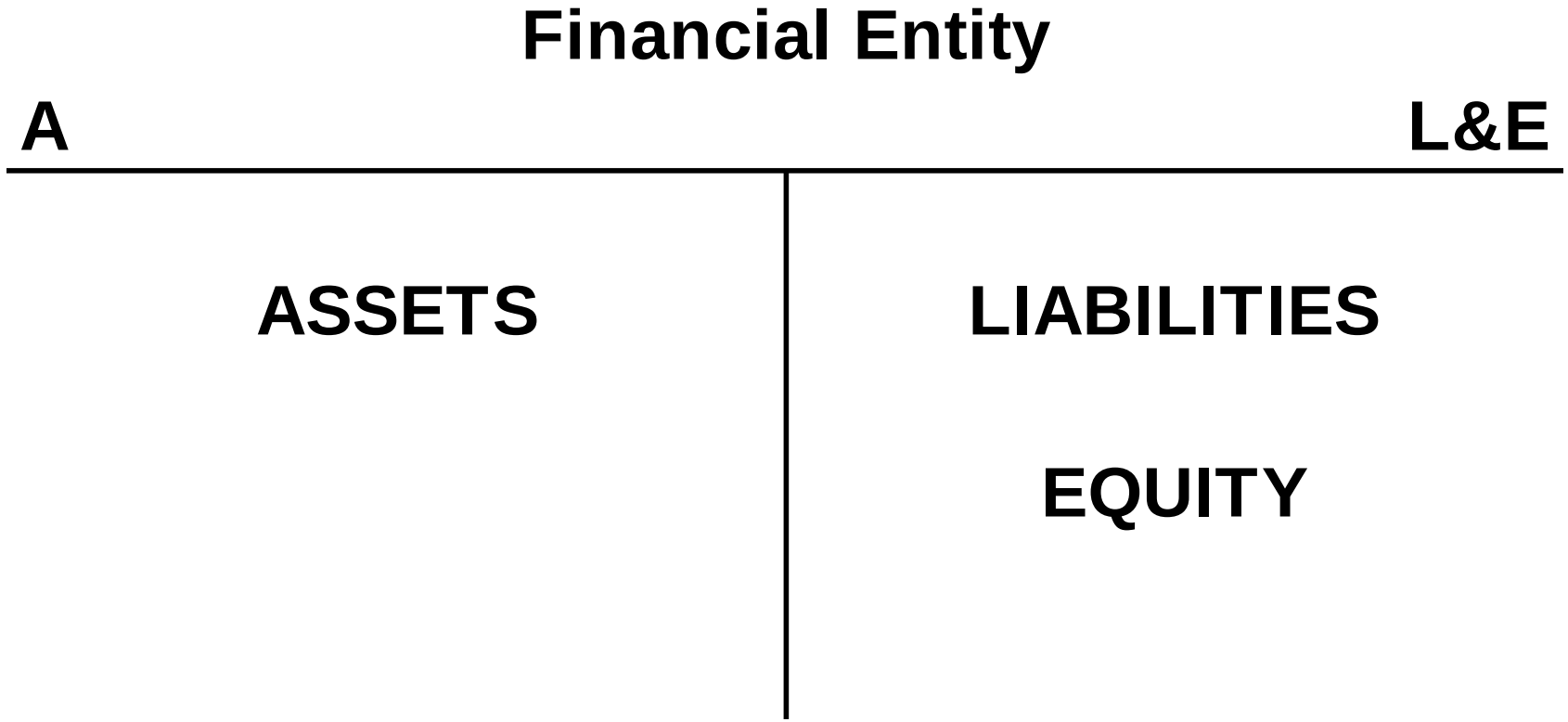
Let’s start with the Babylonian method ...



Assets	Sarah	Liabilities (Debt) & Equity (Net Worth)
	$3,000 cash	$180,000 home loan 
	$37,000 401-K	$4,000 car loan
	$260,000 home	$12,000 student loan
	$12,000 car	$1,000 credit card debt 
	$2,000 misc.	Equity
		$117,000 net worth!

Bank of Claremont

A	L&E
$50 vault cash 	$500 checkable deposits
$100 reserves ???	$300 time deposits
$350 govt bills	$200 certificates of deposit
$1,000 loans	$200 federal funds ???
	$300 equity

All private banks ($billions)

A	L&E
$10 Reserves	$100 Checkable deposits
$80 Loans	$10 Equity
$20 Govt Bills	(checkable deposits are money)

Federal Reserve System

A	L&E
$30 Govt Bills	$10 Reserves
	$20 Equity

Go to the current federal reserve H41 statistics release to show how this is not much of a simplification: http://www.federalreserve.gov/releases/h41/current/h41.htm

The starting point ...

Federal Reserve System

A	L&E
$30 Govt Bills	$10 Reserves
	$20 Equity

All private banks ($billions)

A	L&E
$10 Reserves	$100 Checkable deposits
$80 Loans	$10 Equity
$20 Govt Bills	(checkable deposits are money)

one and the same

How money is created
PBS

A	L&E
+ 50 Loans	+ 50 Checkable Deposits

The Reserve Requirement
… it's the law!!

All federally insured financial institutions are required to keep an amount equal to a specified percentage of their deposit liabilities at a Federal Reserve District Bank (or equivalent) in the form of reserves.

(Vault cash counts as reserves).

This is called the **Reserve Requirement**.

Example …

Reserve requirement = 10%

If Deposit Liabilities = 200, then

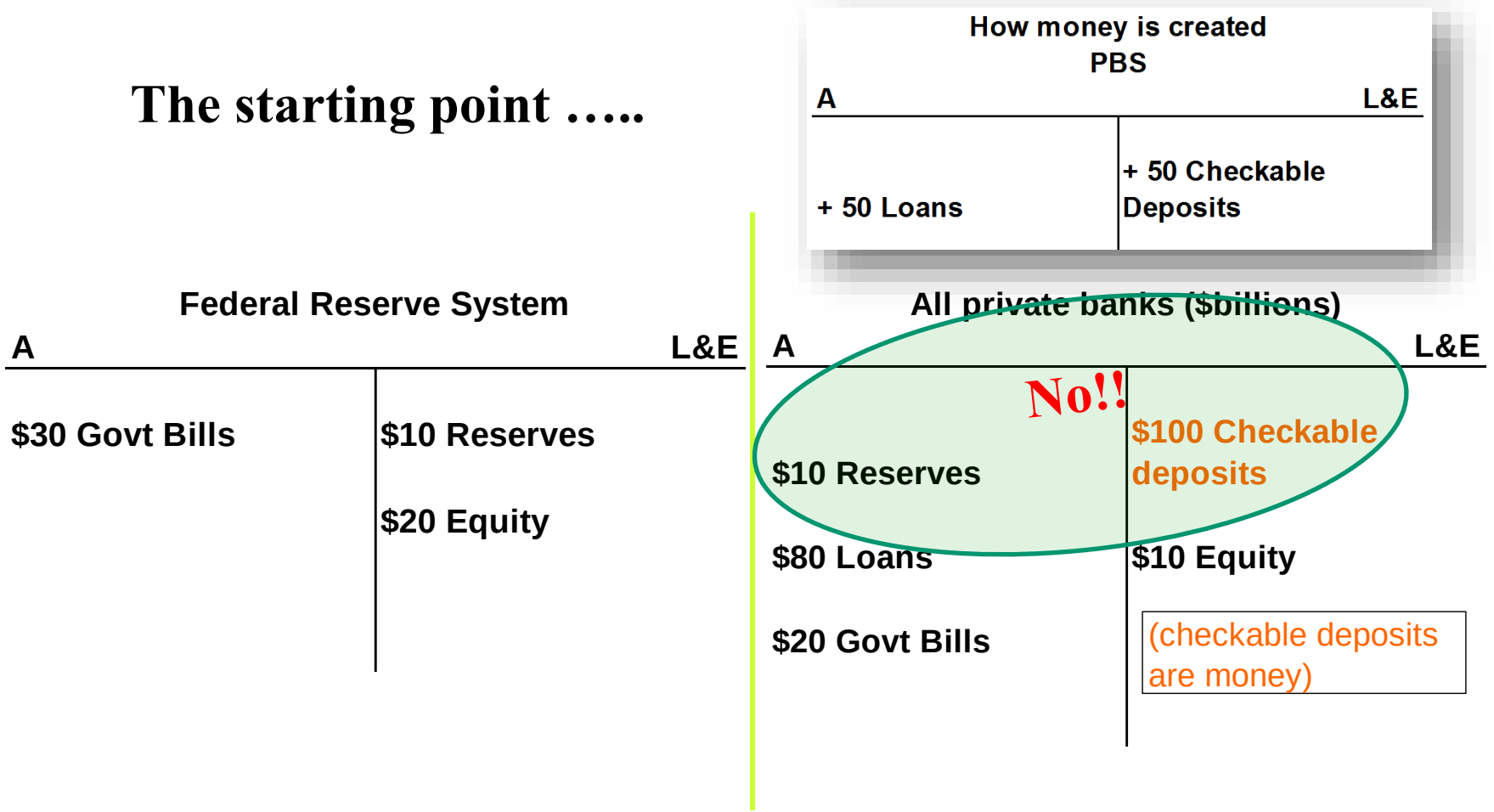
Required Reserves = 200 X .10 = 20

Reserves are technically "deposits" that these banks have at the Federal Reserve district banks ...

Reserve Requirements (actual effective early 2015)

Liability Type	Requirement	
	% of liabilities	Effective date
Net transaction accounts [1]		
$0 to $14.5 million[2]	0	1-22-15
More than $14.5 million to $103.6 million[3]	3	1-22-15
More than $103.6 million	10	1-22-15
Nonpersonal time deposits	0	12-27-90
Eurocurrency liabilities	0	12-27-90

The starting point …..



Question: Can this banking system presently undertake any net new lending, given the reserve requirement?

The Open Market Operation (OMO)

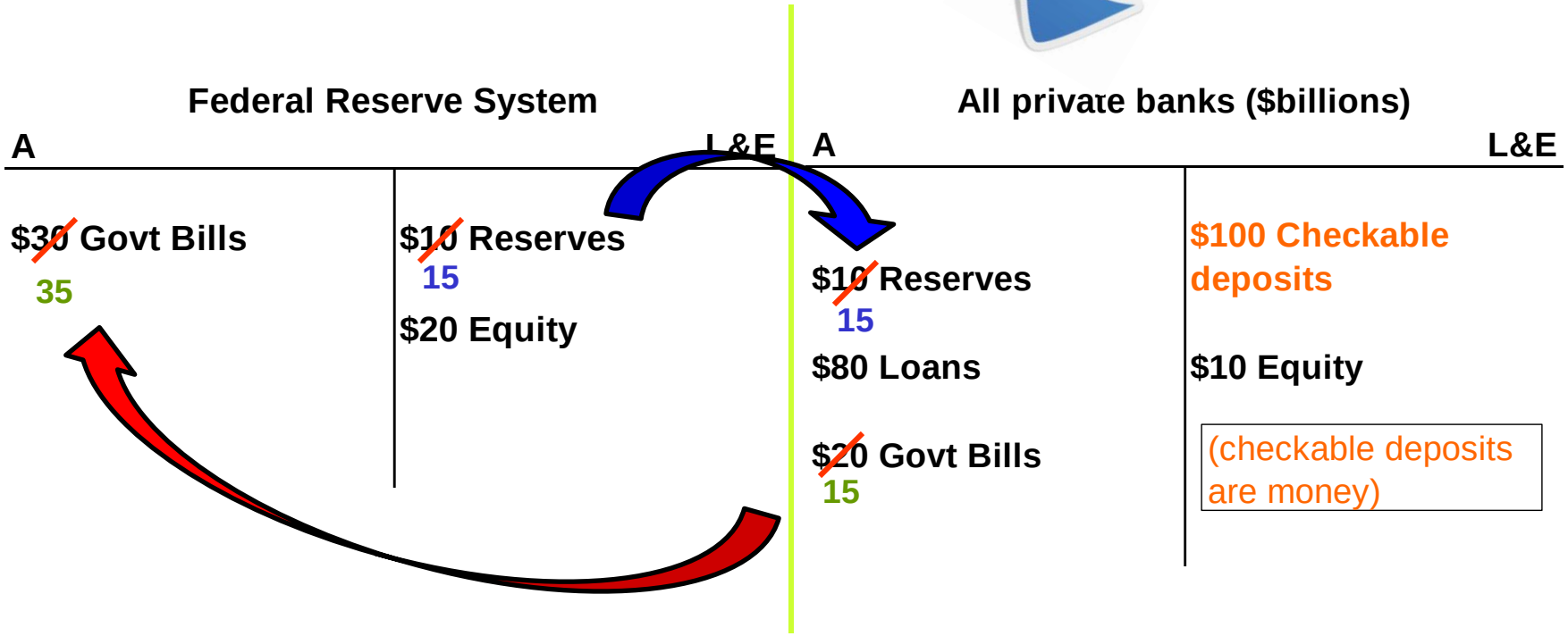
… what you are about to see

The Federal Reserve System will purchase $5 in government bills from the banking system (PBS) and will pay for them with reserves. This is done at the Federal Reserve Bank of New York.

This will give the PBS Free Reserves.

The open market operation …..

... and note that we have created excess reserves!



The FRS buys $5 in Bills and pays for them with $5 in reserves.

All private banks ($billions)

A	L&E
~~$10~~ $15 Reserves	~~$100~~ $150 Ch. Deposits
~~$80~~ $130 Loans	$10 Equity
~~$20~~ $15 Govt Bills	

This reflects the same transaction!

... and now the banks, with free reserves, can lend.

$50 in new money **and** $50 new credit has been created

The Money/Credit Multiplier

$$\Delta \text{ Money Supply} = (k) \times \Delta \text{ Reserves}$$

and

$$\Delta \text{ Debt} = \text{Credit} = (k) \times \Delta \text{ Reserves}$$

where

$$k = \frac{1}{\text{Reserve Requirement}}$$

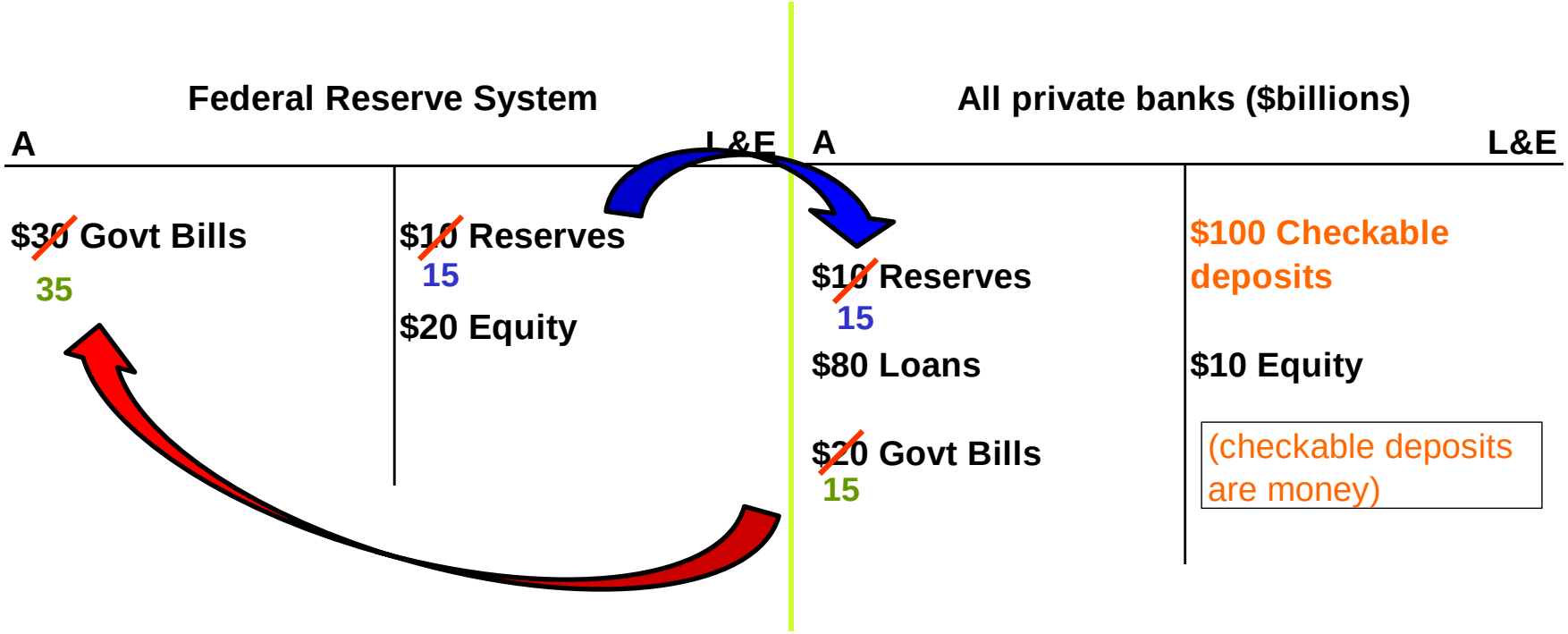
example:

$$k = \frac{1}{0.10} = 10$$

when the reserve requirement is 10%

... and to repeat the two key slides:

The open market operation …..



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This reflects the same transaction!

... and now the banks, with free reserves, can lend.

$50 in new money **and** $50 new credit has been created

Key take-aways that you *should* understand ...

1. The key to following the logic is the T-account and its arrangement.

2. Reserves are account deposits at a Federal Reserve district bank

3. Bank loans, reserves and securities (T-securities) are assets.

4. Bank deposit accounts, although an asset for you, is a bank liability.

5. When there are no free reserves, the system as a whole can't lend on net!

6. All reserves are created **from nothing** by the FRS through OMOs.

7. After the OMO, free reserves allow banks to extend their lending on net.

8. The resulting lending activity results in a net new increase of both money and credit.

9. ... **Note!** I always have a fill-in question about OMOs on the exam!

That's it ...

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