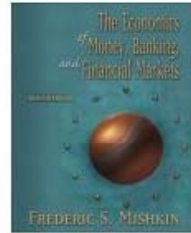


ECON 354
Money and Banking

Professor Yamin Ahmad

Lecture 5b: Money Supply

- Non-Borrowed Reserves and Discount Loans
- Money Multiplier
- The 2007-2009 Economic Crisis



Big Concepts

- M1 and M2 Multipliers
- Non Borrowed Monetary Base and Discount Loans
- Factors that Affect the Money Supply

Note: These lecture notes are incomplete without having attended lectures

The Relationship Between the Monetary Base and Deposits

- Recall from the last lecture that the monetary base, MB consists of Currency (C) and Reserves:

$$MB = C + R$$

- Total Reserves (R) itself consists of Required Reserves (RR) and Excess Reserves (ER):

$$R = RR + ER$$

- As such, by combining these two elements, we obtained:

$$D = \frac{MB}{c + r + e}$$

Note: These lecture notes are incomplete without having attended lectures

Relationship between M1 and the Monetary Base

- Recall that:

$$M1 = C + D$$

- Using the relationship between Deposits and the Monetary Base, we used it to construct the M1 money multiplier:

$$M1 = \frac{1 + c}{c + r + e} \times MB$$

Note: These lecture notes are incomplete without having attended lectures

Factors that effect the M1 Multiplier

Factor	Effect on M1 Multiplier	Effect on M1 Money Supply
c ↑	↓	↓
r ↑	↓	↓
e ↑	↓	↓

- If the public decides to hold more money relative to deposits, then there will be less money available for multiple deposit creations. In turn, the money multiplier falls.
- The same can be said about what happens if banks decide or have to hold more reserves. There will be less funds available for multiple deposit creation resulting in a decline in the money multiplier.

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Relationship between M2 and the Monetary Base

- What about the link between the monetary base and the other (broader) measure of money: M2?
- Recall that:
 - $M2 = M1$
 - + Small denomination time deposits and repurchase agreements; Savings deposits and money market deposit accounts (STSV)
 - + Money market mutual funds shares (MMMF)
- Hence: $M2 = C + D + STSV + MMMF$

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Relationship between M2 and the Monetary Base

- As before assume that they are proportional to deposits, i.e.
- $STSV = s.D \rightarrow s = STSV/D$
- $MMMF = f.D \rightarrow f = MMMF/D$
- Hence, $M2 = (1 + c + s + f)D$
- Using our relationship to the monetary base as before, we obtain:

$$M2 = \frac{1 + c + s + f}{c + r + e} \times MB$$

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Factors that effect the M2 Multiplier

Factor	Effect on M2 Multiplier	Effect on M2 Money Supply
c ↑	↓	↓
r ↑	↓	↓
e ↑	↓	↓
s ↑	↑	↑
f ↑	↑	↑

Banks do not have to hold reserves against time and saving deposits or money market mutual funds. If more money is held in the form of time and saving deposits or money market mutual funds, then there is more money available for multiple deposit creation. The M2 money multiplier, in turn, increases.

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Full Model

- Fed cannot accurately control the Monetary Base: it cannot determine the amount of borrowing that banks will undertake
- Solution: Split Monetary Base into two components:
 - Nonborrowed monetary base (MB_n) which is tightly controlled because it arises from OMO
 - Amount of the base arising from discount loans (DL)
- $MB = MB_n + DL$
Where MB_n is the non-borrowed monetary base, and DL is the Discount Loans from the Fed.

$$M = m \times (MB_n + DL)$$

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Changes In Components of Monetary Base

Note:

- The money supply, M is positively related to the non-borrowed monetary base, MB_n .
- The money supply, M is positively related to the level of discount loans, DL from the Fed.

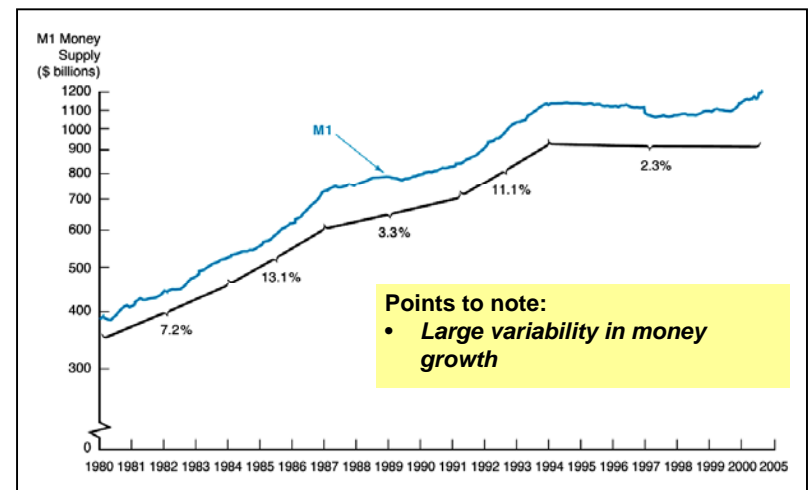
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Factors Determining Money Supply

<u>Player</u>	<u>Variable</u>	<u>Change in Variable</u>	<u>Money Supply Response</u>
Federal Reserve System	r	↑	↓
	MB_n	↑	↑
	DL	↑	↑
Depositors	c	↑	↓
Depositors and Banks	Expected deposit outflows	↑	↓
Borrowers from banks and other three players	i	↑	↑

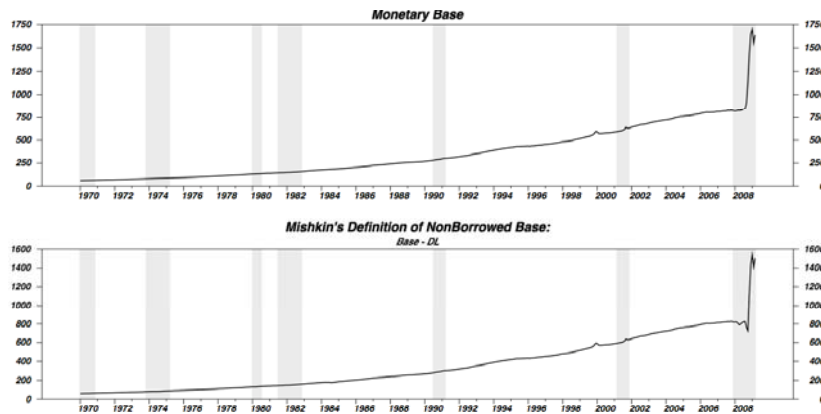
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Money Supply



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Monetary Base and Non Borrowed Base



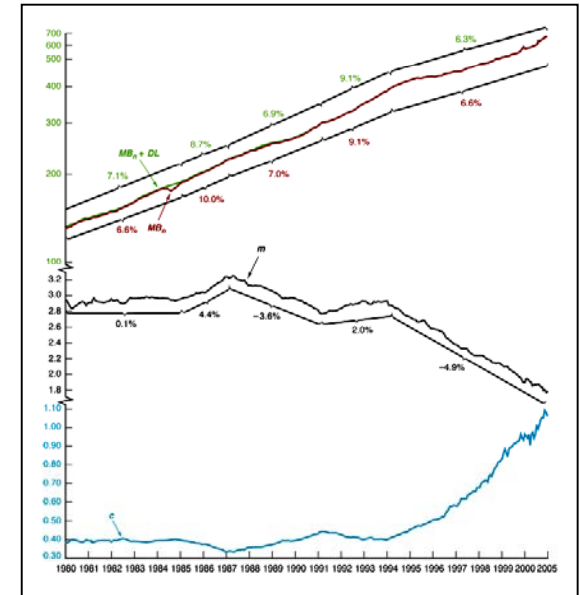
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Determinants of the Money Supply

Movements in M is explained by:

1. either movements in MB_n or DL .
2. Or movements in m (money multiplier)

- Over long periods, the primary determinant of movements in the money supply can be seen to be MB_n .
- Over shorter periods, there is substantial variability in m , caused primarily by c .

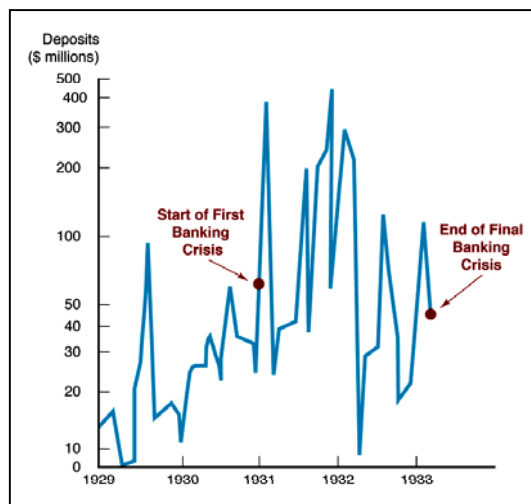


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Case Study: Deposits at Failed Banks: 1929–33

Deposits at banks which failed:

- No deposit insurance, so when banks failed, depositors only received a partial repayment of deposits
- Thus, during a banking crisis, we should expect to see depositors shift their holdings from checkable deposits to currency by withdrawing currency, i.e. an increase in c



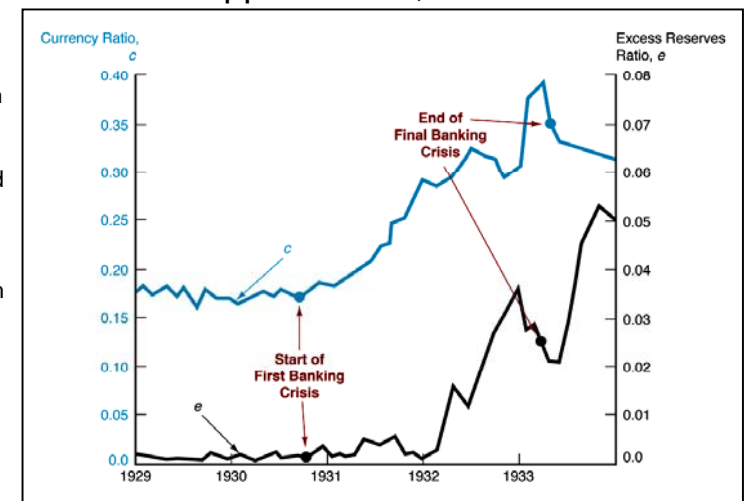
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Case Study: Deposits at Failed Banks (1929-33): What happened to e , c ?

- An increase in the expected deposit outflow should increase e !

Note in the graph on the right:

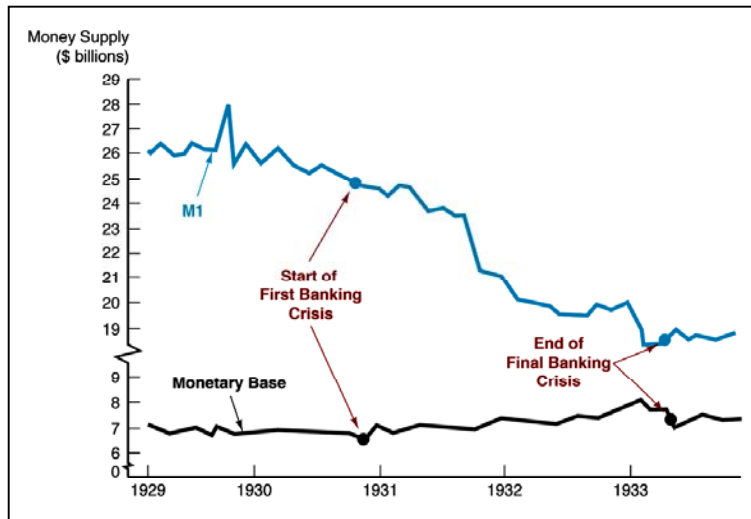
- e increases
- c increases



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Money Supply and Monetary Base: 1929–33

- An increase in e and c lowers the money multiplier, m
- This causes a fall in the money supply.

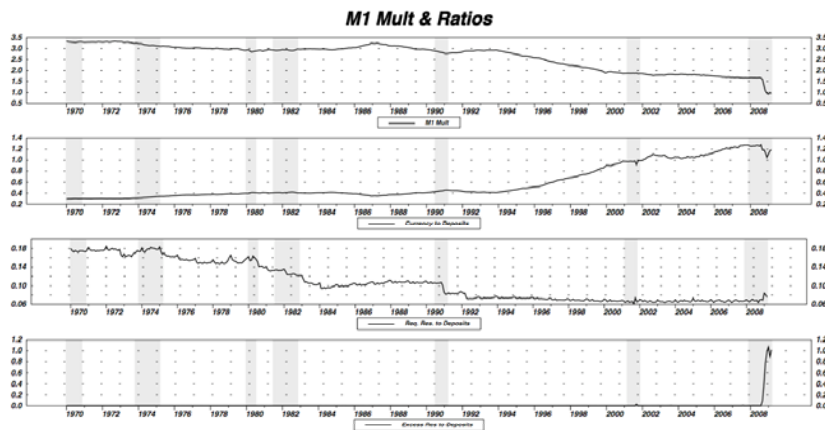


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THE CURRENT ECONOMIC CRISIS

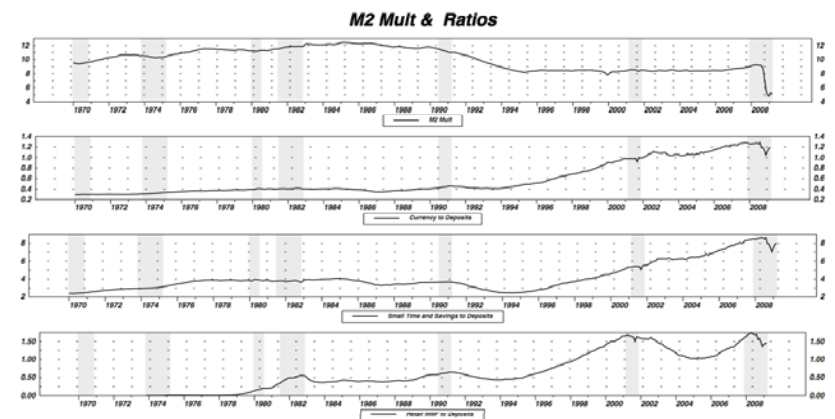
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1970 through March, 2009



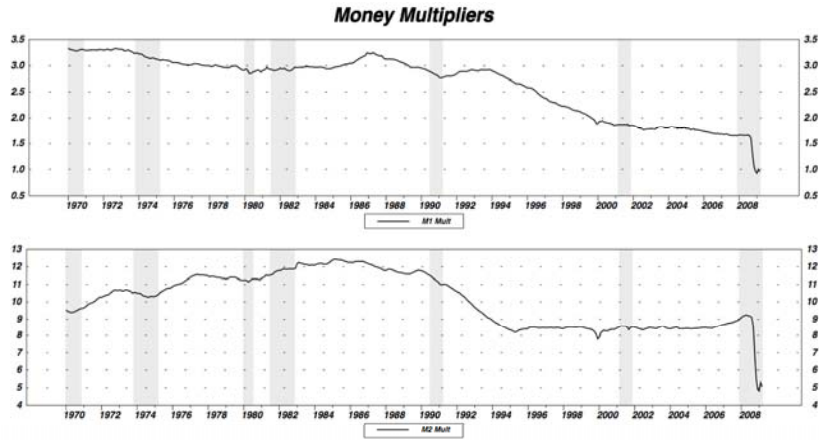
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1970 through March 2009



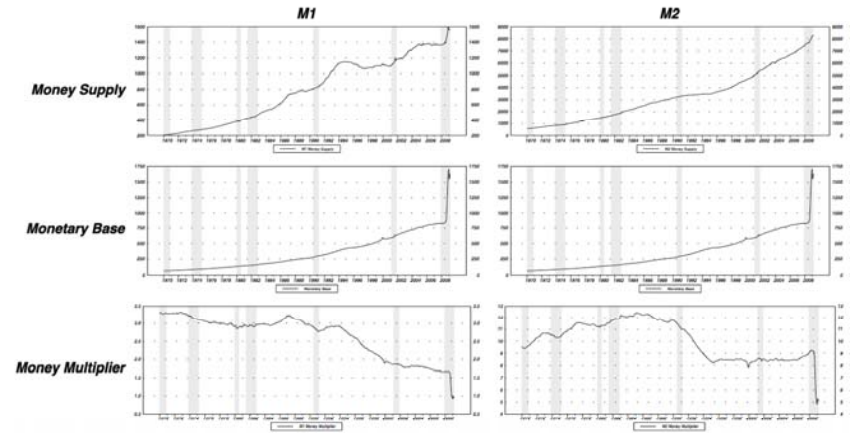
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M1 and M2 Money Multipliers



Note: These lecture notes are incomplete without having attended lectures

Money Supply, Base, and Multiplier for M1 and M2



Note: These lecture notes are incomplete without having attended lectures