

ECON 354 Money and Banking

Professor Yamin Ahmad

Lecture 11: Money Supply

- Non-Borrowed Reserves and Discount Loans
- Money Multiplier



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:

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

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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:

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

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Factors that effect the M1 Multiplier

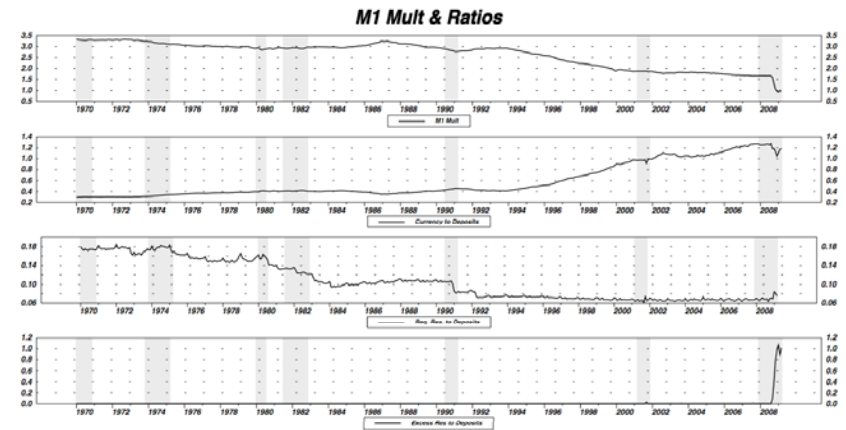
Factor	Effect on M1 Multiplier	Effect on M1 Money Supply
c ↑	↓	↓
r ↑	↓	↓
e ↑	↓	↓

- 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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1970 through March, 2009



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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

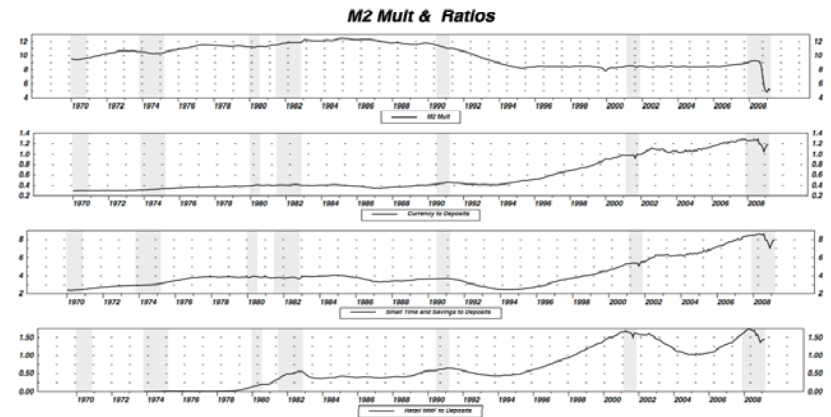
Factor	Effect on M2 Multiplier	Effect on M2 Money Supply
c ↑	↓	↓
r ↑	↓	↓
e ↑	↓	↓
s ↑	↑	↑
f ↑	↑	↑

- 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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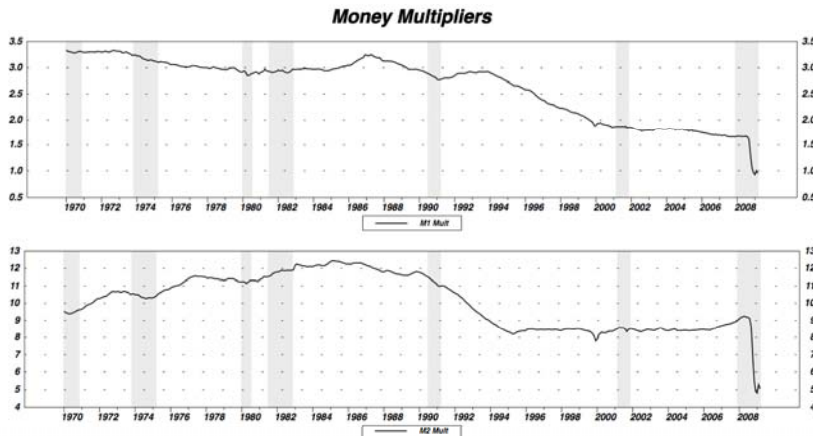
1970 through March 2009



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M1 and M2 Money Multipliers



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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

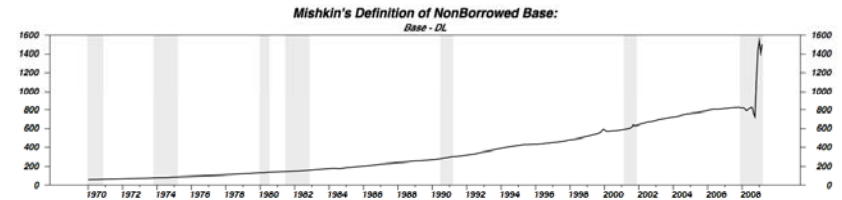
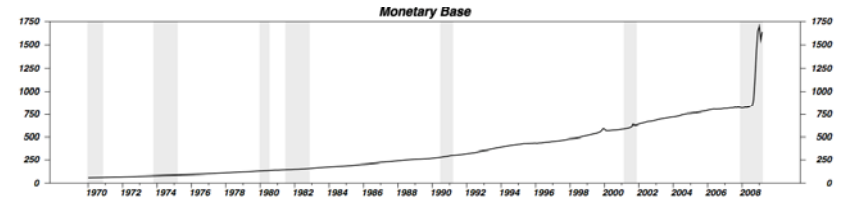
Note:

- 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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Monetary Base and Non Borrowed Base



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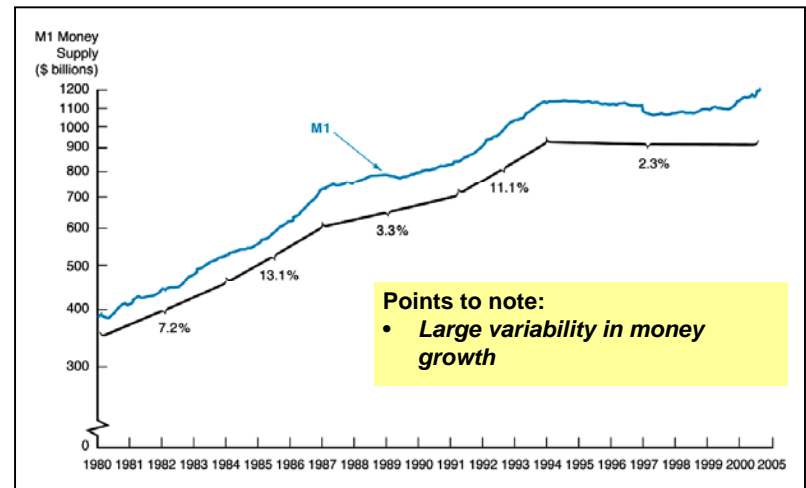
Factors Determining Money Supply

Player	Variable	Change in Variable	Money Supply Response
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

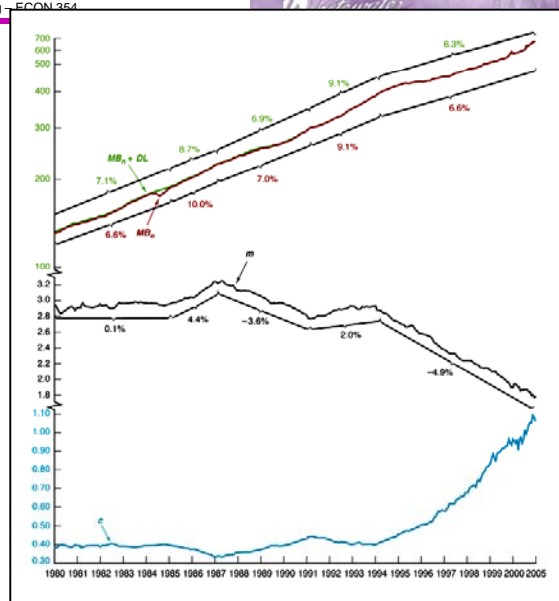


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Determinants of the Money Supply

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 .

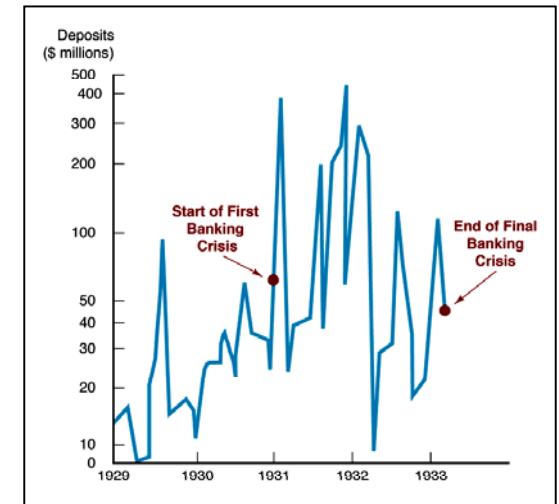


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Case Study: Deposits at Failed Banks: 1929–33

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



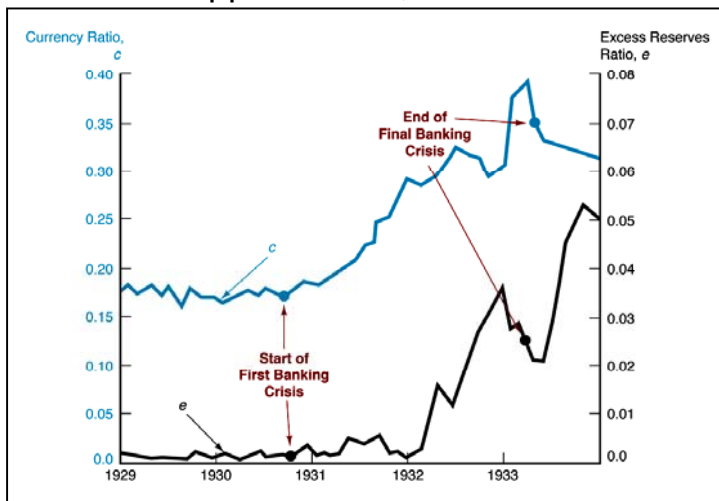
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Case Study: Deposits at Failed Banks (1929-33): What happened to e , c ?

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

Note in the graph on the right:

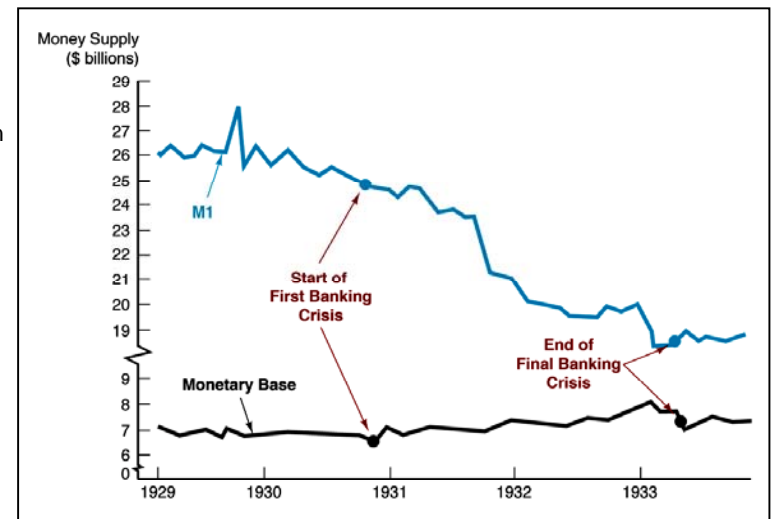
- e increases
- c increases



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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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