

# CHAPTER 16

## Determinants of the Money Supply

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### Money Multiplier (Money is M1)

$$M = m \times MB$$

*m* is function of Depositors, Banks and Reserve Requirements

*m* > 1 [multiplier]

*C* is desired level of currency

Let  $c = C/D =$  Currency ratio

Let  $e = ER/D =$  Excess reserve ratio

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### Money Multiplier (Money is M1)

$$M = m \times MB$$

#### Deriving Money Multiplier

$$R = RR + ER \text{ (in chapter 15 } R=RR \text{ because } ER=0)$$

$$RR = r \times D$$

$$R = (r \times D) + ER$$

#### Adding C to both sides

$$R + C = MB = (r \times D) + ER + C$$

1. If it does not support D, it is not multiplied.
2. Tells us amount of MB needed support D, ER and C
3. \$1 of MB in ER, not support D or C

$$\begin{aligned} MB &= (r \times D) + (e \times D) + (c \times D) \\ &= (r + e + c) \times D \end{aligned}$$

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

$$M = D + C = D + (c \times D) = (1 + c) \times D$$

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

$$m = \frac{1 + c(-ve)}{r(-ve) + e(-ve) + c(-ve)}$$

$m < 1/r$  because no multiple expansion for currency and because as  $D \uparrow$   $ER \uparrow$

**Full Model**

$$M = m \times (MB_n + DL) = m \times (\text{Nonborrowed } MB + \text{Discount Loans})$$

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**Full Model**

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

$$= m \times (\text{Nonborrowed } MB + \text{Discount Loans})$$

Banks also influence the amount of discount loans

Split MB into 2 components: one that is controlled by the Fed and another that is less controlled.

$$MB = MB_n + DL$$

= controlled by Fed by open market + Discount Loans

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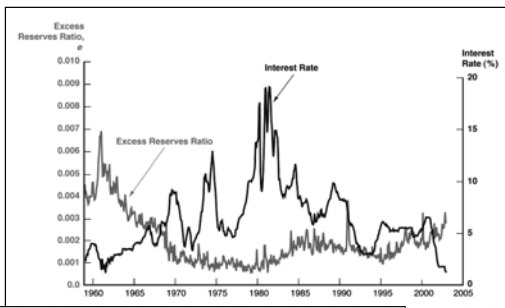
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**Effect of market interest rate  $i$  - Excess Reserves Ratio**



**Determinants of  $e$**

1.  $i \uparrow$ , relative  $R^c$  on  $ER \downarrow$  (opportunity cost  $\uparrow$ ),  $e \downarrow$
2. Expected deposit outflows,  $ER$  insurance worth more,  $e \uparrow$

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# Factors Determining Money Supply

**SUMMARY Table 1 Money Supply (M1) Response**

Player	Variable	Change in Variable	Money Supply Response	Reason
Federal Reserve System	$r$	↑	↓	Less multiple deposit expansion
	$MB_s$	↑	↑	More MB to support D and C
	$DL$	↑	↑	More MB to support D and C
Depositors	$c$	↑	↓	Less multiple deposit expansion
Depositors and banks	Expected deposit outflows	↑	↓	$e$ ↑ so fewer reserves to support D
Borrowers from banks and the other three players	$i$	↑	↑	$e$ ↓ so more reserves to support D

Note: Only increases (↑) in the variables are shown. The effects of decreases on the money supply would be the opposite of those indicated in the "Money Supply Response" column.

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