

The Basic Money Supply Process

1. EXTREME CASE 1: Everyone uses checks

<i>The Central Bank</i>		<i>Schenectady National Bank (SNB)</i>		<i>Alice I. Wonderland</i>	
<i>Changes in Assets</i>	<i>Changes in Liabilities</i>	<i>Changes in Assets</i>	<i>Changes in Liabilities</i>	<i>Changes in Assets</i>	<i>Changes in Liabilities</i>
□	□	□	□	□	
	□	□	□	□	
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2. EXTREME CASE 2: The non-bank public uses only currency

<i>The Central Bank</i>		<i>Schenectady National Bank (SNB)</i>		<i>Alice I. Wonderland</i>	
<i>Changes in Assets</i>	<i>Changes in Liabilities</i>	<i>Changes in Assets</i>	<i>Changes in Liabilities</i>	<i>Changes in Assets</i>	<i>Changes in Liabilities</i>
□	□	□	□	□	
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3. THE GENERAL CASE

Let

H supply of central bank money (also called monetary base, or high-powered money) (\$)
 CU currency held by the non-bank public (\$)
 R reserves held by commercial banks
 D checkable accounts (also called demand deposits) (\$)
 M stock of money (\$)
 θ reserve-deposit ratio: the fraction of deposits that banks hold in reserve (R/D)
 c currency-money demand ratio: shows the preferences of the public about how much money to hold in the form of currency, and how much to hold in the form of checkable accounts.

Superscripts d and s denote demand and supply, respectively

The two demands for currency and checkable deposits can be written as:

$$CU^d = cM^d \quad (1)$$

$$D^d = (1 - c)M^d. \quad (2)$$

The demand for reserves (by commercial banks) can be written as:

$$R^d = \theta D^d. \quad (3)$$

Substituting from (2) into (3) for D^d we get:

$$R^d = \theta(1 - c)M^d \quad (4)$$

Total demand for central bank money can be written as:

$$H^d = CU^d + R^d. \quad (5)$$

Substituting from (1) and (4) into (5), we get:

$$H^d = cM^d + \theta(1 - c)M^d = [c + \theta(1 - c)]M^d. \quad (6)$$

In equilibrium, supply of central bank money, H , is equal to demand, H^d . That is:

$$H = [c + \theta(1 - c)]M^d.$$

Dividing both sides by the expression in the brackets, we get:

$$\frac{1}{[c + \theta(1 - c)]} H = M^d. \quad (7)$$

So the formula for the money supply is:

$$M^s = \frac{1}{[c + \theta(1 - c)]} H. \quad (8)$$

The expression $\frac{1}{[c + \theta(1 - c)]}$ is called the *money multiplier*.

Note that in *EXTREME CASE 1*, $c = 0$, therefore the money multiplier is $\frac{1}{\theta}$. In *EXTREME CASE 2*, however, $c = 1$, so the money multiplier in this case is $= 1$.

Rough estimates for θ and c , for the U.S., before the financial crisis which led to the Great Recession were, respectively: 0.10 and 0.40. Plugging these values into the money multiplier formula we get:

$$\frac{1}{[0.40 + 0.10(1 - 0.40)]} = 2.17.$$