Chapter 3

What Is Money?

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Topics

• Definition of money
• Functions of money
• Alternative types of payment systems
• Evolution of forms of money
• Measurement of the money supply
• Money supply and monetary policy
Definition of Money

• What is it?
  – *Money* is anything that is generally accepted in payment for goods or services or in the repayment of debts.

• A rather broad definition
  – “Money” is defined in terms of function, not form
  – “Money” is a social construction (i.e., it is dependent on social acceptance)
What Money is Not!

- Money is DISTINCT from:

  - **Wealth (or “Net Worth”):** current value of all assets owned by an entity (person, agency, nation,...) net of all liabilities owed by the entity
    - **Example:** His wealth is $10,000 (value amount)

  - **Income:** the flow of earnings of an entity per unit of time
    - **Example:** His income is $10,000 per year (flow of value)
Functions of Money

Medium of Exchange (Means of Payment):
- Eliminates the need to have a “double coincidence of wants” (reduces transaction costs)
- Promotes specialization & division of labor

A medium of exchange must
- be easily standardized
- be widely accepted
- be divisible
- be easy to carry
- not deteriorate quickly
Functions of Money...Continued

**Unit of Account:**
- used to measure value in the economy
- reduces transaction costs

**Store of Value:**
- used to save purchasing power over time.
- other assets also serve this function
- Money is the most liquid of all assets but loses value during inflation
Alternative Payment Systems

• **Autarky:** Group distribution rules for sharing and gift giving. No trade takes place, and no use of money.

• **Barter:** Trade takes place, but no use of money. *Example:* Incas of Peru, 12th-15th c. AD

• **Monetary:** People trade goods and services in exchange for money
Problems with Barter Exchange

- No Medium of Exchange
  - Lack of double coincidence of wants
  - Discourages people from specializing in types of production they do best

- Need for Many Prices
  - \( \frac{N(N-1)}{2} \) prices given \( N \) distinct goods/services

- No Common Unit of Account

- No Common Store of Value
Evolution of Forms of Money

- **Commodity money** (~ 9000 BC)
- **Token Money (No Intrinsic Use-Value)** (~9000BC)
- **Checks** (Medieval Italy & Catalonia, 5th-15th c. AD)
- **Backed Paper** (China ~960AD, British colonies 1690-1776)
- **Unbacked Paper** (China ~618–960AD; US 1862, 1973)
- **Fiat Money** (China ~1300 AD; first U.S. use 1862)
- **Electronic money** (first U.S. use in 1990’s)
Forms of Money ...

• **Traditional Definition of a Commodity**
  - Something with intrinsic use value (e.g., bread)

• **Modern Definition of Commodity**
  - Anything of value available for purchase and sale in standardized form (e.g., cell phone minutes)

• **Commodity Money**
  - Commodity also used as money
  - Commodities used as monies in past tended to be most valuable, easily standardized & divisible
  - **Examples:** Shells, precious metals, cigarettes...
Forms of Money ... Continued

• **Token Money**
  - Face value > intrinsic use value
  - *Examples:* Marked stones, many modern coins (e.g., post-1982 U.S. zinc penny issues, see http://www.coinflation.com/)

• **Checks**
  - An instruction to your bank (in paper form) to transfer money from your account
Forms of Money ... Continued

• **Backed Paper Money**
  - Collateralized by some commodity
  - *Example:* Tobacco in warehouse used as collateral backing for issued paper monies

• **Unbacked Paper Money**
  - No legal requirement that it be collateralized by any commodity

• **Fiat Money:** *Unbacked paper money* decreed by a government to be *legal tender*, meaning that
  - by law - it must be accepted for debt payments.
Forms of Money...Continued

• Electronic Money

  – Debit card

  – “Mobile money” (cell phone networks permitting cell phones to act as debit cards)

  – Stored-value cards

  – Electronic cash and checks – used on Internet
Measuring Monetary Aggregates: An Empirical Approach

Use *whatever* measure works best for the control of key macro variables such as GDP, the general price level, etc.

**PROBLEMS:**

- Different measures work best for different variables

- Usefulness of any one measure for prediction of any one variable varies over time
Measuring Monetary Aggregates: Two Theoretical Approaches

1. Measure as “money” only those assets that are most liquid, hence that function best as a medium of exchange.

   *(Appropriate cut-off not clear)*

2. Include all financial assets in the measure of money, but weight them in proportion to their liquidity.

   *Example:*
   
   $$M = 0.8 \times [\$ \text{ bills}] + 0.1 \times [\text{Treasury Bills}] + \ldots$$

   *(Appropriate weights not clear)*
Measuring Monetary Aggregates via Liquidity

- Actual practice in U.S.
- U.S. uses nested family of money measures constructed on basis of decreasing liquidity

M1 = Most Narrow Measure (Most Liquid)

M1 = currency + traveler’s checks + demand deposits + other checkable deposits
Measuring Money via Liquidity...

- \( M_2 = M_1 + \text{Less Liquid Assets} \)
  
  \[ M_2 = M_1 + \text{small denomination time deposits} + \text{savings deposits} + \text{money market deposit accounts} + \text{money market mutual fund shares} \]

- \( M_3 = M_2 + \text{Less Liquid Assets} \)

- \( L = M_3 + \text{Less Liquid Assets} \)
Table 1  Measures of the Monetary Aggregates

<table>
<thead>
<tr>
<th>Measure</th>
<th>Value as of November 2008 ($ billions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1 = Currency</td>
<td>804.9</td>
</tr>
<tr>
<td>+ Traveler’s checks</td>
<td>5.6</td>
</tr>
<tr>
<td>+ Demand deposits</td>
<td>405.9</td>
</tr>
<tr>
<td>+ Other checkable deposits</td>
<td>306.1</td>
</tr>
<tr>
<td>Total M1</td>
<td>1,522.5</td>
</tr>
<tr>
<td>M2 = M1</td>
<td></td>
</tr>
<tr>
<td>+ Small-denomination time deposits</td>
<td>1,351.0</td>
</tr>
<tr>
<td>+ Savings deposits and money market deposit accounts</td>
<td>4,007.1</td>
</tr>
<tr>
<td>+ Money market mutual fund shares (retail)</td>
<td>1,053.9</td>
</tr>
<tr>
<td>Total M2</td>
<td>6,412.0</td>
</tr>
</tbody>
</table>

Monetary Aggregates

- **M1**: Currency, Traveler’s Checks, Demand Deposits, Other Check. Dep
- **M2**: = M1 + Small Den. Dep., Savings and MM, Money Market Mutual Funds Shares
- **M3**: = M2 +...
M1 vs. M2

• Does it matter which measure of money is considered?
  
  – M1 and M2 can move in different directions in the short run (see the figure on the next slide).

  – Conclusion: the choice of monetary aggregate is important for policymakers.
FIGURE 1  Growth Rates of the M1 and M2 Aggregates, 1960–2008

Sources: Federal Reserve Bulletin, p. A4, Table 1.10, various issues; Citibase databank; www.federalreserve.gov/releases/h6/hist/h6hist1.txt.
How Reliable are Money Data?

• Revisions of money measures are routinely made after initial release:
  – Small depository institutions report infrequently
  – Adjustments must be made for seasonal variation

• We probably should not pay much attention to short-run movements in money measures

• We should be concerned only with longer-run movements
**Table 2** Growth Rate of M2: Initial and Revised Series, 2008 (percent, compounded annual rate)

<table>
<thead>
<tr>
<th>Period</th>
<th>Initial Rate</th>
<th>Revised Rate</th>
<th>Difference Revised Rate – Initial Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>July 2007</td>
<td>4.1</td>
<td>4</td>
<td>-0.1</td>
</tr>
<tr>
<td>August 2007</td>
<td>10.6</td>
<td>8.2</td>
<td>-2.4</td>
</tr>
<tr>
<td>September 2007</td>
<td>5.2</td>
<td>6.2</td>
<td>1</td>
</tr>
<tr>
<td>October 2007</td>
<td>4.4</td>
<td>4</td>
<td>-0.4</td>
</tr>
<tr>
<td>November 2007</td>
<td>5.4</td>
<td>6.4</td>
<td>1</td>
</tr>
<tr>
<td>December 2007</td>
<td>5.9</td>
<td>5.9</td>
<td>0</td>
</tr>
<tr>
<td>January 2008</td>
<td>9.6</td>
<td>9.6</td>
<td>0</td>
</tr>
<tr>
<td>February 2008</td>
<td>19.9</td>
<td>19.7</td>
<td>-0.2</td>
</tr>
<tr>
<td>March 2008</td>
<td>14.7</td>
<td>13.4</td>
<td>-1.3</td>
</tr>
<tr>
<td>April 2008</td>
<td>3.7</td>
<td>3.3</td>
<td>-0.4</td>
</tr>
<tr>
<td>May 2008</td>
<td>2.3</td>
<td>2.4</td>
<td>0.1</td>
</tr>
<tr>
<td>June 2008</td>
<td>-3.7</td>
<td>-3.9</td>
<td>-0.2</td>
</tr>
<tr>
<td>Average</td>
<td>6.8</td>
<td>6.6</td>
<td>-0.2</td>
</tr>
</tbody>
</table>


Averages are close
Direct Effects of $M \rightarrow PQ$?

- Let $M =$ Money supply during year $T$
- $Q =$ Real GDP for year $T$
- $P =$ GDP Deflator for year $T$
- $P \cdot Q =$ (Nominal) GDP for year $T$

**DEFINE:**

$$V = \frac{GDP}{M} = \text{“Velocity of Money”}$$

= Number of times on average that each
dollar was used in trades during year $T$
Direct Effects of $M \rightarrow PQ \ldots$ ?

- Note that the velocity of money definition
  \[ V = \frac{GDP}{M} \]
  implies
  \[ M = \left(\frac{1}{V}\right) \cdot GDP \]

- Thus, **if $V$ were constant over time**, then by controlling $M$ the Fed could also directly control the level of GDP!
Changes in the Velocity of Money Over Time

**Figure 1**  Change in the Velocity of M1 and M2 from Year to Year, 1915–2005

*Sources: Economic Report of the President; Banking and Monetary Statistics; [www.federalreserve.gov/releases/h6/](http://www.federalreserve.gov/releases/h6/).*