Lecture 1: Money I
The Demand for Money

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Outline

- General
- Theoretical framework
  - Quantity Theory of Money
  - Keynes' s Liquidity Preference Theory
  - Friedman's Modern Quantity Theory of Money

Meaning of Money

- Money (money supply)—anything that is generally accepted in payment for goods or services or in the repayment of debts; a stock concept
- Wealth—the total collection of pieces of property that serve to store value
- Income—flow of earnings per unit of time

Functions of Money

- Medium of Exchange —promotes economic efficiency by minimizing the time spent in exchanging goods and services
  - Must be easily standardized
  - Must be widely accepted
  - Must be divisible
  - Must be easy to carry
  - Must not deteriorate quickly
- Unit of Account —used to measure value in the economy
- Store of Value —used to save purchasing power; most liquid of all assets but loses value during inflation

Evolution of the Payments System

- Commodity Money
- Fiat Money
- Checks
- Electronic Payment
- E-Money

Who controls money?

- The central bank manages money or short-end interest rates through the conduct of ‘monetary policy’
- everything else equal (*ceteris paribus*), an increase in the money supply lowers interest rates (the costs of borrowing funds)

Definition of money

- Monetary base (M0): notes and coins in circulation + financial institutions' deposits at the central bank
- Monetary aggregates
  - Narrow money: M1
  - Broad money: M2, M2a and M3

M1 = notes and coins in circulation + business and household call deposits in the commercial banking system

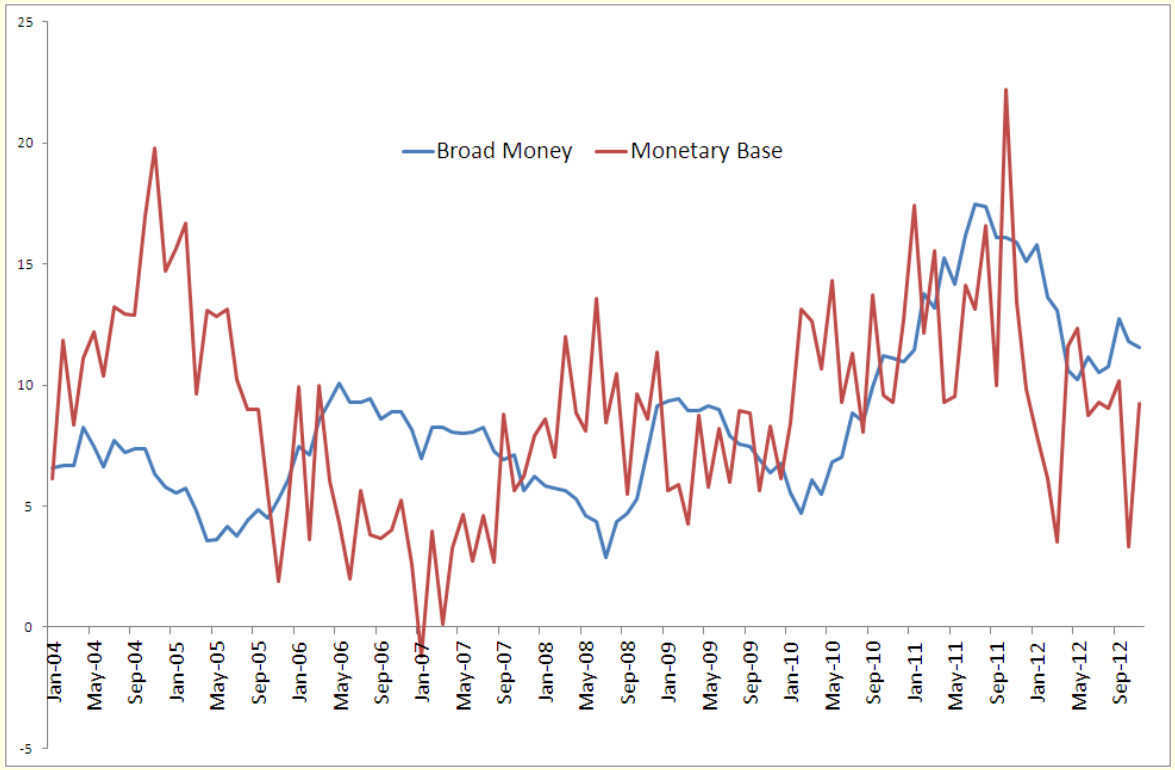
M2 = M1 + time and savings deposits in the commercial banking system

M2a = M2 + deposits in finance and finance & securities companies

M3 = M1 + all types of deposits that financial institutions take from the public

Monetary Base and Broad Money Growth: Thailand

Percent change (y-o-y)



The relationship between *monetary base* and *monetary aggregate* can be derived from the money creation process by financial intermediaries (shall be discussed later on)

How Reliable are the Money Data?

- Revisions are issued because:
  - Small depository institutions report infrequently
  - Adjustments must be made for seasonal variation
- We probably should not pay much attention to short-run movements in the money supply numbers, but should be concerned only with longer-run movements

Quantity Theory of Money (Irving Fisher, 1911)

M = the money supply

P = price level

Y = aggregate output (income)

$P \times Y$ = aggregate nominal income (nominal GDP)

V = velocity of money (average number of times per year that a dollar is spent)

$$V = \frac{P \times Y}{M}$$

Equation of Exchange

$$M \times V = P \times Y$$

$$\%\Delta M + \%\Delta V = \%\Delta P + \%\Delta Y$$

Quantity Theory

$$M \times V = P \times Y$$

$$\%\Delta M + \%\Delta V = \%\Delta P + \%\Delta Y$$

- Velocity fairly constant in short run
- Aggregate output at full-employment level
- Changes in money supply affect only the price level
- Movement in the price level results solely from change in the quantity of money

Quantity Theory of Money Demand

Divide both sides by V

$$M = \frac{1}{V} \times PY$$

When the money market is in equilibrium

$$M = M^d$$

$$\text{Let } k = \frac{1}{V}$$

$$M^d = k \times PY$$

Because k is constant, the level of **transactions generated by a** fixed level of PY determines the quantity of M^d

The demand for money is not affected by interest rates

Keynes's Liquidity Preference Theory

- Transactions Motive
- Precautionary Motive
- Speculative Motive

Transaction Demand

- **money as a medium of exchange to carry out everyday transactions**
- **M_d is proportional to income**
- **Money demand models by Baumol-Tobin: even money balances held for transaction purposes are sensitive to the level of interest rates**

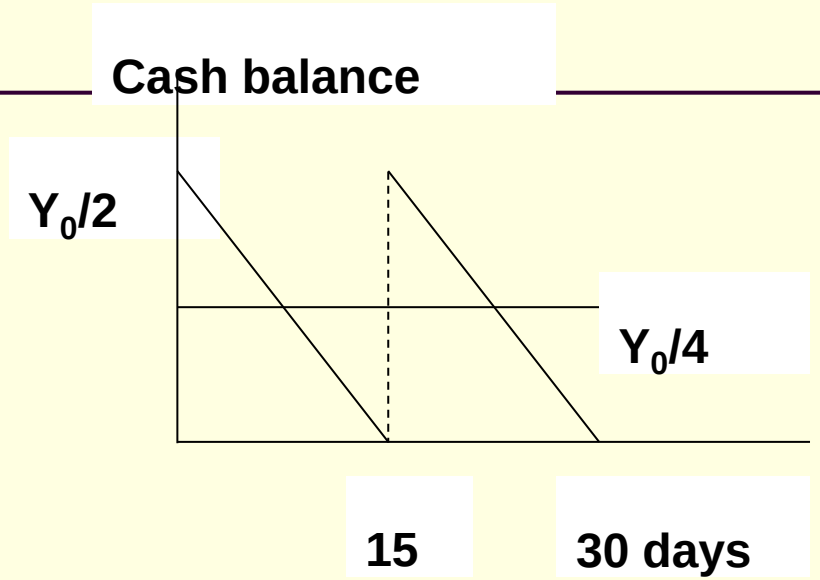
Transaction Demand: Baumol-Tobin

An individual

- **Receives income Y_0 at start of period**
- **Spends at a constant rate**
- **Two assets – money (cash) and bonds**
- **Cash carries no interest return**
- **Bond-money transaction cost is *B* per transaction**

To find the optimal number of money-bond transactions (*n*)

- **Brokerage or transactions costs : *Bn***
- **Interest for gone:** $\frac{iY_0}{2n}$
- **Choose n to minimize the sum of these costs** $\underset{n}{Min}: \frac{iY_0}{2n} + Bn$
- **F.O.C.:** $\frac{-iY_0}{2n^2} + B = 0 \qquad n = ?$



***n* = 2: buying $Y_0/2$ worth of bond at the beginning and selling $Y_0/2$ worth of bond on 15th day**

- There is an opportunity cost and benefit to holding money
- The transaction component of the demand for money is negatively related to the level of interest rates

Precautionary Demand

- Cushion against an unexpected need/ transactions
- Similar to transactions demand
- As interest rates rise, the opportunity cost of holding precautionary balances rises
- The precautionary demand for money is negatively related to interest rates

Speculative Demand

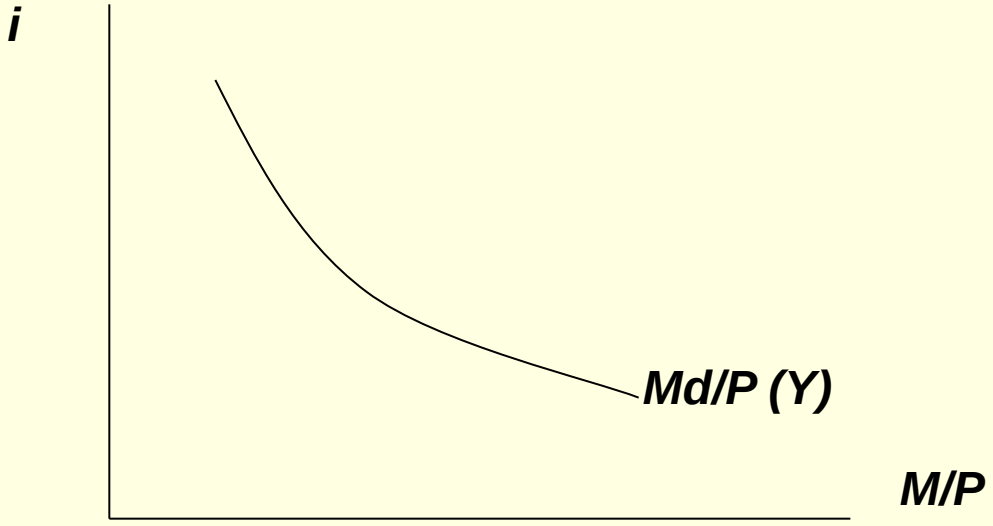
- Wealth: bonds (interest payment vs capital gains) and money (zero expected return)
- Interest rate gravitates to some normal value. If interest rate on bond is below this value, interest rate is expected to rise in the future and capital loss from a fall in bond price is expected. M_d will be high.

The Three Motives

$\frac{M^d}{P} = f(i, Y)$ where the demand for real money balances is

negatively related to the interest rate i,

and positively related to real income Y



Friedman's Modern Quantity Theory of Money

$$\frac{M^d}{P} = f(Y_p, r_b - r_m, r_e - r_m, \pi^e - r_m)$$

$\frac{M^d}{P}$ =demand for real money balances

Y_p = **measure of wealth (permanent income)**

r_m = expected return on money

r_b = expected return on bonds

r_e = expected return on equity

π^e = expected inflation rate

Variables in the Money Demand Function

- Permanent income (average long-run income) is stable, the demand for money will not fluctuate much with business cycle movements
- Wealth can be held in bonds, equity and goods; incentives for holding these are represented by the expected return on each of these assets relative to the expected return on money
- The expected return on money is influenced by:
  - The services proved by banks on deposits
  - The interest payment on money balances

Differences between Keynes's and Friedman's Model

- Friedman
  - Includes alternative assets to money
  - Viewed money and goods as substitutes
  - The expected return on money is not constant; however, $r_b - r_m$ does stay constant as interest rates rise
  - The demand for money is stable $\Rightarrow$ velocity is predictable

Empirical Evidence

- Interest rates and money demand
  - Consistent evidence of the interest sensitivity of the demand for money
  - Little evidence of liquidity trap
- Stability of money demand
  - Prior to 1970, evidence strongly supported stability of the money demand function
  - Since 1973, instability of the money demand function has caused velocity to be harder to predict
- Implications for how monetary policy should be conducted