Demand for Money

Economics 301: Money and Banking

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1.1 Goals

Goals and Learning Outcomes

- Goals:

    - Understand in more detail what can influence the demand for money.

    - Learn criticisms of various theories of money demand.

    - Learn monetary policy implications of for various theories of money demand.

- Learning Outcomes:

    - LO2: Understand the role money plays in the interaction with markets for other assets.

    - LO3: Predict changes in interest rates using fundamental economic theories including present value calculations, behavior towards risk, and supply and demand models of money and bond markets.

1.2 Reading

Reading

- Read Mishkin, Chapter 19.

2 Quantity Theory

2.1 Velocity of Money

Velocity of Money

- **Velocity of money:** the average number of times a dollar is re-spent in a given year to purchase the total amount of goods and services produced in the economy.

- Equation of exchange: total nominal quantity of money exchanged in the economy should equal the nominal value of aggregate production.

$$MV = PY$$

  - M: Total money supply.
  - V: Velocity of money.
  - P: Price level.
  - Y: Real GDP.

Quantity Theory of Money

- Quantity Theory of Money: classical theory of the relationship between money, prices, and output.

- Assumes velocity of money is constant: determined by institutions and technology that govern how transactions are conducted.

- Assumes wages and prices are perfectly flexible: real GDP is determined by a country's production possibilities.

- If V is fixed, Y is fixed, what must happen if money supply doubles?

- Quantity theory of money: increases in money supply lead *only* to an equal percentage increases in prices.

2.2 Money Demand

Quantity Theory of Money Demand

- Rearrange equation of exchange:

$$\frac{M_d}{P} = \frac{1}{V}Y$$

- Money demand depends on:

  - Y: real GDP and therefore income.
  - Financial technology.

- What will be the shape of the real money demand function?

2.3   Criticisms of Quantity Theory

Quantity Theory and Timing

- Is this a long-run theory or a short-run theory?

- If V is determined by technology, financial institutions, laws, etc - these are likely fixed in the *short run*, but not long run.

- Y is only determined by production possibilities (technology) is prices, wages, are perfectly flexible - this is likely only true in the *long run*, but not the short run.

Historical Look at Velocity
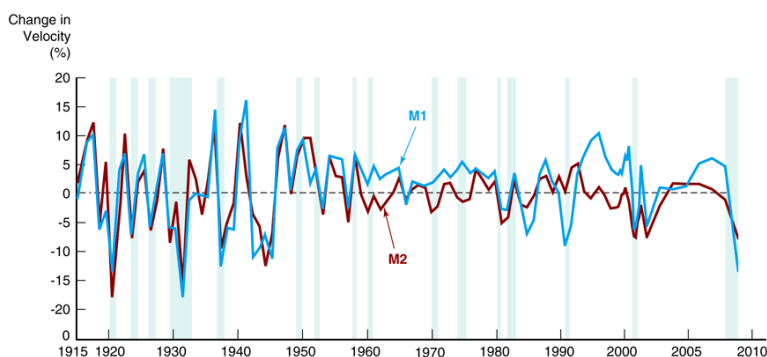
- Velocity of money is *not constant* in short run nor long run.

- Velocity of money tends to fall during recessions.

Quantity Theory and Velocity

- Demand side determinants of velocity.

  - Expected inflation: if people expect money to lose value, they will try to convert money quickly to either goods or interest bearing assets.

  - Interest rate: this is the opportunity cost of holding money. Larger interest rates will cause people to want to convert money more quickly.

- What will be the shape of the real money demand curve?

- What can shift the money demand curve?

3 Keynes Liquidity Preference

Keynes Liquidity Preference

- Money demand depends on three motives.

- **Transactions motive:** people hold money in anticipation of making transactions. Money demand depends positively on income.

- **Precautionary motive:** people hold money in expectation of needing or wanting to make large transactions in the near future. Again, this causes money demand to depend on income.

- **Speculative motive:** people hold money as an alternative asset to bonds. If people expect to earn a lower return holding money, money demand will increase.

    - Money demand depends _____ on interest rates.
    - Money demand depends _____ on expected future interest rates.

3.1 Transactions Motive

Transactions Motive

- William Baumol (1952) and James Tobin (1956).

- Suppose an economic agent earns (and spends) $120,000 / year, after taxes, and is paid monthly.

- Figure shows the quantity of money held throughout the month.
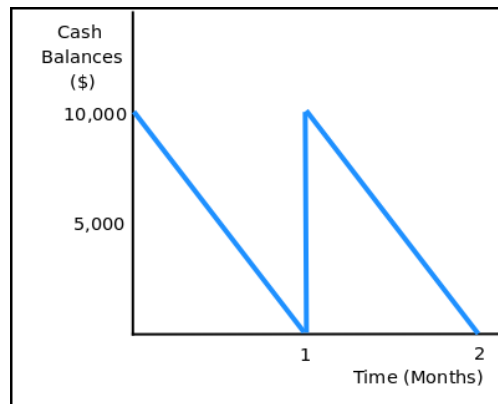
Baumol-Tobin Model

- Suppose agent has an option of investing half of his income in bonds for half the month.

- Figure shows the quantity of money held throughout the month.

- Suppose annual interest rate is 5%. Approximately how much can this agent earn in interest?
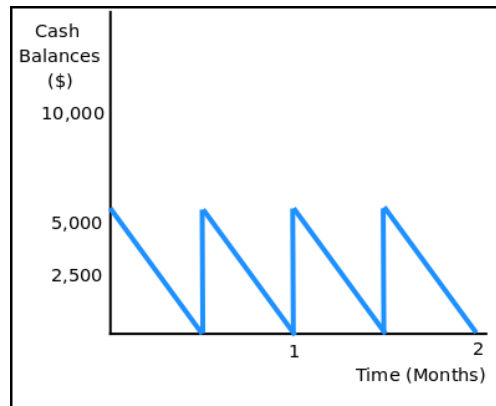
Baumol-Tobin Model

- Suppose agent instead keeps his money in bonds and makes two withdrawals per month.

- Figure shows the quantity of money held throughout the month.

- Suppose annual interest rate is 5%. Approximately how much can this agent earn in interest?
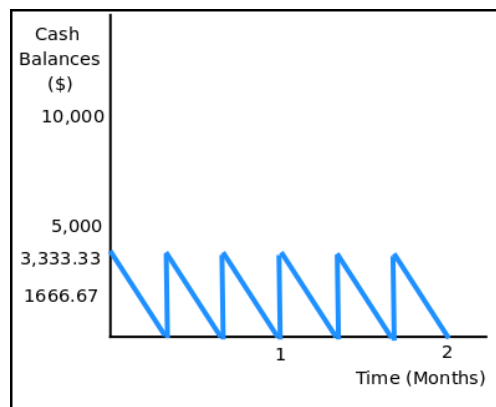
Baumol-Tobin Model

- Positive transaction costs prevent the agent from instantaneously making a withdrawal from bond fund for every purchase.

- Transaction costs can be explicit or implicit.

- Determinants of transactions money demand:

    - Interest rate.
    - Financial transaction cost.

3.2 Precautionary Motive

Precautionary Demand

- Baumol-Tobin model can be extended to account for precautionary demand.

- Agent never lets money balances go to zero.

- Minimum monetary balances depend on expectations and probability of future expenditures.

- Determinants of precautionary demand for money.

    - People with larger incomes tend to make larger unexpected expenditures.
    - Uncertainty regarding difference between future expenditures and future income streams.
    - Interest rate.
    - Transaction cost.

3.3 Speculative Motive

Speculative Demand

- Keynes theory:

    - People will hold all assets in money if they expect a negative return on bonds (due to large capital losses).
    - People will hold all assets in bonds if they expect a positive return on bonds.

- Tobin developed an alternative model (portfolio balance model) with risk-averse agents.

- Agents hold a portfolio of money and bonds, even when expectations of return on bonds is positive.

- Speculative demand for money depends on:

  - Expected capital gain (expected future interest rates).
  - Degree of uncertainty regarding capital gains on bonds.
  - Interest rate.
  - Income.

3.4 Keynesian Determinants of Money Demand

Keynesian Determinants of Money Demand

1. Interest rate (all motives)

2. Income (all motives)

3. Financial transaction costs (transaction and precautionary motives)

4. Uncertainty regarding future income (precautionary motive)

5. Uncertainty regarding future expenditures (precautionary motive)

6. Expected future interest rates (speculative motive)

7. Degree of uncertainty regarding future interest rates (precautionary motive)

4 Modern Quantity Theory of Money

4.1 Determinants of Money Demand

Modern Quantity Theory

- Friedman (1956) drew from various "Keynesian" theories to develop a new quantity theory of money demand.

- Real money demand depends on:

  - *Permanent* income: expected average of future lifetime income (expected net present value of all future income streams).
  - *Difference between* expected return on bonds and expected return on money.
  - *Difference between* expected return on equities and expected return on money.
  - *Difference between* expected return on money and expected inflation rate.

4.2 Permanent Income

Permanent Income

- Recall assumption about diminishing marginal utility.

- Consumption smoothing: despite income fluctuating over a lifetime, consumption should remain constant.

  - Suppose you have low income while in your 20s and high income in your 30s.
  - If you have higher consumption in your 30s, are you maximizing your utility?
  - Same applies during recessions/expansions.

- As consumption should remain smooth, transaction and precautionary demand should remain smooth.

- Money demand depends only on expected permanent income.

4.3 Expected Returns

Expected Returns

- The expected return on holding money can include explicit and implicit returns.

- Competitiveness among banks will cause increases in return on money when interest rates rise.

- Difference between expected return on bonds and money should not change much with interest rates.

- Friedman reasoned therefore, that money demand does not depend on interest rates.

4.4 Implications

Implications of Modern Quantity Theory

- Friedman reasoned the primary determinant of money demand is *permanent income*.
$$\frac{M_d}{P} = f(Y_p)$$

- An increase in nominal money supply will not impact permanent income. Increases in money supply lead to proportional increases in price level.

- Theory does not depend on constant velocity assumption:
$$MV = PY \qquad V = \frac{Y}{f(Y_p)}$$

- Predicts velocity decreases during recessions, increases during expansions.

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5.1   Coming up...

Coming up...

- MyEconLab homework on money demand.

- Structure of the Federal Reserve System.

  - Mishkin, Chapter 12.
  - Belongia, Michael. 2009. "Reforming the Fed: what would real change look like?"