Demand for Money

Economics 301: Money and Banking

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.

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Reading

- Read Mishkin, Chapter 19.

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.

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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.

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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?

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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.

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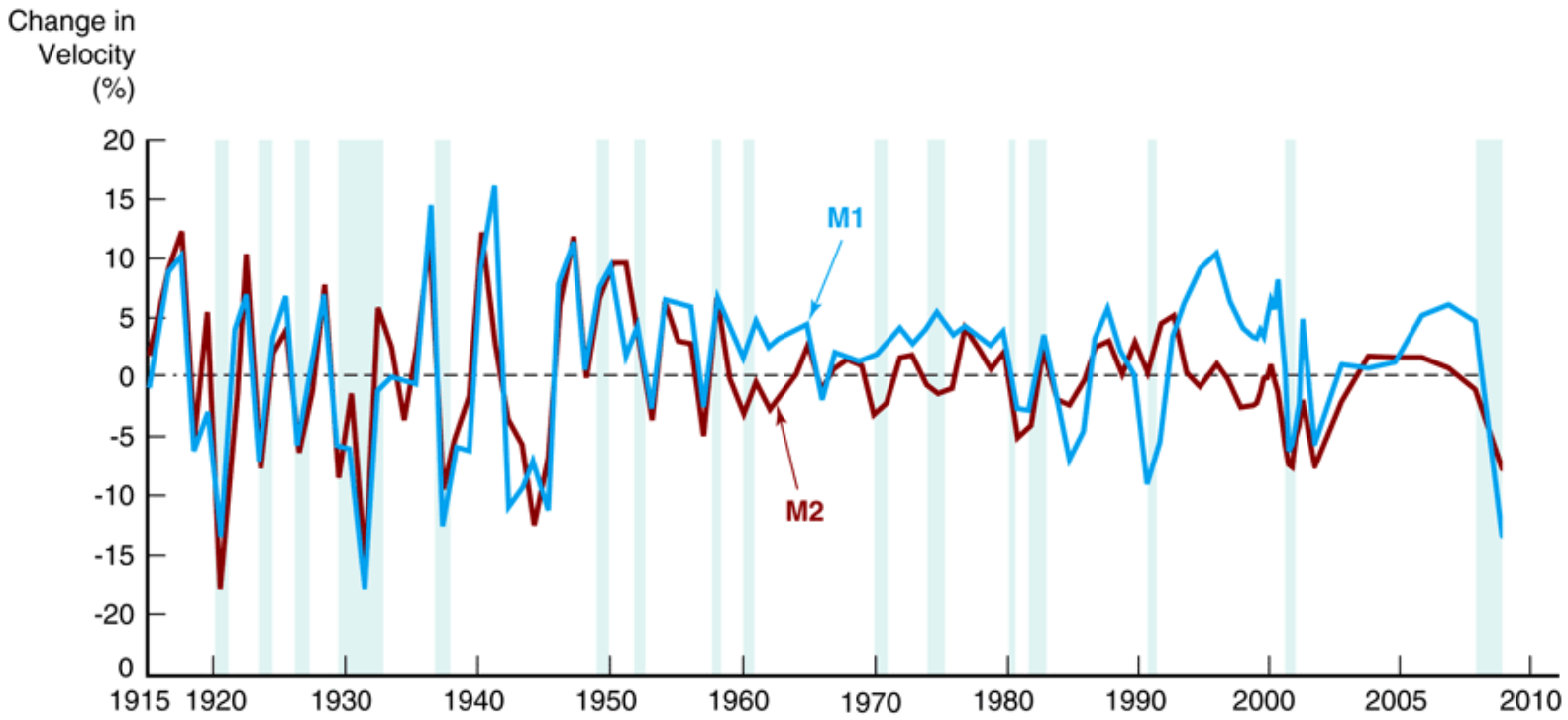
Historical Look at Velocity



- 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?

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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.
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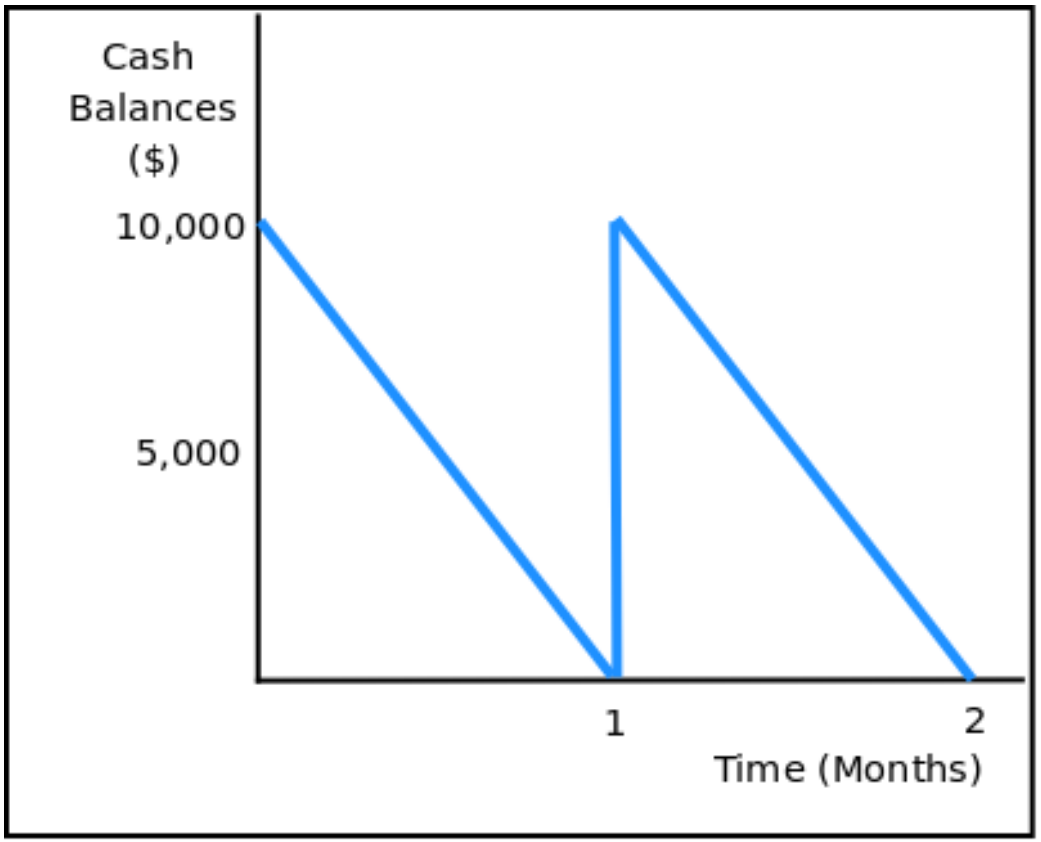
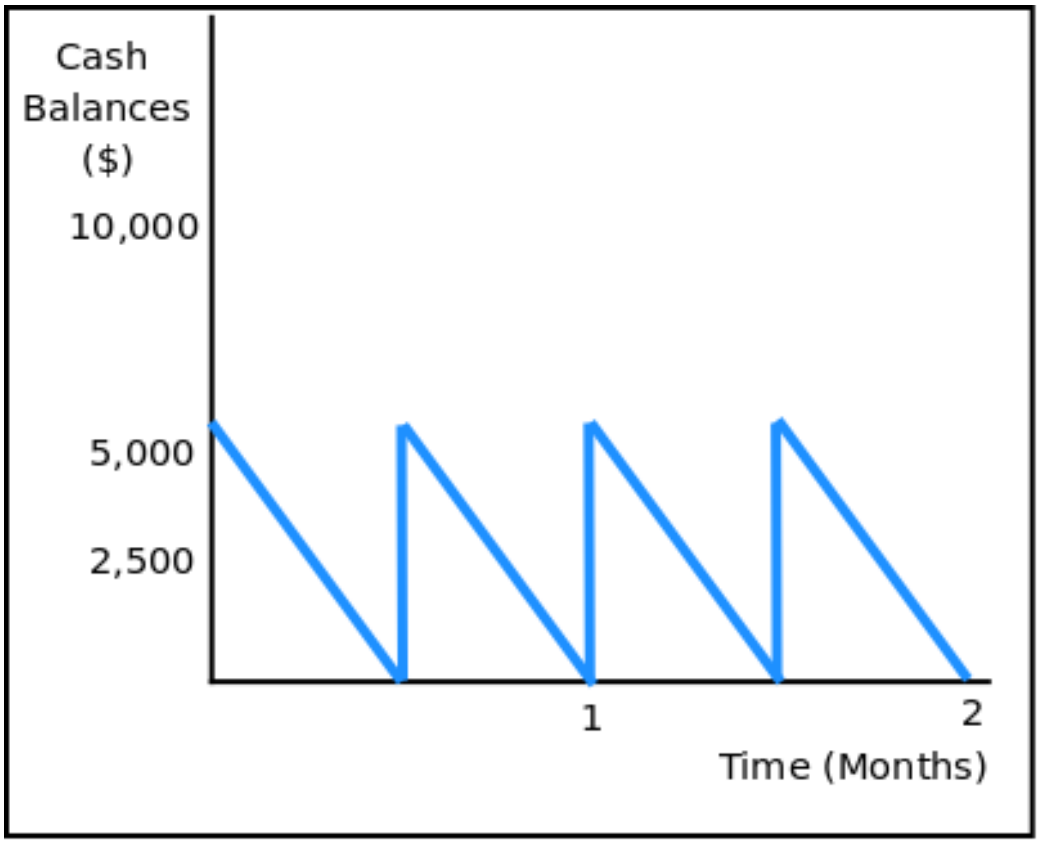
Transactions Motive

- 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.



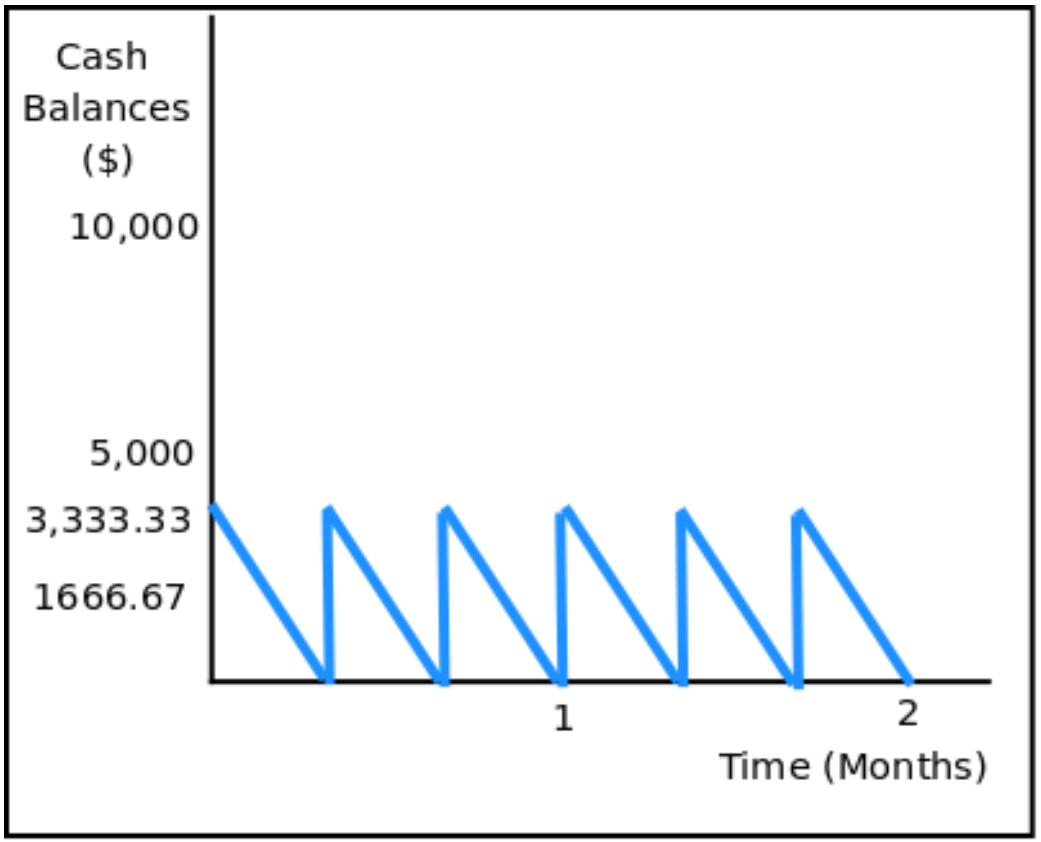
Baumol-Tobin Model

- 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.

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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.
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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.
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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)
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Modern Quantity Theory

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- Real money demand depends on:
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- 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?
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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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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?"