Financial Institutions and System

Week 12: Quantity Theory, Inflation, and the Demand for Money.

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May 23, 2025

Agenda

1. Quantity Theory, Inflation, and the Demand for Money
2. Class Activity

1. Quantity Theory, Inflation, and the Demand for Money

Introduction

- Understanding the link between money supply, inflation, and money demand
- Exploring classical and Keynesian views on money demand
- Examining the impact of interest rates and budget deficits
- Discussing empirical evidence and case studies

Classical Quantity Theory of Money

- The Quantity Theory of Money connects the money supply (M), velocity (V), price level (P), and output (Y).

Equation of Exchange

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

, where money supply times velocity equals nominal GDP.

- The equation of exchange links money supply, price level, and output.
- It helps analyze monetary policy's impact on inflation and economic activity.

Example:

- Nominal GDP = $15 trillion
- Money Supply = $3 trillion
- Velocity (V) = PY/M = 15 / 3 = 5

Determinants of Money Velocity

- Velocity measures the number of times that one unit of currency is used to purchase goods and services within a given time period. Typically stable in the short run.
- Velocity of money is influenced by:
  - Payment technologies (e.g., credit cards, digital payments)
  - Financial innovations (e.g., money market funds)
  - Economic conditions (e.g., inflation, interest rates)
- The determinants of velocity are important for understanding how changes in the money supply can impact the overall economy.
- Changes in velocity can affect the relationship between money supply and price level.
  - For example, if velocity increases due to technological advancements, the same money supply can lead to higher output and lower prices.
  - Conversely, if velocity decreases due to economic uncertainty, the same money supply may lead to higher prices and lower output.

Money Demand

- When Velocity is constant:

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

- Dividing by V:

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

- Money demand is proportional to nominal income (PY).
- Implications for monetary policy:
  - If the central bank increases the money supply, it can lead to higher prices or output.
  - The relationship between money supply and price level is crucial for understanding inflation.

The Classical Quantity Theory and Inflation

- Applying the percentage change formula:

$$\pi = \%\Delta M - \%\Delta Y$$

- If velocity is constant, a 10% increase in the money supply leads to a 10% increase in nominal GDP (PY). How this increase is divided between inflation $\pi = \%\Delta P$ and real output $\%\Delta Y$ depends on the state of the economy:
  - At full employment, the increase manifests entirely as inflation.
  - Below full employment, some of the increase contributes to economic growth $\%\Delta Y$.
- This relationship highlights the importance of controlling the money supply for price stability, a key responsibility of central banks.

Demand for Money

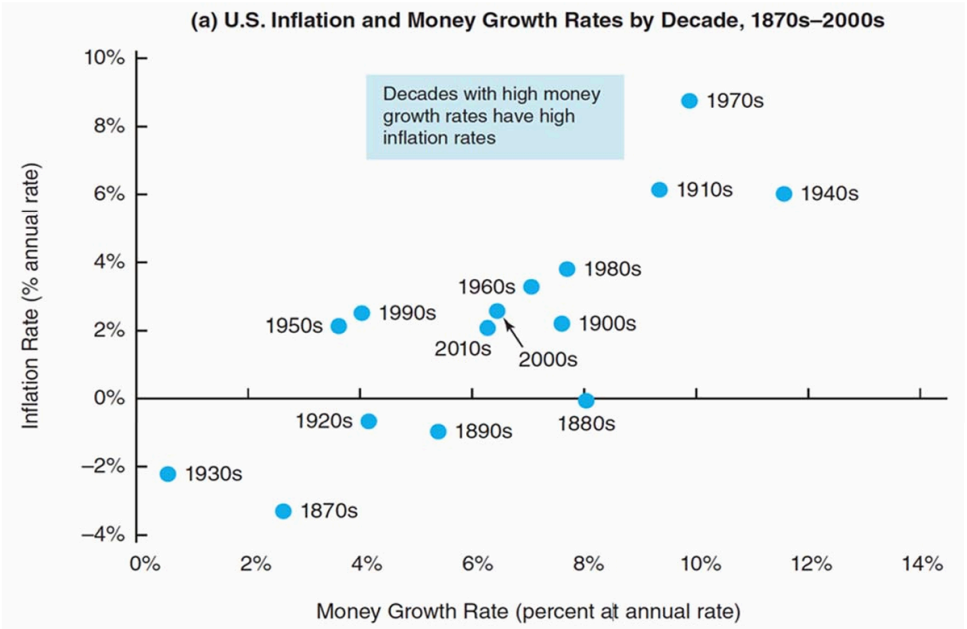
- The demand for money is the desire to hold cash or liquid assets for transactions, precautionary, and speculative purposes.
- The demand for money is influenced by several factors:
  - Interest rates
  - Income levels
  - Inflation expectations
  - Economic conditions
- The demand for money can be represented by the following equation:

$$M_d = f(1/V, Y, P)$$

- Where:
  - M_d = demand for money
  - V = velocity of money
  - Y = income level
  - P = price level

Testing the Classical Quantity Theory of Money

- In the long run, empirical evidence supports the classical quantity theory of money both in the U.S. and across countries.



Source: Mishkin, 13 ed.

Testing the Classical Quantity Theory of Money (cont.)

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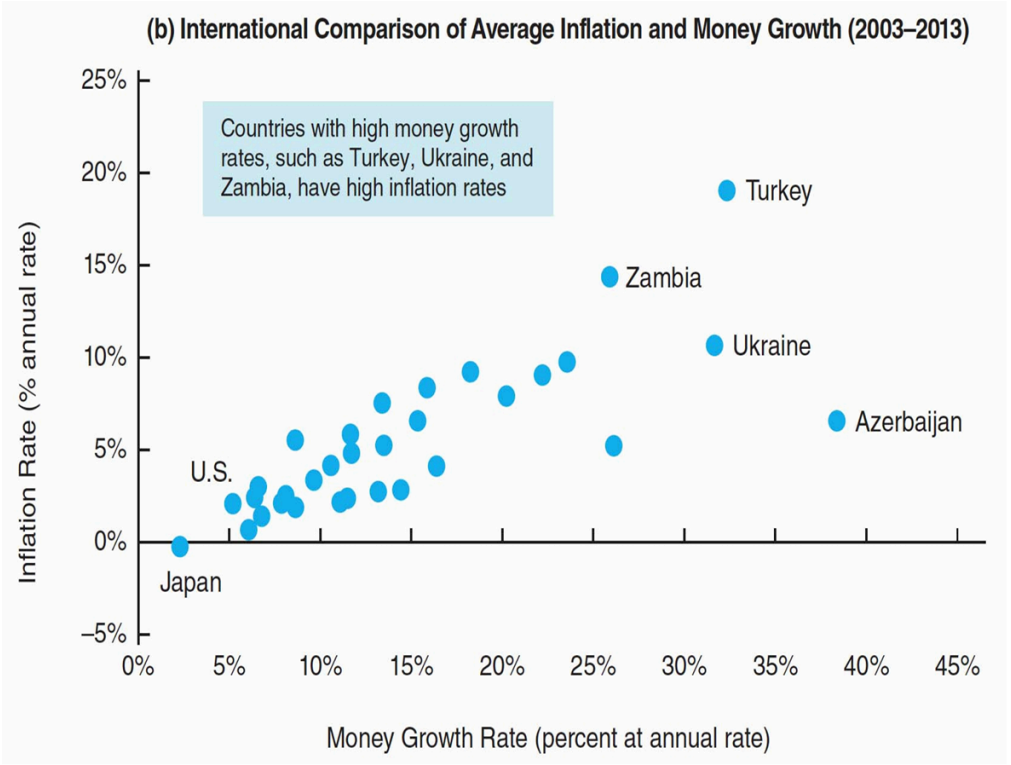
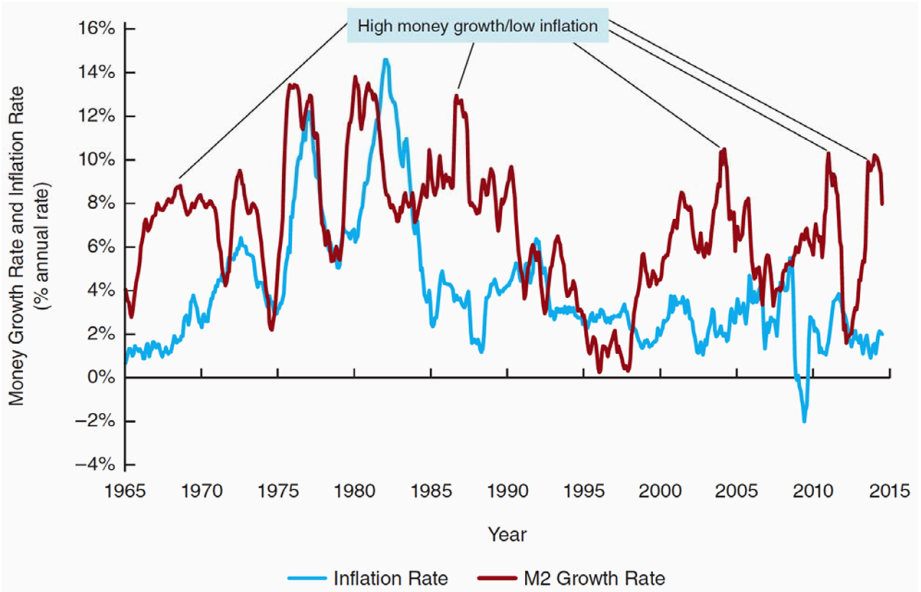


Source: Mishkin, 13 ed.

Testing the Classical Quantity Theory of Money (cont.)

- In the short run, empirical evidence does not support the classical quantity theory of money.



Source: Mishkin, 13 ed.

- The empirical evidence indicates the classical quantity theory of money is a good theory for inflation in the long run but not in the short run.

Keynesian Theories of Money Demand

- Three motives for holding money:
  - Transactions Motive
  - Precautionary Motive
  - Speculative Motive
- Money demand: $M_d = f(i, Y)$
- Real money demand function: $\frac{MD}{P} = L(Y, R)$
- Money demand is inversely related to interest rates and positively related to income.
- Liquidity preference theory highlights the role of interest rates in money demand.
- Higher interest rates reduce money demand due to the opportunity cost of holding money.

Portfolio Theories of Money Demand

- Factors influencing money demand:
  - Wealth
  - Risk
  - Liquidity of other assets
- Money demand is influenced by interest rates, income, wealth, risk, and asset liquidity.
- Portfolio theories highlight trade-offs between holding money and other assets.
- Empirical evidence shows sensitivity of money demand to interest rates and income.

Inflation and Quantity Theory

- Rewriting the quantity equation in percentage change form:

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

- If velocity is constant:

$$\%P = \%M - \%Y$$

- Implications for monetary policy and inflation targeting.
- If the money supply grows faster than output, it can lead to inflation.
- If the money supply grows slower than output, it can lead to deflation.
- The quantity theory of money is a classical economic theory that explains the relationship between the money supply and price levels in an economy.

Budget Deficits and Inflation

- Financing government deficits:
  - Taxation
  - Borrowing
  - Money Creation (Seigniorage)
- Government budget deficit: BD = G - T
- Financing deficit through bond issuance or increasing monetary base:

$BD = \Delta B + \Delta MB$, where:

- BD = budget deficit
- ΔB = change in bonds
- ΔMB = change in monetary base

- Persistent monetization of debt can lead to hyperinflation.

Budget Deficits and Inflation (cont.)

- Hyperinflation example: Zimbabwe (2000s).
- Hyperinflation occurs when there is excessive money supply growth without corresponding economic growth.
- It leads to a rapid increase in prices, eroding the purchasing power of money.
- Hyperinflation can result from various factors, including excessive government spending, loss of confidence in the currency, and external shocks.
- The consequences of hyperinflation include:
  - Decreased savings and investment
  - Increased uncertainty and volatility in the economy
  - Social and political instability

Case Study:

- Germany 1920s and Zimbabwe 2000s

Summary of Key Concepts

- Quantity Theory of Money: $MV = PY$
- Determinants of Money Velocity: Payment technologies, financial innovations, economic conditions
- Demand for Money: $M_d = f(1/V, Y, P)$
- Keynesian Theories: Transactions, precautionary, and speculative motives
- Fisher Equation: $M = \frac{P \times Y}{V}$
- Portfolio Theories: Wealth, risk, liquidity of other assets
- Inflation and Quantity Theory: $\%M + \%V = \%P + \%Y$
- Budget Deficits and Inflation: Financing through taxation, borrowing, or money creation

2. Class Activity

Any QUESTIONS?

Thank You!

Next Class

- (May 30)
  - ESG and Sustainable Finance: The Role of Financial Institutions in Promoting Sustainability
  - Reading will be assigned