Money and Banking

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Lecture 13 Money Demand

- Quantity Theory of Money
- Quantity Theory and Inflation
- Keynesian Theory of Money Demand
- Portfolio Theory of Money Demand

Quantity Theory of Money

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

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

Quantity Theory of Money, Cont'd

- 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, Cont'd

- **Demand for money**: To interpret Fisher's quantity theory in terms of the demand for money…

Divide both sides by *V*

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

When the money market is in equilibrium

$M = M^d$

Let

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

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

Quantity Theory and the Price Level

- Because the classical economists (including Fisher) thought that wages and prices were completely flexible, they believed that the level of aggregate output Y produced in the economy during normal times would remain at the full-employment level
  - Dividing both sides by $\bar{Y}$, we can then write the price level as follows:

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

Quantity Theory and the Price Level

- Percentage Change in ($x \times y$) = (Percentage Change in x) + (Percentage change in y)
- Using this mathematical fact, we can rewrite the equation of exchange as follows:

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

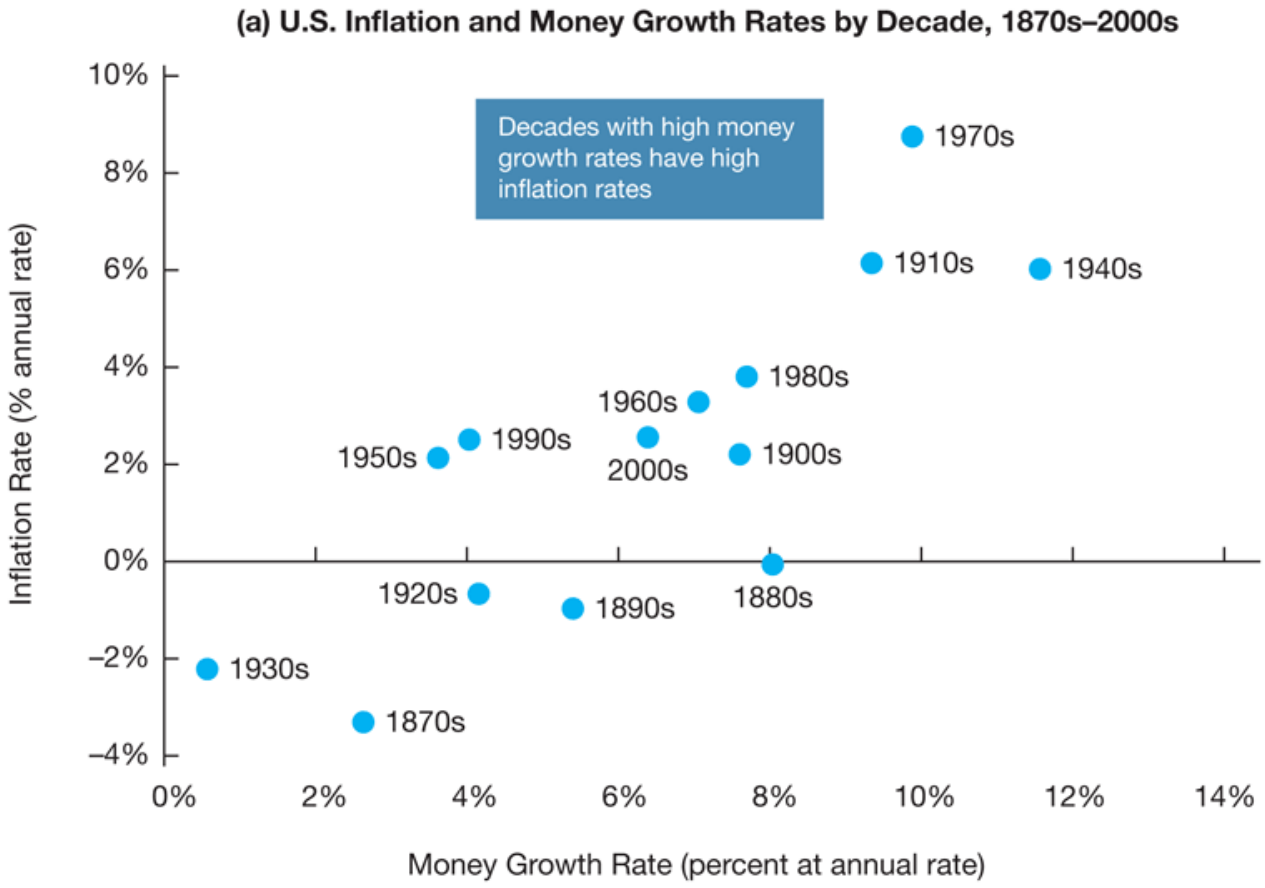
- Subtracting from both sides of the preceding equation, and recognizing that the inflation rate, is the growth rate of the price level,

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

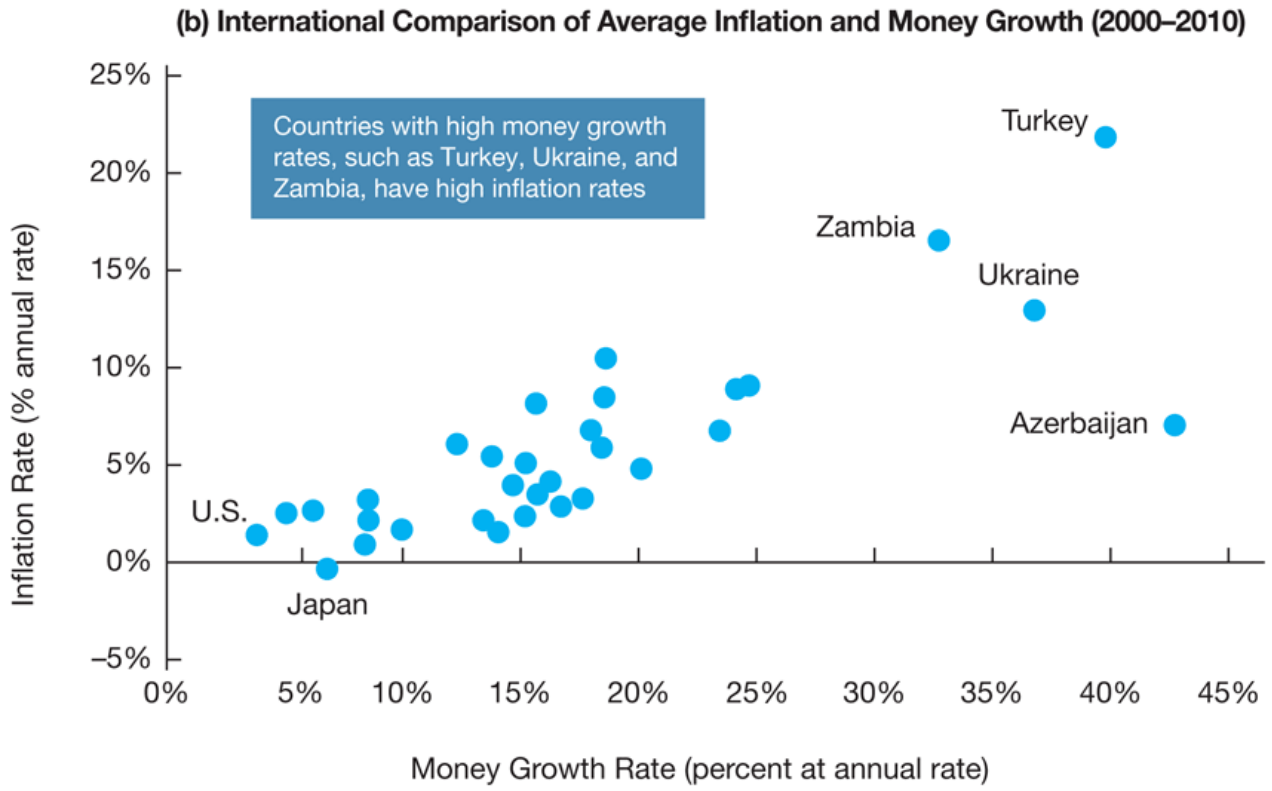
- Since we assume velocity is constant, its growth rate is zero, so the quantity theory of money is also a theory of inflation:

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

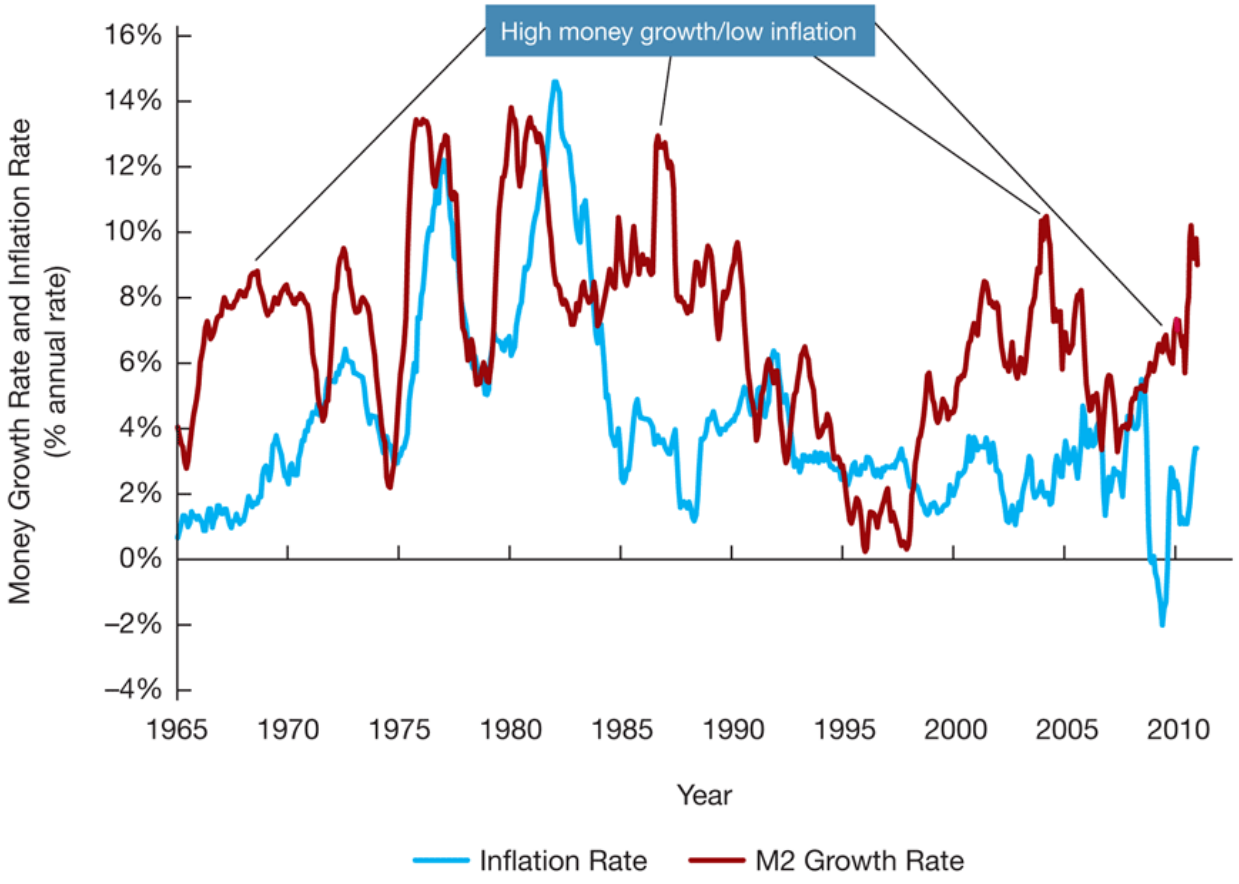
Money Growth and Inflation



Money Growth and Inflation



Money Growth and Inflation



Hyperinflation

- **Hyperinflations** are periods of extremely high inflation of more than 50% per month

- Many economies—both poor and developed—have experienced hyperinflation over the last century, but the United States has been spared such turmoil

- One of the most extreme examples of hyperinflation throughout world history occurred recently in Zimbabwe in the 2000s

Keynes's Liquidity Preference Theory

- Why do individuals hold money? Three Motives
  - Transactions motive
  - Precautionary motive
  - Speculative motive
- Distinguishes between real and nominal quantities of money

Keynes's Liquidity Preference Theory

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

negatively related to the interest rate i,

and positively related to real income Y

Rewriting

$$\frac{P}{M^d} = \frac{1}{f(i, Y)}$$

Multiply both sides by Y and replacing M^d with M

$$V = \frac{PY}{M} = \frac{Y}{f(i, Y)}$$

- Velocity is not constant:
  - The procyclical movement of interest rates should induce procyclical movements in velocity.
  - Velocity will change as expectations about future normal levels of interest rates change

Portfolio Theories of Money Demand

- Theory of Portfolio Choice and Keynesian Liquidity Preference
  - The theory of portfolio choice can justify the conclusion from the Keynesian liquidity preference function that the demand for real money balances is positively related to income and negatively related to the nominal interest rate
- Other Factors That Affect the Demand for Money:
  - Wealth
  - Risk
  - Liquidity of other assets

Empirical Evidence on the Demand for Money

Factors That Determine the Demand for Money

Variable	Change in Variable	Money Demand Response	Reason
Interest rates	↑	↓	Opportunity cost of money rises
Income	↑	↑	Higher transactions
Payment technology	↑	↓	Less need for money in transactions
Wealth	↑	↑	More resources to put into money
Risk of other assets	↑	↑	Money relatively less risky and so more desirable
Inflation risk	↑	↓	Money relatively more risky and so less desirable
Liquidity of other assets	↑	↓	Money relatively less liquid and so less desirable