E216 : Economics of MONEY AND BANKING

Second grade

First term

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Chapter 22

Quantity Theory, Inflation and the Demand for Money

Learning outcome

- The classical theories :

  1. Irving Fisher (Equation of Exchange)

  2. Alfred Marshall, and A. C. Pigou (cash balances)

- Keynesian theory of the demand for money.

- Milton Friedman's modern quantity theory.

1. Monetary Theory

Monetary theory: the effect of money on the economy (i.e., the role of the money supply in determining the price level and total production of goods and services (aggregate output) in the economy

- The supply of money is an essential element in understanding how monetary policy affects the economy.

- Monetary theory suggests the factors that influence the quantity of money in the economy. As expected, another essential part of monetary theory is the demand for money

2. Quantity Theory of money

Equation of exchange:

Irving Fisher (1911):

it examines the link between the total quantity of money M (the money supply) and the total amount of spending on final goods and services produced in the economy

Equation of Exchange

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

M = the money supply
P = price level
Y = aggregate output (income)
PY = aggregate nominal income (nominal GDP)
V = velocity of money
$$V = \frac{P \times Y}{M}$$

Velocity of money: is the average number of times per year that a dollar is spent in buying the total amount of goods and services produced in the economy.

2. Quantity Theory of money

The equation of exchange states that the quantity of money multiplied by the number of times that this money is spent in a given year must be equal to nominal income.

Assumptions:

1. Velocity fairly constant in short run and in the long-run it depends on the technology development and the habits of payments in the society.

    This assumption turns the identity to a theory.

2. Aggregate output at full employment level

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

Therefore, changes in money supply affect the price level only or movements in the price level results from changes in the quantity of money

2. Quantity Theory of money

Example 1:

If the money supply is $500 and nominal income is $3,000, the velocity of money is

- A) 1/60.
- B) 1/6.
- **C) 6.**
- D) 60.

Example 2:

If nominal GDP is $10 trillion, and velocity is 10, the money supply is

A) $1 trillion.

B) $5 trillion.

C) $10 trillion.

D) $100 trillion

$$V = \frac{P \times Y}{M} = \frac{3000}{500} = 6$$

$$M = \frac{P \times Y}{V} = \frac{10}{10} = 1$$

2. Quantity Theory of money

- **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
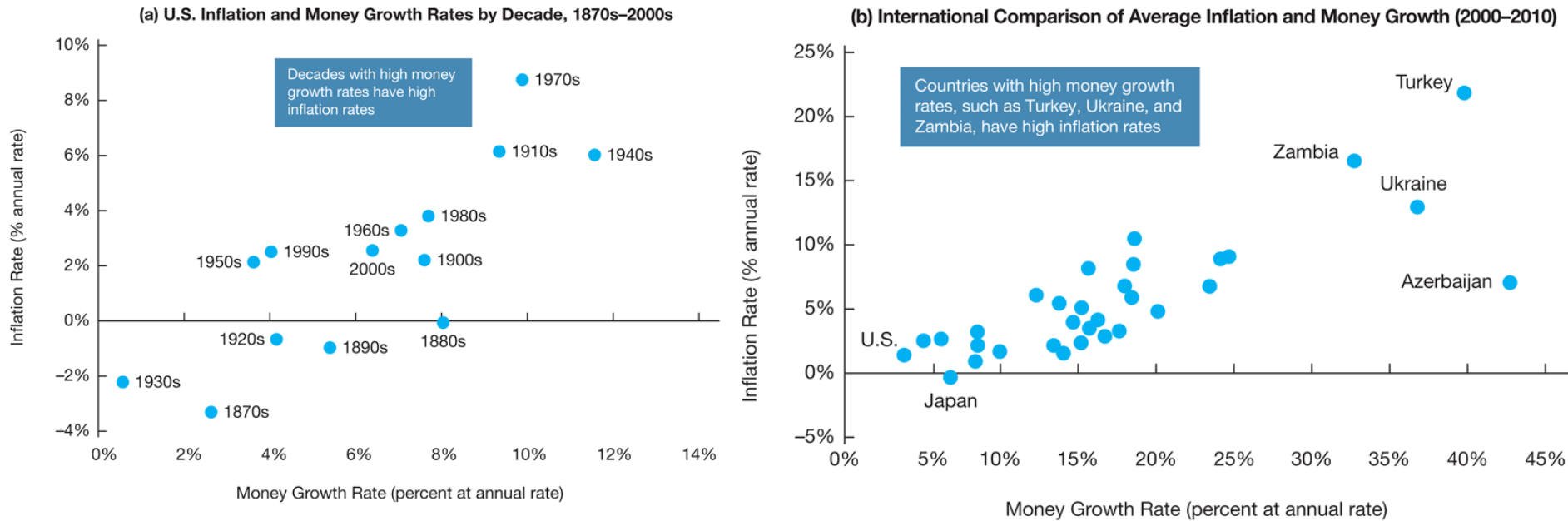
2. Quantity Theory of money

From the equation of exchange to the quantity theory of money

- Fisher's view that velocity is fairly constant in the short run, so that , transforms the equation of exchange into the quantity theory of money, which states that nominal income (spending) is determined solely by movements in the quantity of money M

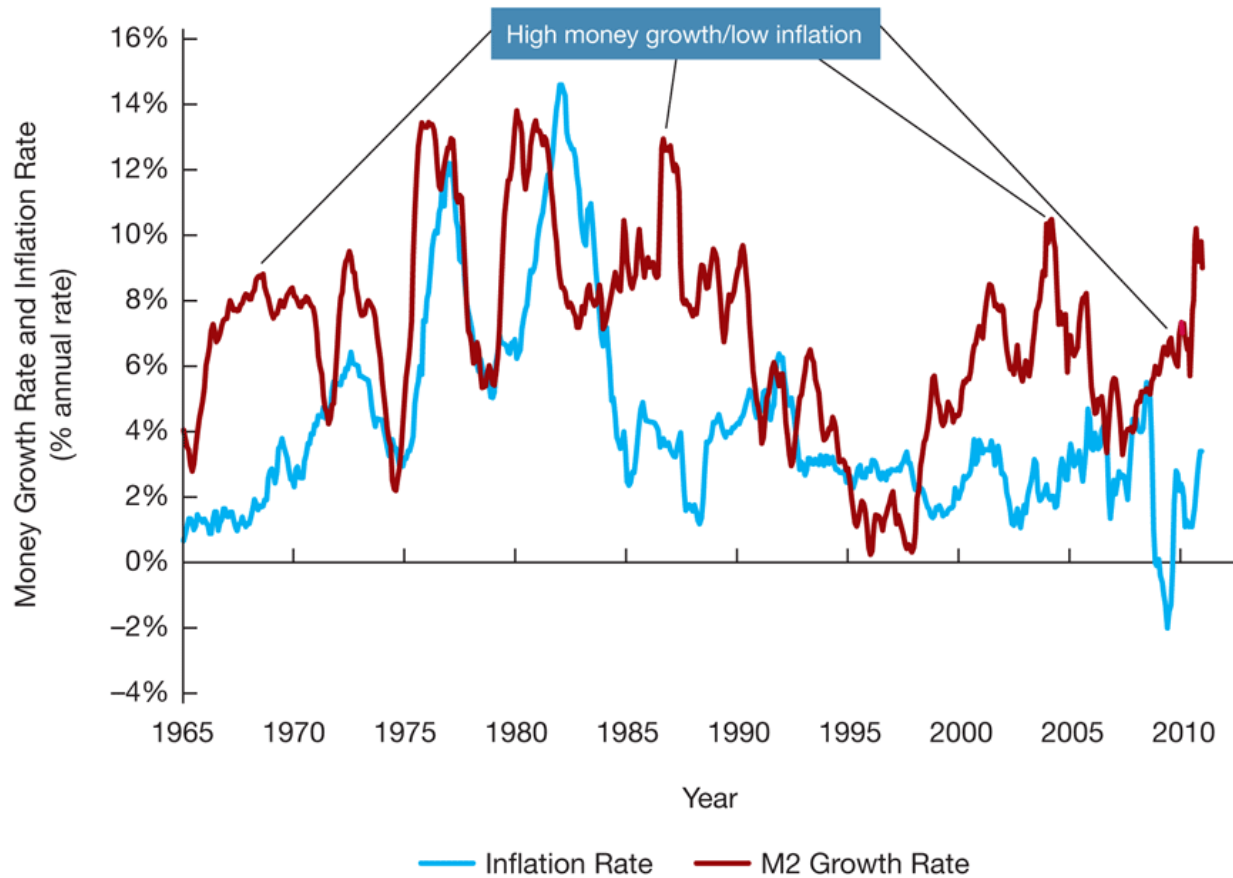$$P \times Y = M \times \bar{V}$$

- Fisher's quantity theory of money suggests that the demand for money is purely a function of income, and interest rates have no effect on the demand for money

Figure 1 Relationship Between Inflation and Money Growth

(a) U.S. Inflation and Money Growth Rates by Decade, 1870s–2000s

Decades with high money growth rates have high inflation rates

(b) International Comparison of Average Inflation and Money Growth (2000–2010)

Countries with high money growth rates, such as Turkey, Ukraine, and Zambia, have high inflation rates

Figure 2 Annual U.S. Inflation and Money Growth Rates, 1965–2010

Keynes's Liquidity Preference Theory (1936):

The General Theory of Employment, Interest, and Money

- Why do individuals hold money? Three Motives

1. **Transactions motive**

- individuals hold money because it is a medium of exchange that can be used to carry out everyday transactions. This component of the demand for money is determined primarily by the level of people's transactions. These transactions are proportional to income. So, this component is proportional to income.

2. **Precautionary motive**

- people hold money to deal with an unexpected need. For example with an unexpected bill, say for car repair or hospitalization. Benefit from some opportunities like buying goods on sale. if you are not holding precautionary money balances, you cannot take advantage of the sale.

- It is determined primarily by the level of transactions that they expect to make in the future and that these transactions are proportional to income. So, this component is also proportional to income.

3. Keynesian Theories of Money Demand

3. **Speculative motive** (Liquidity Preference)

people choose to hold money as a store of wealth

- However wealth is tied closely to income, the speculative component of money demand would not be related only to income. The decisions regarding how much money to hold as a store of wealth depends also on interest rates.

- Keynes divided the assets that can be used to store wealth into two categories: money and bonds.

3. Keynesian Theories of Money Demand

- **Why would individuals decide to hold their wealth in the form of money rather than bonds?**

- People want to hold money if its expected return was greater than the expected return from holding bonds.

- Keynes assumed that the expected return on money was zero because in his time, unlike today, most checkable deposits did not earn interest.

- For bonds, there are two components of the expected return: the interest payment and the expected rate of capital gains.

3. Keynesian Theories of Money Demand

- Keynes assumed that individuals believe that interest rates settle to some normal value, **natural interest rate.**

- If interest rates are below this normal value, individuals expect the interest rate on bonds to rise in the future.

- As a result, individuals will be more likely to hold their wealth as money rather than bonds, and the demand for money will be high.

- **Negative relation between interest rate and the demand for money**

$$M_d = f(Y, i)$$

- At a very low interest rate, all people expect it to rise in the future, so they hold money instead of bonds which is known as **Liquidity trap**.

3. Modern Quantity theory of Money

(Milton Friedman)

- Demand for money is a behavioural function linked to rational behaviour of according to the consumer behaviour theory.

$$M = f(Y, r_b, r_e, \overline{\pi}, w, i, P, T)$$

- M: Nominal demand for money
- Y: permanent nominal income
- r_b: expected return on bonds
- i: interest rate
- $\overline{\pi}$: expected inflation rate
- P: general price level
- W: ratio of human wealth

3. Modern Quantity theory of Money

- **Permeant income** represents wealth and **is defined as**: the weighted average of expected future income.

- It is the main explanatory variable in the demand for money function while interest rate plays a secondary role in the function

- Current income is the income in current period