ECO5002 Introduction to Economics

Lecture 8: Money and Prices in the Long Run

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I. The Monetary System

The Meaning of Money

- **Money** is the set of assets in an economy that people regularly use to buy goods and services from other people.

The Functions of Money

1. **Medium of exchange**: an item that buyers give to sellers when they want to purchase goods and services.
2. **Unit of account**: the yardstick people use to post prices and record debts.
3. **Store of value**: an item that people can use to transfer purchasing power from the present to the future.

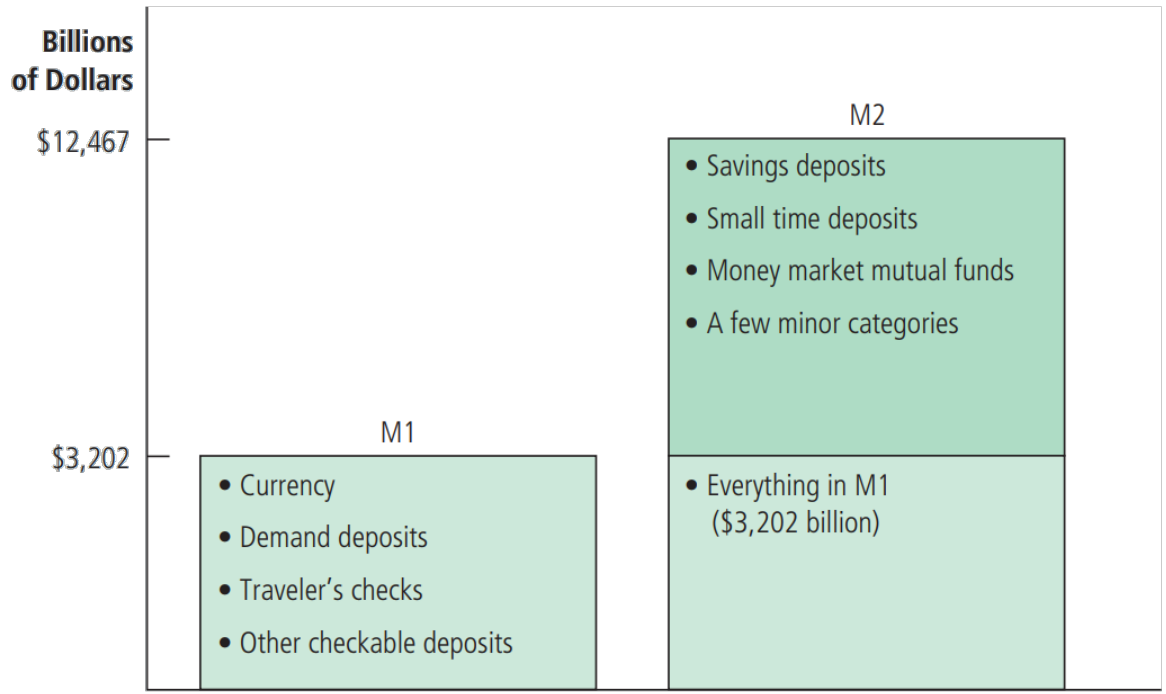
I. The Monetary System

The Kinds of Money

1. **Commodity money**: money that takes the form of a commodity with intrinsic value.
   - The term intrinsic value means that the item would have value even if it were not used as money.
2. **Fiat money**: money without intrinsic value that is used as money by government decree.

I. The Monetary System

- Two measures of the money stock for the U.S. economy: M1 and M2. In M1, we mainly have two items:
  1. **Currency**: the paper bills and coins in the hands of the public.
  2. **Demand deposits**: balances in bank accounts that depositors can access on demand by writing a check.



II. The Federal Reserve System

- Federal Reserve is the central bank of the United State. In China, we have the **People's Bank of China**.
  - an institution designed to oversee the banking system and regulate the quantity of money in the economy.
- The Fed has two related jobs:
  1. regulate banks and ensure the health of the banking system.
  2. control the quantity of money that is made available in the economy, called the money supply.
- Decisions by policymakers concerning the money supply constitute **monetary policy**.
- Banks can also affect money supply. (See the example below.)

II. The Federal Reserve System

Example:

- In a simple world, currency is the only form of money. To be concrete, let's suppose that the total quantity of currency is \$100. The supply of money is, therefore, \$100.
- Now suppose that someone opens a bank (call it Bank I). The purpose of the bank is to give depositors a safe place to keep their money.
  - Deposits that banks've received but haven't loaned out are called **reserves**.
- If this bank does not make loans, then

Assets		Liabilities	
Reserves	\$100.00	Deposits	\$100.00

- If banks hold all deposits in reserve, banks do not influence the supply of money.

II. The Federal Reserve System

Example (Continued):

- Let's suppose that this bank has a reserve ratio of 1/10, or 10 percent. This means that it keeps 10 percent of its deposits in reserve and loans out the rest.

Assets		Liabilities	
Reserves	$10.00	Deposits	$100.00
Loans	90.00		

- The depositors still have demand deposits totaling $100, but now the borrowers hold $90 in currency.
- The money supply (which equals currency plus demand deposits) equals $190.
- When banks hold only a fraction of deposits in reserve, the banking system creates money.

II. The Federal Reserve System

Example (Continued):

- The creation of money does not stop with Bank I. Suppose the borrower from Bank I uses the \$90 to buy something from someone who then deposits the currency in Bank II.

Assets		Liabilities	
Reserves	\$ 9.00	Deposits	\$90.00
Loans	81.00		

- After the deposit, this bank has liabilities of \$90. If Bank II also has a reserve ratio of 10 percent, it keeps assets of \$9 in reserve and makes \$81 in loans. In this way, Bank II creates an additional \$81 of money.
- Total money supply is: $\$100 + \$90 + \$81 = \$271$.

II. The Federal Reserve System

Example (Continued):

- How much money is eventually created in this economy?

$$\$100 \times (1 + 0.9 + 0.9^2 + 0.9^3 + \cdots)$$

$$= \lim_{n \to \infty} \$100 \times \frac{1 - 0.9^{n+1}}{1 - 0.9} = \frac{\$100}{0.1} = \$1000$$

- "0.1" is called the reserve ratio.
- "10" is called the money multiplier.
- Money supply = money base $\times$ money multiplier.

II. The Federal Reserve System

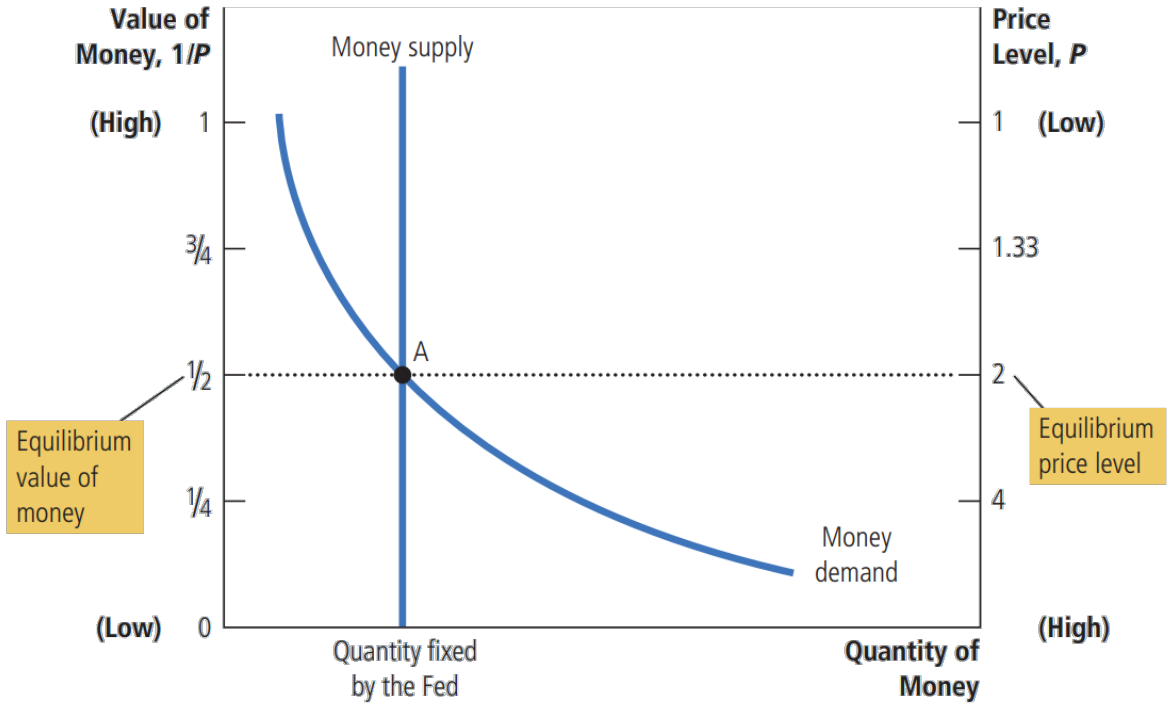
The Fed's Tools of Monetary Control

- **Open-Market Operations**: the purchase and sale of U.S. government bonds by the Fed.
  - the dollars the Fed pays for the bonds increase the number of dollars in the economy. some of these new dollars are held as currency, and some are deposited in banks.
  - each new dollar held as currency increases the money supply by exactly $1. each new dollar deposited in a bank increases the money supply by more than a dollar.
- **Fed Lending to Banks**: the Fed can also increase the quantity of reserves by lending reserves to banks.
  - the interest rate is called **discount rate**.
- **Reserve Requirements**: regulations on the minimum amount of reserves that banks must hold against deposits.
  - change the money multiplier.

III. Money Growth and Inflation

The Classical Theory of Inflation

- Inflation $\approx$ the value of money decreases.
- What determines the value of money? Supply v.s. Demand.



- The demand curve for money slopes downward because people want to hold a larger quantity of money when each dollar buys less.

III. Money Growth and Inflation

The Classical Dichotomy and Monetary Neutrality

- The separation of real and nominal variables is now called the **classical dichotomy**.
- How do monetary changes affect other real variables, such as production, employment, real wages, and real interest rates?
  - **monetary neutrality**: changes in the supply of money, affect nominal variables but not real ones.
  - most economists today believe that over short periods of time - within the span of a year or two - monetary changes affect real variables.

Velocity and the Quantity Equation

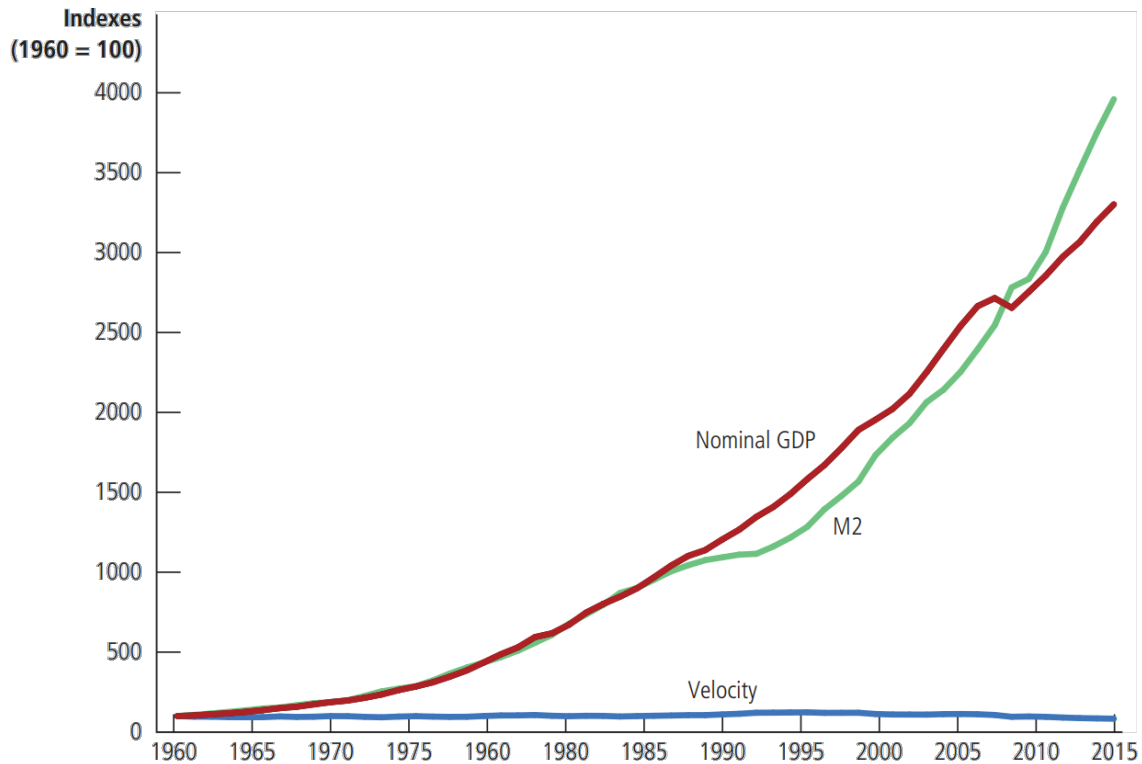
- How many times per year is the typical dollar bill used to pay for a newly produced good or service?
  - velocity of money: the rate at which money changes hands.
  - $V = (P \times Y)/M$.

III. Money Growth and Inflation

Velocity and the Quantity Equation (Continued)

- By rearrangement, we have

$$MV = PY = \text{Nominal GDP}$$

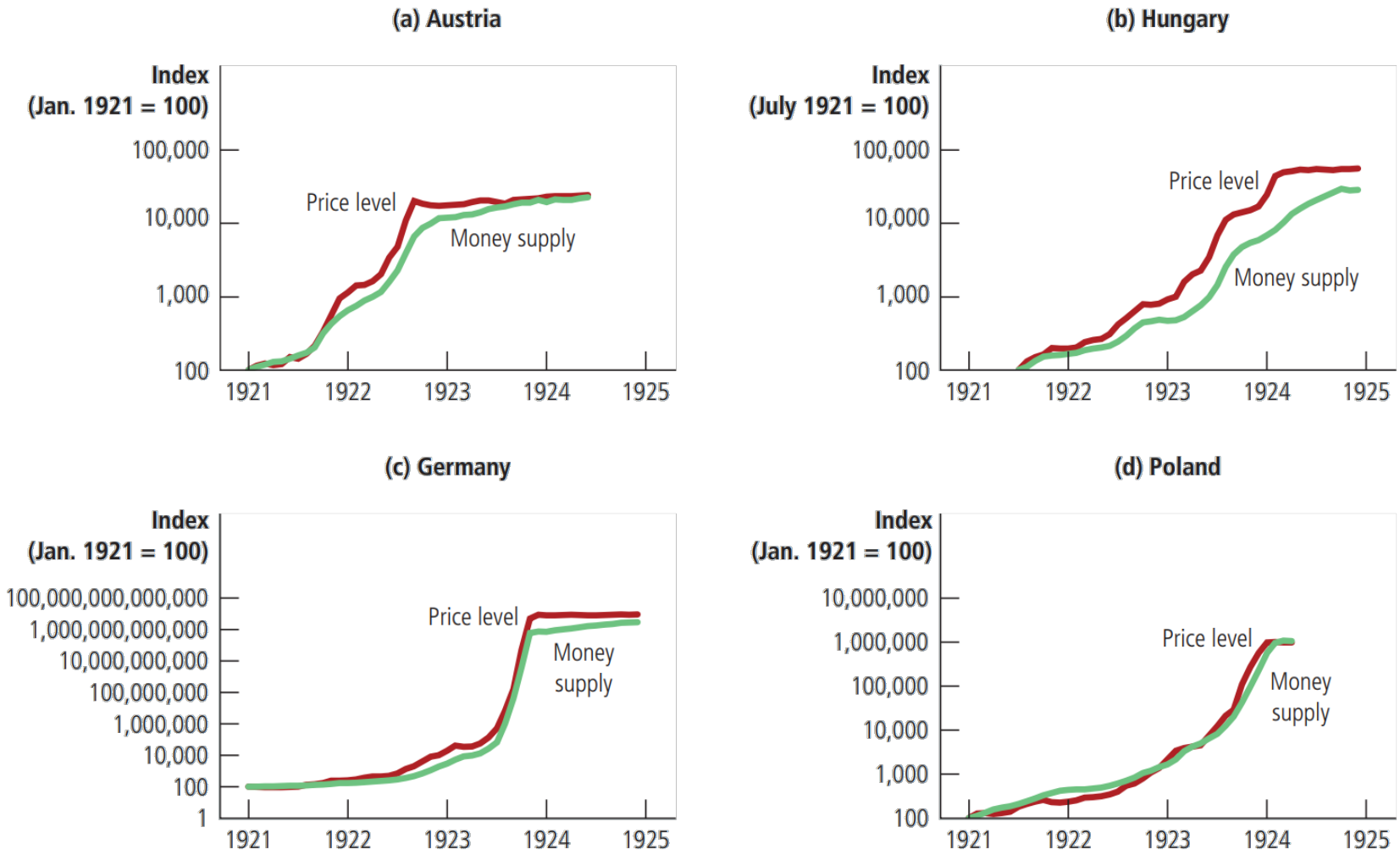


III. Money Growth and Inflation

We now have all the elements necessary to explain the equilibrium price level and inflation rate. They are as follows:

- The velocity of money is relatively stable over time.
- Because velocity is stable, when the central bank changes the quantity of money (M), it causes proportionate changes in the nominal value of output ($P \times Y$).
- The economy's output of goods and services (Y) is primarily determined by factor supplies (labor, physical capital, human capital, and natural resources) and the available production technology. In particular, because money is neutral, money does not affect output.
- With output (Y) determined by factor supplies and technology, when the central bank alters the money supply (M) and induces proportional changes in the nominal value of output ($P \times Y$), these changes are reflected in changes in the price level (P).
- Therefore, **when the central bank increases the money supply rapidly, the result is a high rate of inflation.**

III. Money Growth and Inflation



III. Money Growth and Inflation

- If inflation is so easy to explain, why do countries experience hyperinflation?
- The government can also pay for spending (on public goods) simply by printing the money it needs.
  - **inflation tax**: the revenue the government raises by creating money.
  - the inflation tax is like a tax on everyone who holds money.
- The costs of inflation
  - inflation does not in itself reduce people's real purchasing power.
  - **shoeleather costs**: the resources wasted when inflation encourages people to reduce their money holdings.
  - **menu costs**: the costs of changing prices.
  - relative-price variability and the misallocation of resources.
  - inflation-induced tax distortions.
  - confusion and inconvenience.
  - ...

Reading

- Chapter 29 $\sim$ 30, *Principles of Economics* by Mankiw.