I. Introduction
- A. **Inflation**: Overall increase in prices.
- B. **Hyperinflation**: Periods of extraordinarily high inflation.

II. What is Money?.
- A. **Money**: The stock of assets that can be readily used to make transactions.
- B. **The functions of money**:
  1. Store of value,
  2. unit of account, and
  3. a medium of exchange.
- C. **Double coincidence of wants**: The happenstance of two people each having a good that the other wants at the right time and place to make an exchange.
- D. The types of money.
  1. **Fiat money**: Money that has no intrinsic value.
  2. **Commodity money**: Money with intrinsic value.
  3. **Gold Standard**: An economy is on a gold standard if gold serves as money.
     - *a. The US was on a gold-silver standard from 1789 to 1889 and then on a gold standard until 1934.*
  4. **Case-study: Money in POW camp, p. 157.**
- E. How fiat money evolves:
  - *1. Basically, governments have incentives to debase commodity money.*
  2. **Case-study: Money and Social Conventions on the island of Yap, p. 158.**
- F. How the quantity of money is controlled.
  1. **Money supply**: The quantity of money available.
  2. **Central bank (Federal Reserve)**: The independent institution that partially controls the money supply.
  3. **Monetary policy**: It relates to the control of the money supply.
  4. **Open-market operations**: The primary way in which the central bank controls the money supply.
     - a. It involves the purchase and sale of government bonds.
     - *b. It is conducted by the Open Market Committee consisting of the seven members of the Federal Reserve Board and five of the seven Federal Reserve bank Presidents.*
- G. How the quantity of money is measured.
  - *1. The **monetary base** that is directly affected by monetary policy consists of the currency in circulation and the bank reserves.*
  2. **Currency**: The sum of outstanding paper money and coins.
  3. **Demand deposits**: The funds people hold in their checking accounts.
  4. **Table 7-1: The measures of money, p. 160.**

The Measures of Money		
Symbol	Assets Included	Amount in April 1998 (billions of dollars)
C	Currency	$ 434
M1	C + DD + TC and CD	1,081
M2	M1 + overnight + Euro + MMDA + MMMF + savings and small time deposits.	4,165
M3	M2 + large time deposits and term repurchase agreements.	5,574
L	M3 + savings bonds, st T securities, and other liquid assets.	6,826

III. The Quantity Theory of Money.
- A. Transactions and the quantity equation.
  1. **The quantity equation**: It express the link between transactions and money.
     a. *MV=PT*
  2. **Transactions velocity of money**: V measures the rate at which money circulates in the economy.
  3. V = PT/M
- B. From transactions to income.
  1. *MV=PY*
  2. **Income velocity of money:** V tells us the number of times a dollar bill enters someone's income in a given period of time.
- C. The money demand function and the quantity equation.
  1. **Real money balances**: M/P express the quantity of money in terms of the quantity of goods and services it can buy.
  2. **Money demand function**: The equation that shows what determines the quantity of real money balances people wish to hold.
     a. $(M/P)^d = kY$
- D. The assumption of constant velocity. *MV=PY (with V fixed)*
  1. We can turn the equation into a useful theory--called the quantity theory of money--by making the additional assumption that velocity is constant.

E. Money, prices and inflation.
  1. The theory has three building blocks.
    a. The factors of production and the production function determine the level of output Y.
    b. The money supply determines the nominal value of output PY.
    c. The price level P is then the ratio of the nominal value of output PY to the level of output Y.
  2. % change in M + % change in V = % change in P + % change in Y
  3. The quantity theory of money states that the central bank, which controls the money supply, has the ultimate control over the rate of inflation.
    a. If the central bank keeps the money supply stable, the price level will be stable.
    b. If the central bank increases the money supply quickly, the price level will rise quickly.
  4. **Case-study: Inflation and money growth, p. 165.**
    a. **Figure 7-1: Historical data on inflation and money, p. 165.**
    b. **Figure 7-2: International data on inflation and money growth, p. 166.**

IV. Seigniorage: The Revenue from Printing Money.
  A. The government can finance its spending in three ways:
    1. it can raise revenue through taxes,
    2. it can borrow from the public and
    3. it can simply print money.
  B. **Seigniorage** is the revenue raised through the printing of money.
  C. **Case-study: Paying for the American revolution, p. 168.**

V. Inflation and Interest Rates.
  A. Two interest rates: real and nominal.
    1. **Nominal interest rate**: The rate the bank pays.
    2. **Real interest rate**: The difference between the nominal interest rate and the rate of inflation.
      a. $r = i - \delta$
  B. **The Fisher effect**: *According to the Fisher equation, a 1% increase in the rate of inflation causes a 1% increase in the nominal interest rate.*
    1. **The Fisher equation**: $i = r + \delta$
    2. **Case-study: Inflation and nominal interest rates, p. 170.**
      a. **Figure 7-3: Inflation and nominal interest rates over time, p. 170.**
      b. **Figure 7-4: Inflation and nominal interest rates across countries, p. 171.**

C. Two real interest rates: *Ex Ante* and *Ex Post*.
   1. ***Ex Ante* real interest rate**: The real interest rate that the borrower and lender expect when the loan is made: $i = r + \delta^e$.
   2. ***Ex Post* real interest rate**: The real interest rate actually realized: $i = r + \delta$
   3. **New Fisher effect:** $i = r + \delta^e$

D. **Case-study: Nominal interest rates in the nineteenth century, p. 163.**

VI. The Nominal Interest Rate and The Demand for Money.
   A. Think of equilibrium in terms of supply and demand.
   B. The cost of holding money.
      1. $(M/P)d = L(i,Y)$
   C. Future money and current prices.
      1. $M/P = L\ (r + \delta^e, Y)$
      2. This general money demand equation implies that the price level depends not just on today's money supply but also on the money supply expected in the future.
      3. **Figure 7-5: The Linkages among money, prices, and interest rates, p. 174.**

VII. The Social Costs of Inflation.
   A. The costs of inflation are subtle.
      1. Not everyone loses.
   B. Expected inflation.
      1. **Shoeleather cost** of inflation: The inconvenience derived of reducing money holding.
      2. **Menu cost** of inflation: It appears when high inflation force firms to change their posted prices more often.
      3. Prices become more variable.
      4. Tax avoidance due to capital gains taxation.
      5. The inconvenience of price uncertainty.
   C. Unexpected inflation.
      1. There are winners (debtors) and losers (creditors).
      2. **Case study: The free silver movement, the election of 1896, and the Wizard of Oz, p. 179.**
         a. This is an interesting example.
   D. The level and variability of inflation.
      1. High inflation is variable inflation.

VIII. Hyperinflation
   A. The Costs of Hyperinflation
      1. **FYI: Keynes (and Lenin) on the Cost of Inflation, p. 181.**

2. **Case Study: Life During the Bolivian Hyperinflation, p. 182.**

B. The Causes of Hyperinflation

1. **Case Study: Hyperinflation in Interwar Germany, p. 184.**
   a. **Figure 7-6(a): Money and Prices, p. 185.**
   b. **Figure 7-6(b): Inflation and Real Money Balances, p. 185.**

IX. Conclusion: The Classical Dichotomy.

A. **Real variables**: Variables that relate to quantities or relative prices.
B. **Nominal variables**: Variables expressed in terms of money.
C. **The classical dichotomy**: The theoretical separation of real and nominal variables.
D. **Monetary neutrality**: The irrelevance of money for real variables in classical theory, in which changes in the money supply do not influence real variables.

X. Summary.

XI. Appendix: The Cagan Model: How Current and Future Money Affect the Price Level