
Learning Objectives: Chapter 11

- See why inflation results from rapid growth in the money supply
- Learn the meaning of the classical dichotomy and monetary neutrality
- See why some countries print so much money they experience hyperinflation
- Examine how the nominal interest rate responds to the inflation rate
- Consider the various costs that inflation imposes on society

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Intro:

- **Inflation**
  - Increase in the overall price levels
- **Deflation**
  - Decrease in the overall price levels

The Classical Theory of Inflation

The Level of Prices and the Value of Money

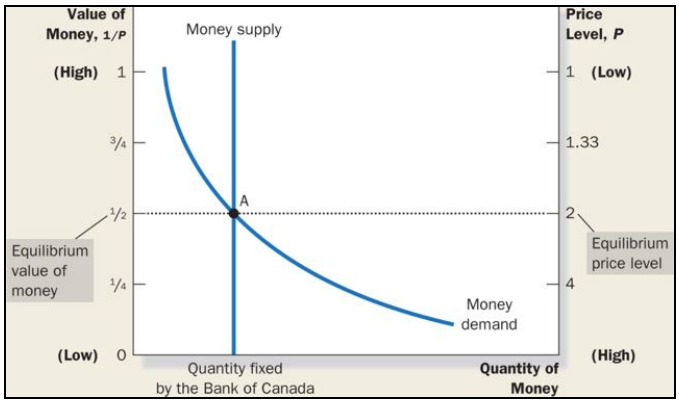
- When the overall price level rises, the value of money decrease.

Money Supply, Money Demand, and Monetary Equilibrium

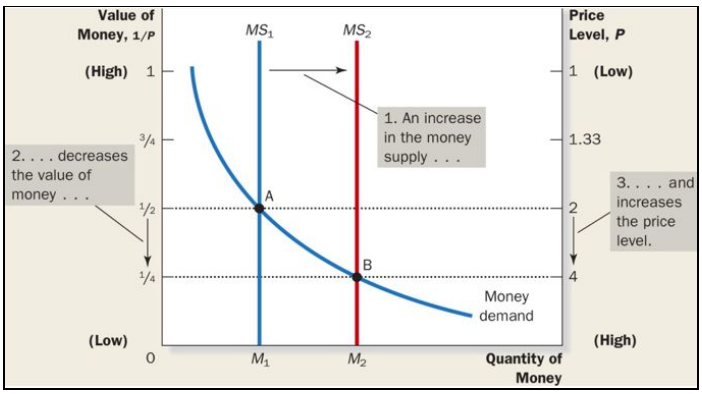
- The value of money is determined by the supply and demand of money
- Recall the supply of money is controlled by the BoC
- The value of money is = to 1/P (P being the price level)
- **Supply**
  - Assume that the supply of money is a fixed amount set by the BoC
- **Demand**
  - There are many factors that affect the demand of money but the most important is the ***level of prices*** in the economy
  - **In the long run**, the overall level of prices adjusts to the level at which the demand for the money equals the supply

explanation:

- This graph has both the *price level* and the *value of money*.
- When the price levels increase the value of money decreases, vice versa.
- Therefore when the value of money and price levels are high the demand for money is greater because more money is needed, vice versa.



The Effects of a Monetary Injection



When the BoC increases the supply of money, the money supply curve shifts from MS1 to MS2. The value of money and the price level adjust to bring supply and demand back into balance. The equilibrium moves from point A to point B.

Thus, when an **increase in the money supply** makes dollars more plentiful, **the price level increases, making each dollar less valuable.**

- This explanation is called the **Quantity theory of money:**
    - Which is a theory asserting that the quantity of money available determines the price level and that the growth rate in the quantity of money available determines the inflation rate

Adjustment Process (Brief look)

- How does the economy get from the old to the new equilibrium?
    a. Money injections leads to an excess supply of money
    b. The demand for goods/services increases because people have more money
    c. Upward pressure on prices because the economy's ability to produce stays the same.
    d. The demand for money increases because of the increase in prices
    e. Eventually the price level adjusts to reach a new equilibrium
- The opposite is true when the BoC reduces the money supply

The Classical Dichotomy and Monetary Neutrality

Classical Dichotomy:

- The theoretical separation of nominal and real variables

Economic variables can be divided into **2 groups:**

1. **Nominal variables:** variables measured in monetary units
2. **Real variables:** variables measured in real variables, ex 1 hat is worth 3 loafs of bread

Monetary neutrality:

- The proposition that changes in the money supply do not affect real variables
    - In the long run this is true, however in the short run (1-2 years) a change in the money supply this has a noticeable impact of the economy

- If monetary neutrality holds then the price level will change by the amount of the change in the money supply

Velocity and the Quantity Equation

Velocity of money:

- The rate at which money changes hands

Velocity of money

$V = Velocity\ of\ money\ P = price\ level\ (GDP\ deflator)\ Y = Real\ GDP\ M = Money\ Supply$

$$V = (P \cdot Y)/M$$

Quantity equation

- The equation which relates the quantity of money, the velocity of money, and the dollar value of the economy's output of goods and services
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Quantity equation

$V = Velocity\ of\ money\ P = price\ level\ (GDP\ deflator)\ Y = Real\ GDP\ M = Money\ Supply$

$$M \cdot V = P \cdot Y$$

Quantity theory of money

Explains the equilibrium price level and inflation rate:

1. The velocity of money relatively stable over time
2. Because velocity is stable, when the central bank changes the quantity of money (M), it causes a proportionate changes in the nominal value of output (P x Y)
3. Since the economy's output of goods/services (Y = real GDP) is determined by the factors of production and money is neutral, money does not affect input. Factors:
    a. Labour
    b. Physical capital
    c. Human capital
    d. Natural resources
    e. Production technology
4. Since the *output* (Y) is not affected and the *velocity of money* (V) is stable the only variable that can be affected by a increase/decrease in the money supply is the price level
5. Therefore when the central bank increase/decreases the money supply rapidly, the result is a high rate of inflation

Inflation Tax

Inflation Tax:

- The revenue the government raises by creating money
- This tax is directly applied like normal taxes, instead it raises the price level and therefore the value of money decreases

The Fisher Effect

- For the real interest rate to be not affected, the nominal interest rate must adjust proportionately to changes in the inflations rate
- Thus **when the BoC increases the rate of money growth, the result is both a higher inflation rate and higher nominal interest rate.**

Real and nominal interest rate

$$Real\ interest\ rate = Nominal\ interest\ rate - Inflation\ rate$$

$$Nominal\ interest\ rate = Real\ interest\ rate + Inflation\ rate$$

- Used in **the long run** and not short run because in the long run the nominal interest rate accounts for the inflation rate because the **inflation becomes expected**.

The Costs of Inflation

A Fall in Purchasing Power? The Inflation Fallacy

- **Inflation does not in itself reduce people's real purchasing power** because inflation income is proportionate to inflation prices
- If nominal incomes tend to keep pace with rising prices, inflation is not a problem
- There are, however, costs associated with inflation **(6)**

Shoeleather Costs (1)

Shoeleather costs:

- The resources wasted when inflation encourages people to reduce their money holdings
- In order to reduce the effects of inflation people chose to carry less money and put more in a interest-bearing savings account
    - The cost of reducing money holdings is called shoe leather costs
        - The costs are associated to the time and convenience that must be sacrificed

Menu Costs (2)

Menu costs:

- The costs associated to having to change prices to correct for inflation

Relative-Price Variability and Misallocation of Resources (3)

- Because prices change only once in awhile, inflation becauses relatives prices to vary more than they otherwise would
    - Since, consumers indirectly allocate the resources of production because their demand determines which products are going to be produced, which is based off decisions they make based off prices and quality.
        - Therefore when inflation distorts relative prices, consumers make decisions they otherwise wouldn't make which results in markets being less able to allocate resources most efficiently

Inflation-Induced Tax Distortions (4)

- Inflation makes nominal income grow faster than real income. Taxes are based on nominal income, and some are not adjusted for inflation.
    - Therefore inflation causes people to pay more taxes even when their real incomes don't increase.

Ex:

	Economy A (price stability)	Economy B (inflation)
Real interest rate	4%	4%
Inflation rate	0	8
Nominal interest rate (real interest rate + inflation rate)	4	12
Reduced interest due to 25 percent tax (0.25 × nominal interest rate)	1	3
After-tax nominal interest rate (0.75 × nominal interest rate)	3	9
After-tax real interest rate (after-tax nominal interest rate − inflation rate)	3	1

Confusion and Inconvenience

- Money is the ruler with which we measure economic transactions
- The BoC ensure the reliability of commonly used unit of measurement (ex money)'
- However when the Boc increases the money supply and creates inflation, it erodes the real value of the unit of account.
    - This leads to confusion in the financial markets

A Special Cost of Unexpected Inflation: Arbitrary Redistributions of Wealth (6)

- Unexpected inflation redistributes wealth among the population in one of two ways: either benefiting the creditor or the borrower
    - If inflation is high, the borrower benefits because his supply of money increases while the original loan's value doesn't.
    - If inflation is low, the lender benefits because the lenders supply of money decreases but the value of the loan doesn't.

Deflation

- Deflation shares many of the costs with inflation
    - Menu costs
    - Relative-price variability
- Deflation also redistributes wealth toward creditors and away from debtors
- A sign of broader macroeconomic difficulties

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