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# 货币增长与通货膨胀

## Money Growth and Inflation



# 通货膨胀 Inflation

**通货膨胀**是总体价格水平的上升 **Inflation** is an increase in the overall level of prices.

# 通货膨胀：历史面目

## Inflation: Historical Aspects

- 在过去 70 年里，价格平均每年上升约 4 个百分点。 Over the past seventy years, prices have risen on average about 5 percent per year.
- **通货紧缩**，即平均价格的下降，在 19 世纪的美国出现过。

**Deflation**, meaning decreasing average prices, occurred in the U.S. in the nineteenth century.

- **超速通货膨胀**指的是很高的通货膨胀率，例如 20 世纪 20 年代的德国所经历的那样。

**Hyperinflation** refers to high rates of inflation such as Germany experienced in the 1920s.

# 通货膨胀：历史面目

## Inflation: Historical Aspects

- （在美国）在 20 世纪 70 年代，价格每年上升 7 个百分点。

**In the 1970s prices rose by 7 percent per year.**

- 在 20 世纪 90 年代，价格平均每年上升 2 个百分点。

**During the 1990s, prices rose at an average rate of 2 percent per year.**

# 通货膨胀：历史面目

## Inflation: Historical Aspects

- 在中国，改革开放以前，价格平均每年上升约 1 个百分点。大部分时期价格稳定甚至下降。
  - 最高的 1961 年达到 16 个百分点
  - 最低的 1963 年为 -6 个百分点（通货紧缩）
- 改革开放以来，价格平均每年上升约 7 个百分点。
  - 最高的 1994 年达到了 24 个百分点
  - 最低的 1999 年为 -1 个百分点（通货紧缩）
  - 2000-2007 年均 2 个百分点

# 通货膨胀的古典理论

## The Classical Theory of Inflation

- **货币数量论**用来解释价格水平和通货膨胀率的长期决定因素。

The **quantity theory of money** is used to explain the long-run determinants of the price level and the inflation rate.





# 价格水平与货币价值

## The Level of Prices and the Value of Money

- 通货膨胀是涉及经济中交换媒介的价值的整体经济现象。

Inflation is an economy-wide phenomenon that concerns the value of the economy's *medium of exchange*.

- 如果  $P$  是用货币衡量的物品与服务的价格，则  $1/P$  就是用物品与服务衡量的货币价值。

If  $P$  is the price of goods and services,  $1/P$  is the value of money measured in terms of goods and services.

- 当整个价格水平上升，货币价值下降。  
When the overall price level rises, the value of money falls.



# **货币供给、货币需求与货币均衡**

## **Money Supply, Money Demand, and Monetary Equilibrium**

**货币的价值是由货币的供给与需求决定的。**

**The value of money is  
determined by the supply and  
demand for money.**





# 货币供给 Money Supply

- **货币供给**是由美联储控制的政策变量。 The **money supply** is a policy variable that is controlled by the Fed.
- 通过公开市场运作等工具，美联储直接控制货币供给的数量。

Through instruments such as open-market operations, the Fed directly controls the quantity of money supplied.



# 货币需求

## Money Demand

- **货币需求**反映人们愿意以流动的形式持有的财富数量。  
**The demand for money** reflects how much wealth people want to hold in liquid form.
- **货币需求有若干决定因素：**  
**Money demand has several determinants:**
  - **物价水平**  
the average level of prices in the economy
  - **产出** Production
  - **利率** interest rates

# 货币需求

## Money Demand

- 人们持有货币是因为它是交换媒介。  
People hold money because it is the medium of exchange.

- 人们选择持有的货币数量，取决于物品与服务的价格。

The amount of money people choose to hold depends on the prices of goods and services.

- 物价水平上升（货币价值下降）增加了货币的需求量。

A higher price level (a lower value of money) increases the



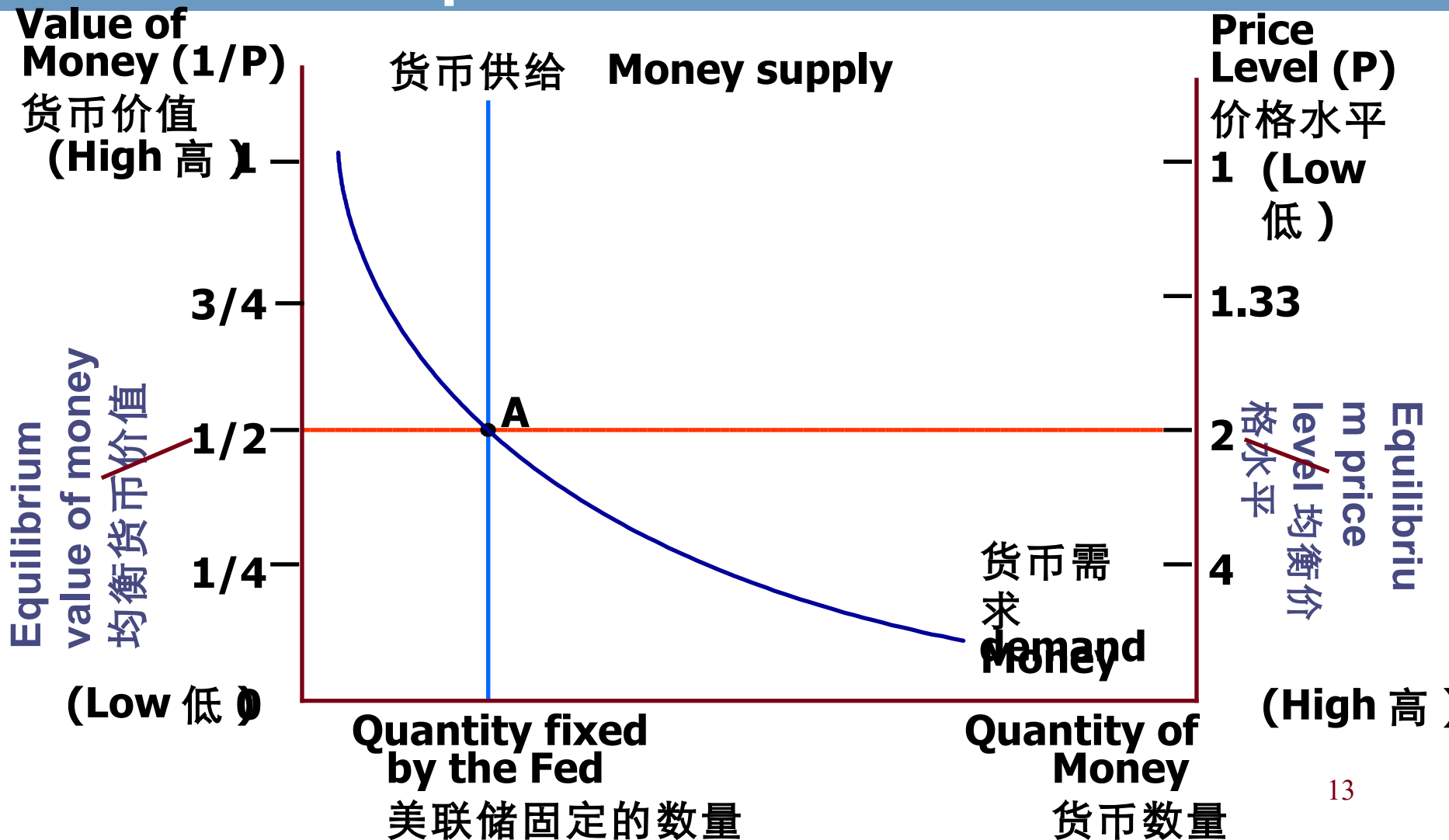
# **货币供给、货币需求与货币均衡** **Money Supply, Money Demand,** **and Monetary Equilibrium**

**在长期，总体价格水平调整到  
货币供求平衡的水平。**

**In the long run, the  
overall level of prices adjusts to  
the level at which the demand for  
money equals the supply.**

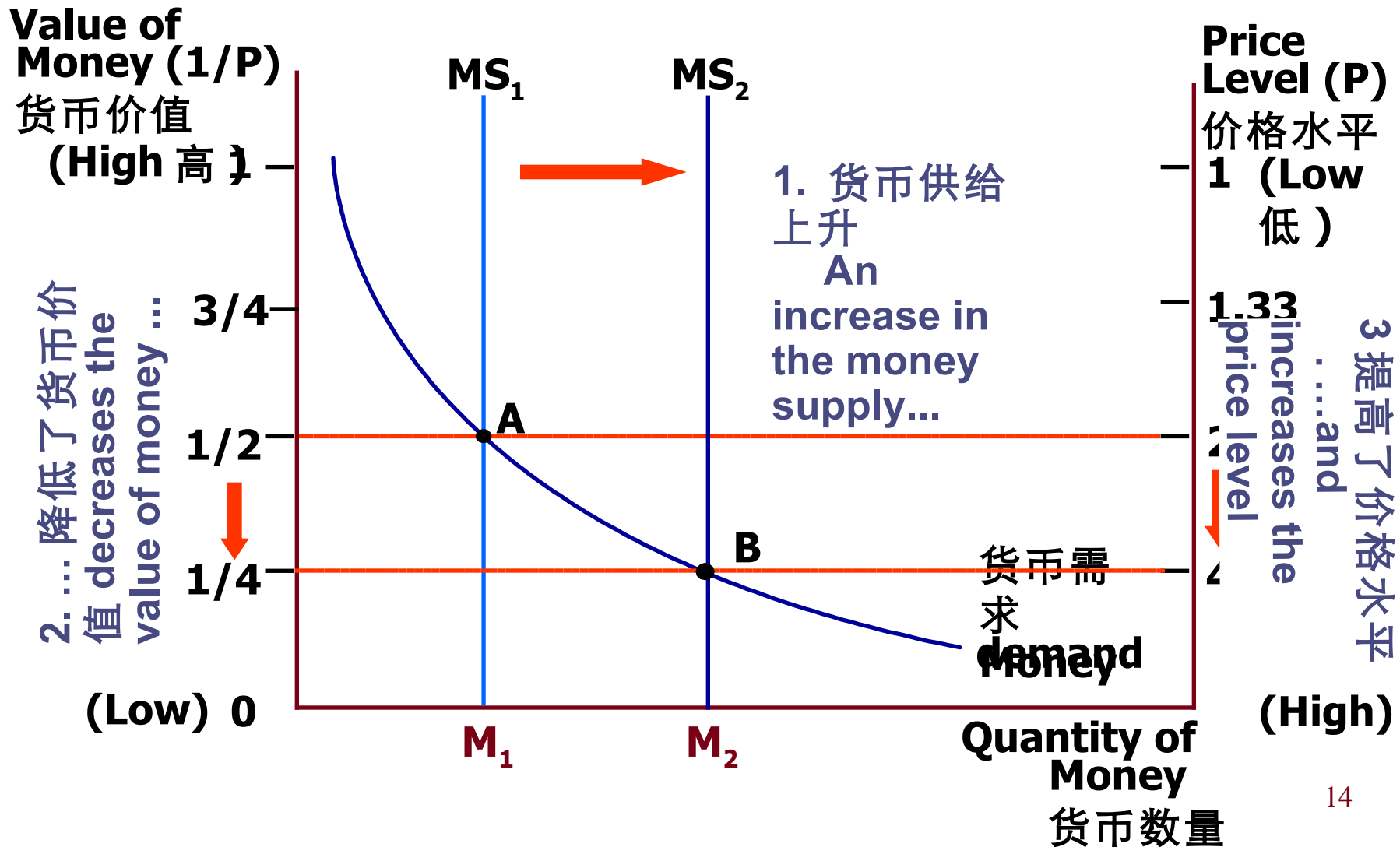
# 货币供给、货币需求与均衡价格水平

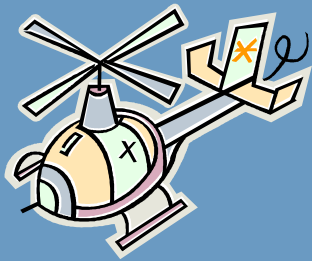
## Money Supply, Money Demand, and the Equilibrium Price Level



# 货币注入的影响

## The Effects of Monetary Injection





# 调整过程简述

## A Brief Look at the Adjustment Process

- 货币注入的直接影响是创造了超额货币供给。  
The immediate effect of a monetary injection is to create an excess supply of money.
- 它增加了物品与服务的需求。  
It increases the demand for goods and services.
- 但是，经济生产物品与服务的能力并没有变。  
However, the economy's ability to supply goods and services has not changed.
- 因此，这种更大的物品与服务的需求就引起物品与服务的价格上升。  
Thus, the greater demand for goods and services causes the prices of goods and services to increase.
- 物价水平上升又增加了货币需求量，直到它等于新的货币供给量。  
The increase in the price level increases the quantity of money demanded until it equals the new quantity of money supplied.





# 货币数量理论

## The Quantity Theory of Money

- 价格水平如何决定、它为何会随时间改变，对此的（一种）解释是**货币数量论**。

How the price level is determined and why it might change over time is called the **quantity theory of money**.

- 经济中可得的货币数量决定了货币价值。

The quantity of money available in the economy determines the value of money.

- 通货膨胀的基本原因是货币数量的增长。

The primary cause of inflation is the growth in the quantity of money.



# 古典二分法与货币中性

## The Classical Dichotomy and Monetary Neutrality

- 货币供给变动导致物品与服务的平均价格水平变动。

**Changes in the money supply lead to changes in the average level of prices of goods and services.**

- 货币变动如何影响其他重要的宏观经济变量，如产出、就业、实际工资与实际利率呢？  
**How do these monetary changes affect other important macroeconomic variables, such as production, employment, real wages, and real interest rates?**



# 古典二分法与货币中性

## The Classical Dichotomy and Monetary Neutrality

- 所有经济变量应该分为两类：名义变量与实际变量。

All economic variables should be divided into two groups: **nominal variables** and **real variables**.

- 把变量分为这两类的方法现在称为古典二分法。

This separation of variables into these groups is now called the **classical dichotomy**.



# 古典二分法与货币中性

## The Classical Dichotomy and Monetary Neutrality

- **名义变量**是以货币单位衡量的变量。  
**Nominal variables** are variables measured in monetary units.
  - 例：名义 GDP，名义利率，名义工资，美元价格
- **实际变量**是以物质单位衡量的变量。  
**Real variables** are variables measured in physical units.
  - 例：实际（不变价）GDP，实际利率，实际工资，相对价格



# 古典二分法与货币中性

## The Classical Dichotomy and Monetary Neutrality

- 按照古典二分法，影响实际和名义变量的是不同的经济力量。

According to the classical dichotomy, different forces influence real and nominal variables.

- 货币供给的改变影响名义变量但不影响实际变量。

Changes in the money supply affect nominal variables but not real



# 古典二分法与货币中性

## The Classical Dichotomy and Monetary Neutrality

货币变化与实际变量无关的性质被称为**货币中性**。

The irrelevance of monetary changes for real variables is called **monetary neutrality**.

# 古典二分法与货币中性

## The Classical Dichotomy and Monetary Neutrality

- 在研究经济的长期变动（例如 10 年内）时，货币中性对世界如何运行提供了一个很好的描述 When studying long-run changes – those over the course of a decade - in the economy, the neutrality of money offers a good description of how the world works.
- 但在短期内（例如 1、2 年内），有理由认为货币变动对实际变量有重要影响。  
But over short periods of time - within the span of a year or two – there is reason to think that monetary changes do have important effects on real variables.



# 货币流通速度与数量论方程式

## Velocity and the Quantity Equation

- **数量论方程式**用一种简单概括的方式，将货币供给与物价水平、产出的关系表示出来。

The relationship among money supply, price level and output can be summarized in the **quantity equation**.



# 货币流通速度与数量论方程式

## Velocity and the Quantity Equation

货币流通速度指普通的一美元钞票在经济当中从一个人的钱包流动到另一个人的钱包的速度。

The **velocity of money** refers to the speed at which the typical dollar bill travels around the economy from wallet to wallet.







# 货币流通速度与数量论方程式

## Velocity and the Quantity Equation

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

此处 Where:  $V$  = velocity 流通速度

$P$  = the price level 价格水平

$Y$  = the quantity of output 产出数

$M$  = the quantity of money 货币数量





# 货币流通速度与数量论方程式

## Velocity and the Quantity Equation

- 重写等式给出了数量论方程式：  
Rewriting the equation gives the quantity equation:

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

- 增量形式 In growth form :

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

货币增长率 + 货币流通速度变化率 = 通胀率 + 产出增长率

# 货币流通速度与数量论方程式

## Velocity and the Quantity Equation

数量论方程式将货币数量  
( $M$ ) 与产出的名义值  
( $P \times Y$ ) 联系起来。 The  
quantity equation relates the  
quantity of money ( $M$ ) to the  
nominal value of output ( $P \times Y$ ).

# 货币流通速度与数量论方程式

## Velocity and the Quantity Equation

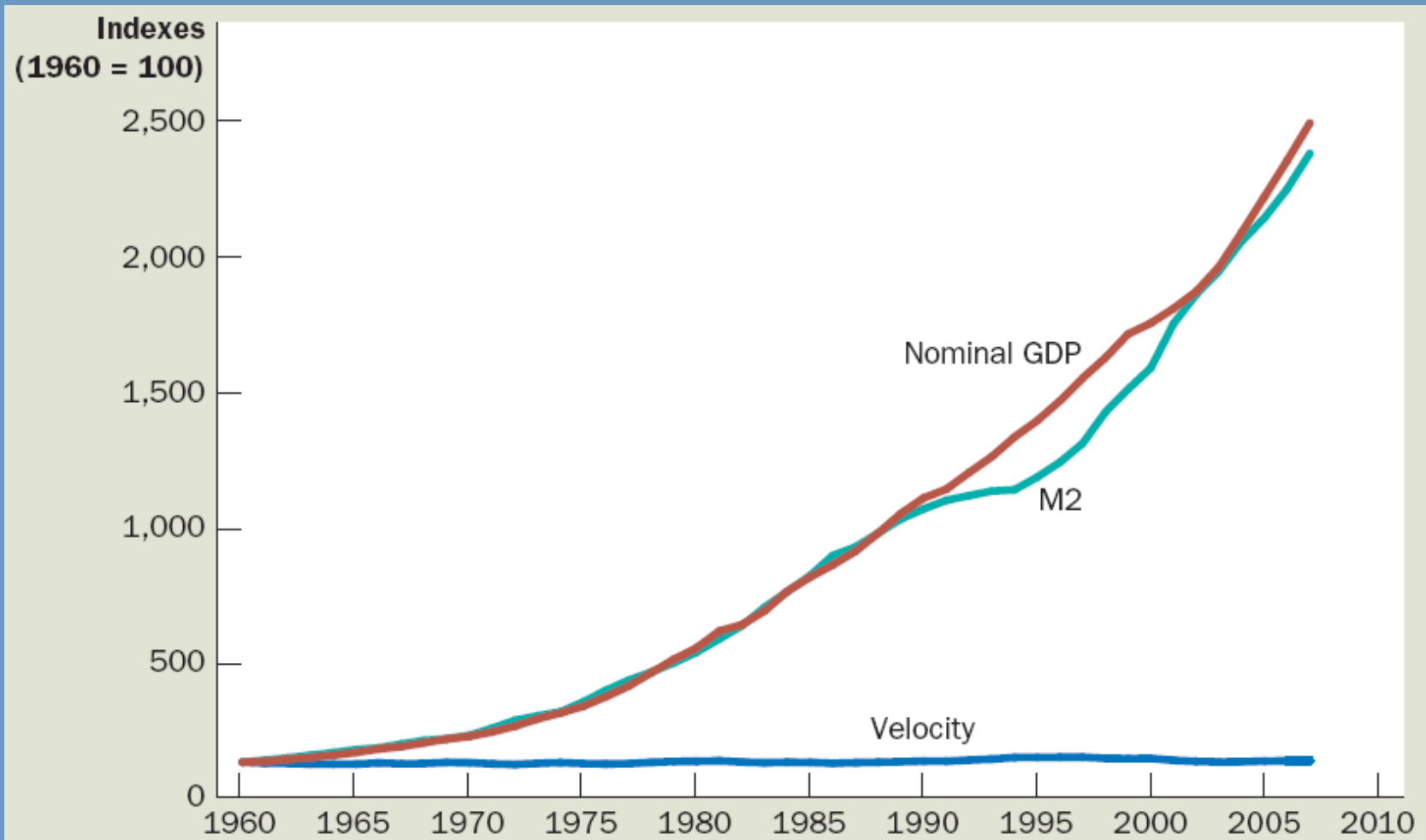
- 数量论方程式表明，经济中货币数量的增加必然反映在其他三个变量中的一个：

The quantity equation shows that an increase in the quantity of money in an economy must be reflected in one of three other variables:

- 价格水平必然上升，  
the price level must rise,
- 产出数量必然增加， 或  
the quantity of output must rise, or
- 货币流通速度必然下降  
the velocity of money must fall.

# 名义 GDP、货币数量与货币流通速度

## Nominal GDP, the Quantity of Money, and the Velocity of Money



# 均衡价格水平、通货膨胀率与货币数量论

## The Equilibrium Price Level, Inflation Rate, and the Quantity Theory of Money

- 货币流通速度随时间是相对稳定的。

**The velocity of money is relatively stable over time.**

- 当美联储改变货币数量（ $M$ ）时，它就造成了同比例的产出名义值（ $P \times Y$ ）的变动。

**When the Fed changes the quantity of money ( $M$ ), it causes proportionate changes in the nominal value of output ( $P \times Y$ ).**

- 因为货币是中性的，货币不影响产出。  
**Because money is neutral, money does not affect output.**

# 均衡价格水平、通货膨胀率与货币数量论

## The Equilibrium Price Level, Inflation Rate, and the Quantity Theory of Money

- 当美联储改变货币供给，引起产出名义值的相同变动，这些变动又都反映在价格水平的变动上了。

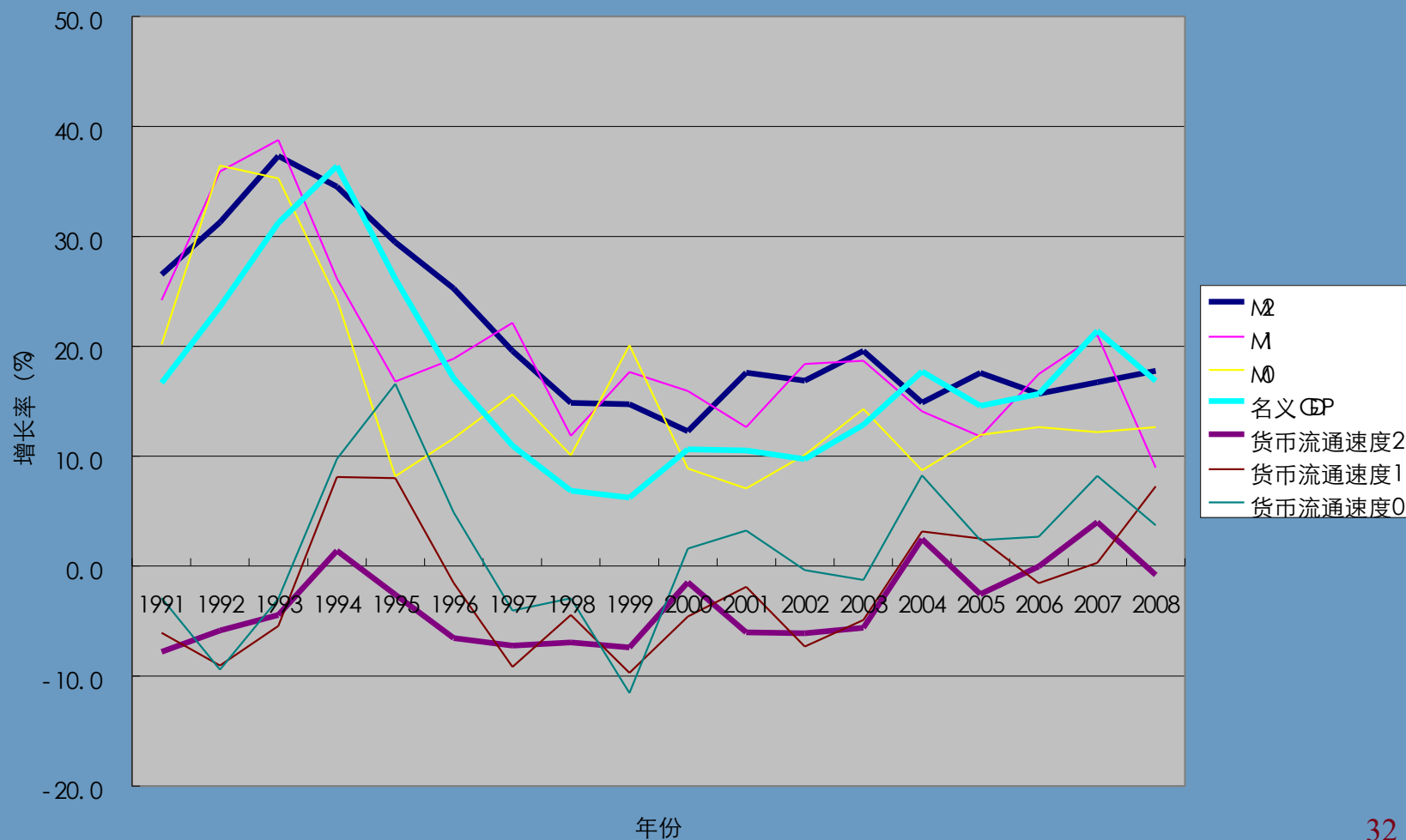
**When the Fed alters the money supply and induces parallel changes in the nominal value of output, these changes are also reflected in changes in the price level.**

- 当美联储迅速地增加货币供给，结果就是高速通货膨胀。

**When the Fed increases the money supply rapidly, the result is a high rate of inflation.**

# 名义 GDP、货币数量与货币流通速度：中国的例子

## Nominal GDP, the Quantity of Money, and the Velocity of Money: The Case of China





# 名义 GDP、货币数量与货币流通速度：中国的例子

## Nominal GDP, the Quantity of Money, and the Velocity of Money: The Case of China

- 改革以来，中国的货币增长率（特别是 M2）快于 GDP 增长率，使得衡量到的货币流通速度下降，这被称为“**货币沉淀**”。
- 可能的解释：
  - 经济市场化引起的货币化：经济中通过货币来完成的交易比例显著地上升
  - 银行不良贷款与“投机泡沫”：使得货币量（M2 和 M1）上升，但没有导致产出增加。
  - 更多人（外国人、罪犯等）持有现金：导致 M0 过快上升。

# 超速通货膨胀 Hyperinflation

- 超速通货膨胀是月度通胀率超过 50 个百分点的通货膨胀。

Hyperinflation is inflation that exceeds 50 percent per month.

- 超速通货膨胀曾在某些国家发生过，起因是政府印刷了过多的钞票以弥补其支出。

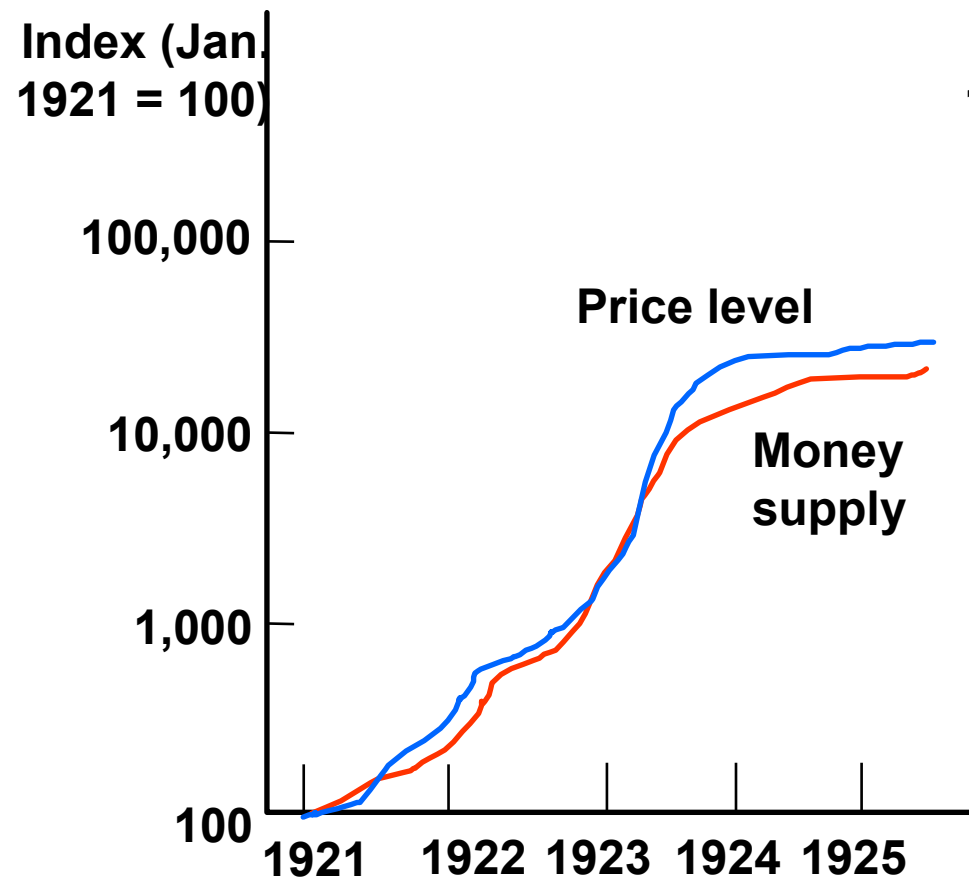
Hyperinflation occurs in some countries because the government prints too much money to pay for its spending.



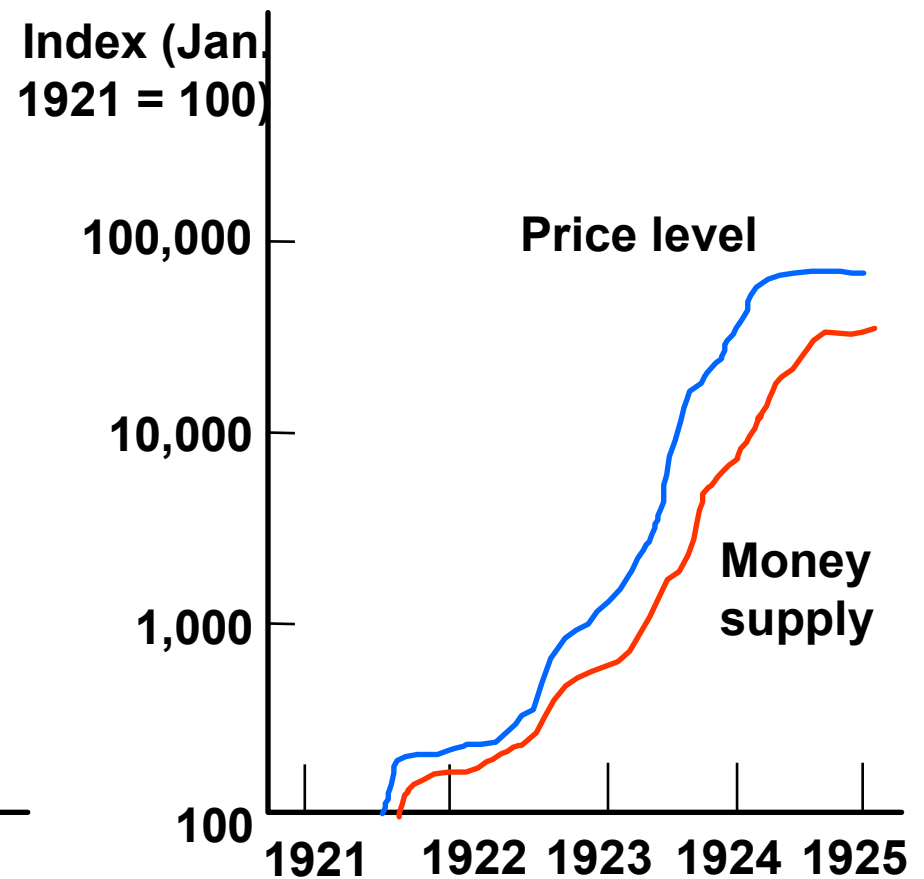
Germany, 1923:  
banknotes had lost  
so much value that  
they were used as  
wallpaper.

# 四次超速通货膨胀时期的货币与价格 Money and Prices During Four Hyperinflations

(a) 奥地利 Austria

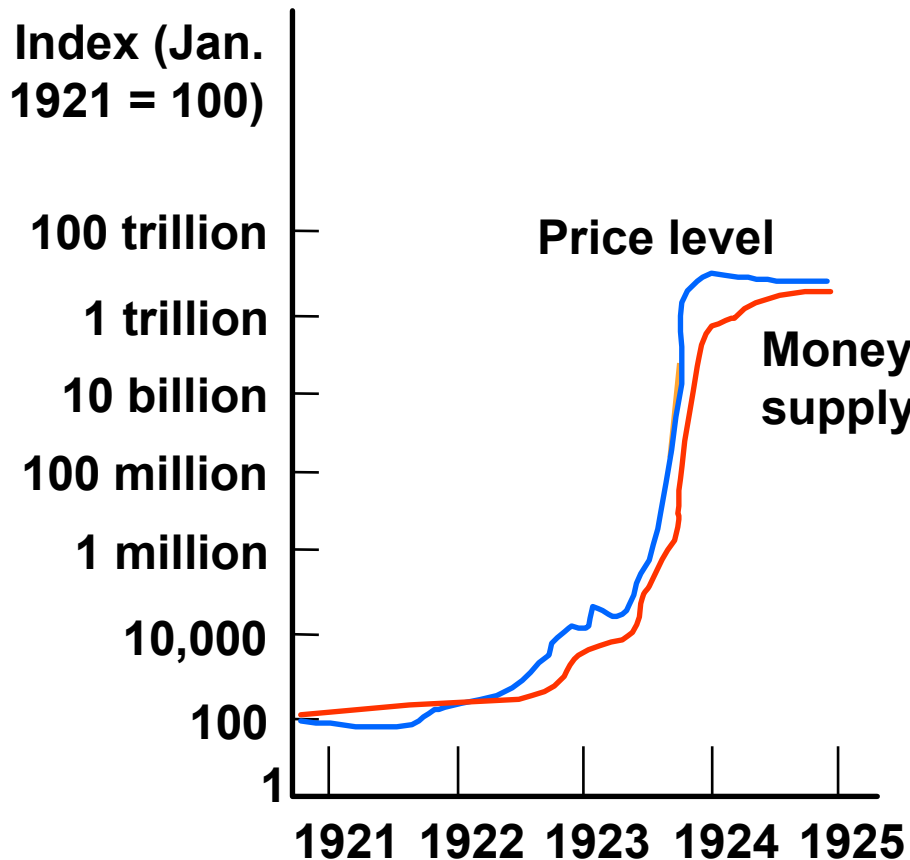


(b) 匈牙利 Hungary

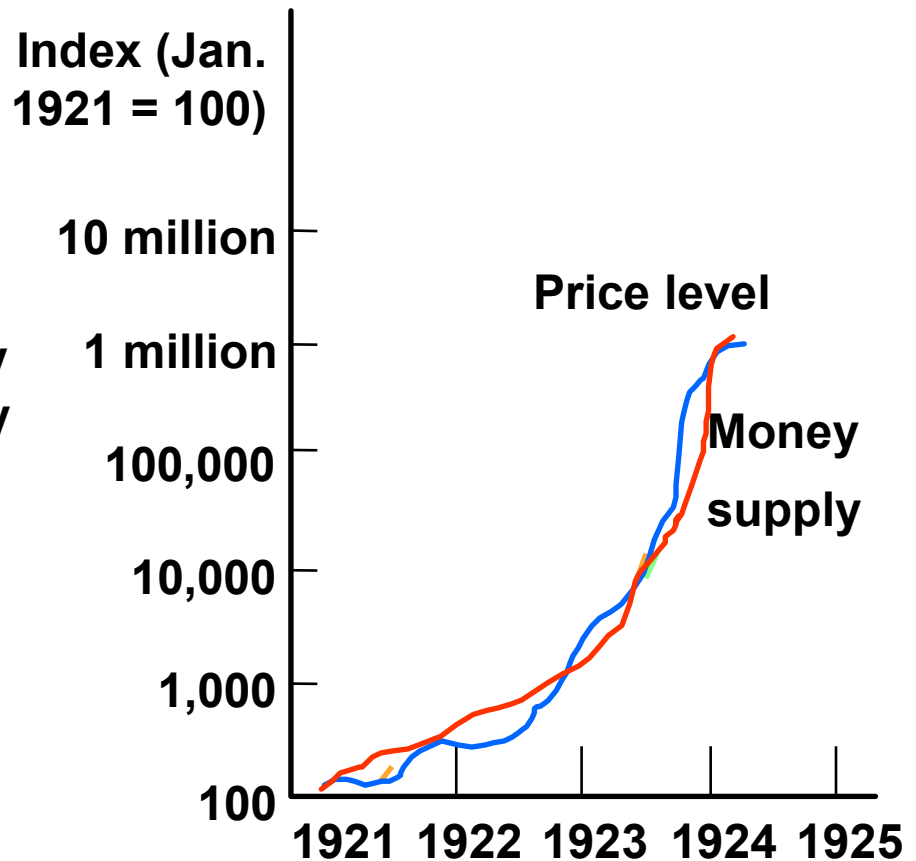


# 四次超速通货膨胀时期的货币与价格 Money and Prices During Four Hyperinflations

c) 德国 Germany



d) 波兰 Poland





# 超速通货膨胀与通货膨胀税

## Hyperinflation and the Inflation Tax

- 如果政府通过印制钞票来增加收入，就被说成是征收了**通货膨胀税**。

When the government raises revenue by printing money, it is said to levy an **inflation tax**.

- 通货膨胀税就像一个向所有货币持有者征收的税。  
An inflation tax is like a tax on everyone who holds money.
- 当政府机构进行财政改革，例如削减政府支出时，通货膨胀就会结束。

The inflation ends when the government institutes fiscal reforms such as cuts in government spending.



# 费雪效应

## The Fisher Effect

- 货币中性一个重要应用涉及到货币对利率的影响

An important application of the principle of monetary neutrality concerns the effect of money on interest rate.

- 回顾 Recall that :

名义利率 = 实际利率 + 通货膨胀率

Nominal interest rate = Real interest rate + Inflation rate

- 因为实际利率是实际变量，货币增长的变动并不影响它。

Since the real interest rate is a real variable, a change in money growth cannot should



# 费雪效应

## The Fisher Effect

- 因此，当中央银行提高货币增长率时，通货膨胀率上升，名义利率会有同等数量的上升。

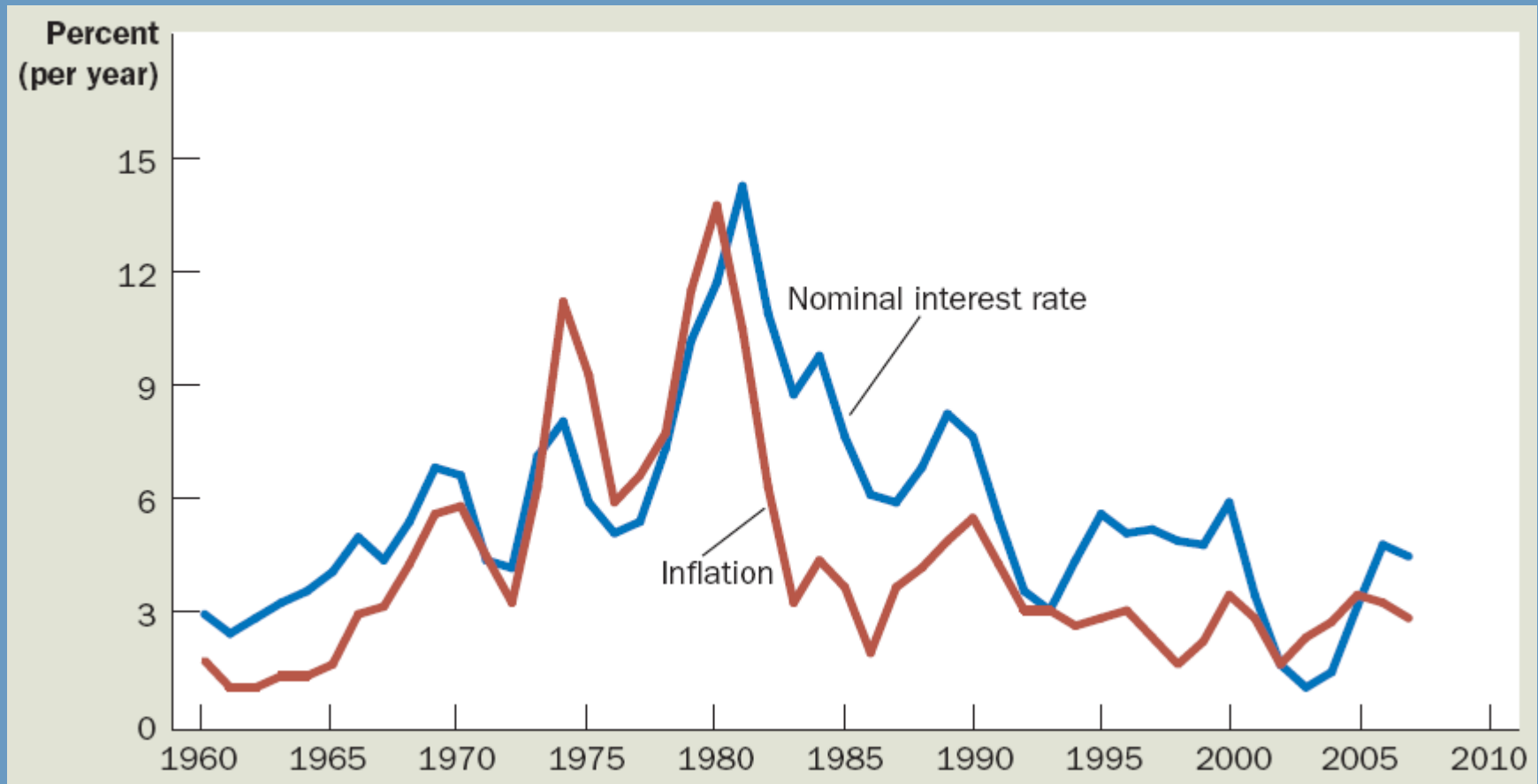
Thus, when the Fed increase the rate of money growth, the rate of inflation rises and the nominal interest rate rises *by the same amount*.

- 这种名义利率根据通货膨胀的调整被称为**费雪效应**。

This adjustment of the nominal interest rate to the inflation rate is

# 名义利率与通货膨胀率

## The Nominal Interest Rate and the Inflation Rate







**通货膨胀的成本：购买力下降？**

**The Costs of Inflation:  
A Fall in Purchasing Power?**

**通货膨胀本身并不减少人们的实际购买力。**

**Inflation *does not* in itself  
reduce people's real  
purchasing power.**



# **通货膨胀的成本**

## **The Costs of Inflation**

- **皮鞋成本 Shoeleather costs**
- **菜单成本 Menu costs**
- **相对价格变动 Relative price variability**
- **税收扭曲 Tax distortions**
- **混乱与不便 Confusion and inconvenience**
- **任意的财富再分配**  
**Arbitrary redistribution of wealth**



# 皮鞋成本

## Shoeleather Costs

- 当通货膨胀鼓励人们减少货币持有量时，由此导致的资源浪费就是**皮鞋成本**。

**Shoeleather costs** are the resources wasted when inflation encourages people to reduce their money holdings.

- 通货膨胀减少了货币的真实价值，因此人们就有激励去最小化其现金持有。

Inflation reduces the real value of money, so people have an incentive to minimize their cash holdings.

# 皮鞋成本

## Shoeleather Costs

- 更少的现金持有要求更为频繁地跑到银行去，从支付利息的帐户中提取现金。

**Less cash requires more frequent trips to the bank to withdraw money from interest-bearing accounts.**

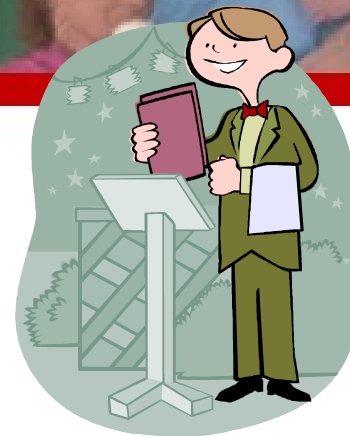
- 减少货币持有的实际成本，就是你为了不在手里多留现金而必须牺牲的时间和便利。

**The actual cost of reducing your money holdings is the time and convenience you must sacrifice to keep less money on hand.**

- 此外，更多地去银行耽误了生产性活动。

**Also, extra trips to the bank take time away from productive activities.**

# 菜单成本 Menu Costs



- **菜单成本**是调整价格的成本。  
**Menu costs** are the costs of adjusting prices.
- 在通货膨胀时期，有必要随时更新价目表和其他标价。

During inflationary times, it is necessary to update price lists and other posted prices.

- 这是一个耗费资源的过程，耽误了其他的生产性活动。

This is a resource-consuming process that takes away from other productive



# **相对价格变动**

## **Relative-Price Variability**

- **通货膨胀扭曲相对价格。**  
**Inflation distorts relative prices.**
- **消费者的决策被扭曲，市场将资源配置到其最优用途的能力下降。**  
**Consumer decisions are distorted, and markets are less able to allocate resources to their best use.**



# **通货膨胀引致的税收扭曲**

## **Inflation-Induced Tax Distortion**

- **通货膨胀夸大了资本收益的数量，加重了此类收入的税收负担。**

**Inflation exaggerates the size of capital gains and increases the tax burden on this type of income.**

- **如果是累进税率，资本收益被征的税更重**

**With progressive taxation, capital gains are taxed more heavily.**

# 通货膨胀引致的税收扭曲

## Inflation-Induced Tax Distortion

- 收入税将储蓄的名义利息收入作为收入看待，即使部分的名义利息收入只不过弥补了通货膨胀的损失。

The income tax treats the nominal interest earned on savings as income, even though part of the nominal interest rate merely compensates for inflation.

- 税后的利率下降，使得储蓄的吸引力下降。  
The after-tax real interest rate falls, making saving less attractive.





# 通货膨胀上升如何加重了储蓄的税收负担

## How Inflation Raises the Tax Burden On Saving

	<b>Economy 1 (price stability)</b>	<b>Economy 2 (inflation)</b>
Real interest rate 实际利率	4%	4%
Inflation rate 通胀率	0	8
Nominal interest rate 名义利率 (Real interest rate + inflation rate)	4	12
Reduced interest due to 25 percent tax (.25 x nominal interest rate) 25 % 征税减少的利率	1	3
After-tax nominal interest rate (.75 x nominal interest rate) 税后名义利率	3	9
After-tax real interest rate 税后实际利率 (after-tax nominal interest rate - inflation rate)	3	1



# 混乱与不便

## Confusion and Inconvenience



- 当美联储增加货币供给并制造了通胀，它就侵蚀了记帐单位的实际价值。

When the Fed increases the money supply and creates inflation, it erodes the real value of the unit of account.

- 通胀导致不同时点的美元具有不同的实际价值。

Inflation causes dollars at different times to have different real values.

- 因此，随着价格上升，比较实际收入、成本和利润就变得更加困难。

Therefore, with rising prices, it is more difficult to compare real revenues, costs, and profits



# 任意的财富再分配

## Arbitrary Redistribution of Wealth

- 未预期的通货膨胀在人们中间，以一种与才能和需要都毫无关系的方式，进行**财富再分配**。 Unexpected inflation **redistributes wealth** among the population in a way that has nothing to do with either merit or need.
- 这些再分配之所以发生，是因为经济当中的许多借贷关系都是按照记帐单位——货币来约定条件的。

These redistributions occur because many loans in the economy are specified in terms of the unit of account – money.



# 总结

## Summary

- 经济当中的价格总水平进行调整，以使货币的供求平衡。

**The overall level of prices in an economy adjusts to bring money supply and money demand into balance.**

- 当中央银行增加货币供给的时候，它就导致了价格水平的上升。

**When the central bank increases the supply of money, it causes the price level to rise.**

- 货币供给数量的持续增长导致持续的通货膨胀 Persistent growth in the quantity of money<sup>52</sup>



# 总结

## Summary

- 货币中性原理假定货币数量的变动影响名义变量而非实际变量。

The principle of money neutrality asserts that changes in the quantity of money influence nominal variables but not real variables.

- 政府想要弥补其支出，只要印刷更多的钞票就可以了。

A government can pay for its spending simply by printing more money.

- 这就导致了“通货膨胀税”和超速通货膨胀。

This can result in an “inflation tax” and



# 总结

## Summary

- 按照费雪效应，当通货膨胀上升时，名义利率上升同样的数量，实际利率保持不变。

**According to the Fisher effect, when the inflation rate rises, the nominal interest rate rises by the same amount, and the real interest rate stays the same.**

- 许多人认为通货膨胀使得他们变得更加贫穷，因为它增加了他们买东西的花费。

**Many people think that inflation makes them poorer because it raises the cost of what they buy.**

- 这个观点是错误的，因为通货膨胀也增加了名义收入。  
**This view is a fallacy because inflation also raises nominal incomes.**



# 总结 Summary

- **经济学家归纳了通货膨胀的六种成本：**  
**Economists have identified six costs of inflation:**
  - **皮鞋成本 Shoeleather costs**
  - **菜单成本 Menu costs**
  - **相对价格的变动加剧**  
**Increased variability of relative prices**
  - **未预料到的税收负担变化**  
**Unintended tax liability changes**
  - **混乱与不便 Confusion and inconvenience**
  - **任意的财富再分配**  
**Arbitrary redistributions of wealth**