

# PART 1

## Ten Principles of Economics

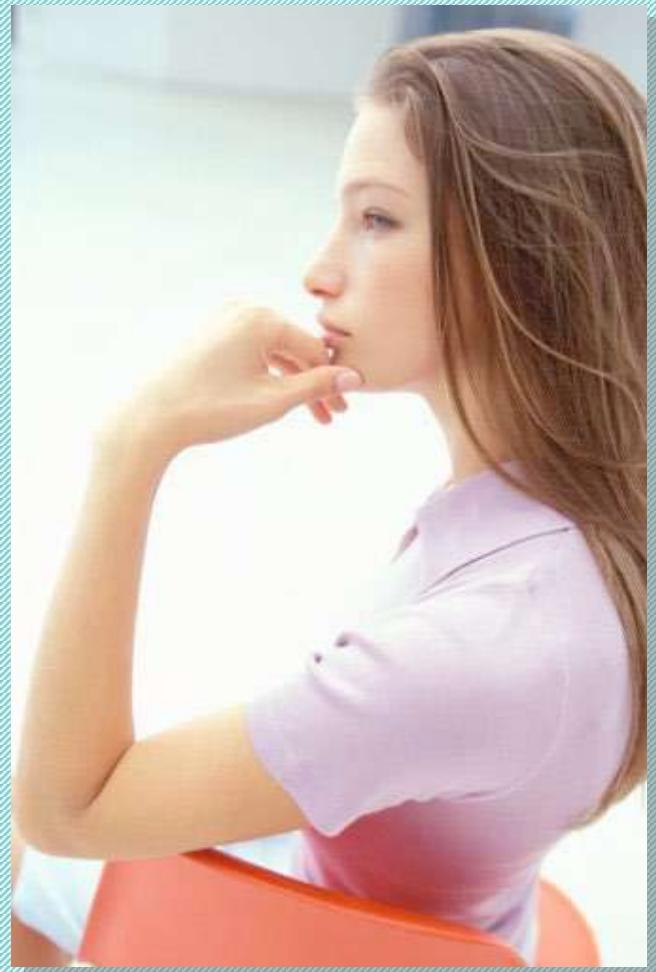
PRINCIPLES OF

## Microeconomics

Shizhe Peng

School of Economics and Management  
Changsha University of Science and Technology

# *Chapter 3: How the Overall Economy Works*



# **Chapter 3: How the Overall Economy Works**

- The first two chapters discussed how individuals make decisions and interact with each other.
- These decisions and interactions collectively form a nation's economy.
- The following principles will describe how the overall economy operates.

# Chapter 3: How the Overall Economy Works

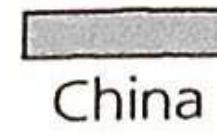
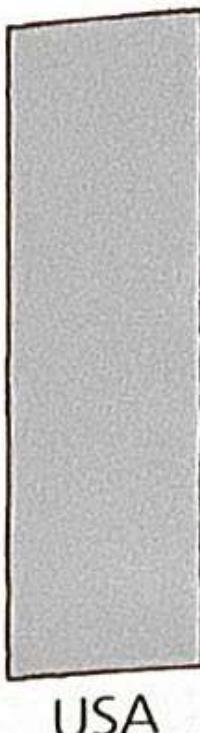
- Principle 8: A country's standard of living depends on its ability to produce goods and services.
- Principle 9: Prices rise when the government prints too much money.
- Principle 10: Society faces a short-run trade-off between inflation and unemployment.

## Principle 8: A country's standard of living depends on its ability to produce goods and services.

Principle

8

A country's standard of living depends on its ability to produce goods and services.

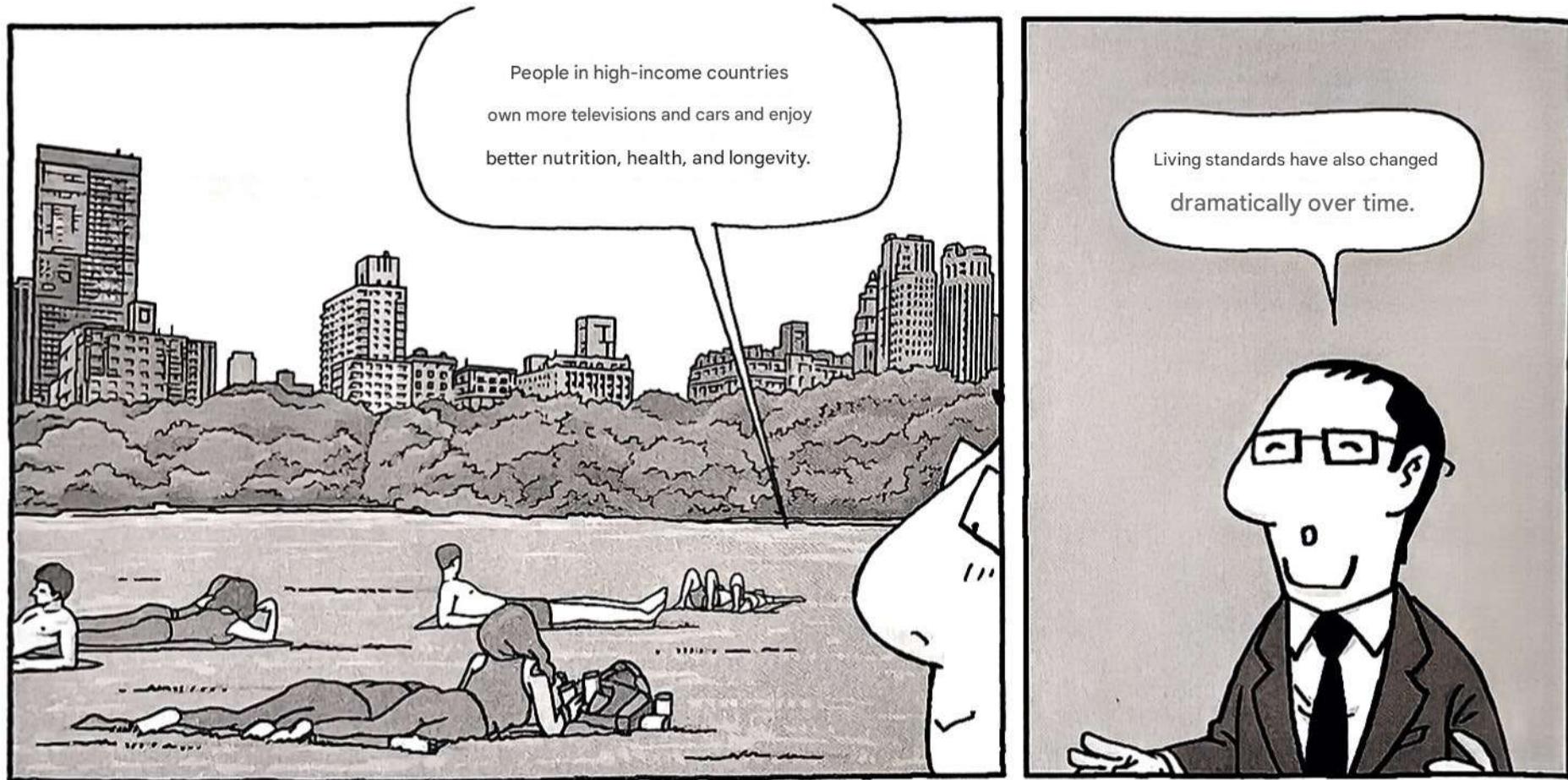


In 2011, the per capita national income of the US was 48,000 dollars while that of Mexico was \$9,000. China's per capita national income was \$5,000 and Nigeria's was \$1,200.

The income gap among countries represents the 'gap in quality of life'.



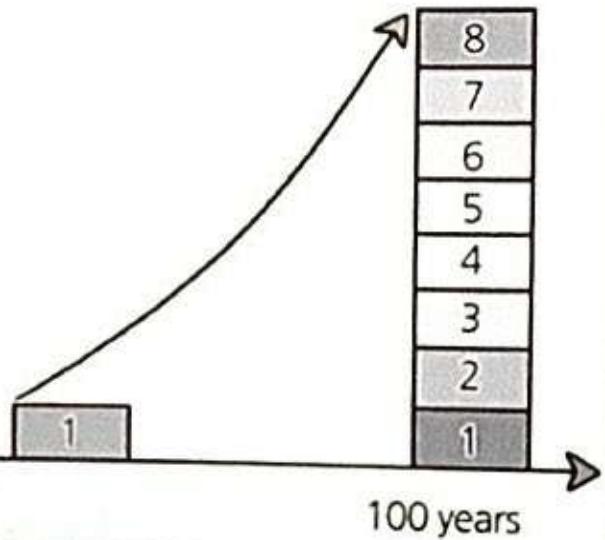
## Principle 8: A country's standard of living depends on its ability to produce goods and services.



in an average sense

## Principle 8: A country's standard of living depends on its ability to produce goods and services.

The US saw its incomes rise by 2% per year, which means it doubled every 35 years. As a result, its average income grew eight times over the past century.



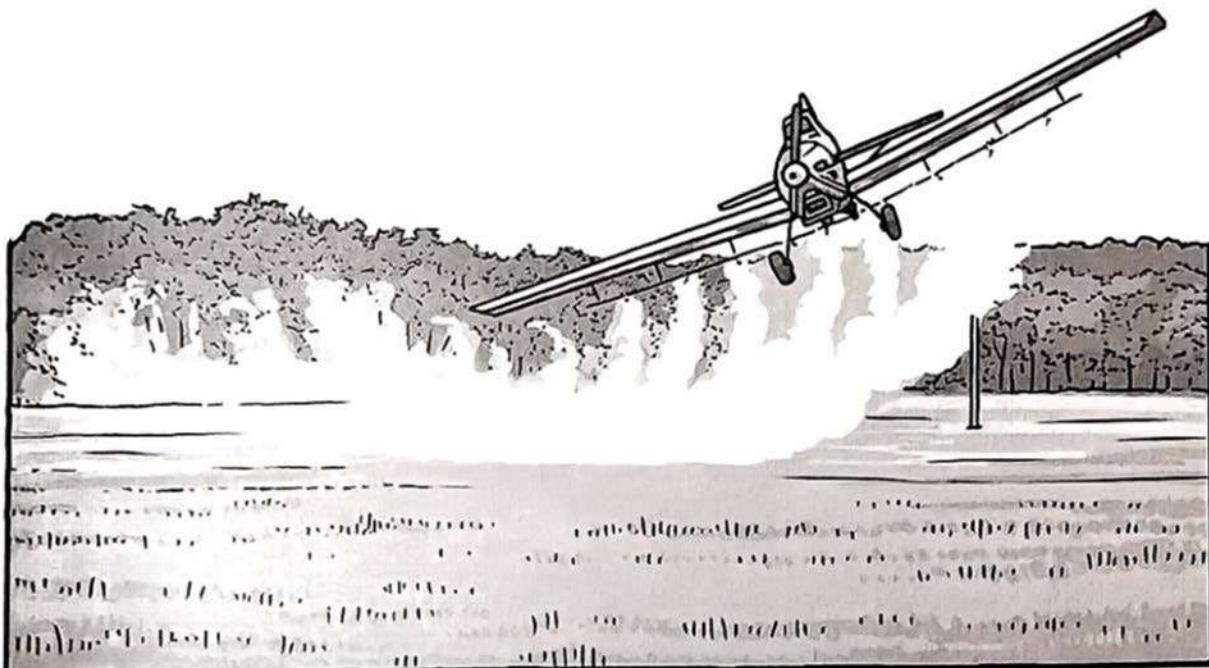
Changes in people's living standards come from differences in productivity



In other words, it results from differences in ability to produce goods and services per unit of labor input.

## Principle 8: A country's standard of living depends on its ability to produce goods and services.

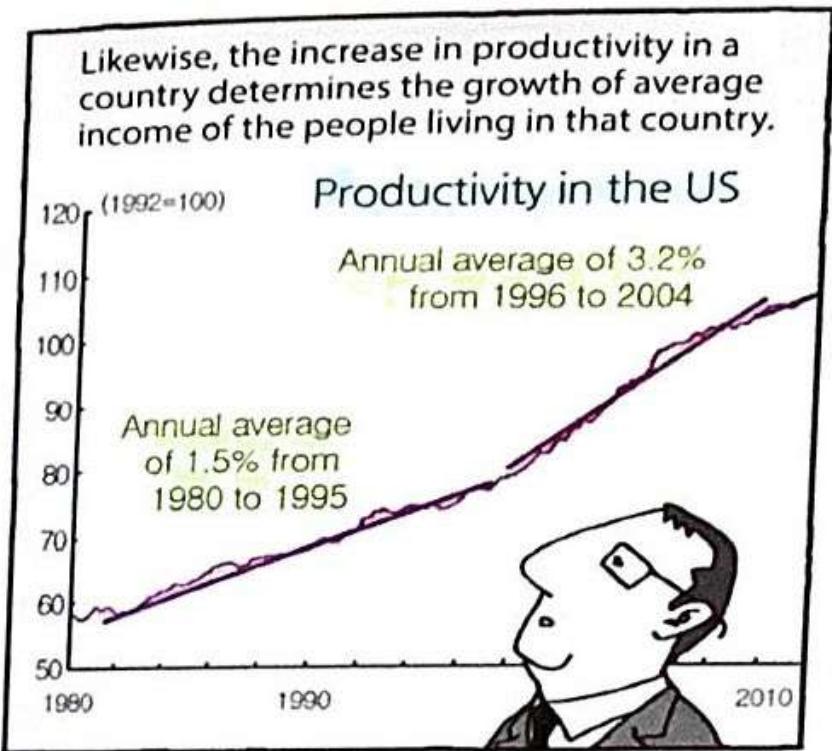
In countries where more goods and services are produced per hour worked, people have a higher standard of living.



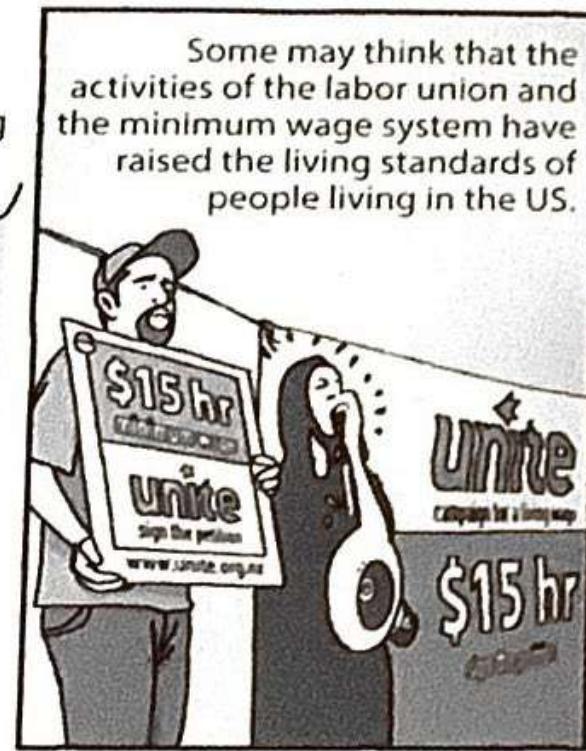
In countries where labor productivity is low, people have to endure a poorer life.



## Principle 8: A country's standard of living depends on its ability to produce goods and services.

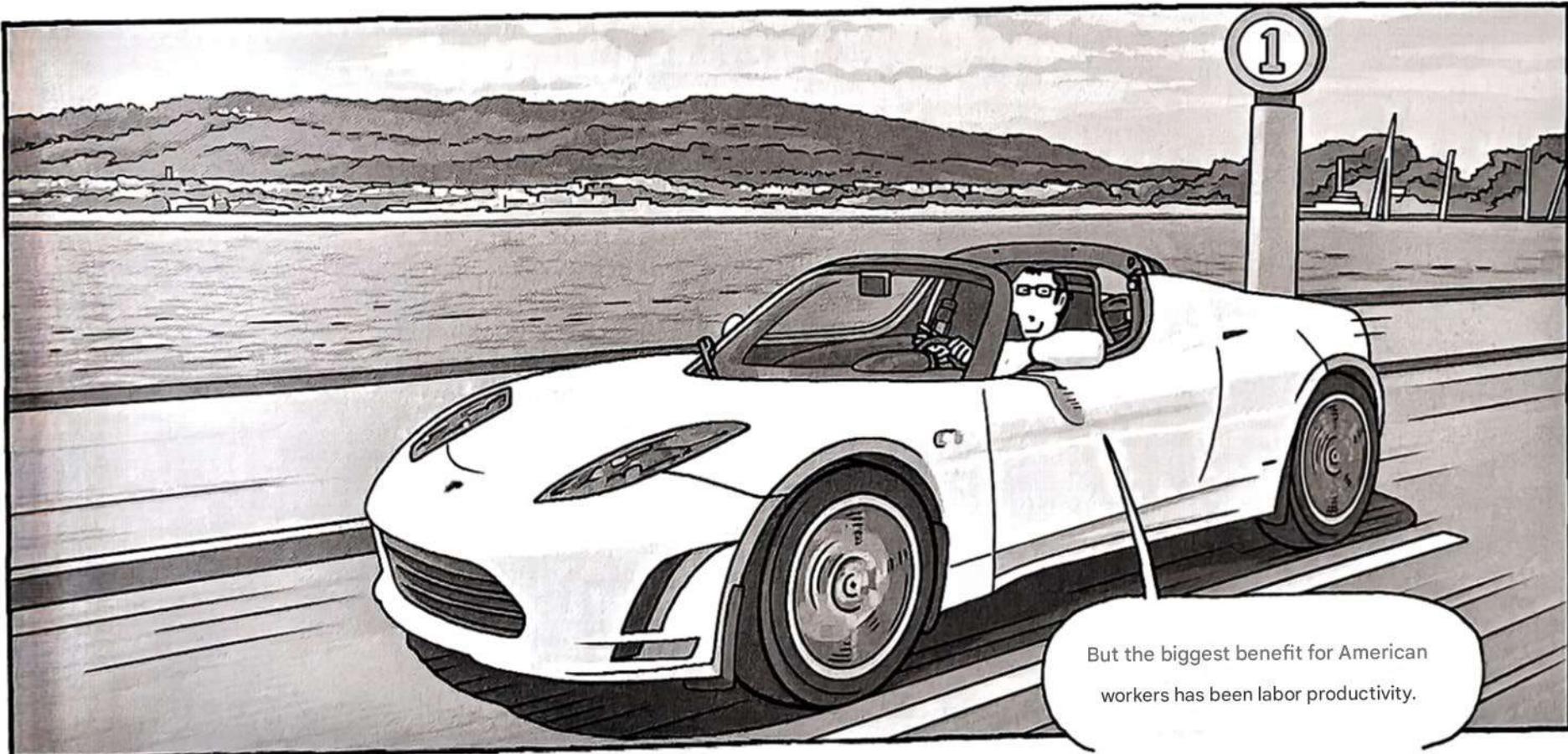


There is a clear correlation between productivity and living standards, but people are often confused.



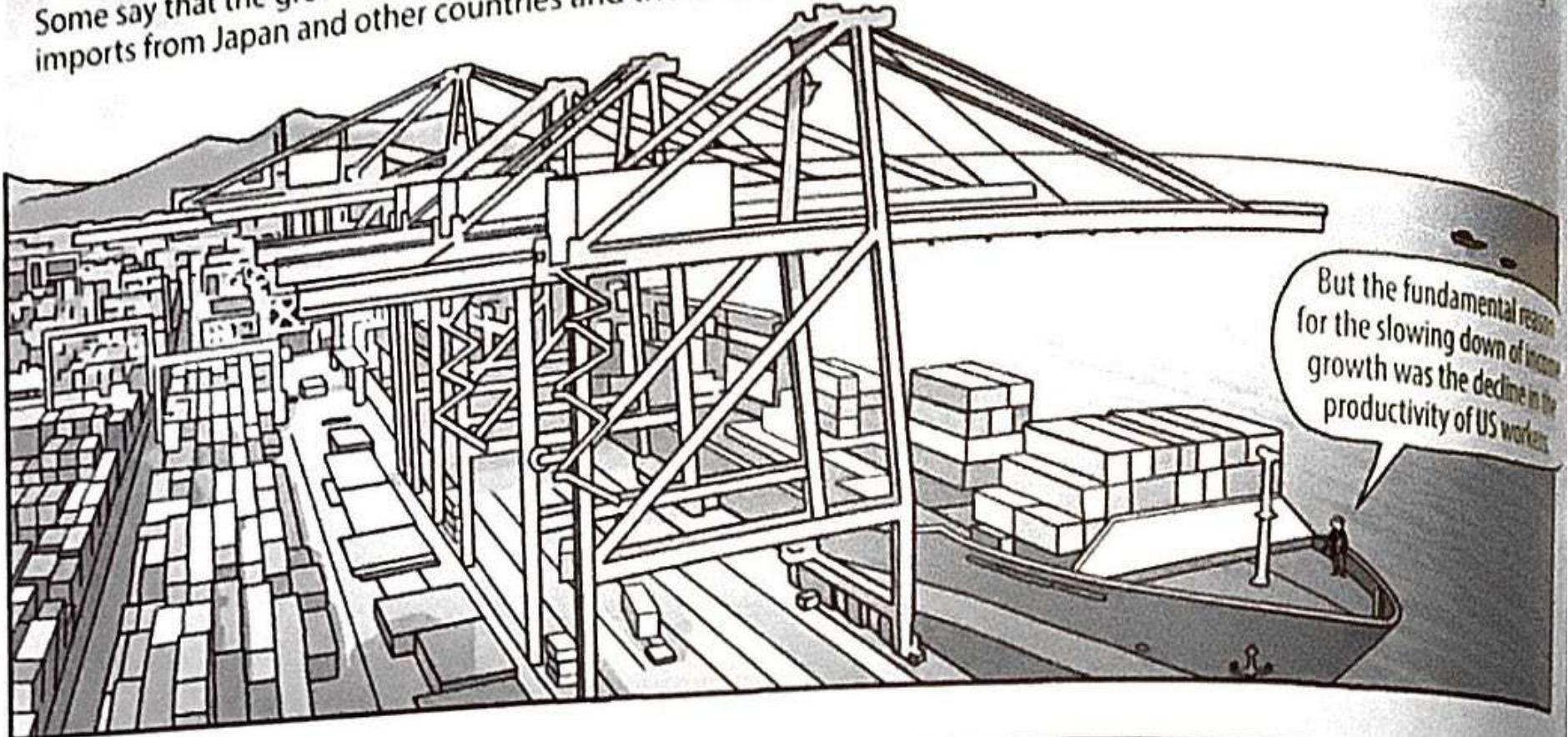
An increase in productivity means more output per unit of time. For example, a worker who originally produced 5 units per hour can now produce 10 units due to technological advancements. As the total revenue of the enterprise grows, the company is willing to allocate a portion of this increase toward raising wages, achieving a win-win outcome.

## Principle 8: A country's standard of living depends on its ability to produce goods and services.

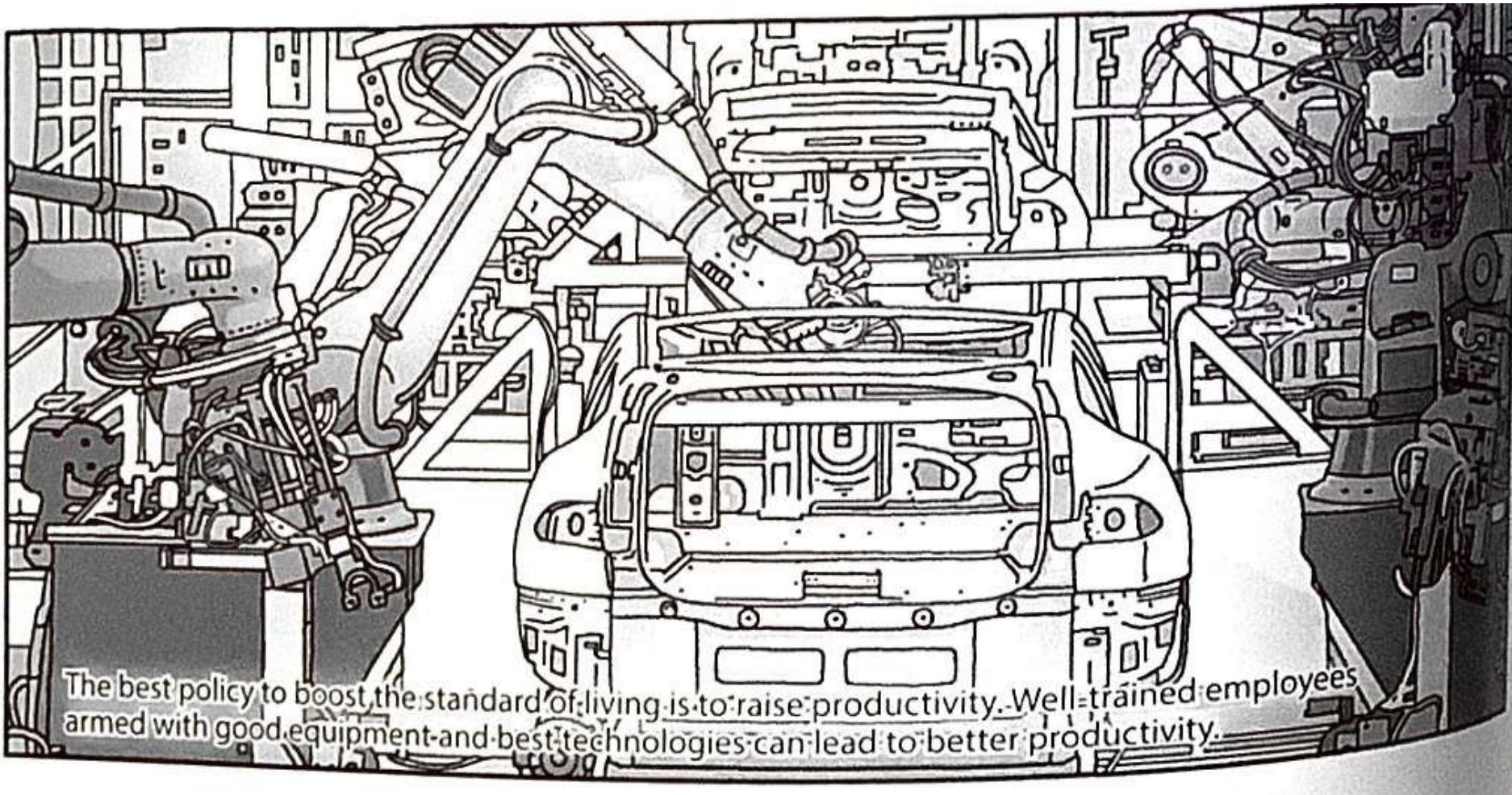


## Principle 8: A country's standard of living depends on its ability to produce goods and services.

Some say that the growth in the income of Americans slowed down in 1970s and 1980s because of increasing imports from Japan and other countries and the subsequent market competition.

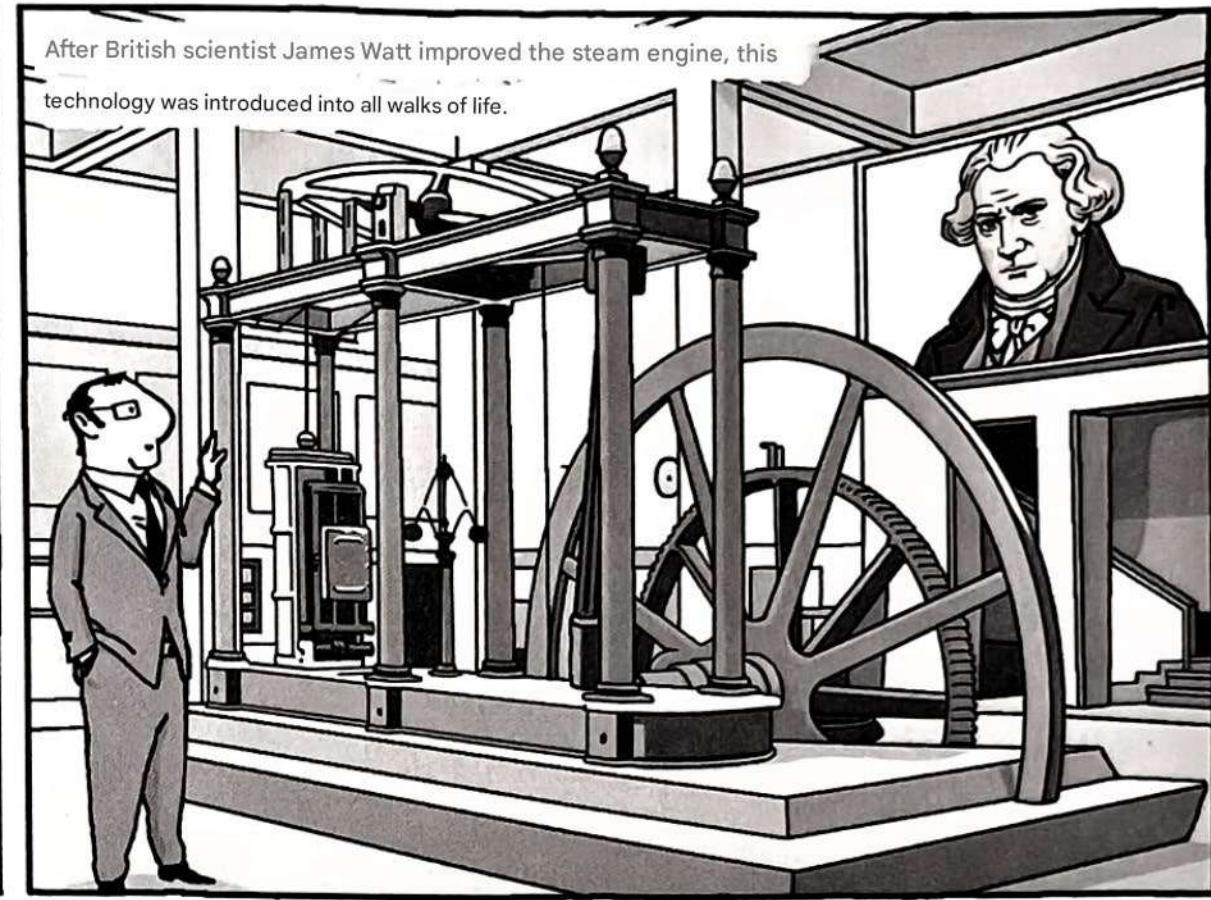


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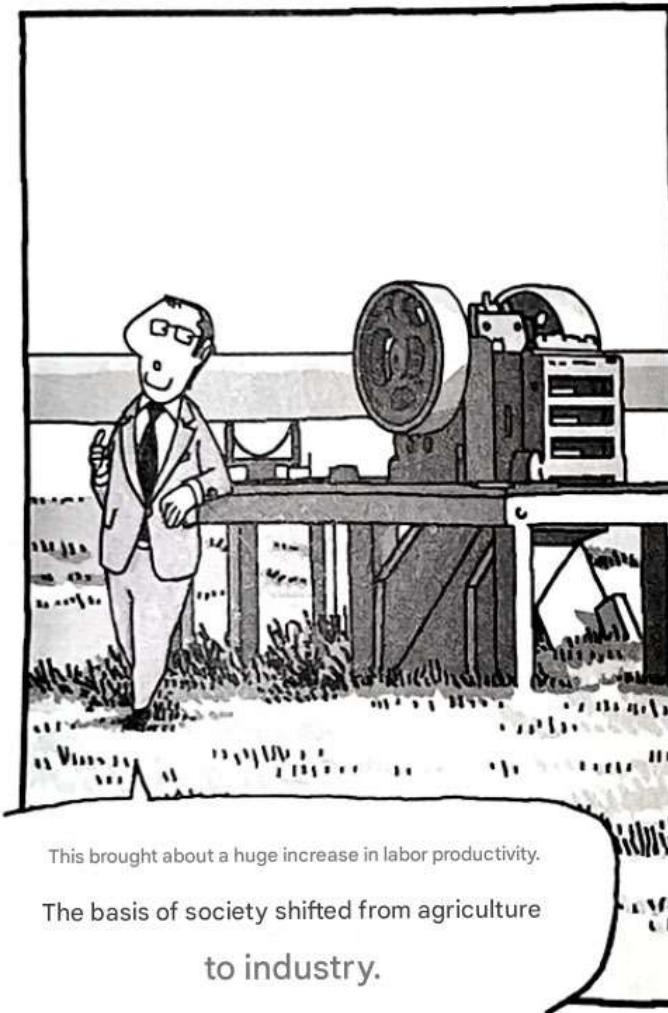
# Industrial revolution and employment

Industrial Revolution  
and Employment



There have been four industrial revolutions since the Industrial Revolution: the first (at the end of the 18th century) was represented by the steam engine and achieved mechanization; the second (at the end of the 19th century) was centered on electricity and the internal combustion engine and initiated large-scale production; the third (in the second half of the 20th century) relied on computers and automation technology to achieve automation and informatization; currently, we are in the midst of the fourth industrial revolution, whose core is to achieve intelligence and the deep integration of the physical and digital worlds through technologies such as data, the Internet of Things, and artificial intelligence.

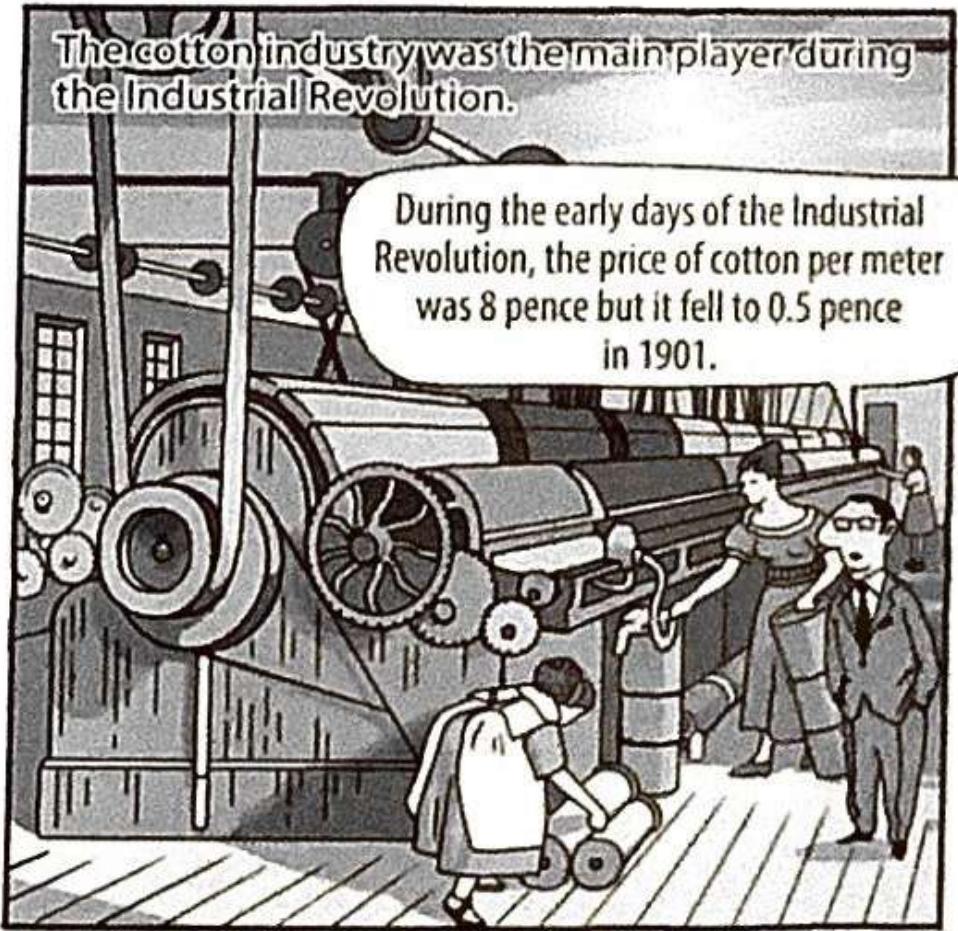
# Industrial revolution and employment



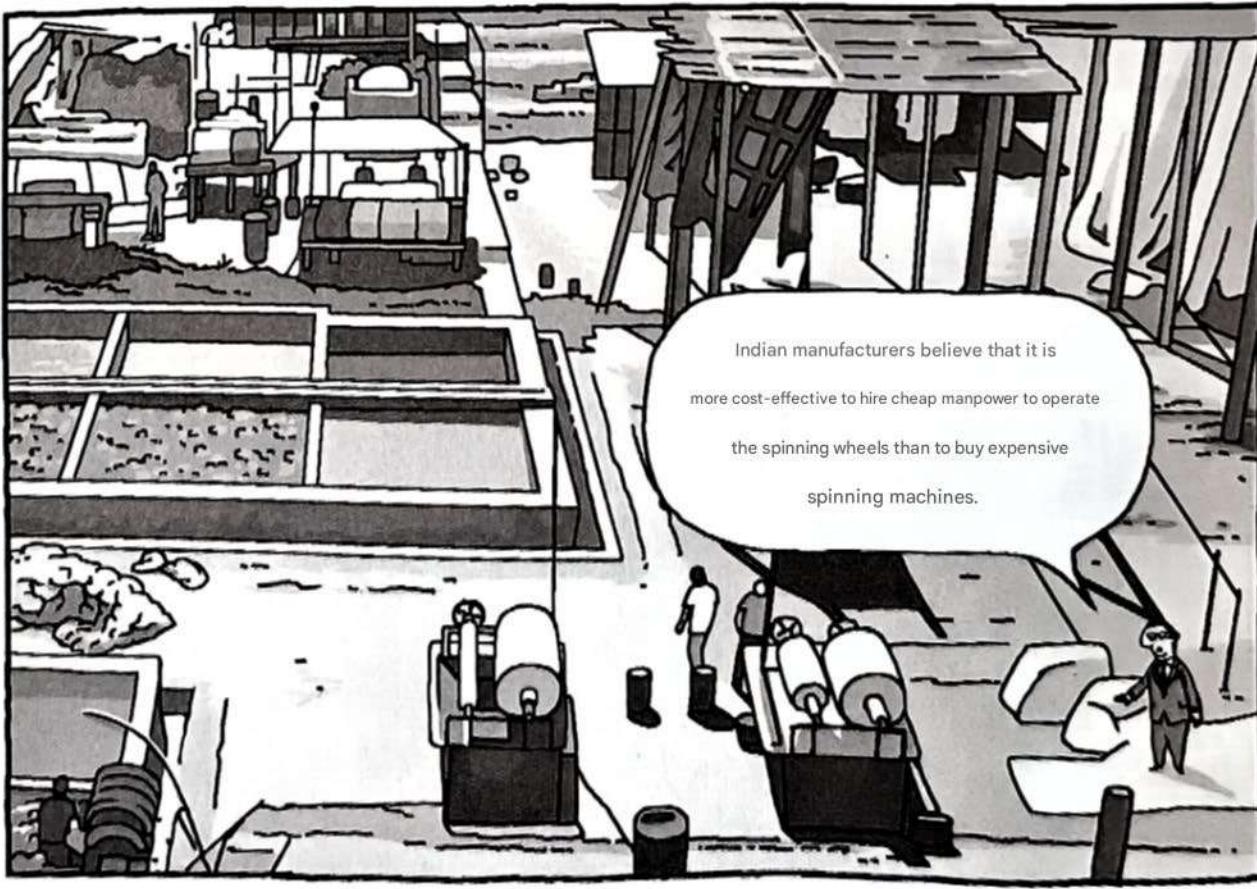
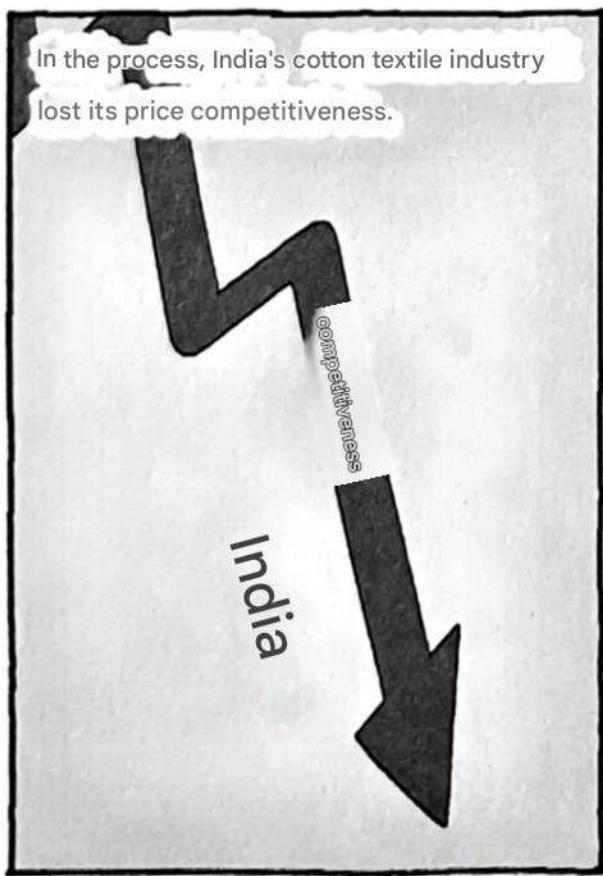
This brought about a huge increase in labor productivity.

The basis of society shifted from agriculture  
to industry.

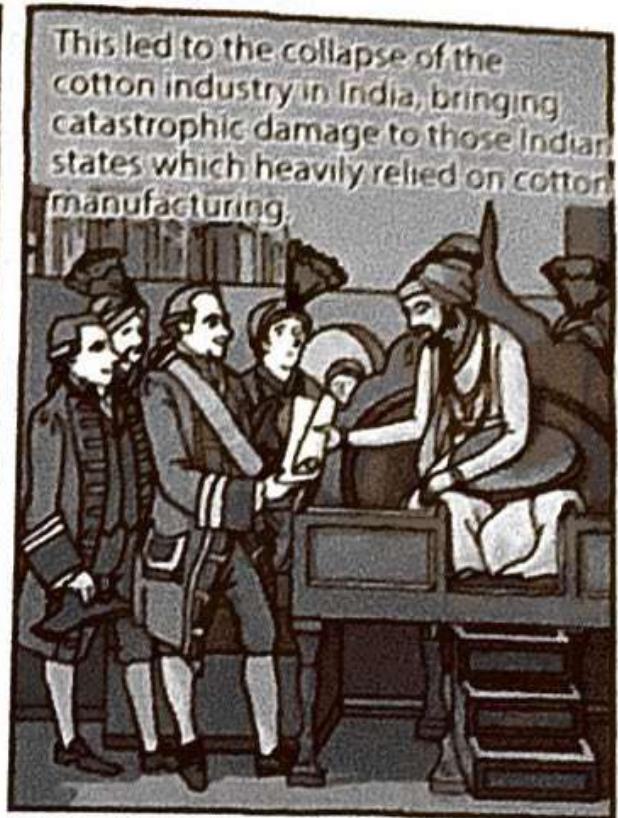
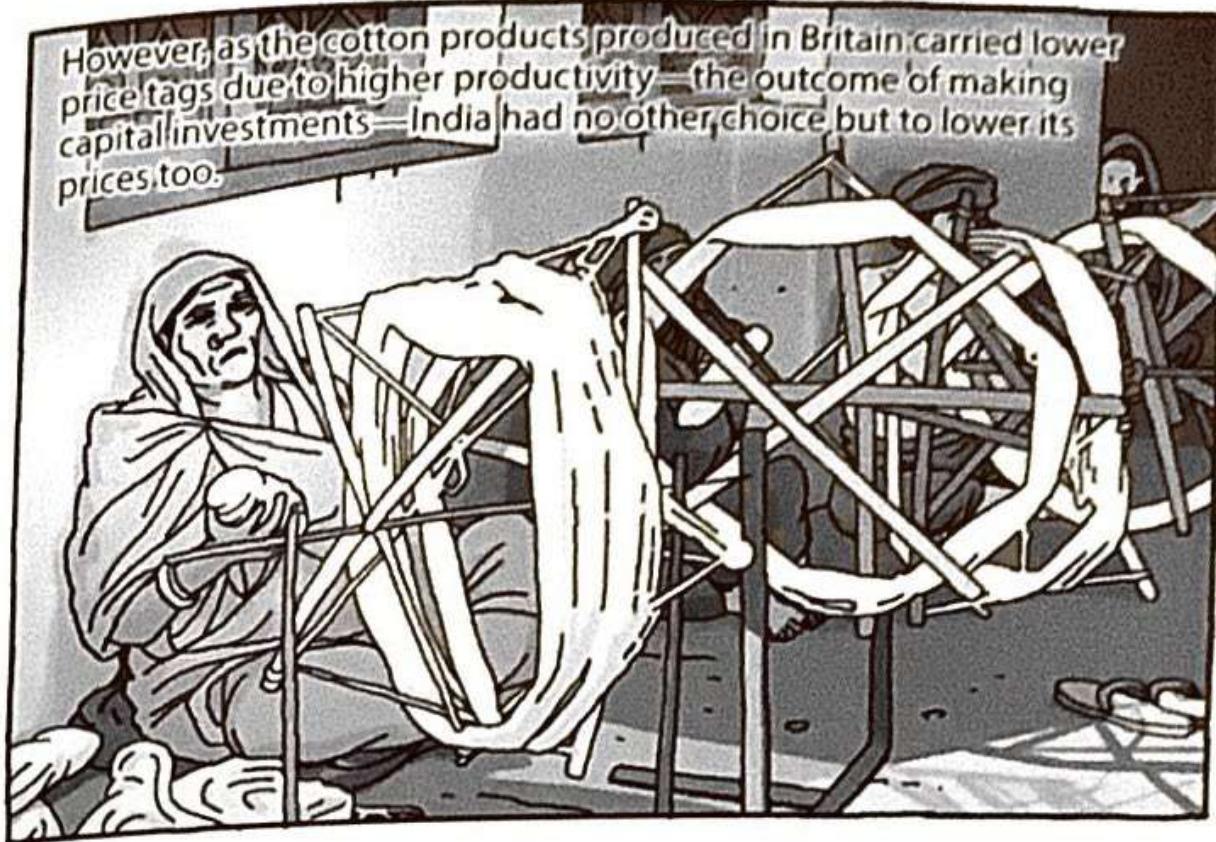
# Industrial revolution and employment



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# Industrial revolution and employment

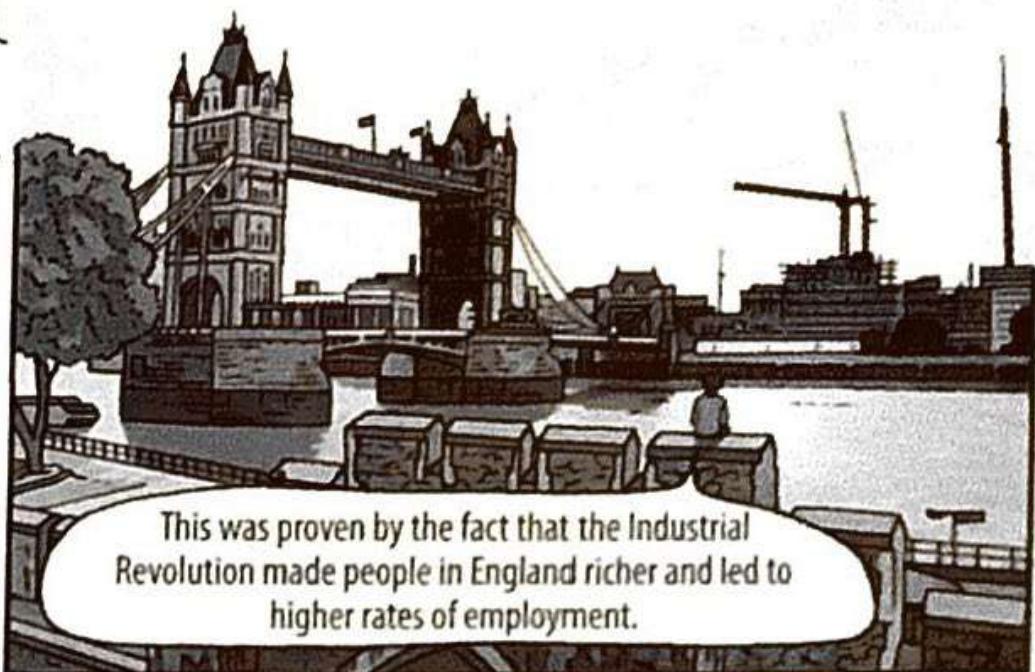


# Industrial revolution and employment

So there came the Luddites who destroyed weaving machines, as a form of protest. There were individuals or countries that suffered from the development of machinery.



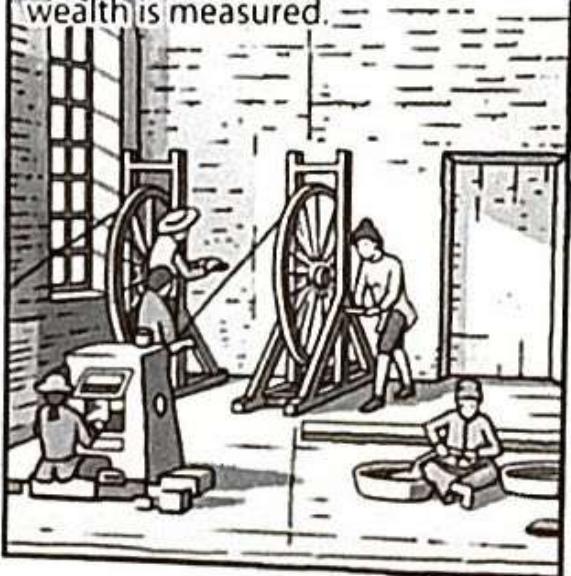
When all the surplus workers look for jobs that yield better productivity, more diverse goods and services become available.



When technological progress boosts the productivity of a certain industry, it no longer requires as many workers as before to meet social demands. The surplus laborers and corresponding capital thus freed up form a new, freely disposable "resource pool" for society. At this point, these resources will naturally flow to areas that can generate higher wages and profits.

# What is labor productivity

Since the introduction of machines in the Industrial Revolution, economists have taken the output produced by the combination of labor and capital as the new standard on which wealth is measured.



Productivity refers to the efficiency with which products are made. In a nutshell, people living in countries with higher productivity are better off than those living in countries with lower productivity.



So, labor productivity represents the core index that explains the living standard of different countries.

Labor productivity

$$= \frac{\text{Added value}}{\text{Hours of labor}} \\ (\text{or manpower employed})$$

# What is labor productivity

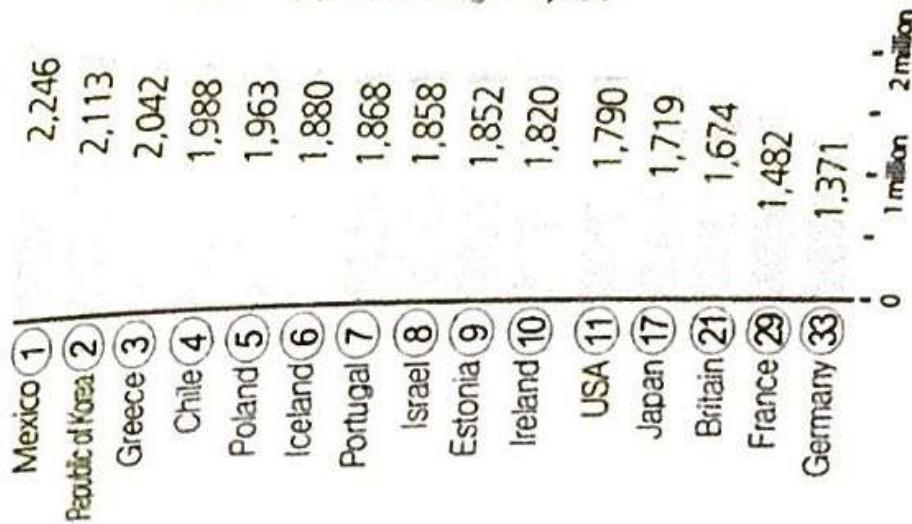
Such measures allow us to determine the welfare conditions of the people living in different parts of the world.



## Annual labor hours

Unit: Time (hour)

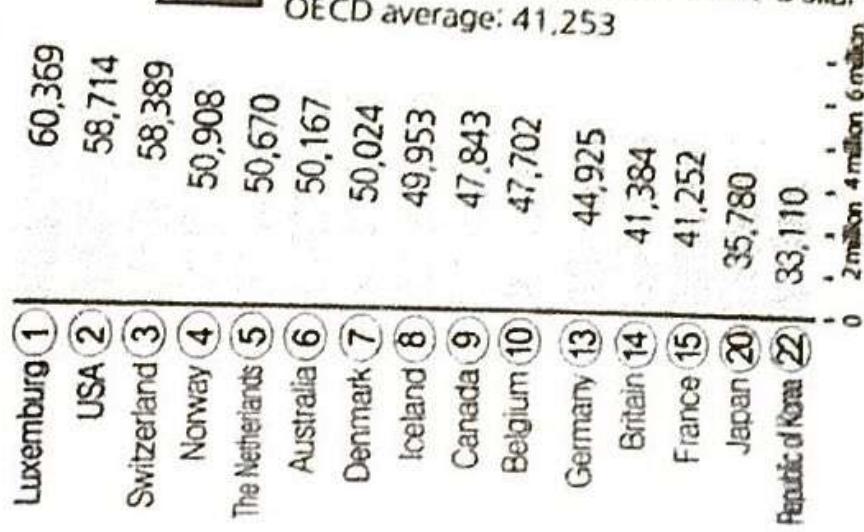
OECD average: 1,766



## Average actual wage per year

Based on purchasing power. Unit: Dollar

OECD average: 41,253



# What is labor productivity

According to labor productivity data released by the OECD in 2015, Mexico ranked last among its member countries. Mexicans work an average of 41.2 hours per week.

Mexico



Luxembourgers work an average of 29 hours per week and produce \$93.4 per hour, ranking first.

Luxembourg



# SUMMARY



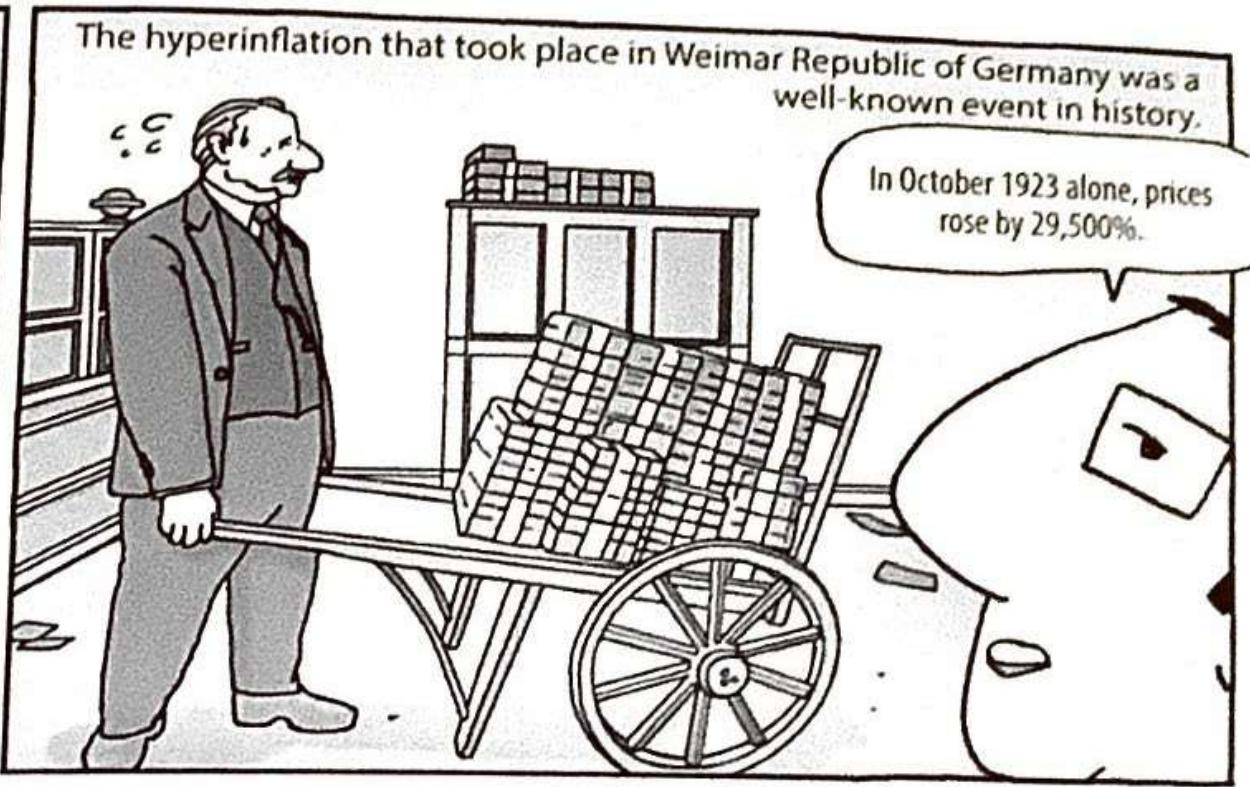
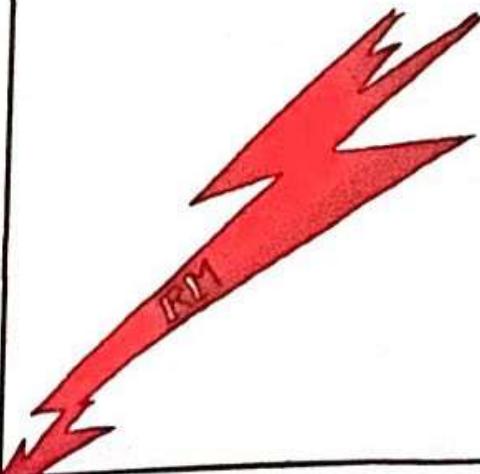
- Large differences in income and living standards among countries around the world are generally due to differences in labor productivity.
  - Labor productivity refers to the ratio of the quantity of labor input to the goods and services it can produce.
  - In short, the higher a country's labor productivity, the better the standard of living for its residents.
- Labor productivity is the primary determinant of living standards.
  - In comparison, factors such as union activities, minimum wage systems, and international competition are secondary.
- Therefore, to understand the impact of government policies on living standards, one must first grasp how these policies affect productivity.

# Chapter 3: How the Overall Economy Works

- Principle 8: A country's standard of living depends on its ability to produce goods and services.
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## Principle 9: Prices rise when the government prints too much money

Hyperinflation  
in Germany



## Principle 9: Prices rise when the government prints too much money



## Principle 9: Prices rise when the government prints too much money

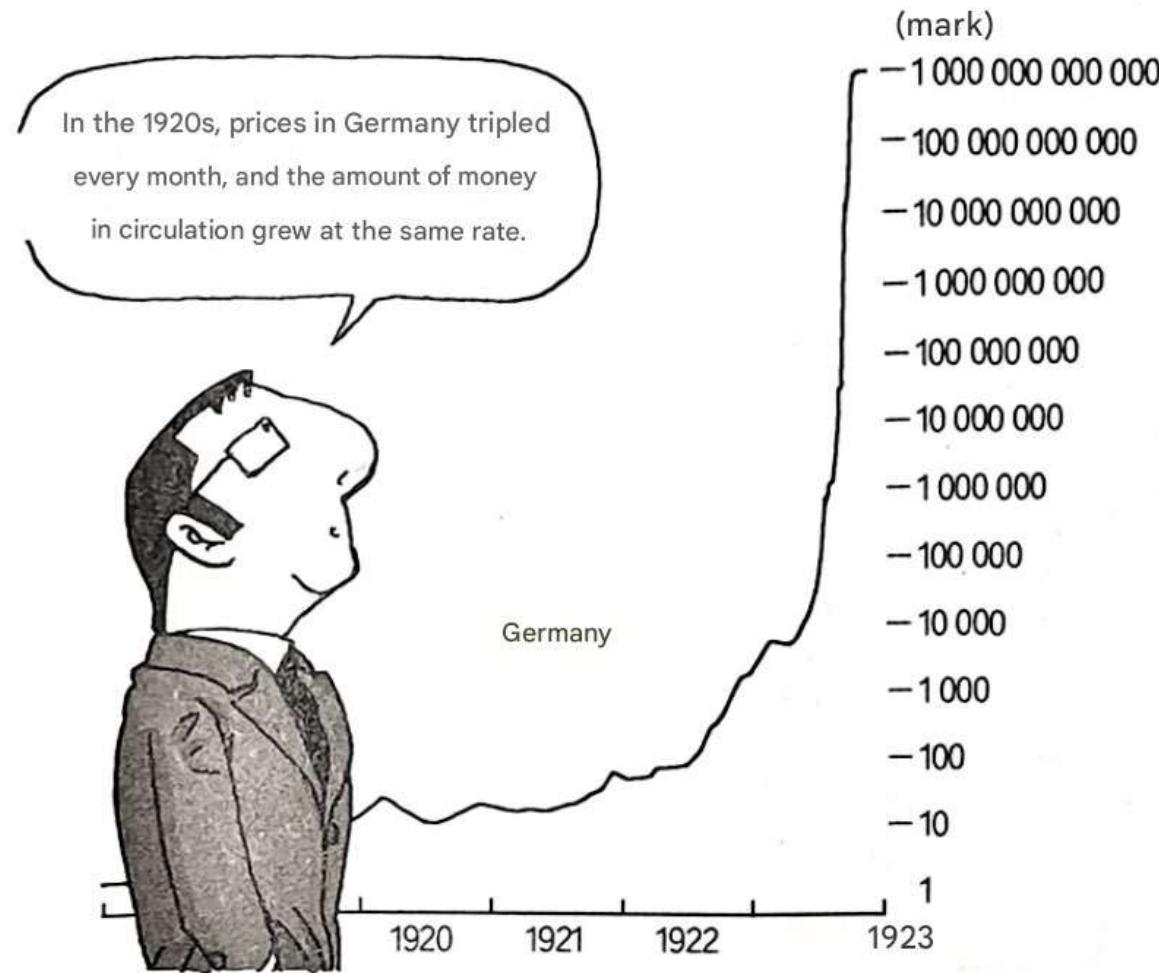


## Principle 9: Prices rise when the government prints too much money

A high inflation entails high social costs, which makes keeping price increase in control one of the highest priorities of any government.

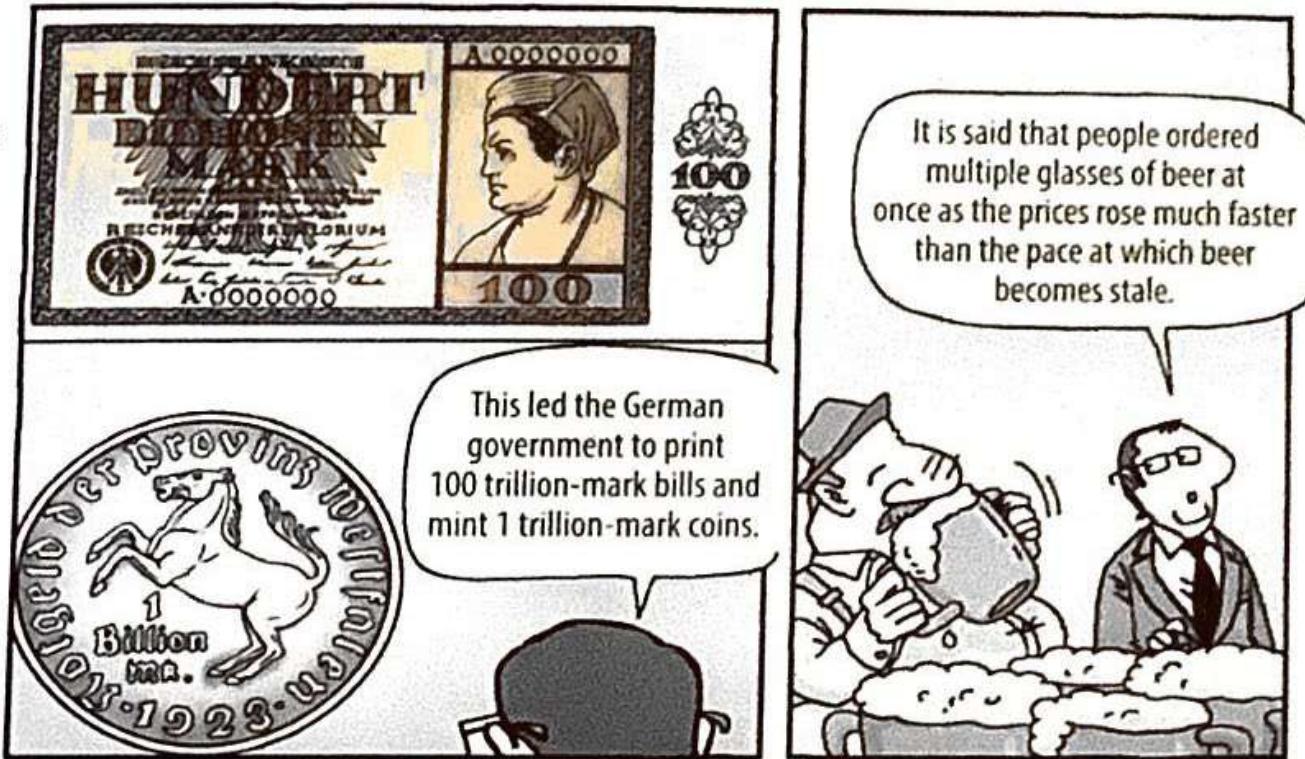
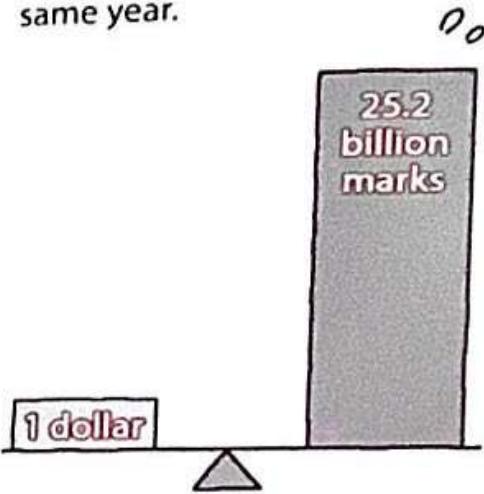


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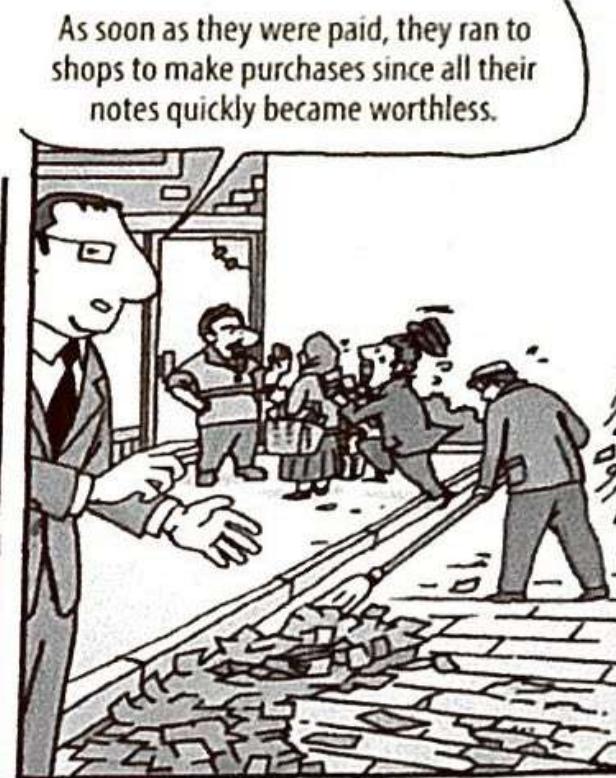
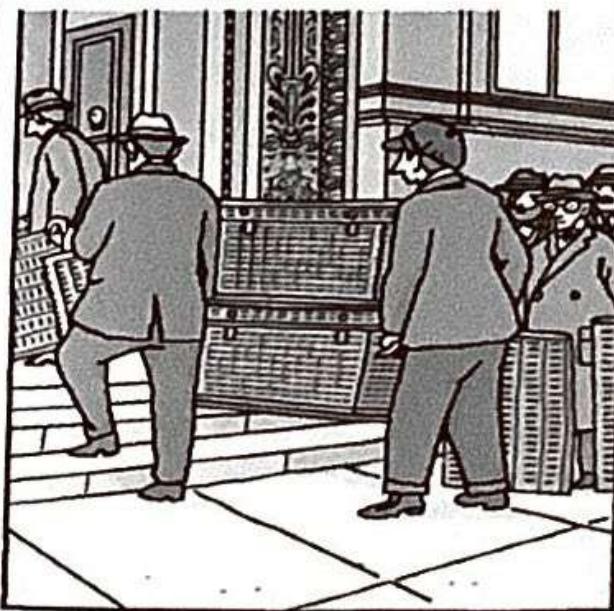
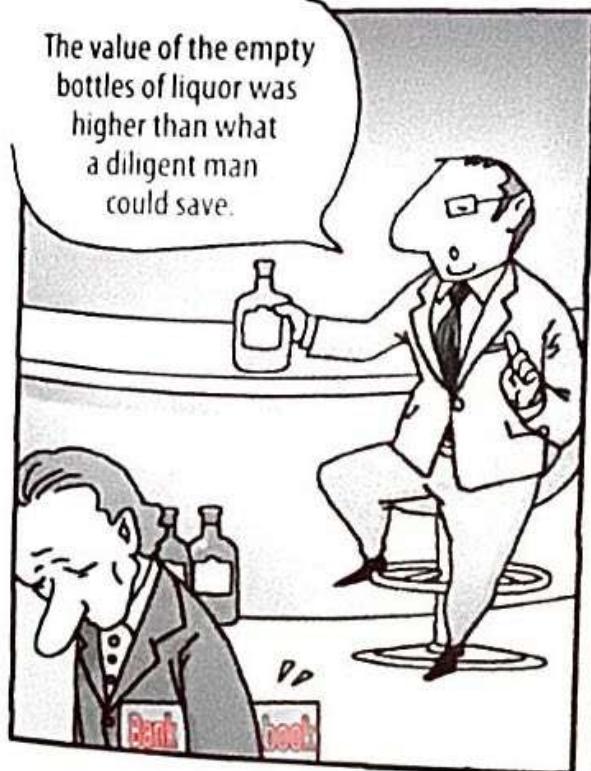


## Principle 9: Prices rise when the government prints too much money

The exchange rate was 49,000 marks per dollar on January 31, 1923. It rose to 25.2 billion mark per dollar on October 31 of the same year.



## Principle 9: Prices rise when the government prints too much money

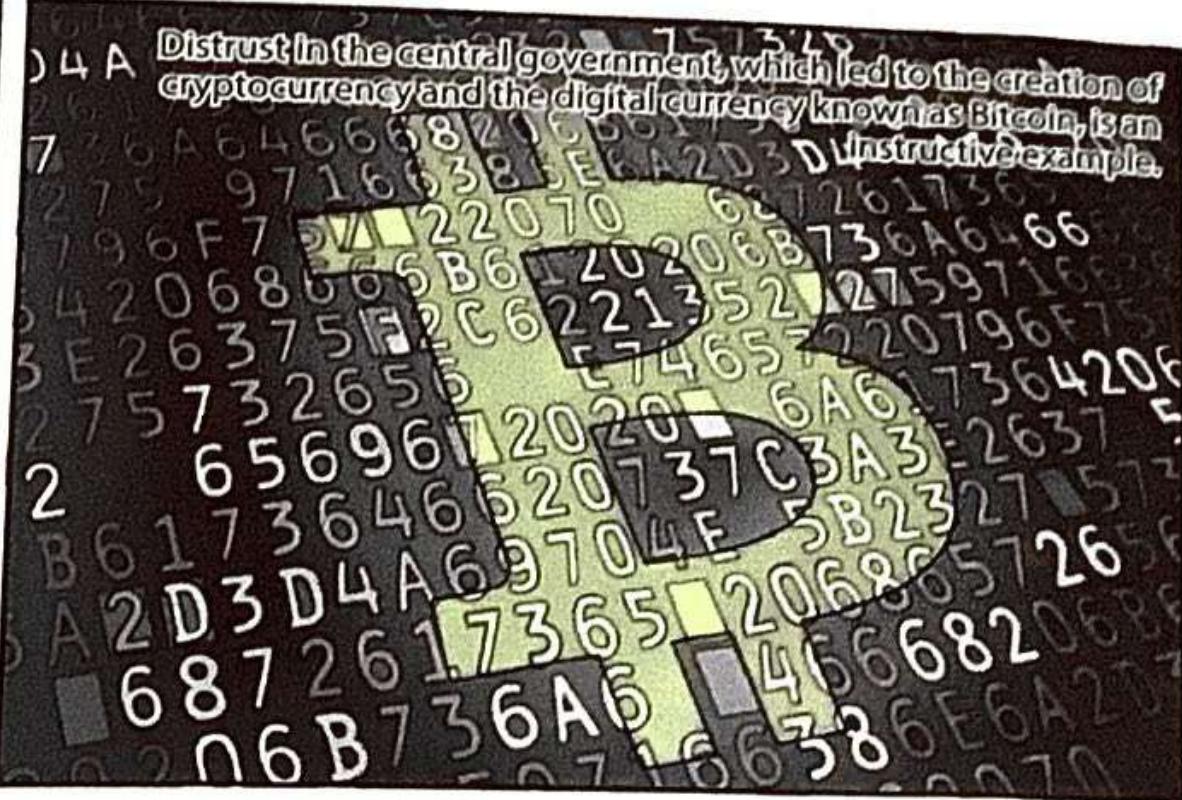


## Principle 9: Prices rise when the government prints too much money



# Bitcoin

Bitcoin



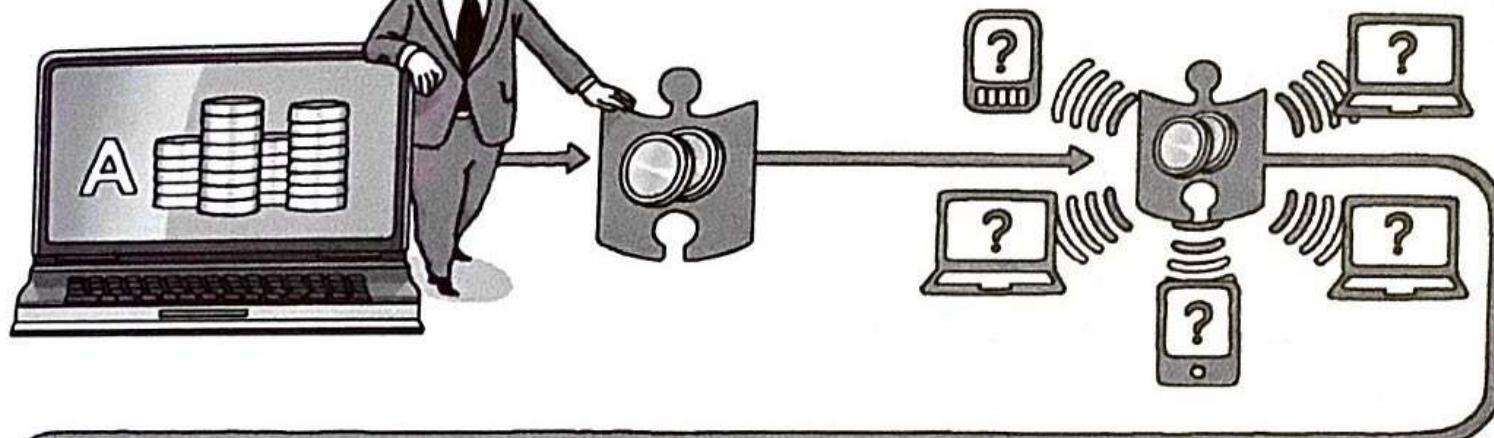
Bitcoin is the currency used for P2P transactions with no intervention from the bank.

The validity of the transactions is guaranteed by the consent of more than half of the people who joined the network.

- ① A wants to send money to B.

- ② Transaction is generated by the block on-line.

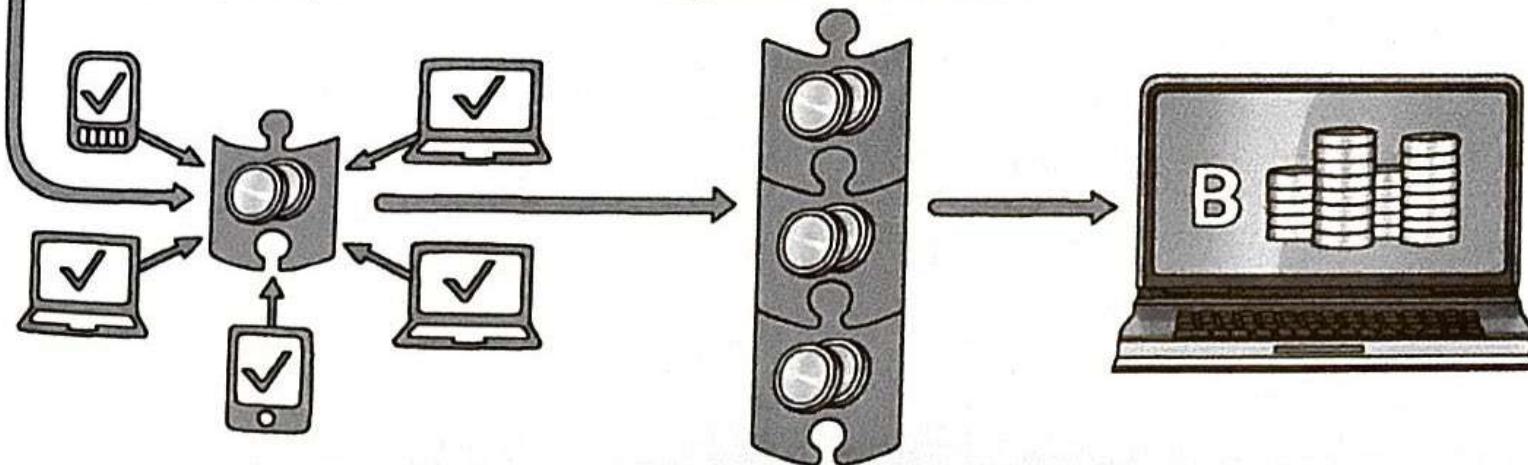
- ③ The relevant block is sent to all the participants in the network.



- ④ Validity of the participants is verified mutually by all the participants.

- ⑤ The block where transaction information is verified is registered on the chain.

- ⑥ Transmission from A to B is completed.



# Bitcoin

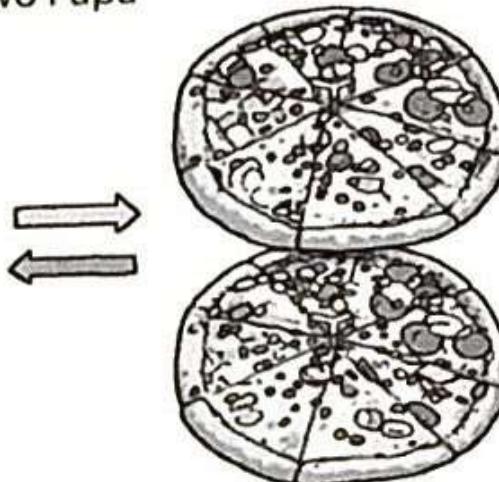
The system was at first thought to be created by a man named Satoshi Nakamoto. In 2016, the BBC uncovered its real creator, Craig Light, a businessman from Australia.



The first bitcoin transaction took place in May 2010, when 10,000 bitcoins were paid to purchase two Papa John's pizzas.

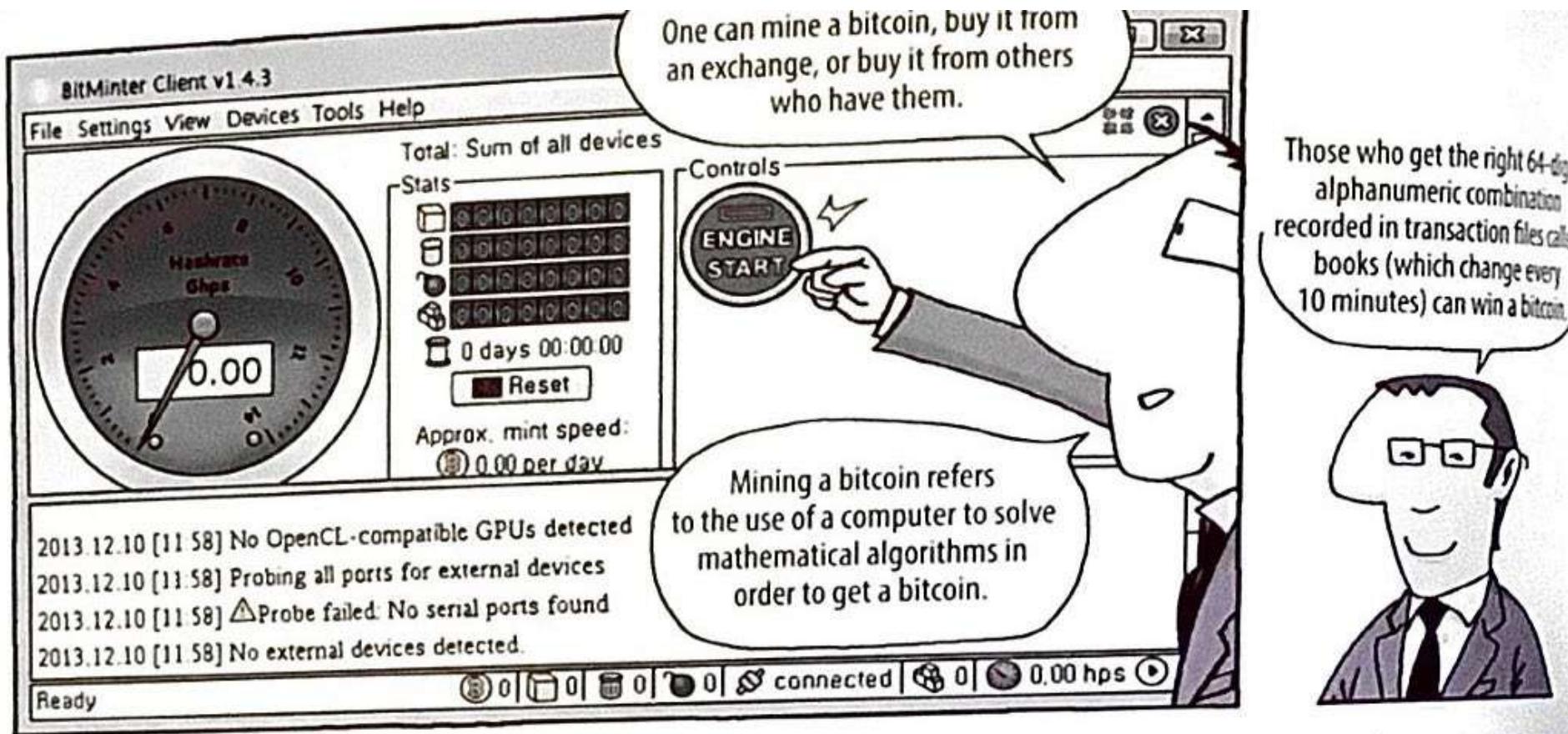


10,000 bitcoins

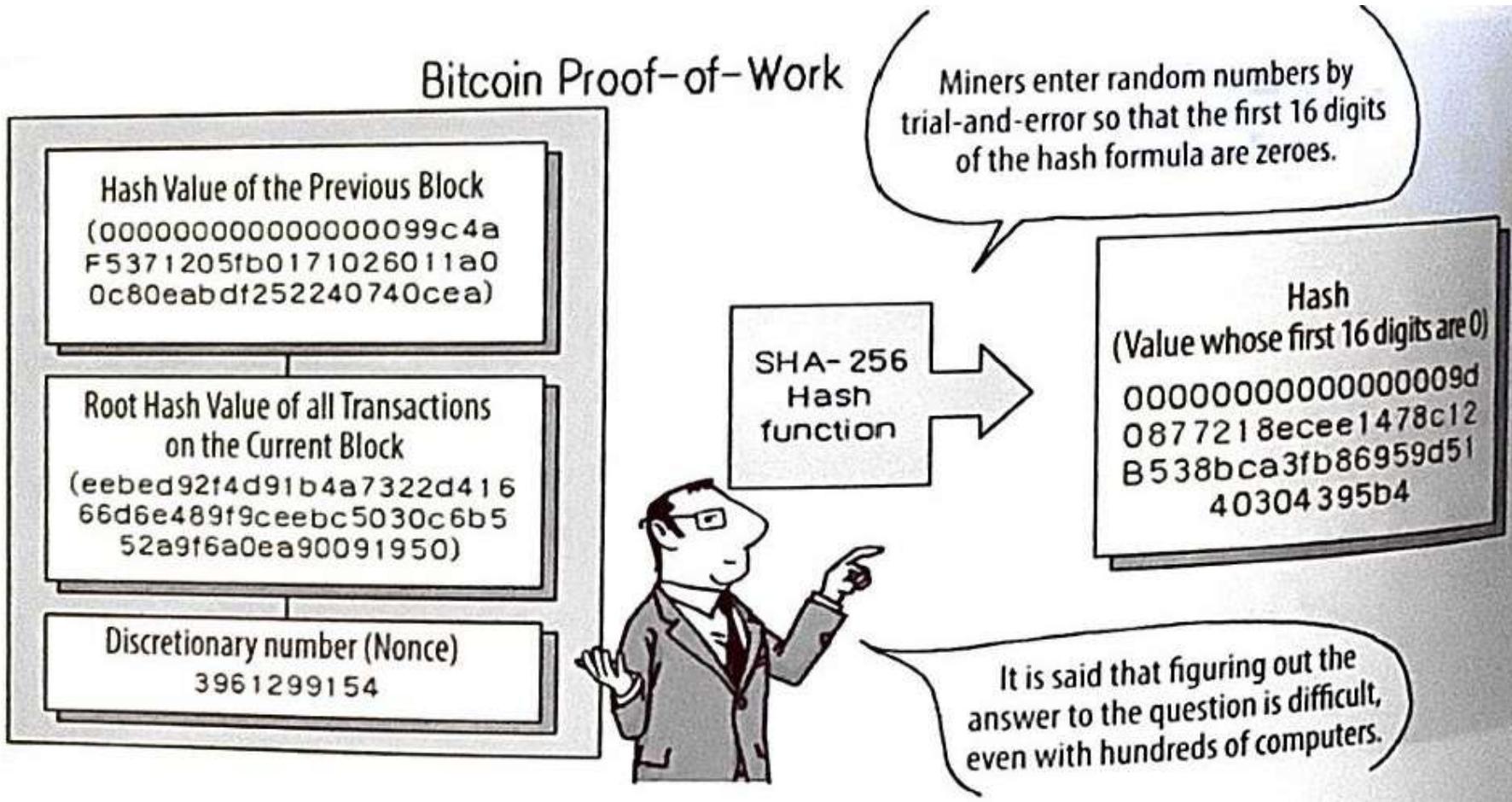


As of July 2017, one bitcoin is traded for 2,500 dollars. The price of those two pizzas today is 25 million dollars.

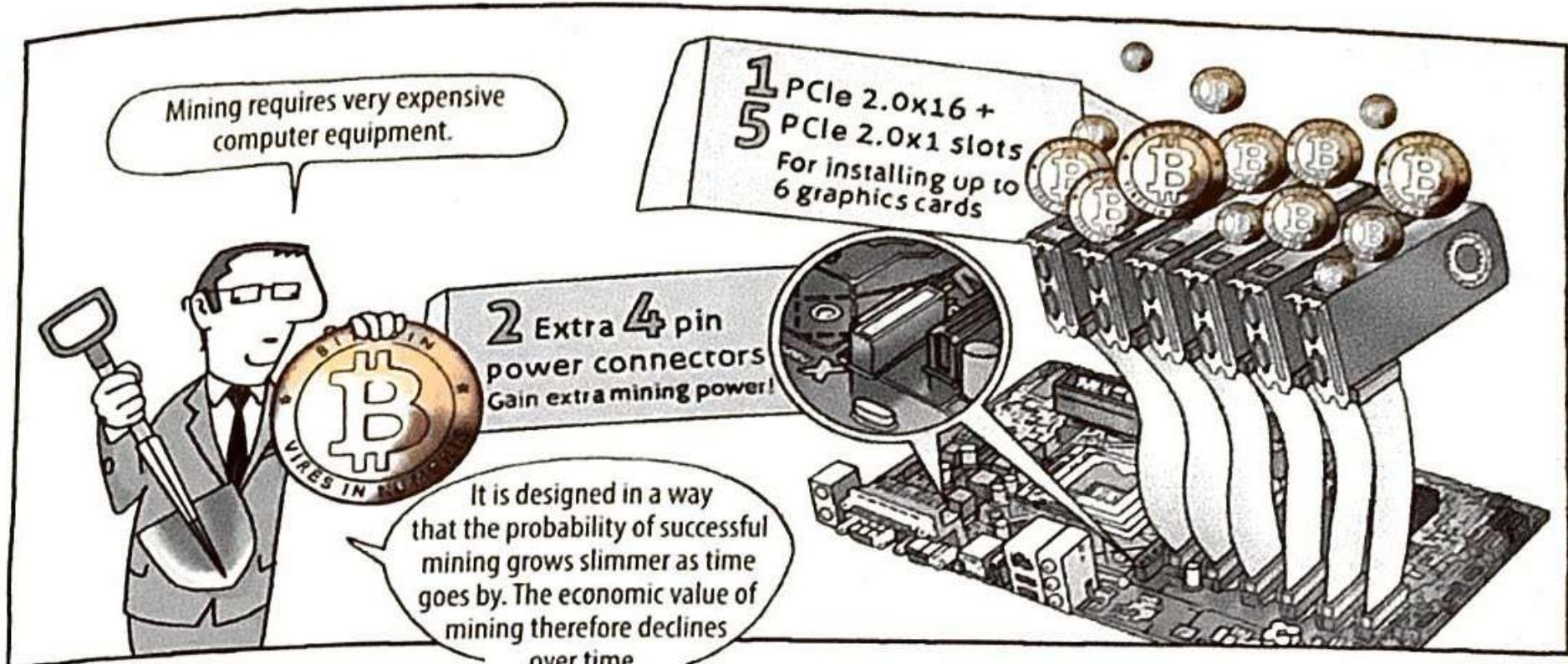
# Bitcoin



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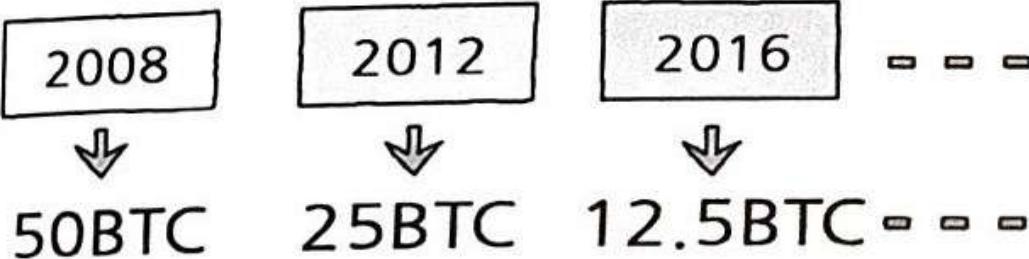
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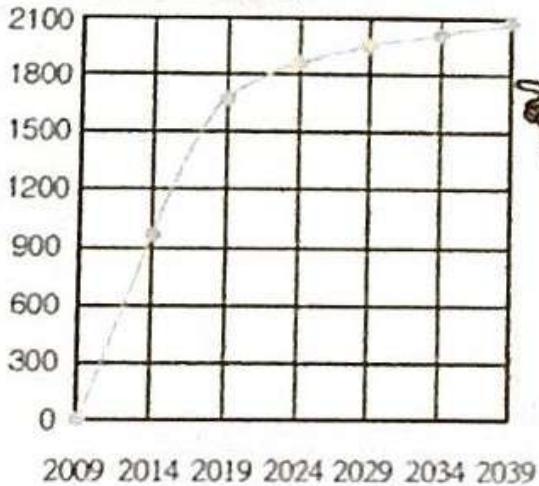
Bitcoins available to miners every 10 minutes are halved every four years.

## Half-life



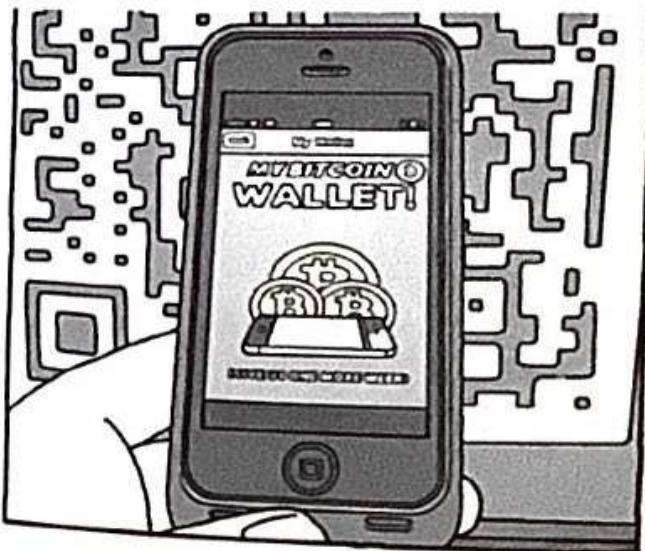
And it is designed in such a way that when the number of bitcoins mined reaches 21 million by 2040, there will be no more bitcoins to be mined.

(unit: tens of thousands)

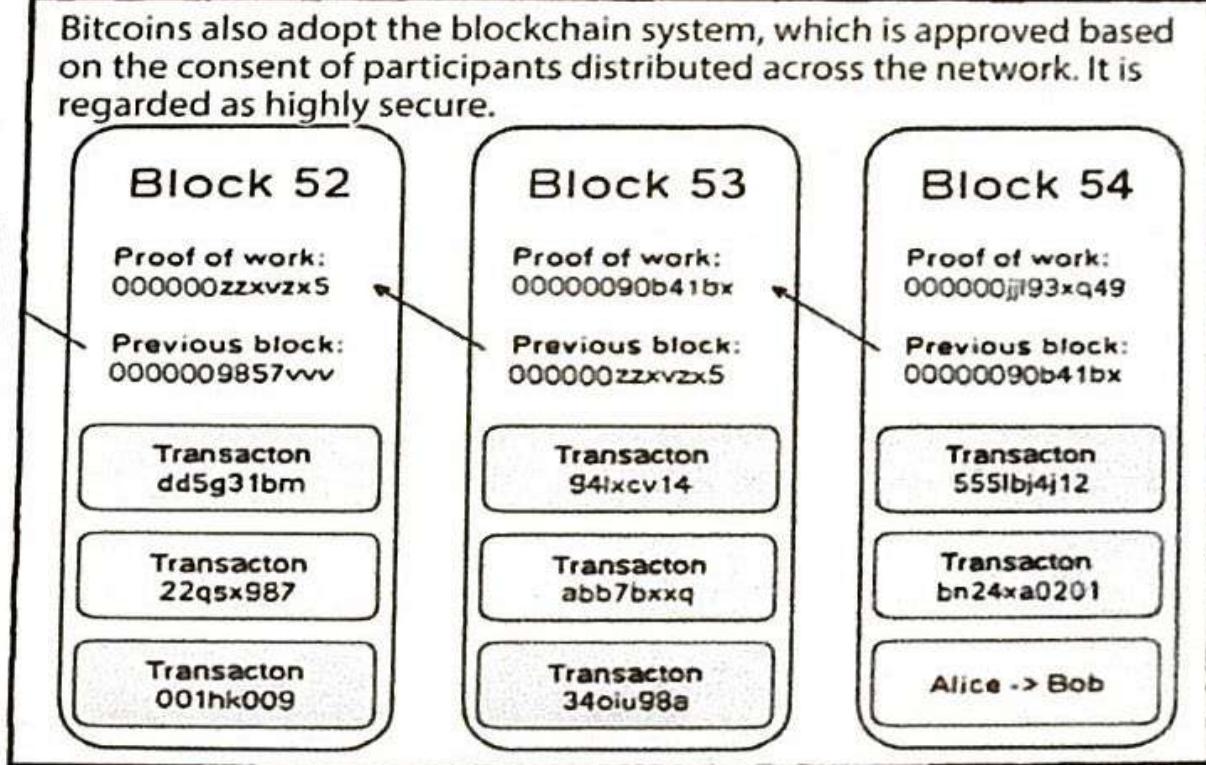


# Bitcoin

There is an ongoing experiment on bitcoin, regarded by Wall Street as a safe asset as long as it takes root, since there is no concern for inflation.



Bitcoins also adopt the blockchain system, which is approved based on the consent of participants distributed across the network. It is regarded as highly secure.



# SUMMARY



- Inflation refers to a general and sustained increase in prices across the economy.
- Deflation refers to a general and steady decline in prices.
- Hyperinflation describes rapid and uncontrollable price increases.
- It is crucial for governments to maintain low and stable price growth, as high inflation affects the entire economy and imposes significant costs at all levels of society.

# SUMMARY



- A sustained and rapid rise in the price level is caused by an increase in the money supply.
- When the government prints more money, the value of currency declines, which means the real value of the money people hold decreases.
- This was the case in Germany in the early 1920s and in the United States during the 1970s. Both governments resorted to printing money to cover massive budget deficits, leading to a significant expansion of the money supply.

# **Chapter 3: How the Overall Economy Works**

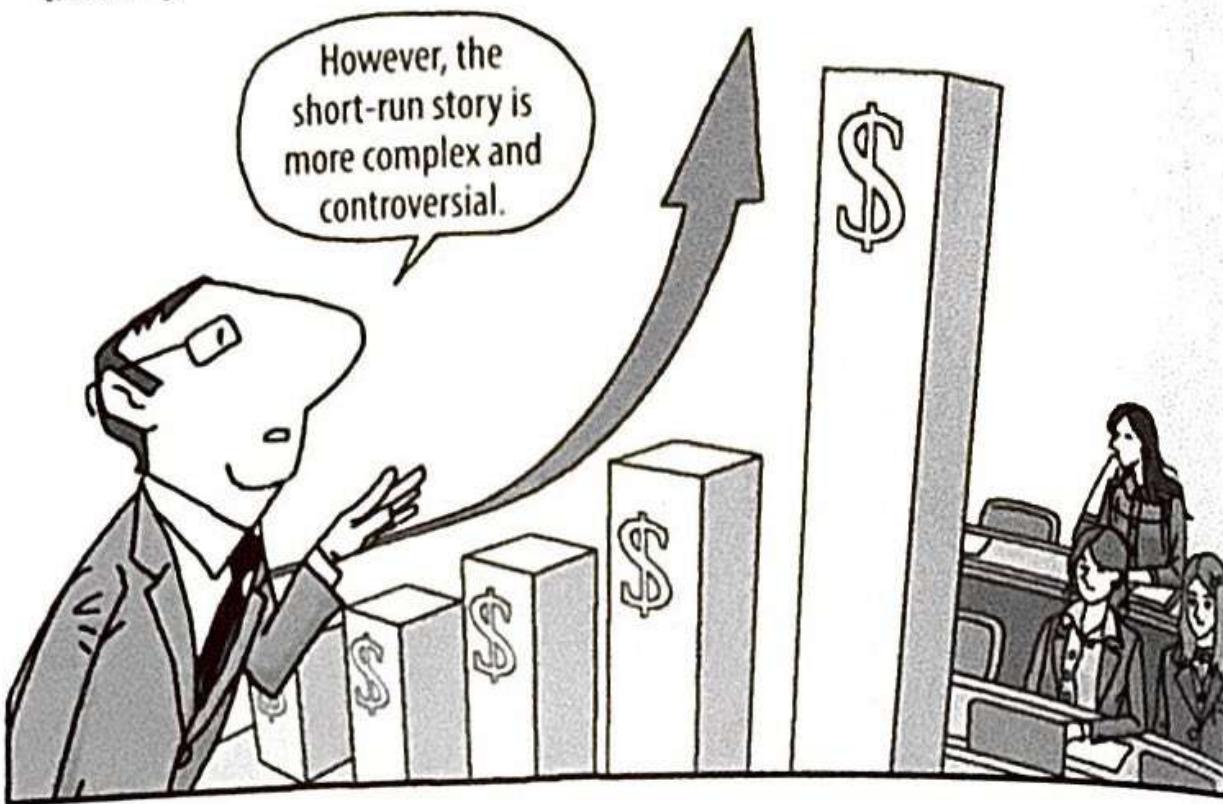
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## Principle 10: Society faces a short-run trade-off between inflation and unemployment

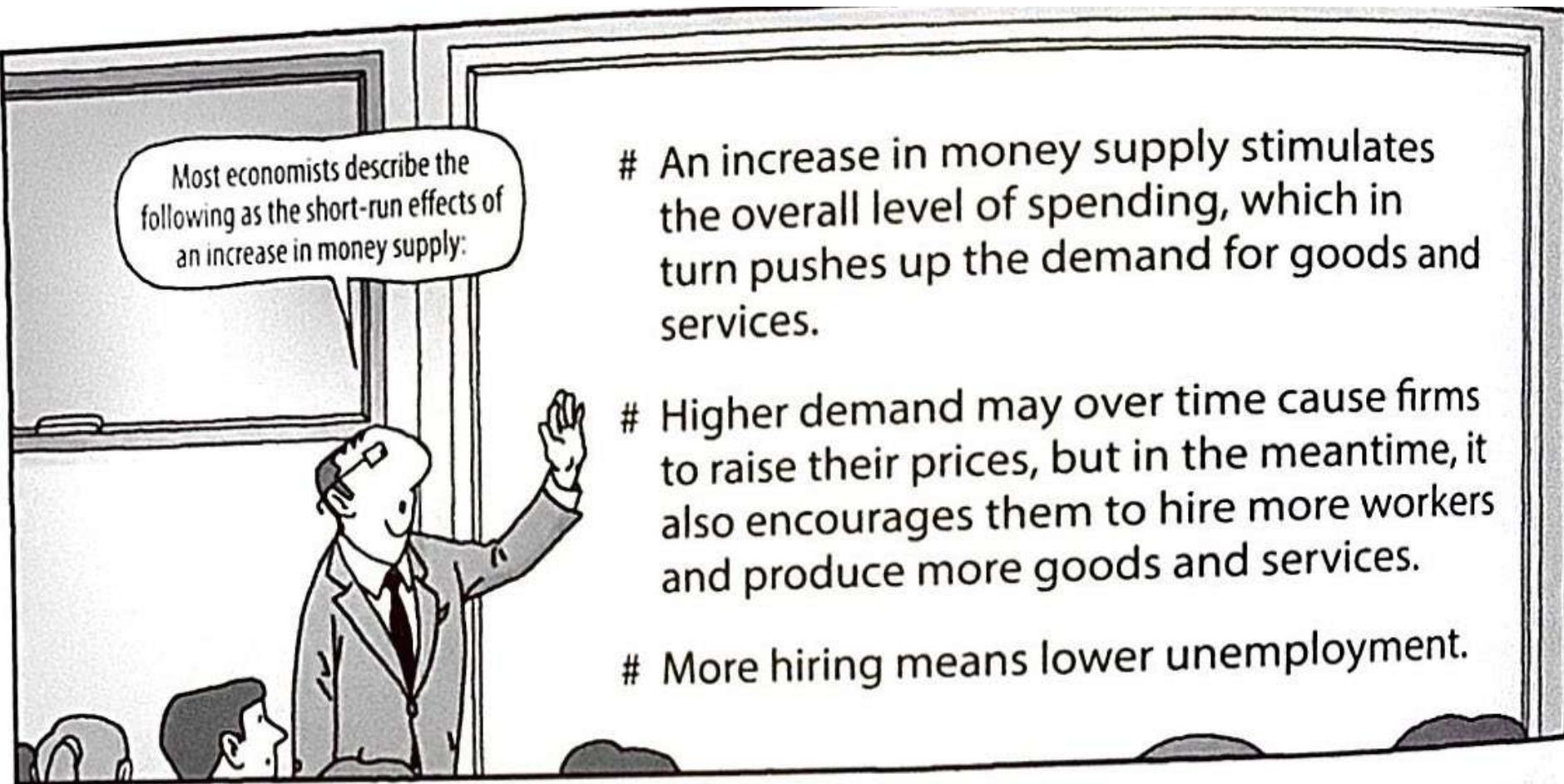
### Principle **10**

Society faces a short-run trade-off between inflation and unemployment.

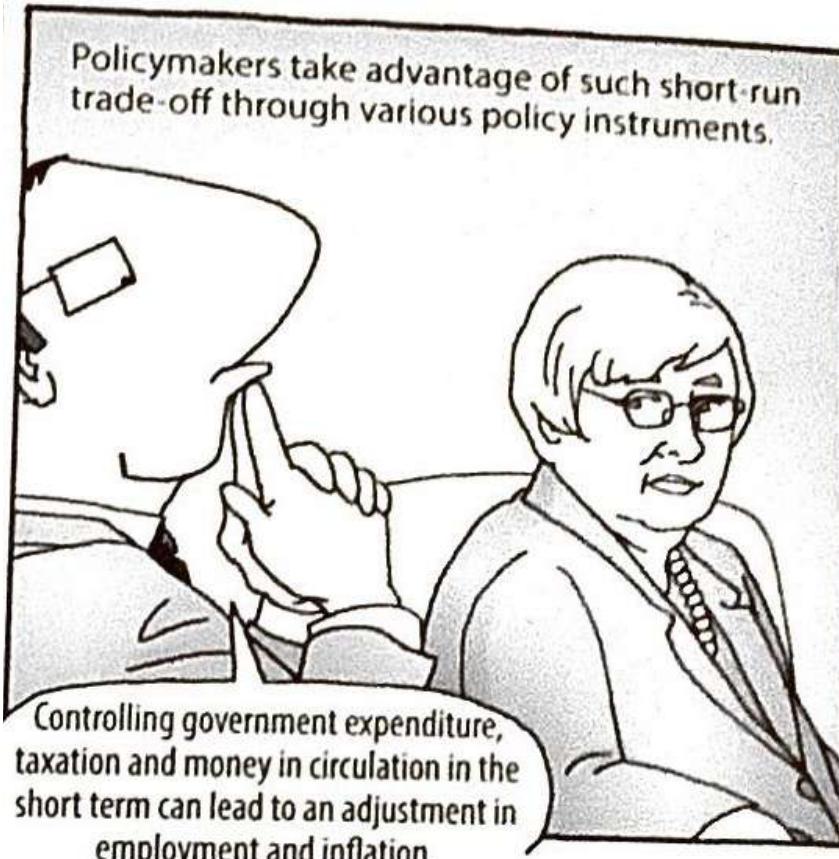
An increase in money supply leads to an increase in the price level in the long term.



## Principle 10: Society faces a short-run trade-off between inflation and unemployment



## Principle 10: Society faces a short-run trade-off between inflation and unemployment



## Principle 10: Society faces a short-run trade-off between inflation and unemployment

Because these economic policy tools  
are so powerful,

So there is fierce debate among  
economists about how they should  
be used.

The debate intensified after President Obama  
took office, as the United States and many  
other economies around the world fell into  
a severe recession starting in 2008.

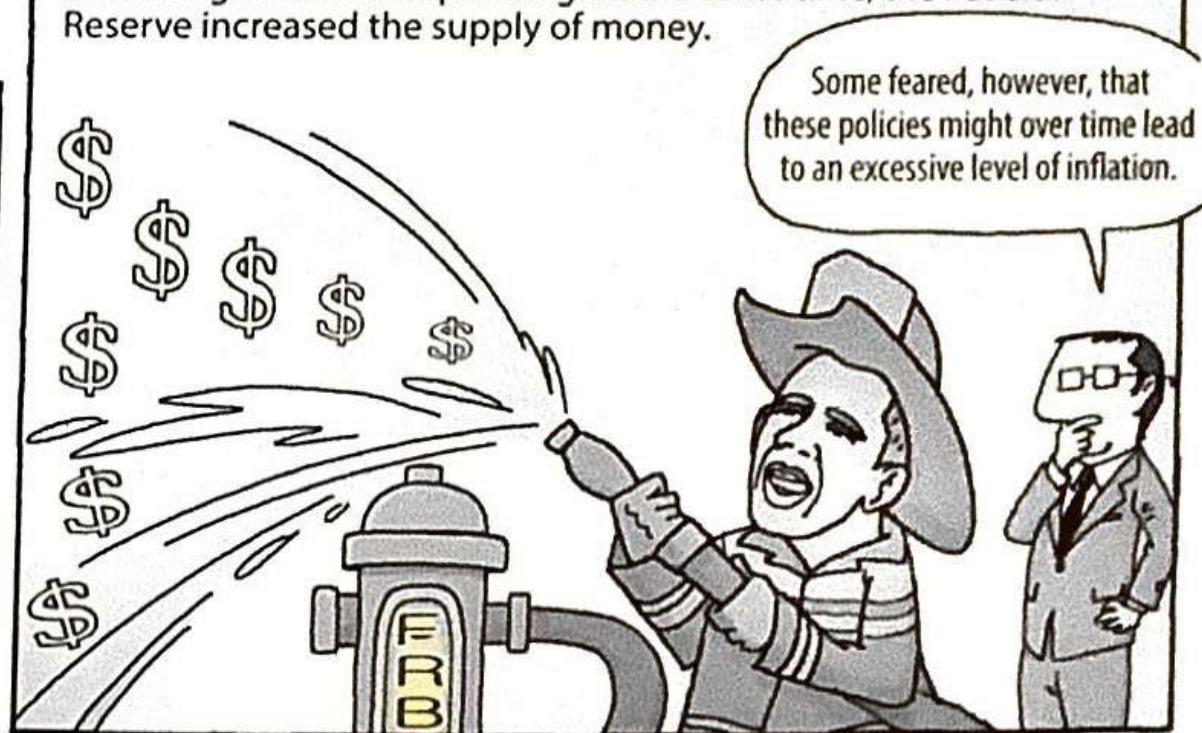


## Principle 10: Society faces a short-run trade-off between inflation and unemployment

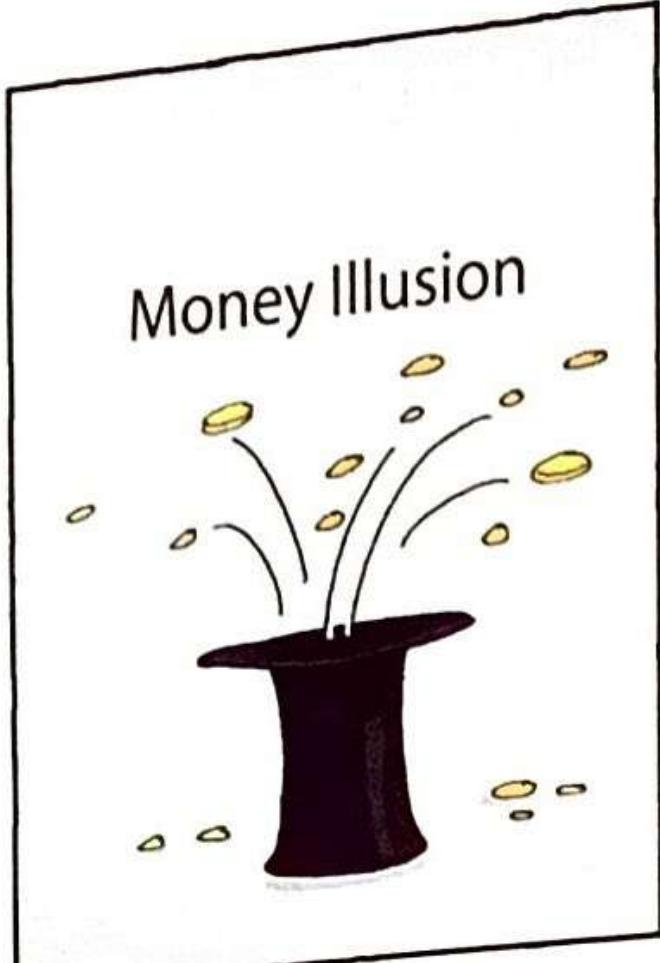
Problems in the financial system, caused by bad bets on the housing market, spilled over into the rest of the economy, causing incomes to fall and unemployment to soar.



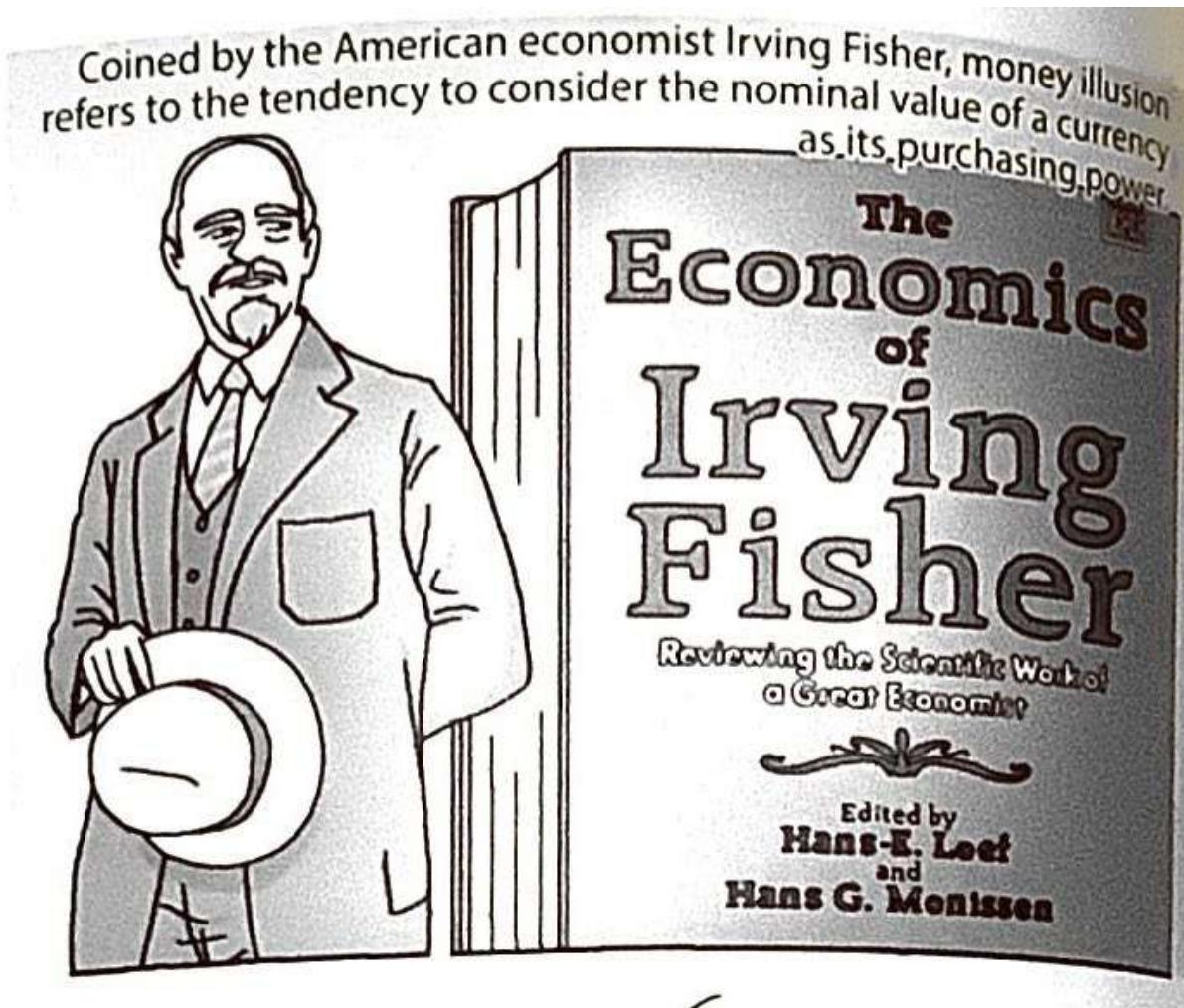
President Obama's first major initiative was to lower tax rates and increase government spending. At the same time, the Federal Reserve increased the supply of money.



# Money illusion

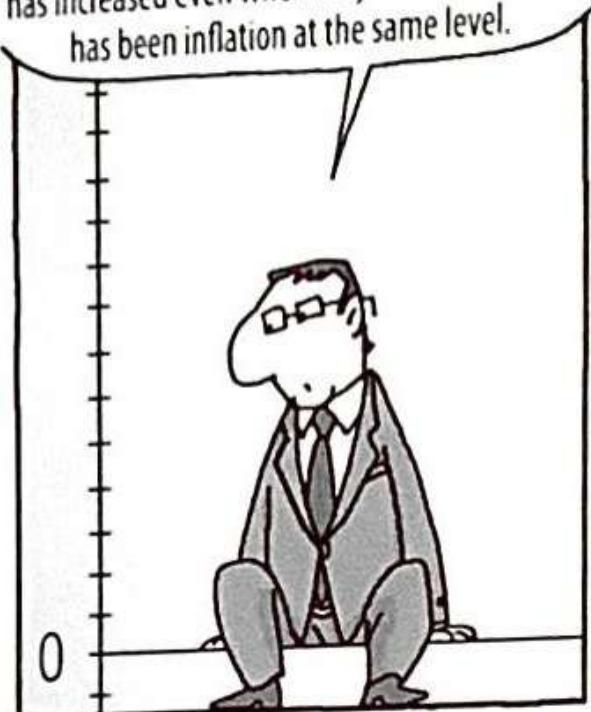


Money Illusion



# Money illusion

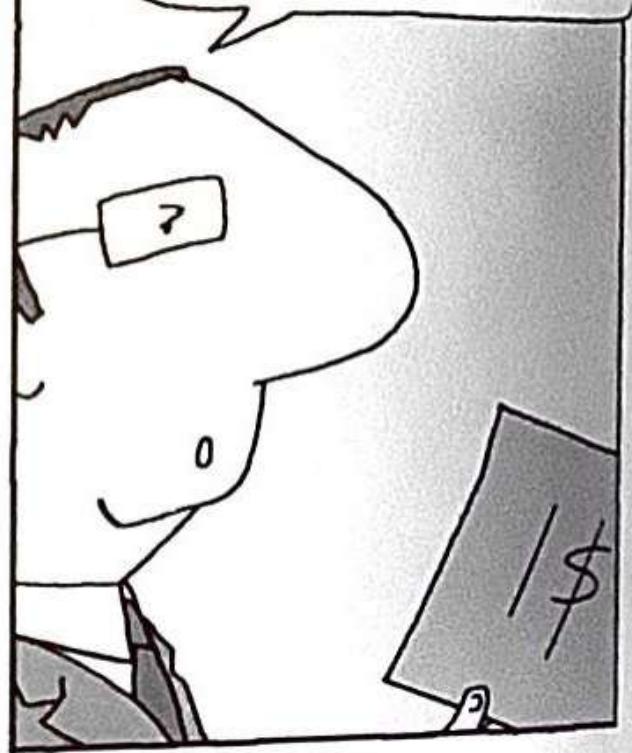
Let's say that you have a 3% increase in your wage but prices in general rose 3% as well. Then the actual rise in your wage would be 0%. People, however, tend to think that your wage has increased even when they know that there has been inflation at the same level.



The money illusion, the failure of people to recognize the real value of money, has long been a subject of debate among economists.



Then how come people use the nominal value of the money, not the actual value, as the basis on which they make judgments?



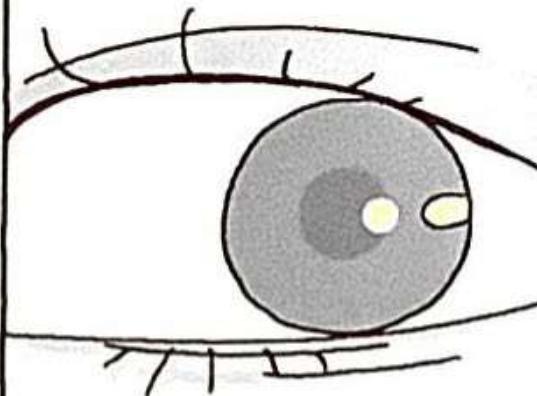
$$\text{Real interest rate} \approx \text{Nominal interest rate} - \text{Inflation rate}$$

Society faces a short-run trade-off between inflation and unemployment

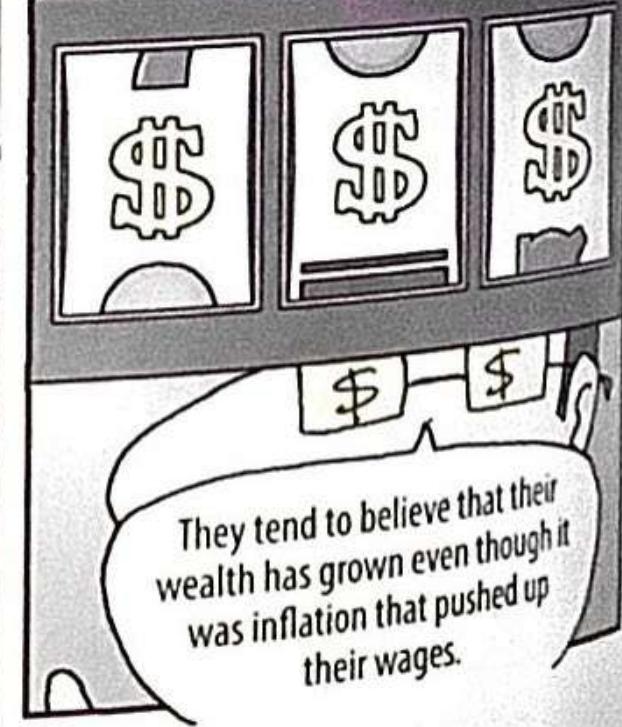
# Money illusion

The money illusion is a failure of our cognitive power, according to behavioral psychologists.

Exposed to loss, our brain is busy taking in information on the spot, thus failing to make reasonable judgments.

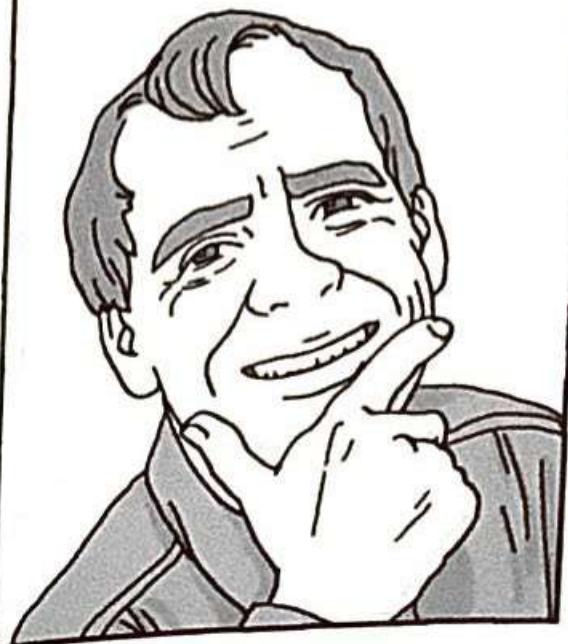


The section of the brain in charge of controlling our emotions is obsessed with the figure itself rather than what such figures actually mean



# Money illusion

Behavioral economist,  
Amos Tversky, conducted  
an experiment.



Annual salary during  
the second year of service

A

\$ 30,600

B

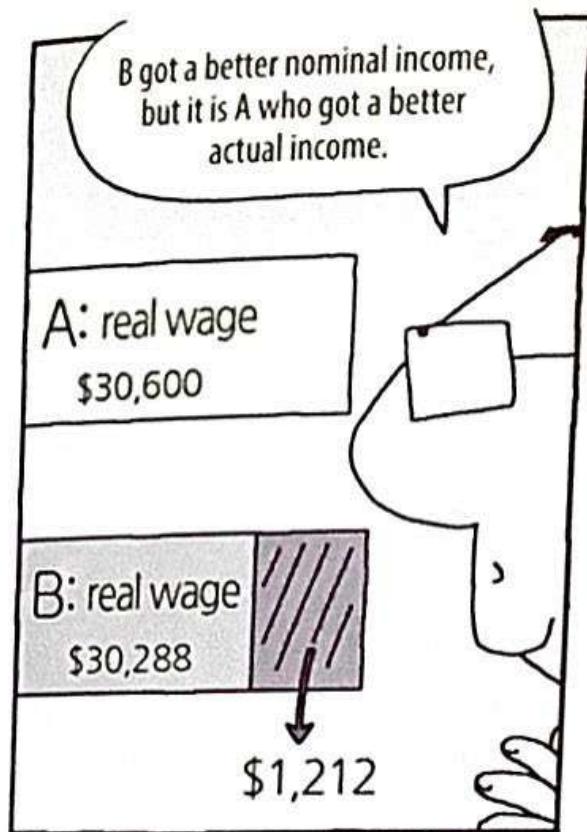
\$ 31,500

In case A the annual salary was \$30,000, and there was 0% inflation during the first year. The annual salary increased by 2% on the second year.



Employee B's annual salary was the same. There was 4% inflation during the first year he joined the company and he got a 5% raise in his salary in the second year.

# Money illusion



He asked the following questions to those who participated in the experiment.

Question 1: Who is economically favored?

Question 2: Who is happier?

Question 3: Who is more likely to accept any head-hunting offer from another company on his second year?



# Money illusion

To Question Number One, 71% of the respondents answered A. This means that they understood what actual wage means.

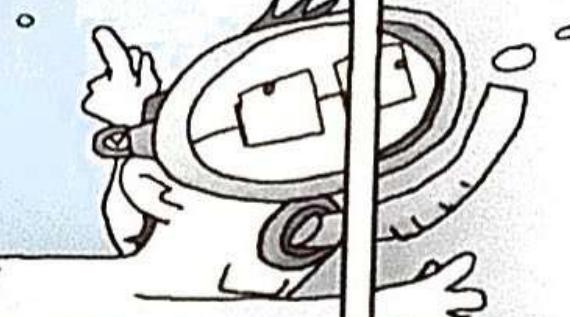
A 71%

..



When asked about Question Number Two, 64% of the respondents answered that B must be happier.

B 64%



Another group was asked about Question Number 3 and 65% of them answered that A was more likely.

A 65%



# Money illusion

Although people understand the concept of real value, they still tend to answer questions in terms of nominal value.



When property prices generally rise, people will still feel happy even if the relative value of their own property has not changed.



This monetary illusion can make mild inflation, which allows employers to satisfy workers by raising nominal wages without incurring additional real costs, a good thing.

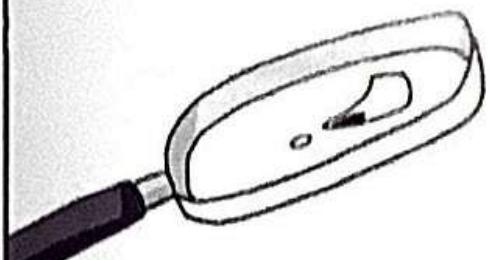


Workers demand wage increases, but under moderate inflation, a wage raise effectively amounts to no real gain – yet workers feel satisfied.

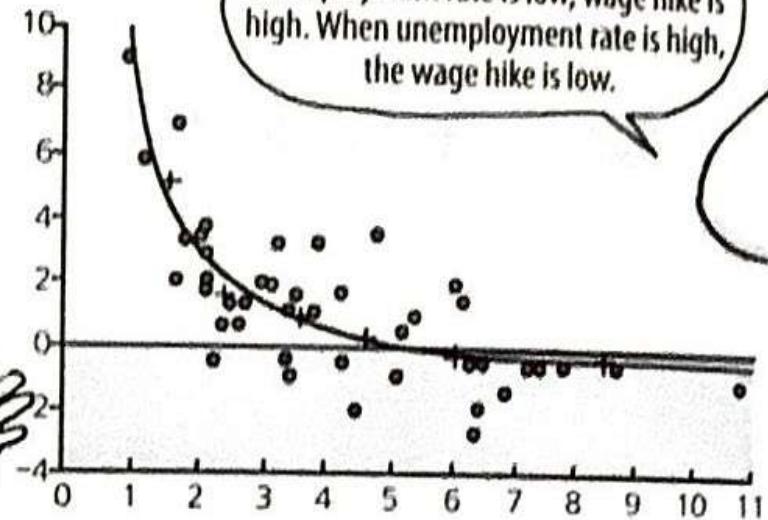
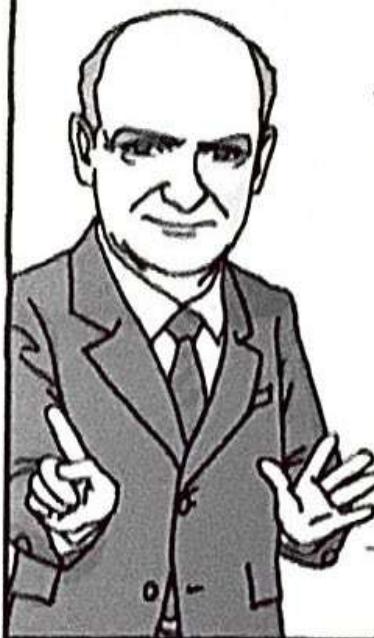
Society faces a short-run trade-off between inflation and unemployment

# The Philips curve

## The Phillips Curve



In 1958, British economist Phillips showed that there was an inverse relationship between nominal wage increase and unemployment rate.



When the unemployment rate is low, the labor market becomes tight, workers' bargaining power increases, and wages rise rapidly.

Society faces a short-run trade-off between inflation and unemployment

# The Philips curve

When the economy is in recession, unemployment rate goes up.

## Tarot Fortune Teller

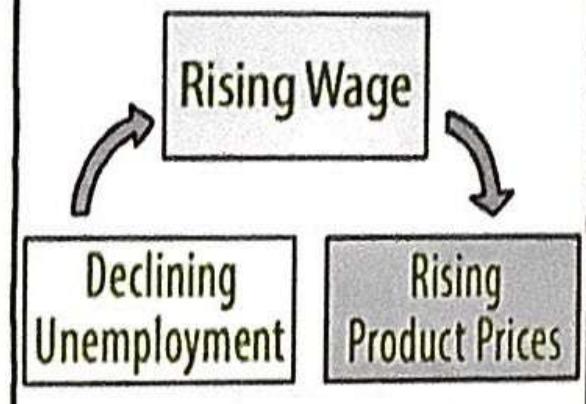


since there is an oversupply of labor in the market.



As the economy starts to recover, total demand will rise along with employment.

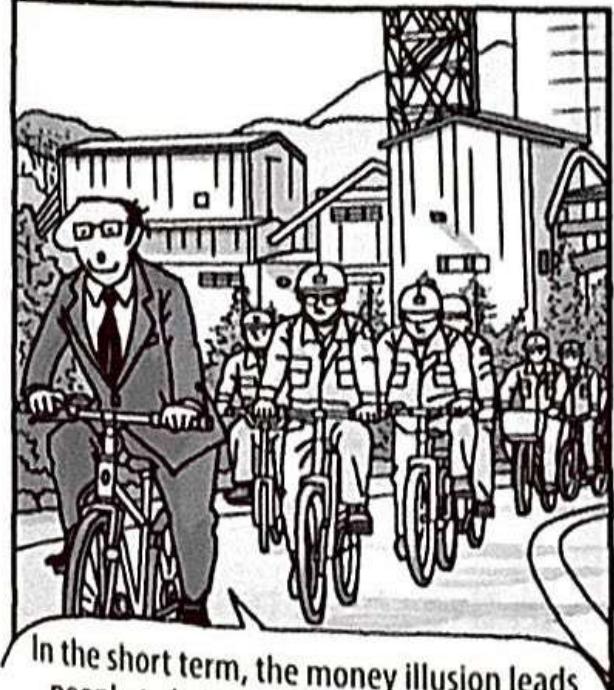
A decline in unemployment leads to wage inflation, which in turn leads to price inflation.



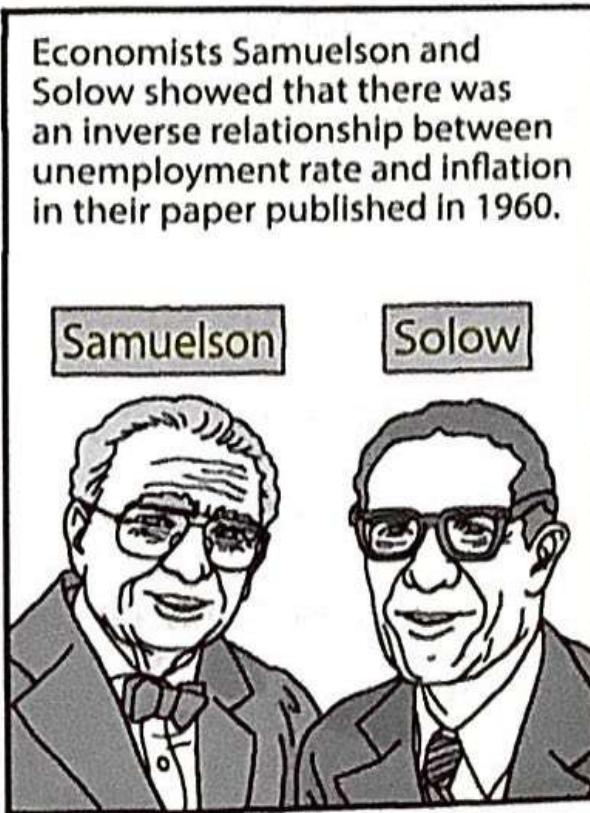
Economists soon replaced the wage growth rate with the more generalized inflation rate, because wages constitute a major portion of business costs, and wage increases are passed on to rising product prices (as businesses seek to maintain their profit margins).

Society faces a short-run trade-off between inflation and unemployment

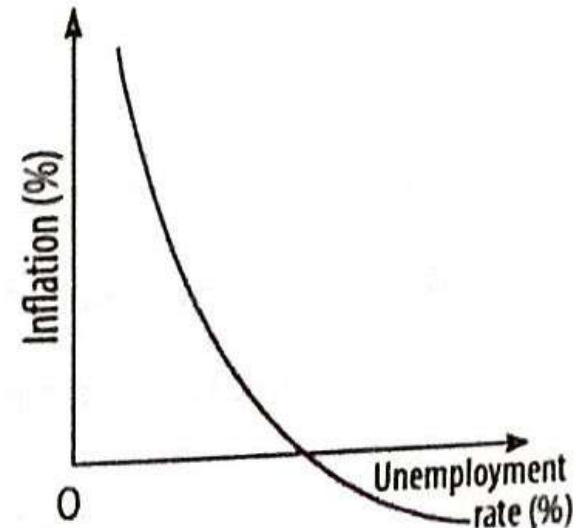
# The Philips curve



In the short term, the money illusion leads people to believe that their wages have increased, which in turn make them accept jobs, thereby bringing down unemployment.



Named the Phillips Curve, this has been recognized as a major economic principle.



This relationship presents policymakers (such as governments and central banks) with a seemingly straightforward "menu of choices":

Option A: Implement expansionary policies (e.g., increasing government spending, lowering interest rates) to stimulate the economy and reduce unemployment, but at the cost of higher inflation.

Option B: Implement tightening policies (e.g., cutting spending, raising interest rates) to curb inflation, but at the cost of rising unemployment.

# SUMMARY



- Most economists agree that, based on the following logic, society faces a short-term trade-off between inflation and unemployment:
  - An increase in the money supply leads to a rise in aggregate expenditure, which in turn drives up the demand for goods and services.
  - The increase in demand prompts businesses to raise the prices of goods and services, while also hiring more workers to meet the expansion in production.
  - As more people are employed, the unemployment rate declines.
- Policymakers leverage this short-term trade-off through various policy tools. By controlling government spending, taxation, and the money supply, they can adjust the unemployment and inflation rates in the short term.

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## Quick Quiz

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1. After World War I, Germany printed 132.0 billion marks in banknotes to compensate for the damages inflicted on its citizens during the war. This led to currency devaluation and soaring prices. When price increases are caused by the government increasing the money supply, it is often referred to as an "inflation tax." So, who ends up paying this "inflation tax," and why?

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## Quick Quiz

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2. Suppose people deposit more money in banks, which then lend these funds to businesses that use the capital to build new factories. Please describe how increased savings lead to improved labor productivity. Who benefits from this productivity gain? Does this process essentially create a "free lunch"?

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## Quick Quiz

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3. Explain the differences between your standard of living today and that of your grandparents and parents when they were young. How did these differences arise?

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# Quick Quiz

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4. Why is labor productivity important?

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# Quick Quiz

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5. What is inflation? What causes inflation?

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## Quick Quiz

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6. Describe the short-run relationship between inflation and unemployment.

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## Quick Quiz

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7. A country experiences persistently high inflation because:
- a. The central bank supplies too much money
  - b. Unions demand significant wage increases
  - c. The government sets tax rates too high
  - d. Large corporations exploit their market monopoly position to set excessively high prices