PART 1

Ten Principles of Economics

PRINCIPLES OF
Microeconomics

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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.

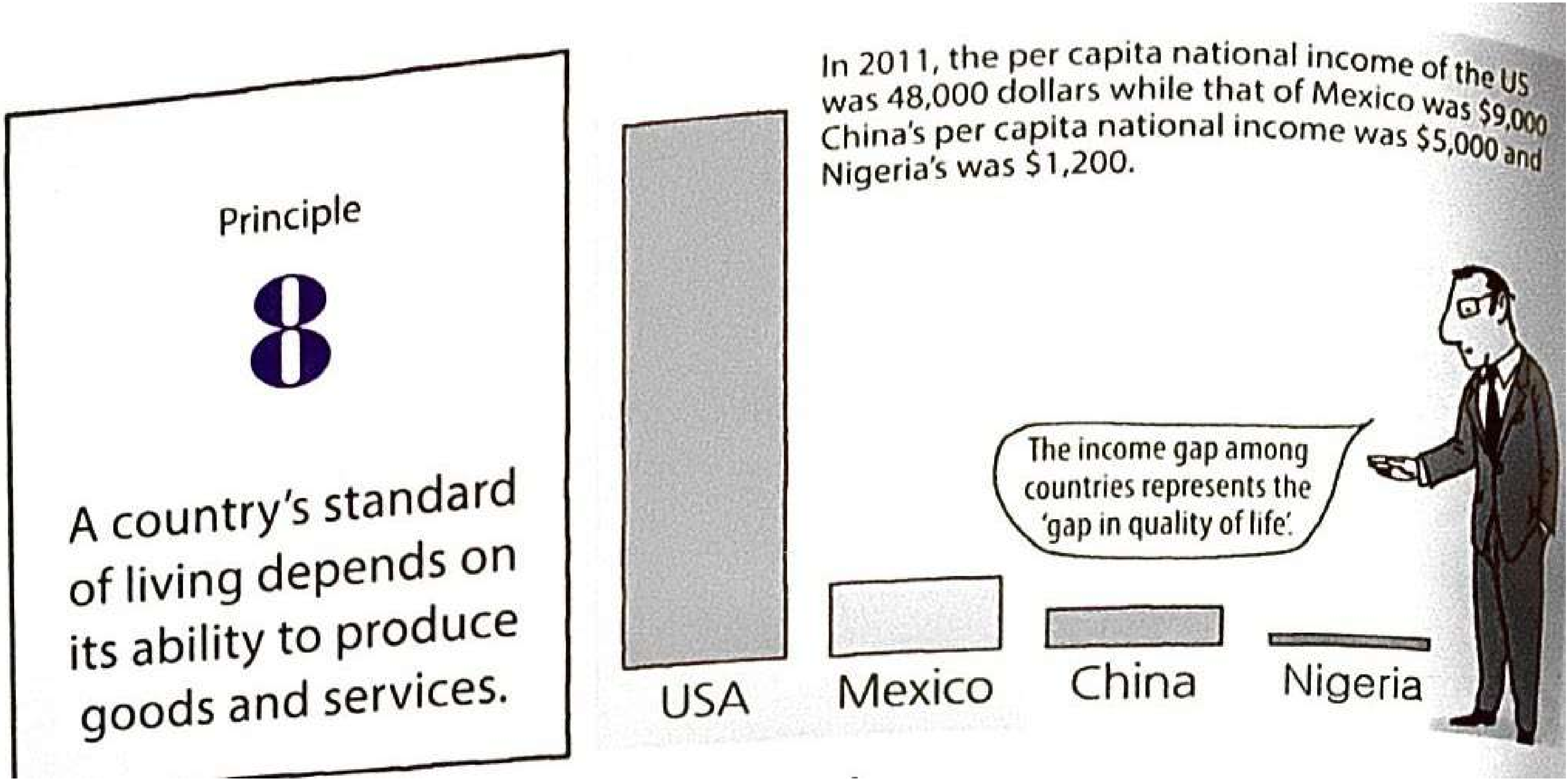
- These decisions and interactions collectively form a nation's economy.

- 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.



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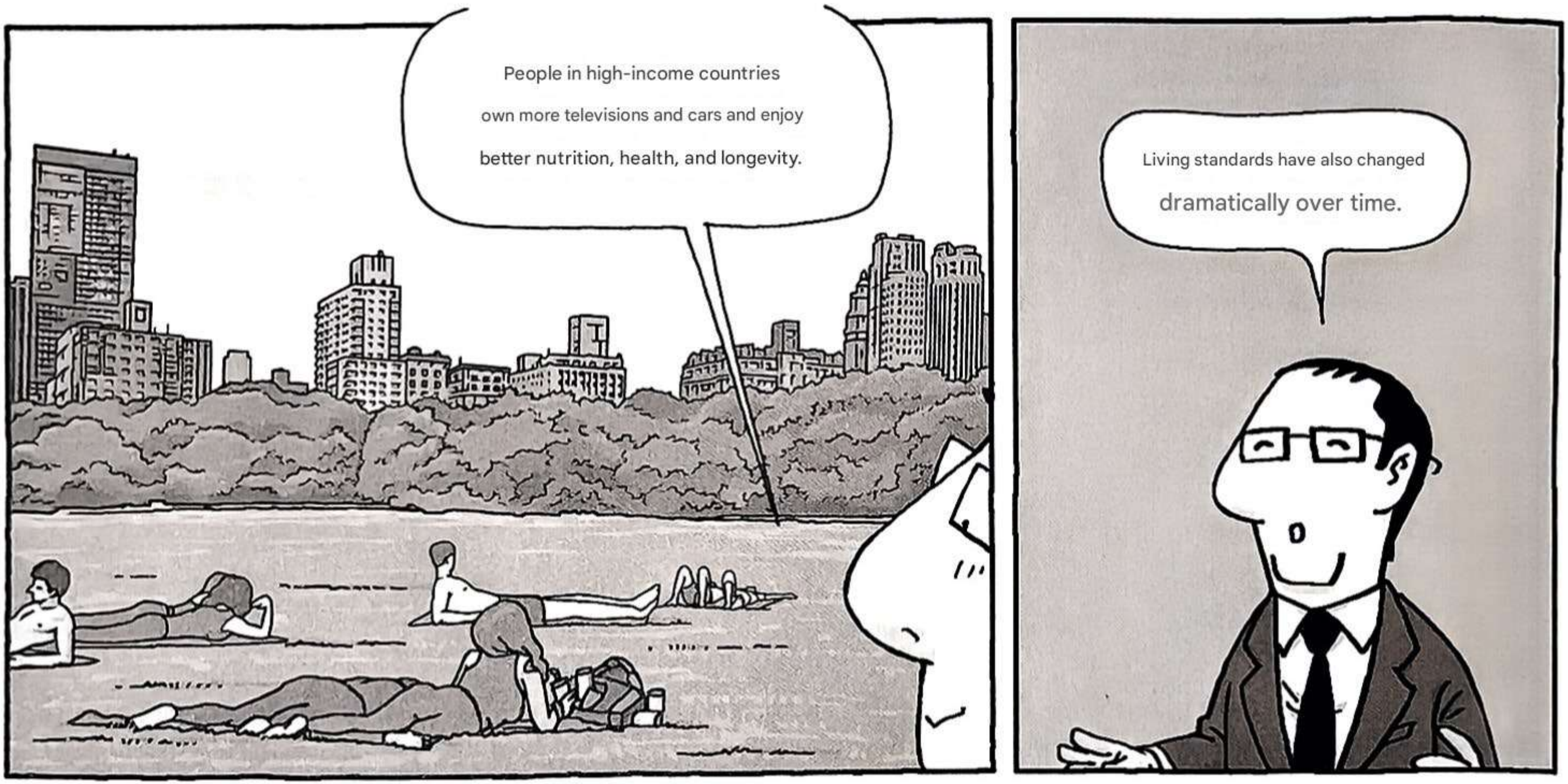
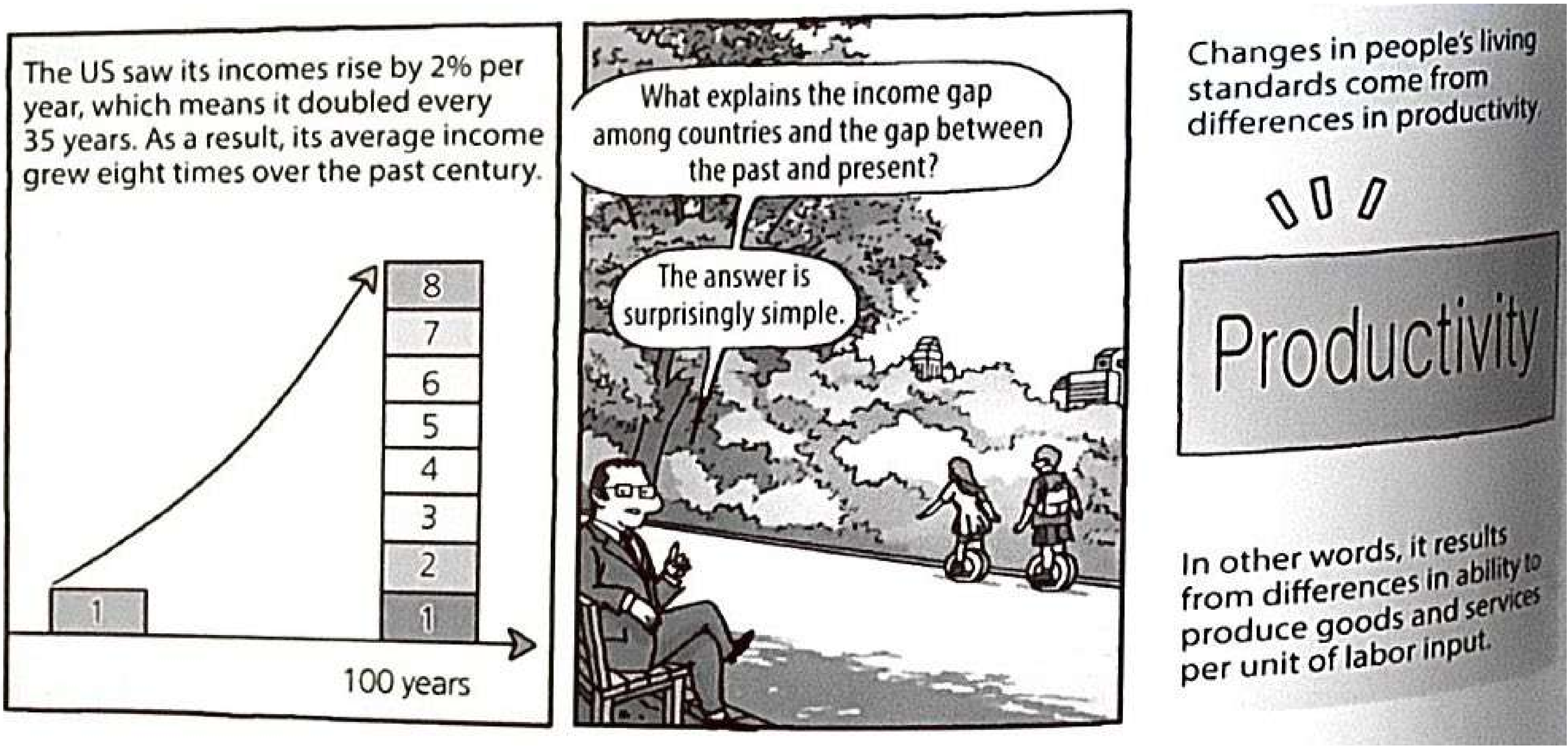


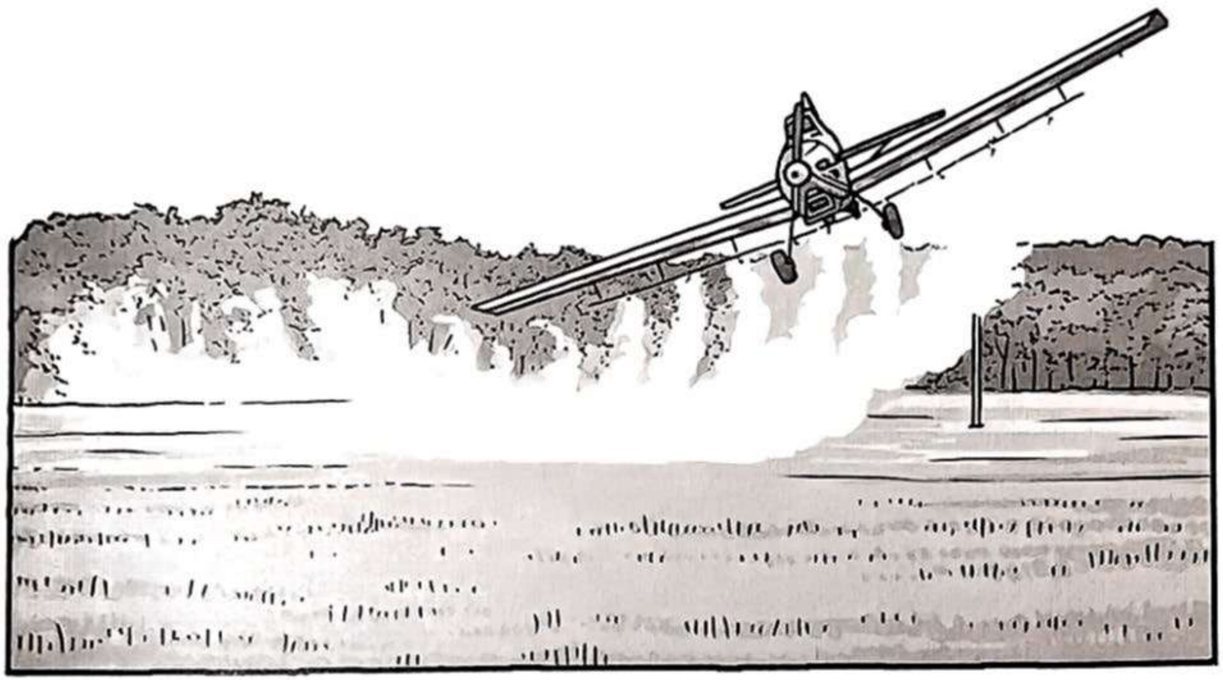
in an average sense

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



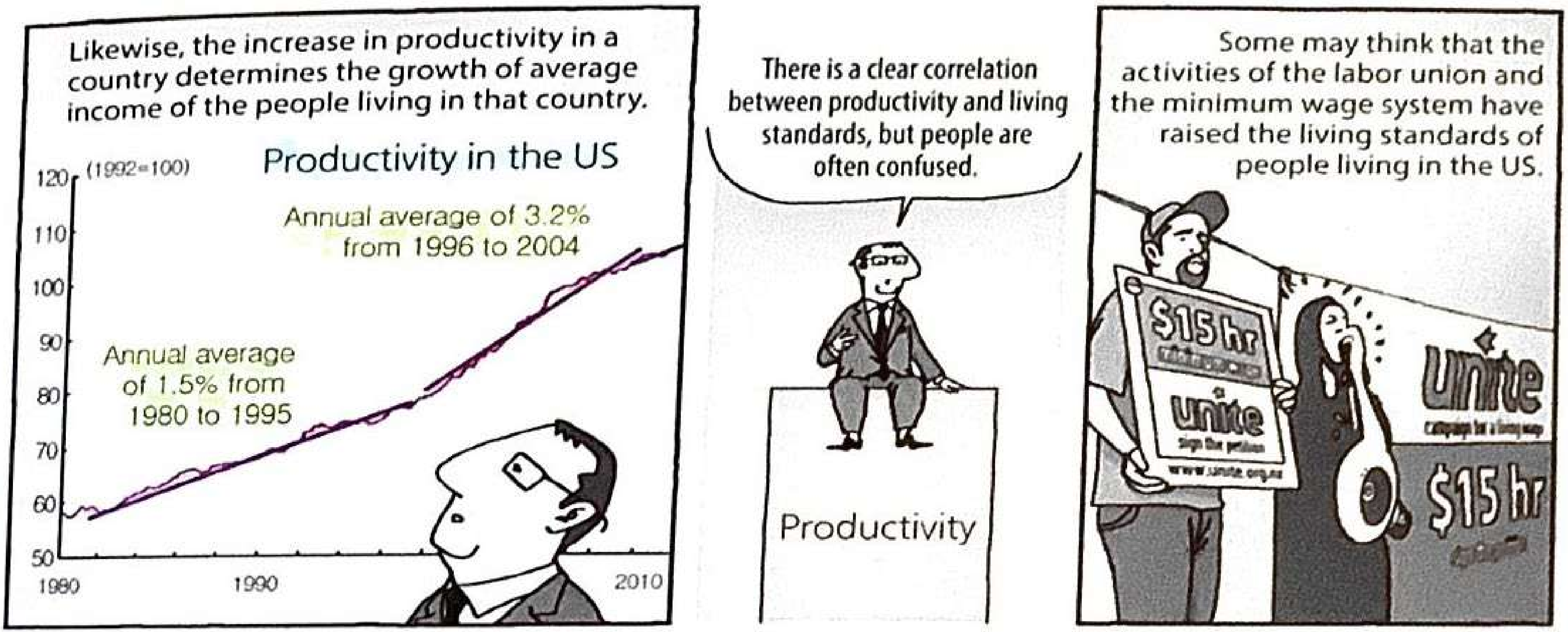
Principle 8: A country's standard of living depends on its ability to produce goods and services.

In 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.



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.

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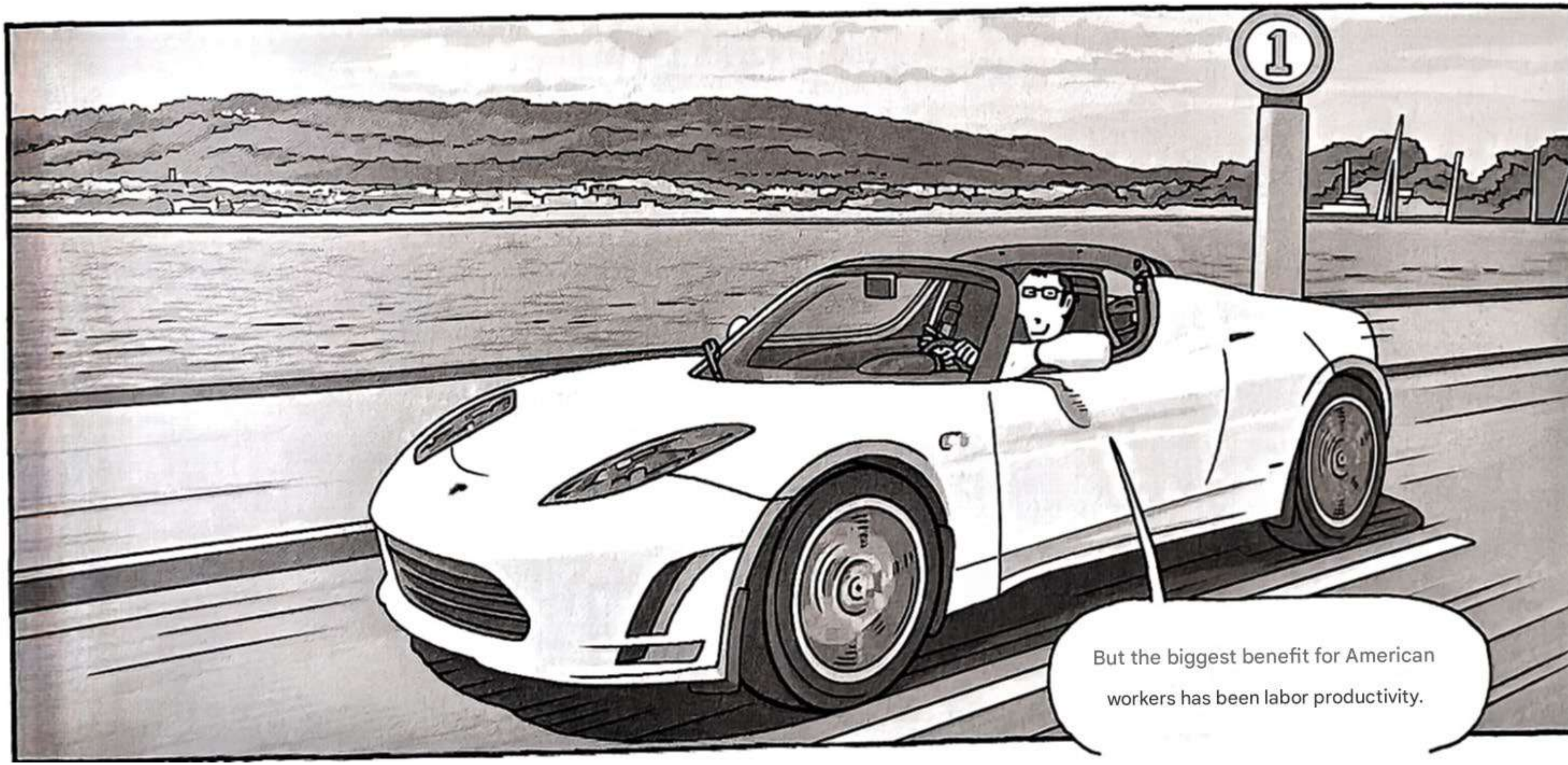

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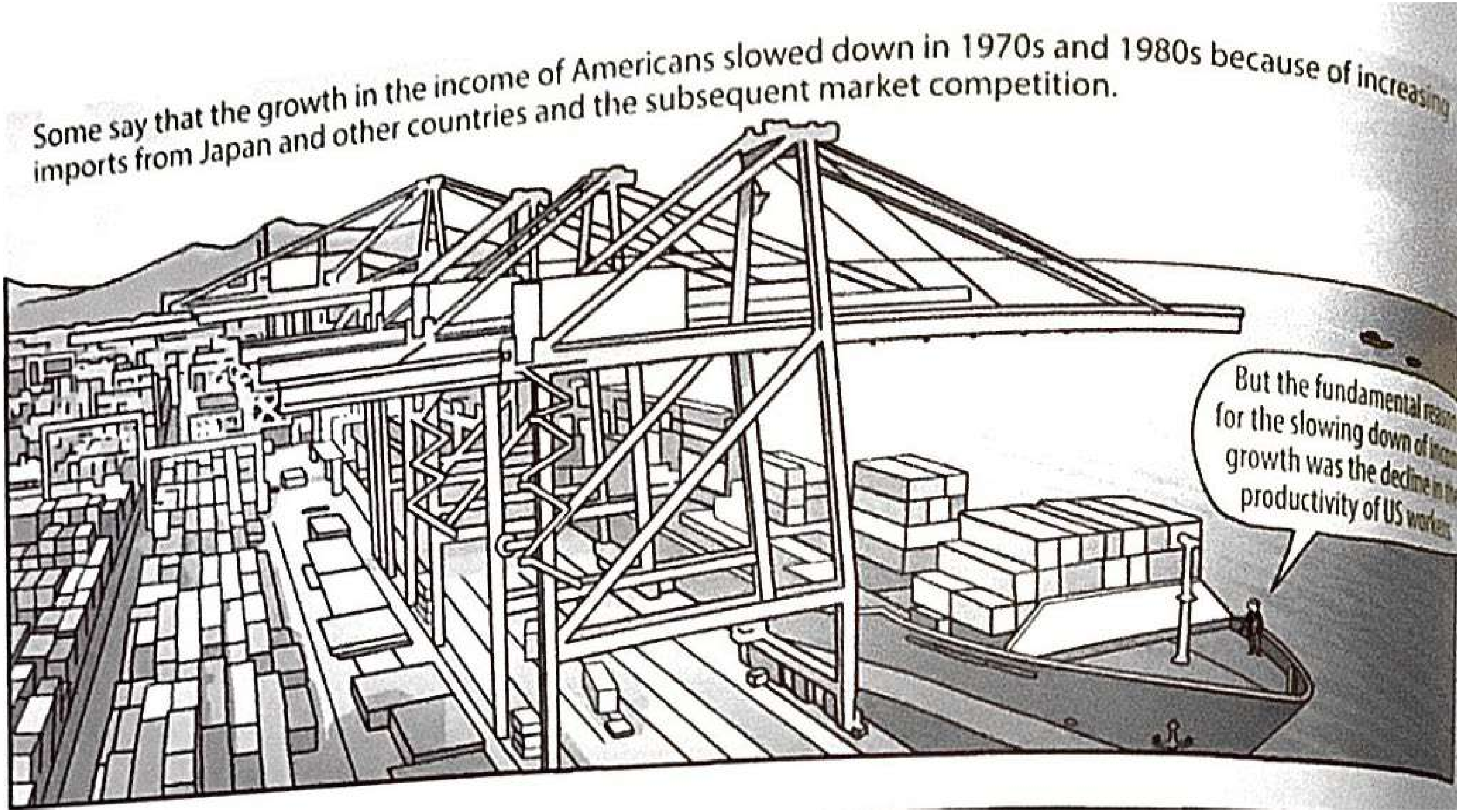

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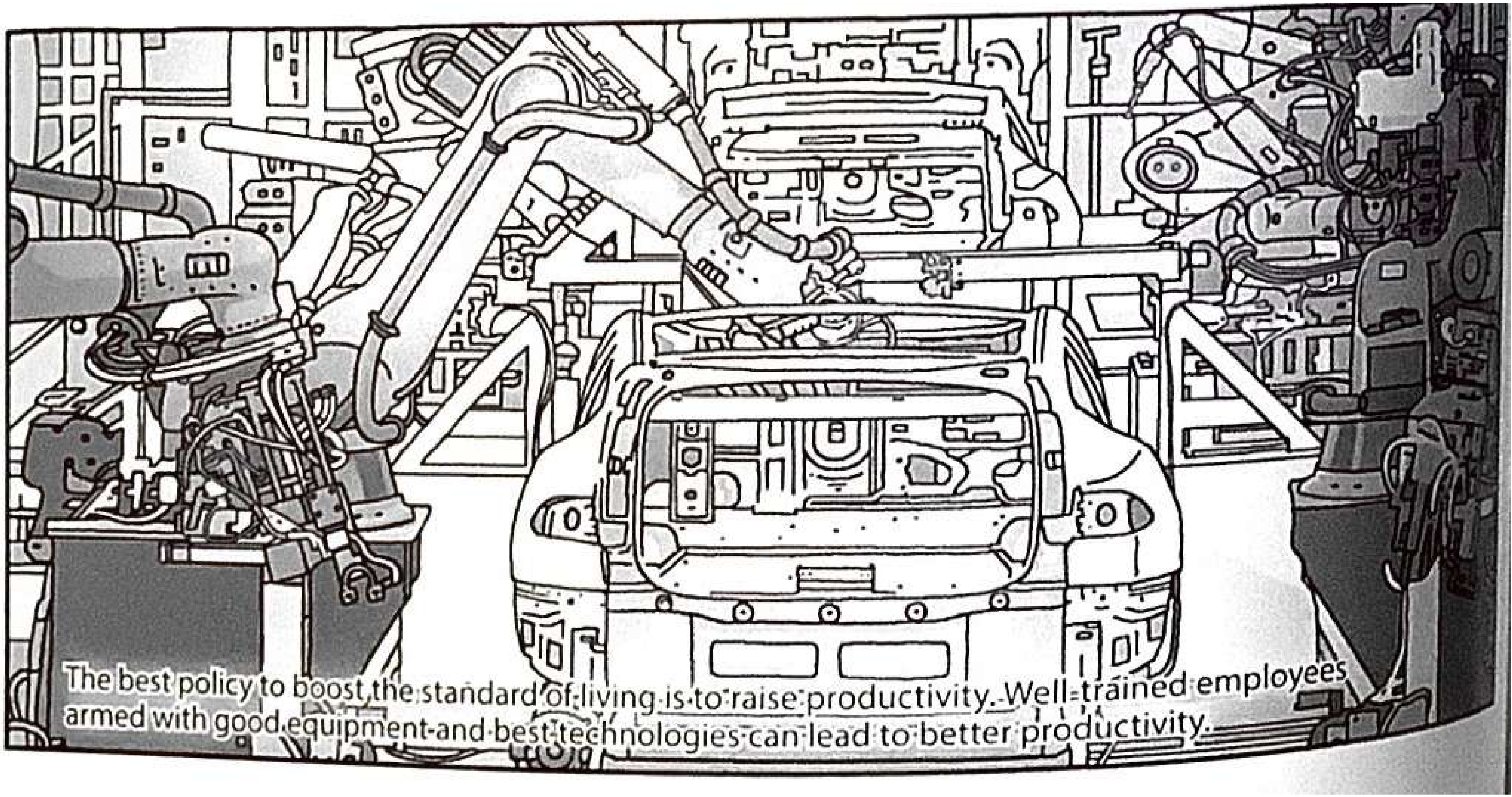
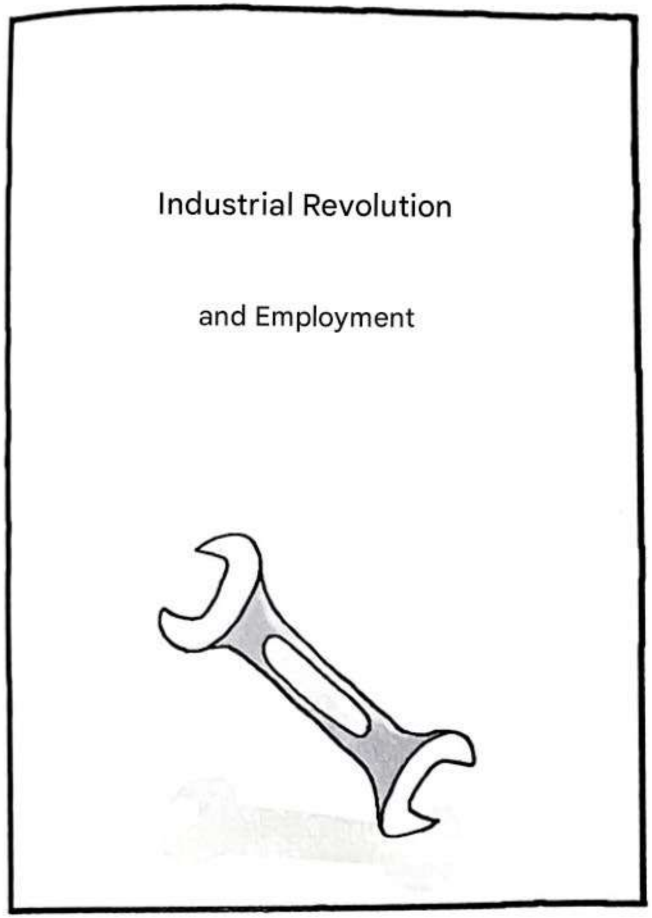
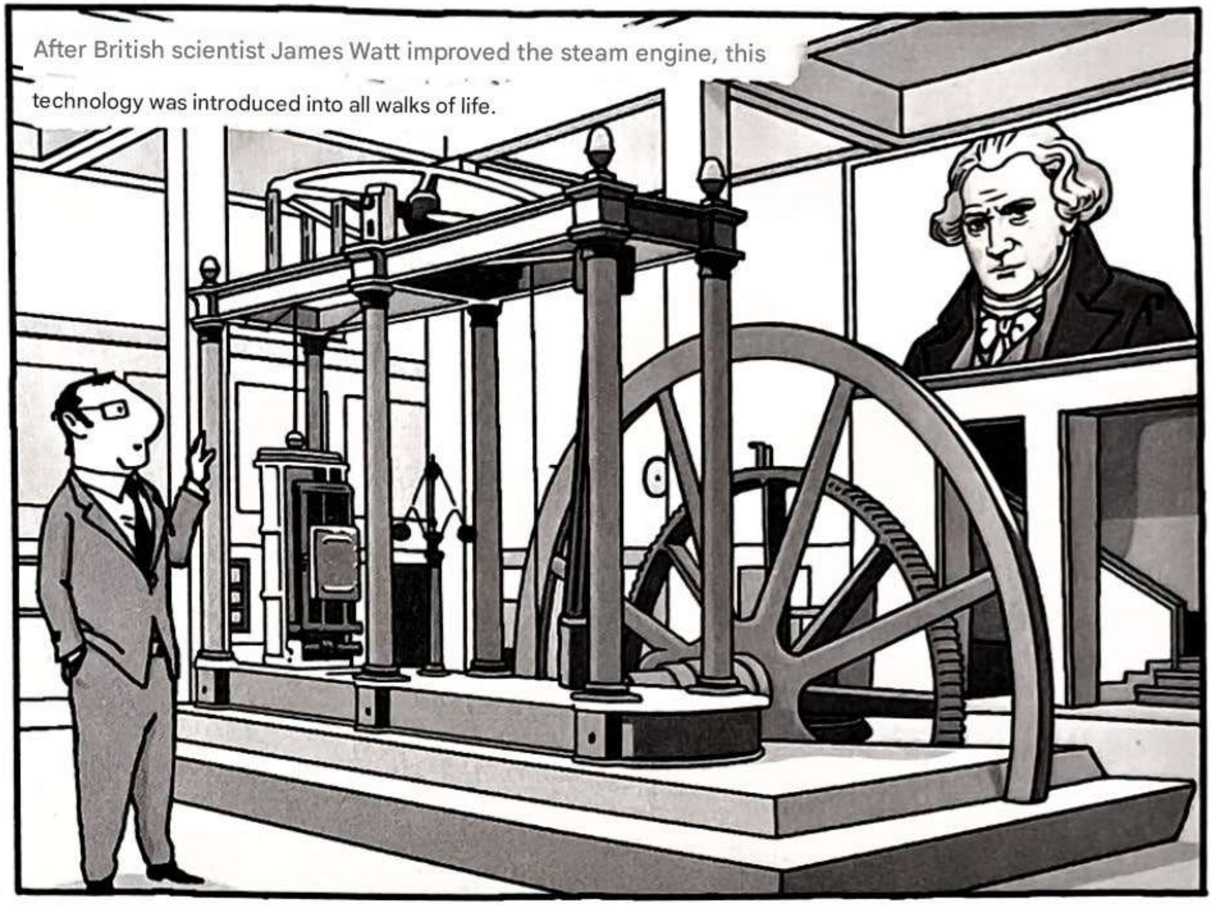


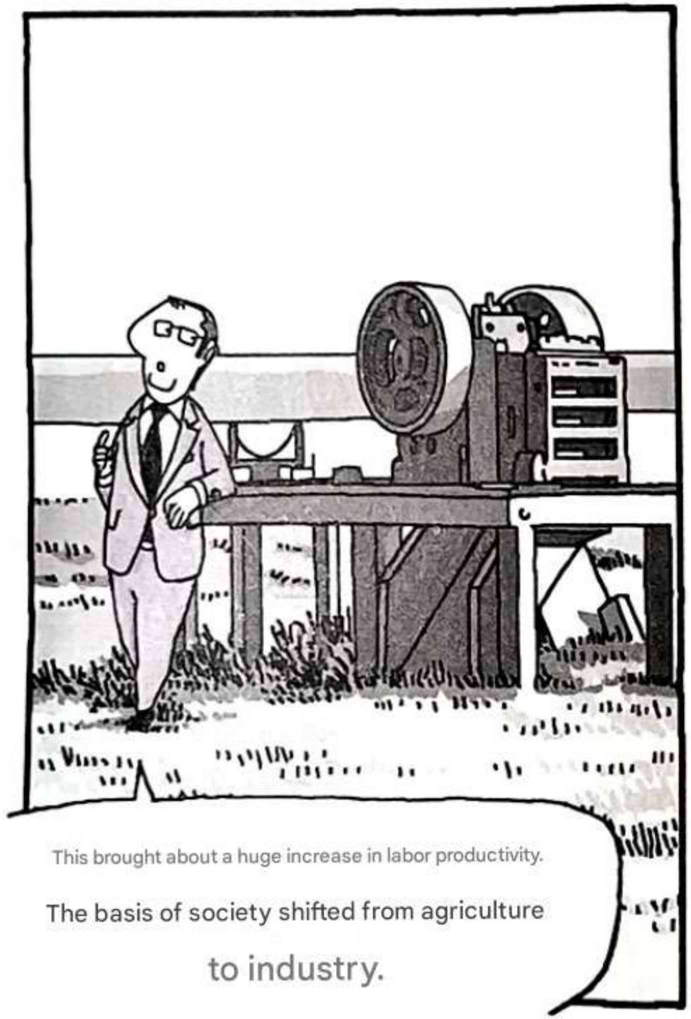
Industrial revolution and employment



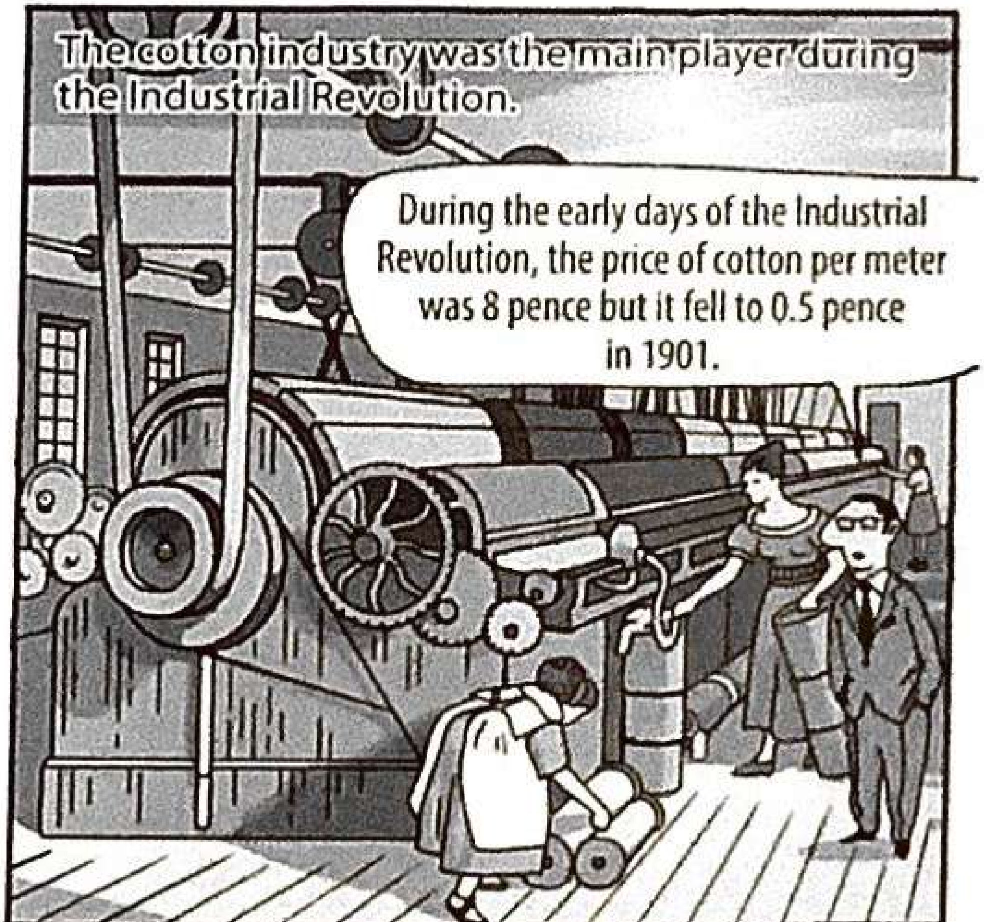


There have been four industrial revolutions since the Industrial Revolution: the first (at the end of the 18th century) was represented by the steam engine and achieved mechanization; the second (at the end of the 19th century) was centered on electricity and the internal combustion engine and initiated 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



Industrial revolution and employment



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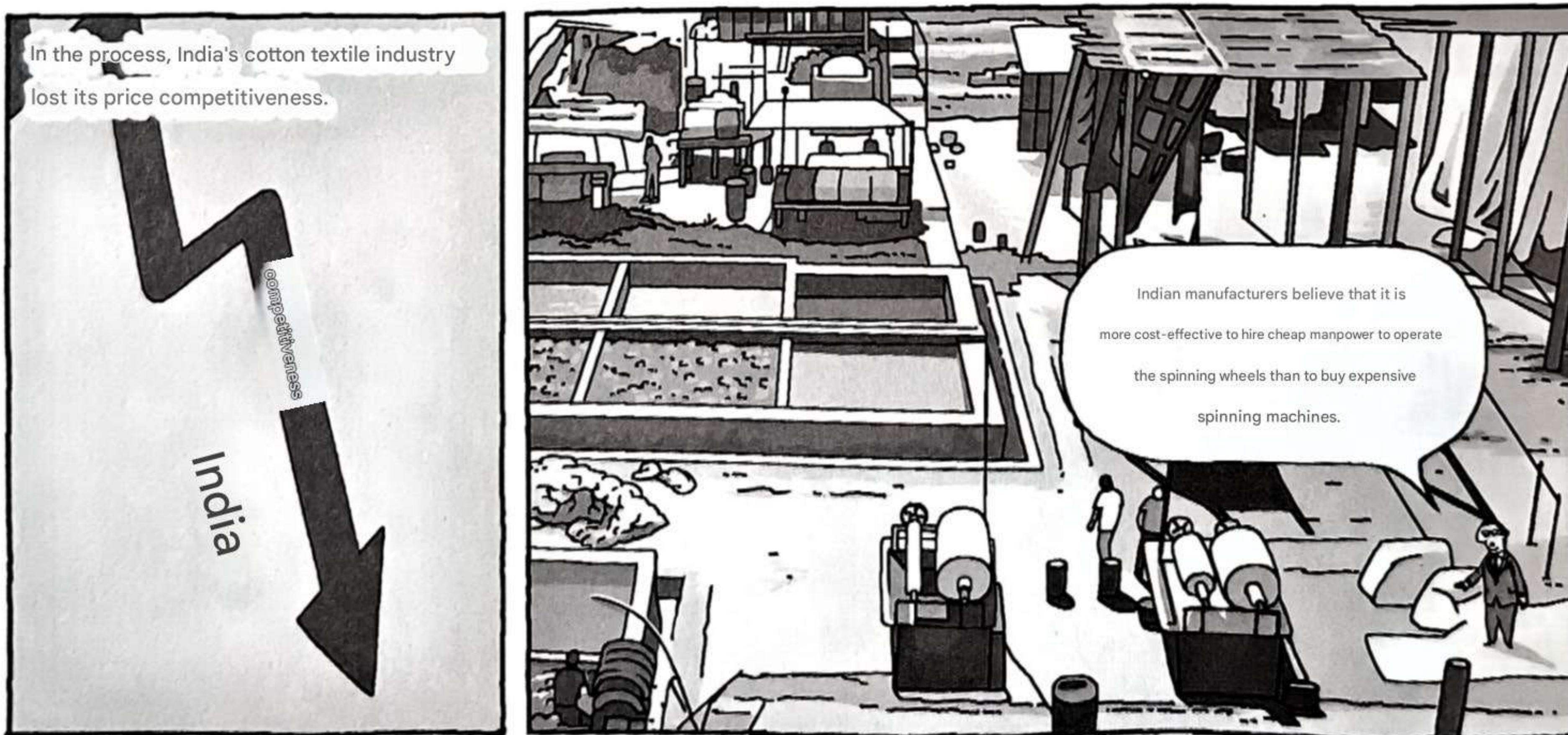

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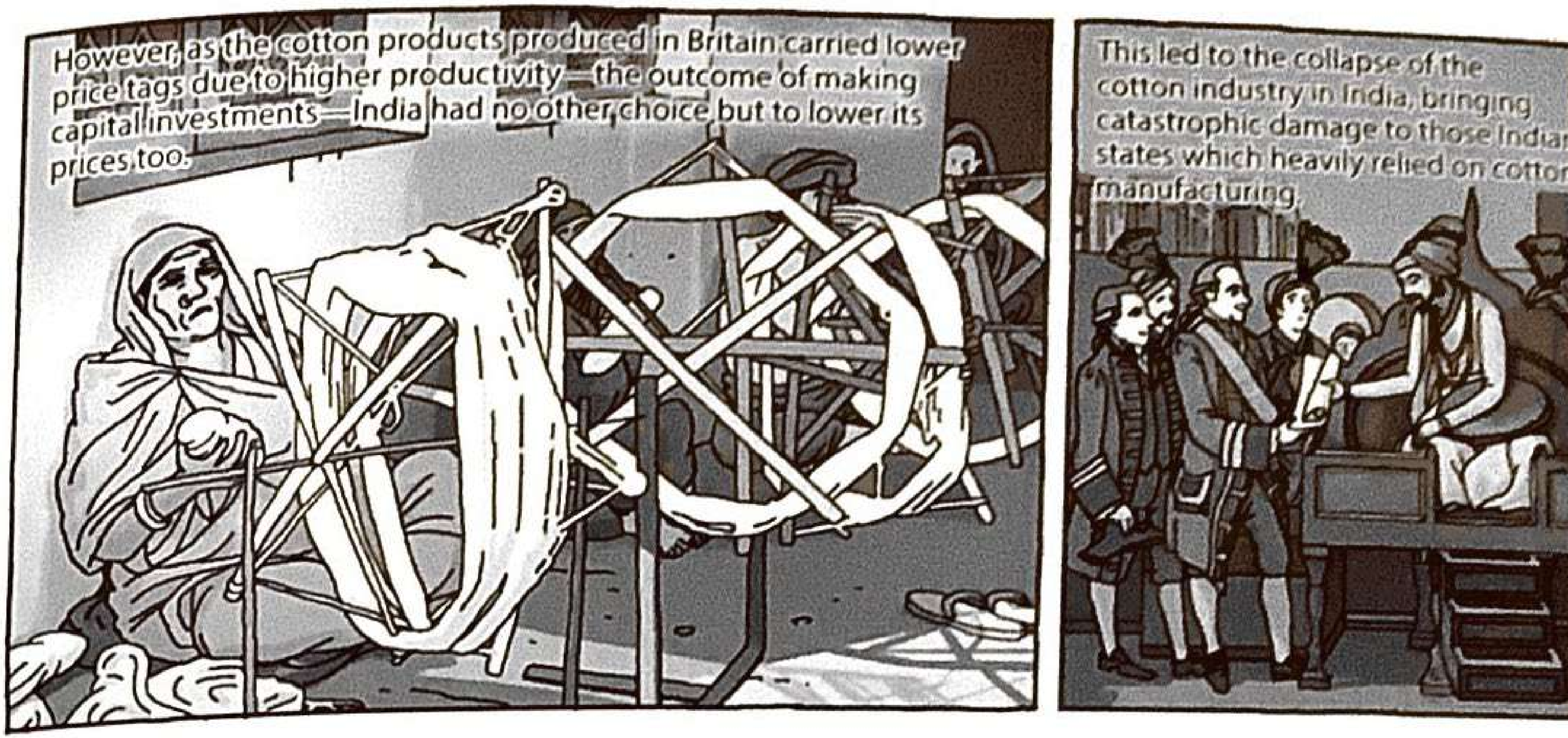

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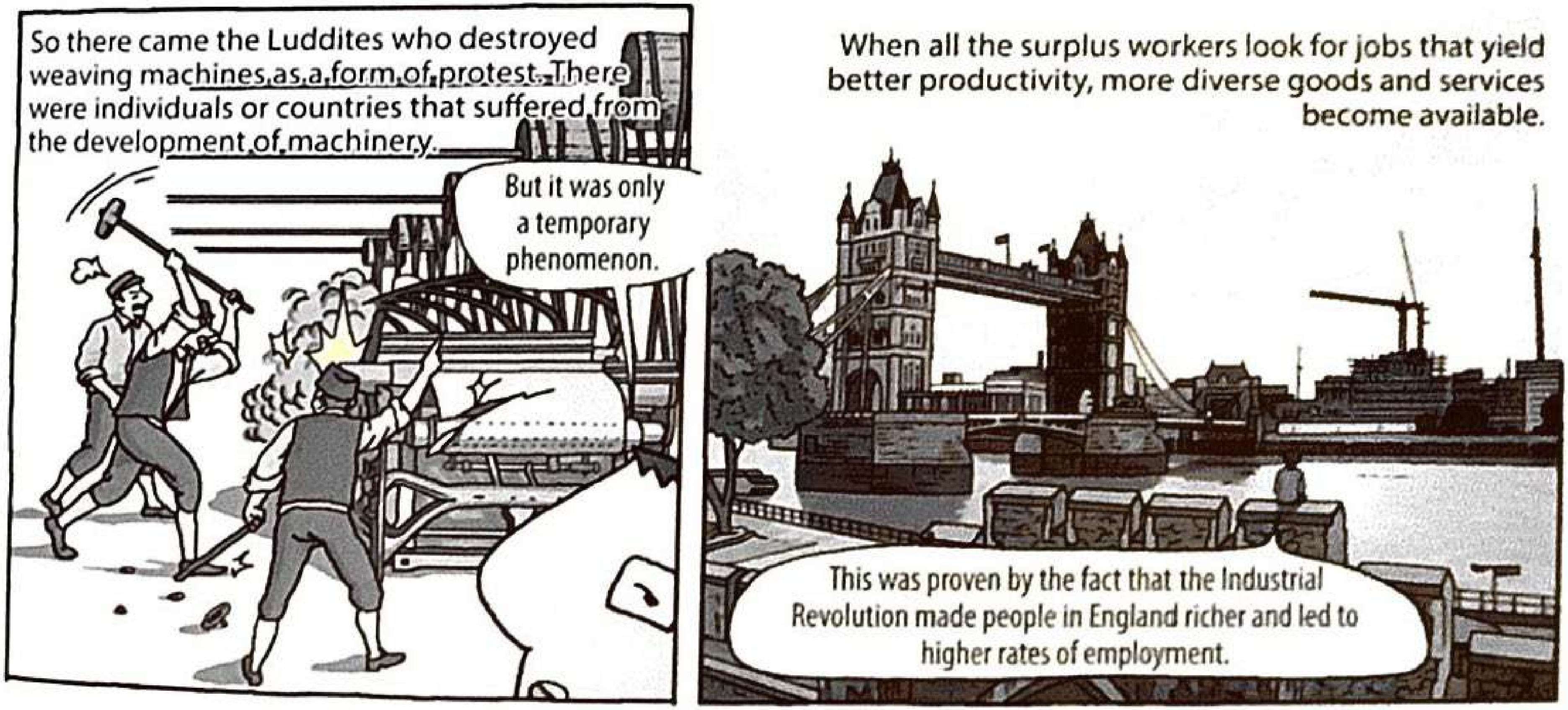
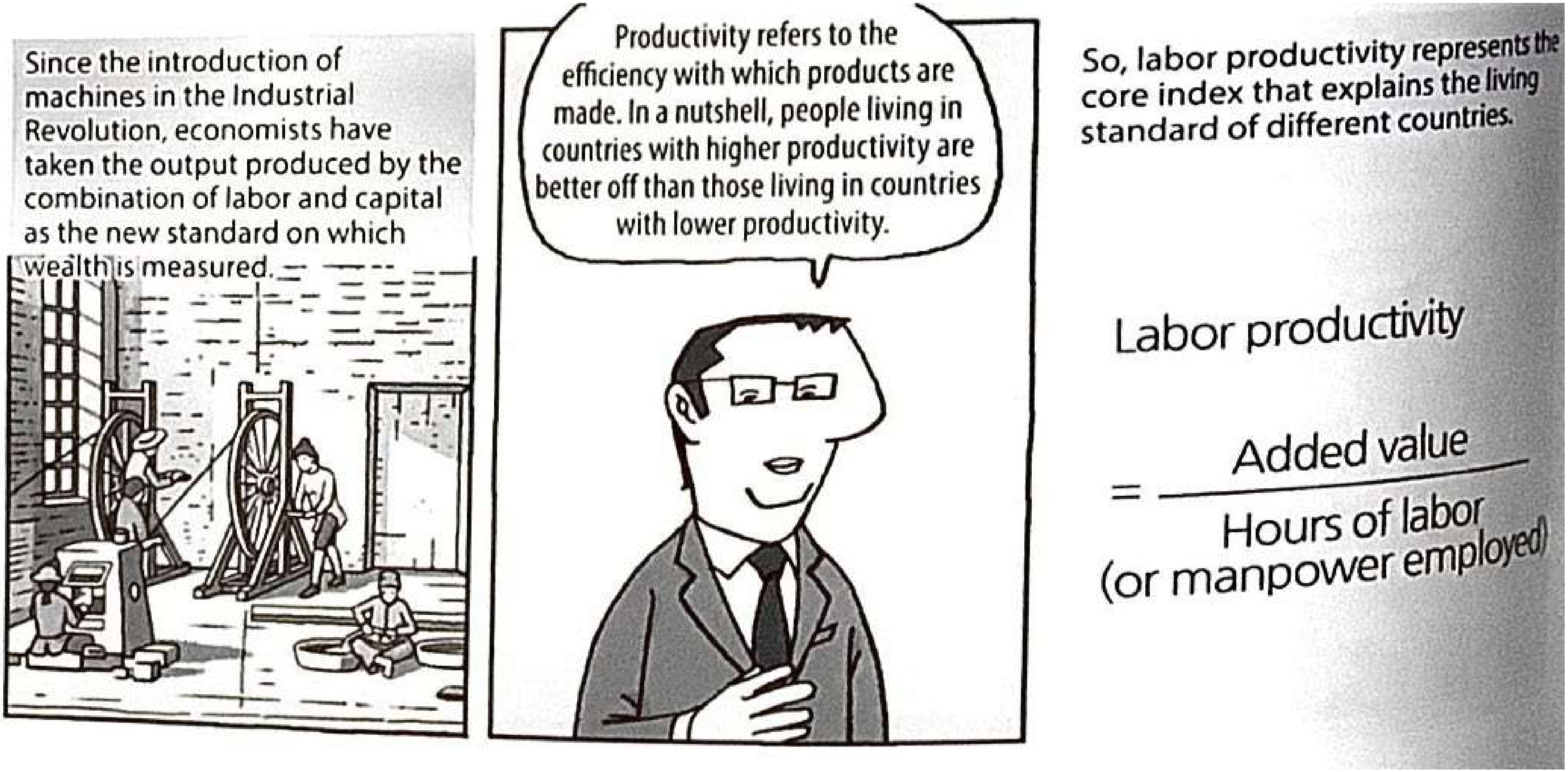


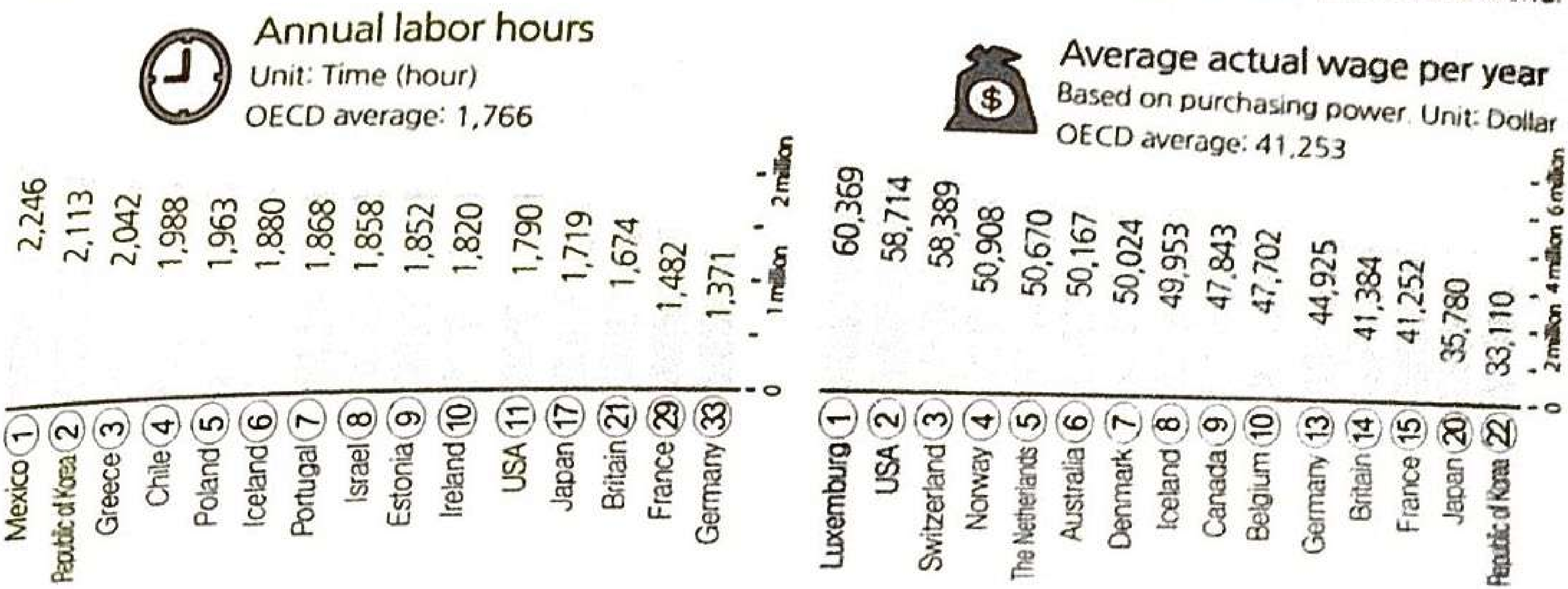
When technological progress boosts the productivity of a certain industry, it no longer requires as many workers as before to meet social demands. The surplus laborers and corresponding capital thus freed up form a new, freely disposable "resource pool" for society. At this point, these resources will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

What is labor productivity

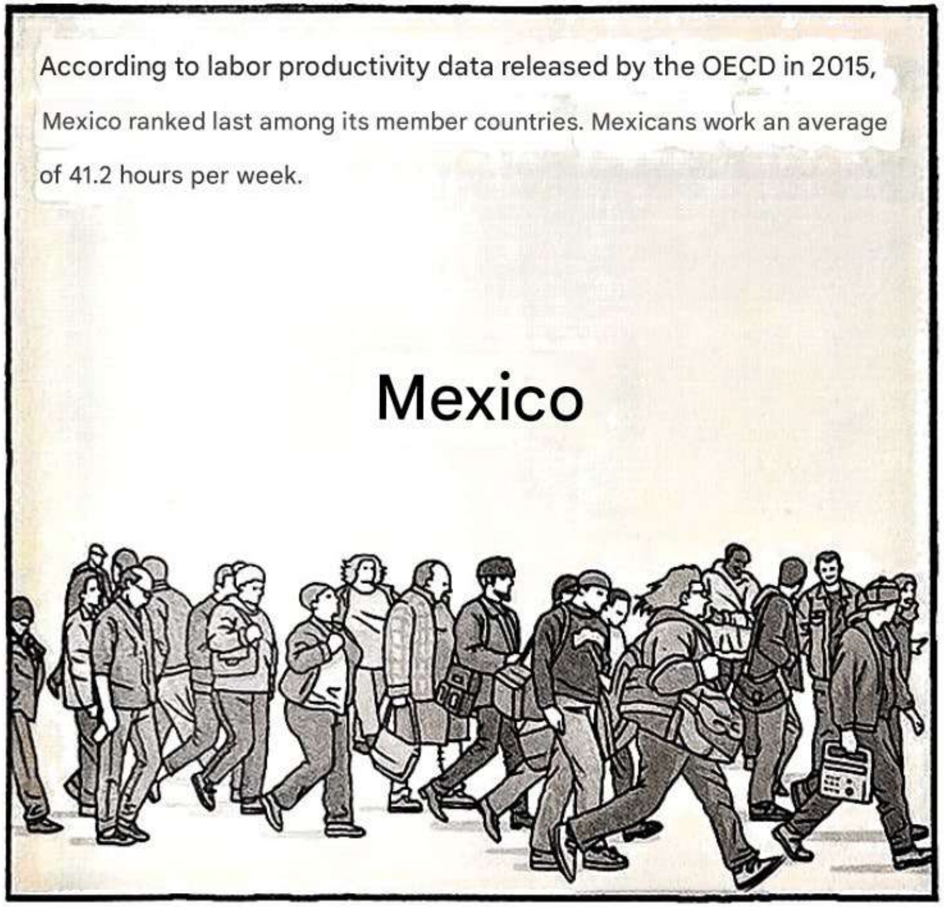


What is labor productivity

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



What is labor productivity



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.

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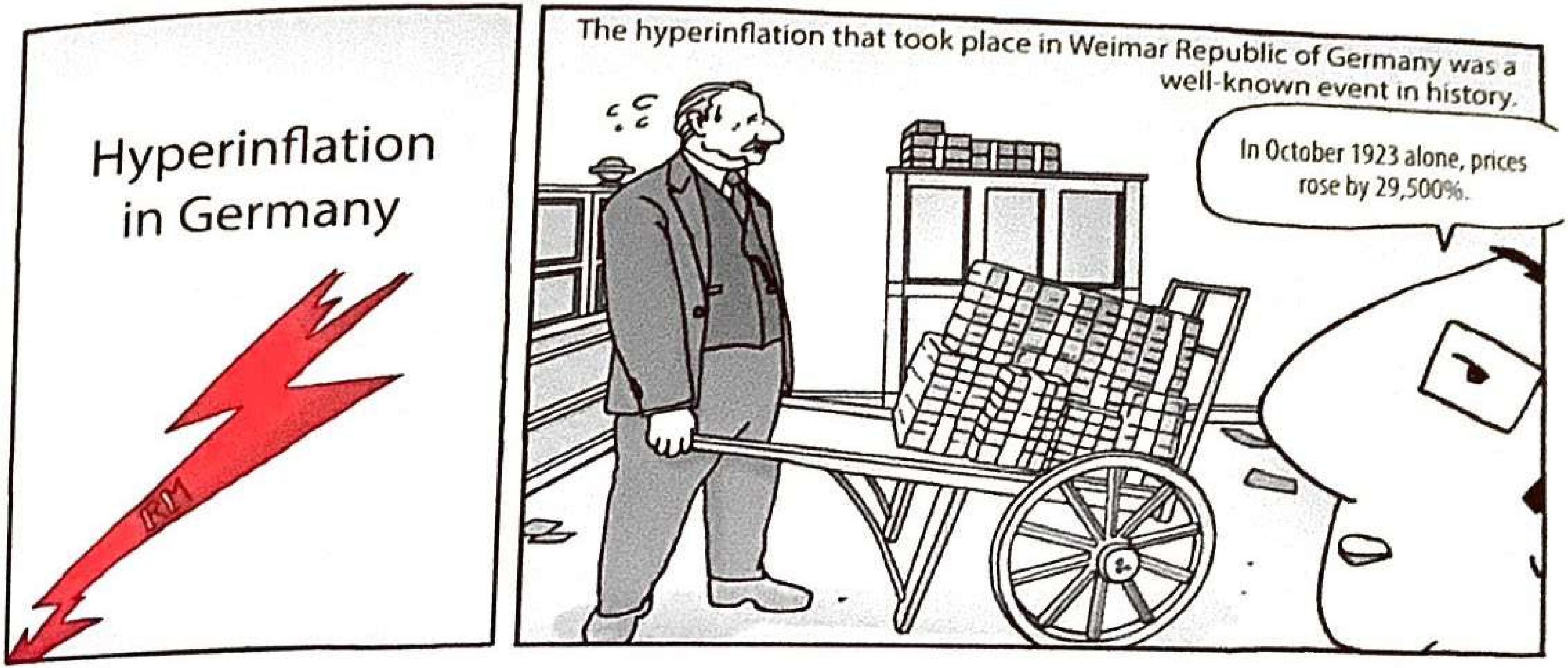
Principle 9: Prices rise when the government prints too much money



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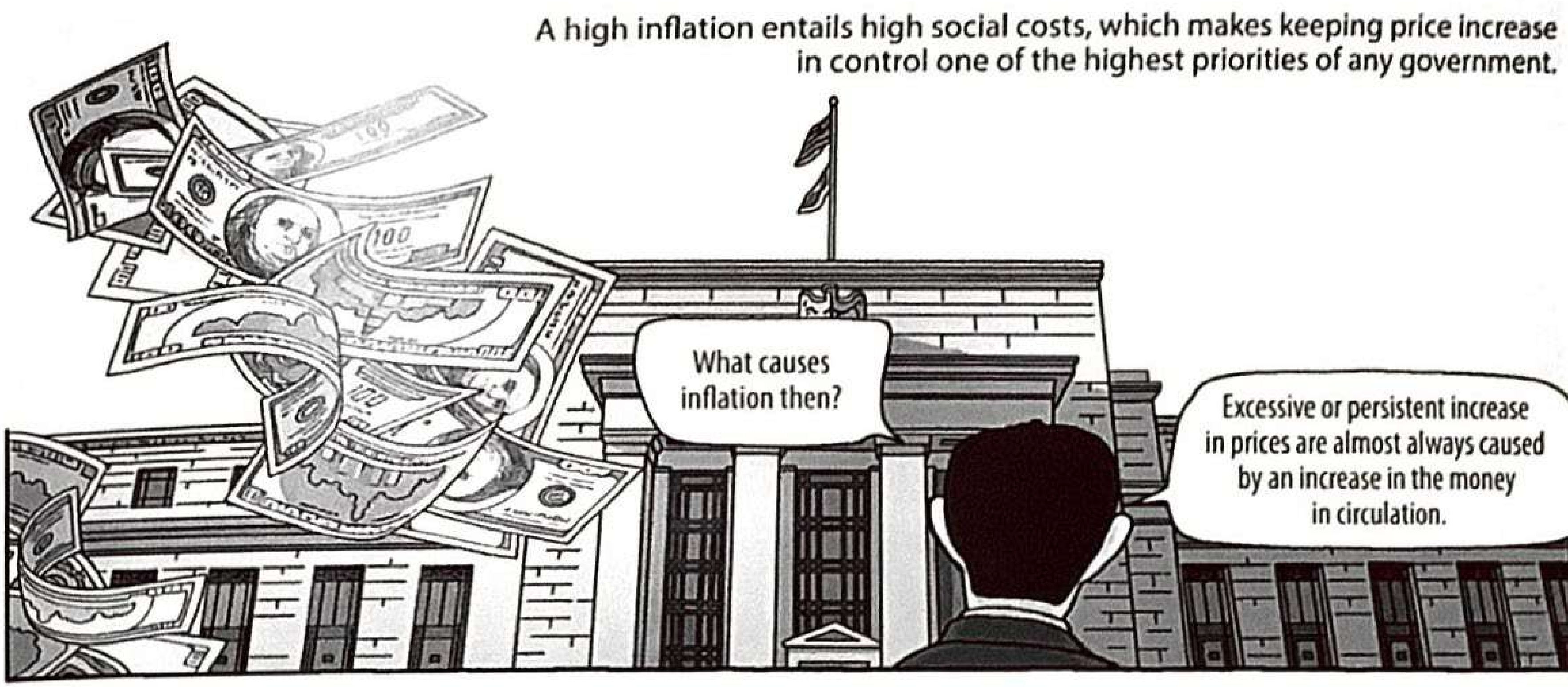

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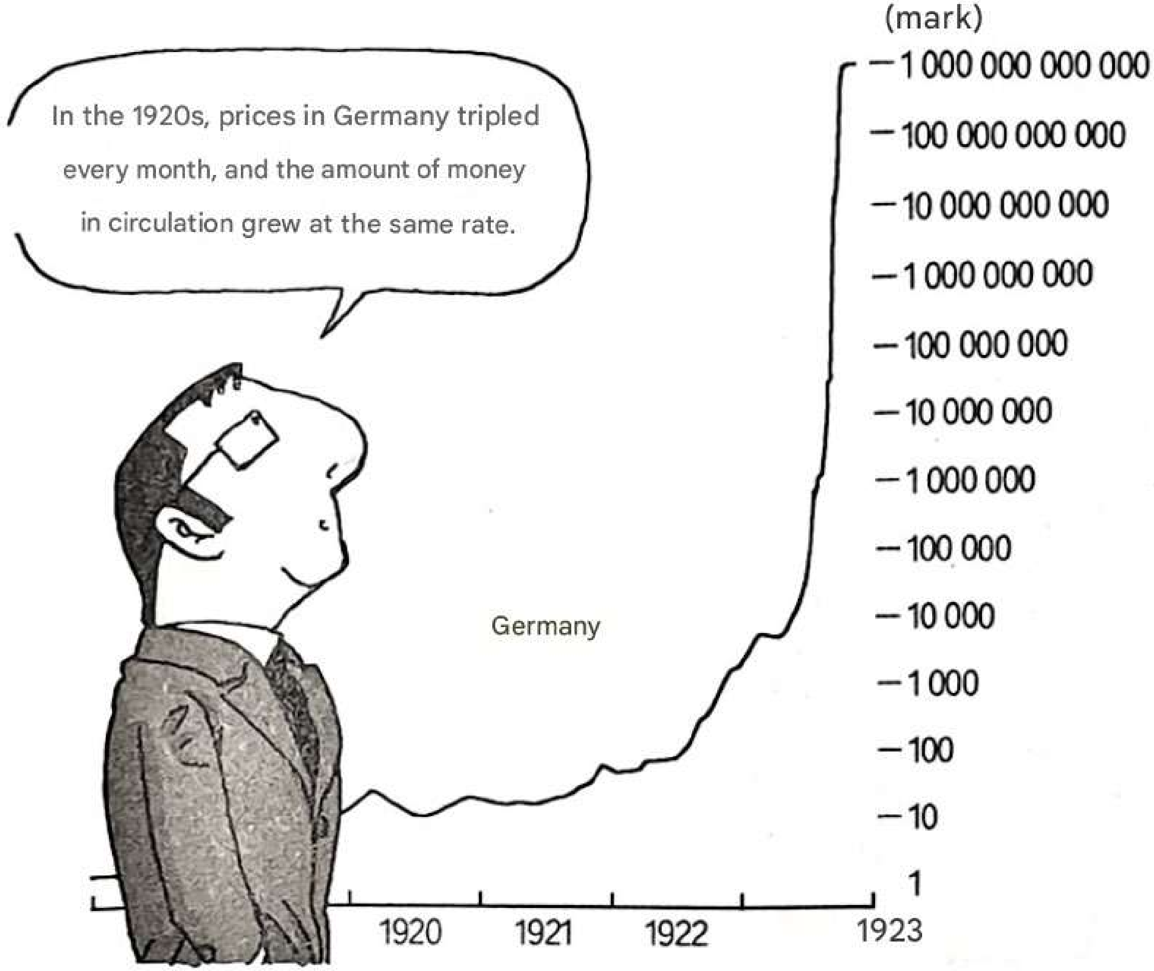

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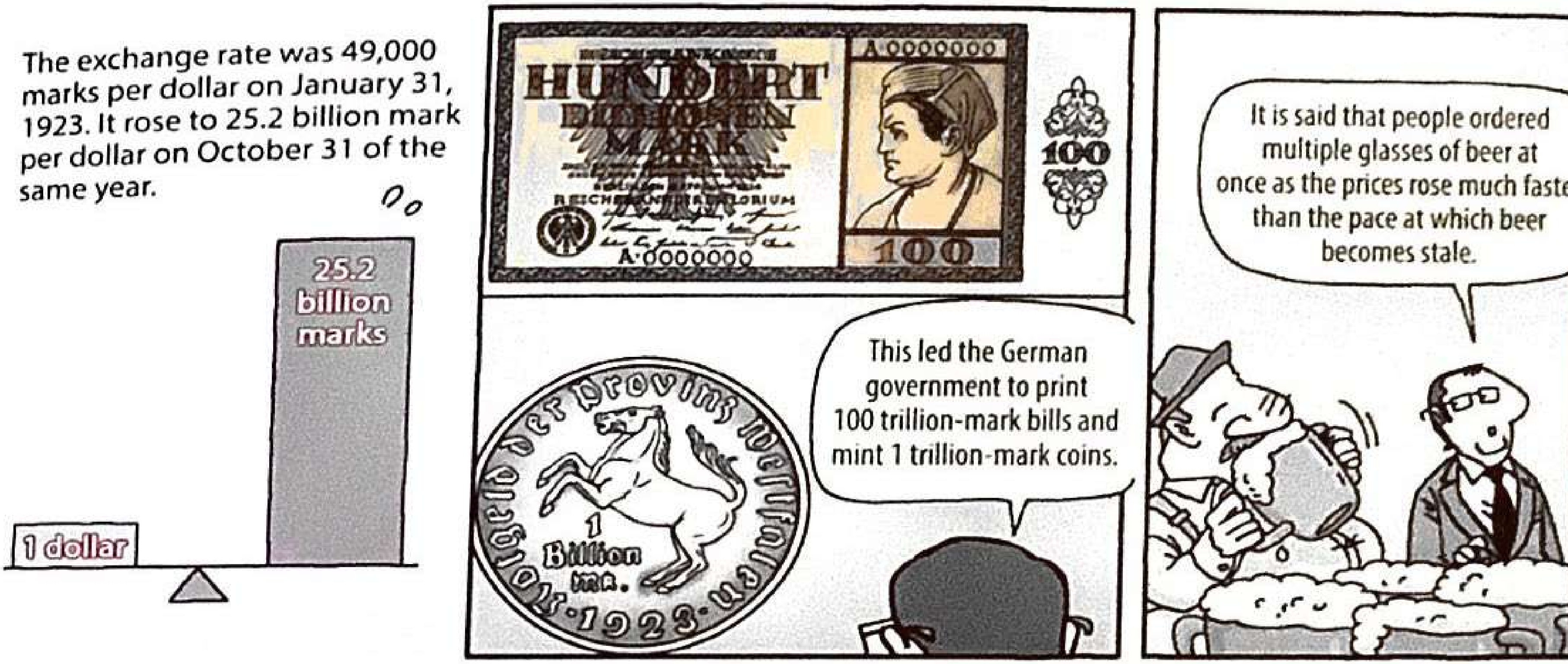

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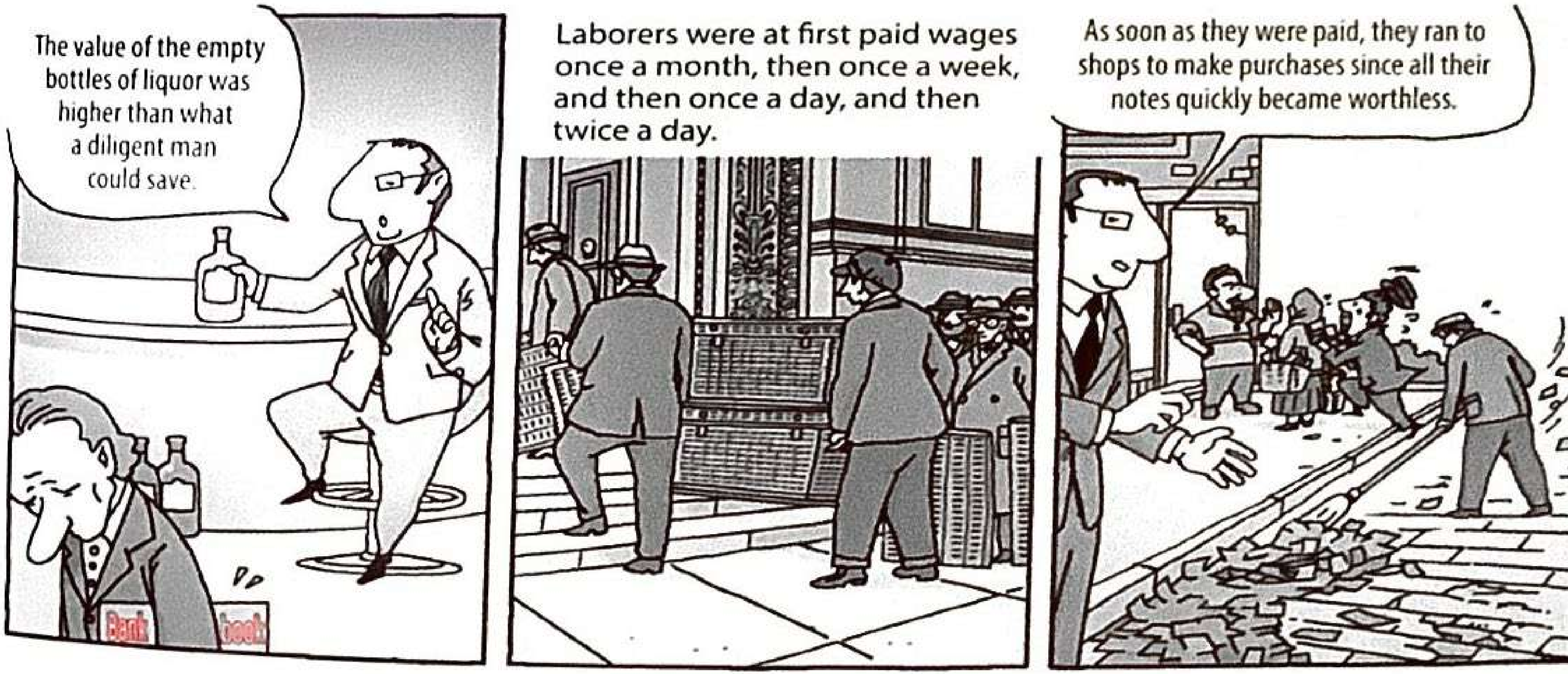
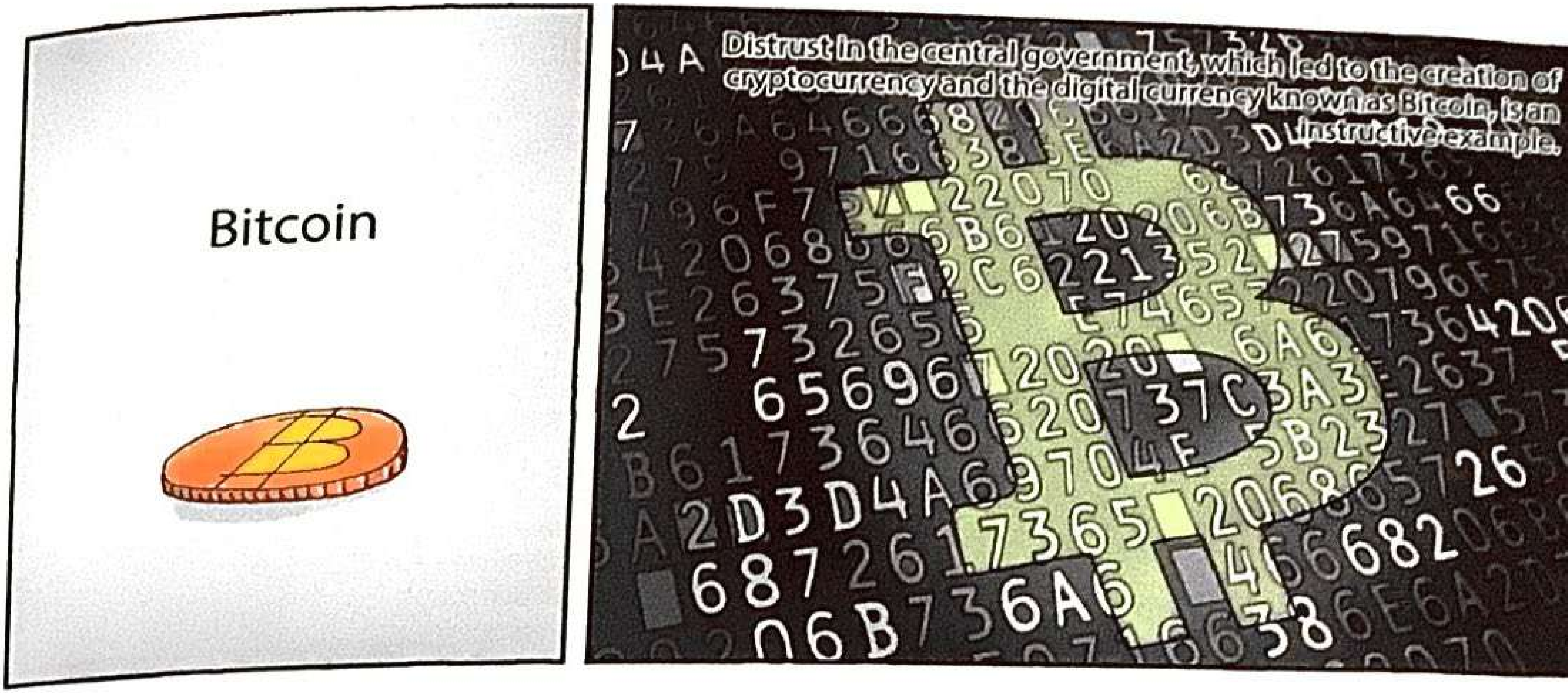
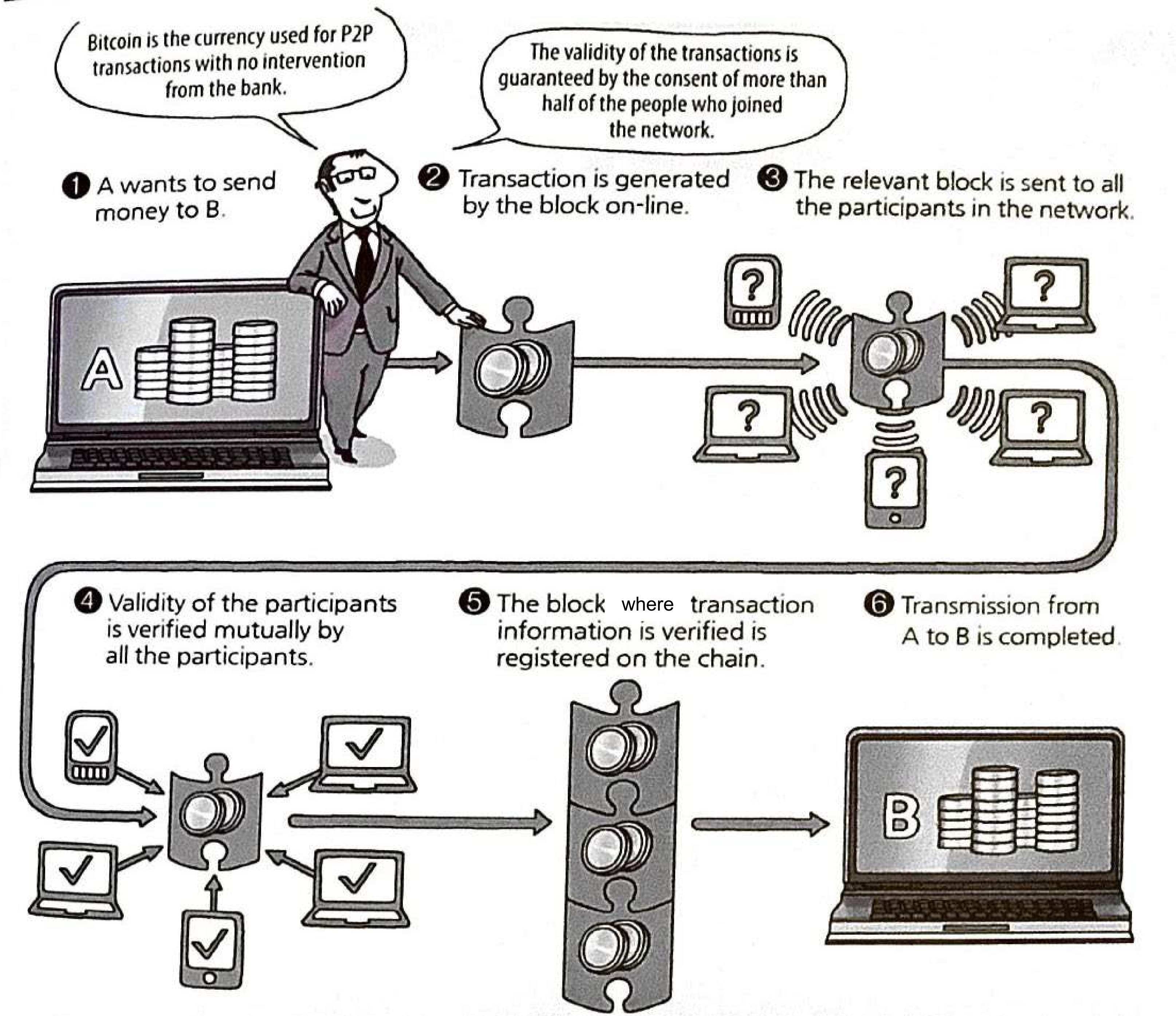


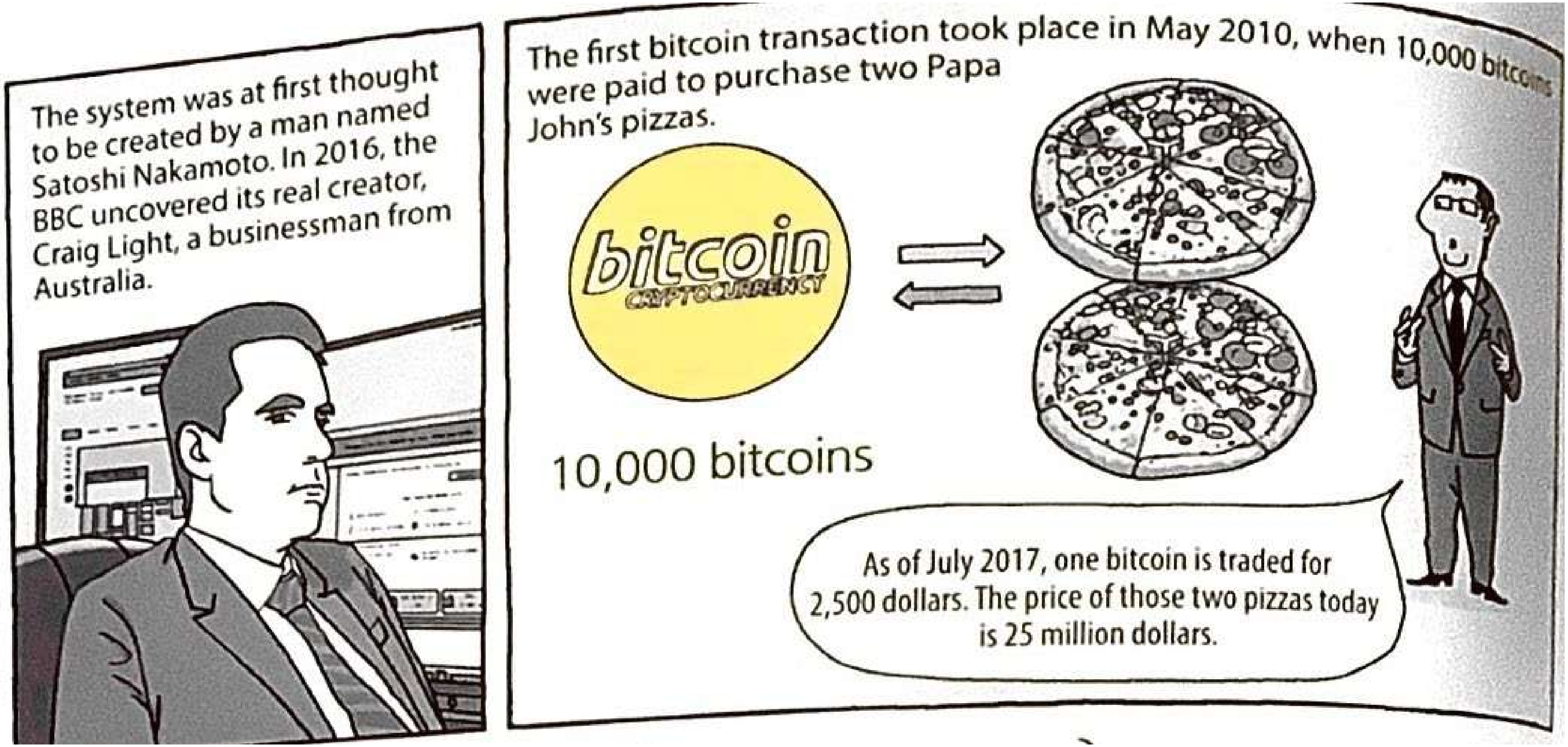
Principle 9: Prices rise when the government prints too much money

Bitcoin


Bitcoin
Distrust in the central government, which led to the creation of cryptocurrency and the digital currency known as Bitcoin, is an instructive example.

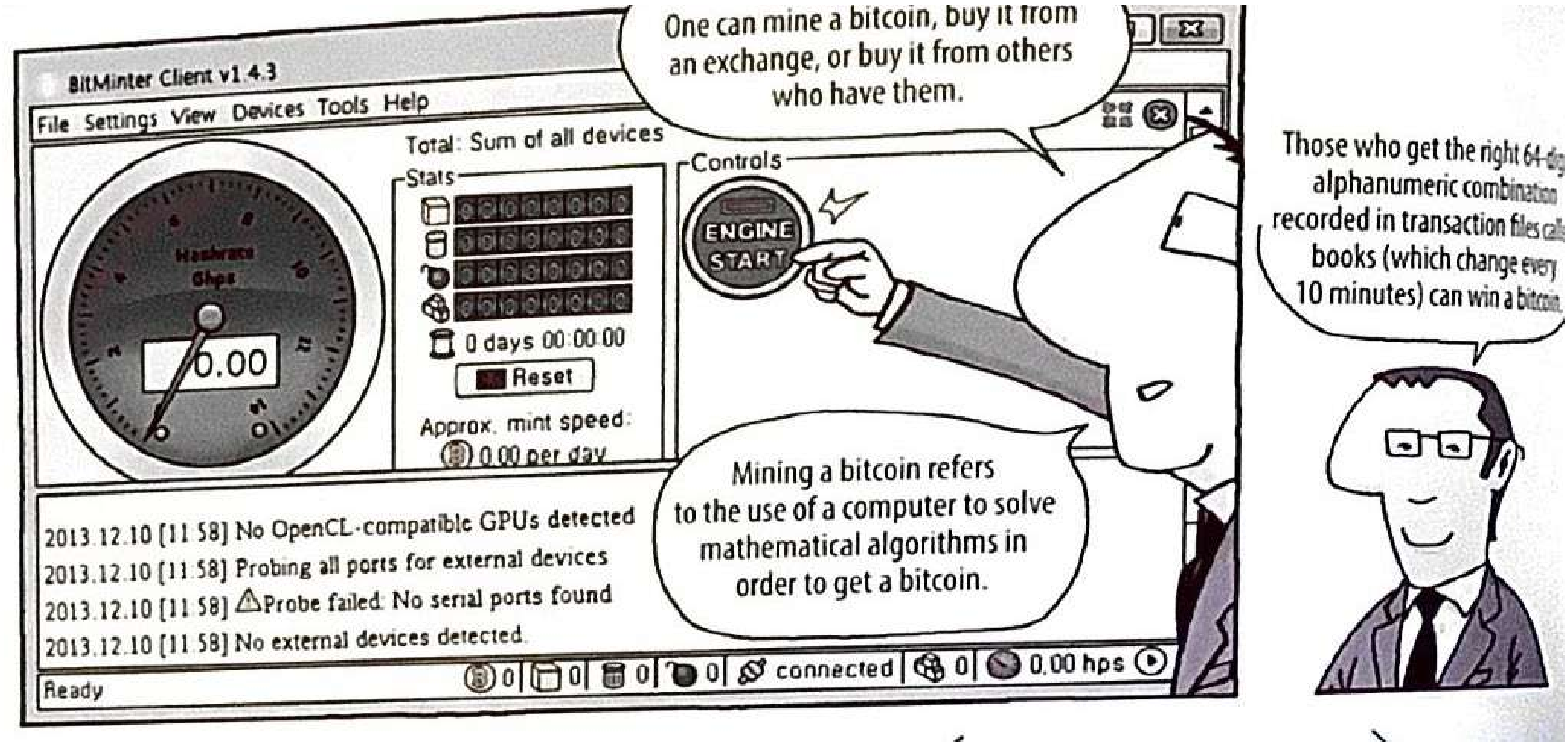

Bitcoin is the currency used for P2P transactions with no intervention from the bank.
The validity of the transactions is guaranteed by the consent of more than half of the people who joined the network.
❶ A wants to send money to B.
❷ Transaction is generated by the block on-line.
❸ The relevant block is sent to all the participants in the network.
A
?
❹ Validity of the participants is verified mutually by all the participants.
❺ The block where transaction information is verified is registered on the chain.
❻ Transmission from A to B is completed.
B

Bitcoin

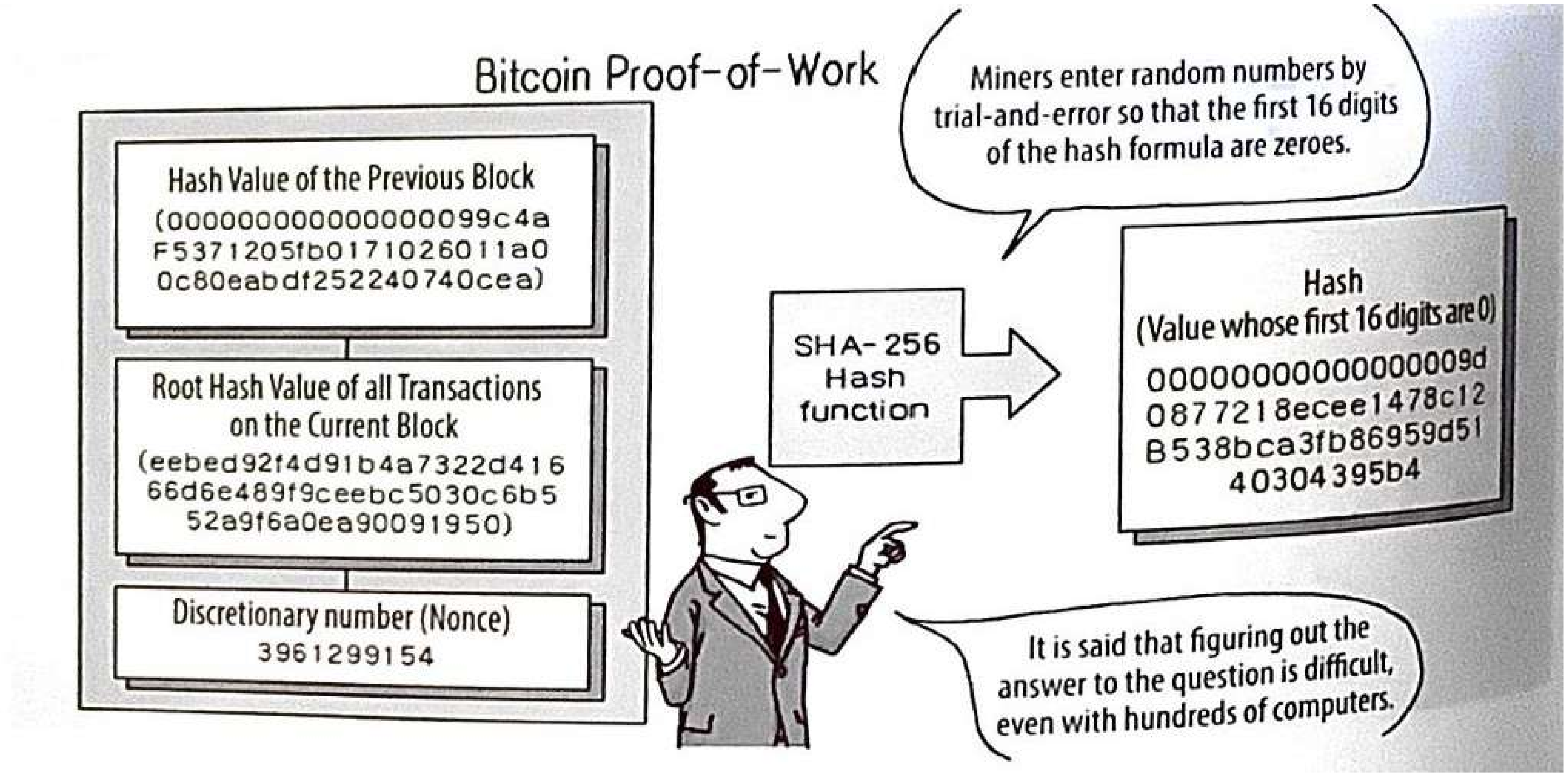


The system was at first thought to be created by a man named Satoshi Nakamoto. In 2016, the BBC uncovered its real creator, Craig Light, a businessman from Australia.
The first bitcoin transaction took place in May 2010, when 10,000 bitcoins were paid to purchase two Papa John's pizzas.
bitcoin
CRYPTOCURRENCY
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

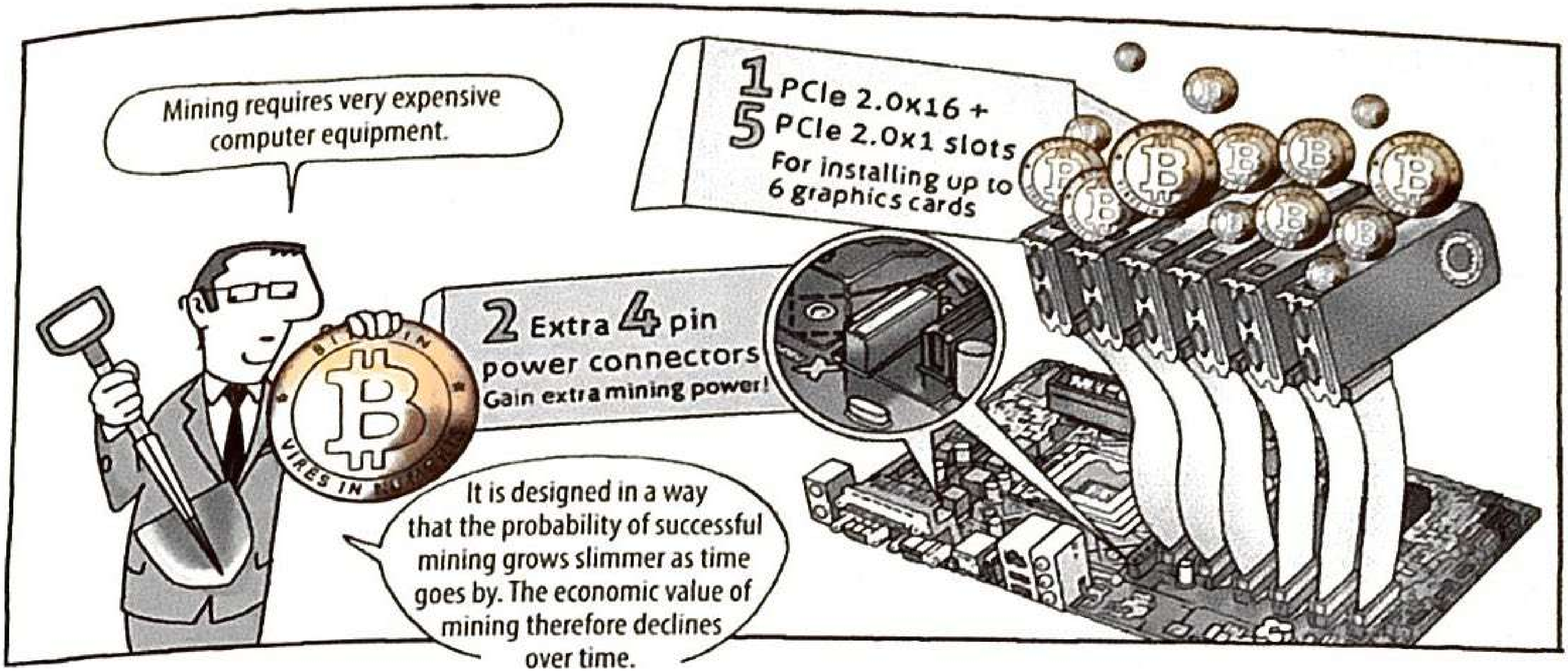

BitMinter Client v1.4.3
File Settings View Devices Tools Help
Total: Sum of all devices
Stats
Hashrate Ghps
0.00
0 days 00:00:00
Reset
Approx. mint speed:
0.00 per day
Controls
ENGINE START
2013.12.10 [11:58] No OpenCL-compatible GPUs detected
2013.12.10 [11:58] Probing all ports for external devices
2013.12.10 [11:58] Probe failed: No serial ports found
2013.12.10 [11:58] No external devices detected.
Ready
connected
0.00 hps
One can mine a bitcoin, buy it from an exchange, or buy it from others who have them.
Mining a bitcoin refers to the use of a computer to solve mathematical algorithms in order to get a bitcoin.
Those who get the right 64-dig alphanumeric combination recorded in transaction files cal books (which change every 10 minutes) can win a bitcoin.

Bitcoin



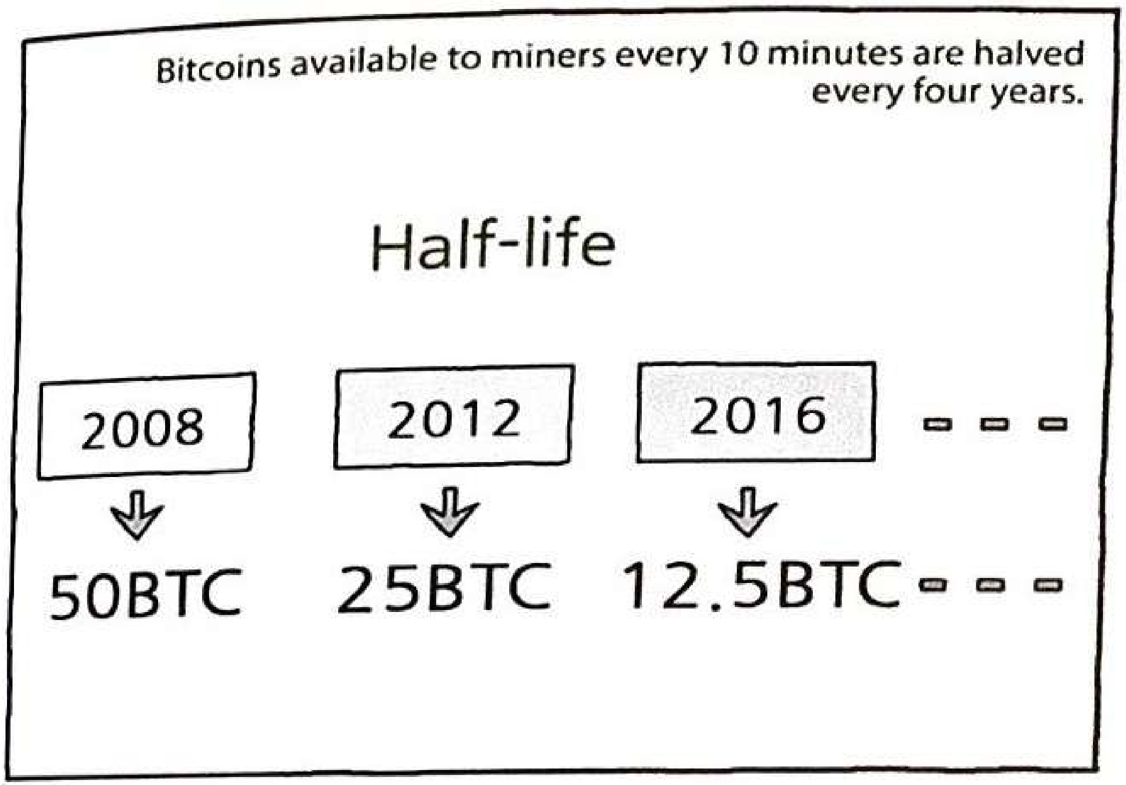
Bitcoin Proof-of-Work
Miners enter random numbers by trial-and-error so that the first 16 digits of the hash formula are zeroes.
Hash Value of the Previous Block (0000000000000000099c4a F5371205fb017102601 1a0 0c80eabdf252240740cea)
Root Hash Value of all Transactions on the Current Block (eebed92f4d91b4a7322d416 66d6e489f9ceebc5030c6b5 52a9f6a0ea90091950)
Discretionary number (Nonce) 3961299154
SHA-256 Hash function
Hash (Value whose first 16 digits are 0) 0000000000000000009d 087721 8ecee1478c12 B538bca3fb86959d51 40304395b4
It is said that figuring out the answer to the question is difficult, even with hundreds of computers.

Bitcoin

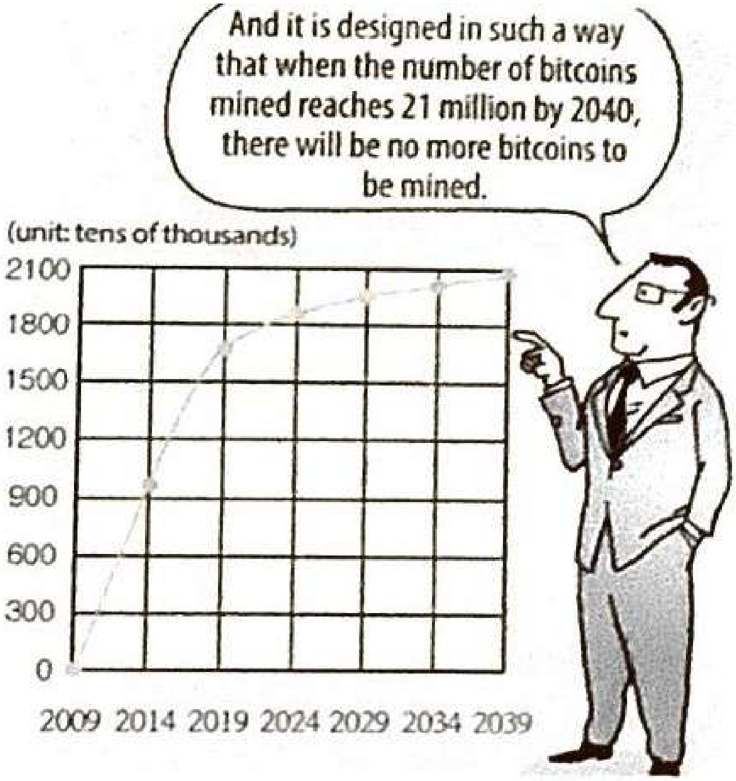


Mining requires very expensive computer equipment.
1 PCle 2.0x16 +
5 PCle 2.0x1 slots
For installing up to 6 graphics cards
2 Extra 4 pin power connectors
Gain extra mining power!
It is designed in a way that the probability of successful mining grows slimmer as time goes by. The economic value of mining therefore declines over time.

Bitcoin

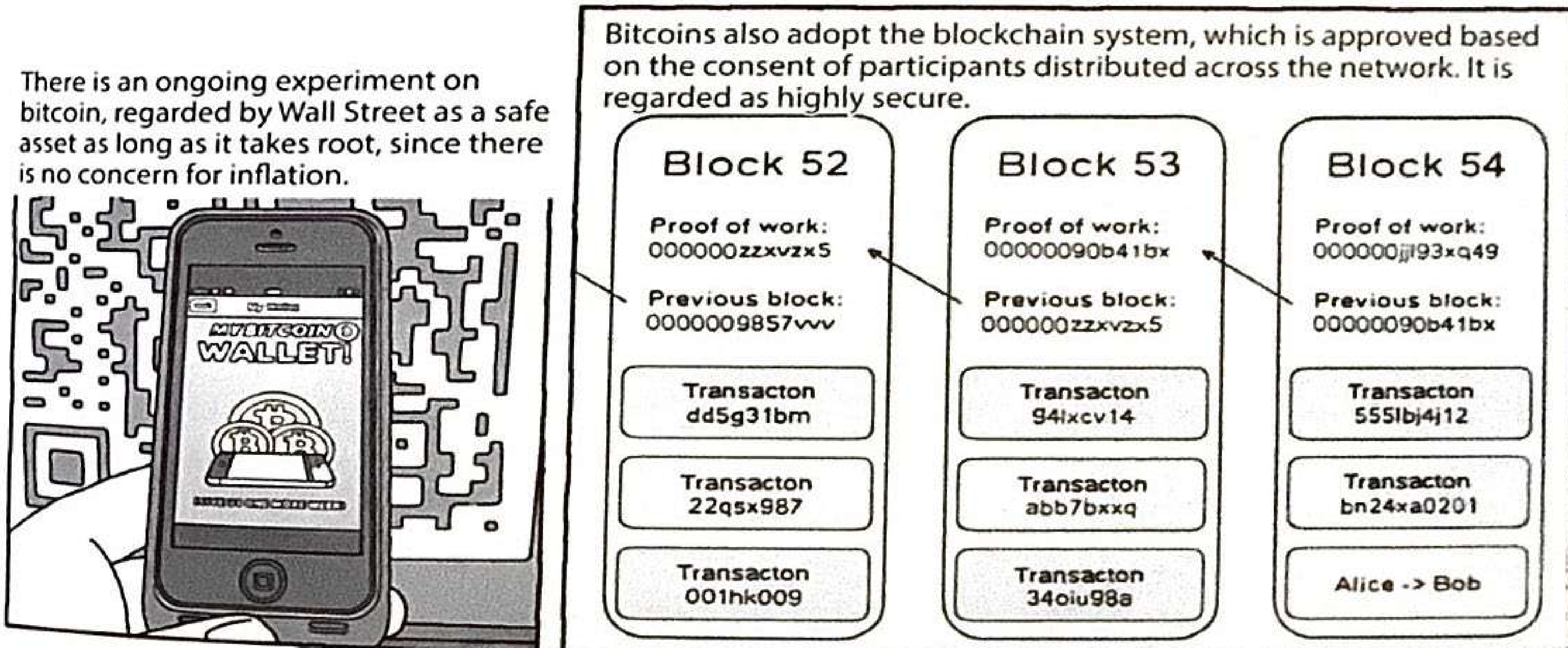


Bitcoins available to miners every 10 minutes are halved every four years.
Half-life
2008
2012
2016
50BTC
25BTC
12.5BTC



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)
2100
1800
1500
1200
900
600
300
0
2009 2014 2019 2024 2029 2034 2039

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.
MYBITCOIN WALLET!
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.
Block 52
Proof of work: 000000zzxvzx5
Previous block: 0000009857vvv
Transacton dd5g31bm
Transacton 22qsx987
Transacton 001hk009
Block 53
Proof of work: 00000090b41bx
Previous block: 000000zzxvzx5
Transacton 94lxcv14
Transacton abb7bxxq
Transacton 34oiu98a
Block 54
Proof of work: 000000jjl93xq49
Previous block: 00000090b41bx
Transacton 555lbj4j12
Transacton bn24xa0201
Alice -> Bob

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.

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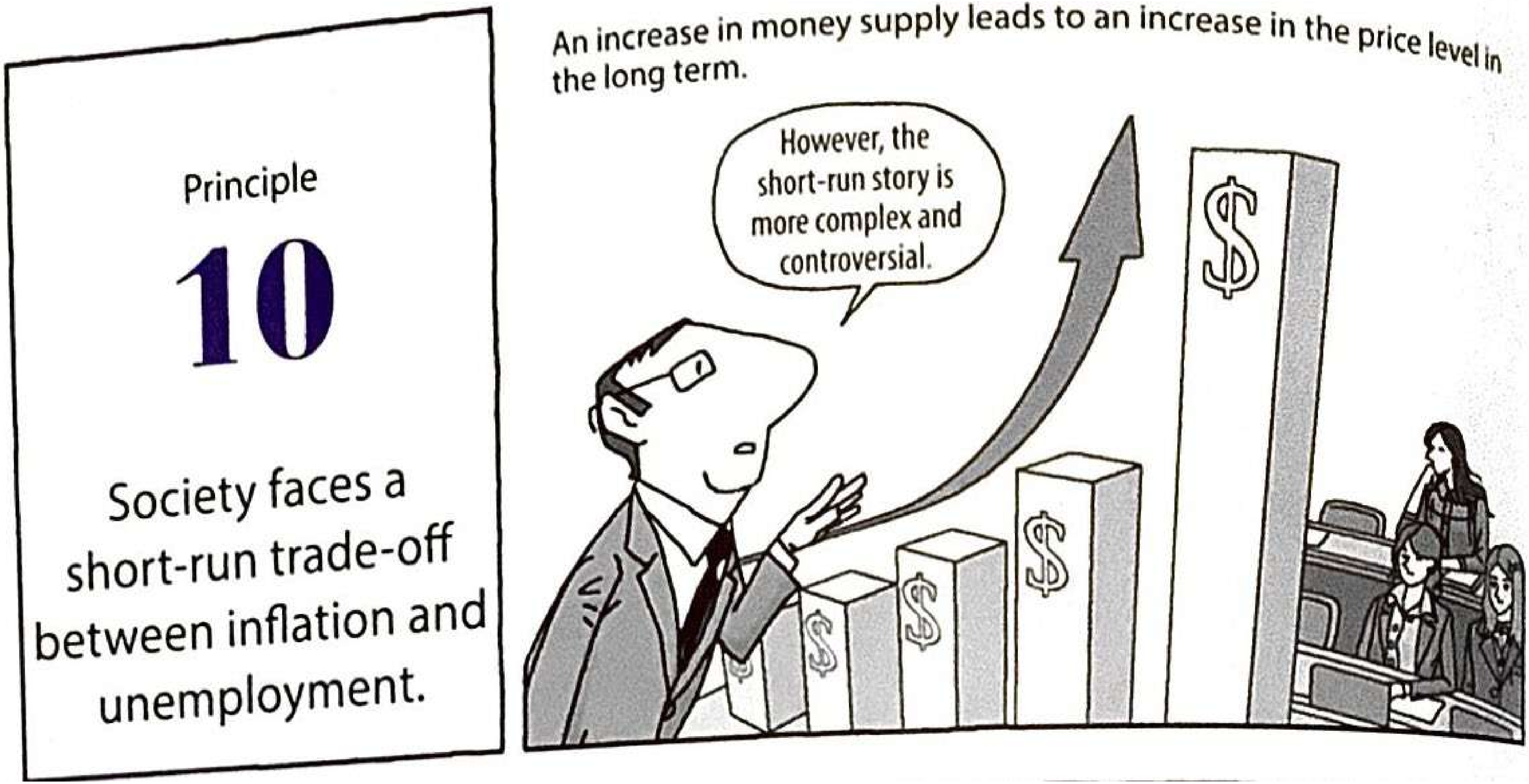
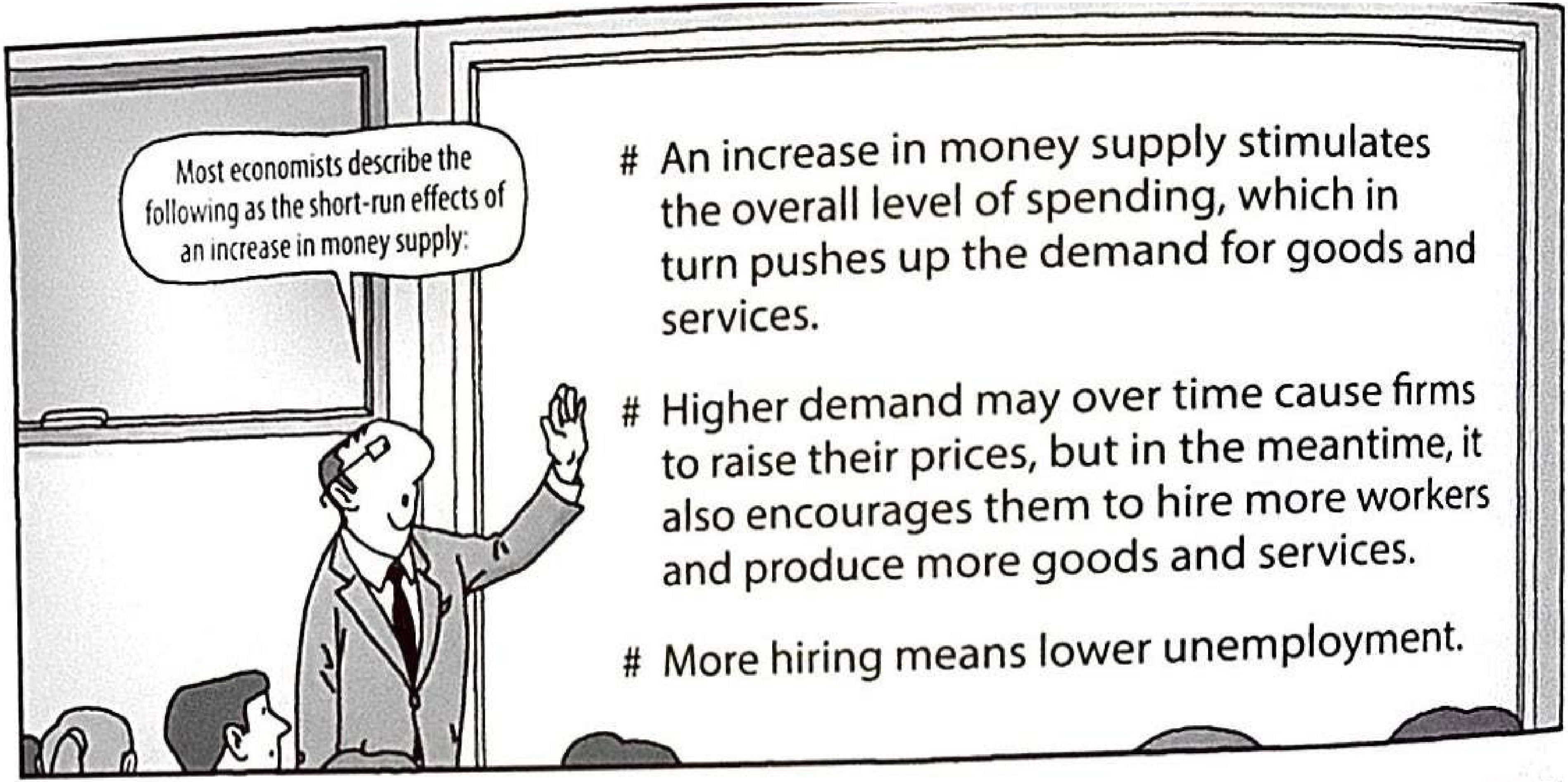


Principle 10: Society faces a short-run trade-off between inflation and unemployment



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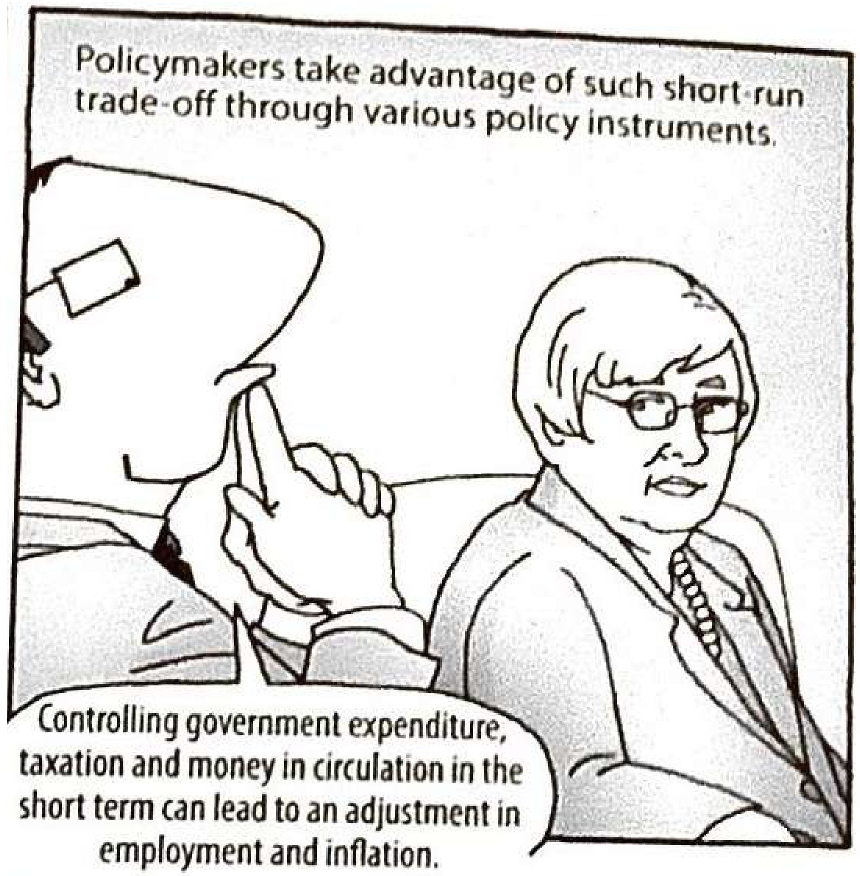

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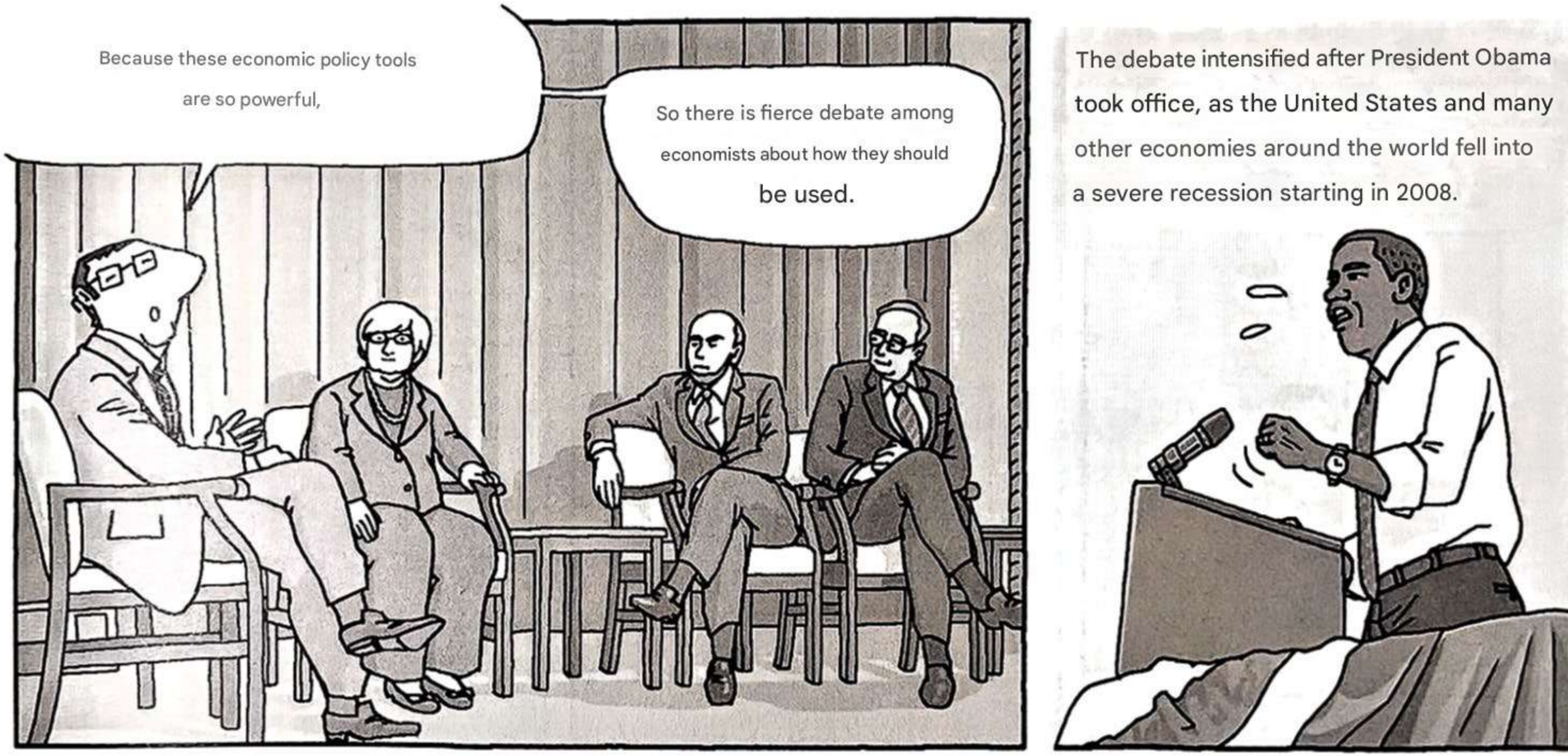

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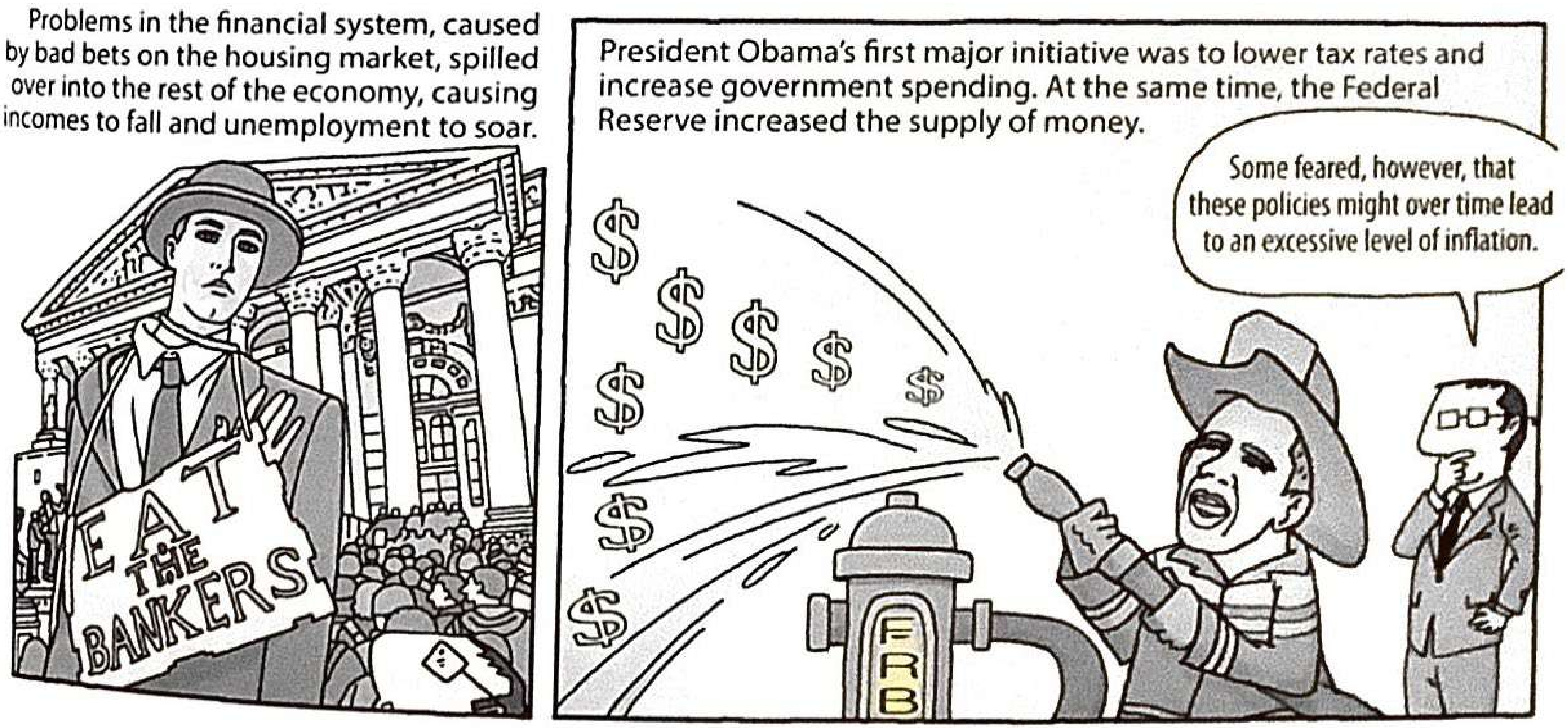
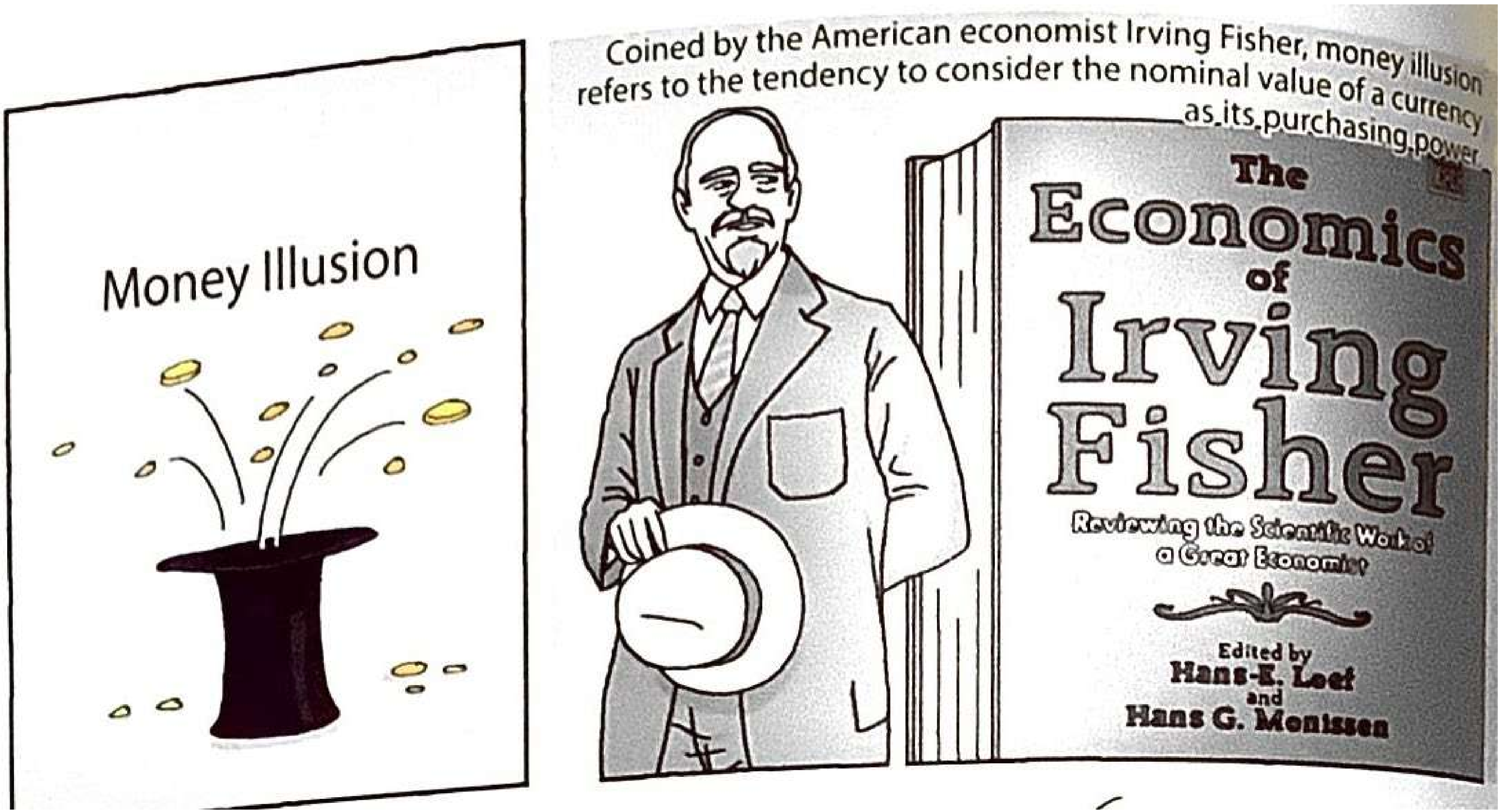


Money illusion



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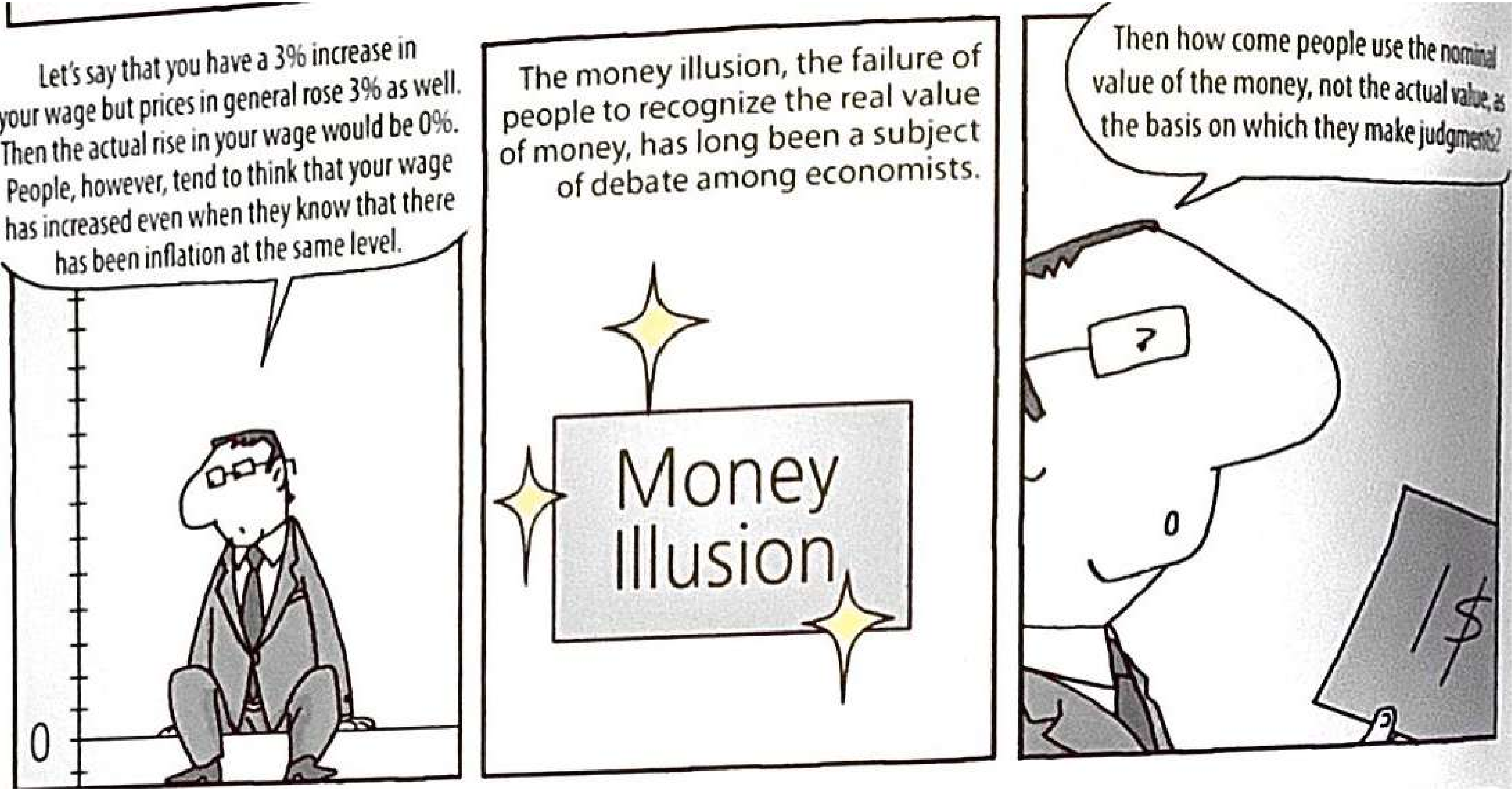
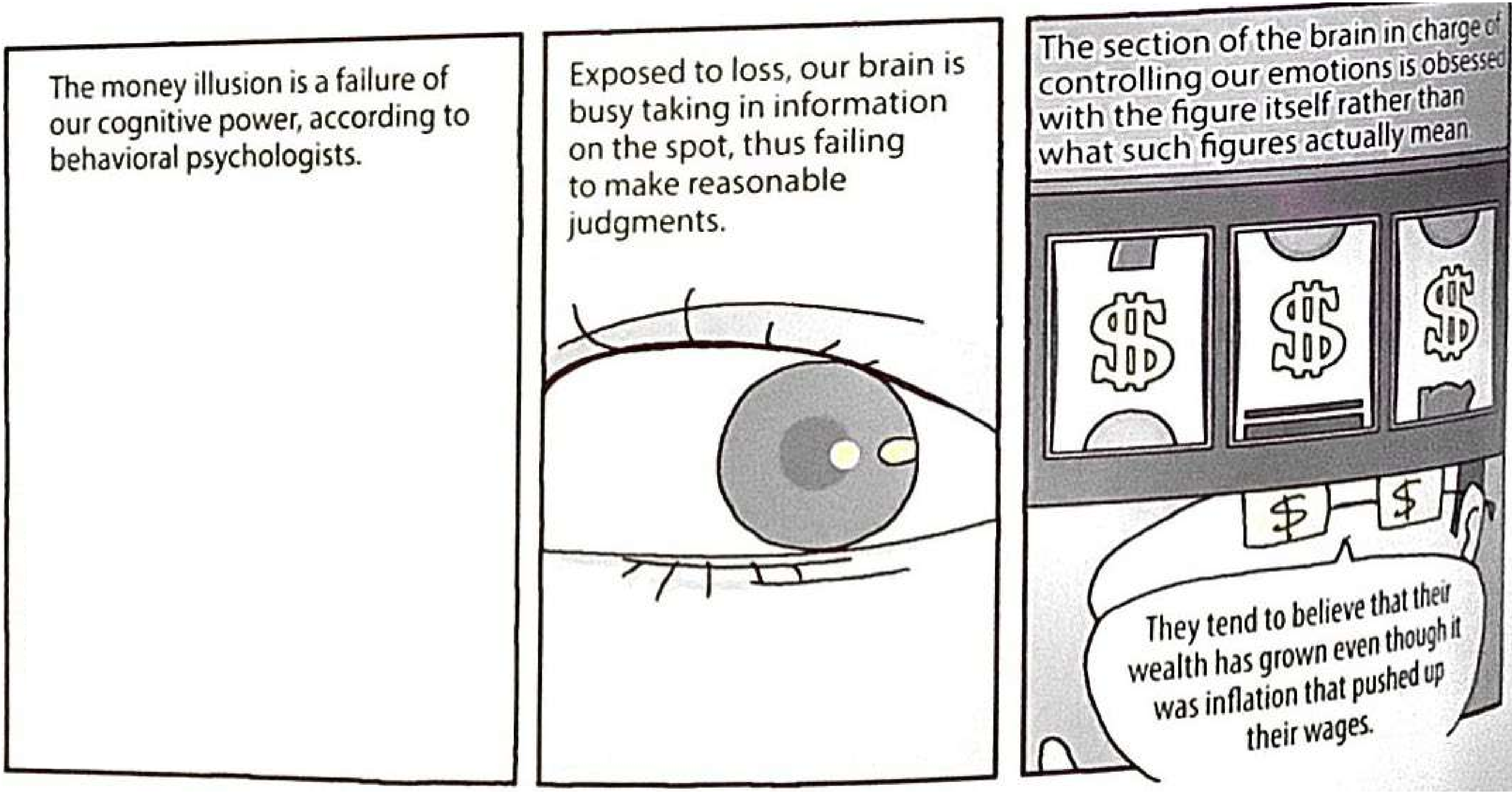


Real interest rate ≈ Nominal interest rate - Inflation rate

Money illusion



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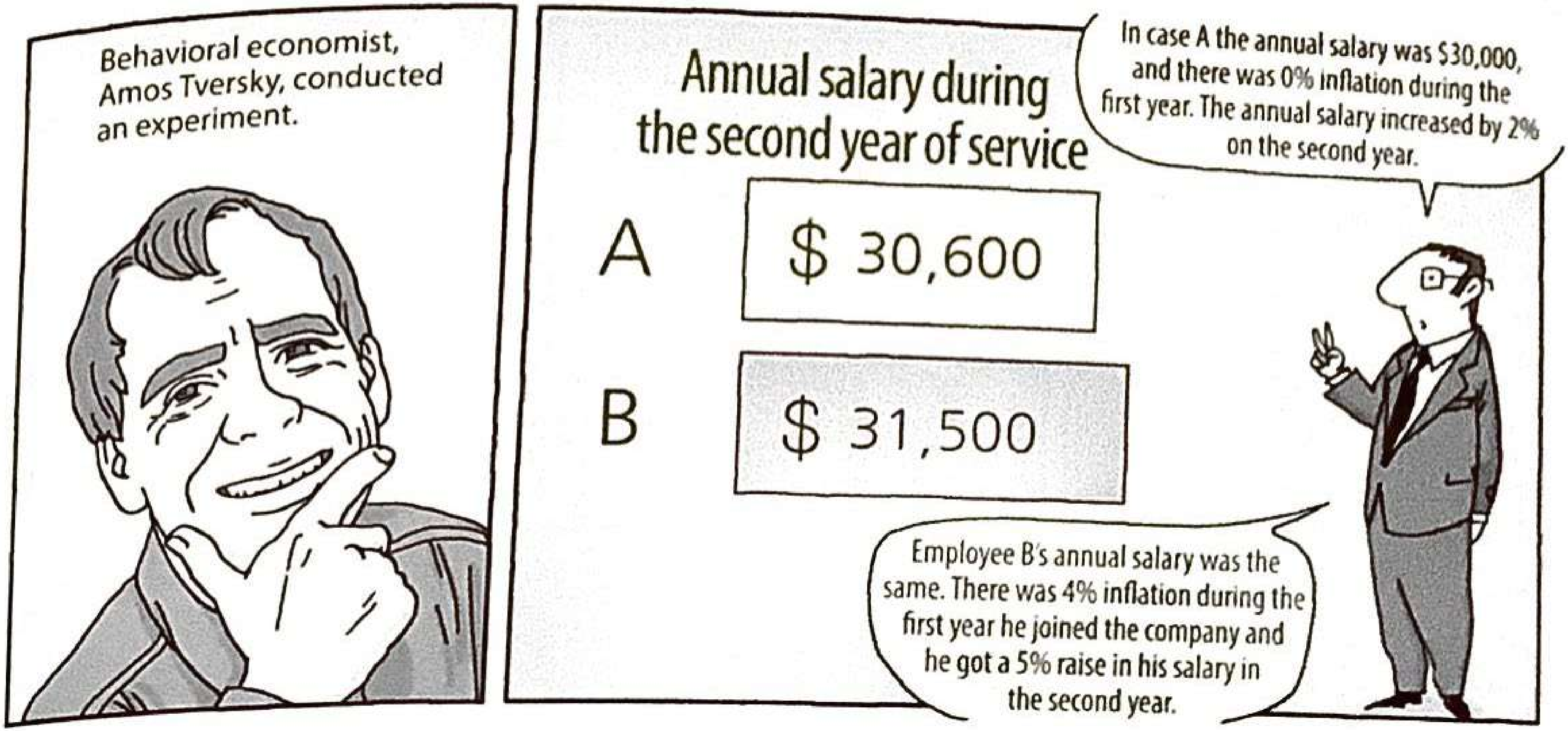

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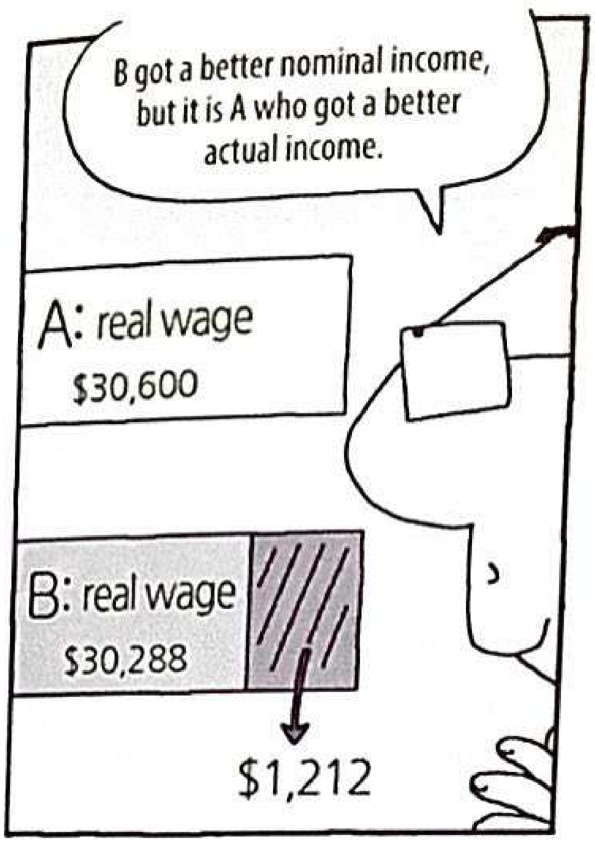
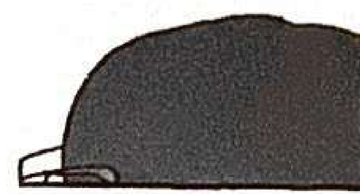


He asked the following questions to those who participated in the experiment.

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?



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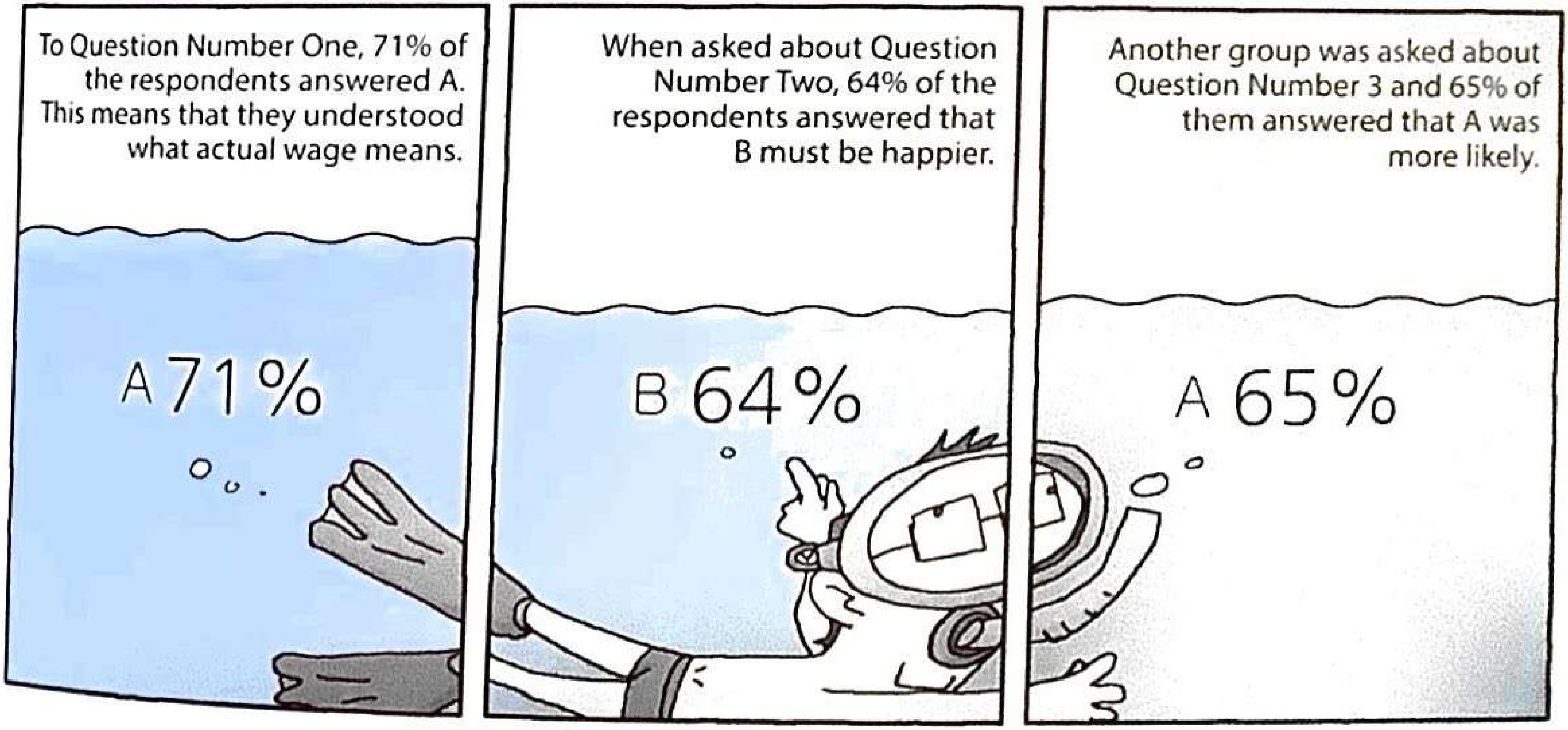

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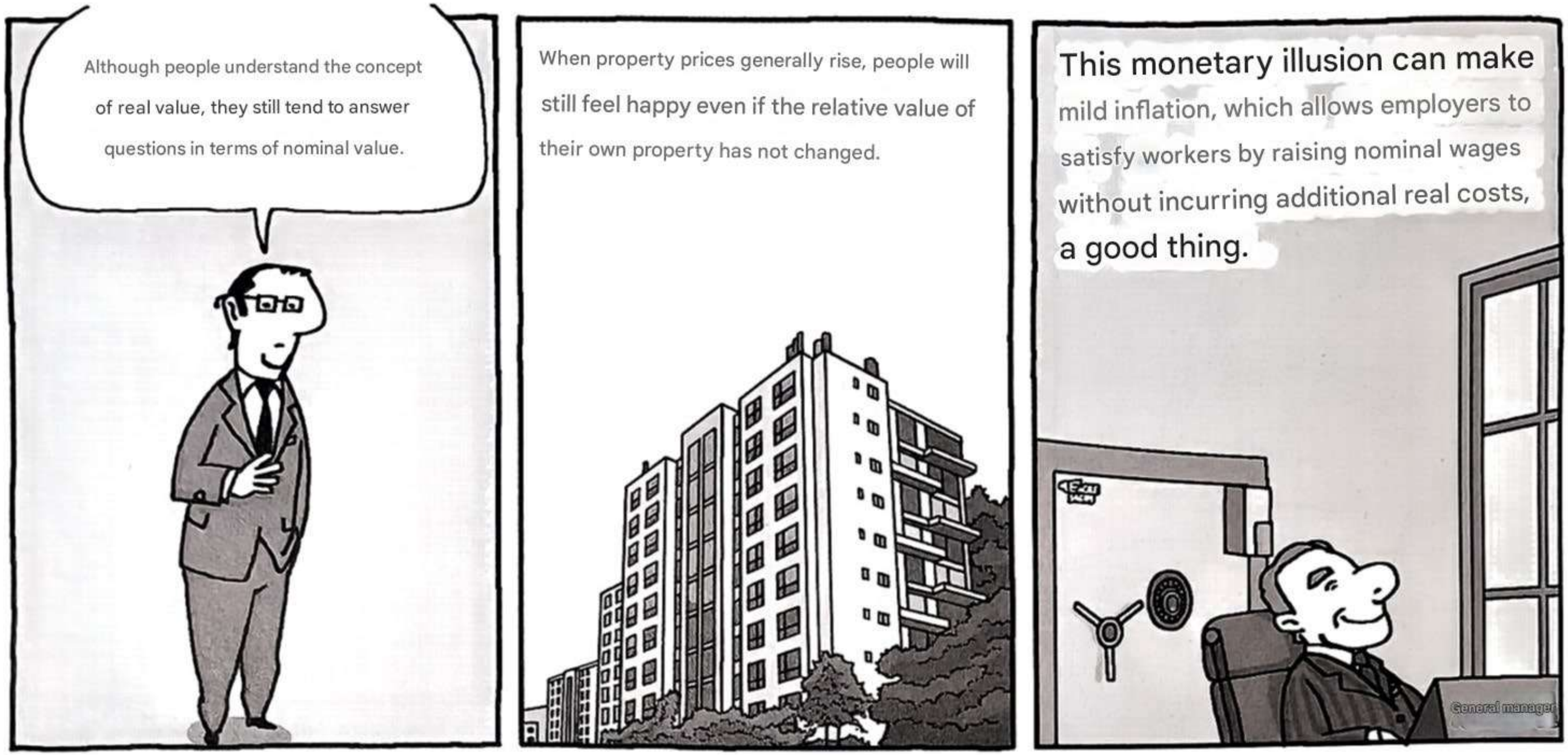
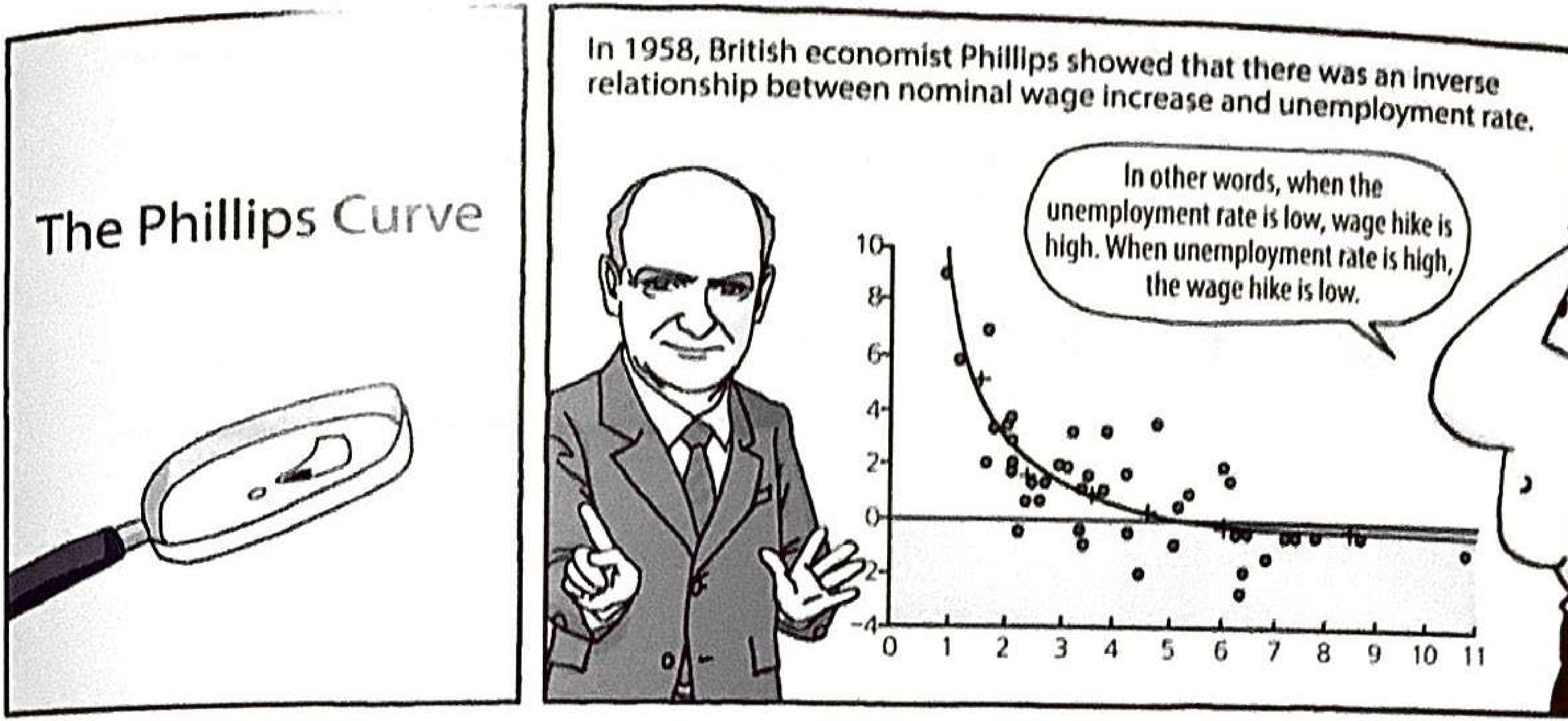


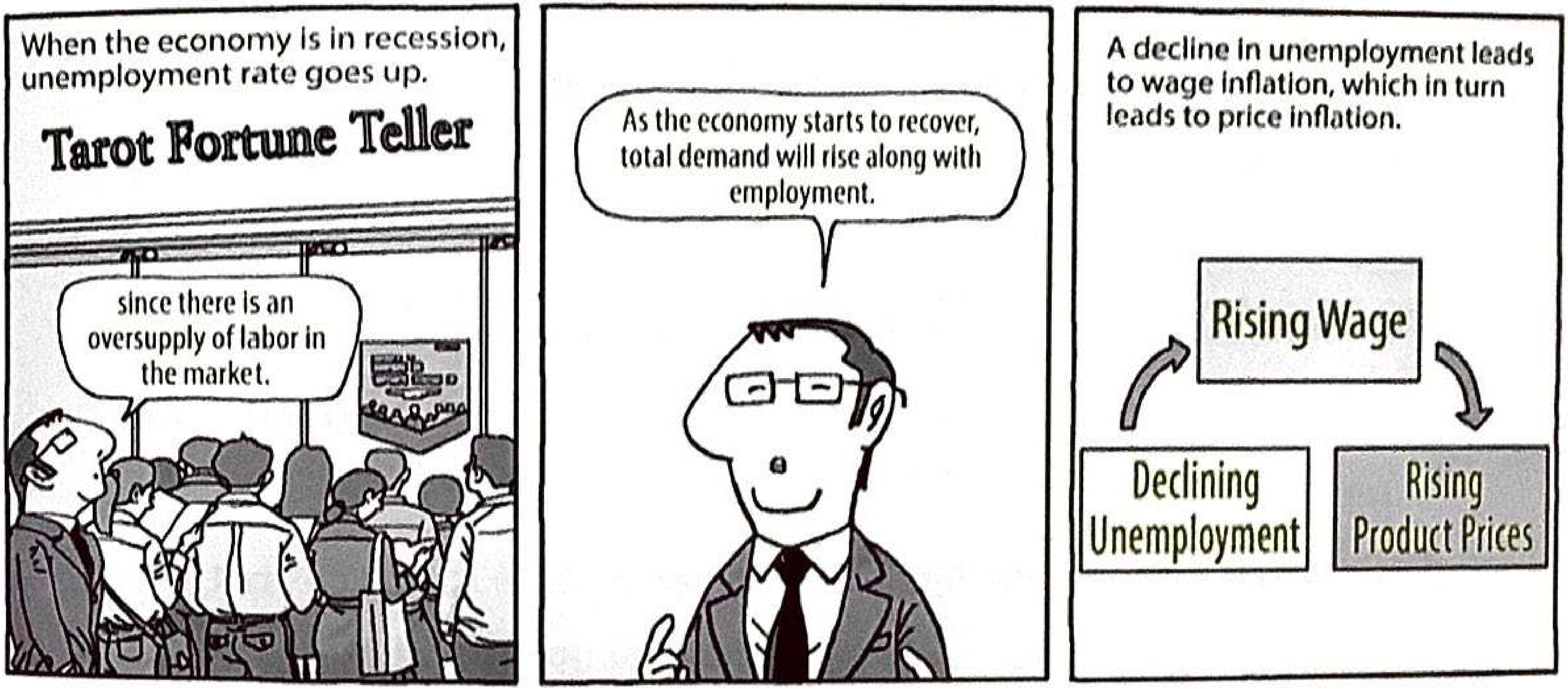
Workers demand wage increases, but under moderate inflation, a wage raise effectively amounts to no real gain—yet workers feel satisfied.

The Philips curve



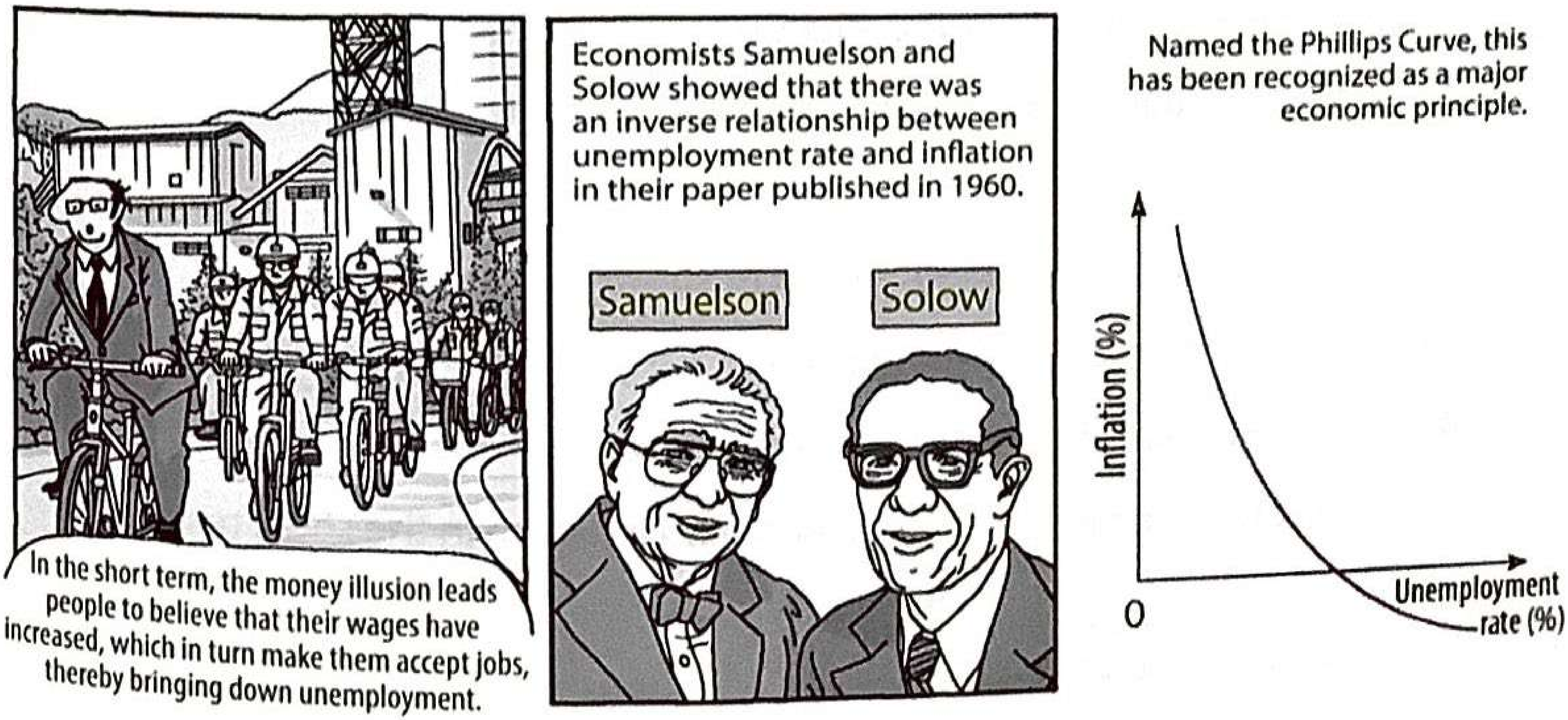
When the unemployment rate is low, the labor market becomes tight, workers' bargaining power increases, and wages rise rapidly.

The Philips curve



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).

The Philips curve



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.

Quick Quiz

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?

Quick Quiz

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"?

Quick Quiz

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?

Quick Quiz

4. Why is labor productivity important?

Quick Quiz

5. What is inflation? What causes inflation?

Quick Quiz

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

Quick Quiz

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