

# 12 The Design of the Tax System

## PRINCIPLES OF MICROECONOMICS FOURTH CANADIAN EDITION

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PowerPoint® Slides  
by Ron Cronovich  
Canadian adaptation by Marc Prud'Homme

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In this chapter, look for the answers to these questions:

- What are the largest sources of government tax revenue?
- What are the efficiency costs of taxes?
- How can we evaluate the equity of a tax system?

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### Introduction

- One of the Ten Principles from Chapter 1:  
*A government can sometimes improve market outcomes.*
  - providing public goods
  - regulating use of common resources
  - remedying the effects of externalities
- To perform its many functions, the government raises revenue through taxation.



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## Introduction

- Lessons about taxes from earlier chapters:
  - A tax on a good reduces the market quantity of that good.
  - The burden of a tax is shared between buyers and sellers depending on the price elasticities of demand and supply.
  - A tax causes a deadweight loss.



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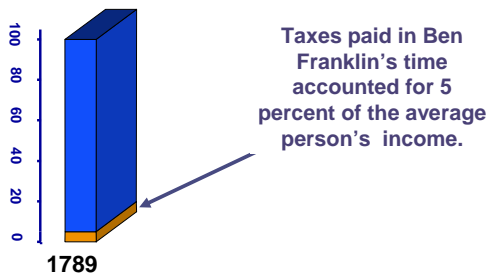
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*"In this world nothing is certain but death and taxes."*  
... Benjamin Franklin



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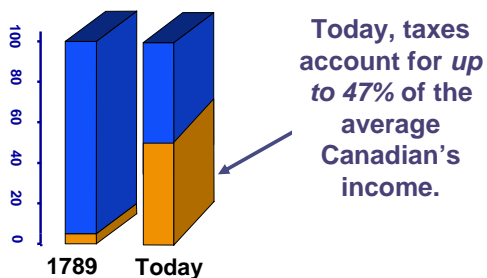
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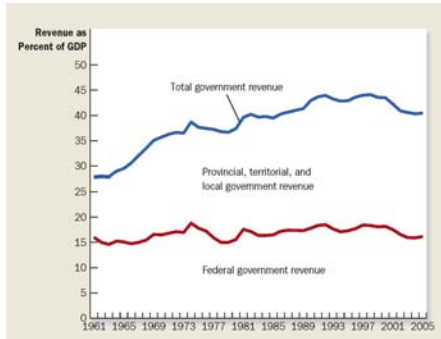
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**FIGURE 12.1: Government Revenue as a Percentage of GDP**



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**TABLE 12.1: Total Government Revenue as a Percent of GDP**

| Country        | Tax Revenue as % of GDP |
|----------------|-------------------------|
| France         | 51.4%                   |
| Italy          | 44.0                    |
| Germany        | 43.5                    |
| United Kingdom | 41.9                    |
| Canada         | 41.0                    |
| United States  | 32.8                    |
| Japan          | 31.7                    |
| G7 Average     | 37.0                    |

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### Structure of Canadian Government

- Federalist structure
  - Political power divided between federal government and provincial governments
  - Federal government has the greater power
  - Local and municipal governments are granted powers by the provincial government

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### Structure of Canadian Government

- Federal government responsibilities
  - Matters of national interest: national defence and foreign policy, international trade, competition policy, criminal law and money and banking
  - Delivery of national social programs, e.g., Employment Insurance (EI) and Canadian Pension Plan (CPP).
  - Has unlimited taxing powers

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### Structure of Canadian Government

- Provincial government responsibilities
  - Health care, education, welfare, natural resources within their boundaries, and civil law
  - Extensive taxing powers, but less than federal government
  - Account for more than half of activities by the public sector in Canada

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### Structure of Canadian Government

- Transfers from federal government to provinces
  - Intended help finance provincial programs in health, education and welfare
- Equalization payments
  - To make it possible for all provinces to provide comparable services to residents

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11

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The Federal Government: Tax Revenues

- The Canadian federal government collects about 45 percent of the taxes in our economy.
- The largest source of revenue for the federal government is the personal income tax, which accounts for almost half of total federal revenue.

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TABLE 12.2: Federal Government Revenue, 2005-2006

| Revenue Source                     | Amount (in billions) | Amount per Person | % of Revenue |
|------------------------------------|----------------------|-------------------|--------------|
| Personal income taxes              | \$104                | \$3190            | 47%          |
| Corporate income taxes             | 32                   | 982               | 14           |
| Goods and Services Tax             | 33                   | 1012              | 15           |
| Excise taxes and duties            | 13                   | 400               | 6            |
| Employment Insurance payroll taxes | 16                   | 490               | 7            |
| Other                              | 24                   | 736               | 11           |
| Total                              | 222                  | 6810              | 100          |

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The Federal Government: Tax Revenues

- Personal Income Taxes
  - The *marginal tax rate* is the tax rate applied to each additional dollar of income.
  - Higher-income individuals pay a larger percentage of their income in taxes.

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**TABLE 12.3: Federal Personal Income Tax Rates, 2003**

| On taxable income . . .    | The tax rate is |
|----------------------------|-----------------|
| Up to \$36 378             | 15.25%          |
| From \$36 379 to \$72 756  | 22              |
| From \$72 757 to \$118 285 | 26              |
| Over \$118 285             | 29              |

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15

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### The Federal Government: Tax Revenues

- The next-largest source of federal revenue is the Goods and Services Tax (GST)
  - accounts for about 16% of federal government revenue
  - levied at a 7% rate on the sales of most goods in Canada, with some notable exceptions (like food)
- Excise and customs duties account for another 7% of federal revenue
  - Excise taxes are sales tax on specific goods (e.g., gasoline, cigarettes and alcohol)
  - Customs duties are taxes on imported goods

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16

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### The Federal Government: Tax Revenues

- Corporate income taxes
  - account for 12% of federal revenue
  - based on a corporation's profits
- Payroll taxes
  - tax on wages a firm pays its workers
  - paid by both employees and employers
  - used to finance
    - *Employment Insurance (EI)* program
    - *Canada Pension Plan (CPP)*

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17

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## The Federal Government: Spending

- Federal spending goes to interest on the debt and program spending
  - Old Age Security (OAS)
  - Canada Health and Social Transfer (transfers to the provinces)
  - Employment Insurance payments (EI)
  - National defence

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18

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**TABLE 12.4: Federal Government Spending, 2005-2006**

| Category                             | Amount<br>(in billions) | Amount<br>per person | % of<br>Spending |
|--------------------------------------|-------------------------|----------------------|------------------|
| Old Age Security                     | \$ 29                   | \$ 890               | 14%              |
| Canada Health and Social<br>Transfer | 37                      | 1135                 | 18               |
| Equalization                         | 11                      | 337                  | 5                |
| Employment Insurance                 | 14                      | 430                  | 7                |
| National defence                     | 15                      | 460                  | 7                |
| Other                                | 69                      | 2116                 | 33               |
| Total program spending               | 175                     | 5368                 | 84               |
| Debt service                         | 34                      | 1043                 | 16               |
| Total spending                       | 209                     | 6410                 | 100              |

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19

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## The Federal Government *Budget Balance*

- **Budget Surplus** is an excess of government receipts over government spending.
- **Budget Deficit** is an excess of government spending over government receipts.

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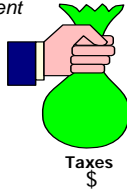
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## Provincial and Local Governments

- Provincial and Local governments collect more than 50% of taxes in the economy

- Transfers from the federal government
- Personal income taxes
- General sales taxes
- Excise taxes
- Property taxes
- Corporate income taxes
- Health premiums and payroll taxes



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21

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**TABLE 12.5: Provincial Government Revenue, 2005-2006**

| Category                     | Amount<br>(in billions) | Amount<br>per person | % of<br>Revenue |
|------------------------------|-------------------------|----------------------|-----------------|
| Personal income taxes        | \$ 62                   | \$1900               | 20%             |
| Corporate income taxes       | 17                      | 520                  | 6               |
| Provincial sales taxes       | 34                      | 1043                 | 11              |
| Excise taxes                 | 25                      | 767                  | 8               |
| Property taxes               | 10                      | 307                  | 3               |
| Payroll taxes                | 9                       | 276                  | 3               |
| Health premiums              | 3                       | 92                   | 1               |
| Federal government transfers | 55                      | 1687                 | 18              |
| Other                        | 85                      | 1687                 | 28              |
| Total                        | 300                     | 9200                 | 100             |

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22

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**TABLE 12.6: Provincial Sales Tax Rates**

| Province/Territory        | Rate   |
|---------------------------|--------|
| British Columbia          | 7%     |
| Alberta                   | No PST |
| Saskatchewan              | 5%     |
| Manitoba                  | 7%     |
| Ontario                   | 8%     |
| Quebec                    | 7.5%   |
| Newfoundland and Labrador | 8%     |
| Nova Scotia               | 8%     |
| New Brunswick             | 8%     |
| Prince Edward Island      | 10%    |
| Northwest Territories     | No PST |
| Nunavut                   | No PST |
| Yukon                     | No PST |

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23

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### Provincial and Local Governments Spending

- Health, education and social services ("the big three")
  - Accounted for 68% of total spending in 2002
- Protection, transportation and communication
  - Accounted for 9% of total provincial spending

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24

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**TABLE 12.7: Provincial Government  
Spending, 2005-2006**

| Category  | Amount<br>(in billions) | Amount<br>per person | % of<br>Spending |
|---|-------------------------|----------------------|------------------|
| Health  | \$ 98                   | \$3005               | 33%              |
| Education   | 70                      | 2145                 | 24               |
| Social services                                     | 50                      | 1530                 | 17               |
| Transportation and<br>communication                 | 13                      | 400                  | 5                |
| Resource conservation and<br>industrial development | 11                      | 335                  | 4                |
| Police and protection                               | 10                      | 305                  | 4                |
| Debt service  | 24                      | 735                  | 8                |
| Other   | 19                      | 580                  | 6                |
| Total   | 295                     | 9050                 | 100              |

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### TAXES AND EFFICIENCY

- Policymakers have two objectives in designing a tax system...
  - Efficiency
  - Equity

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26

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## TAXES AND EFFICIENCY

- Measures of *efficiency*
  - One tax system is more *efficient* than another if
    - it raises the same amount of revenue
    - at a smaller cost to taxpayers.
  - An *efficient* tax system is one that imposes
    - small deadweight losses and
    - small administrative burdens.

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27

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## TAXES AND EFFICIENCY

- The Cost of Taxes to Taxpayers
  - The tax payment itself
  - Deadweight losses
    - Resulting when tax distorts consumer decisions
  - Administrative burdens
    - The cost of compliance with tax laws

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28

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## Deadweight Losses

- Because taxes distort incentives, they entail deadweight losses.
  - The deadweight loss of a tax is the reduction of the economic well-being of taxpayers in excess of the amount of revenue raised by the government.

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29

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### Administrative Burdens

- Complying with tax laws creates additional losses to taxpayers.
  - Taxpayers lose additional time and money documenting, computing, and avoiding taxes over and above the actual taxes they pay.
  - The administrative burden of any tax system is part of the inefficiency it creates.

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30

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### Marginal Tax Rates versus Average Tax Rates

- The **average tax rate** is total taxes paid divided by total income.
- The **marginal tax rate** is the extra taxes paid on an additional dollar of income.

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31

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### Lump-Sum Taxes

- A **lump-sum tax** is a tax that is the same amount for every person, regardless of earnings or any actions that the person might take.

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32

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## TAXES AND EQUITY

- Questions to answer to determine equity
  - How *should* the burden of taxes be divided among the population?
  - How do we *evaluate* whether a tax system is fair?
- Economists tend to focus on the efficiency of taxes
- Canadian policy debates are dominated by discussions about whether the tax burden is distributed fairly

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33

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## TAXES AND EQUITY

- Evaluating the equity of a tax system
  - Benefits principle
  - Ability-to-pay principle

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34

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## Benefits

- The **benefits principle** is the idea that people should pay taxes based on the benefits they receive from government services.
- An example is a gasoline tax:
  - Tax revenues from a gasoline tax are used to finance our highway system.
  - People who drive the most also pay the most toward maintaining roads.

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35

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### Ability-to-Pay Principle

- The **ability-to-pay principle** is the idea that taxes should be levied on a person according to how well that person can shoulder the burden.
- The ability-to-pay principle leads to two corollary notions of equity.
  - Vertical equity
  - Horizontal equity

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36

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### Ability-to-Pay Principle Vertical Equity

- **Vertical equity** is the idea that taxpayers with a greater ability to pay taxes should pay larger amounts.
  - For example, people with higher incomes should pay more than people with lower incomes.

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37

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### Ability-to-Pay Principle Vertical Equity

- Vertical Equity and Alternative Tax Systems
  - A **proportional tax** is one for which high-income and low-income taxpayers pay the same fraction of income.
  - A **regressive tax** is one for which high-income taxpayers pay a smaller fraction of their income than do low-income taxpayers.
  - A **progressive tax** is one for which high-income taxpayers pay a larger fraction of their income than do low-income taxpayers.

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38

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## Ability-to-Pay Principle Horizontal Equity

- **Horizontal equity** is the idea that taxpayers with similar abilities to pay taxes should pay the same amounts.
  - For example, two families with the same number of dependents and the same income living in different parts of the country should pay the same federal taxes.

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39

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**TABLE 12.8: Three Tax Systems**

| Income    | Proportional Tax |                   | Regressive Tax |                   | Progressive Tax |                   |
|-----------|------------------|-------------------|----------------|-------------------|-----------------|-------------------|
|           | Amount of Tax    | Percent of Income | Amount of Tax  | Percent of Income | Amount of Tax   | Percent of Income |
| \$ 50 000 | \$12 500         | 25%               | \$15 000       | 30%               | \$10 000        | 20%               |
| 100 000   | 25 000           | 25                | 25 000         | 25                | 25 000          | 25                |
| 200 000   | 50 000           | 25                | 40 000         | 20                | 60 000          | 30                |

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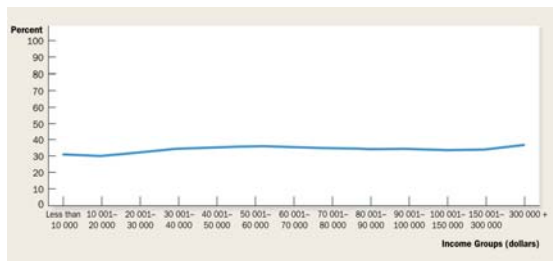
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**FIGURE 12.2: Effective Tax Rate, Total Taxes, Canada, 1988**



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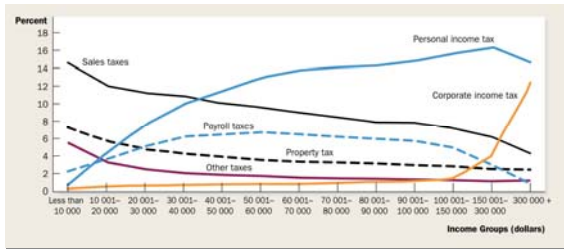
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**FIGURE 12.3: Effective Tax Rate, by Revenue Source, Canada, 1988**



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**TABLE 12.9: Average Tax Rates of Canadian Households by Decile**

| Income Decile | Taxes as a Percentage of Lifetime Income |           | Taxes as a Percentage of Annual Income |           |
|---------------|--|-----------|--|-----------|
|               | Sales and Excise Taxes                   | All Taxes | Sales and Excise Taxes                 | All Taxes |
| 1             | 15.0%                                    | 30.9%     | 27.2%                                  | 35.4%     |
| 2             | 14.3                                     | 35.5      | 20.3                                   | 28.4      |
| 3             | 14.1                                     | 35.9      | 15.8                                   | 30.1      |
| 4             | 13.9                                     | 37.7      | 14.6                                   | 31.9      |
| 5             | 13.8                                     | 38.1      | 14.0                                   | 32.6      |
| 6             | 13.5                                     | 39.3      | 13.4                                   | 33.6      |
| 7             | 13.6                                     | 39.8      | 13.5                                   | 33.7      |
| 8             | 13.3                                     | 42.2      | 13.2                                   | 35.0      |
| 9             | 13.2                                     | 41.3      | 12.8                                   | 36.8      |
| 10            | 12.4                                     | 46.5      | 8.5                                    | 46.0      |

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### Tax Incidence and Tax Equity

- The difficulty in formulating tax policy is balancing the often conflicting goals of *efficiency* and *equity*.
- The study of who bears the burden of taxes is central to evaluating tax equity.
- This study is called *tax incidence*.

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## CHAPTER SUMMARY

- The Canadian government raises revenue using various taxes. The most important tax for the federal and provincial governments is the personal income tax.

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## CHAPTER SUMMARY

- Equity and efficiency are the two most important goals of the tax system.
- The efficiency of a tax system refers to the costs it imposes on the taxpayers.
- The equity of a tax system concerns whether the tax burden is distributed fairly among the population.

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46

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## CHAPTER SUMMARY

- According to the benefits principle, it is fair for people to pay taxes based on the benefits they receive from the government.
- According to the ability-to-pay principle, it is fair for people to pay taxes on their capability to handle the financial burden.

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## CHAPTER SUMMARY

- The distribution of tax burdens is not the same as the distribution of tax bills.
- Much of the debate over tax policy arises because people give different weights to the two goals of efficiency and equity.

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48

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## End: Chapter 12

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