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Public Finance: The Economics of Taxation

19

CHAPTER OUTLINE

The Economics of Taxation
 Taxes: Basic Concepts
 Tax Equity
 What Is the "Best" Tax Base?
 The Gift and Estate Tax

Tax Incidence: Who Pays?
 The Incidence of Payroll Taxes
 The Incidence of Corporate Profits Taxes
 The Overall Incidence of Taxes in the United States: Empirical Evidence

Excess Burdens and the Principle of Neutrality
 How Do Excess Burdens Arise?
 Measuring Excess Burdens
 Excess Burdens and the Degree of Distortion

The Principle of Second Best
 Optimal Taxation

No matter what functions we end up assigning to government, to do anything at all, government must first raise revenues.

The primary vehicle that the government uses to finance itself is taxation.

Taxes may be imposed on transactions, institutions, property, meals, and other things, but in the final analysis they are paid by individuals or households.

The Economics of Taxation

Taxes: Basic Concepts

tax base The measure or value upon which a tax is levied.

tax rate structure The percentage of a tax base that must be paid in taxes—25 percent of income, for example.

Taxes on Stocks versus Taxes on Flows

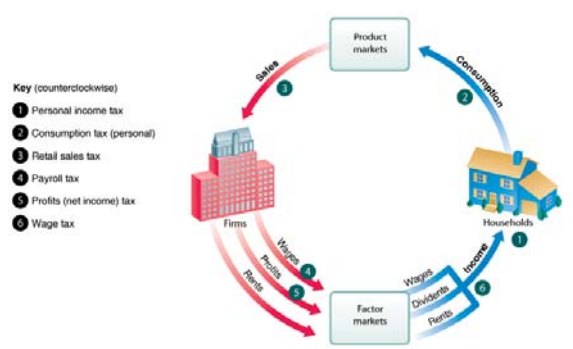


TABLE 19.1 Federal Government Receipts 1960–2012 (billions of dollars)

	Individual Income Tax	Corporation Income Tax	Social Insurance Payroll Taxes	Excise Taxes	Other Receipts	Total
1960	41.8	21.4	16.0	13.1	1.6	93.9
%	44.5	22.8	17.0	14.0	1.7	100
1970	88.9	30.6	45.5	18.1	3.0	186.1
%	47.8	16.4	24.4	9.7	1.6	100
1980	250.0	70.3	163.6	33.7	15.2	532.8
%	46.9	13.2	30.7	6.3	2.9	100
1990	470.1	118.1	402.0	50.9	41.7	1,082.8
%	43.4	10.9	37.1	4.7	3.9	100
2000	995.6	219.4	698.6	87.3	56.2	2,057.1
%	48.4	10.7	34.0	4.2	2.7	100
2012	1137.8	373.7	934.8	82.6	145.6	2,674.5
%	42.5	14.0	35.0	3.1	5.4	100

Over this long period, the share of individual income taxes in government receipts has fluctuated, falling below 40% in the 2008–2010 period (not shown). Social insurance payroll taxes have changed more dramatically over this period, doubling as a share of total receipts, to become the second most important part of federal receipts. Excise taxes and the corporate income taxes as a share of receipts, on the other hand, have fallen over time.

▲ FIGURE 19.1 Taxes on Economic "Flows"
 Most taxes are levied on measurable economic flows. For example, a profits, or net income, tax is levied on the annual profits earned by corporations.



Since 1960, which of the following types of taxes has fallen?

- a. The individual income tax.
- b. The payroll tax.
- c. The corporate income tax.
- d. All of the above.

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- a. The individual income tax.
- b. The payroll tax.
- c. **The corporate income tax.**
- d. All of the above.

Proportional, Progressive, and Regressive Taxes

proportional tax A tax whose burden is the same proportion of income for all households.

progressive tax A tax whose burden, expressed as a percentage of income, increases as income increases.

regressive tax A tax whose burden, expressed as a percentage of income, falls as income increases.



The U.S. individual income tax is:

- a. A progressive tax.
- b. A proportional tax.
- c. A regressive tax.
- d. None of the above.

TABLE 19.2 The Burden of a Hypothetical 5% Sales Tax Imposed on Three Households with Different Incomes

Household	Income	Saving Rate, %	Saving	Consumption	5% Tax on Consumption	Tax as a % of Income
A	\$10,000	20	\$ 2,000	\$ 8,000	\$ 400	4.0
B	20,000	40	8,000	12,000	600	3.0
C	50,000	50	25,000	25,000	1,250	2.5

The U.S. individual income tax is:

- a. **A progressive tax.**
- b. A proportional tax.
- c. A regressive tax.
- d. None of the above.



Which of the following pairs of taxes are regressive?

- a. Taxes on income and consumption.
- b. Retail sales taxes and excise taxes.
- c. Luxury taxes and state taxes.
- d. None of the above.

ECONOMICS IN PRACTICE

Calculating Taxes

A 2009 tax table is reproduced below. As you see, the tax rate increases with income, making it a *progressive* system. In the last two columns we calculate the taxes owed at the two income levels.

Rate	On income between	Amount owed on \$100K (\$90,650 taxed)	Amount owed on \$125K (\$115,650 taxed)
10%	\$0-\$8,350	\$835	\$835
15%	\$8,350-\$33,950	\$3,840	\$3,840
25%	\$33,950-\$82,250	\$12,075	\$12,075
28%	\$82,250-\$171,500	\$2,352	\$9,352
33%	\$171,500-\$372,950	0	0
35%	\$372,950+	0	0
Tax owed (Sum)		\$19,102	\$26,102
Average tax rate (Tax/Income)		0.1910	0.2088
Marginal tax rate		0.28	0.28

THINKING PRACTICALLY

1. If you are considering increasing your work hours, would you be more interested in your marginal tax rate or the average?

Which of the following pairs of taxes are regressive?

- Taxes on income and consumption.
- Retail sales taxes and excise taxes.**
- Luxury taxes and state taxes.
- None of the above.

Marginal versus Average Tax Rates

average tax rate Total amount of tax paid divided by total income.

marginal tax rate The tax rate paid on the next dollar earned.

As shown in the *Economics in Practice* box in the previous slide, the average and marginal tax rates are not the same in a progressive tax system.

Average rates show the percent of one's income that goes to the government. But for many decisions, the marginal rate is more relevant. For example, if you are thinking of working more hours, you will be paying the marginal (higher) rate on the incremental income earned.

How Much Does a Deduction Save You in Taxes?

As you saw in the *Economics in Practice*, you were allowed to subtract \$9,350 from your income as a single person before calculating taxes.

Taxpayers may deduct income taxes paid to a state, charitable contributions to qualifying organizations, real estate taxes, and interest paid on a mortgage to finance the purchase of a home, as well as other items.



Which of the following more directly affects decisions to work and invest?

- Average tax rates.
- Marginal tax rates.
- Progressive tax rates.
- Regressive tax rates.

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Tax Equity

benefits-received principle A theory of fairness holding that taxpayers should contribute to government (in the form of taxes) in proportion to the benefits they receive from public expenditures.

ability-to-pay principle A theory of taxation holding that citizens should bear tax burdens in line with their ability to pay taxes.

Horizontal and Vertical Equity

If we accept the idea that ability to pay should be the basis for the distribution of tax burdens, two principles follow.

First, the principle of *horizontal equity* holds that those with equal ability to pay should bear equal tax burdens.

Second, the principle of *vertical equity* holds that those with greater ability to pay should pay more.

What Is the “Best” Tax Base?

The three leading candidates for best tax base are *income*, *consumption*, and *wealth*.

Income—to be precise, *economic income*—is anything that enhances your ability to command resources.

$$\text{Economic Income} = \text{Consumption} + \text{Change in Net Worth}$$

For income tax purposes, capital gains (increases in the value of assets, like shares of stock) count as income only when they are realized, but for purposes of defining economic income, all increases in asset values count, whether they are realized or not.

Consumption is the total value of goods and services that a household consumes in a given period.

Wealth, or *net worth*, is the value of all the goods and services you own after your liabilities are subtracted.

$$\text{Net worth} = \text{Assets} - \text{Liabilities}$$



Which of the following would increase your economic income?

- All money receipts, whether from employment, interest on savings, dividends, or profits.
- The value of benefits not received in money form, such as medical benefits or employer retirement contributions.
- Increases or decreases in the value of stocks or bonds, whether or not they are “realized” through sale.
- All of the above.

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Consumption as the Best Tax Base

Thomas Hobbes argued that people should pay taxes in accordance with “what they actually take out of the common pot, not what they leave in” since consumption is the best measure of well-being.

Taxing consumption is more efficient than taxing income.

A tax that distorts economic choices creates *excess burdens*.

If we want to redistribute well-being, therefore, the tax base should be consumption because consumption is the best measure of well-being. The value-added tax (VAT) used by most developed economies other than the United States is essentially a tax on consumption.

Income as the Best Tax Base

According to proponents of income as a tax base, you should be taxed not on what you actually draw out of the common pot, but rather on the basis of your *ability* to draw from that pot, which is measured best by income.



If the income tax rate is 20 percent, you earn \$60,000, consume \$40,000 and save the rest, how much is the tax on savings?

- Zero. In this case your income is taxed, not your savings.
- \$12,000.
- \$8,000.
- \$4,000.

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- \$8,000.
- \$4,000.**

Wealth as the Best Tax Base

Still others argue that the real power to command resources comes not from any single year's income, but from accumulated wealth.

Aggregate net worth in the United States is many times larger than aggregate income.

It is important to note that if income is already taxed, a wealth tax, in essence, taxes the same dollars again.

No Simple Answer

What is the single best measure of ability to pay? There is ongoing debate in the United States about whether it would be better to shift toward a more comprehensive consumption tax.

The tax discussions during the Obama administrations have included the possibility of introducing a VAT, as well as ideas for code simplification.

The Gift and Estate Tax

One of the oldest and most common forms of taxation in the world is the taxation of property held by an individual at the time of his or her death.

estate The property that a person owns at the time of his or her death.

estate tax A tax on the total value of a person's estate.

The United States levies a Gift and Estate Tax on gifts made over a person's lifetime and the value of the person's estate, for estates over a certain level.

As part of the budget crisis resolution in late 2012, Congress voted to resume an estate tax, with an exemption of \$5,120,000 per estate and a tax rate of 35% on any excess over that limit.

Tax Incidence: Who Pays?

The burden of a tax is ultimately borne by individuals or households; institutions such as business firms and colleges have no real taxpaying capacity.

Also, the burden of a tax is not always borne by those initially responsible for paying it. Directly or indirectly, tax burdens are often shifted to others.

tax incidence The ultimate distribution of a tax burden.

sources side/uses side The impact of a tax may be felt on one or the other or on both sides of the income equation. A tax may cause net income to fall (damage on the sources side), or it may cause prices of goods and services to rise so that income buys less (damage on the uses side).

tax shifting Occurs when households can alter their behavior and do something to avoid paying a tax.



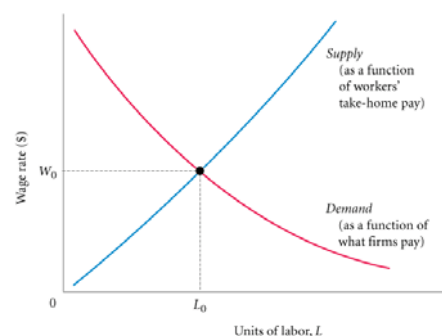
Which taxes are less likely to be shifted?

- Broad-based taxes, such as a tax on all consumer goods.
- Partial taxes, or the case in which certain items are singled out for taxation.
- Taxes that prompt consumers to consume less of everything.
- None of the above. Tax shifting is only a theoretical concept.

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- None of the above. Tax shifting is only a theoretical concept.

The Incidence of Payroll Taxes



▲ FIGURE 19.2 Equilibrium in a Competitive Labor Market—No Taxes

With no taxes on wages, the wage that firms pay is the same as the wage that workers take home.

At a wage of W_0 , the quantity of labor supplied and the quantity of labor demanded are equal.

Recall that the demand for labor in perfectly competitive markets depends on its productivity.

The shape of the demand curve for labor shows how responsive *firms* are to changes in wages.

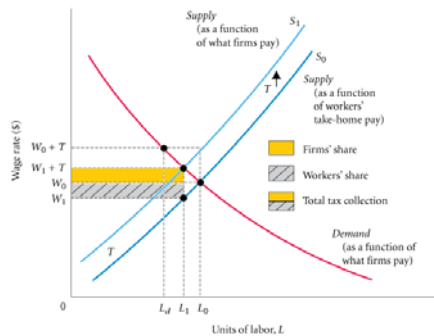
Household behavior and thus the shape of the labor supply curve depend on the relative strengths of income and substitution effects.

The labor supply curve represents the reaction of workers to changes in the wage rate.

A payroll tax drives a “wedge” between the price of labor that firms face and take-home wages.

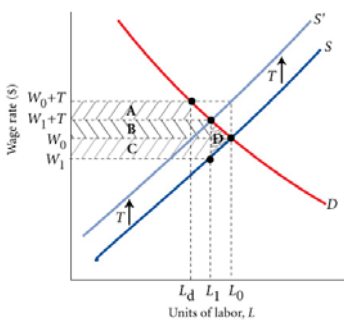
► **FIGURE 19.3 Incidence of a per-Unit Payroll Tax in a Perfectly Competitive Labor Market**

With a tax on firms of $\$T$ per unit of labor hired, the market will adjust, shifting the tax partially to workers. When the tax is levied, firms must first pay $W_0 + T$. This reduces the labor demand to L_d . The result is excess supply, which pushes wages down to W_1 and passes some of the burden of the tax onto workers.



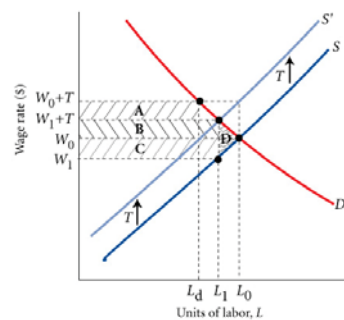
Refer to the figure below. The figure shows the incidence of a per-unit payroll tax in a perfectly competitive labor market. Which area represents the total tax collection?

- a. Area A + B + C.
- b. Area B + C + D.
- c. Area B + C.
- d. Area B.



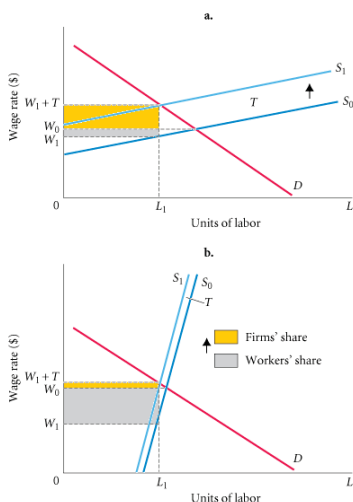
Refer to the figure below. The figure shows the incidence of a per-unit payroll tax in a perfectly competitive labor market. Which area represents the total tax collection?

- a. Area A + B + C.
- b. Area B + C + D.
- c. Area B + C.
- d. Area B.



► **FIGURE 19.4 Payroll Tax with Elastic (a) and Inelastic (b) Labor Supply**

The ultimate burden of a payroll tax depends on the elasticities of labor supply and labor demand. For example, if supply is relatively elastic, as in part a, the burden falls largely on employers; if the supply is relatively inelastic, as in part b, the burden falls largely on workers.



If labor supply is relatively inelastic, who bears the greater burden of a payroll tax?

- a. The firms.
- b. The workers.
- c. The government.
- d. All of the above equally.

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- a. The firms.
- b. The workers.
- c. The government.
- d. All of the above equally.

Imposing a Payroll Tax: Who Pays?

TABLE 19.3 Estimated Incidence of Payroll Taxes in the United States in 2007

Population Ranked by Income	Tax as a % of Total Income
Bottom 20%	7.5
Second 20%	9.9
Third 20%	10.6
Fourth 20%	11.4
Top 20%	8.0
Top 10%	6.3
Top 5%	5.1
Top 1%	2.5

Table 19.3 presents an estimate of the incidence of payroll taxes (Social Security taxes) in the United States in 2007. This estimate assumes that both the employers' share and employees' share of the payroll taxes are ultimately borne by employees.

The payroll tax is regressive at the top income levels. Those with higher incomes earn a larger portion of their incomes from profits, dividends, rents, and so on, and these kinds of income are generally not subject to the payroll tax.

The Incidence of Corporate Profits Taxes

The *corporate profits tax*, or *corporation income tax*, is a tax on the profits of firms that are organized as corporations.

Corporations are firms granted limited liability status by the government. Limited liability means that shareholders/owners can lose only what they have invested.

The owners of *partnerships* and *proprietorships* do not enjoy limited liability and do not pay this tax; rather, they report their firms' income directly on their individual income tax returns.

Like the payroll tax, the corporate tax may affect households on the sources or the uses side of the income equation.

The tax may affect profits earned by owners of capital, wages earned by workers, or prices of corporate and noncorporate products.

Assuming the economy was in long-run equilibrium, and firms earned a normal rate of return, there was no reason to expect higher profits in one sector than in the other.

Suddenly, firms in the corporate sector become significantly less profitable as a result of the tax. In response to these lower profits, capital investment begins to favor the nontaxed sector.

The flow of capital from the taxed to the nontaxed sector reduces the profit rate in the nontaxed sector: More competition springs up, and product prices are driven down. Some of the tax burden shifts to capital income earners in the noncorporate sector, who end up earning lower profits.

As capital flows out of the corporate sector in response to lower after-tax profits, the profit rate in that sector rises somewhat because fewer firms means less supply, which means higher prices.

In essence, the excise effects, or the effects of price increases in the corporate sector and price decreases in the noncorporate sector cancel each other out.

The Burden of the Corporate Tax

The general conclusion that capital owners bear most of the corporate income tax burden is still viewed as correct by most economists.

One exception to this conclusion is corporate taxation of a monopolist. If a proportion of its profit is taxed, the choice of price and quantity will not change. The tax is shifted to the monopolist.

TABLE 19.4 Estimated Burden of the U.S. Corporation Income Tax in 2007

Population Ranked by Income	Corporate Tax Burden as a % of Total Income
Bottom 20%	1.2
Second 20%	1.1
Third 20%	1.5
Fourth 20%	1.6
Top 20%	4.7
Top 10%	5.6
Top 5%	7.3
Top 1%	9.0

The burden of the corporate income tax is clearly progressive because profits and capital income make up a much bigger part of the incomes of high-income households.

The Overall Incidence of Taxes in the United States: Empirical Evidence

Many researchers have done complete analyses under varying assumptions about tax incidence, and in most cases their results are similar.

State and local taxes (with sales taxes playing a big role) seem as a group to be mildly regressive.

Federal taxes, dominated by the individual income tax but increasingly affected by the regressive payroll tax, are mildly progressive.

The overall system is mildly progressive.

Excess Burdens and the Principle of Neutrality

When taxes distort economic conditions, they impose burdens on society that, in aggregate, exceed the revenue collected by the government.

excess burden The amount by which the burden of a tax exceeds the total revenue collected. Also called deadweight loss.

The *total burden* of a tax is the sum of the revenue collected from the tax and the excess burden created by the tax.

principle of neutrality All else equal, taxes that are neutral with respect to economic decisions (that is, taxes that do not distort economic decisions) are generally preferable to taxes that distort economic decisions. Taxes that are not neutral impose excess burdens.

In practice, all taxes change behavior and distort economic choices.

How Do Excess Burdens Arise?

Technology	Input requirements per unit of output X		Per-unit cost of X $= K(P_K) + L(P_L)$ $P_K = \$2 + \$1 \text{ tax} = \$3$ $P_L = \$2$
	K	L	
A	7	3	\$27
B	4	7	\$26

Least cost

▲ FIGURE 19.5 Firms Choose the Technology That Minimizes the Cost of Production

If the industry is perfectly competitive, long-run equilibrium price will be \$20 per unit of X. If 1,000 units of X are sold, consumers will pay a total of \$20,000 for X.

Technology	Input requirements per unit of output X		Per-unit cost of X $= K(P_K) + L(P_L)$ $P_K = \$2$ $P_L = \$2$
	K	L	
A	7	3	\$20
B	4	7	\$22

Least cost

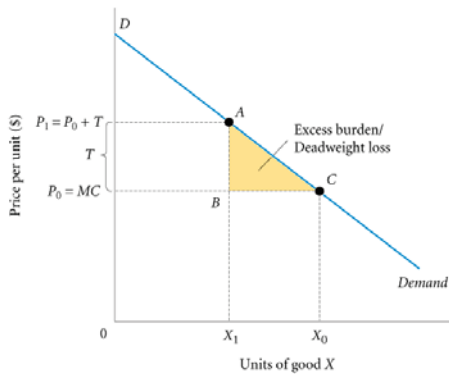
▲ FIGURE 19.6 Imposition of a Tax on Capital Distorts the Choice of Technology

If the industry is perfectly competitive, price will be \$26 per unit of X when a tax of \$1 per unit of capital is imposed. If technology B is used and if we assume that total sales remain at 1,000 units, total tax collections will be $1,000 \times 4 \times \$1 = \$4,000$. But consumers will pay a total of \$26,000 for the good—\$6,000 more than before the tax. Thus, there is an excess burden of \$2,000.

Measuring Excess Burdens

► FIGURE 19.7 The Excess Burden of a Distorting Excise Tax

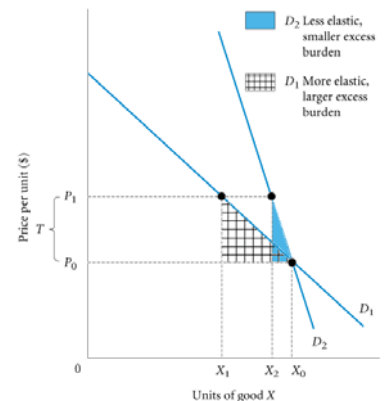
A tax that alters economic decisions imposes a burden that exceeds the amount of taxes collected. An excise tax that raises the price of a good above marginal cost drives some consumers to buy less desirable substitutes, reducing consumer surplus.



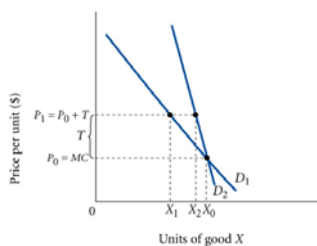
Excess Burdens and the Degree of Distortion

► FIGURE 19.8 The Size of the Excess Burden of a Distorting Excise Tax Depends on the Elasticity of Demand

The size of the excess burden from a distorting tax depends on the degree to which decisions or behaviors change in response to it.

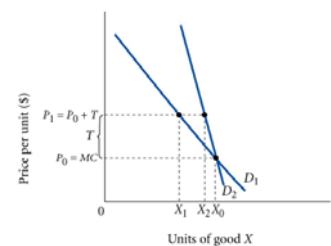


Refer to the figure below. When is the size of the excess burden larger?



- When demand is D_2 .
- When demand is D_1 .
- In this graph, the excess burden of the tax is the same, whether demand is D_1 or D_2 .
- There is insufficient information on the graph to establish which demand curve yields a larger excess burden.

Refer to the figure below. When is the size of the excess burden larger?



- When demand is D_2 .
- When demand is D_1 .**
- In this graph, the excess burden of the tax is the same, whether demand is D_1 or D_2 .
- There is insufficient information on the graph to establish which demand curve yields a larger excess burden.

The Principle of Second Best

principle of second best The fact that a tax distorts an economic decision does not always imply that such a tax imposes an excess burden. If there are previously existing distortions, such a tax may actually improve efficiency.

At least two kinds of circumstances favor nonneutral (that is, distorting) taxes: the presence of externalities and the presence of other distorting taxes.

Optimal Taxation

The idea that taxes work together to affect behavior has led tax theorists to search for optimal taxation systems however impossible to implement—bringing us full circle.

We end up where we started, with the *principle of neutrality*: All else equal, taxes that are neutral with respect to economic decisions are generally preferable to taxes that distort economic decisions.

Taxes that are not neutral impose excess burdens.

REVIEW TERMS AND CONCEPTS

ability-to-pay principle	progressive tax
average tax rate	proportional tax
benefits-received principle	regressive tax
estate	sources side/uses side
estate tax	tax base
excess burden	tax incidence
marginal tax rate	tax rate structure
principle of neutrality	tax shifting
principle of second best	