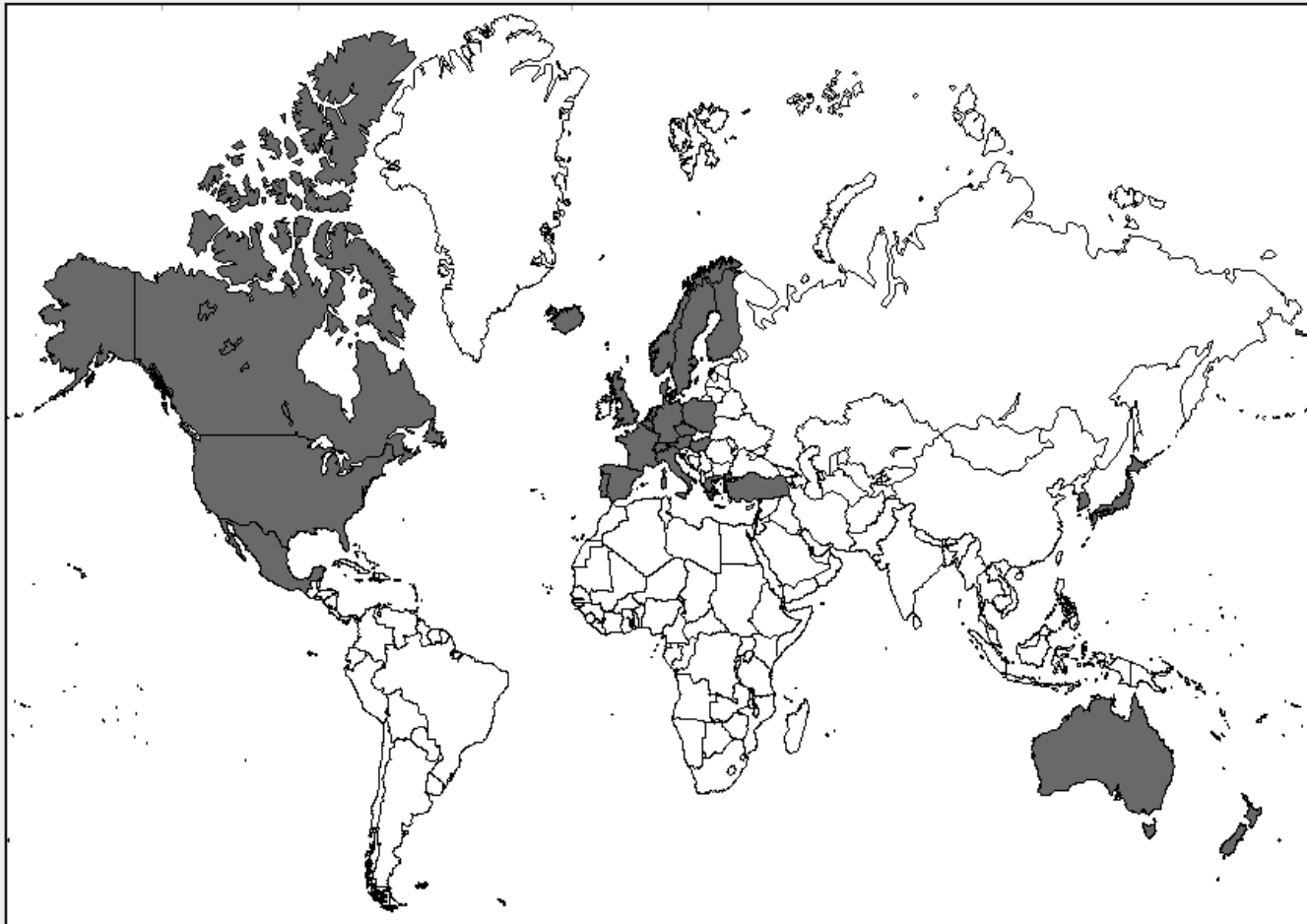


Corporate Income Tax Rates: International Comparisons



NOVEMBER 2005



Corporate Income Tax Rates: International Comparisons

November 2005



Preface

Corporate income taxes can distort the allocation of productive resources both within the United States and across countries. This Congressional Budget Office (CBO) paper—prepared at the request of the Chairman of the House Committee on Ways and Means—examines the ways in which the corporate tax can distort economic behavior and shift resources among alternative uses in ways that reduce overall well-being in the United States. The analysis compares statutory and marginal corporate income tax rates between 1982 and 2003 across a broad range of countries. In keeping with CBO’s mandate to provide objective, impartial analysis, this report makes no recommendations.

William Randolph of CBO’s Tax Analysis Division wrote the paper under the direction of Robertson Williams and Thomas Woodward. Marika Santoro and Doug Hamilton of CBO provided helpful comments, as did James Hines of the University of Michigan and Kevin Hassett of the American Enterprise Institute. (The assistance of external participants implies no responsibility for the final product, which rests solely with CBO.)

Leah Mazade edited the paper, and Janey Cohen proofread it. Denise Jordan-Williams prepared early drafts of the text, tables, and figures. Maureen Costantino designed the cover and prepared the report for publication. Lenny Skutnik produced the printed copies, and Annette Kalicki and Simone Thomas prepared the electronic version for CBO’s Web site (www.cbo.gov).

Douglas Holtz-Eakin
Director

November 2005

Summary and Introduction *ix*

1

**Analyzing the Distorting Effects of
Corporate Income Tax Systems** *1*

Domestic Distortions *1*

International Distortions *5*

2

**Comparing the United States' Corporate Income
Tax Rates with Those of Other Countries** *11*

The Structure of Corporate Income Taxes *11*

Statutory Corporate Tax Rates *14*

Effective Marginal Corporate Tax Rates *15*

Tables

S-1.	Taxes on Corporate Income in OECD Countries in 2002 as a Percentage of Gross Domestic Product	x
2-1.	Taxes on Corporate Income in OECD Countries in 2002 as a Percentage of Gross Domestic Product	13

Figures

2-1.	Top Statutory Corporate Tax Rates in All OECD Countries, 2003	22
2-2.	Gross Fixed-Capital Formation in OECD Countries, 2003	23
2-3.	OECD Countries' Top Statutory Corporate Tax Rates Relative to Total Investment, 2003	24
2-4.	Top Statutory Corporate Tax Rates in Selected OECD Countries, 2003	25
2-5.	Top Statutory Corporate Tax Rates in the United States Compared with Summary Measures of Top Statutory Rates for Selected OECD Countries	26
2-6.	Top Statutory Corporate Tax Rates in the United States Compared with Summary Measures of Top Statutory Rates for the Other G7 Industrialized Countries	27
2-7.	Present Value of Depreciation Deductions for Investments in Machinery in Selected OECD Countries, 2003	28
2-8.	Relationship Between Top Statutory Corporate Tax Rates and Depreciation Deductions for Investments in Machinery in Selected OECD Countries, 2003	29
2-9.	Depreciation Deductions for Investments in Machinery in the United States Compared with Summary Measures of Depreciation Deductions for Selected OECD Countries	30
2-10.	Present Value of Depreciation Deductions for Investments in Machinery in Selected OECD Countries Based on Actual Inflation, 2003	31
2-11.	Depreciation Deductions for Investments in Machinery in the United States Based on Actual Inflation Compared with Summary Measures of Depreciation Deductions for Selected OECD Countries	32
2-12.	Present Value of Depreciation Deductions for Investments in Industrial Structures in Selected OECD Countries, 2003	33

Figures (Continued)

2-13.	Depreciation Deductions for Investments in Industrial Structures in the United States Compared with Summary Measures of Depreciation Deductions for Selected OECD Countries	34
2-14.	Effective Marginal Corporate Tax Rates for Equity-Financed Investments in Machinery in Selected OECD Countries, 2003	35
2-15.	Effective Marginal Corporate Tax Rates for Equity-Financed Investments in Machinery in the United States Compared with Summary Measures of Effective Marginal Tax Rates for Selected OECD Countries	36
2-16.	Effective Marginal Corporate Tax Rates for Equity-Financed Investments in Machinery in the United States Compared with Summary Measures of Effective Marginal Tax Rates for the Other G7 Industrialized Countries	37
2-17.	Effective Marginal Corporate Tax Rates for Equity-Financed Investments in Machinery in Selected OECD Countries Based on Actual Inflation, 2003	38
2-18.	Effective Marginal Corporate Tax Rates for Equity-Financed Investments in Machinery in the United States Based on Actual Inflation Compared with Summary Measures of Effective Marginal Tax Rates for Selected OECD Countries	39
2-19.	Effective Marginal Corporate Tax Rates for Equity-Financed Investments in Machinery in the United States Based on Actual Inflation Compared with Summary Measures of Effective Marginal Tax Rates for the Other G7 Industrialized Countries	40
2-20.	Effective Marginal Corporate Tax Rates for Equity-Financed Investments in Industrial Structures in Selected OECD Countries, 2003	41
2-21.	Effective Marginal Corporate Tax Rates for Equity-Financed Investments in Industrial Structures in the United States Compared with Summary Measures of Effective Marginal Tax Rates for Selected OECD Countries	42
2-22.	Effective Marginal Corporate Tax Rates for Equity-Financed Investments in Industrial Structures in the United States Compared with Summary Measures of Effective Marginal Tax Rates for the Other G7 Industrialized Countries	43
2-23.	Tax-Exclusive Effective Marginal Corporate Tax Rates for Debt-Financed Investments in Machinery in Selected OECD Countries, 2003	44

Figures (Continued)

2-24.	Tax-Exclusive Effective Marginal Corporate Tax Rates for Debt-Financed Investments in Machinery in the United States Compared with Summary Measures of Effective Marginal Tax Rates for Selected OECD Countries	45
2-25.	Tax-Exclusive Effective Marginal Corporate Tax Rates for Debt-Financed Investments in Machinery in the United States Compared with Summary Measures of Effective Marginal Tax Rates for the Other G7 Industrialized Countries	46

Box

2-1.	Data and Methods for CBO's Analysis	12
------	-------------------------------------	----



Summary and Introduction

The corporate income tax is a significant part of the United States' tax system. Federal corporate income tax revenues in 2004 were \$189.4 billion, or 1.6 percent of gross domestic product (GDP).¹ Federal plus state corporate income tax revenues in 2004 totaled \$225.8 billion, or 2.1 percent of GDP. Corporate income taxes are also a major source of revenues in other countries. For members of the Organization for Economic Cooperation and Development (OECD), corporate income tax revenues in 2002—the most recent year for which data are available—averaged 3.4 percent of GDP (see Summary Table 1).² Like all taxes, the corporate income tax may distort economic decisions and reduce economic well-being.

The choices that each country makes about its corporate tax structure are significant for two reasons. First, the corporate tax distorts domestic economic behavior, as investors respond to the incentives that the tax creates. Those purely domestic distortions may occur regardless of how other countries structure their tax systems. Second, corporate tax systems in different countries interact with one another to distort decisions about international investment and to invite additional kinds of costly international tax planning. Concern about the potential for such international distortions provides a rationale for comparing different nations' corporate tax systems—the focus of this Congressional Budget Office (CBO) paper.

CBO presents the analytical context for such comparisons in Chapter 1 and discusses how corporate income taxes may distort economic incentives, both domestic and international. It also examines several features of corporate tax systems to show how corporate tax rates in the United States differ from those in other OECD coun-

tries. The comparisons themselves are presented in Chapter 2. Highlights of CBO's analysis include the following:

- **The domestic distortions that the corporate income tax induces are large compared with the revenues that the tax generates. That finding is independent of how the United States' corporate income tax compares with the taxes imposed by other countries.** The corporate income tax in the United States generates a variety of domestic economic distortions that may have little relationship to what other countries do with their corporate income taxes. Those domestic distortions bring about reductions in economic efficiency that researchers estimate are large relative to the amount of revenues that are collected.³ Reforms to the tax system that reduced those distortions would not depend on how the United States' corporate tax rate ranked in relation to the rates of other countries.
- **Differences among countries in their corporate income tax structures distort incentives for locating investments and create additional opportunities for tax planning.** In addition to distorting firms' decisions about domestic investment, corporate income taxes may distort their international economic decisions. Costs to efficiency may arise because countries impose varying tax rates on corporate income, which may influence where and for what purpose a corporation chooses to invest. Those differential rates may distort the international allocation of investment and cause businesses to engage in additional costly international tax planning.
- **An international comparison of corporate income taxes should account for differences among countries.** The size of a country's economy as well as its

1. For comparison, federal revenues from the individual income tax (excluding payroll taxes) in 2004 were \$809 billion, or 7.0 percent of GDP.

2. Because that figure includes both national and subnational (for example, county or provincial) tax revenues, it is most comparable to U.S. state plus federal corporate income tax revenues.

3. Economic efficiency generally is the extent to which a given set of resources is allocated across uses or activities in a manner that maximizes whatever value they are intended to produce.

Summary Table 1.

Taxes on Corporate Income in OECD Countries in 2002 as a Percentage of Gross Domestic Product

Country	Percentage of GDP
Austria	2.3
Australia	5.3
Belgium	3.5
Canada	3.4
Czech Republic	4.6
Denmark	2.9
Finland	4.3
France	2.9
Germany	1.0
Greece	3.8
Hungary	2.4
Iceland	1.1
Ireland	3.7
Italy	3.2
Japan	3.1
Republic of Korea	3.1
Luxembourg	8.6
Mexico	*
Netherlands	3.5
New Zealand	4.2
Norway	8.2
Poland	2.0
Portugal	3.6
Slovak Republic	2.7
Spain	3.2
Sweden	2.4
Switzerland	2.7
Turkey	2.2
United Kingdom	2.9
United States	1.8
Unweighted average	3.4
Weighted average	2.5

Source: Congressional Budget Office based on Organization for Economic Cooperation and Development, *Revenue Statistics of OECD Member Countries* (Paris: Organization for Economic Cooperation and Development, 2004), Table 12.

Notes: Percentages include both national and subnational taxes on corporate income.

* = data not available.

other economic characteristics influences the corporate tax rate that a country establishes. Consequently, an analysis of tax-rate differentials should recognize the ways in which countries vary. For example, comparing corporate income taxes in the United States with those of other large industrialized countries may be more revealing than comparing the United States' corporate tax structure with the structures of much smaller and less industrialized countries.

- **Both statutory corporate tax rates and effective marginal corporate tax rates affect economic incentives.** The full effect of statutory corporate income tax rates, rules for depreciation of productive assets, and other features of the tax code—as they determine effective marginal corporate tax rates—influences where corporations choose to invest.⁴ For certain other costly types of international tax planning, the most important factor is differences among countries in their statutory tax rates alone.

As a consequence, statutory and effective marginal tax rates in the international context have both combined and separate importance to corporate tax policy. For a country starting out with relatively high effective marginal and statutory tax rates, corporate tax cuts in the form of, for example, larger allowances for depreciation of equipment and structures will reduce effective marginal rates and attract more investment. But such cuts will not reduce the type of corporate tax planning aimed at taking advantage of the differences in countries' statutory corporate tax rates. The incentives for that kind of activity can be diminished—and investment attracted—by adopting depreciation rules that more closely approximate economic depreciation and combining them with lower statutory rates.⁵

- **Although the United States' statutory corporate tax rates are among the highest of those in OECD countries, they are comparable with the statutory**

4. An effective marginal corporate tax rate is the percentage of the income from a marginal investment that must be paid as corporate income taxes. An investment is considered marginal when it pays just enough income to make the investment worthwhile.

5. Economic depreciation is what is generally meant by the term "depreciation"—that is, the decrease in the value of a productive asset that occurs because the asset provides less remaining productivity as it ages. By contrast, tax depreciation is the depreciation allowed by the tax code.

rates imposed by other members of the Group of Seven (G7).⁶

- **How effective marginal corporate tax rates in the United States compare with other countries' rates depends on the type of corporate investment being made and the way in which it is financed.** Corporate investments are financed by either shareholders or lenders (which include corporate bondholders). Compared with the average effective marginal corporate tax rates for shareholder-financed investment in machinery among all other OECD countries, the United States' rate is slightly higher; compared with the average among other G7 countries, the United States' rate is about the same. Compared with the average rate for shareholder-financed investment in industrial structures among all other OECD countries, the United States' rate is significantly higher; however, the United States' rate is close to the average among other G7 countries. In contrast to rates for shareholder-financed investment, the United States' effective marginal corporate tax rate for lender-financed investment in ma-

chinery is low by comparison with the average for other OECD countries and for other G7 countries. From an international perspective, although the United States' effective marginal corporate rates for shareholder-financed investments are higher than the average, such rates for investments financed by a combination of shareholders and lenders may be lower than the average if a sufficient fraction of the marginal investment is financed by lenders.

- **The history of corporate tax rates between 1982 and 2003 suggests that countries do not change their corporate tax rates independent of one another.** After large reductions in statutory corporate tax rates by Ireland, the United Kingdom, and the United States in the mid-1980s, other OECD countries also cut their rates, perhaps out of concern that they would lose investments or part of their tax base—for example, when corporations moved their operations to a lower-tax country. Hence, the corporate tax rates that the United States establishes may affect the choices that other countries make about rates. Thus, how the United States' corporate tax rate ranks in relation to the rates in other countries is not determined by U.S. policy choices alone.

6. The G7 industrialized countries are Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States.

Analyzing the Distorting Effects of Corporate Income Tax Systems

Taxes—including corporate income taxes—distort incentives, primarily by taxing endeavors unevenly. When two kinds of economic activity are taxed at different rates, the more highly taxed activity tends to diminish and the less heavily taxed activity expands. Once economic activity takes on a pattern that is based on tax rates, resources in the economy are misallocated and inefficiency results, as economic activity shifts away from its most valuable opportunities.

In spite of its potential to distort economic behavior, the corporate income tax exists in part because it is administratively less costly to collect some taxes on income at the level of the firm rather than at the level of the individual. Corporations frequently distribute only some of their profits to creditors and shareholders; they retain the rest for reinvestment. Those reinvested profits typically increase the value of the firm and represent income for shareholders in the form of capital gains—that is, gains in the value of shareholders' ownership shares. Although such capital gains may eventually be taxed, only profits that are distributed as interest to lenders or dividends to shareholders are considered cash flows, which are subject immediately to taxation under the individual income tax. Thus, in part to fully tax all profits, the United States' tax system subjects a corporation's profits to their own income tax.¹

That arrangement has the advantage of bringing income that the corporation retains into the tax system. But the approach may go too far when it distorts economic incentives for investment by taxing some corporate earnings twice, first at the corporate level and then as income re-

ceived by individual taxpayers. Policymakers could end the double levy by simply eliminating the corporate tax; doing so, however, would introduce new distortions by favoring corporations that did not distribute profits but rather accumulated and reinvested them. Moreover, some of the distortions that the corporate income tax causes are inherent to the taxation of capital income in general. To eliminate the distortions specific to the corporate income tax would require integrating the corporate and individual income taxes.²

Serious concern about the corporate income tax springs from the ways in which it distorts economic incentives both at home and abroad. The result of such distortions is that resources are not allocated to their best uses and thus cannot yield their fullest benefits to society.

Domestic Distortions

At a purely domestic level, the corporate income tax has the potential to distort economic incentives and generate inefficiency in at least six ways. First, because it is imposed on income from capital, it biases individuals' decisions about how much to save and can therefore influence overall capital investment and economic growth. Second, because the corporate income tax is imposed only on some kinds of business profits (in the United States, typically those of corporations that have many shareholders) and not on others (such as the profits of partnerships and sole proprietorships), it affects the ways in which businesses are organized and creates biases in investment and

1. Using the corporation to withhold other taxes—for example, income and payroll taxes—may also confer advantages, but analysis of those levies is beyond the scope of this report.

2. See Richard M. Bird, "Why Tax Corporations?" Working Paper No. 92-2, prepared for the Technical Committee on Business Taxation (Ottawa: Department of Finance, 1996); and U.S. Department of the Treasury, *Integration of the Individual and Corporate Tax Systems* (January 1992).

production toward those types of business structures that are not subject to the corporate income tax. Third, it creates a bias in corporate financing toward the use of debt—because the tax is imposed on income from equity-financed investment and not on the return to debt-financed investment. Fourth, because the law treats a corporation as a separate taxable entity from which shareholders subsequently realize income in the form of either dividends or capital gains, the relatively beneficial tax treatment of capital gains under the individual income tax creates a bias toward them and against the payment of dividends. Fifth, because the United States levies corporate income tax on the basis of schedules for depreciation that do not correspond to economic depreciation, it taxes different kinds of assets and industries at different effective rates, creating a bias in investment and production toward the more lightly taxed assets and sectors. Finally, the corporate income tax may distort the allocation of resources by making corporations' compliance with taxation costly and by creating additional opportunities for tax planning.³

Saving and Investment

The corporate income tax is part of the broader taxation of income from capital. Consequently, it may affect capital investment through its effects on both the supply of and demand for capital. The corporate income tax may affect the supply of capital by reducing the returns that individuals receive from saving. It may affect the demand for capital by changing what businesses must pay to acquire capital for investment.

Saving by Individuals. Saving is income that is not currently consumed. Saving is positive when individuals consume less than their current income to finance their future consumption. It may be negative if individuals consume more than their current income, either borrowing or using accumulated wealth to finance their current consumption. Taxes on income from capital introduce a bias into the incentives for saving because they make consumption in the future relatively more expensive than consumption today. Thus, such taxes may alter when an individual chooses to consume (although whether those taxes increase or decrease saving is uncertain because it is the temporal decision that they affect). For example, in

the face of taxes on capital income, an individual who decides to keep future consumption at a fixed level must save more and consume less now. Alternatively, the same individual could decide to save less now and also consume less in the future.

The net effect of capital income taxes on how much individuals save therefore depends on two offsetting factors. First, such taxes reduce the after-tax rate of interest that a saver (or investor) receives and thus decrease the price of current consumption relative to future consumption. That decrease in the relative price tends to cause people to increase their current consumption and save less (the "substitution effect"). Second, capital income taxes may decrease current consumption or future consumption, or both, by making less income available for consumption both now and in the future (the "income effect"). The income effect may lead people to respond to capital income taxes by consuming less now (and in the future) and saving more. Whether the overall effect of capital income taxes is to cause people to save less or more depends on whether the substitution effect is stronger or weaker than the income effect—and that depends on peoples' preferences and can only be determined by empirical investigation.

A variety of empirical studies have tried to measure the net effect on saving of changes in the rate of interest, but the results have been inconclusive.⁴ No researcher has made a compelling case that a significant net effect exists in either direction. However, the shortcomings of the studies and of the data they use are such that a realistic chance remains that taxes on capital income affect saving.

Investment by Businesses. How the corporate income tax affects businesses' demand for capital is less ambiguous: the tax diminishes the demand for capital in the corporate sector by increasing the cost of capital (the before-tax rate of return that is just high enough for an investment to be funded). A business will undertake a particular investment only if the business expects to earn a before-tax rate of return that is high enough to satisfy its financial investors after taxes are paid; otherwise, the investors will supply their funds elsewhere. The corporate income tax increases the cost of capital by driving a wedge between

3. See Jane G. Gravelle, *The Economic Effects of Taxing Capital Income* (Cambridge, Mass.: MIT Press, 1994), pp. 75-93, for a survey of the literature on the domestic efficiency costs of the corporate income tax.

4. See B. Douglas Bernheim, "Taxation and Saving," in Alan J. Auerbach and Martin Feldstein, eds., *Handbook of Public Economics*, vol. 3 (Amsterdam: North-Holland Press, 2002), pp. 1173-1249, for a survey of the literature on the effects of taxation on saving.

the after-tax return that investors demand and the pretax return that a business's investment must earn to pay both taxes and investors.

Organizational Form

The United States' tax system does not subject all business activity to the corporate income tax. Unincorporated businesses, such as sole proprietorships and partnerships, do not pay the tax. Instead, all of their income, whether it is distributed to owners as dividends or retained for additional internal investment, is "passed through" and taxed only at the level of the individual—that is, the owner or owners. In the United States, some corporations may elect treatment under subchapter S of the corporate income tax, which allows them the same kind of pass-through arrangements that the tax code permits unincorporated firms.⁵ Pass-through treatment is also available to real estate investment trusts and to mutual funds that are organized as regulated investment companies. Limited liability companies (LLCs) are another form of business organization. Although practically indistinguishable from corporations, LLCs are not subject to the corporate income tax because technically they are not incorporated.

The fact that different types of organizations are taxed differently creates a bias against organizing as a corporation, which is subject to the corporate income tax, and an incentive for businesses to organize in noncorporate forms that are not subject to the tax. But the extent of those effects goes beyond a shift by some businesses to a different organizational form. Not all industries lend themselves to the noncorporate structure. The corporate form is particularly prevalent among industries that use large quantities of capital drawn from many investors. Consequently, the bias against the corporate form also becomes a bias against some industries and types of production. To the extent that the corporate tax lessens the demand for capital in the corporate sector, it makes more of that capital available for investment in the noncorporate sector. However, the overall efficiency of investment will be reduced if businesses invest that capital within the noncorporate sector even when those investments provide a lower pretax rate of return than do other potentially better investments forgone by firms in the corporate sec-

5. Tax law requires that S corporations be structured in such a way that it is administratively easy to tax them as pass-through entities. Thus, an S corporation must be a purely domestic corporation that issues only one class of stock to no more than 75 shareholders.

tor (because the tax has raised their cost of capital). Thus, the corporate income tax tends to distort production within both sectors by decreasing production in the corporate sector and increasing it in the noncorporate sector and by changing the ways in which those sectors use capital assets in production.

Financing

Businesses may finance investment either by selling ownership shares, or stock (equity), or by borrowing (debt). If firms choose equity financing, investors realize returns in the form of residual profits—that is, the profits that remain after the business pays all of its creditors and suppliers. If businesses finance investment through debt, investors receive their returns as interest. The corporate income tax may distort a business's decisions about financing because the tax is imposed only on residual profits; it is not imposed on the income a firm pays as interest to investors (because such interest is deductible from the firm's taxable corporate income). As a result, the tax creates a bias in favor of debt financing, and corporations are likely to be more heavily financed by debt than they would have been without the corporate income tax. That greater dependence on debt financing may increase the chance that companies will not be able to pay their creditors, thus heightening the risk of bankruptcy.⁶ Further, shareholders, creditors, and managers have divergent interests that are partly balanced by each company's chosen mix of debt and equity financing. The corporate income tax may upset that balance by encouraging firms to use too much debt.⁷

Dividends

After a corporation pays the interest owed to its creditors, it may distribute its residual profits to its shareholders as dividends, use the profits to repurchase shares from shareholders, or retain those profits for reinvestment. In each case, the profits become income of the shareholders; how-

6. See Roger Gordon and Burton Malkiel, "Corporation Finance," in Henry J. Aaron and Joseph A. Pechman, eds., *How Taxes Affect Economic Behavior* (Washington, D.C.: Brookings Institution, 1981), pp. 131-198.

7. See Michael Jensen, "Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers," *American Economic Review Papers and Proceedings*, vol. 76 (May 1986), pp. 323-329. See Alan J. Auerbach, "Taxation and Corporate Financial Policy," in Auerbach and Feldstein, *Handbook of Public Economics*, pp. 1252-1292, for a survey of the literature on how taxation affects corporate financial decisions.

ever, in the case of reinvested profits, the shareholders do not immediately receive that income. The reinvested profits will generally increase the value of the firm—and therefore the value of its stock—creating a capital gain for shareholders.

Under the individual income tax, capital gains are not taxed until they are realized, which in the case of stocks usually occurs when a stock is sold. That deferral of taxation reduces the effective tax rate on capital gains because of the time value of money—that is, the value that people place on receiving money now rather than later. If investors hold stock until they die, the gains may escape income tax altogether.⁸ Consequently, after taxes, corporate earnings that shareholders accrue as capital gains are more valuable to them than earnings paid as dividends, even if realized capital gains and dividends are taxed at the same statutory rate. The tax system thus creates a bias against paying dividends.⁹

The bias against dividends may diminish economic efficiency by reducing such payments. There are two general analytical viewpoints about the cost of that reduced efficiency. In one such view, a company uses dividend payments to send information to shareholders about the company's prospects for future earnings. But the tax bias against dividends may make firms hesitate to send such signals—in which case, shareholders will have less information and will therefore make less efficient decisions when they buy and sell shares.¹⁰ In another view, corpo-

rate managers may not always make the best investments of retained earnings. A reduction in dividend payments will make more cash available to managers, who may then undertake inferior corporate investments.¹¹

Types of Investments

The corporate income tax may affect the demand for various types of capital investment in different ways because its rules vary across investment types. For example, its rules for tax depreciation may have different effects on the cost of capital for investments in different types of business assets. Depreciation rules under the corporate income tax prescribe specific formulas for each type of asset to spread deductions for the initial cost of an investment over a number of years. Because the depreciation formulas do not necessarily track economic depreciation closely, differences in the formulas for different types of assets may increase or decrease the cost of capital for some business investments relative to other investments. Such differences may distort the incentives for investing in various types of assets and for producing various goods and services.

Although the distortions that arise from depreciation rules may be significant, they are not inherent to corporate income taxation. It is possible in principle, though perhaps difficult in practice, to design a corporate income tax that will minimize those biases by aligning tax depreciation with economic depreciation. The failure of tax depreciation to track its economic counterpart is not unique to the corporate income tax: the same depreciation rules apply to noncorporate businesses and introduce similar distortions.¹²

Tax Compliance and Planning

The corporate income tax may distort the allocation of resources by making compliance with the tax costly and by creating additional opportunities for tax planning. Significant costs may arise simply from the task of properly applying detailed corporate tax rules to often highly com-

8. Under the individual income tax, when an appreciated stock is transferred on the death of its holder, the calculation of any subsequent capital gain to the recipient is based only on the appreciation that occurs after the stock is acquired from the decedent, which results in the forgiveness of tax on previous capital gains. The Economic Growth and Tax Relief Reconciliation Act of 2001 capped that so-called step-up in basis for individuals who die during 2010.

9. The Jobs and Growth Tax Relief Reconciliation Act of 2003 temporarily weakened that bias by cutting the tax rates on both dividends and capital gains to 15 percent. However, the change did not eliminate the bias against dividend payments because the tax on capital gains is still deferred—that is, it is not due until an asset is sold.

10. That bias is called the signaling view. See Sudipto Bhattacharya, “Imperfect Information, Dividend Policy, and the Bird in the Hand Fallacy,” *Bell Journal of Economics*, vol. 10 (1979), pp. 259-270; and Merton H. Miller and Kevin Rock, “Dividend Policy Under Asymmetric Information,” *Journal of Finance*, vol. 40 (1985), pp. 1031-1051.

11. That so-called agency cost view is discussed in Michael Jensen and William Meckling, “Theory of the Firm: Managerial Behavior, Agency Costs, and Ownership Structures,” *Journal of Financial Economics*, vol. 3 (1976), pp. 305-360.

12. The importance and difficulties of following patterns of economic depreciation are discussed by David W. Brazell and James B. Mackie III, “Depreciation Lives and Methods: Current Issues in the U.S. Capital Cost Recovery System,” *National Tax Journal*, vol. 53, no. 3 (September 2000), pp. 531-561.

plex business activities, organizational structures, and transactions. Additional costs, perhaps larger, may result from companies' efforts to maximize their after-tax profits, in part by taking full advantage of tax-planning opportunities. Companies are likely to engage in tax planning up to the point at which additional gains in their after-tax profits are equal to the added costs and risks of greater planning.

Tax planning leads to efficiency costs when businesses structure their organizations and activities in less-than-optimal ways to take advantage of the opportunities that tax planning offers. Examples include some of the distortions discussed earlier, such as the choice between corporate and noncorporate forms of organization or the ways in which corporations finance their investments. Although a company benefits its shareholders when it reduces its tax payments through such planning, the resulting decrease in tax revenues may lead to less well-being elsewhere in the economy. In addition, the resources that the corporation expends on tax planning, though producing a private benefit for the shareholders, provide no additional output. Therefore, from an overall economic perspective, those resources are essentially wasted.

The Economic Importance of Domestic Distortions

Considerable economic research has tried to measure the efficiency costs from distortions associated with the corporate income tax. Studies have produced a wide range of estimates, some quite large, of the tax's inefficiency.¹³ Several well-known studies examine the costs that result from distortions in the allocation of capital and output between corporate and noncorporate businesses. Harberger, for example, estimates that those costs equal about 24 percent of corporate income tax revenues.¹⁴ On the basis of research with Kotlikoff, Gravelle puts those costs higher—as exceeding half of all such revenues;¹⁵ an even larger estimate, by Fullerton and Rogers, suggests that they represent about 65 percent of revenues.¹⁶ In contrast, Fullerton's and Henderson's estimate of the costs of

that inefficiency is much smaller than Harberger's.¹⁷ Overall, on the basis of a survey of estimates derived from published corporate tax studies, Gravelle concludes that the combined cost of the first five domestic inefficiencies discussed in this chapter could exceed the total amount of corporate tax revenues collected.¹⁸

Measures of the costs of complying with the corporate income tax have also been large. Slemrod and Blumenthal, for example, estimate that average annual compliance costs for a Fortune 500 company in 1992 exceeded \$2 million.¹⁹ And Slemrod reports total annual compliance costs for midsized companies in 2002 of approximately \$22 billion.²⁰

International Distortions

Corporate income taxes may also distort the incentives for international investment and create opportunities for international tax planning. If an economy was closed off from the rest of the world, total domestic investment would equal total domestic saving. The effect of the corporate income tax on total investment would then depend critically on the extent to which the tax affected domestic saving. For example, if the tax did not influence the total amount of domestic saving, it could not affect the total amount of investment. Such prices as interest, wage rates, and the prices of goods and services would adjust to bring saving and investment into alignment.

13. See Congressional Budget Office, *The Incidence of the Corporate Income Tax* (March 1996), and Gravelle, *The Economic Effects of Taxing Capital Income*, pp. 76-93, for discussion of the reasons that studies have produced a variety of estimates.

14. Arnold C. Harberger, "Efficiency Effects of Taxes on Income from Capital," in Marian Krzyzaniak, ed., *Effects of the Corporate Income Tax* (Detroit: Wayne State University Press, 1966), pp. 107-117.

15. Gravelle, *The Economic Effects of Taxing Capital Income*, p. 81.

16. Don Fullerton and Diane Lim Rogers, *Who Bears the Lifetime Tax Burden?* (Washington, D.C.: Brookings Institution, 1993).

17. Don Fullerton and Yolanda Kodrzycki Henderson, "A Disaggregate Equilibrium Model of the Tax Distortions Among Assets, Sectors, and Industries," *International Economic Review*, vol. 30, no. 2 (May 1989), pp. 391-413.

18. Gravelle, *The Economic Effects of Taxing Capital Income*, pp. 89-90.

19. Joel Slemrod and Marsha Blumenthal, "The Income Tax Compliance Cost of Big Business," *Public Finance Quarterly*, vol. 24, no. 4 (October 1996), pp. 411-438.

20. Joel Slemrod, *The Economics of Corporate Tax Selfishness*, Working Paper No. 10858 (Cambridge, Mass.: National Bureau of Economic Research, October 2004), p. 25. It is not clear how that amount should be divided between the costs of routine compliance and the costs of other types of tax planning. Also unclear is whether the costs of the latter are captured fully by these or any other existing estimates of corporate income tax inefficiency. (The costs reviewed in this paragraph may include some of the costs of international tax planning discussed later in this chapter.)

However, because nations' economies are open to international flows of capital, the supply of funds available for domestic investment in each country is determined not only by the total worldwide amount of saving but also by where savers choose to supply their funds. Consequently, regardless of whether corporate income taxes affect total worldwide saving, such taxes—by varying across countries—may affect where savers decide to invest. In such an internationally open economy, differences in the tax rates that countries impose may distort the total amount of investment within each country, the tax revenues that each nation collects, and the costs that companies bear in order to plan ways to reduce the taxes they must pay.

The international dimension adds three main concerns about the corporate income tax. First, the potential for shifting the location of investment outside a country and for drawing investment into a country in response to differences in tax rates may reduce the efficiency of investment, as businesses allocate capital to specific uses on the basis of tax considerations. A country with a relatively high corporate income tax, for example, stands to lose investment to lower-tax countries. Second, a drop in investment in a relatively high-tax country may reduce the amount of capital available to workers and thus reduce real (price-adjusted) wages in that country. Third, the tax base of a relatively high-tax country may erode further because businesses with operations in multiple countries can reduce their taxes by “recharacterizing” where their taxable income is earned to place relatively more of it in low-tax countries.

International Tax Policies and Cross-Country Variation in Corporate Tax Rates

Countries have structured their international tax policies in such a way that cross-country differences in tax systems distort economic decisions. If, however, every country chose to levy capital income taxes only on its own resident individual savers and then imposed a tax whose rate remained the same regardless of where the savings were invested, the tax would not distort decisions about international investment, even if each country had a different rate.²¹ Under such an approach, where a saver invested or made income appear to be located for tax purposes would

be immaterial, because the saver would face the same tax rate regardless of where the investment or income was located. Although another saver in a different country might face a different home-country tax rate on income, that other saver would also face a uniform home-country tax rate everywhere and—for tax purposes—would not care where the savings were invested. If all countries followed that approach, international differences in capital income tax rates would cause neither an international misallocation of capital investment nor a shifting of taxable income among countries.

Although such uniform taxation has merit in terms of global economic efficiency, countries have not embraced it, perhaps because they view it as not being in their national interest. Moreover, even if countries wanted to adopt uniform taxation, the ability that individuals have to invest through corporations raises legal and administrative barriers that stand in the way of fully achieving it. Adhering to the uniform taxation principle would require countries to fully integrate individual income taxes with the taxes of domestic and foreign corporations, so that an individual investor would be subject to the same rate of tax regardless of where the investment was located.

For example, the United States would have to tax individual U.S. shareholders in a U.S. company on their shares of the corporation's worldwide income as it was earned—whether that income came from the firm's domestic or foreign operations—regardless of whether the company or its foreign subsidiary businesses paid dividends. However, the United States would not tax foreign shareholders in the same company on their shares of the company's worldwide income. In addition, the United States would have to tax U.S. individuals who owned stocks in foreign companies on their portion of the income those companies earned—as the income was accrued—through the foreign companies' worldwide operations. That taxation would occur regardless of whether the foreign companies had any operations in the United States and regardless of whether the companies paid dividends. To achieve the full advantages of taxation based on the uniform taxation principle, other countries would have to follow the same approach when taxing their own resident savers.²²

21. That principle of international taxation is known as capital export neutrality (CEN). For a discussion of that and other international taxation issues, see Roger H. Gordon and James R. Hines Jr., “International Taxation,” in Auerbach and Feldstein, *Handbook of Public Economics*, pp. 1935-1995.

22. Each country could also impose tax on income earned within it from investments of foreign-supplied capital, but to achieve CEN in that case would require each country to allow a full credit for any foreign taxes paid by its resident savers. Countries are unlikely to allow such an unlimited foreign tax credit because such a policy could result in unacceptable transfers to foreign treasuries.

Such a fully integrated approach to the taxation of worldwide corporate profits might not be administratively feasible. To adopt that approach, the United States, for example, would have to be able to collect information on all of the income earned by U.S. individuals through their ownership shares of foreign corporations, including income that was retained and reinvested by companies' affiliates located throughout the world. Such information is not likely to be available unless other countries fully integrate their systems in a similar way—which will bring them face to face with similar administrative obstacles. And because most countries that currently integrate their corporate and individual income taxes do so only partially and do not typically pass the benefits of integration through to foreign shareholders, the United States would have to provide the tax relief that should have been available from those countries' integration. That relief would come in the form of full credits to U.S. shareholders for income taxes paid by the foreign corporations in which they owned shares, an approach that would essentially transfer funds from the U.S. Treasury to treasuries abroad.

As a practical alternative to taxing the capital income of resident individuals at the same rate regardless of where their savings were invested, the United States could choose to apply the uniform taxation principle at the corporate level alone.²³ But it is not clear how well that alternative would work if the United States applied it only to U.S. corporations and their foreign subsidiaries. Because the same tax rates on capital income could not apply to investments made through foreign companies that were owned directly by individual U.S. shareholders, switching to such a system would create an additional incentive for U.S. individuals to purchase shares in foreign rather than in domestic companies. Those foreign companies would then have a substantial advantage over U.S. firms: they would be better able either to acquire U.S. companies or to use capital raised from U.S. shareholders to produce the same or similar goods and services as the U.S. companies produced but at lower costs—provided they could achieve lower effective corporate tax rates on their worldwide operations under foreign tax laws. Such a reorganization of business activity, however, might be costly to execute, lead to less efficient organizational structures, and

23. Even at that level, application of the principle would be incomplete unless the United States fully credited taxes paid by U.S. corporations abroad, even when foreign nations' tax rates exceeded the United States'.

undermine the goal of taxing investment income at the same rate regardless of the investment's location. Applying the principle of uniform taxation at the corporate level alone therefore would not necessarily improve economic well-being.²⁴

Other countries face similar administrative and legal obstacles and are likely to have similar concerns about adopting uniform taxation at the corporate level only. As a consequence, the corporate tax rate that a country chooses may affect the international supply of capital and the degree to which companies engage in tax planning to shift taxable income among countries.

Tax Rates and the Location of Investment

Differences in corporate tax rates affect where businesses decide to invest. In general, investment in countries whose corporate income taxes are relatively high is likely to account for a smaller share of the world's supply of capital than it would if countries did not differ in their tax rates. Total investment is likely to be smaller in countries that have relatively high corporate income tax rates and larger in countries that have relatively low rates.

Once differences in tax rates affect decisions about where to invest, those decisions no longer properly reflect the underlying social costs and benefits. Investment becomes misallocated—in terms of economic efficiency—on a worldwide basis. But worldwide efficiency is not typically the motive for nations' actions, and countries often set tax rates to attract investment and boost their own national well-being. Such policies may decrease investment in other countries, which may then respond in kind by changing their tax rates to increase their national well-being.

24. Harry Grubert and John Mutti ("Taxing Multinationals in a World with Portfolio Flows and R&D: Is Capital Export Neutrality Obsolete?" *International Tax and Public Finance*, vol. 2, 1995, pp. 439-457) show that under certain conditions, it may be economically desirable for the United States to follow a policy of CEN at the corporate level, even if U.S. individuals can easily purchase shares in foreign companies. Grubert and Mutti, however, show that CEN's desirability as policy depends on the degree to which goods produced by domestic and foreign firms may be substituted for each other. But the authors do not establish that conditions are actually such that CEN should be preferred. In addition, even if conditions did favor CEN, Grubert and Mutti do not claim that switching from current U.S. policies to a policy of CEN will increase economic efficiency.

Under such circumstances, one country's choice of its "best" tax rate to impose depends to some extent on the rates imposed by other countries. That country's decision, however, is more complicated than simply trying to choose a low tax rate to garner an advantage over other nations. To maximize its national well-being in an international environment, a country must balance several, sometimes competing, goals. One goal is to ensure that residents receive the maximum returns possible from their saving, taking into account the fact that they may invest either at home or abroad. Another of the country's goals is to maximize the real wage income of its workers by considering the effect of its corporate taxes on the international flow of capital and the size of its domestic capital stock. Yet another goal is to minimize the costs of administering taxes and of complying with them. Last, a country will balance those goals with broader policy objectives, such as the size of government it desires and the fairness it requires of its tax system. That balance is likely to differ from country to country.

Moreover, a country's ability to change its tax rates to gain an advantage varies with its economic circumstances. For example, such flexibility may depend on whether the country's total capital investment is small or large relative to investment worldwide.²⁵ It may also depend on the extent to which the country provides unique opportunities for investment and the degree to which other countries might change their tax rates in response.

At one extreme, a country may choose to set a low corporate tax rate because that country accounts for a very small part of worldwide investment and does not offer any unique investment opportunities tied to its location.²⁶ In such a case, the demand by businesses for capital within that country will essentially determine the amount of domestic investment that occurs. International investors will supply those businesses with as much or as little capital as they request, as long as the investors receive a sufficiently high rate of return after the businesses pay their corporate income taxes. For investment

in such a small country (measured, that is, in terms of its share of worldwide real investment), world capital markets determine the rate of return that international suppliers of capital require. That rate is not influenced by the level of investment in the small country or by its level of corporate income taxation. As a result, the supply of capital to such a country may be very sensitive to the level of its corporate income tax.

In contrast, the international supply of capital in a country that accounts for a large share of worldwide investment is likely to be less sensitive than in a smaller country to the after-tax rate of return that suppliers receive. Supply will be less affected if the country's total demand for investment is large enough to influence the after-tax rate of return required in world capital markets. Supply may also be less sensitive if the country provides investment opportunities that cannot be found elsewhere.

From a purely international perspective, small countries are likely to choose low corporate income tax rates. Such countries are often more concerned than are nations with larger shares of worldwide investment about the effect of a higher corporate income tax rate on their ability to attract capital and the effect that such a choice may have on domestic labor productivity and real wages. In contrast, larger countries may worry less about the effects their tax rates have on international investors' willingness to supply capital. Instead, their choices of corporate tax rates are likely to be governed primarily by a broader range of policy considerations.

An international comparison of corporate income taxes should therefore account for differences among countries. Economies differ with regard to how much their taxes are likely to affect the international supply of capital and therefore the extent to which differences in tax rates will affect the overall amount of investment within each country. Although broad comparisons of tax rates can be informative, it is also useful to limit comparisons to countries that face similar opportunities and constraints in their attempts to balance the competing objectives of their tax policies.

Tax Rates and the Location of Income

In addition to their effect on the location of capital, international differences in corporate tax rates may also create significant incentives for multinational companies to engage in costly tax planning that aims, for tax purposes, to

25. In economic terms, the issue is whether investment within the country is large enough to influence the after-tax rate of return required by financial investors.

26. The amount of investment in a country can influence the after-tax rate of return required by financial investors, even if that country is small, if the country offers investors unique opportunities to reduce the riskiness of their investments. See Gordon and Hines, "International Taxation," pp. 1948-1951.

alter, or recharacterize, where their income was earned.²⁷ The motivation underlying that kind of behavior is the same as the motivation to locate investment in a country with low corporate tax rates: to raise the investment's after-tax return by avoiding taxes. The outcome is analogous: it imposes economic efficiency costs and shifts tax revenue between countries. The mechanism, however, is a little different. Instead of placing capital in a low-tax country so that the profits generated by that investment are taxed at lower rates, a firm uses various tax-planning methods to recharacterize its profits—regardless of where they were actually earned—as originating in low-tax countries.

One such means of shifting income involves the choice of where to borrow and what method to use. Because interest expenses are deductible, a multinational corporation may shift taxable income by borrowing relatively more through affiliated companies in high-tax countries than they borrow through affiliates in low-tax countries. Corporations may also shift income out of a high-tax country by financing investments undertaken by an affiliated company in that country using direct loans from affiliates in low-tax countries.²⁸

Internal transfer pricing provides another means for shifting profits out of high-tax countries. Multinational corporations engage in a substantial amount of international trade between affiliated companies located in different countries. A multinational firm may try to shift profits out of high-tax countries by setting their internal prices artificially high or low for goods or services that are traded between its business affiliates in different countries.²⁹ For example, the firm may shift income out of a high-tax country when an affiliate in that country is paid too little for its export sales to affiliates in low-tax countries. It may also shift income when an affiliate in a high-

tax country pays too much for imports purchased from affiliates in low-tax countries.

In such instances, the cross-country tax differentials may also influence where businesses choose to invest but in a more complicated way than by simply moving their production operations to low-tax countries. Instead, tax planning may require that businesses structure their activities in ways that make it easier to shift income. Such planning may result in economically inefficient behavior by the company, both in terms of how it must structure its operations and finances to shift the income and in terms of the direct costs that it must pay to acquire planning expertise and either avoid or resolve controversies with tax authorities.

The incentives to shift profits between two countries depend for the most part on the differences between statutory tax rates. That contrasts with the incentives for the location of capital used in production, which depend on the ways in which a wider range of tax provisions work together to determine the taxes imposed on new investment. When a company shifts profits from a high-tax to a low-tax country, the company pays tax on those profits at the lower statutory rate. The company's tax saving equals the amount of profits shifted times the difference between the statutory tax rates in the two countries.

In that way, the shifting of income may also redistribute tax revenue between the two countries, as the company pays tax to the low-tax country—at a lower rate—instead of paying it to the high-tax country. As a result, only part of the revenue lost by the high-tax country represents a reduction in the taxes paid by the company. The rest is revenue gained by the low-tax country.

27. Gordon and Hines, "International Taxation," pp. 1970-1975, discuss evidence that such incentives may have large effects on tax revenues and economic behavior.

28. The tax laws of some countries limit the extent to which borrowing can be used to shift taxable income. (An example is the U.S. tax code's rules about the use of foreign tax credits and other laws that effectively constrain the amount of lending among affiliates.) Still, the paragraph describes the basic structure of a key aspect of multinational tax planning.

29. The United States and other member countries of the Organization for Economic Cooperation and Development impose limits on the ability of companies to manipulate such internal transfer pricing, generally on the basis of the arm's-length principle. Under that approach, the "correct" price is the price at which companies or people would be willing to trade if those traders were not economically related. In many cases, determining the correct arm's-length price—especially when the item traded is unique, such as a patent or a trademark—is difficult. As a result, taxpayers and tax authorities often disagree about the correct price.

2

Comparing the United States' Corporate Income Tax Rates with Those of Other Countries

International comparisons of corporate income tax rates are potentially difficult to carry out, for several reasons: effective tax rates may be measured in a variety of ways, the differences among countries' tax rates may distort aspects of economic behavior, and the characteristics of countries' economies may differ and interact in ways that affect how those nations' tax systems should be compared. Further complicating such analyses are the existence of subnational corporate income taxes, differences between the ways that returns to investments financed by debt and by equity are taxed, and the various ways in which taxable income may be defined and calculated.¹ On the one hand, comparisons that do not fully account for such intricacies must be interpreted with care. On the other, an attempt to account for all factors would quickly become unwieldy as countries and years were added to the analysis.

Rather than trying to account for all such factors, the Congressional Budget Office compared corporate tax systems across a number of countries and in various years, focusing on the systems' simplest and most essential features. Its analysis begins with a comparison of statutory corporate tax rates and then considers the factors (such as depreciation and sources of financing) that are essential to understanding how the different countries' tax systems affect economic incentives. The data that CBO used in its study come primarily from the work of M.P. Devereux, R. Griffith, and A. Klemm (see Box 2-1).

1. Still other complications arise from the ways in which a corporation's foreign earnings are taxed at home. Complex provisions relating to foreign tax credits, deferral of tax payments, and other features of the tax code may cause companies' investment and other business decisions to depend on more than just the tax rates imposed in different countries.

An important goal of this international comparison is to characterize the influence that corporate taxes have on the incentives for businesses to invest. Every corporation invests in the assets it uses in its productive activities so that it can provide income to its financial investors. A business will invest only if it expects to earn enough income before taxes to pay those investors at least as much income after taxes as they could earn from other similar investments. Corporate taxes affect the incentives to invest when they raise the cost of capital by driving a wedge between the after-tax return required by financial investors and the return before taxes that investments must yield if they are to cover both taxes and investors' returns.

The Structure of Corporate Income Taxes

In the United States, in addition to the national tax on corporate income, many states tax the portion of such income attributable to business activity within the state. In many other countries as well, corporate income taxes are imposed at both the national and subnational levels (see Table 2-1). International comparisons must take both levels of taxation into account.

The corporate income tax rules can be excruciatingly complicated, but most of their specific details may be ignored in favor of a basic understanding. Briefly, to determine its total corporate income tax, a business first calculates its taxable income. It then applies a schedule of statutory tax rates to that income and subtracts any tax credits.

To understand how corporate income tax rules affect the incentives for business investment requires combining statutory tax rates with the effects of legal provisions that define taxable income and allow for tax credits. The eco-

Box 2-1.**Data and Methods for CBO's Analysis**

For this paper, the Congressional Budget Office primarily used information from a database prepared by M. P. Devereux, R. Griffith, and A. Klemm for the publication "Corporate Income Tax Reforms and International Tax Competition," *Economic Policy*, vol. 35 (October 2002), pp. 451-495. Another publication—M.P. Devereux and R. Griffith, "Evaluating Tax Policy for Location Decisions," *International Tax and Public Finance*, vol. 10, no. 2 (March 2003), pp. 107-126—presents the methods that the authors used to calculate effective marginal corporate tax rates. The data that Devereux, Griffith, and Klemm prepared are available at www.ifs.org.uk, the Web site of London's Institute for Fiscal Studies (IFS); the site also provides documentation for the data sources and economic assumptions. Additional data on stat-

tutory tax rates for selected member countries of the Organization for Economic Cooperation and Development (those shown in italic type in Figure 2-1) were drawn from KPMG's "Corporate Tax Rate Survey—2003," available at www.in.kpmg.com/pdf/2003CorporateTaxSurveyFINAL.pdf [*sic*].

The basic economic assumptions incorporated in the calculations by Devereux, Griffith, and Klemm for their 2002 publication are described in detail on the IFS Web site. Specifically, those authors assumed the following: rates of economic depreciation were 12.25 percent and 3.61 percent for machinery and industrial structures, respectively; inflation was 3.5 percent in all years for all countries; and the real (inflation-adjusted) interest rate was 10 percent.

economic construct that results is the effective marginal corporate income tax rate, which is defined as the percentage of the income from a marginal investment (an investment for which the income is just high enough to pay the cost of capital) that must be paid as corporate taxes.² An increase in the effective marginal corporate tax rate will tend to reduce the amount of investment that a corporation seeks to undertake. For a particular after-tax return that investors require, a higher effective marginal rate implies that the threshold for businesses to undertake investments (the cost of capital) will be higher. As a result, fewer potential investments will provide businesses with a sufficiently high rate of return, and those firms' investment will be reduced.

Effective marginal tax rates typically differ from statutory tax rates. If the tax code defined taxable income as always

equal to economic income (see below) and provided no special tax credits, an international comparison of investment incentives could be based on a comparison of statutory tax rates alone. However, because the corporate tax rules cause taxable income to diverge from economic income, the rules for computing taxable income may be just as important as the statutory tax rates when measuring effective marginal corporate tax rates.

Economic income from a business investment equals receipts minus expenses, with both measured on a real accrued basis—that is, as they accrue, adjusted for inflation. (The main types of expenses include the costs of labor compensation; purchases of raw materials, goods, and services; and the economic depreciation of a company's capital assets.) In contrast, taxable income is defined by law; it reflects no adjustment for inflation and excludes some components of economic income earned from certain types of business activity, such as investment in research and development, oil exploration and extraction, and marketing. Economic income can be very difficult to measure, and the tax rules contain some practical compromises. For example, in many cases, it is not easy to measure the real accrued components of income, so the law defines some components of taxable income on the basis of the receipts and outlays that the business actually realizes.

2. Note that this measure covers only corporate-level taxes; however, individual-level taxes may also affect investment incentives. Although international comparisons that accounted for taxes at the level of the individual would be informative, full consideration of the taxes paid by equity or debt investors would be substantially more difficult because the equity or debt investors of a particular country may reside there or in any other country and may be either individuals or other businesses. Corporate-level taxes provide important information about how the differences across countries affect international investment incentives.

Table 2-1.

Taxes on Corporate Income in OECD Countries in 2002 as a Percentage of Gross Domestic Product

Country	Percentage of GDP
Austria	2.3
Australia	5.3
Belgium	3.5
Canada	3.4
Czech Republic	4.6
Denmark	2.9
Finland	4.3
France	2.9
Germany	1.0
Greece	3.8
Hungary	2.4
Iceland	1.1
Ireland	3.7
Italy	3.2
Japan	3.1
Republic of Korea	3.1
Luxembourg	8.6
Mexico	*
Netherlands	3.5
New Zealand	4.2
Norway	8.2
Poland	2.0
Portugal	3.6
Slovak Republic	2.7
Spain	3.2
Sweden	2.4
Switzerland	2.7
Turkey	2.2
United Kingdom	2.9
United States	1.8
Unweighted average	3.4
Weighted average	2.5

Source: Congressional Budget Office based on Organization for Economic Cooperation and Development, *Revenue Statistics of OECD Member Countries* (Paris: Organization for Economic Cooperation and Development, 2004), Table 12.

Notes: Percentages include both national and subnational taxes on corporate income.

* = data not available.

Two common differences between economic income and taxable income in many countries' tax systems are the treatment of interest and the treatment of depreciation. (There are other differences as well, but the approaches to interest and depreciation are the most critical.) Interest payments on debt that a corporation uses to finance investment are part of the economic income that the investment generates. In contrast, in figuring their taxable corporate income, corporations subtract the interest payments as an expense. For that reason, the tax imposed at the corporate level on the income from an investment depends on the extent to which that investment has been financed by shareholders (equity investors) or creditors (debt investors).

Economic depreciation is the decrease in the value of a productive asset that occurs because the asset provides less remaining productivity as it ages. Consequently, a key component of the cost of using capital equipment is the rate at which it depreciates. Accounting based on economic principles would permit each firm to deduct that depreciation as an expense as it accrues. However, for tax purposes, firms must use a rate of depreciation derived from tax rules that usually specify the length of time over which an asset may be fully depreciated and how the asset's loss in value should be distributed over those years. "Tax depreciation" may thus differ substantially from economic depreciation.

Ultimately, the sum of deductions for tax depreciation of an asset equals the cost of purchasing it, but the value of deductions to the taxpayer depends on their timing—the depreciation schedule—which is determined by law. The deductions are more valuable when the period for them is shorter or when they are more concentrated in the earlier years of an asset's useful life. In addition, because deductions for tax depreciation are based only on an asset's purchase price and are not adjusted for subsequent inflation, the deductions become less valuable to the taxpayer when inflation is higher. Consequently, the differences between tax depreciation and economic depreciation mean that taxable income differs from economic income, which leads to variation in effective marginal tax rates. The difference between tax depreciation and economic depreciation may depend on the type of asset purchased; for example, those depreciation values may differ for machinery and structures. And because depreciation schedules for assets vary substantially from country to country, international comparisons of effective marginal tax rates must account for differences among them.

Statutory Corporate Tax Rates

Many countries, including the United States, apply statutory tax rates to taxable corporate income according to a schedule—that is, they tax different portions of taxable income at different rates. CBO has limited the comparisons it presents to the top corporate tax rates in those schedules. An international comparison of, for example, intermediate statutory corporate tax rates would add little information about investment incentives because most corporate investment is undertaken by corporations that face the highest statutory rates.

The top statutory corporate tax rates in 2003 among the 30 members of the Organization for Economic Cooperation and Development (OECD) ranged from 12.5 percent to 40.9 percent (see Figure 2-1 on page 22). The statutory rate for each country combined the top national corporate income tax rate with any subnational top corporate tax rates averaged across regions.³ Thus, in the case of the United States, the top statutory rate imposed in 2003 at the federal level on business income subject to the corporate income tax was 35 percent, and the average top statutory corporate income tax rate imposed by states in that year added just over 4 percent (after accounting for the fact that state taxes are deducted from federal taxable income)—for a combined top statutory rate of 39.3 percent.

Among all OECD countries in 2003, the United States' top statutory corporate tax rate was the third highest;⁴ it was also higher than the top statutory rates in approximately 90 percent of those countries. The United States' top rate of 39.3 percent was 6.3 percentage points higher

than the median for all OECD countries (33.0 percent) and 4.4 percentage points higher than the upper quartile (34.9 percent).⁵ With a few exceptions, tax rates did not vary substantially across countries. Fourteen of the OECD countries had top statutory rates between 29.2 percent (the lower quartile) and 34.9 percent (the upper quartile).

With the exception of the United Kingdom, top statutory corporate tax rates among the Group of Seven (G7) countries were close to the top statutory tax rate in the United States.⁶ Among the OECD members, the G7 countries are the most similar to the United States in the size of their economies, level of industrialization, and, probably, the degree to which the overall supply of capital and the corporate tax base are sensitive to corporate tax rates. The United States' top statutory tax rate (39.3 percent) was only about 2.4 percentage points higher than the median rate for all other G7 countries (36.9 percent). Again, with the exception of the United Kingdom, the G7 countries had the highest top statutory corporate tax rates within the OECD.

Countries with the lowest top statutory corporate tax rates all have much smaller economies than that of the United States and account for much smaller amounts of investment (see Figure 2-2 on page 23). In general, OECD countries that account for smaller amounts of investment have lower statutory corporate tax rates (see Figure 2-3 on page 24). In those countries, the supply of capital and the size of the corporate tax base are probably more sensitive to corporate tax rates than they are in the larger countries.⁷

Similar patterns of statutory rates appear among a smaller group of 19 OECD countries for which a long history

3. For each country in which subnational corporate taxes are deductible at the national level, such as in the United States, the combined statutory tax rate is the sum of the national and subnational tax rates minus the product of the national and subnational statutory tax rates—which is the value of the deduction.

4. CBO analyzed tax rates for 2003 because that is the latest year for which the necessary data are available for all of the OECD countries. More recently, the American Jobs Creation Act of 2004 effectively reduced the United States' highest federal statutory corporate tax rate for income from domestic production from 35 percent to 31.85 percent through the allowance for a special deduction from taxable income. That reduction is phased in over several years. The deduction allowed under the law is 3 percent of income from domestic production in 2005 and 2006; 6 percent in 2007, 2008, and 2009; and 9 percent thereafter. Other corporate income is still taxed in the United States at a top federal statutory rate of 35 percent.

5. The median is a value that divides the ranked countries in half. The upper quartile is a value that divides the upper quarter from the lower three-quarters of ranked countries. The lower quartile is a value that divides the lower quarter from the upper three-quarters of countries. Those divisions are not always precise because a group of countries cannot always be divided exactly by two or four.

6. The G7 industrialized countries are Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States.

7. The relationship between statutory corporate tax rates and investment appears to be essentially the same as the relationship between statutory corporate tax rates and gross domestic product when those factors are ranked in the same manner.

(since at least 1982) of combined national and subnational top statutory rates and other important data are available for analysis (see Figure 2-4 on page 25). (The remaining analysis presented in this report is based on the countries shown in that figure.) Although that subgroup of 19 countries excludes a few smaller nations that had the lowest top statutory tax rates among all countries in the OECD, distributions for the total group and the subgroup are very similar. Among both groups, the United States and most of the G7 countries had the highest top statutory tax rates, and Ireland had the lowest.

For the subgroup of 19 OECD countries, the top statutory rates have changed significantly since 1982 (see Figure 2-5 on page 26). The Tax Reform Act of 1986 substantially reduced the United States' top statutory corporate tax rate; however, policymakers increased it in 1993 by 1 percentage point. The median of the top statutory rates in the other 18 countries began falling before 1986, primarily because of a reduction in the United Kingdom's statutory rate—from 52 percent to 35 percent—between 1982 and 1986.⁸ Top statutory rates in the other countries in the subgroup continued to decline steadily until the early 1990s; by 2003, the median of those rates had fallen from 50 percent in 1982 to 34 percent.

The variation across countries also lessened. In 1982, half of the countries had a top statutory rate between 43.8 percent (the lower quartile) and 55.0 percent (the upper quartile), a range of 11.2 percentage points. That range had shrunk by more than half, to 5.3 percentage points, by 2003. The United States' top statutory rate was near the median for other countries in 1982, briefly dropped below the lower quartile right after 1986, and has been near and finally above the upper quartile since the early 1990s. Although the 1986 tax law substantially reduced the United States' top corporate rate, other countries eventually reduced their rates even more.

The general historical patterns of change seen among the OECD nations were similar for the G7 countries when those countries were considered alone (see Figure 2-6 on page 27). The G7 nations reduced their top statutory rates over the period, although not by quite as much as many of the other OECD countries did: top rates of the G7 countries tended to be higher than those of non-G7

countries throughout the period. Variation of the top statutory rates across the G7 countries was less in 2003 than it had been in earlier years. In 1982, the United States' top tax rate was just below the median of rates in other G7 countries. By 2003, the United States' top rate equaled the upper quartile for other G7 countries. Variation across the G7 countries by 2003 was very small, however: tax rates at the lower and upper quartiles differed by just 4 percentage points.

To sum up, although the United States' top statutory corporate rate is one of the highest among all OECD countries, it is comparable to the rates in other similar, large industrialized economies (members of the Group of Seven). That relatively high rate creates incentives for U.S. and foreign multinational companies to use international tax planning to reduce their U.S. taxable income by shifting it to low-tax countries. The rate also affects the incentives for business investment (discussed later). However, the countries most similar to the United States have made similar choices about their statutory rates.

Historical trends suggest that countries do not choose their tax rates independent of one another. After the United Kingdom and the United States reduced their corporate tax rates in the 1980s, other OECD countries reduced theirs, apparently in response and perhaps out of concern that they would otherwise lose investment or a portion of their tax base to other nations. Those other countries eventually reduced their own tax rates by even more than did the United States.⁹

Effective Marginal Corporate Tax Rates

Effective marginal corporate tax rates depend on a large number of factors. Although broad international comparisons ideally would account for those factors in a comprehensive manner, such studies are not currently available. Important differences among countries may nevertheless be distinguished through a relatively simpler assessment. Two factors—the treatment of depreciation and the treatment of different sources of financing—largely determine the difference between statutory and effective marginal

8. During the same period, the United Kingdom eliminated full expensing for new investment in machinery.

9. M.P. Devereux, R. Griffith, and A. Klemm, in "Corporate Income Tax Reforms and International Tax Competition," *Economic Policy*, vol. 35 (October 2002), pp. 451-495, relate the observed trends to recent studies on international tax competition. See also Rosanne Altshuler and Timothy J. Goodspeed, "Follow the Leader? Evidence on European and U.S. Tax Competition" (mimeo, Hunter College, 2003).

corporate tax rates and how that difference varies among countries. By factoring in the depreciation rules for representative types of assets, researchers can calculate country-specific effective marginal corporate tax rates for investments in those assets—investments that may be financed by equity or debt. Such calculations reveal the basic differences and similarities in effective marginal corporate tax rates across countries.

The Treatment of Depreciation

Researchers can determine whether the depreciation schedule for an asset is generous relative to economic depreciation by considering the value today of deductions for depreciation over the life of the asset—that is, the discounted present value. The depreciation schedule's generosity influences the effective marginal corporate tax rate. For example, in the case of equity-financed investment:

- If the present value of deductions for depreciation exceeds the present value of economic depreciation, the effective marginal corporate tax rate will be less than the statutory tax rate.
- If the present value of deductions for depreciation is less than the present value of economic depreciation, the effective marginal rate will exceed the statutory rate.
- If the two depreciation values are equal, the effective marginal corporate tax rate will equal the statutory rate.
- If the present value of tax depreciation equals the full initial cost of the asset, the tax depreciation allowance is the economic equivalent of expensing. (Expensing is an allowance for immediate deduction of the full cost of an asset in the year that it is acquired.) Under a system that allows expensing, the effective marginal corporate tax rate for equity-financed investment is zero.

As discussed later, the generosity of depreciation deductions also influences the effective marginal corporate tax rates for debt-financed investment but in a slightly more complicated way.

CBO examined cross-country differences in tax depreciation rules for two representative classes of tangible assets.¹⁰ It considered machinery, which Devereux, Griffith, and Klemm assume will depreciate in real economic terms at an average rate of 12.25 percent a year; and in-

dustrial structures, which those authors assume will depreciate at an average real rate of 3.61 percent annually.¹¹ Because depreciable assets may generally be divided into those whose useful lives are relatively short (such as machinery) and those whose lives are relatively long (such as structures), the two categories represent key classes of tangible assets and provide a useful basis for exploring international differences in marginal corporate tax rates.

Machinery. For the 19 OECD countries in 2003, the present value of depreciation deductions for an investment in machinery, measured as a percentage of the initial cost of the investment, ranged from 66.4 percent to 87.1 percent (see Figure 2-7 on page 28). For the United States, the present value under the tax code in 2003 was 78.5 percent of the asset's initial cost, which is higher than the present value of such deductions in more than 80 percent of the other OECD countries.¹² In contrast, the present value of economic depreciation for machinery, under an assumption of economic depreciation of an estimated 12.25 percent, equals 55.1 percent of the value of an investment.¹³ Every country that CBO examined allowed depreciation deductions for machinery that were more generous than they would have been if they had been based on the estimated value of economic depreciation.

10. There many types of tangible assets—and intangible assets as well—with varying depreciation rates.

11. Devereux, Griffith, and Klemm, in “Corporate Income Tax Reforms and International Tax Competition,” employed those depreciation rates to prepare the data used in this report. The rates correspond to estimates by Charles R. Hulten and Frank C. Wykoff, “The Measurement of Economic Depreciation,” in Charles R. Hulten, ed., *Inflation and the Taxation of Income from Capital* (Washington, D.C.: Urban Institute Press, 1981), pp. 81-125. Hulten and Wykoff estimated that annual average depreciation rates for metalworking machinery and industrial structures were 12.25 percent and 3.61 percent, respectively.

12. In their calculations, Devereux, Griffith, and Klemm assumed that the real annual discount rate was 10 percent and that expected annual inflation was fixed for all years and all countries at 3.5 percent. The authors also provided calculations that used actual inflation in each country in each year (see the later discussion).

13. The computation of economic value shown in Figure 2-7 is based on the estimated real economic depreciation rate of 12.25 percent, discounted at a real interest rate of 10 percent. Thus, the present value is 55.1 percent = 12.25 percent / (10 percent + 12.25 percent).

Some of the countries whose statutory tax rates were among the highest also had some of the largest tax depreciation deductions for machinery. For example, the United States and Italy, which had top statutory corporate tax rates that were some of the highest among the 19 countries, each allowed depreciation deductions for machinery that were some of the most generous. Ireland, which had the lowest top statutory tax rate, was among the countries with the least generous depreciation deductions. Overall, according to the data, countries with higher statutory tax rates tend to have larger tax depreciation allowances (see Figure 2-8 on page 29). Notwithstanding, depreciation deductions vary widely, regardless of the level of the statutory tax rate. Such variation indicates the need, when measuring effective marginal tax rates, to combine depreciation deductions and statutory rates.¹⁴

Depreciation deductions for investment in machinery have generally declined in the 19 OECD countries since 1982 (see Figure 2-9 on page 30). In the United States, the Tax Reform Act of 1986 reduced those deductions, which have not been altered since then. Among the 18 other countries, the most significant changes occurred in the early to mid-1980s, when the United Kingdom and Ireland eliminated expensing for investments in machinery and Canada reduced its allowable depreciation deductions for machinery. Another noticeable change occurred in 2001, when Germany reduced the value of such deductions.

The depreciation deductions discussed thus far incorporated the assumption that annual inflation was 3.5 percent in every country in all years. That approach of keeping inflation constant highlights the effects of changes that countries made in their depreciation rules rather than capturing the changes that might have occurred coincidentally with alterations in other economic conditions.

When actual annual levels of inflation in each country are taken into account, the patterns of cross-country differences in depreciation deductions change very little. Thus, for 2003, although minor changes occur in the ranking of countries, the most obvious change is that depreciation is slightly more generous, on average, because actual annual inflation in most of the countries during that year was

slightly less than 3.5 percent (see Figure 2-10 on page 31). If actual inflation had been higher, the present value of depreciation deductions would be lower—because countries do not allow the deductions to be adjusted upward for the effect that inflation has on the cost of replacing an asset. In contrast, economic depreciation incorporates upward adjustments for inflation. But even without those adjustments, the value of depreciation deductions for machinery in all of the countries in 2003 was higher than the estimated value of economic depreciation.

Historical patterns of depreciation deductions also change only slightly when actual inflation is taken into account (see Figure 2-11 on page 32). Because inflation generally declined over the 1982-2003 period, depreciation deductions for machinery tended to become somewhat larger. Although changes in many countries' tax rules for machinery tended to make such deductions slightly smaller, as Figure 2-9 shows, inflation declined by enough to more than offset that trend. In the United States, however, the drop in inflation was not sufficient to offset the effects of changes under the Tax Reform Act of 1986.¹⁵

Industrial Structures. The present values of depreciation deductions for buildings among the 19 OECD countries in 2003 were substantially smaller than those for machinery (see Figure 2-12 on page 33). That difference stems mainly from a lower rate of economic depreciation for buildings than for machinery. In further contrast to the case of machinery, the value of depreciation deductions for structures was relatively smaller in many countries when compared with the value of economic depreciation: in 2003, nearly one-third of the countries allowed depreciation deductions whose value was less than the estimated value of economic depreciation.

The United States' tax rules provide one of the clearest examples of depreciation deductions that are lower in value for industrial structures than for machinery. Its depreciation rules for machinery were among the most generous of those in all countries examined; they resulted in deductions whose value was substantially greater than the

14. Depreciation deductions for industrial structures are even more variable and are generally unrelated to statutory tax rates.

15. Devereux, Griffith, and Klemm provide computations based on actual inflation only for equity-financed investment in machinery. However, the effects that actual inflation would have on the computations for industrial structures and for debt-financed investment are also likely to be minor.

estimated value of the asset's economic depreciation. In contrast, the United States' depreciation rules for industrial structures were among the least generous of those in all countries, resulting in deductions whose value was slightly less than that of estimated economic depreciation.

In general, the depreciation schedules for industrial structures have fallen in value since 1982 (see Figure 2-13 on page 34). The history of the United States' tax rules provides a striking pattern of change. Between 1982 and 1986, the tax depreciation rules for structures represented substantially larger deductions than would have been available using the estimated value of economic depreciation; those deductions were also substantially larger than those typically available under the depreciation rules for industrial structures in the other 18 OECD countries. The Tax Reform Act of 1986 reduced the value of depreciation deductions for U.S. industrial structures to roughly the level of the estimated value of economic depreciation. A further change in the law made tax depreciation after 1992 in the United States slightly less generous than economic depreciation.¹⁶

The value of depreciation deductions for industrial structures in other countries also declined over the roughly 20-year period and moved toward the estimated value of economic depreciation. In addition, the variation across countries lessened, as shown by a gradually narrowing difference between 1982 and 2003 between the lower and upper quartiles.

Summing Up. Compared with the value represented by the tax depreciation rules in the 18 other OECD countries that CBO examined and the estimated value of economic depreciation, the value that the United States' rules represent tends to be more valuable for investments in machinery and significantly less valuable for investments in industrial structures. That pattern, combined with the United States' relatively high statutory tax rates, implies that the corporate income tax in the United States distorts, to a greater degree than in most of the other

countries, the marginal investment incentives associated with the choice between the two types of assets.

Effective Marginal Corporate Tax Rates and the Type of Investment Financing

The present value of depreciation may be used to compute effective marginal corporate tax rates on investments in machinery and structures. Those computations show how the top statutory rates and depreciation rules work together to affect the incentives for investment in the two types of assets. They also show the effect on those incentives of whether the investments are financed by equity or debt.

Equity-Financed Investments in Machinery. For the 19 OECD countries that CBO examined, effective marginal corporate tax rates for equity-financed investments in machinery in 2003 were considerably lower than top statutory tax rates (compare Figure 2-14 on page 35 with Figure 2-4 on page 25). The median effective marginal corporate rate was only 20.6 percent, considerably below the median top statutory rate of 34.0 percent. The finding of lower effective marginal corporate rates held true for all 19 countries because the value of tax depreciation deductions for structures and equipment was higher than the value of economic depreciation.

The United States' effective marginal corporate tax rate for machinery in 2003 (23.6 percent) was only slightly higher than the median rate for the 18 other OECD countries (20.6 percent) and about the same as the median rate for the other G7 countries (23.2 percent). Although the United States had one of the highest top statutory corporate tax rates among the 19 countries, its relatively larger depreciation deductions for machinery helped lower its effective marginal tax rate relative to the median for the other OECD nations.

Over the past two decades, the United States' effective marginal corporate tax rates for equity-financed investment in machinery have remained relatively constant, whereas those rates for the 18 other OECD countries have generally declined (see Figure 2-15 on page 36). Even though the Tax Reform Act of 1986 substantially reduced the top statutory corporate tax rate in the United States, the law also reduced the value of depreciation deductions for machinery, leaving the effective marginal corporate tax rate relatively unchanged. The lower top statutory corporate rate and smaller depreciation deduc-

16. The history of depreciation deductions since 1982 does not tell the whole story; an important factor is that in 1981, the United States' depreciation rules were made more generous. Before that change, the value of the depreciation rule for buildings was about equal to the 1982 median value for the other 18 OECD countries.

tions had offsetting effects on effective marginal corporate tax rates for investments in machinery.¹⁷

In contrast to the United States' relatively unchanged effective marginal rates for such investments, effective rates in the 18 other OECD countries declined between 1982 and 2003, with the median falling from 31.8 percent in 1982 to 20.6 percent in 2003. The primary force behind that decline—given that tax depreciation deductions for machinery over the period became only slightly less generous—was the drop in top statutory corporate tax rates in those countries. The combined effect was a significant reduction in those nations' effective marginal corporate rates.

Because the United States' effective marginal rates remained fairly constant and the other countries' rates declined, the United States' rates climbed from the first quartile for other countries in 1982 (21.2 percent) to the third quartile in 2003 (23.4 percent). In 1982, the United States' effective marginal rate was low in comparison with the widely varying cross-country distribution of effective marginal rates—the lower and upper quartiles for other countries differed by 19.0 percentage points—but in 2003, it was high relative to the much less dispersed cross-country distribution.

Effective marginal corporate rates for equity-financed investment in machinery in the other G7 countries, like rates in the United States, actually increased slightly between 1982 and 2003 (see Figure 2-16 on page 37). The United States' marginal rate almost matched the median rate for other G7 countries in both those years. Because the median top statutory rate for the other G7 countries declined by more than the United States' top statutory rate did, the relative movement of rates compared with the other G7 countries resulted from the fact that the other G7 countries reduced their depreciation deductions for machinery by even more than the United States did. The increase in the lowest quartile for other G7 countries in the early 1980s reflects the United Kingdom's elimination of expensing and Canada's significant reduction of its depreciation deductions for machinery.

When calculations were based on the actual inflation experienced in each country rather than on a fixed rate of 3.5 percent, effective marginal corporate tax rates for equity-financed investment in machinery were slightly lower for 2003 (see Figure 2-17 on page 38). The lower rates were the outcome of actual inflation that was slightly lower than 3.5 percent in 2003, on average, for the countries that CBO examined. As discussed earlier, depreciation deductions are worth more when inflation is lower than when it is higher. Those more valuable depreciation deductions reduced countries' effective marginal corporate tax rates.

The historical patterns of effective marginal rates for each of the 19 OECD countries in each year also changed slightly when actual inflation was used in calculating rates (compare Figure 2-18 on page 39 with Figure 2-15 on page 36). Because actual inflation was lower than 3.5 percent, effective marginal rates in the early to mid-1980s declined more rapidly than they did when inflation was held constant. For G7 countries other than the United States, the fall in inflation made effective marginal rates decline between 1982 and 2003 (see Figure 2-19 on page 40). For those countries, lower inflation offset reductions in depreciation deductions for machinery.

Equity-Financed Investments in Industrial Structures.

Among the 19 OECD countries that CBO examined, effective marginal corporate tax rates for equity-financed investments in industrial structures differed less from top statutory rates than did effective marginal rates for machinery (see Figure 2-20 on page 41 and Figure 2-14 on page 35). The median effective marginal rate for structures among those countries was 28.7 percent, compared with the median top statutory rate of 34.0 percent. The G7 countries had some of the highest effective marginal tax rates for investments in industrial structures, reflecting the pattern of top statutory tax rates in those nations. The reason that effective marginal rates for industrial structures bear a closer resemblance to the top statutory rates is that the depreciation allowed for tax purposes tends to be closer to economic depreciation than is the case for machinery. In fact, several countries' effective marginal tax rates for equity-financed investments in industrial structures—specifically, those of Canada, Germany, Japan, Spain, and the United States—exceed their top statutory rates. Those countries all allow deductions of depreciation for tax purposes that are smaller than the estimated economic depreciation occurring for industrial structures.

17. The 1986 tax reform law also eliminated the investment tax credit, which CBO did not examine in this analysis. If the effects of the tax credit had been taken into account, effective marginal corporate tax rates in the United States would have been lower in the period before 1987.

The United States substantially increased tax depreciation in 1981, but then, when it reduced its top statutory rate in 1987, it cut depreciation as well. Those changes in the depreciation that the law allowed caused the United States' effective marginal corporate tax rate for industrial structures to decline in 1981 and then rise slightly in 1987, despite the drop in the top statutory rate (see Figure 2-21 on page 42). In 1993, the United States' effective marginal rate increased again, this time by a slightly larger amount because of an increase in the top statutory rate and a reduction in allowed tax depreciation. By the mid-1990s, the United States' effective marginal rate exceeded its value in the early 1980s but was lower than it had been before 1981. The United States' effective marginal rate for industrial structures before 1981 roughly equaled the median for other countries in 1982, was somewhat below the median in the early to mid-1980s, and rose substantially above the upper quartile in the early 1990s. Those relative changes reflect the fact that in the other countries, top statutory rates declined by more and depreciation deductions for industrial structures declined by less than they did in the United States.

Effective marginal corporate rates among the G7 countries decreased by less than they did in the non-G7 countries. In 1979, the United States' effective marginal rate was about the same as the median rate for the other G7 countries; it fell below that median in 1981, roughly equaled it between 1987 and 1997, and was above the upper quartile by 2003 (see Figure 2-22 on page 43). Nevertheless, at 41 percent, the United States' effective marginal rate in 2003 was somewhat closer to the median for other G7 countries (34.7 percent) than it was to the median for non-G7 countries (27.1 percent).

Debt-Financed Investments in Machinery. Effective marginal corporate tax rates for debt-financed investment may be negative if inflation is positive or if tax depreciation is more generous than economic depreciation. If the value of deductions based on tax depreciation equaled the value of economic depreciation and there was no inflation, the effective marginal corporate tax rate would be zero for debt-financed investment. In that case, the rate of return on a marginal investment (that is, the cost of capital) would equal the interest rate, resulting in no taxable income at the corporate level. In other words, because there was no corporate tax wedge, a corporate investment would be worthwhile as long as the investment paid a rate of return that was no smaller than the interest rate the company paid to finance the investment. Alter-

natively, if inflation was positive or tax depreciation exceeded economic depreciation, the cost of capital would be less than the real interest rate, and the effective marginal corporate tax rate would be negative for debt-financed investment. Under such conditions, an investment might be worthwhile to a corporation even if the investment paid a real rate of return that was less than the real rate of interest.¹⁸

Among the 19 OECD countries that CBO examined, the United States and most of the other G7 countries had some of the lowest (most negative) effective marginal corporate tax rates on debt-financed investments in machinery in 2003 (see Figure 2-23 on page 44). Those countries (the United States and most of the G7 nations) also were among the countries that had the highest top statutory tax rates. When tax depreciation is greater than economic depreciation and inflation is positive, countries with the highest statutory tax rates will tend to have the lowest (most negative) effective marginal tax rates on debt-financed investment. That pattern is most pronounced for the United States and Italy, because their statutory tax rates in 2003 were among the highest and their tax depreciation deductions for machinery were among the largest. The (tax-exclusive) effective marginal corporate tax rate of -45.9 percent for the United States implies that a corporation will find an investment in machinery financed by debt at a real interest rate of 10 percent worth undertaking as long as the investment is expected to pay a real rate of return that exceeds 5.41 percent (the cost of capital), which is 45.9 percent below the real interest rate.

The G7 countries had some of the lowest effective marginal corporate tax rates on debt-financed investment among the 19 countries CBO studied because they provided substantial deductions for tax depreciation and had top statutory tax rates that were among the highest levied by the 19 countries. Ireland had the highest effective marginal corporate tax rate on debt-financed investment in machinery because it had the lowest top statutory rate and the least generous tax depreciation deductions.

18. If the value of deductions for tax depreciation equaled the value of economic depreciation but inflation was positive, the effective marginal tax rate on debt-financed investment would still be negative because the corporation could deduct nominal interest (real interest plus inflation), even though its taxable income, before deductions for interest, included only the real economic return to an investment.

The United States' effective marginal rate increased substantially in 1987 because the Tax Reform Act of 1986 reduced both the top statutory tax rate and deductions for tax depreciation (see Figure 2-24 on page 45). Because effective marginal rates for equity-financed investment in machinery changed very little, the 1986 law substantially reduced the corporate-level bias toward debt-financed investment in machinery in the United States. That trend is also evident among the 18 other OECD countries in CBO's analysis: effective marginal rates for equity-financed investment declined substantially while the (negative) effective marginal rate for debt-financed investment substantially increased. CBO found similar patterns among the G7 countries when they were considered as a separate group (see Figure 2-25 on page 46).

The overall patterns for effective marginal corporate tax rates on debt-financed investment imply that, compared with the corporate income tax in the 18 other OECD countries, the United States' levy induces a stronger bias toward the use of debt financing for investments in machinery. For all 19 countries, including the United States, that bias diminished between 1982 and 2003.¹⁹

19. CBO does not present computations of effective marginal corporate tax rates for debt-financed investment in industrial structures because those computations are not available from Devereux, Griffith, and Klemm. If those rates had been computed, they would have been negative and exhibited patterns very similar to those evident among the effective marginal rates for debt-financed investment in machinery. The marginal tax rates for debt-financed investment in industrial structures would not be quite as negative as the corresponding rates for machinery because depreciation deductions for industrial structures are generally less generous (relative to economic depreciation) than they are for machinery.

Summing Up. Compared with effective marginal corporate tax rates among the broad group of the 18 other OECD countries, rates in the United States in 2003 were close to the group's average for equity-financed investments in machinery, substantially above the average for equity-financed investments in industrial structures, and substantially below the average for debt-financed investments in machinery.

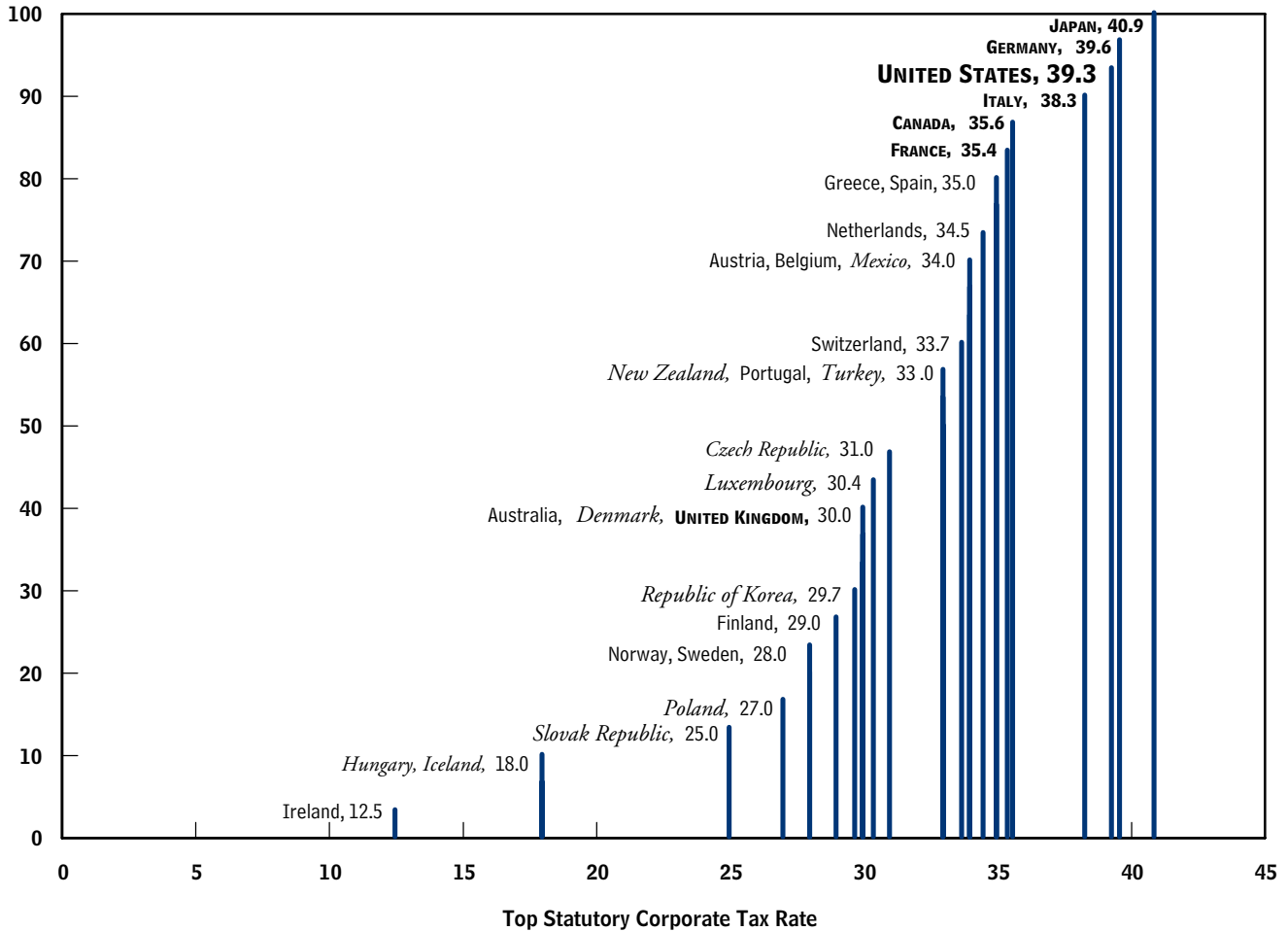
Compared with the average effective marginal corporate tax rate for equity-financed investment in machinery among other members of the G7, the rate in the United States was about the same. For equity-financed investments in industrial structures, the United States' marginal rate exceeded the average for the other G7 countries but by only half as much as it exceeded the average for the broader group of 18 OECD countries. For debt-financed investments in machinery, the United States' effective marginal rate was below the average for the other G7 countries but not by as much as it was when compared with the broader group of OECD countries.

The United States' effective marginal corporate tax rate is relatively high for equity-financed investments but relatively low for debt-financed investments. Thus, the extent to which effective marginal tax rates distort decisions about international investments depends on how the investments are financed. For example, although the United States' effective marginal corporate tax rates for equity-financed investments are higher than the average for the other OECD countries, rates for investments financed by a combination of debt and equity may be lower than the average if a sufficient fraction of the investment is financed by debt.

Figure 2-1.

Top Statutory Corporate Tax Rates in All OECD Countries, 2003

(Ranking, by tax rate, as a percentage of countries)



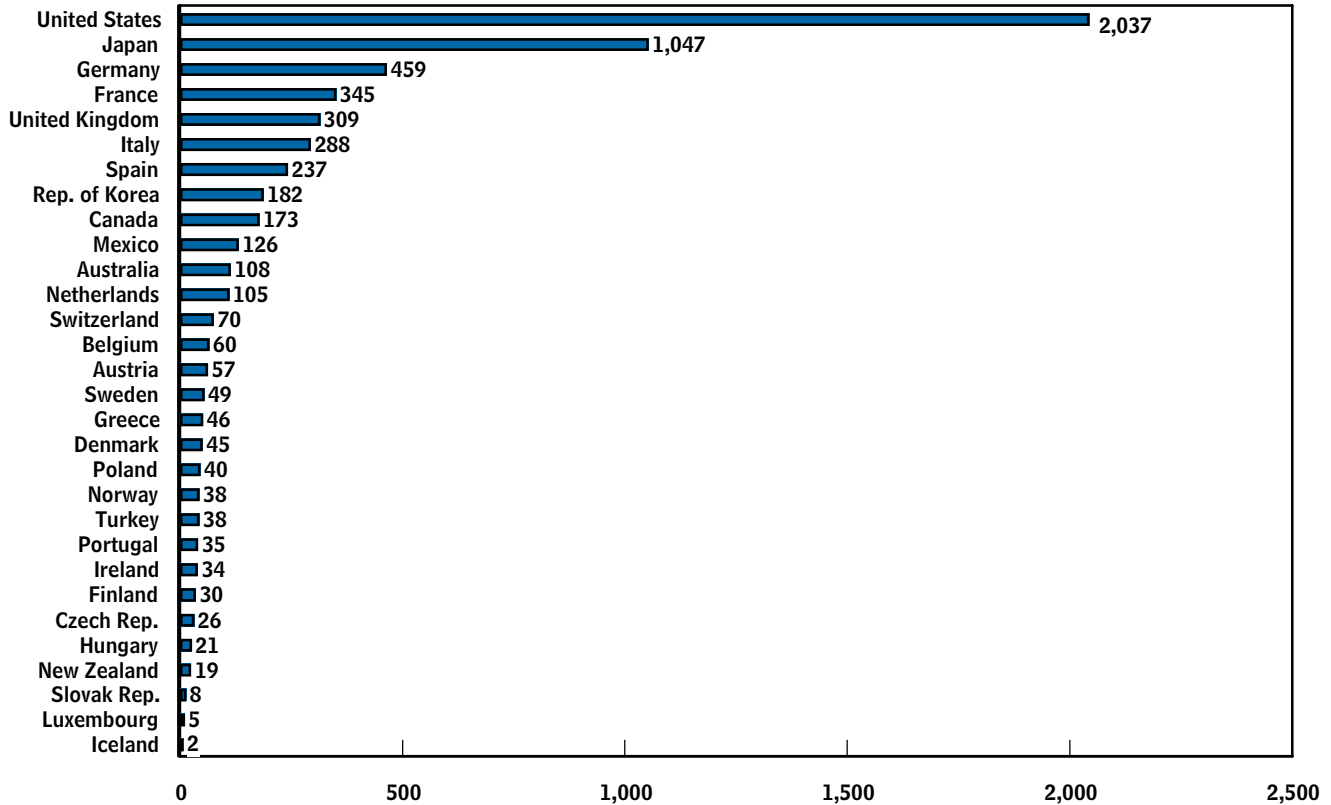
Source: Congressional Budget Office based on data from M.P. Devereux, R. Griffith, and A. Klemm, "Corporate Income Tax Reforms and International Tax Competition," *Economic Policy*, vol. 35 (October 2002), pp. 451-495; and KPMG, "Corporate Tax Rate Survey—2003," available at www.in.kpmg.com/pdf/2003CorporateTaxSurveyFINAL.pdf [*sic*].

Notes: The position of the vertical bars shows the countries' top statutory tax rates, which include both national and subnational taxes; the exact value of the tax rate appears next to each name. The height of each vertical bar indicates a country's percentage ranking by its top statutory rate relative to all OECD countries displayed. The Group of Seven industrialized countries appear in boldface type; the subgroup of OECD countries that CBO examined in its analysis appear in roman type. Italic type indicates the remaining members of the OECD.

OECD = Organization for Economic Cooperation and Development.

Figure 2-2.**Gross Fixed-Capital Formation in OECD Countries, 2003**

(Billions of dollars)



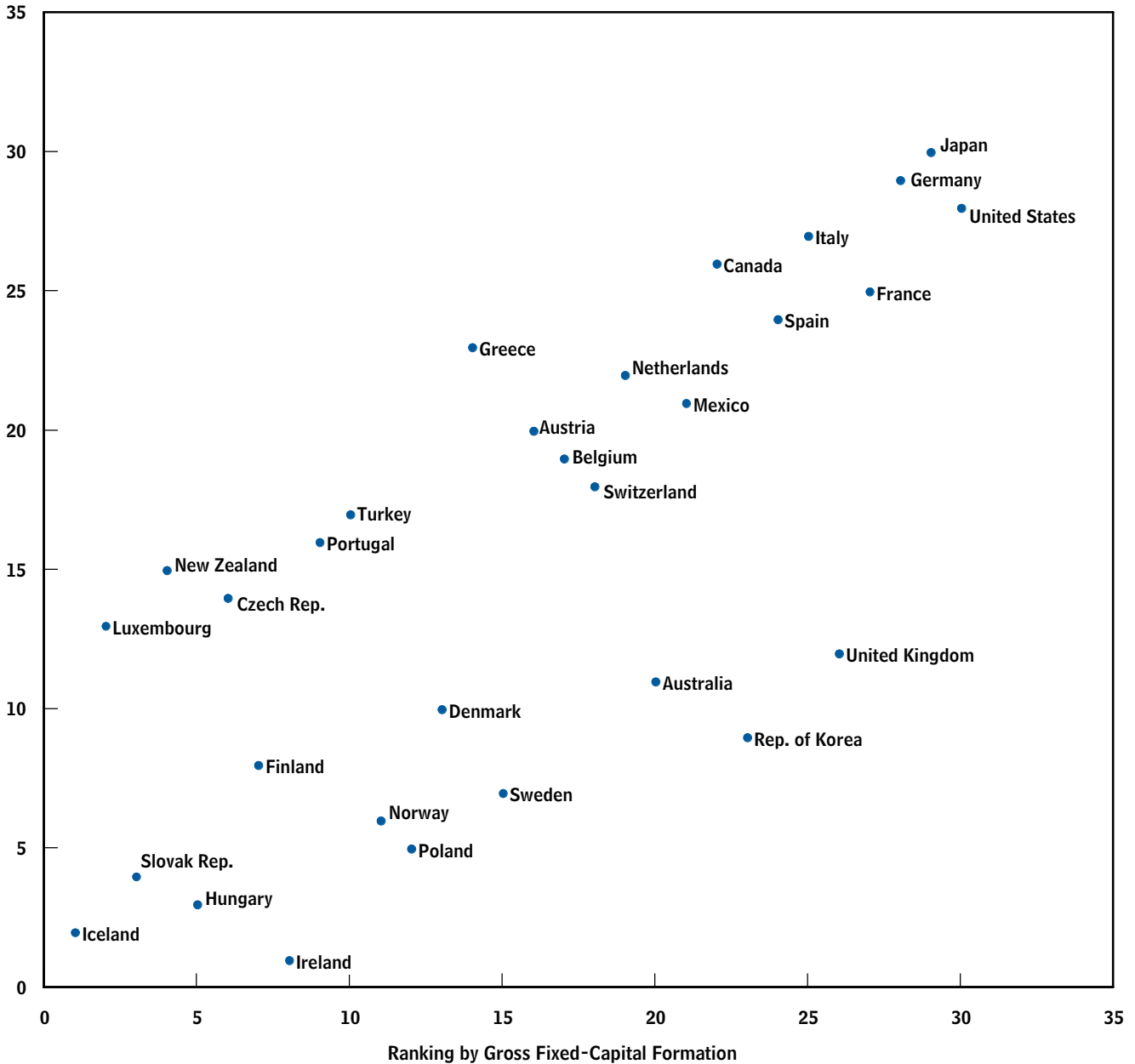
Source: Congressional Budget Office based on Organization for Economic Cooperation and Development, *Main Economic Indicators* (Paris: Organization for Economic Cooperation and Development, 2005).

Note: Fixed capital is any kind of real or physical capital that is not used up in the production of a product—for example, structures or machinery.

Figure 2-3.

OECD Countries' Top Statutory Corporate Tax Rates Relative to Total Investment, 2003

(Ranking by top statutory corporate tax rate)



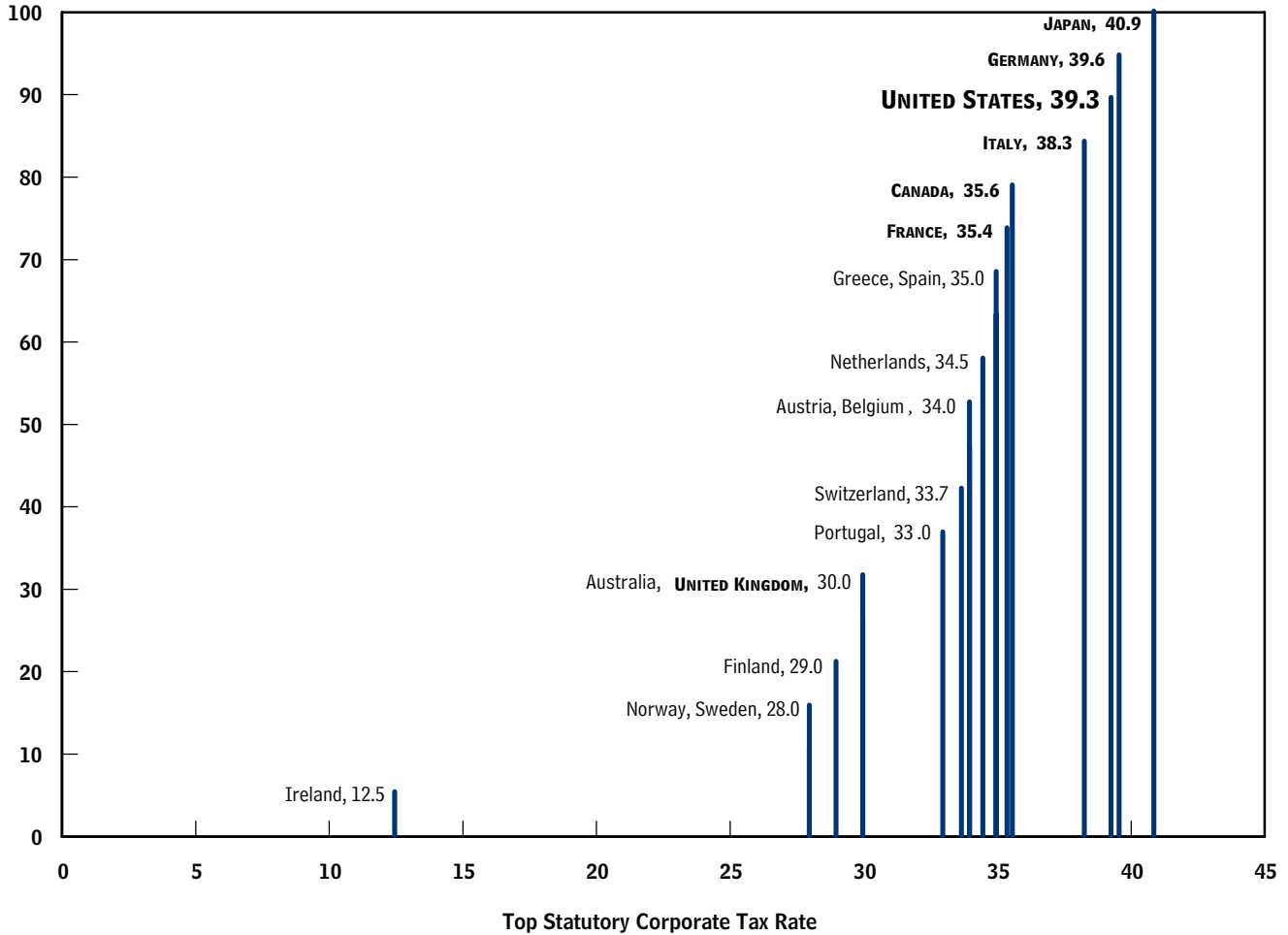
Source: Congressional Budget Office based on data from M.P. Devereux, R. Griffith, and A. Klemm, "Corporate Income Tax Reforms and International Tax Competition," *Economic Policy*, vol. 35 (October 2002), pp. 451-495; and Organization for Economic Cooperation and Development, *Main Economic Indicators* (Paris: Organization for Economic Cooperation and Development, 2005).

Note: Top statutory corporate tax rates include both national and subnational taxes.

Figure 2-4.

Top Statutory Corporate Tax Rates in Selected OECD Countries, 2003

(Ranking, by tax rate, as a percentage of countries)



Source: Congressional Budget Office based on data from M.P. Devereux, R. Griffith, and A. Klemm, "Corporate Income Tax Reforms and International Tax Competition," *Economic Policy*, vol. 35 (October 2002), pp. 451-495.

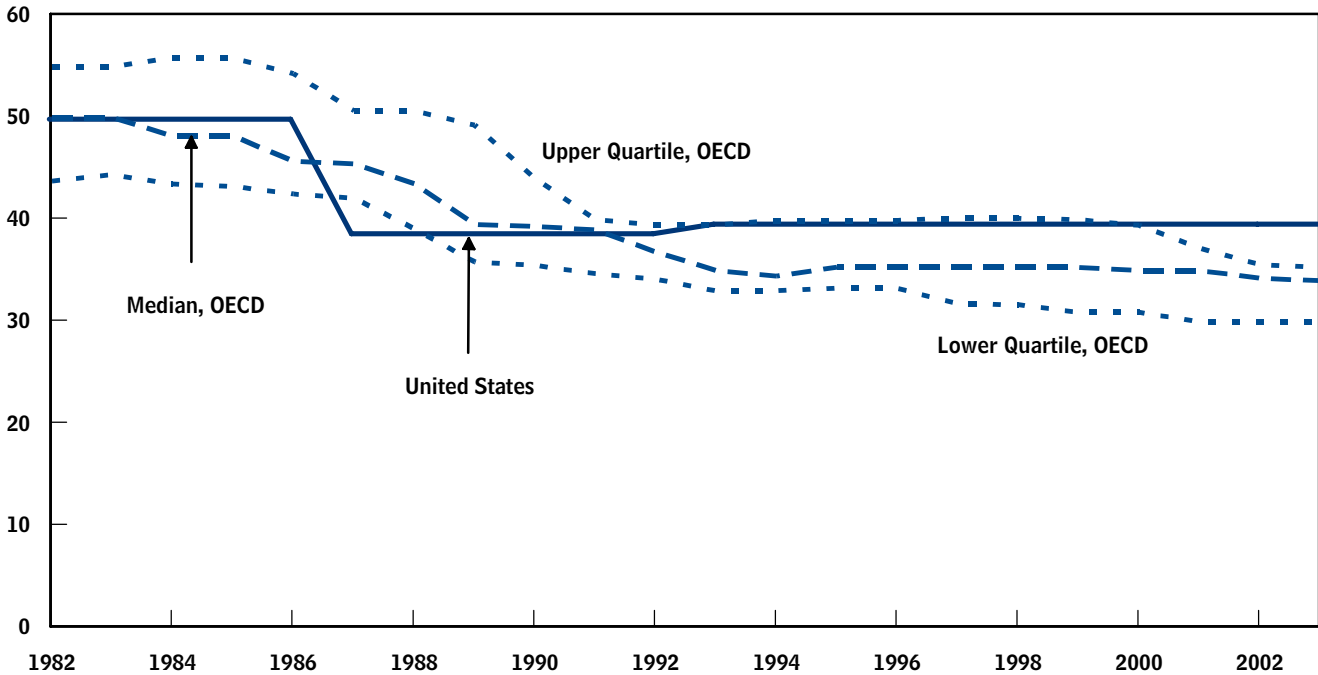
Notes: The position of the vertical bars shows the countries' top statutory tax rates, which include both national and subnational taxes; the exact value of the tax rate appears next to each name. The height of each vertical bar indicates a country's percentage ranking by its top statutory rate relative to the selected OECD countries displayed. The Group of Seven industrialized countries appear in boldface type.

OECD = Organization for Economic Cooperation and Development.

Figure 2-5.

Top Statutory Corporate Tax Rates in the United States Compared with Summary Measures of Top Statutory Rates for Selected OECD Countries

(Top statutory corporate tax rate)



Source: Congressional Budget Office based on data from M.P. Devereux, R. Griffith, and A. Klemm, "Corporate Income Tax Reforms and International Tax Competition," *Economic Policy*, vol. 35 (October 2002), pp. 451-495.

Notes: For this analysis, selected members of the Organization for Economic Cooperation and Development are Australia, Austria, Belgium, Canada, Finland, France, Germany, Greece, Ireland, Italy, Japan, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

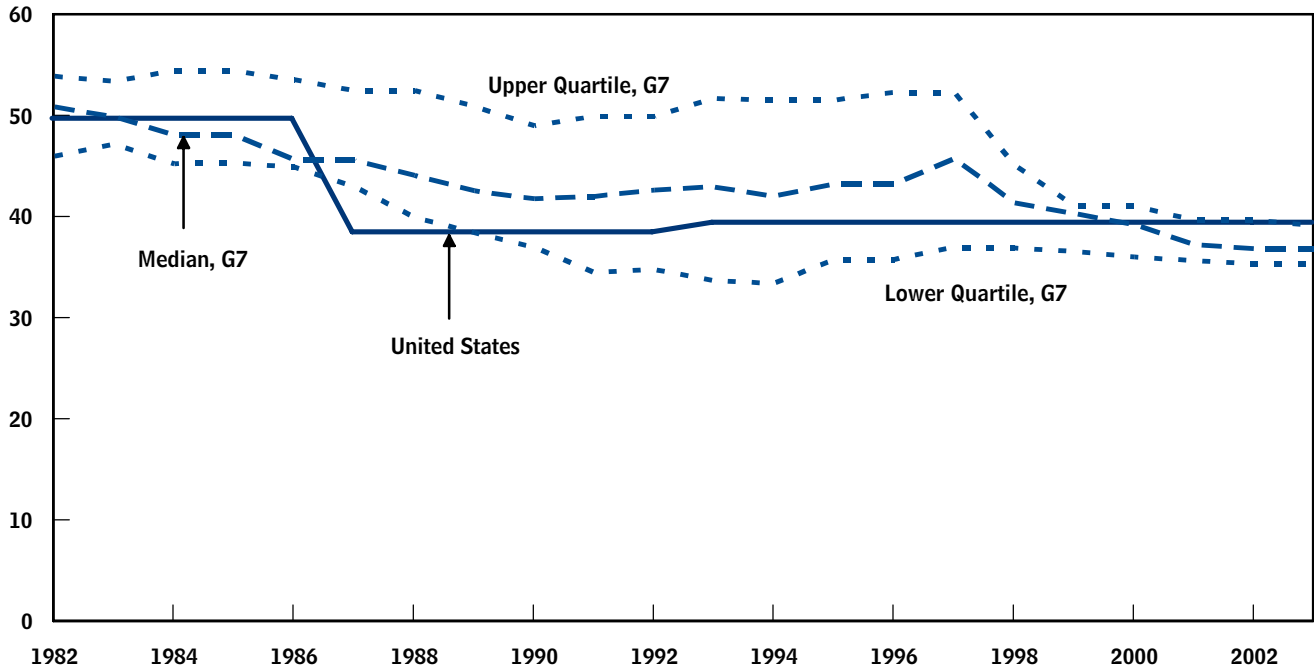
Top statutory corporate tax rates include both national and subnational taxes.

The median is a value that divides the ranked countries in half. The upper quartile is a value that divides the upper quarter from the lower three-quarters of ranked countries. The lower quartile is a value that divides the lower quarter from the upper three-quarters of countries. Those divisions are not always precise because a group of countries cannot always be divided exactly by two or four.

Figure 2-6.

Top Statutory Corporate Tax Rates in the United States Compared with Summary Measures of Top Statutory Rates for the Other G7 Industrialized Countries

(Top statutory corporate tax rate)



Source: Congressional Budget Office based on data from M.P. Devereux, R. Griffith, and A. Klemm, "Corporate Income Tax Reforms and International Tax Competition," *Economic Policy*, vol. 35 (October 2002), pp. 451-495.

Notes: The G7 industrialized countries are Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States.

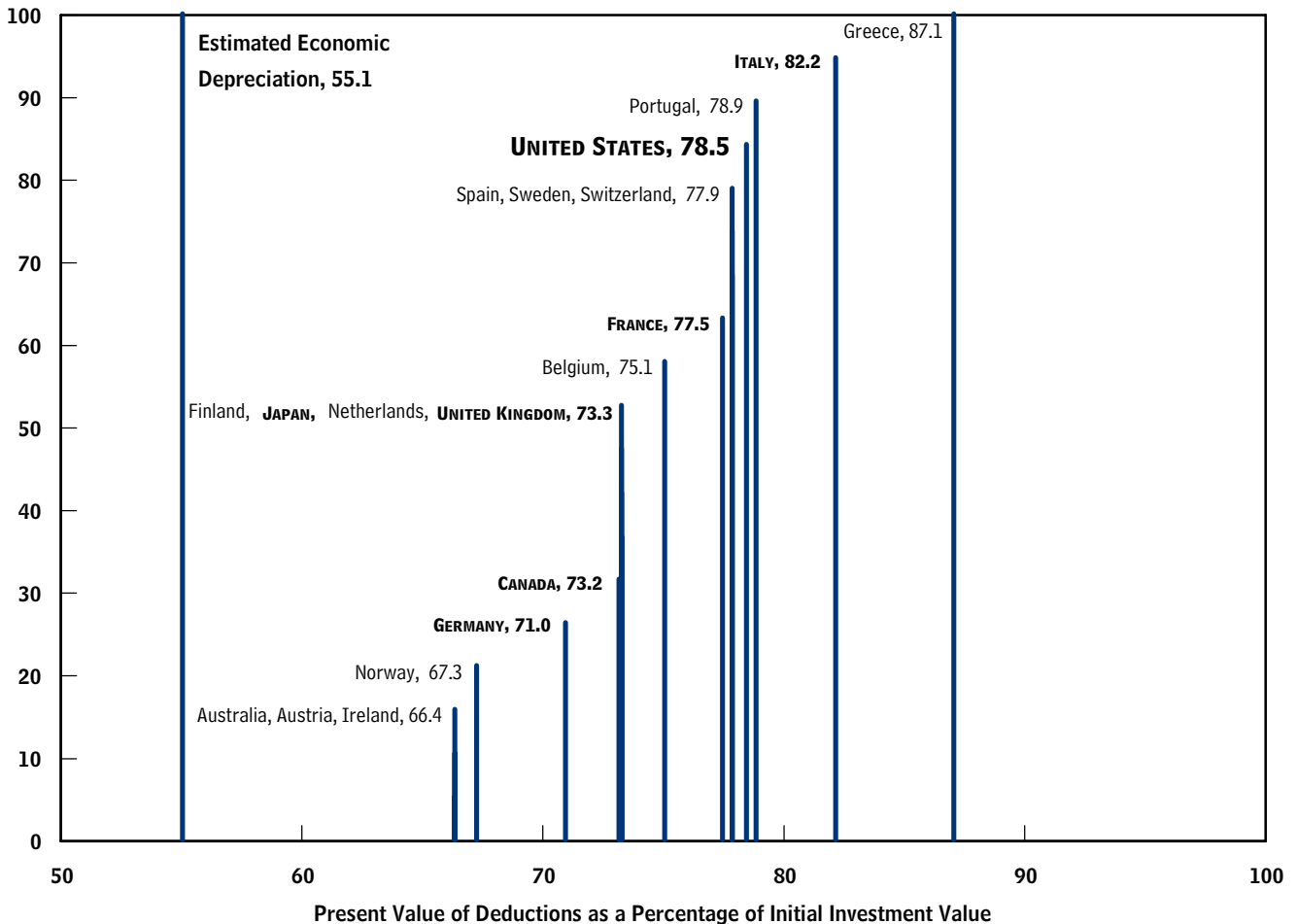
Top statutory corporate tax rates include both national and subnational taxes.

The median is a value that divides the ranked countries in half. The upper quartile is a value that divides the upper quarter from the lower three-quarters of ranked countries. The lower quartile is a value that divides the lower quarter from the upper three-quarters of countries. Those divisions are not always precise because a group of countries cannot always be divided exactly by two or four.

Figure 2-7.

Present Value of Depreciation Deductions for Investments in Machinery in Selected OECD Countries, 2003

(Ranking, by present value of deductions, as a percentage of countries)



Source: Congressional Budget Office based on data from M.P. Devereux, R. Griffith, and A. Klemm, "Corporate Income Tax Reforms and International Tax Competition," *Economic Policy*, vol. 35 (October 2002), pp. 451-495.

Notes: The position of the vertical bars shows the present value of the depreciation deductions that each country provides as a percentage of initial investment value; the exact value appears next to each name. The height of each vertical bar indicates a country's percentage ranking by the value of its deductions relative to the selected OECD countries displayed. The Group of Seven industrialized countries appear in boldface type.

For this comparison, calculations are based on an annual rate of economic depreciation of 12.25 percent and an annual rate of inflation of 3.5 percent.

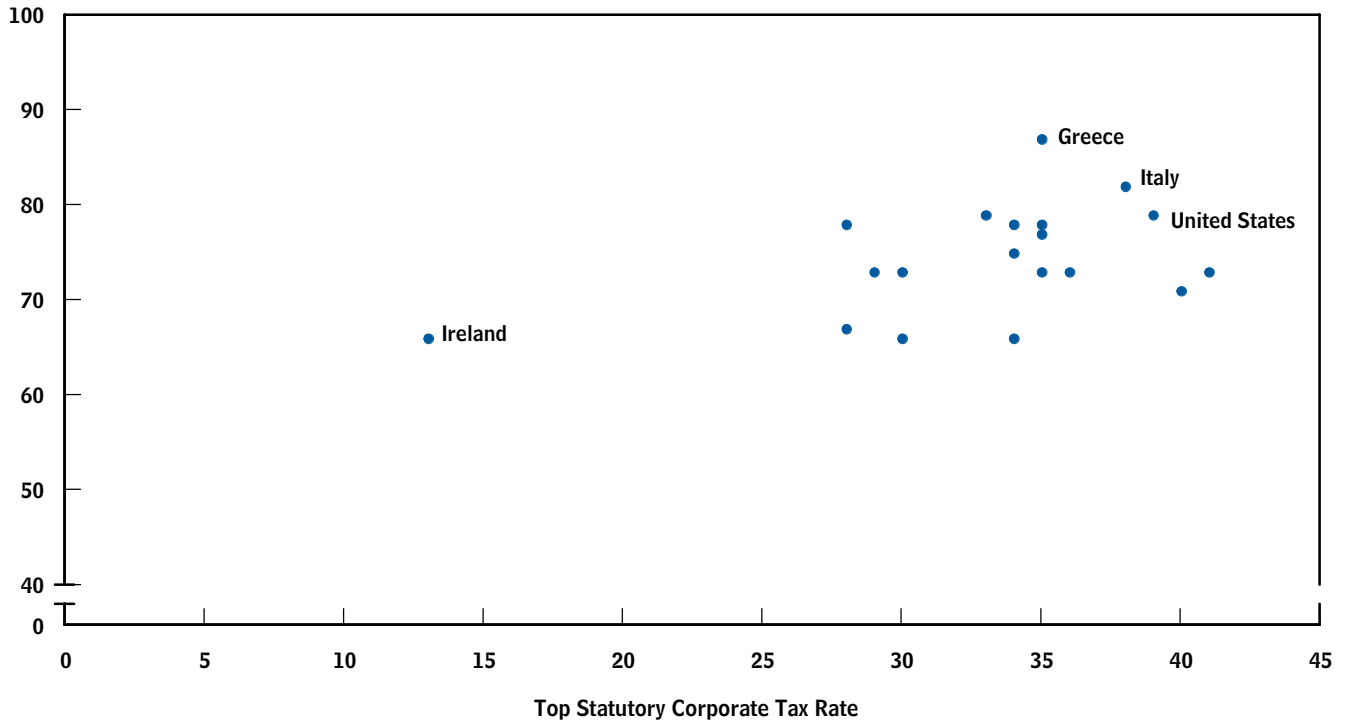
Economic depreciation is the decrease in value of a productive asset that occurs because the asset provides less remaining productivity as it ages.

OECD = Organization for Economic Cooperation and Development.

Figure 2-8.

Relationship Between Top Statutory Corporate Tax Rates and Depreciation Deductions for Investments in Machinery in Selected OECD Countries, 2003

(Present value of depreciation deductions)



Source: Congressional Budget Office based on data from M.P. Devereux, R. Griffith, and A. Klemm, "Corporate Income Tax Reforms and International Tax Competition," *Economic Policy*, vol. 35 (October 2002), pp. 451-495.

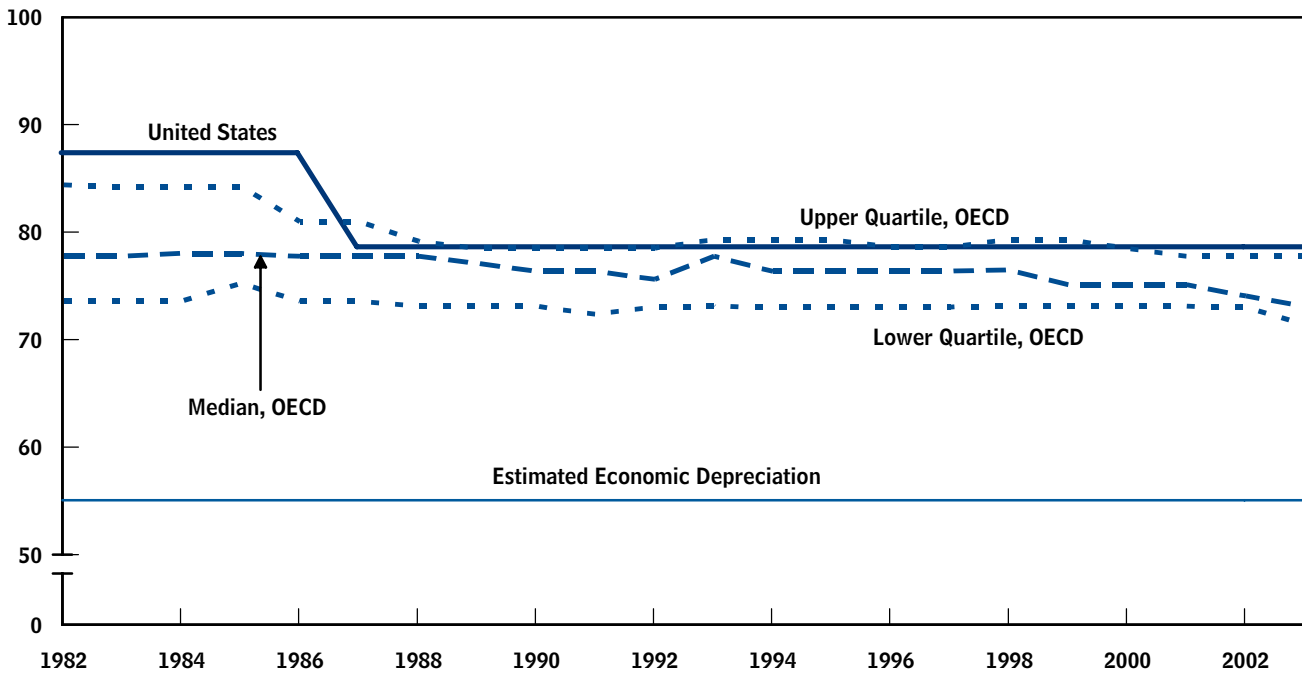
Note: For this analysis, selected members of the Organization for Economic Cooperation and Development are Australia, Austria, Belgium, Canada, Finland, France, Germany, Greece, Ireland, Italy, Japan, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

For this comparison, calculations are based on an annual rate of economic depreciation of 12.25 percent and an annual rate of inflation of 3.5 percent.

Figure 2-9.

Depreciation Deductions for Investments in Machinery in the United States Compared with Summary Measures of Depreciation Deductions for Selected OECD Countries

(Present value of deductions as a percentage of initial investment value)



Source: Congressional Budget Office based on data from M.P. Devereux, R. Griffith, and A. Klemm, "Corporate Income Tax Reforms and International Tax Competition," *Economic Policy*, vol. 35 (October 2002), pp. 451-495.

Notes: For this analysis, selected members of the Organization for Economic Cooperation and Development are Australia, Austria, Belgium, Canada, Finland, France, Germany, Greece, Ireland, Italy, Japan, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

The median is a value that divides the ranked countries in half. The upper quartile is a value that divides the upper quarter from the lower three-quarters of ranked countries. The lower quartile is a value that divides the lower quarter from the upper three-quarters of countries. Those divisions are not always precise because a group of countries cannot always be divided exactly by two or four.

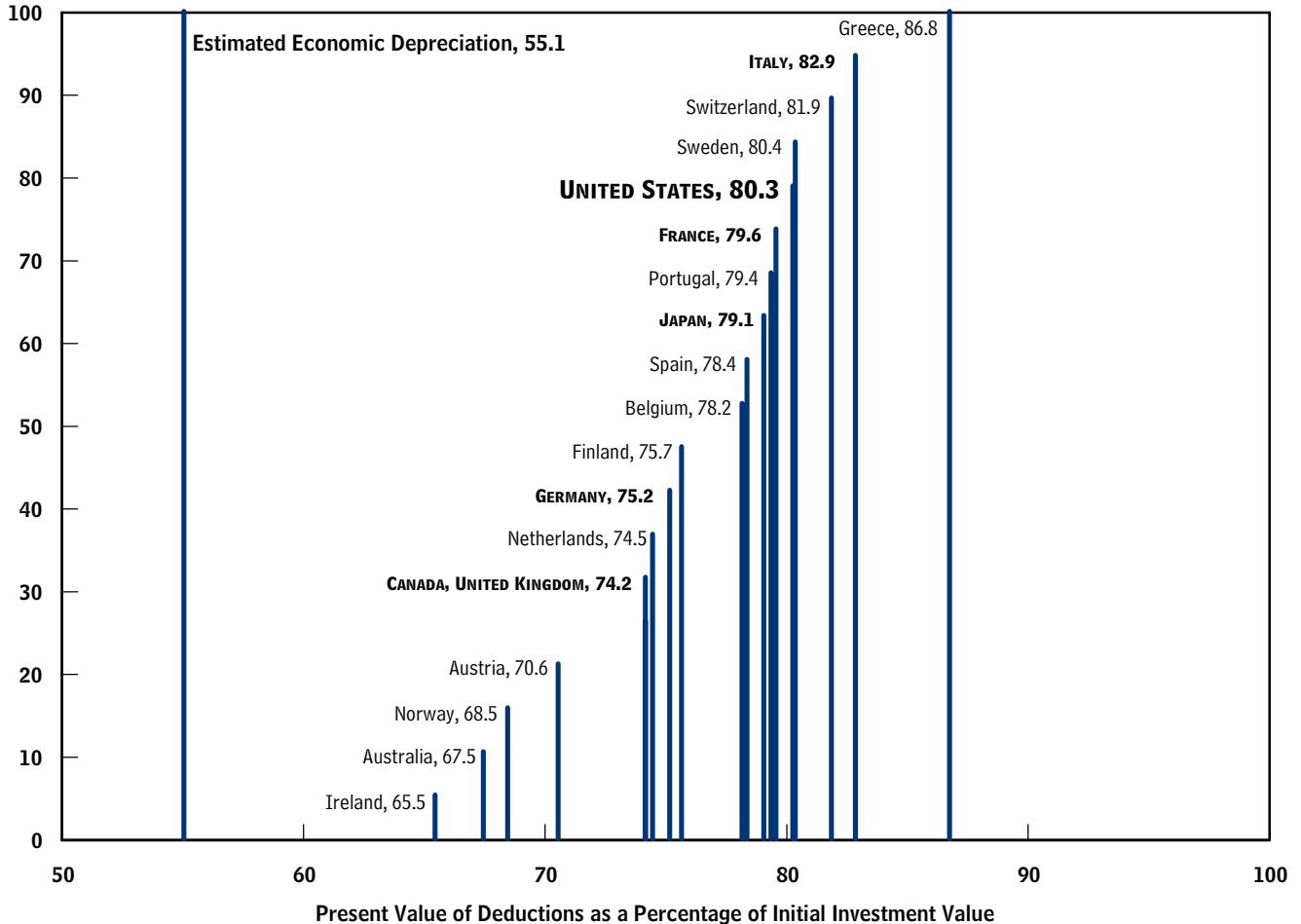
For this comparison, calculations are based on an annual rate of economic depreciation of 12.25 percent and an annual rate of inflation of 3.5 percent.

Economic depreciation is the decrease in value of a productive asset that occurs because the asset provides less remaining productivity as it ages.

Figure 2-10.

Present Value of Depreciation Deductions for Investments in Machinery in Selected OECD Countries Based on Actual Inflation, 2003

(Ranking, by present value of deductions, as a percentage of countries)



Source: Congressional Budget Office based on data from M.P. Devereux, R. Griffith, and A. Klemm, "Corporate Income Tax Reforms and International Tax Competition," *Economic Policy*, vol. 35 (October 2002), pp. 451-495.

Notes: The position of the vertical bars shows the present value of the depreciation deductions that each country provides as a percentage of initial investment value; the exact value appears next to each name. The height of each vertical bar indicates a country's percentage ranking by the value of its deductions relative to the selected OECD countries displayed. The Group of Seven industrialized countries appear in boldface type.

For this comparison, calculations are based on an annual rate of economic depreciation of 12.25 percent and on each country's actual annual rate of inflation in 2003.

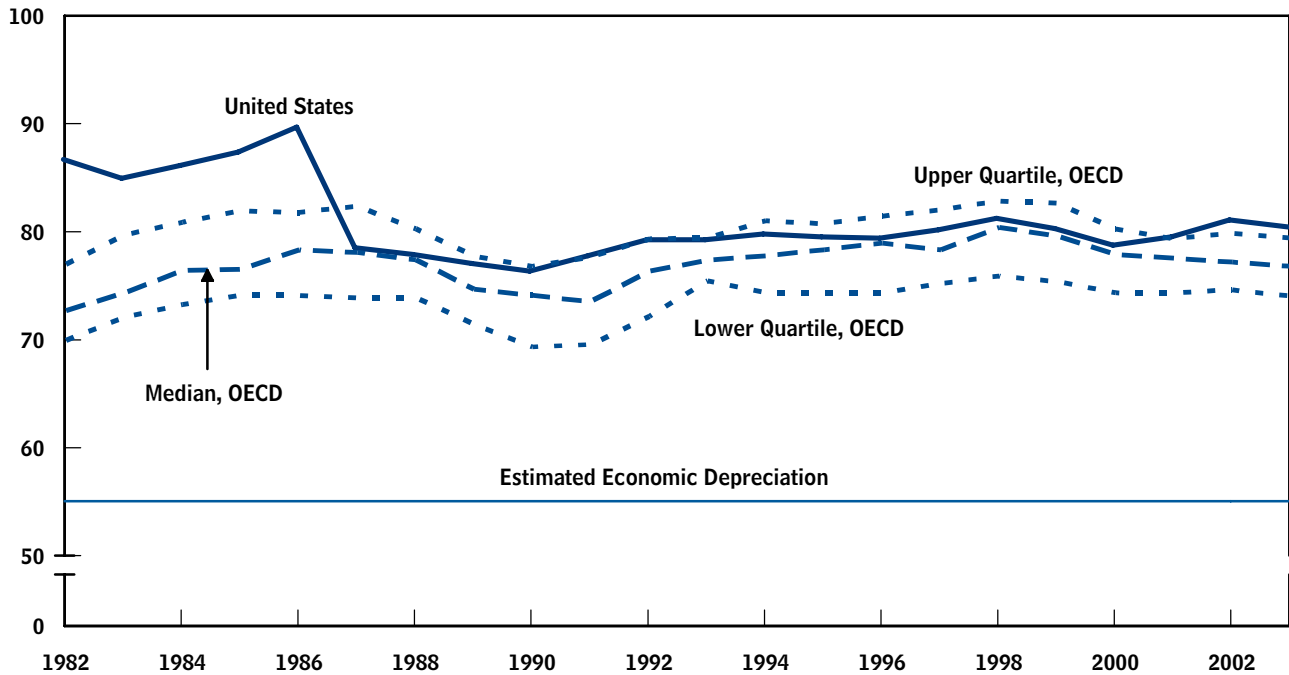
Economic depreciation is the decrease in value of a productive asset that occurs because the asset provides less remaining productivity as it ages.

OECD = Organization for Economic Cooperation and Development.

Figure 2-11.

Depreciation Deductions for Investments in Machinery in the United States Based on Actual Inflation Compared with Summary Measures of Depreciation Deductions for Selected OECD Countries

(Present value of depreciation deductions)



Source: Congressional Budget Office based on data from M.P. Devereux, R. Griffith, and A. Klemm, "Corporate Income Tax Reforms and International Tax Competition," *Economic Policy*, vol. 35 (October 2002), pp. 451-495.

Notes: For this analysis, selected members of the Organization for Economic Cooperation and Development are Australia, Austria, Belgium, Canada, Finland, France, Germany, Greece, Ireland, Italy, Japan, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

The median is a value that divides the ranked countries in half. The upper quartile is a value that divides the upper quarter from the lower three-quarters of ranked countries. The lower quartile is a value that divides the lower quarter from the upper three-quarters of countries. Those divisions are not always precise because a group of countries cannot always be divided exactly by two or four.

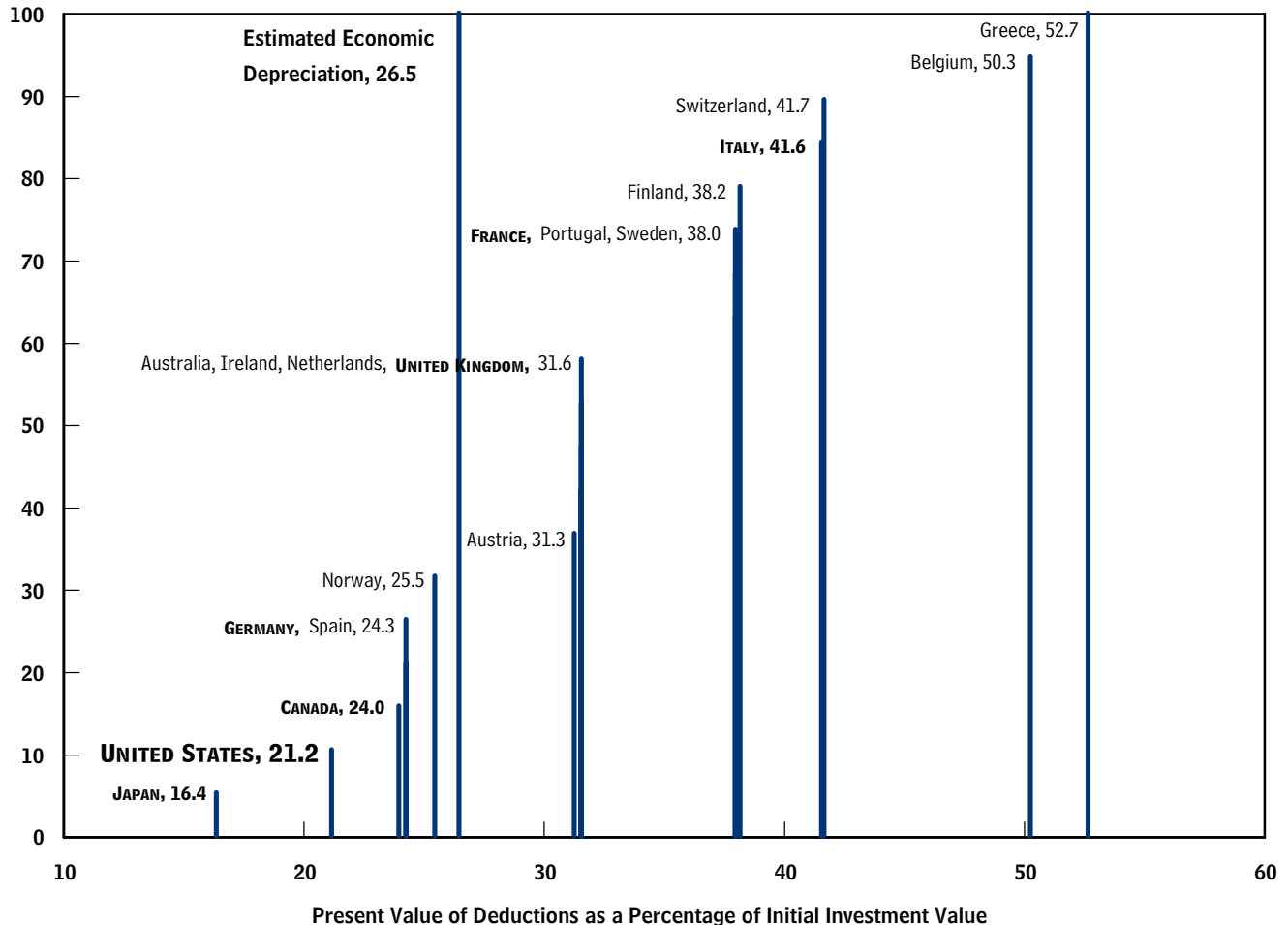
For this comparison, calculations are based on an annual rate of economic depreciation of 12.25 percent and on each country's actual annual rate of inflation in each year.

Economic depreciation is the decrease in value of a productive asset that occurs because the asset provides less remaining productivity as it ages.

Figure 2-12.

Present Value of Depreciation Deductions for Investments in Industrial Structures in Selected OECD Countries, 2003

(Ranking, by present value of deductions, as a percentage of countries)



Source: Congressional Budget Office based on data from M.P. Devereux, R. Griffith, and A. Klemm, "Corporate Income Tax Reforms and International Tax Competition," *Economic Policy*, vol. 35 (October 2002), pp. 451-495.

Notes: The position of the vertical bars shows the present value of the depreciation deductions that each country provides as a percentage of initial investment value; the exact value appears next to each name. The height of each vertical bar indicates a country's percentage ranking by the value of its deductions relative to the selected OECD countries displayed. The Group of Seven industrialized countries appear in boldface type.

For this comparison, calculations are based on an annual rate of economic depreciation of 3.61 percent and an annual rate of inflation of 3.5 percent.

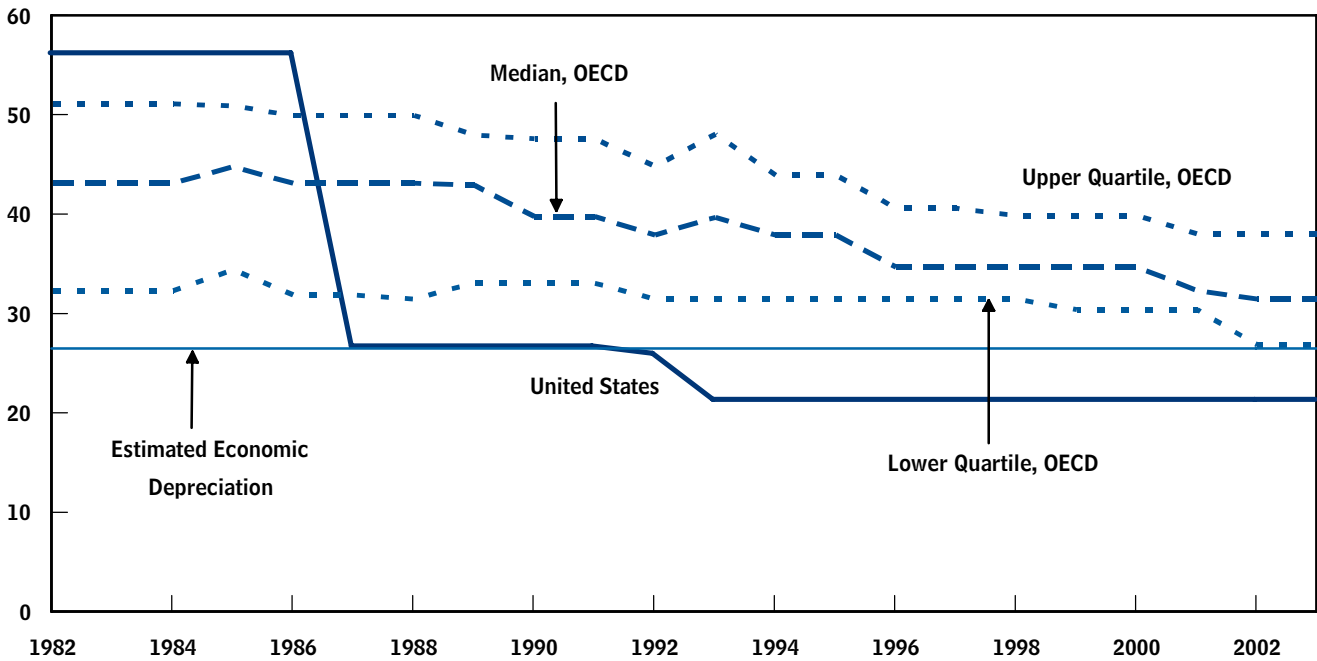
Economic depreciation is the decrease in value of a productive asset that occurs because the asset provides less remaining productivity as it ages.

OECD = Organization for Economic Cooperation and Development.

Figure 2-13.

Depreciation Deductions for Investments in Industrial Structures in the United States Compared with Summary Measures of Depreciation Deductions for Selected OECD Countries

(Present value of depreciation deductions)



Source: Congressional Budget Office based on data from M.P. Devereux, R. Griffith, and A. Klemm, "Corporate Income Tax Reforms and International Tax Competition," *Economic Policy*, vol. 35 (October 2002), pp. 451-495.

Notes: For this analysis, selected members of the Organization for Economic Cooperation and Development are Australia, Austria, Belgium, Canada, Finland, France, Germany, Greece, Ireland, Italy, Japan, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

The median is a value that divides the ranked countries in half. The upper quartile is a value that divides the upper quarter from the lower three-quarters of ranked countries. The lower quartile is a value that divides the lower quarter from the upper three-quarters of countries. Those divisions are not always precise because a group of countries cannot always be divided exactly by two or four.

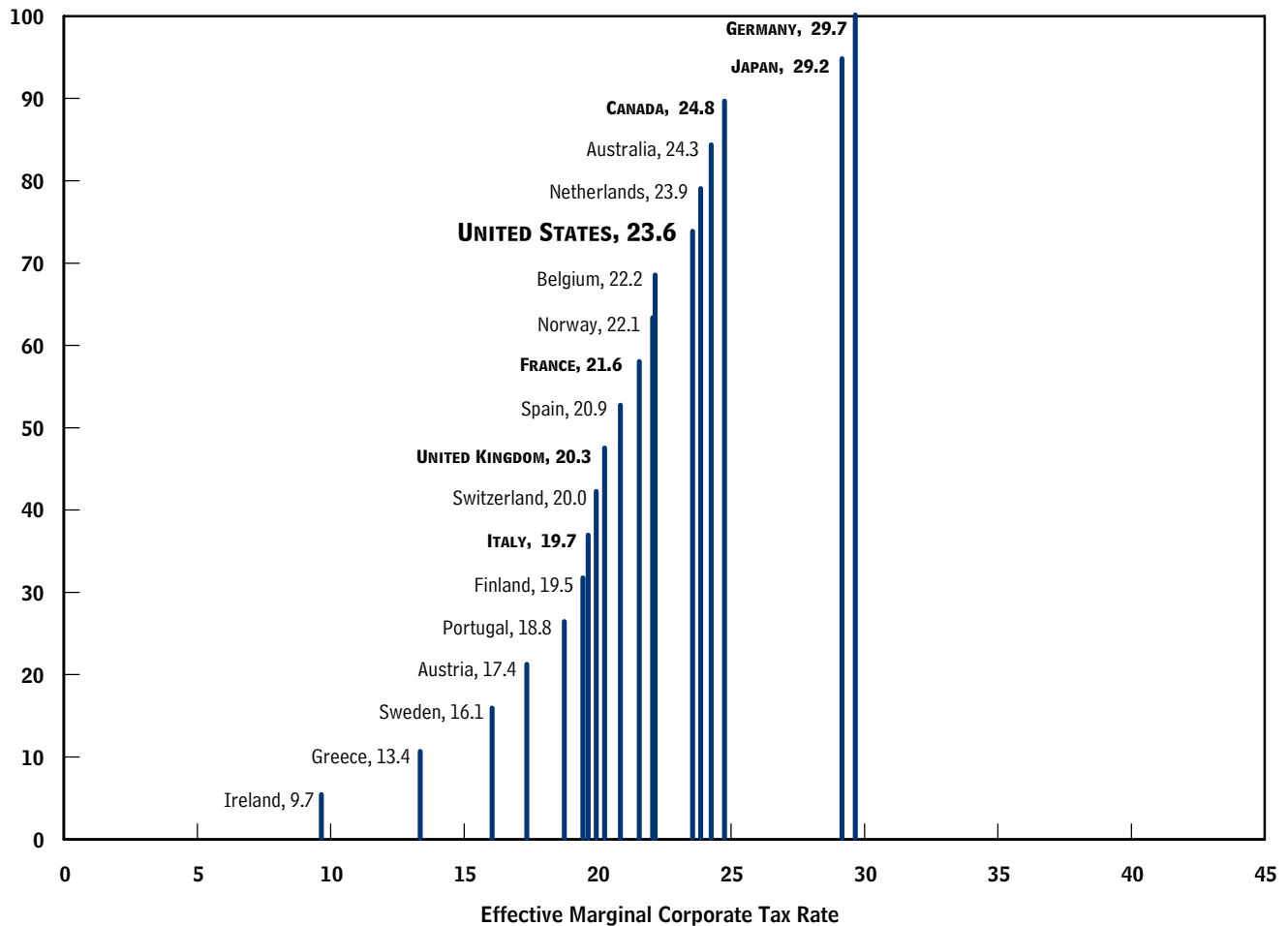
For this comparison, calculations are based on an annual rate of economic depreciation of 3.61 percent and an annual rate of inflation of 3.5 percent.

Economic depreciation is the decrease in value of a productive asset that occurs because the asset provides less remaining productivity as it ages.

Figure 2-14.

Effective Marginal Corporate Tax Rates for Equity-Financed Investments in Machinery in Selected OECD Countries, 2003

(Ranking, by tax rate, as a percentage of countries)



Source: Congressional Budget Office based on data from M.P. Devereux, R. Griffith, and A. Klemm, "Corporate Income Tax Reforms and International Tax Competition," *Economic Policy*, vol. 35 (October 2002), pp. 451-495.

Notes: An effective marginal corporate tax rate is the percentage of the income from a marginal investment that must be paid as corporate income taxes. An investment is considered marginal when it pays just enough income to make the investment worthwhile.

The position of the vertical bars shows the countries' effective marginal tax rates, which include both national and subnational taxes; the exact value of the tax rate appears next to each name. The height of each vertical bar indicates a country's percentage ranking by its effective marginal rate relative to all OECD countries displayed. The Group of Seven industrialized countries appear in boldface type.

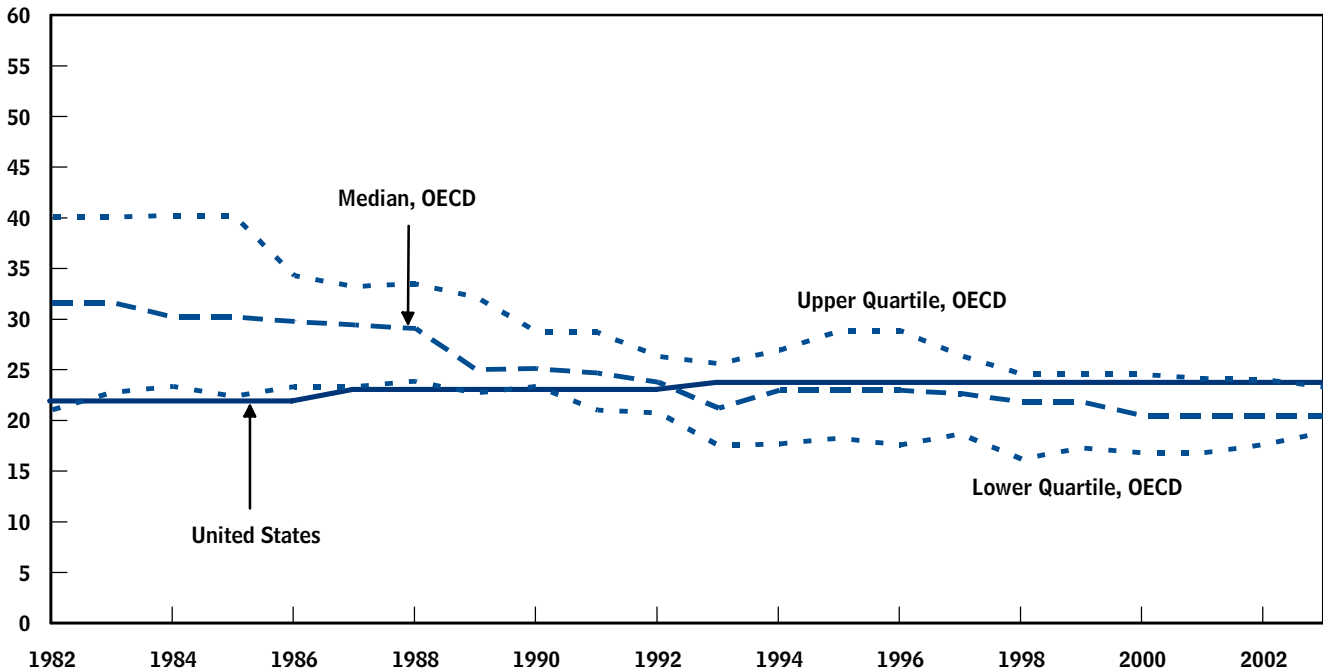
For this comparison, calculations are based on an annual rate of economic depreciation of 12.25 percent and an annual rate of inflation of 3.5 percent.

OECD = Organization for Economic Cooperation and Development.

Figure 2-15.

Effective Marginal Corporate Tax Rates for Equity-Financed Investments in Machinery in the United States Compared with Summary Measures of Effective Marginal Tax Rates for Selected OECD Countries

(Effective marginal corporate tax rate)



Source: Congressional Budget Office based on data from M.P. Devereux, R. Griffith, and A. Klemm, "Corporate Income Tax Reforms and International Tax Competition," *Economic Policy*, vol. 35 (October 2002), pp. 451-495.

Notes: An effective marginal corporate tax rate is the percentage of the income from a marginal investment that must be paid as corporate income taxes. An investment is considered marginal when it pays just enough income to make the investment worthwhile.

For this analysis, selected members of the Organization for Economic Cooperation and Development are Australia, Austria, Belgium, Canada, Finland, France, Germany, Greece, Ireland, Italy, Japan, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

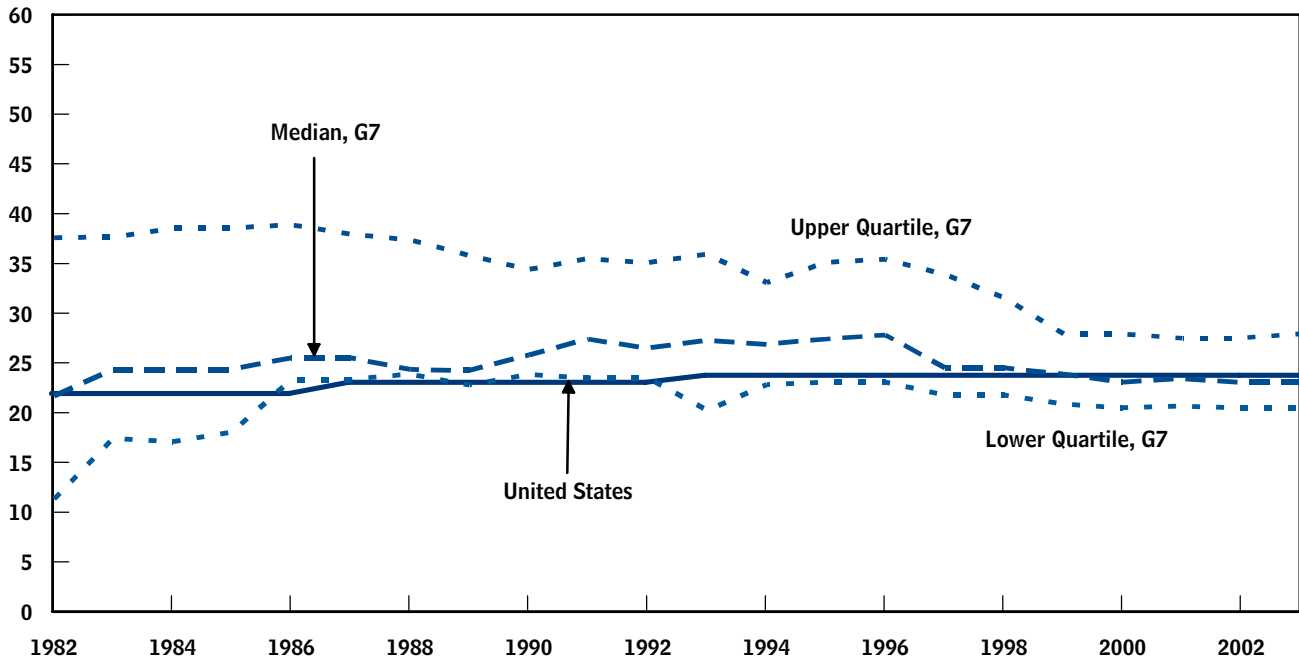
The median is a value that divides the ranked countries in half. The upper quartile is a value that divides the upper quarter from the lower three-quarters of ranked countries. The lower quartile is a value that divides the lower quarter from the upper three-quarters of countries. Those divisions are not always precise because a group of countries cannot always be divided exactly by two or four.

For this comparison, calculations are based on an annual rate of economic depreciation of 12.25 percent and an annual rate of inflation of 3.5 percent.

Figure 2-16.

Effective Marginal Corporate Tax Rates for Equity-Financed Investments in Machinery in the United States Compared with Summary Measures of Effective Marginal Tax Rates for the Other G7 Industrialized Countries

(Effective marginal corporate tax rate)



Source: Congressional Budget Office based on data from M.P. Devereux, R. Griffith, and A. Klemm, "Corporate Income Tax Reforms and International Tax Competition," *Economic Policy*, vol. 35 (October 2002), pp. 451-495.

Notes: An effective marginal corporate tax rate is the percentage of the income from a marginal investment that must be paid as corporate income taxes. An investment is considered marginal when it pays just enough income to make the investment worthwhile.

The G7 industrialized countries are Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States.

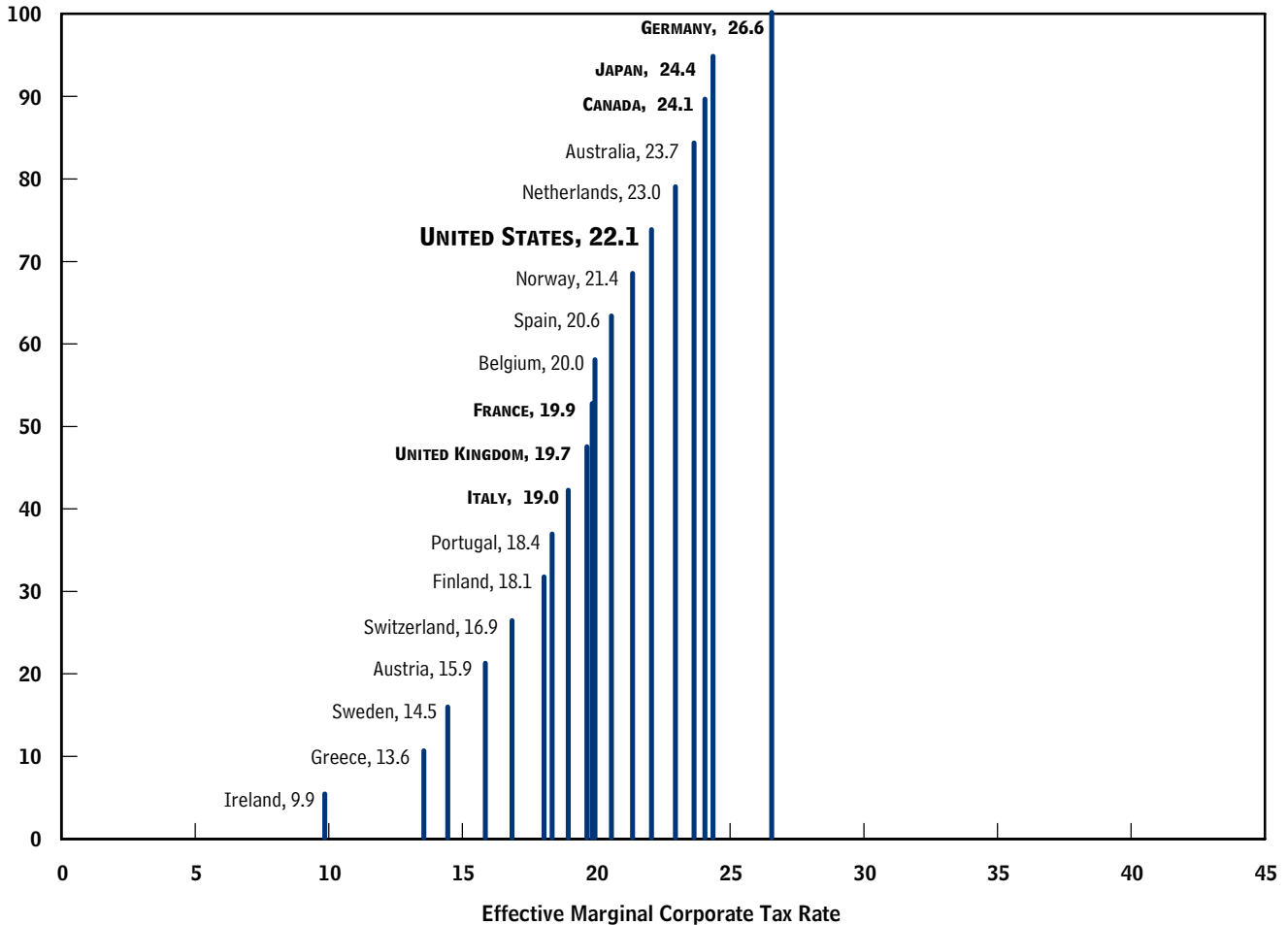
The median is a value that divides the ranked countries in half. The upper quartile is a value that divides the upper quarter from the lower three-quarters of ranked countries. The lower quartile is a value that divides the lower quarter from the upper three-quarters of countries. Those divisions are not always precise because a group of countries cannot always be divided exactly by two or four.

For this comparison, calculations are based on an annual rate of economic depreciation of 12.25 percent and an annual rate of inflation of 3.5 percent.

Figure 2-17.

Effective Marginal Corporate Tax Rates for Equity-Financed Investments in Machinery in Selected OECD Countries Based on Actual Inflation, 2003

(Ranking, by tax rate, as a percentage of countries)



Source: Congressional Budget Office based on data from M.P. Devereux, R. Griffith, and A. Klemm, "Corporate Income Tax Reforms and International Tax Competition," *Economic Policy*, vol. 35 (October 2002), pp. 451-495.

Notes: An effective marginal corporate tax rate is the percentage of the income from a marginal investment that must be paid as corporate income taxes. An investment is considered marginal when it pays just enough income to make the investment worthwhile.

The position of the vertical bars shows the countries' effective marginal tax rates, which include both national and subnational taxes; the exact value of the tax rate appears next to each name. The height of each vertical bar indicates a country's percentage ranking by its effective marginal rate relative to all OECD countries displayed. The Group of Seven industrialized countries appear in boldface type.

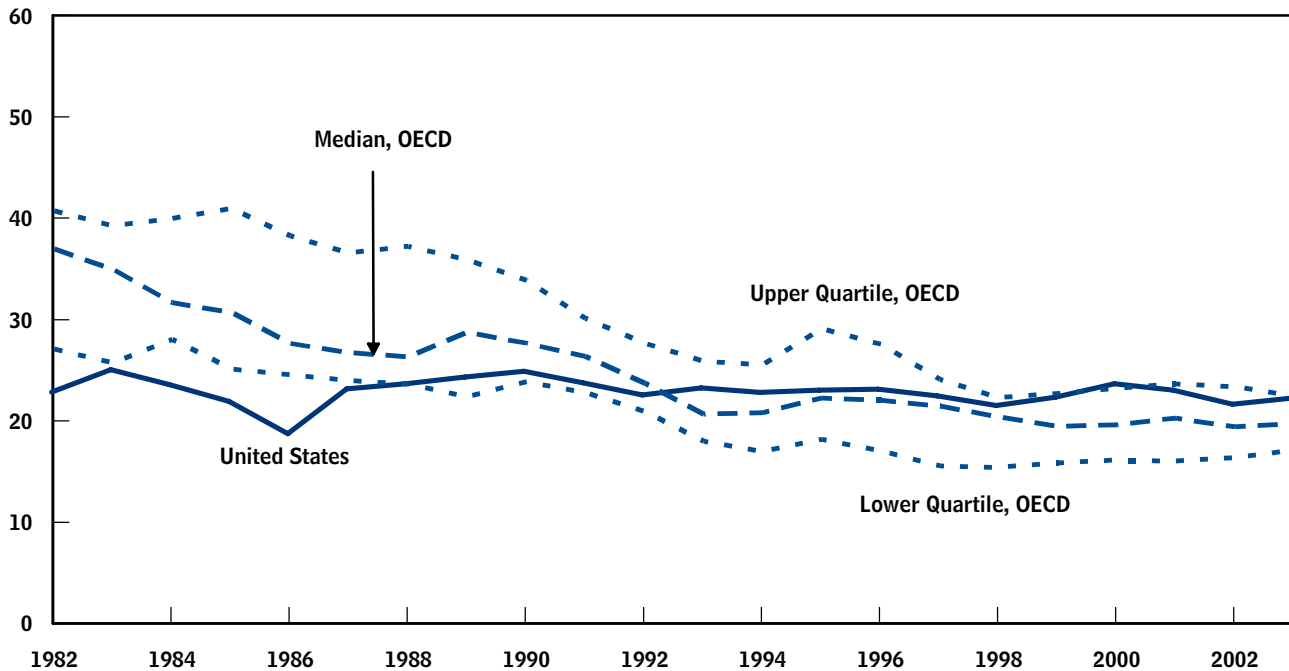
For this comparison, calculations are based on an annual rate of economic depreciation of 12.25 percent and on each country's actual annual rate of inflation in 2003.

OECD = Organization for Economic Cooperation and Development.

Figure 2-18.

Effective Marginal Corporate Tax Rates for Equity-Financed Investments in Machinery in the United States Based on Actual Inflation Compared with Summary Measures of Effective Marginal Tax Rates for Selected OECD Countries

(Effective marginal corporate tax rate)



Source: Congressional Budget Office based on data from M.P. Devereux, R. Griffith, and A. Klemm, "Corporate Income Tax Reforms and International Tax Competition," *Economic Policy*, vol. 35 (October 2002), pp. 451-495.

Notes: An effective marginal corporate tax rate is the percentage of the income from a marginal investment that must be paid as corporate income taxes. An investment is considered marginal when it pays just enough income to make the investment worthwhile.

For this analysis, selected members of the Organization for Economic Cooperation and Development are Australia, Austria, Belgium, Canada, Finland, France, Germany, Greece, Ireland, Italy, Japan, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

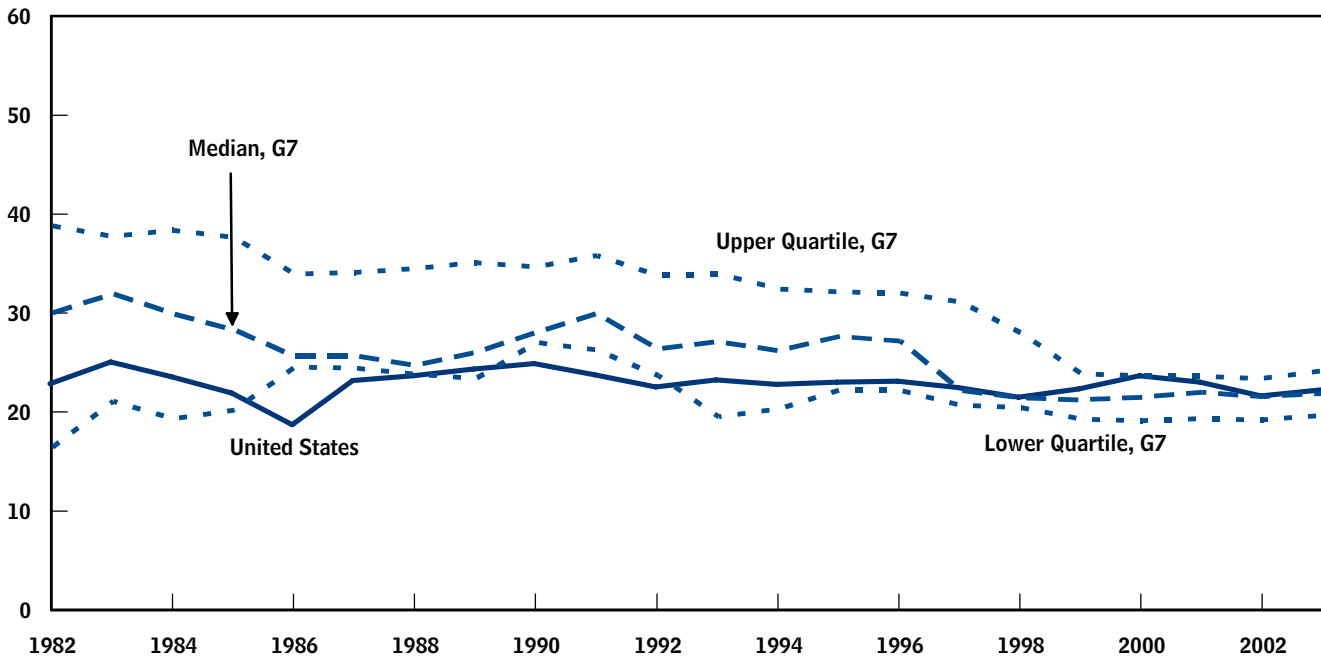
The median is a value that divides the ranked countries in half. The upper quartile is a value that divides the upper quarter from the lower three-quarters of ranked countries. The lower quartile is a value that divides the lower quarter from the upper three-quarters of countries. Those divisions are not always precise because a group of countries cannot always be divided exactly by two or four.

For this comparison, calculations are based on an annual rate of economic depreciation of 12.25 percent and on each country's actual annual rate of inflation in each year.

Figure 2-19.

Effective Marginal Corporate Tax Rates for Equity-Financed Investments in Machinery in the United States Based on Actual Inflation Compared with Summary Measures of Effective Marginal Tax Rates for the Other G7 Industrialized Countries

(Effective marginal corporate tax rate)



Source: Congressional Budget Office based on data from M.P. Devereux, R. Griffith, and A. Klemm, "Corporate Income Tax Reforms and International Tax Competition," *Economic Policy*, vol. 35 (October 2002), pp. 451-495.

Notes: An effective marginal corporate tax rate is the percentage of the income from a marginal investment that must be paid as corporate income taxes. An investment is considered marginal when it pays just enough income to make the investment worthwhile.

The G7 industrialized countries are Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States.

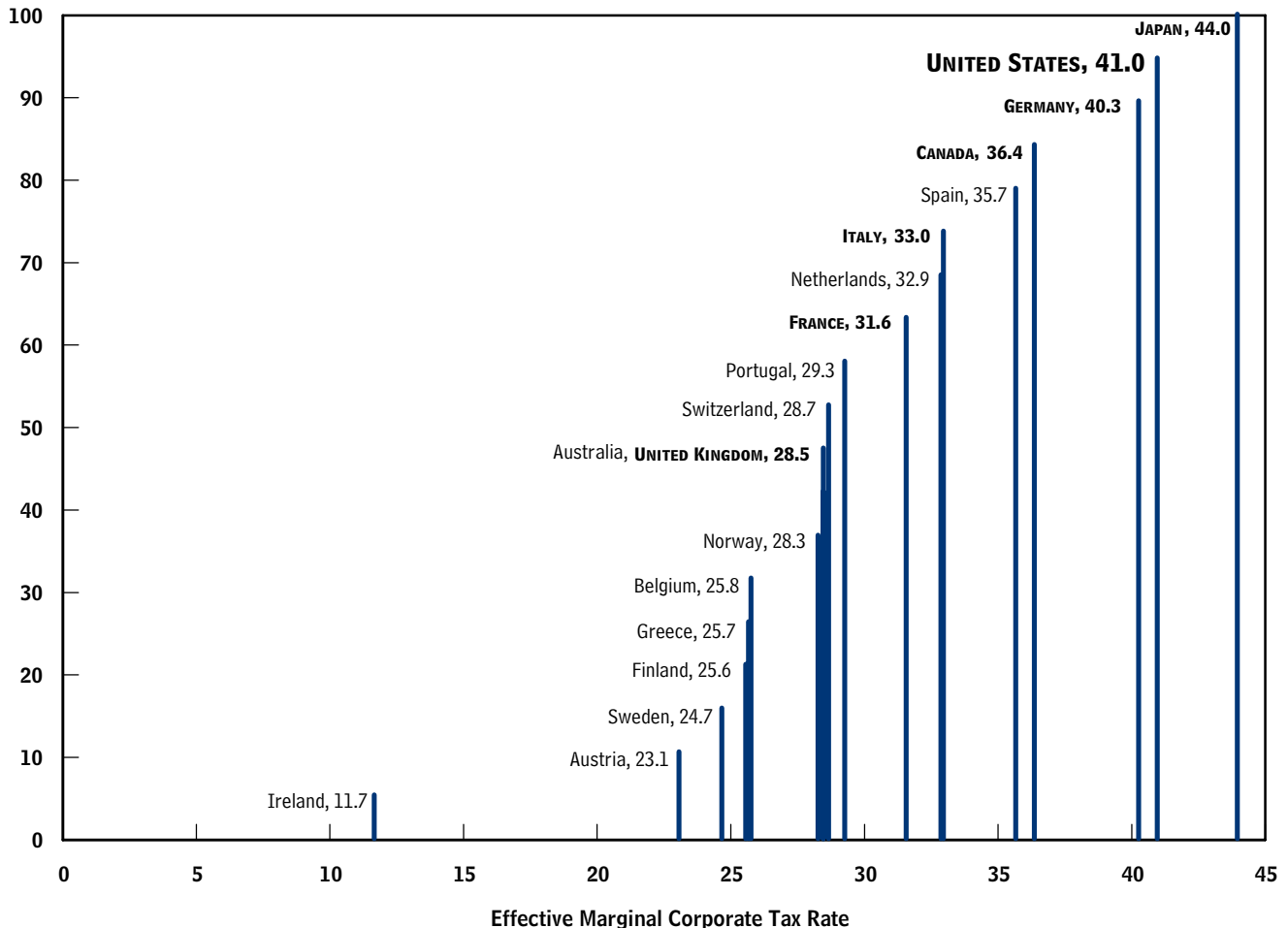
The median is a value that divides the ranked countries in half. The upper quartile is a value that divides the upper quarter from the lower three-quarters of ranked countries. The lower quartile is a value that divides the lower quarter from the upper three-quarters of countries. Those divisions are not always precise because a group of countries cannot always be divided exactly by two or four.

For this comparison, calculations are based on an annual rate of economic depreciation of 12.25 percent and on each country's actual annual rate of inflation in each year.

Figure 2-20.

Effective Marginal Corporate Tax Rates for Equity-Financed Investments in Industrial Structures in Selected OECD Countries, 2003

(Ranking, by tax rate, as a percentage of countries)



Source: Congressional Budget Office based on data from M.P. Devereux, R. Griffith, and A. Klemm, "Corporate Income Tax Reforms and International Tax Competition," *Economic Policy*, vol. 35 (October 2002), pp. 451-495.

Notes: An effective marginal corporate tax rate is the percentage of the income from a marginal investment that must be paid as corporate income taxes. An investment is considered marginal when it pays just enough income to make the investment worthwhile.

The position of the vertical bars shows the countries' effective marginal tax rates, which include both national and subnational taxes; the exact value of the tax rate appears next to each name. The height of each vertical bar indicates a country's percentage ranking by its effective marginal rate relative to all OECD countries displayed. The Group of Seven industrialized countries appear in boldface type.

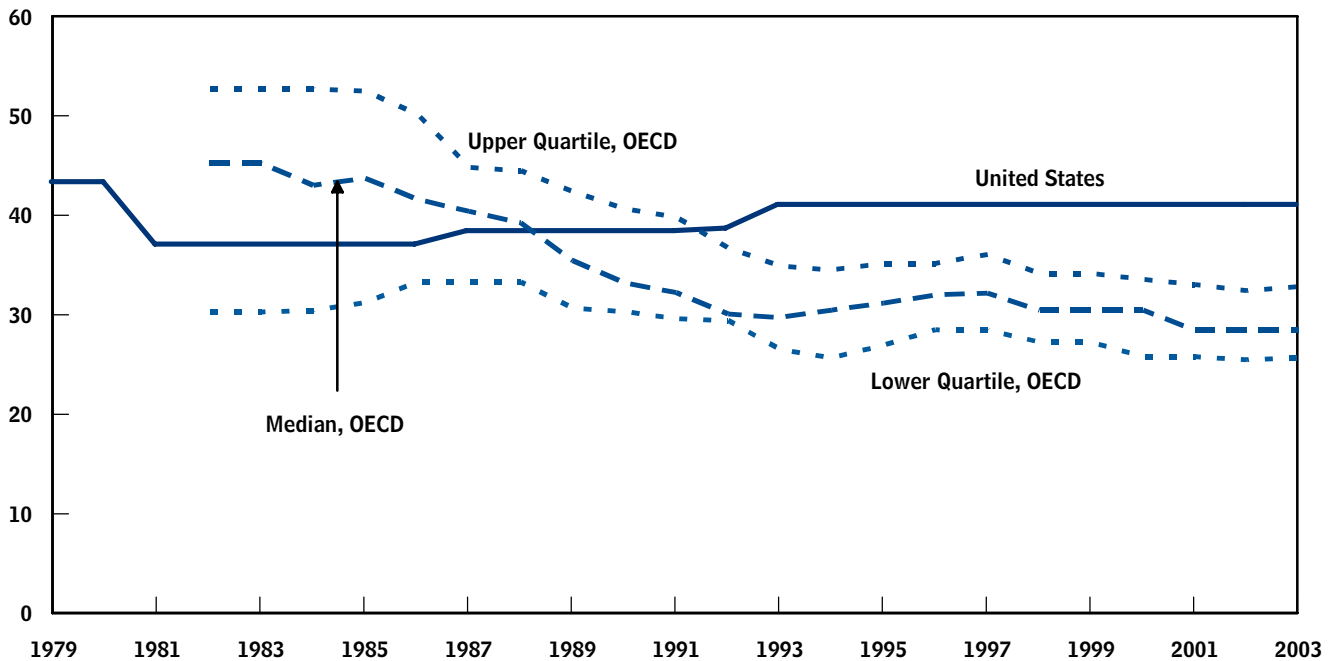
For this comparison, calculations are based on an annual rate of economic depreciation of 3.61 percent and an annual rate of inflation of 3.5 percent.

OECD = Organization for Economic Cooperation and Development.

Figure 2-21.

Effective Marginal Corporate Tax Rates for Equity-Financed Investments in Industrial Structures in the United States Compared with Summary Measures of Effective Marginal Tax Rates for Selected OECD Countries

(Effective marginal corporate tax rate)



Source: Congressional Budget Office based on data from M.P. Devereux, R. Griffith, and A. Klemm, "Corporate Income Tax Reforms and International Tax Competition," *Economic Policy*, vol. 35 (October 2002), pp. 451-495.

Notes: Marginal tax rates before 1982 are presented only for the United States because data were not available for all of the other countries.

An effective marginal corporate tax rate is the percentage of the income from a marginal investment that must be paid as corporate income taxes. An investment is considered marginal when it pays just enough income to make the investment worthwhile.

For this analysis, selected members of the Organization for Economic Cooperation and Development are Australia, Austria, Belgium, Canada, Finland, France, Germany, Greece, Ireland, Italy, Japan, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

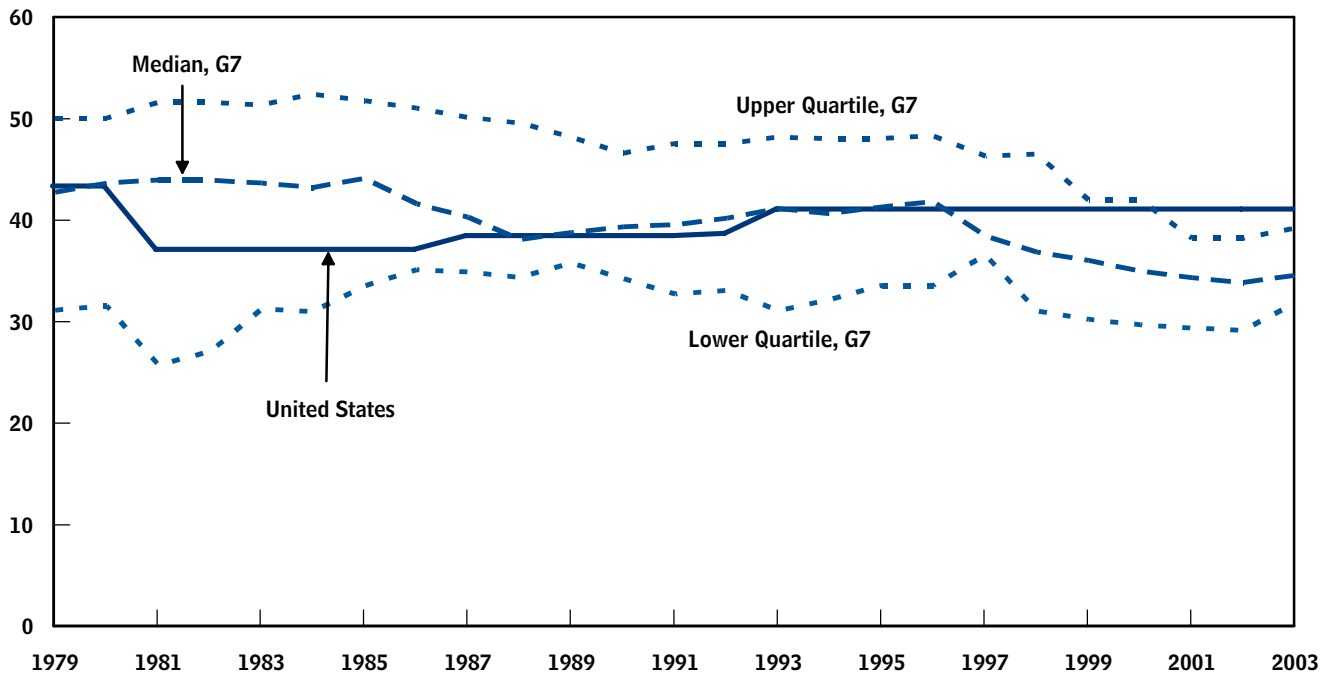
The median is a value that divides the ranked countries in half. The upper quartile is a value that divides the upper quarter from the lower three-quarters of ranked countries. The lower quartile is a value that divides the lower quarter from the upper three-quarters of countries. Those divisions are not always precise because a group of countries cannot always be divided exactly by two or four.

For this comparison, calculations are based on an annual rate of economic depreciation of 3.61 percent and an annual rate of inflation of 3.5 percent.

Figure 2-22.

Effective Marginal Corporate Tax Rates for Equity-Financed Investments in Industrial Structures in the United States Compared with Summary Measures of Effective Marginal Tax Rates for the Other G7 Industrialized Countries

(Effective marginal corporate tax rate)



Source: Congressional Budget Office based on data from M.P. Devereux, R. Griffith, and A. Klemm, "Corporate Income Tax Reforms and International Tax Competition," *Economic Policy*, vol. 35 (October 2002), pp. 451-495.

Notes: An effective marginal corporate tax rate is the percentage of the income from a marginal investment that must be paid as corporate income taxes. An investment is considered marginal when it pays just enough income to make the investment worthwhile.

The G7 industrialized countries are Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States.

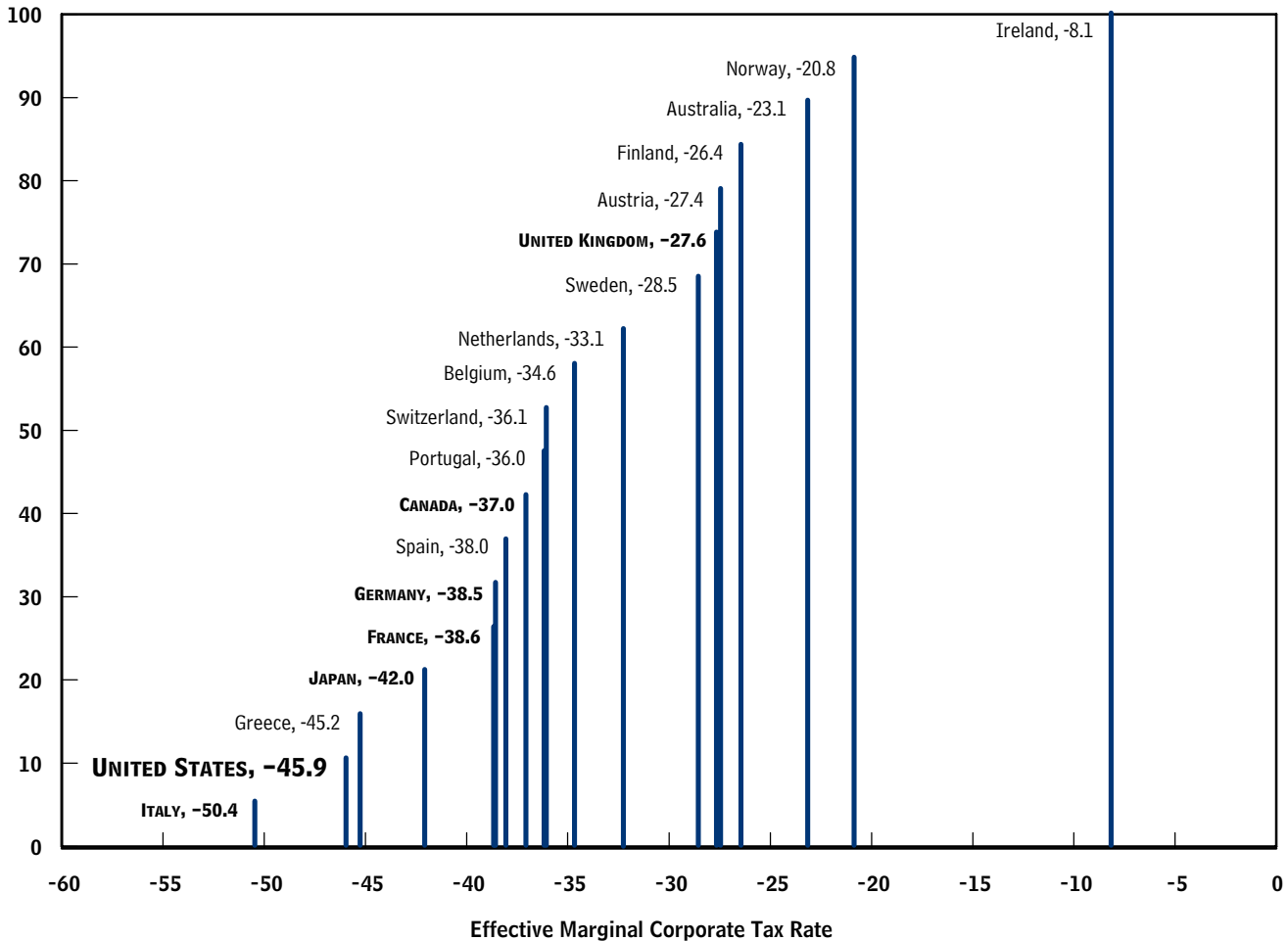
The median is a value that divides the ranked countries in half. The upper quartile is a value that divides the upper quarter from the lower three-quarters of ranked countries. The lower quartile is a value that divides the lower quarter from the upper three-quarters of countries. Those divisions are not always precise because a group of countries cannot always be divided exactly by two or four.

For this comparison, calculations are based on an annual rate of economic depreciation of 3.61 percent and an annual rate of inflation of 3.5 percent.

Figure 2-23.

Tax-Exclusive Effective Marginal Corporate Tax Rates for Debt-Financed Investments in Machinery in Selected OECD Countries, 2003

(Ranking, by tax rate, as a percentage of countries)



Source: Congressional Budget Office based on data from M.P. Devereux, R. Griffith, and A. Klemm, "Corporate Income Tax Reforms and International Tax Competition," *Economic Policy*, vol. 35 (October 2002), pp. 451-495.

Notes: An effective marginal corporate tax rate is the percentage of the income from a marginal investment that must be paid as corporate income taxes. An investment is considered marginal when it pays just enough income to make the investment worthwhile.

The rates presented here are "tax-exclusive" rates, which means that the effective marginal tax rate is expressed as a percentage of the real rate of return (the real rate of interest) paid by a corporation to its investors after corporate taxes are paid. Tax-exclusive effective marginal rates are reported for debt-financed investment because some of the denominators for tax-inclusive rates (the tax rate is measured as a percentage of the rate of return before taxes—that is, the cost of capital) are close to zero.

The position of the vertical bars shows the countries' effective marginal tax rates, which include both national and subnational taxes; the exact value of the tax rate appears next to each name. The height of each vertical bar indicates a country's percentage ranking by its effective marginal rate relative to all OECD countries displayed. The Group of Seven industrialized countries appear in boldface type.

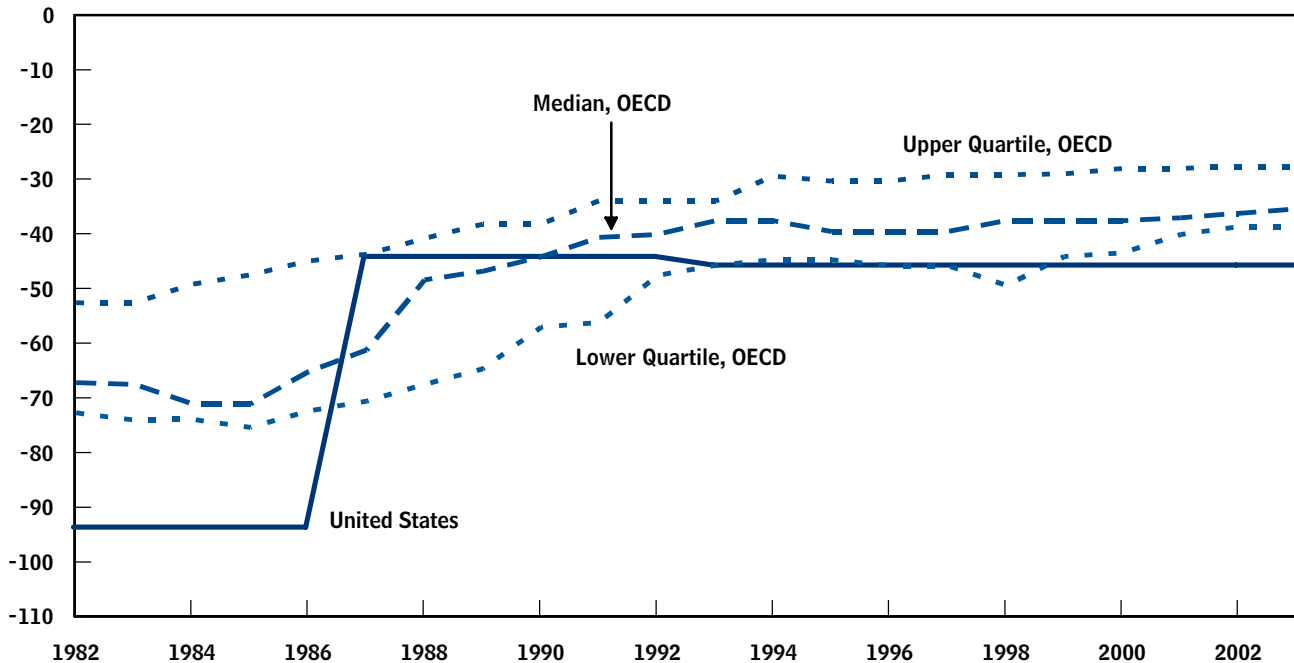
For this comparison, calculations are based on an annual rate of economic depreciation of 12.25 percent and an annual rate of inflation of 3.5 percent.

OECD = Organization for Economic Cooperation and Development.

Figure 2-24.

Tax-Exclusive Effective Marginal Corporate Tax Rates for Debt-Financed Investments in Machinery in the United States Compared with Summary Measures of Effective Marginal Tax Rates for Selected OECD Countries

(Effective marginal corporate tax rate)



Source: Congressional Budget Office based on data from M.P. Devereux, R. Griffith, and A. Klemm, "Corporate Income Tax Reforms and International Tax Competition," *Economic Policy*, vol. 35 (October 2002), pp. 451-495.

Notes: An effective marginal corporate tax rate is the percentage of the income from a marginal investment that must be paid as corporate income taxes. An investment is considered marginal when it pays just enough income to make the investment worthwhile.

The rates presented here are "tax-exclusive" rates, which means that the effective marginal tax rate is expressed as a percentage of the real rate of return (the real rate of interest) paid by a corporation to its investors after corporate taxes are paid. Tax-exclusive effective marginal rates are reported for debt-financed investment because some of the denominators for tax-inclusive rates (the tax rate is measured as a percentage of the rate of return before taxes—that is, the cost of capital) are close to zero.

For this analysis, selected members of the Organization for Economic Cooperation and Development are Australia, Austria, Belgium, Canada, Finland, France, Germany, Greece, Ireland, Italy, Japan, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

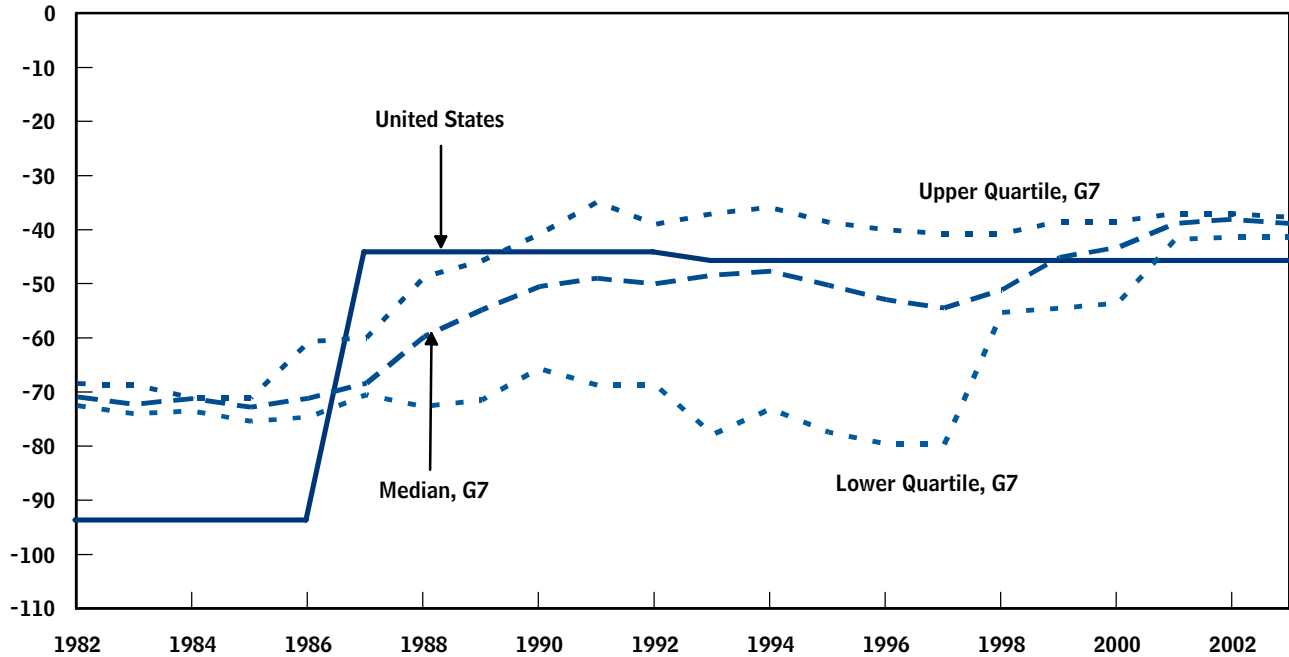
The median is a value that divides the ranked countries in half. The upper quartile is a value that divides the upper quarter from the lower three-quarters of ranked countries. The lower quartile is a value that divides the lower quarter from the upper three-quarters of countries. Those divisions are not always precise because a group of countries cannot always be divided exactly by two or four.

For this comparison, calculations are based on an annual rate of economic depreciation of 12.25 percent and an annual rate of inflation of 3.5 percent.

Figure 2-25.

Tax-Exclusive Effective Marginal Corporate Tax Rates for Debt-Financed Investments in Machinery in the United States Compared with Summary Measures of Effective Marginal Tax Rates for the Other G7 Industrialized Countries

(Effective marginal corporate tax rate)



Source: Congressional Budget Office based on data from M.P. Devereux, R. Griffith, and A. Klemm, "Corporate Income Tax Reforms and International Tax Competition," *Economic Policy*, vol. 35 (October 2002), pp. 451-495.

Notes: An effective marginal corporate tax rate is the percentage of the income from a marginal investment that must be paid as corporate income taxes. An investment is considered marginal when it pays just enough income to make the investment worthwhile.

The rates presented here are "tax-exclusive" rates, which means that the effective marginal tax rate is expressed as a percentage of the real rate of return (the real rate of interest) paid by a corporation to its investors after corporate taxes are paid. Tax-exclusive effective marginal rates are reported for debt-financed investment because some of the denominators for tax-inclusive rates (the tax rate is measured as a percentage of the rate of return before taxes—that is, the cost of capital) are close to zero.

The G7 industrialized countries are Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States.

The median is a value that divides the ranked countries in half. The upper quartile is a value that divides the upper quarter from the lower three-quarters of ranked countries. The lower quartile is a value that divides the lower quarter from the upper three-quarters of countries. Those divisions are not always precise because a group of countries cannot always be divided exactly by two or four.

For this comparison, calculations are based on an annual rate of economic depreciation of 12.25 percent and an annual rate of inflation of 3.5 percent.