

# The Economics of Federal Tax Policy

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## Abstract

The federal government faces increasing revenue needs driven by the aging of the population and emerging challenges. But the United States collects less revenue than it typically has in the past and less revenue than other governments do today. In addition, how the government raises revenue—not just how much it raises—has critical implications for economic prosperity. This chapter provides a framework for assessing tax policies and understanding their implications for growth and economic inequality.

## Introduction

At just above 16 percent of GDP in 2018, federal revenues were below the post-war average (OMB 2019b). This low level of revenues is particularly striking given the relatively strong state of the economy—when revenues would typically be above average—and substantially reflects the tax cuts enacted at the end of 2017. Looking forward, the federal government faces increasing revenue needs given the aging of the population and the need to address emerging challenges.

But how the government raises revenue—not just how much it raises—has critical implications for economic prosperity. The other chapters in this volume provide detailed proposals for how to raise revenue in efficient and equitable ways. This chapter provides important background on the current state of federal taxation in the United States and the considerations that inform tax design.

The current level of federal revenues is not just low relative to its past values, but also relative to the rest of the world. The U.S. government raises less in taxes as a share of the economy than nearly every other advanced country. This is not simply due to government doing less in the United States. The

federal government does not raise enough revenue to pay for its current and projected spending, making up the shortfall with substantial borrowing. The United States relies heavily on payroll taxes and income taxes and raises far less from corporate taxes or estate taxes. In contrast to many other countries, it also has very little direct federal taxation of consumption. U.S. tax rates have come down over the past half century, with the exception of payroll tax rates. Revenue is reduced further by credits and deductions, often known as tax expenditures.

The way we tax has important implications for economic efficiency. Taxes may discourage particular activities—employment or saving, for example—thus generating economic distortions. Recognizing this, one challenge for policymakers is to tax in ways that minimize distortions—not discouraging activities that should be taking place (i.e., those activities for which social benefits exceed social costs).<sup>1</sup> Efficient taxation can be an important part of a growth-friendly fiscal framework.

Tax design also matters for progressivity and the overall fairness of our economic system. The guiding principle of progressive taxation is that those with greater ability to pay should contribute a higher share of their resources. Perhaps the most important justification for progressive taxation is that ability to pay is sharply different across people, such that the welfare cost of a dollar in tax payments is much lower for high-income people. Someone with \$1,000,000 of income likely derives a smaller benefit from the last dollar they spend than someone with \$10,000 in income. Also, in practice the poorest of the poor simply have extremely limited resources; policymakers' goal is to increase their resources, not reduce them through taxation. Balancing efficiency and progressivity—and looking for opportunities to enhance both at the same time—is a core task for tax policymakers.

The current federal income tax system does impose higher tax rates on those with higher income, though state and local taxes and other non-income taxes often fall more heavily on the poor, making the combined system less progressive than it might appear based on income tax rates alone (TPC 2019). The high levels of both income and wealth inequality in the United States suggest a need to tilt the tax system in a more progressive direction, while doing so in as growth-friendly a way as possible.

This chapter reviews the economics of taxation and the facts about how the federal government raises revenue today. It makes clear that the current tax system does not raise enough revenue to cover costs or prevent debt levels from rising. Further, given demographic shifts and new public challenges, the need for revenue (possibly including new revenue sources)

will grow over time. The chapter also makes clear that how we raise that revenue will be crucial. Taxes have important economic effects and can cause undesirable distortions. Raising revenue in a growth-friendly way is therefore crucial. Finally, we conclude by discussing the high degree of income and wealth inequality in the United States, which strengthens the case for raising revenue in a progressive manner.

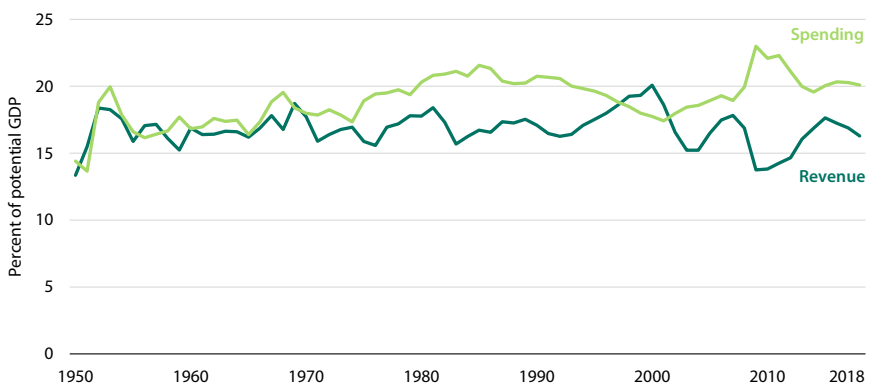
## Trends in Federal Taxation

Despite changed circumstances and policy priorities, the federal government's revenue has stayed in a range of 13–20 percent of potential GDP for the past 75 years.<sup>2</sup> However, the ebbs and flows of tax revenue have recently intensified: For example, federal revenue as a share of potential GDP dropped nearly a quarter, from 20.1 to 15.2 percent, from 2000 to 2003.<sup>3</sup> Current federal revenues are lower than the historical average and have been trending downward as a share of potential GDP since 2015 even as the economy continues to grow.

In figure 1 we plot both revenue and spending as a share of potential GDP. In 2018 federal revenue stood at 16.3 percent of potential GDP, below its 1950–2018 average of 16.8 percent. Typically, federal revenues have grown

FIGURE 1.

### U.S. Federal Revenue and Spending as Percent of Potential GDP, 1950–2018



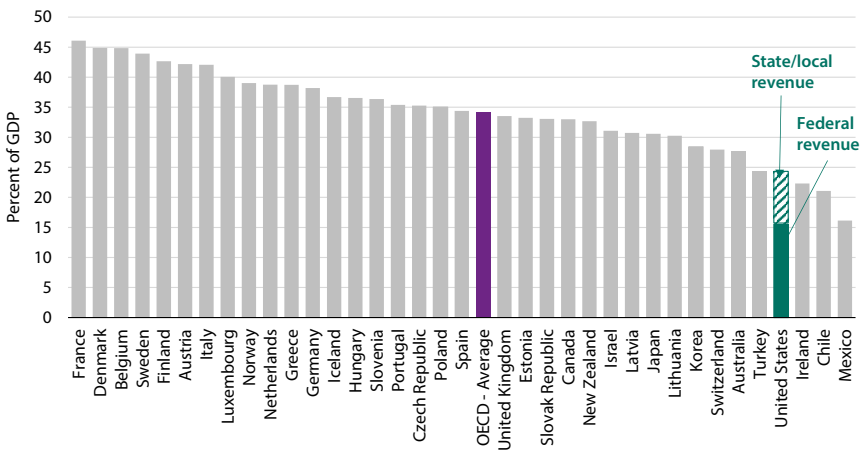
Source: Congressional Budget Office (CBO) 1950–2018; Office of Management and Budget (OMB) 2019a; authors' calculations.

Note: Revenue and spending data are from the OMB historical tables summarizing receipts, outlays, and surpluses or deficits. Total federal revenue includes the sum of individual income taxes, corporate income taxes, social insurance and retirement receipts, excise taxes, and other federal receipts. Total federal spending includes interest and transfer payments. Estimates of potential GDP are from the CBO. Potential GDP is the maximum sustainable output that can be produced.

during economic expansions (e.g., the mid-1980s, the late 1990s, and the mid-2000s) and dipped during recessions due to both temporary tax relief and falling incomes. The recent decline in tax revenues since 2015 despite a growing economy is unusual. In addition, federal spending was 20.1 percent of potential GDP in 2018, driven higher than its long-run average by the aging of the population and the associated rise in retirement and health-care expenditures (CBO 2019a). Though today’s federal tax burden is only slightly below historical standards, it is historically low relative to federal spending. In addition, federal deficits have never been this high when the unemployment rate is this low (indicating a relatively strong economy). Though largely outside the scope of this chapter, deficits and accumulated debt are certainly a core consideration when setting the overall tax burden (Gale 2019).

Taxes in the United States are also low relative to other advanced economies. In figure 2 we show total tax revenue—including subnational and federal revenue—as a share of GDP for each Organisation for Economic Co-operation and Development (OECD) country. Ranging from France at 46.1 percent to Mexico at 16.1 percent, different advanced economies have made different choices about revenues and the size of their respective governments. The United States sits squarely on the low end of this distribution at 24.3 percent after adding state and local revenue to the 15.7

FIGURE 2.  
Government Revenue as a Percent of GDP, by Country



Source: Organisation for Co-operation and Development (OECD) Revenue Statistics 2018.  
 Note: Data are for 2018. Estimates for Australia and Japan were not updated in 2018; Australia and Japan data are for 2017. For some countries’ data, the OECD adjusts to take into account capital transfer and facilitate comparability between countries.

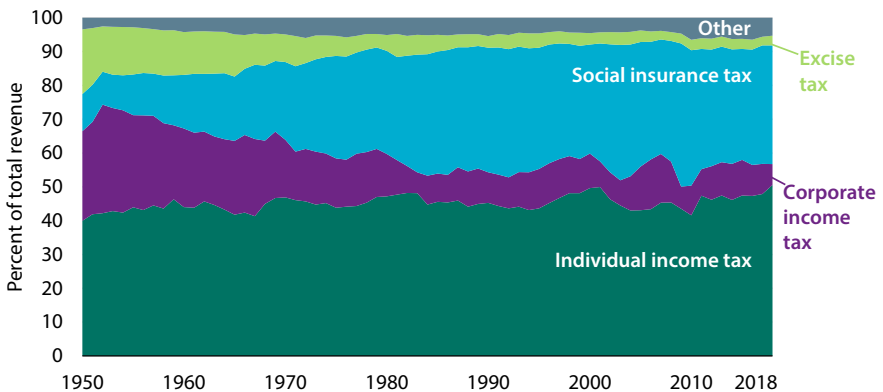
percent of GDP from federal revenue. The combined U.S. rate is nearly 10 percentage points below the OECD average of 34.3 percent in 2018.

## WHERE FEDERAL REVENUE COMES FROM

While federal revenue as a share of income has roughly remained in its historical range, the key components of federal revenue have shifted considerably over time (see figure 3). The United States has historically relied heavily on personal income taxes (including taxes on labor and investment income), raising between 39.9 and 50.6 percent of its federal revenue from that source. What has changed is that the federal government of 1950 also raised a large share of its revenue from corporate income and excise taxes (26.5 percent and 19.1 percent of revenue, respectively). Over time those sources of revenue have declined in comparison to the payroll taxes that fund Social Security, Medicare, and other social insurance programs.<sup>4</sup> This shift away from corporate and excise taxation to payroll taxation (and, to a lesser extent, personal income taxation) had significant implications for the progressivity of the federal tax system, as discussed at the end of this chapter. Given that a substantial portion of payroll taxes phases out as incomes rise, payroll taxes are regressive: Low-income individuals pay a higher share of their income than high-income individuals.

FIGURE 3.

### Sources of U.S. Federal Revenue, 1950–2018



Source: Office of Management and Budget (OMB) 2019c; authors' calculations.

Note: Data are from the OMB historical tables of federal receipts by source. Social insurance tax includes both the employee and employer portions of payroll taxes, as well as employment insurance (e.g. disability), unemployment insurance, and other retirement receipts. Excise tax includes federal funds (e.g. alcohol, tobacco) and trust funds (e.g. transportation, airport/airway). Other federal revenue includes estate and gift taxes, customs duties and fees, and other miscellaneous receipts.

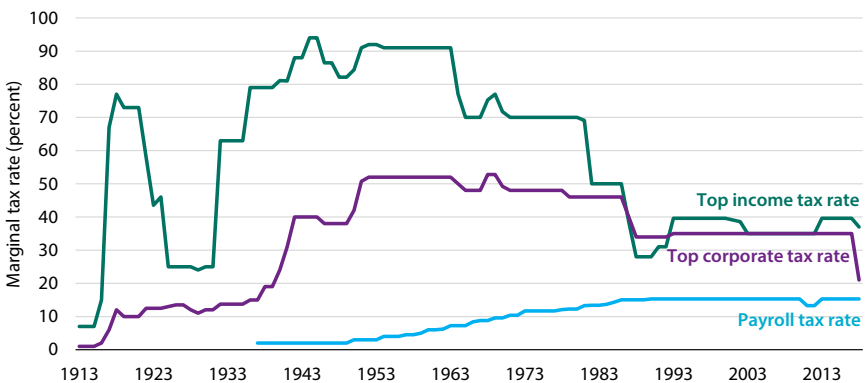
The revenue raised from a tax is the product of the taxable base and the average tax rate applied to that base. Figure 3 therefore reflects changes over time in both components. For example, an increase in the share of personal income taxes could be driven by rising rates or rising personal income, both of which would tend to raise the revenue generated by that tax. In addition, higher income inequality can raise revenue if more income is earned by those at the top of the distribution where marginal income tax rates are higher. To help illustrate this distinction between rates and the share of revenue raised, figure 4 shows changes over time in the statutory top marginal rates of federal personal income, corporate, and payroll taxation (i.e., the highest tax rate applied to income for a given tax).

Perhaps the most striking aspect of figure 4 is the dramatic decline in the top marginal tax rate on individual income since the 1960s.<sup>5</sup> In part because this decline occurred at the same time that income inequality rose sharply—exposing more income to the top marginal tax rate—the personal income tax has nonetheless maintained and slightly increased its share of federal revenues.<sup>6</sup> The decline in the top income tax rate was not uniform. At times, there have been increases in the top rate, but today it is well below its historical average.

By contrast, reductions in the corporate income tax rate have been accompanied by a falling share of federal revenues. Increases in payroll tax

FIGURE 4.

## U.S. Top Marginal Tax Rate by Federal Revenue Source, 1913–2018



Source: Internal Revenue Service (IRS) 1913–2018; Social Security Administration (SSA) 1937–2018; Urban–Brookings Tax Policy Center (TPC) 1913–2018; authors' calculations.

Note: Data for the top income tax rates are from the TPC. Data for the top corporate tax rates are from the IRS. Data for the payroll tax rates are from the SSA. Payroll tax includes both the employee and employer contributions.

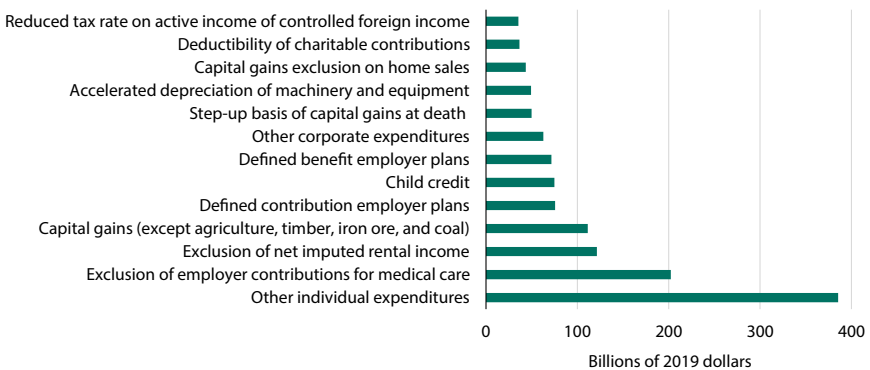
rates have led to a rising share of social insurance tax revenue (as shown in figure 3).

### THE TAXABLE BASE AND ITS CARVEOUTS

Having examined how tax rates have evolved, we now examine the taxable base, focusing on carveouts and exceptions in the personal and corporate income tax bases—referred to as tax expenditures—that constrict the scope of taxation relative to total personal and corporate income.<sup>7</sup> Figure 5 shows the annual value of these tax expenditures in fiscal year 2019.<sup>8</sup> Some are relatively familiar—such as the deduction for charitable contributions and the child credit—and others are less so, like the exclusion of net imputed rental income and the capital gains expenditure.<sup>9</sup> Most of the largest expenditures are exclusions from the individual income tax base. Of these, most (e.g., employer contributions for medical insurance) do not require the itemization of a personal income tax return because they are not counted as part of income. But many of the smaller individual tax expenditures (collected in the largest bar in figure 5) do require itemization and are consequently unavailable to low- and middle-income taxpayers who claim the standard deduction.

One way to think about tax expenditures is in terms of the public subsidy they provide for spending on tax-favored activities. For example, the deduction for charitable giving gives a strong incentive for donations, albeit only for those who itemize the deductions on their tax returns, and at a rate

FIGURE 5.  
Cost of Federal Income Tax Expenditures, by Type



Source: U.S. Department of the Treasury 2019; authors' calculations.

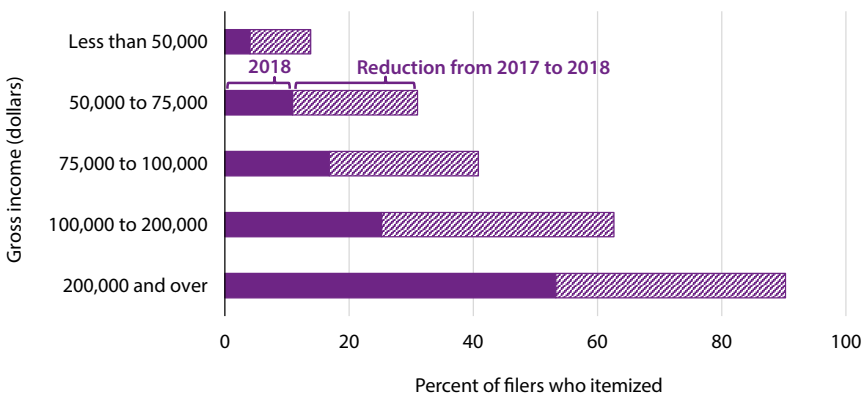
Note: Dollar amounts are fiscal year 2019 estimates. "Capital gains (except agriculture, timber, iron ore, and coal)" refers to preferential rate structure for capital gains. Refundable portions of tax credits are excluded.

that equals the marginal tax rate faced by the taxpayer (such that someone in the top bracket receives a larger subsidy for the same-sized donation than someone in a lower bracket). Understanding and evaluating a given tax expenditure is therefore partly a matter of deciding whether a particular good or service merits a public subsidy.

In addition to examining tax expenditures one by one, it is useful to examine how tax expenditures as a whole affect the tax burdens of different income groups. We explore how expenditures affect tax burdens by showing the share of filers who itemized their deductions before and after the Tax Cuts and Jobs Act of 2017 (TCJA), which dramatically increased the number of taxpayers who take the standard deduction. Figure 6 indicates that itemization is much less common than it was previously among those with less than \$200,000 in gross income. For example, of those with incomes between \$100,000 and \$200,000, 63 percent itemized in 2017 and only an estimated 25 percent itemized in 2018. As described above, this decline has implications for public subsidies—lower-earning taxpayers are no longer given a tax incentive to engage in otherwise tax-preferred activities—and renders the distribution of tax expenditures more unequal than before. After the TCJA, virtually no taxpayers with less than \$50,000 in gross income receive incentives to engage in tax-preferred activities, since virtually none of them itemizes their tax returns. The large majority of taxpayers with incomes below \$200,000 no longer itemize. It

FIGURE 6.

## Percent of Tax Filers Who Itemized in 2017 and 2018



Source: Joint Committee on Taxation (JCT) 2018; authors' calculations.

Note: The horizontal bars show the percent of taxpayers itemizing in 2017; the solid portion of the bars show the percent itemizing in 2018. "Gross income" refers to adjusted gross income plus tax-exempt interest, contributions for health plans and life insurance, employer share of FICA tax, workers' compensation, nontaxable Social Security benefits, insurance value of Medicare benefits, alternative minimum tax preference items, individual share of business taxes, and excluded income of U.S. citizens living abroad. The percent of filers who itemized in 2018 is categorized by 2017 income levels; the percent who itemized in 2017 is categorized by 2016 income levels.



has always been the case that tax expenditures disproportionately benefited high-income individuals. For the same deduction, high-income individuals lowered their taxes by a larger amount due to their higher tax rate. But, after the TCJA, itemized deductions are now more exclusively the province of the rich. The hundreds of billions of dollars of tax expenditures thus substantially reduce the progressivity of the tax code.

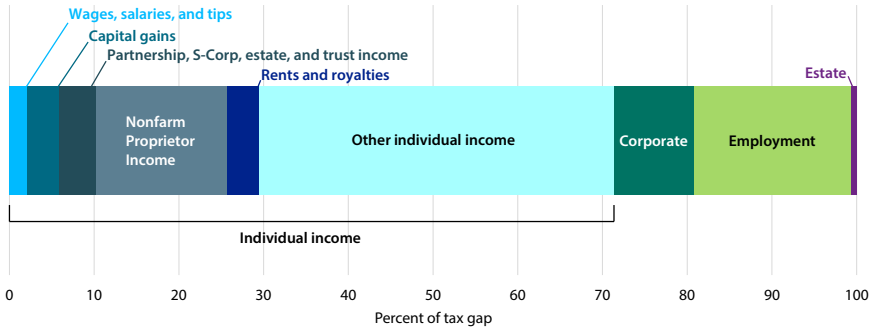
## THE EXTENT OF TAX EVASION

Tax expenditures are not the only means by which tax bases can be eroded. Some individuals and businesses simply evade taxes and refuse to pay the legally required amounts.<sup>10</sup> Tax evasion in the United States is substantial: The IRS estimates that \$441 billion, or 14.6 percent of the estimated tax due (on average each year between fiscal years 2011 and 2013), was not paid voluntarily in a timely manner; this is referred to as the gross tax gap (IRS 2019b). Figure 7a shows the misreporting rate for various components of individual income taxation, including wages, salaries, and tips; capital gains; partnership, S-Corporation, estate, and trust income; nonfarm proprietor income; and rents and royalties. Rents and royalties and nonfarm proprietor income (and to a lesser extent, capital gains and partnership income) have much higher rates of evasion than wage income (which is typically reported on a Form W-2; see also Krupkin and Looney 2017). Driven in large part by misreporting of business income, individual tax evasion is estimated by the IRS to be the largest component of the overall tax gap as shown in figure 7b.

It is important to note that the figure describes illegal evasion and not legal avoidance. As discussed in subsequent chapters by Jason Furman (2020) and Kimberly Clausing (2020), there are extensive opportunities for corporations to avoid taxation legally, such that 60 of the top Fortune 500 companies owed no taxes in 2018 (ITEP 2019). There are also many opportunities for individual taxpayers, and especially high earners, to shelter their income from taxation.<sup>11</sup>

Of course, tax authorities conduct enforcement activities that aim to boost compliance with the tax law. The federal government spends roughly \$4.7 billion per year on enforcement (IRS 2019a). An extensive system of information reporting (e.g., reports triggered when organizations make payments) allows the tax authorities to detect some noncompliance and to focus their enforcement efforts. Audits by the tax authorities are an important part of these efforts to detect and deter evasion.<sup>12</sup>

**FIGURE 7A.**  
**Tax Gap Components, 2011–13**

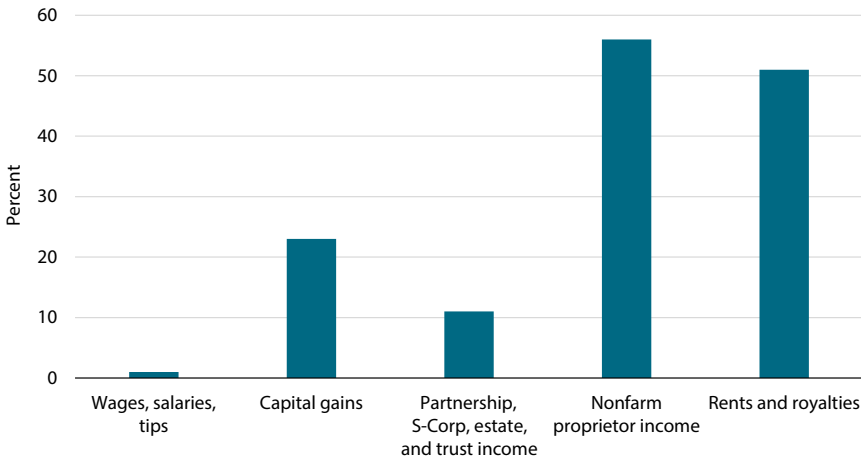


Source: International Revenue Service (IRS) 2019b; authors' calculations.

Note: Estimates are for the average of 2011, 2012, and 2013. Each component represents a given component's tax gap as a percent of the gross tax gap (\$458 billion). The gross tax gap is the sum of the nonfiling tax gap, underreporting tax gap, and underpayment tax gap. Individual incomes (wage, salaries, and tips; capital gains; partnership, S-Corp, estate, and trust income; nonfarm proprietor income; and rents and royalties) are estimates of underreporting. Other individual income, corporate, employment, and estate are sums of nonfiling, underreporting, and underpayment estimates for each given tax gap component.



**FIGURE 7B.**  
**Percent of Individual Income Taxes Underreported, 2011–13**



Source: International Revenue Service (IRS) 2019b.

Note: Estimates are for the average of 2011, 2012, and 2013. Each bar represents the percent of taxes due for that particular tax return line item that were underreported in an average year between tax years 2011–13.



## Economic Implications of Tax Design

The taxes described above do more than simply raise revenue: They also shape the economy by changing incentives and generating economic distortions. The cost of the tax system is often referred to as deadweight loss or excess burden, defined as the cost incurred by society above and beyond the revenues raised by government. (See the appendix for an illustration of deadweight loss and tax incidence.) If revenues could be raised without changing the behavior of firms or individuals, the tax system would generate no economic distortions. However, with some exceptions—Pigouvian taxes, discussed in box 1, are an important example—taxes tend to discourage socially beneficial activities and thereby generate costs for society. Another exception relates to what economists call “economic rents” (i.e., unearned profits often generated by monopoly profits or preferential government regulation). If supernormal returns—that is, returns above the normal return to capital that prevails in the economy—tend to be associated with economic rents, then taxes on those supernormal returns (see Furman 2020 in this volume) would be less socially costly.

In the case of personal income and payroll taxation, individuals subject to a tax on their labor earnings will have an incentive to supply less market labor and to spend more time on untaxed leisure. Individual responses to labor taxation can also take the form of reduced human capital investments, given that the return on those investments is diminished by the tax. Such changes in behavior contribute to the social cost of taxation (above and beyond the transfer of income from taxpayers to the government). Minimizing these costs and building an efficient tax system is an important objective for policymakers.

Fairness in taxation is just as important as efficiency. An oft-used taxonomy of fairness concerns includes horizontal equity, vertical equity, and simplicity. Horizontal equity requires that taxpayers of equal means (or in similar circumstances) face the same tax burden. This principle is violated when, for example, consumption of certain goods is taxed more heavily than consumption of other goods, causing individuals with different preferences to make different tax payments, or when tax avoidance and evasion allow some to escape taxation. Vertical equity requires that those with greater means make greater contributions. This can be understood in terms of the progressivity of a tax: the degree to which those with greater resources pay a higher *share* of their resources. And simplicity makes it easier for taxpayers to understand how they contribute, allowing participation in discussions about appropriate tax policy.

Here we focus on two concepts for understanding excess burden and fairness: the elasticity of taxable income (ETI) and progressivity, respectively.<sup>13</sup> The first is a measure of how much taxable income declines as the tax rate rises and is in some circumstances proportional to the social cost of a tax (Chetty 2009; Feldstein 1999). When an ETI is estimated to be higher for one tax instrument than for an alternative, taxpayers are escaping the tax to a greater extent either through shifts in their economic behavior or other forms of tax avoidance. In turn, a high ETI estimate is an indication that the tax is costlier than the alternative.

BOX 1.

## Pigouvian Taxes

For one specific type of tax, discouraging the taxed activity is a feature rather than a bug. A Pigouvian tax is applied to activities that have negative social impacts that are not taken into account by market participants. In the presence of such a tax, market participants internalize such costs and adjust their behavior accordingly. For example, if a firm does not pay for the pollution it generates, it will generally produce too much of a good that generates pollution. To address this problem, policymakers could regulate the pollution directly, or alternatively could apply a tax equal to the social cost of the pollution. With the latter approach, the firm faces the true social cost of its activity and engages in the efficient amount of pollution abatement.

In many ways, Pigouvian taxes are the opposite of typical taxes. Instead of seeking revenue with minimal distortions, the point of Pigouvian taxes is in fact to generate changes in behavior. They can still be used to raise revenue, and often are, but the point of such taxation is to align social costs and benefits.

A notable Pigouvian tax under discussion today is a tax on carbon emissions. Economic activities that generate carbon emissions impose costs on society, but, except in jurisdictions with a sufficiently high carbon tax or cap-and-trade system, those activities do not bear the true social cost of emitting carbon.<sup>14</sup>

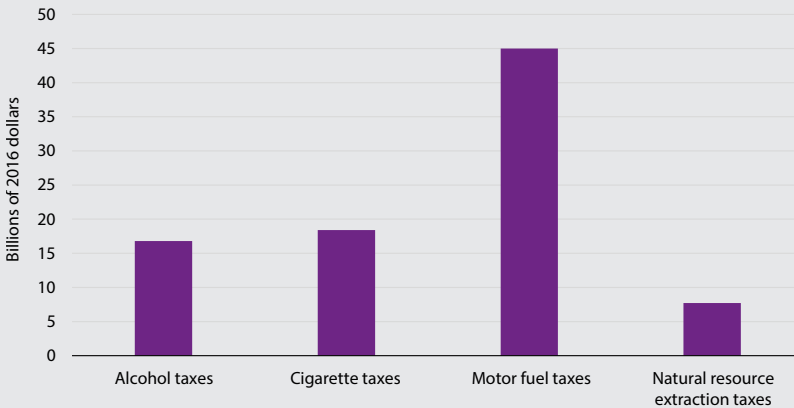
So-called sin taxes on activities such as drinking and smoking are similar to Pigouvian taxes in that they tax behaviors that have negative spillovers. However, the more important motivation

for such taxes may be that they are a source of revenue with an unsympathetic tax base. User fees (such as tolls) are also analogous to Pigouvian taxes in that when any one individual uses a road or a bridge, they generate costs for others in the form of wear and tear and congestion. By pricing the use of infrastructure, the tax or fee can realign social costs and benefits.

Box figure 1 shows the sums of revenue raised at the state and local level from taxes with Pigouvian features. A concern with such taxes is that they often fall more heavily on the poor, who spend a higher share of their income on cigarettes or gasoline, making these taxes regressive in structure. The regressivity of Pigouvian taxes can be offset with either an increase in the overall progressivity of the tax system or through lump-sum rebates.

BOX FIGURE 1.

### State and Local Revenue from Pigouvian Taxes



Source: Urban Institute 2016.

Note: Estimates are for 2016 and represent revenue from state and local governments only. Motor fuel taxes include taxes on gasoline, diesel, and gasohol. Natural resource extraction taxes (severance taxes) include taxes on the extraction of various natural resources, including oil and natural gas.

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The second concept—progressivity—is typically understood in terms of tax burden as a share of taxpayer income. When those with higher incomes face a higher average tax rate, a tax is progressive. The two concepts are sometimes in tension and sometimes in agreement. For example, additional tax enforcement could raise the effective tax rate on the highest-income households and corporations while reducing taxable income elasticities—

which would be both efficient and equitable (Saez, Slemrod, and Giertz 2012). But raising taxes on high-income taxpayers could increase progressivity at the cost of greater excess burden, depending on their response to the increase. We examine the progressivity of the tax code in the final section of this chapter.

## HOW TAXPAYERS RESPOND TO TAXES

At the most basic level, a tax rate increase tends to further discourage whatever is being taxed. This takes the form of a substitution effect (which means that untaxed activities such as leisure are now more appealing relative to taxed activities such as supplying labor in the marketplace); and an income effect (the tax reduces a person's available resources and may lead them to supply more labor). But the exact extent to which a tax discourages something is important for assessing the desirability of that tax.

There are reasons why some taxes should, in theory, be more efficient than other taxes. A land tax should be especially efficient because the total stock of land is fixed and landowners cannot (in aggregate) escape the tax. A tax on consumption, such as a value-added tax, distorts the labor-leisure decision but does not affect the decision to consume today or tomorrow. By contrast, a tax on income (with no deduction for savings) discourages both labor supply and savings. Taxes on capital income tend to lower the attractiveness of deferring consumption and thereby reduce savings and investment.<sup>15</sup>

Another relevant consideration is the *salience* of a tax. Some taxes are especially visible to payers, like an income tax that they must pay explicitly at the end of the year.<sup>16</sup> Other taxes, especially if they are not incorporated into posted prices, may be less salient and will tend to produce a smaller taxpayer response (Chetty, Looney, and Kroft 2009).<sup>17</sup>

Economists have extensively explored the empirical effects of different taxes (e.g., Gruber and Saez 2002; and Saez, Slemrod, and Giertz 2012). One of the most important effects to estimate is the ETI. As mentioned above, the ETI measures how responsive the tax base is to the tax rate. The higher the elasticity, the more dramatically the tax base erodes when the tax rate rises, and the less efficient the tax is at raising revenue.<sup>18</sup>

Some taxes tend to offer few avoidance opportunities and consequently have low ETIs. For example, payroll taxes are generally more difficult to avoid than income taxes, which results in diminished responsiveness (relative to the income tax) of the earnings base to the payroll tax rate (Lehmann, Marical, Rioux 2013; Saez, Matsaganis, and Tsakloglou 2012).

Other taxes (at least as currently designed and enforced) are easier to avoid, especially when set at high rates: Recent studies of the United States have tended to find capital gains ETIs in the range of 0.6 to 0.9, reflecting the fact that people can avoid the tax by not selling assets (Congressional Research Service 2019).

Much of the research on taxpayer responses has focused on the individual income tax, given its large role in the tax system and the many opportunities it offers for avoiding tax burden. In table 1 we present a range of ETI estimates from different researchers. The studies featured here focus on different taxpayer populations, apply different methods, and evaluate different tax reforms; it is therefore unsurprising that estimates vary. But recent studies have produced estimates between 0.3 and 0.9, which are smaller than older estimates but still suggestive of considerable taxpayer responsiveness to changes in income tax rates.

However, one should not think of the ETI as being an immutable characteristic of a tax: Saez, Slemrod, and Giertz (2012) note that the ETI is to some extent a policy choice, affected by the avoidance opportunities offered in a given tax policy environment, as well as by the enforcement activities undertaken by the tax authority. For example, if evasion is more harshly punished, the ETI will likely be lower than otherwise.

Tax expenditures are another such policy choice. When taxpayers have many opportunities to shelter income from taxation (e.g., incurring mortgage debt or delaying realizations of capital gains), a marginal tax rate increase tends to yield less additional revenue. Indeed, individuals' use of tax expenditures may be substantially more responsive to the marginal tax rate than their gross income (Hamilton 2018). This downside must be balanced against the social objective of subsidizing the tax-favored activity: for example, a tax expenditure exists for charitable donations because policymakers believe it to be in the public interest for charitable activities to be encouraged. When evaluating a tax expenditure, it is important to ask whether the favored activity is worth subsidizing through the tax code.

## **HOW THE ECONOMY RESPONDS TO TAXES**

Countries have made widely varying choices about the level of their tax burdens. As shown in figure 2, revenue as a share of GDP varies from 16.1 percent in Mexico to 46.1 percent in France in 2018. How do all these different choices affect overall economic growth and other macroeconomic outcomes?

TABLE 1.

## Taxable Income Elasticity Estimates for the Individual Income Tax

Author (date)	Estimate of taxable income elasticity	Sample	Tax law change	Dataset
Lindsey (1987)	1.6–1.8	All income groups	ERTA (1979)	SOI
Auten and Carroll (1995)	0.46–3.04	All income groups	TRA 86 (1985, 1989)	CWHS
Feldstein (1995)	1.04–3.05	All income groups	TRA 86 (1985, 1988)	SOI/CWHS
Sammartino and Weiner (1997)	Large transitory; small permanent	Top 1 percent	OBRA 90 and 93 (1989–1994)	SOI/SOCA
Carroll (1998)	0.4	> \$50K percent	OBRA 90 and 93 (1989–1995)	SOI
Auten and Carroll (1999)	1.1–1.3	Joint > \$21K Single > \$15.6K	TRA 86 (1985, 1989)	SOI
Long (1999)	0.193–0.819	\$0 to \$200K	State variation (1991)	SOI Public Use File
Goolsbee (2000)	0–0.40	Upper income	OBRA 93 (1991–1995)	S&P EXECUCOMP
Moffitt and Wilhelm (2000)	0–1.83	All income groups	TRA 86 (1983, 1989)	SCF
Gruber and Saez (2002)	0.4	All income groups	ERTA and TRA 86 (1979–1990)	SOI/CWHS
Kopczuk (2003)	0.21–0.57 without tax base effect; 0.53 overall	All income groups	ERTA & TRA 86 (1979–1990)	SOI/CWHS
Saez (2003)	0.311	All income groups	Bracket creep (1979–1981)	SOI/Michigan Panel
Saez (2004)	0–1.7 (pairs of years); 0.62 for top 1 percent	All income groups	1960–2000	SOI
Giertz (2007)	0.2–0.3	All income groups	1979–2001	SOI/CWHS
Auten and Joulfaian (2009)	0.6–1.3	Incomes exceeding \$200K	Various reforms	SOI
Heim (2009)	0.3–0.4	All income groups	EGTRRA 2001 and JGTRRA 2003	1995–2001 Edited Panel
Weber (2014)	0.86	Incomes exceeding \$10K	TRA 1986	CWHS
Kumar and Liang (2016)	0.7	Incomes exceeding \$10K	ERTA 1981, TRA 1986	CWHS

Source: Auten and Joulfaian 2009; Giertz 2004; Heim 2009; Kumar and Liang 2016; Saez, Slemrod, and Giertz 2012; Weber 2014.

Note: Estimates are net-of-tax elasticities; i.e., estimates indicate the percent increase in taxable income associated with a one-percentage-point increase in the net-of-tax rate. The net-of-tax rate is one minus the tax rate. ERTA refers to the Economic Recovery Tax Act of 1981. TRA refers to the Tax Reform Act of 1986. OBRA refers to the Omnibus Budget Reconciliation Acts of 1990 and 1993. EGTRRA refers to the Economic Growth and Tax Relief Reconciliation Act of 2001. JGTRRA refers to the Jobs and Growth Tax Relief Reconciliation Act of 2003. SOI refers to the IRS Statistics of Income data. CWHS refers to the Continuous Work History Survey of the SOI. SOCA refers to the Sales of Capital Assets panel of the SOI. SCF refers to the Survey of Consumer Finances.



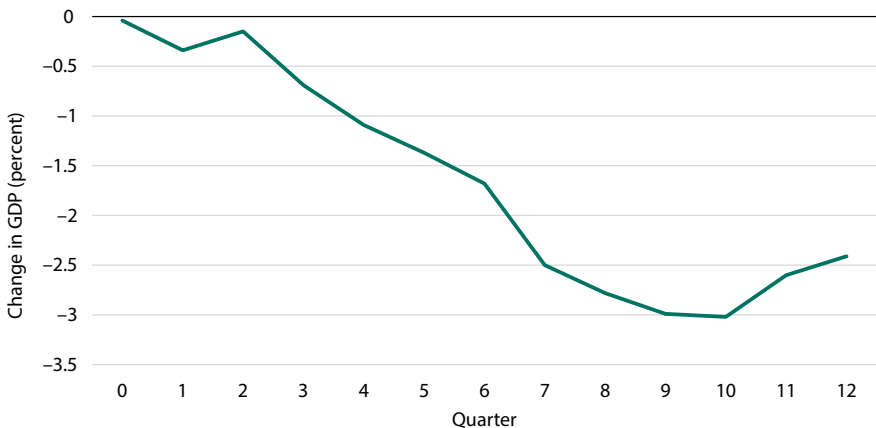
Overall tax burden reflects a balance between conflicting objectives. On the one hand, tax revenue is necessary to fund valuable public goods: infrastructure, social insurance, national defense, and other public priorities contribute to economic output and social welfare more broadly. On the other hand, taxes impose burdens on individuals and families that can be impediments to economic activity. It is therefore an empirical matter whether a small tax increase from a given level would, in the long run, tend to boost or harm economic activity.

Macroeconomic effects may also vary over the short and long runs. A deficit-financed tax cut, for example, serves as fiscal stimulus and could increase growth over the short run even if it does not increase it in the long run.<sup>19</sup>

Figure 8, reproduced from Romer and Romer (2010), shows that an incrementally larger tax burden tends to reduce GDP. The authors estimate that a one-percentage-point increase in tax burden (as a share of GDP) reduces GDP by roughly 3.1 percent (relative to a counterfactual in which taxes were not increased) after 2.5 years have elapsed. These effects are estimated based on exogenous tax changes (i.e., those not driven by changing economic conditions or by the desire to fund new government spending). Of course, taxes are usually not raised and lowered in a vacuum. If the tax increase is used to finance activities with substantial value to

FIGURE 8.

### Change in GDP After a 1-Percent of GDP Increase in Tax Revenue



Source: Romer and Romer 2010.

Note: The figure shows the estimated percent change in GDP (i.e., the percent difference between GDP with and without the tax increase) after an exogenous tax increase equal to 1 percent of GDP. Estimates control for lagged GDP growth.

the economy (e.g., education, transfers that benefit children, research, and infrastructure), the net effect on the economy could be either positive or negative. Similarly, a tax cut that generates reductions in crucial investments would likely be a net negative for economic growth.

Every tax reform is different. A reform could start from a position of fiscal strength or weakness, could occur in a strong or weak economy, and could make the tax system more or less efficient. The TCJA of 2017 made sweeping changes to the U.S. tax system and raised projected deficits by \$1 trillion to \$2 trillion over 10 years (TPC 2019). Box 2 describes estimates and projections of the 2017 law's effects on U.S. GDP.

Another way that tax reforms differ is by how they shift the burden across low- and high-income taxpayers. The effects shown in box figure 2 are for the economy as a whole, but do the macroeconomic impacts differ when tax burdens are changed for low-income versus high-income people? A recent study examining these differences found that tax increases levied on the bottom 90 percent of taxpayers are substantially more harmful to GDP, consumption, labor force participation, and employment growth

#### BOX 2.

### What Did TCJA Do for Growth?

The name of the Tax Cuts and Jobs Act of 2017 suggests that part of the stated goal of the act was to reduce taxpayer burden and spur employment to increase economic growth. A number of studies have examined the expected impact, with nearly all studies expecting a short-run boost to growth as taxpayers and firms received additional after-tax income (enabling greater spending) but a minimal long-run impact for economic growth (Mertens 2018; Page et al. 2017). Over time, many of the individual tax cut provisions expire. In addition, as detailed in Furman's (2020) and Clausung's (2020) chapters in this volume, although the law cut taxes on corporate income, it did not do so in a way that maximized the increase in economic growth.

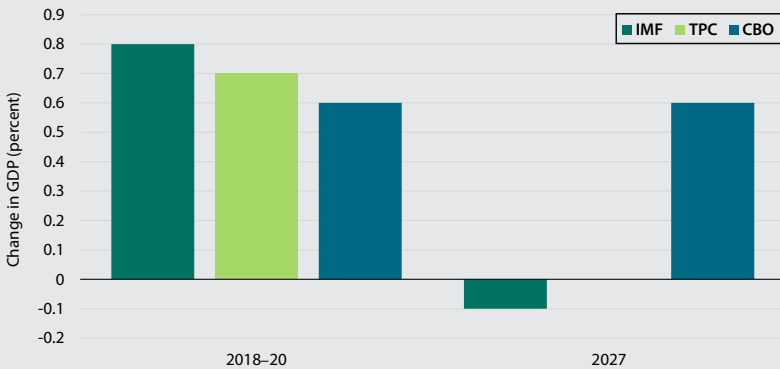
Balanced against the changes to rates are the effects of having larger levels of debt and/or smaller levels of government investment due to the \$1.5 trillion to \$2.0 trillion of reduced revenues (TPC 2019). Furthermore, even the short-run stimulus impact of the law

may have been minimized if the Federal Reserve already thought the economy was approaching full employment, in which case a tax cut may have simply caused the Federal Reserve to raise rates faster than it otherwise would have.

As seen in box figure 2, most studies expected the level of GDP to be between 0.6 and 0.8 percent higher on average from 2018–20, implying that the TCJA lifted annual growth by 0.2 to 0.4 percentage points over that period. After 10 years, though, some modelers expect that there will be zero impact on the level of GDP; the Congressional Budget Office (CBO) expects GDP to be 0.6 percent higher, which implies annual growth impacts of roughly 0.05 percentage points.

BOX FIGURE 2.

### Estimates of Percent Change in GDP Due to TCJA



Source: Urban–Brookings Tax Policy Center (TPC) 2019.

Note: Estimates are the change in GDP relative to a baseline without the TCJA in a given year. The TPC estimate for 2027 is zero.

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than the same tax increases levied on the top 10 percent (Zidar 2019). For consumption in particular, one possible explanation for the difference is that lower-income people are more likely to be liquidity constrained, such that a tax increase forces a sharp cut in consumption (Zidar 2019).

Figure 9 shows the effects of a tax increase equal to 1 percent of GDP on the labor force participation rate of the bottom 90 percent and top 10 percent of the income distribution, respectively. By three to four years after a tax increase, the labor force participation rate for the bottom 90 percent has

FIGURE 9.

## Effect of a 1-Percent of GDP Tax Increase on Labor Force Participation



Source: Zidar 2019.

Note: Figure shows effects of a 1-percent of GDP tax increase on the labor force participation rate for those with adjusted gross income in the bottom 90 percent nationally and for those with adjusted gross income in the top 10 percent nationally.



declined more than three percentage points. For the top 10 percent, the labor force participation rate fell only about one percentage point.

The pattern evident in figure 9 is consistent with a larger body of evidence demonstrating low and stagnant returns to work for low- and middle-wage workers (Nunn, Parsons, and Shambaugh 2019; Shambaugh et al. 2017). Lower returns to work can make labor force attachment more sensitive to changes in taxes. Figure 9 also reflects the tendency for lower-wage workers to be more exposed to cyclical fluctuations in the economy. Hence, a tax increase that reduces fiscal stimulus and slows the economy is more likely to decrease the labor force participation of lower-wage workers (Bernstein 2018).

## Distributional Impacts of Tax Policies

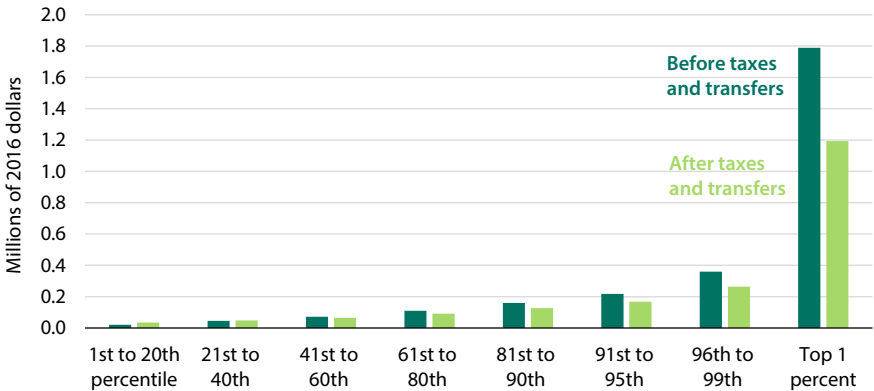
Are taxes distributed fairly? Who bears the burden of the U.S. tax system? And how does that tax system ameliorate (or exacerbate) inequality?

### **INCOME IS HIGHLY CONCENTRATED BUT FEDERAL TAXATION IS PROGRESSIVE**

The U.S. federal tax code (including government transfers) is progressive, drawing on a larger share of top earners' income than that of lower earners. Comparing the distributions of pretax and posttax income illustrates this

FIGURE 10.

## Average Income Levels Before and After Taxes and Transfers, by Income Percentile Group



Source: Congressional Budget Office (CBO) 2019b.

Note: Data are from 2016. “Before taxes and transfers” refers to market income plus social insurance benefits. Market income consists of labor income, business income, capital income (including capital gains), income received in retirement for past services, and other nongovernmental sources of income. “After taxes and transfers” refers to income before taxes and transfers plus federal, state, and local means-tested transfers (including benefits from Medicaid and the Children’s Health Insurance Program, the Supplemental Nutrition Assistance Program, and Supplemental Security Income) minus federal taxes. See CBO (2019b) for more details.

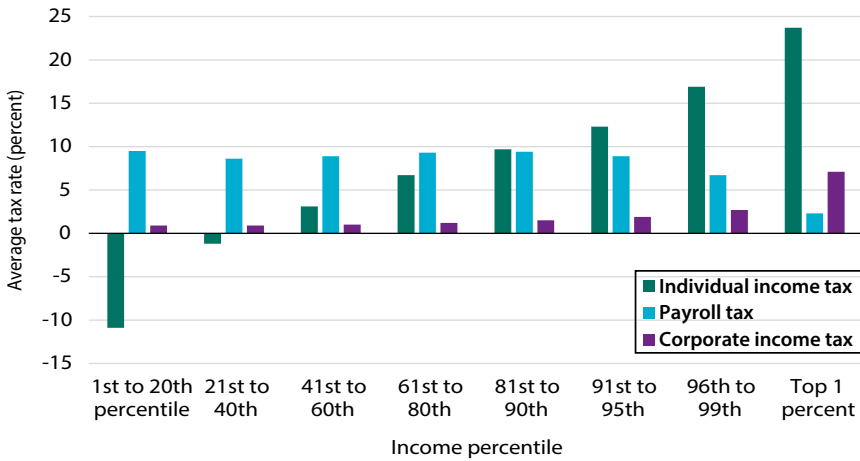


point (figure 10).<sup>20</sup> More striking, though, is the highly unequal allocation of income across households. As many have noted, the period from 1980 through the present has seen income become much more concentrated at the top.<sup>21</sup>

The current income distribution depicted in figure 10 shows this high concentration of income. By the Congressional Budget Office’s (CBO) estimate, the top 1 percent of the income distribution has an average annual income (before taxes and transfers) of nearly \$1,800,000, as compared to \$73,000 for the average of the middle quintile.<sup>22</sup> Those numbers are reduced to \$1,200,000 and \$66,000, respectively, after adjusting for taxes and transfers. At the bottom 20 percent of the income distribution, taxes and transfers boost average incomes from \$21,000 to \$35,000. Transfers—including the value of government-subsidized health care—explain why income can be higher after taxes for those at the bottom of the distribution. In some cases these transfers are not actually cash income but rather access to resources like food (through SNAP) or healthcare (through Medicaid or CHIP). The inclusion of the value of health insurance may boost incomes at the bottom of the distribution by a misleading amount if people do not place as high a value on the insurance as it costs to provide it.

FIGURE 11.

## Average Effective Federal Tax Rates by Income Percentile Group



Source: Congressional Budget Office (CBO) 2019b.

Note: Data are from 2016. Average effective federal tax rates are calculated by dividing total federal taxes by total income before transfers and taxes in each income group. Income before taxes and transfers refers to market income plus social insurance benefits. Market income consists of labor income, business income, capital income (including capital gains), income received in retirement for past services, and other nongovernmental sources of income. Social insurance benefits include Social Security and disability insurance, Medicare, unemployment insurance, and workers' compensation. Income percentile groups are created based on household income before taxes and transfers. Excise taxes are not included in this figure; thus, the sum of the average effective federal tax rates in this figure (individual income, payroll, and corporate income taxes) are not exactly equal to the effective marginal tax rates.

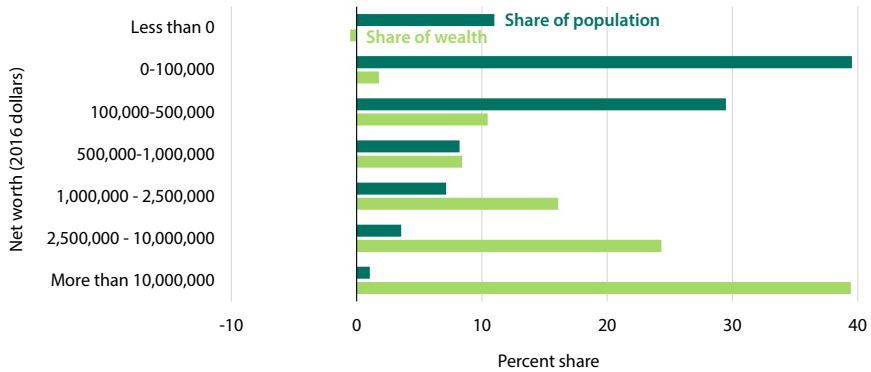
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The gaps between pretax and posttax income can also be understood in terms of the average tax rates faced by taxpayers in different parts of the income distribution. Figure 11 shows average effective federal tax rates, as opposed to top marginal rates, by percentile of the income distribution. The individual income tax is the primary driver of overall progressivity, whereas the corporate income tax, after it is assigned to individual taxpayers who ultimately bear its burden, makes a smaller contribution to progressivity, and the payroll tax has a regressive effect. For the lowest earners, tax burden consists almost entirely of payroll taxes, which for some households can be offset by refundable credits like the Earned Income Tax Credit. The shift over time away from corporate taxation and towards payroll taxation has reduced the progressivity of the tax code, as have the most recent reductions in corporate tax rates and top marginal rates on individual income.

The CBO calculated that the top percentile of earners faced an average effective federal rate of 33.3 percent in 2016, most of which is associated with the individual income tax.<sup>23</sup> At the other end of the distribution, the bottom 20 percent of the income distribution faced a combined federal

FIGURE 12.

## Wealth and Population Shares, by Net Worth



Source: Federal Reserve 2016 (Survey of Consumer Finance); authors' calculations.

Note: Data are from 2016. "Share of wealth" is created by totaling net worth across the sample. "Net worth" is defined as all assets and debts of an individual. The share of wealth for those with a negative net worth is represented as a negative value since those with a negative net worth decrease the net worth calculation.



effective rate of 1.7 percent in 2016.<sup>24</sup> Total tax burdens, inclusive of state and local taxes, are less progressive than the federal burden alone: most transfers to low-income households are funded at the federal level and state and local governments often rely heavily on sales tax or other taxes that can be regressive.

When assessing the distributional impacts of taxes, it is important to be aware that the statutory incidence of tax instruments—the distribution of actual payments made to the government—is sometimes different from *economic* incidence, which falls on the individuals who ultimately bear the burden of a tax. For example, the Social Security payroll tax is split equally between employers and employees: its statutory incidence is equally shared. But the economic incidence of the tax is believed to be mostly on workers, who experience a decline in their pretax wages when a payroll tax is instituted and effectively pay some of the employer share of the payroll tax, in addition to their own share (Fullerton and Metcalf 2002).<sup>25</sup> Changes in wages and other prices can shift the burden of a tax from the individual or business that nominally pays it to a different party.<sup>26</sup>

## WEALTH IS HIGHLY CONCENTRATED

Despite a certain degree of progressivity in the tax and transfer system, economic prosperity remains very unequally shared. This inequality is fully evident in figure 12, which draws on family-level microdata from the Survey

of Consumer Finances to show the extremely concentrated distribution of wealth.<sup>27</sup> Over 10 percent of the population has negative wealth and almost another 40 percent of the population has a net worth of less than \$100,000 (which includes housing, vehicles, and retirement wealth). One percent of the population has a net worth of at least \$10 million; this group accounts for 39 percent of total net worth held in the United States.

The U.S. tax system is largely oriented around income rather than wealth, but wealth disparities have increasingly been discussed in conjunction with tax policy (Saez and Zucman 2019). These disparities can serve as motivation for enhanced progressivity in traditional tax instruments, like estate and income taxes, or they can be addressed directly through progressive wealth taxes.<sup>28</sup> Box 3 describes two important drivers of wealth disparities: education and race.

BOX 3.

### Educational and Racial Disparities in the Distribution of Wealth

Wealth disparities across groups reflect accumulated differences in after-tax income, much of which is the product of racial barriers to economic opportunity (Hardy, Logan, and Parman 2018). Though it does not explicitly address racial disparities, tax policy affects racial wealth gaps. Those gaps are large: White households comprise 90 percent of households in the top 1 percent of the wealth distribution despite constituting only 65 percent of all households. By contrast, Black households represent 15 percent of all households but comprise 20 percent of households in the bottom 60 percent of the wealth distribution (Huang and Taylor 2019). In 2016 the median White household had a net worth 10 times greater than that of the median Black household (Federal Reserve 2016; authors' calculations).

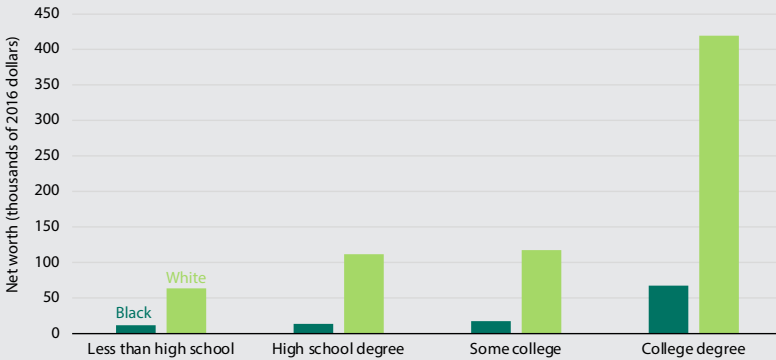
These racial gaps persist even after adjusting for differences in educational attainment. Although college graduates—Black and White—have greater net worth than others, box figure 3 underscores that educational differences are insufficient to account for the racial wealth gap. The net worth of White household heads who have completed less than a high school education is 5.5 times greater than that of Black household heads with similar education,



while the net worth of White household heads with a college degree is 6.2 times greater than that of Black household heads with similar education. As wealth can accumulate over generations, wealth gaps can represent discrimination or unequal opportunities that persist across many generations. Similarly, wealth gaps by education represent not only the impact of education on income and wealth but also the fact that children from wealthy families are more likely to attend college.

BOX FIGURE 3.

### Median Net Worth, by Education and Race



Source: Federal Reserve 2016 (Survey of Consumer Finance); authors' calculations.

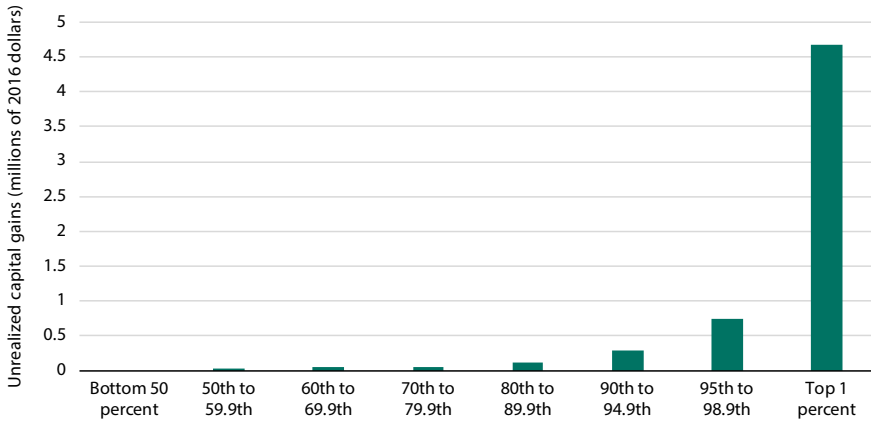
Note: Data are from 2016. Observations are household heads and restricted to ages 25 and older. "High school degree" includes observations with a high school diploma or GED. "Some college" includes observations who attended some college but did not obtain a degree, or who completed an associate degree. "College degree" includes observations with a bachelor's, master's, doctorate, or professional school degree.

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One factor that limits the progressivity of the current U.S. tax system is its treatment of capital income, which is disproportionately received by high-income taxpayers. The receipt of capital gains and dividend income are taxed at top rates of 23.8 percent and 20.0 percent, respectively—well below the 37.0 percent top marginal rate on ordinary income (TPC 2018; 2019). For some, this preferential treatment of capital income is explained by optimal tax theory: Capital income taxation can discourage savings and generate additional economic distortions relative to labor income taxation, though there is little evidence that the reduction in capital gains taxes in 2003 had meaningful impacts on savings, investment, or growth (Yagan 2015).<sup>29</sup>

FIGURE 13.

## Median Unrealized Capital Gains, by Net Worth



Source: Federal Reserve 2016 (Survey of Consumer Finance); authors' calculations.

Note: Data are from 2016. Data include the following capital gains: primary residence, other real estate, businesses, and stocks and pooled investment funds.

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But the lower rates for capital gains and dividends are sometimes also justified by the realization-based nature of capital income. That is, investors do not pay tax until they “realize” a capital gain by selling an asset that has risen in value.<sup>30</sup> Higher capital gains tax rates intensify the taxpayer incentive to delay their capital gains realizations, thereby limiting how much tax revenue can be obtained as well as distorting the allocation of assets in capital markets. A taxpayer with a gain can effectively continue to generate additional capital income with money that would have been paid to the government if they had instead sold the asset.

Even with relatively low tax rates for capital income, taxpayers maintain vast unrealized capital income. Figure 13 shows the distribution of unrealized capital gains by taxpayer net worth. The top 1 percent of wealth holders possess on average \$4,670,000 of capital gains that they have yet to realize, while those in the 50th to 59th percentile of net worth report only \$27,000. *Realized* capital gains in a typical year averaged roughly \$700 billion from 2014 to 2016, or roughly 4 percent of GDP.<sup>31</sup> In general, capital gains taxation represents less than 10 percent of overall income taxes paid (Federal Reserve 2016). Combined with the small—and shrinking—share of taxes from corporate income, this means a large share of U.S. taxation falls on work, and not on wealth.

## Conclusion

Decisions about taxes are among the most frequently and hotly debated policy choices a government makes, affecting people in many aspects of their lives. Changes in tax policy generally create both winners and losers and are therefore especially controversial. The United States remains a relatively lightly taxed economy, and projections are that tax revenue will substantially lag spending for the foreseeable future.

Fiscal policy must be evaluated from several perspectives. From a macroeconomic standpoint, the size of a budget deficit (or surplus) matters for the amount of aggregate demand the government is providing to the economy; a fiscal deficit can also raise solvency concerns and affect financial market conditions more broadly. From a microeconomic standpoint, the details of spending policy are crucial: Government spending on infrastructure, education, health, research, defense, and countless other priorities help determine our economic future. Spending on income transfers, whether to the elderly or the poor, can have substantial impacts on peoples' lives and overall income inequality.

How revenue is raised, though, can be just as important. Taxes can discourage some economic activities or, via deductions and credits, can be used to encourage activity. Current tax policy falls heavily on work through payroll taxes and income taxes. Capital income is also taxed, but the corporate tax raises far less revenue as a share of the economy than it used to, and capital gains and estate taxation are a small share of income taxation. Furthermore, while the U.S. tax code is on average progressive, high levels of income and wealth inequality provide strong arguments for raising revenue in a more progressive fashion.

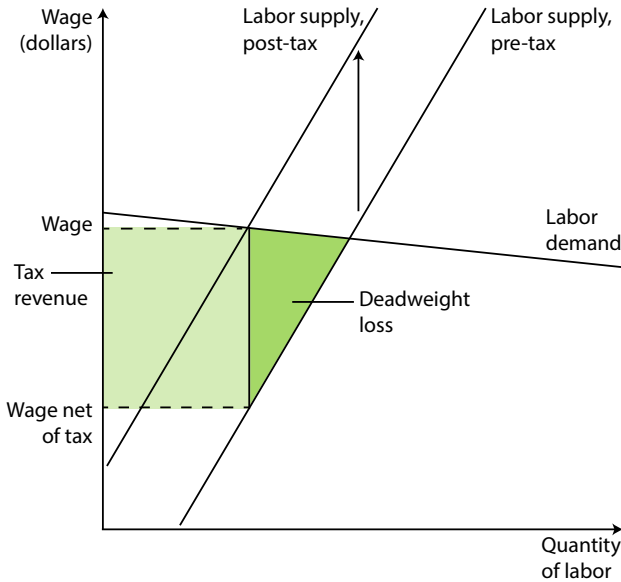
## Appendix

When an activity is taxed, it is discouraged to some extent. Appendix figure 1 characterizes this effect and the possible distortions that arise from taxation by showing the impact of an income tax on labor supply. The impact of the tax is depicted by the inward shift in the labor supply schedule from the pretax to posttax lines.<sup>32</sup> Workers receive a lower wage net of the tax, and thus the amount of labor workers are willing to supply would be lower at the same wage before the tax was instituted. The darker green shaded area directly below that arrow is the deadweight loss. This deadweight loss represents the fact that the tax does not simply raise revenue, but also generates a reduction in the taxed activity. The more an activity is discouraged, and the larger this shaded area, the larger the

efficiency cost of a tax. As discussed near the end of this chapter, figure 8 also depicts the *incidence* of a tax, or the allocation of the burden across market participants. In this case, the bulk of the tax falls on workers, but a small portion falls on firms who will need to pay more to get a given amount of labor due to the labor supply shift.

APPENDIX FIGURE 1.

### The Deadweight Loss from Taxation



### Acknowledgments

We are grateful to Lauren Bauer, David Dreyer, William Gale, Joy Fox, Seth Giertz, Greg Leiserson, Kriston McIntosh, Elena Patel, David Splinter, Owen Zidar, and Gabriel Zucman for insightful comments. We would also like to thank Jimmy O’Donnell, Jana Parsons, and Christopher Robinson for excellent research assistance.

## Endnotes

1. As is discussed later, in some cases the government wants to discourage certain activities and can use taxes to curtail them (e.g., smoking or pollution).
2. Potential GDP is a measure of maximum sustainable economic output; it abstracts from business cycle volatility that generates fluctuations in actual GDP.
3. This decline was prompted by major tax cuts in 2001 and 2003 as well as a recession in 2001.
4. The reduction in corporate tax revenue share is partly attributable to the increase in income flowing to pass-through businesses (Smith et al. 2019).
5. Note that the top marginal rate and the average tax rate (not shown in figure 4) are distinct; over time the fraction of taxpayers (and taxable income) exposed to the top marginal rate can vary.
6. This is in part due to a shift from corporate income to business pass-through income that increased personal income tax revenue (Smith et al. 2019).
7. The payroll tax base is comparatively simple, consisting of personal labor income up to a cap (\$132,900 in 2019) for the 12.4 percent Social Security taxes and personal labor income without a cap for the 2.9 percent Medicare payroll tax.
8. Note that these calculations are static in the sense that, for example, the capital gains expenditure assumes no taxpayer response if the capital gains tax rate were to be raised to that of ordinary income taxation (Kamin 2015).
9. The rent that landlords receive is subject to tax. Similarly, economists think of homeowners as paying (in their capacity as housing users) themselves an imputed rent (in their capacity as housing owners). This imputed rent is not subject to tax under current law. The capital gains expenditure is the lost revenue associated with the lower rate on capital gains relative to personal income.
10. In the public finance literature, the term “evasion” refers to illegal activities, while the term “avoidance” refers to legal responses to taxes that may include use of tax expenditures.
11. For example, taxpayers respond substantially to the estate tax, with larger responses from those who have advance warning of their deaths (Kopczuk 2007, 2013).
12. Slemrod (2019) reviews empirical research on tax evasion and strategies to combat it. He explains that the optimal degree of tax enforcement depends on the costs of these strategies as well as the efficiency costs and equity concerns raised by tax evasion. See also Sarin and Summers (2019) for an extensive discussion of tax enforcement in the United States.
13. We follow the public finance literature in defining the ETI as the percent change in taxable income resulting from a 1-percent increase in the net-of-tax rate, which is in turn defined as one minus the tax rate.
14. For a detailed discussion of carbon taxes, see The Hamilton Project and Stanford Institute for Economic Policy Research (2019) and Morris (2013).
15. Tax economists have described conditions under which it is socially optimal to set a tax rate of zero on capital income (Chamley 1986 and Judd 1985). However, practical considerations, such as the ease with which labor income can be misclassified as capital income (Christiansen and Tuomala 2008; Smith et al. 2019) or imperfections in capital markets (Piketty and Saez 2012), among other reasons, justify substantial positive capital income tax rates. See also Conesa, Kitao, and Krueger (2009) for further discussion.
16. Policy choices about implementation of a tax can affect its salience. For example, income tax withholding may reduce the salience of the income tax by reducing or eliminating the necessity of making an end-of-year payment (Jones 2012).
17. For reasons of space, we do not discuss other types of response. For example, Piketty, Saez, and Stantcheva (2014) suggest a role for bargaining effects, whereby low tax rates on income induce high earners to bargain aggressively for additional compensation.
18. Researchers focus on the compensated ETI, which is the taxpayer response to an increased rate when holding taxpayer utility constant. In other words, the compensated ETI abstracts from income effects and implicitly assumes that tax revenues are returned lump sum to taxpayers.
19. Some researchers argue that fiscal contraction, particularly when associated with spending reductions, can be expansionary in some special circumstances (Alesina, Favero, and Giavazzi 2018), but the overwhelming bulk of evidence shows that fiscal expansion when the economy is below full employment has positive impacts. See Boushey, Nunn, O’Donnell, and Shambaugh

- (2019) for discussion.
20. Posttax income includes transfers like benefits from Medicaid and the Children's Health Insurance Program, the Supplemental Nutrition Assistance Program, and Supplemental Security Income.
  21. See Piketty, Saez, and Zucman (2019) as well as the updated data available at <http://gabriel-zucman.eu/usdina/>. There is a consensus that the top share of pre-tax/pre-transfer income has increased over time. However, researchers disagree about the precise size of this increase (for example, see Auten and Splinter 2019).
  22. It is important to note that this constitutes a snapshot of income and does not capture volatility. Auten, Gee, and Turner (2013) found that more than half of those in the top one percent dropped out of that group after five years.
  23. Researchers disagree about this number and the overall progressivity of the tax code. In particular, there are debates about the very top of the distribution where Saez and Zucman (2019) find a lower tax rate for this group (inclusive of federal, state, and local taxes) than for many other taxpayers. See also Piketty, Saez, and Zucman (2018) and Auten and Splinter (2019).
  24. One important analytical consideration is whether transfers are included in the definition of income used to estimate average tax rates. Saez and Zucman (2019) calculate a bottom 50 percent average tax rate of 25 percent (inclusive of all local, state, and federal taxes) when excluding the refundable portion of tax credits from the denominator, whereas Auten and Splinter (2019) calculate this rate to be 13 percent when including transfers in the denominator (both calculations are for 2015).
  25. However, statutory incidence may affect economic incidence to some extent, as was found by Saez, Matsaganis, and Tsakoglou (2012) in a study of a Greek tax reform, and by Chetty, Looney, and Kroft (2009) in cases where tax salience is limited.
  26. The corporate income tax produces an even more complicated problem for analysts seeking to understand its incidence. Ultimately, corporate taxation is borne by some combination of workers, consumers, and capital owners. If wages fall in response to an increased corporate income tax, then workers bear some of the total burden. The Urban-Brookings Tax Policy Center (TPC), for example, assumes that in the long run workers bear 20 percent of the burden of the corporate income tax (TPC 2019).
  27. The Survey of Consumer Finances sample excludes the top earners listed in the Forbes 400, which limits its ability to capture wealth owned by the very wealthiest families. The Survey also omits the capitalized value (i.e. wealth) of defined benefit retirement income. However, it has the desirable features of (a) capturing the market value (as opposed to book value) of assets, and (b) not being sensitive to estimated parameters like rates of return, among other advantages (Bricker et al. 2016). Other methodological approaches to wealth estimation like the estate and capitalization approaches can provide complementary assessments of wealth inequality.
  28. See the subsequent chapters in this volume by Lily Batchelder (2020) and Greg Leiserson (2020).
  29. Yagan (2015) finds that the reduction in the dividend tax generated no new corporate investment or increased employee compensation.
  30. Realized capital gains are procyclical, boosting federal revenues during economic booms and reducing revenues during downturns. This can make the tax system appear more progressive during booms, when high-income taxpayers report substantial capital gains income.
  31. Capital gains accruing to the bottom 80 percent represent less than 1 percent of that cohort's taxable income, but those accruing to the top 1 percent account for as much as 40 percent of their income (Federal Reserve 2016).
  32. There is also an offsetting income effect. Because the tax makes people poorer, they may want to work more to have a desired amount of income to spend. The shift shown in the figure is the total effect including this offsetting influence.

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