



Munich Personal RePEc Archive

Raising Revenue with a Progressive Value-Added Tax

Gale, William G.

The Hamilton Project

January 2020

Online at <https://mpra.ub.uni-muenchen.de/99197/>

MPRA Paper No. 99197, posted 25 Mar 2020 10:26 UTC

Raising Revenue with a Progressive Value-Added Tax

William Gale, *Brookings Institution and Urban-Brookings Tax Policy Center*

Abstract

To raise revenue in a progressive, efficient, and administrable manner, this chapter proposes a new national consumption tax: a broad-based credit-invoice value-added tax (VAT). The proposal comes with several qualifications: the VAT should complement, not substitute for, new direct taxes on the wealth or income of affluent households; to ensure the policy change is progressive, the VAT should be coupled with adjustments to government means-tested programs to account for price level changes, and with a universal basic income (UBI) program; to avoid having the VAT depress the economy, revenues should be used to raise aggregate demand in the short run and the Federal Reserve should accommodate the tax by allowing prices to rise. A 10 percent federal VAT that funded a UBI equal to 20 percent of the federal poverty line would be highly progressive (with net income rising among the bottom forty percent and not changing in the middle quintile) and would still raise more than 1 percent of GDP in net revenue. VATs are a proven success, existing in 168 countries. VATs have been proposed by both Democrats and Republicans in recent years. Concerns about small businesses, vulnerable populations, and the states can be easily addressed.

Introduction

The future fiscal and economic health of the United States depends on its ability to increase revenues.¹ With high and rising public debt, an aging population that will place increasing demands on federal spending, and a need for new investments in infrastructure, research and development, and human capital, the federal government requires more funding to improve its finances and promote future economic growth and opportunity. Recent fiscal actions that raised current and future budget deficits, including the

Tax Cuts and Jobs Act of 2017 and the Bipartisan Budget Acts of 2018 and 2019, make these matters worse.

One way to collect more revenue is to reform existing taxes. Instead, or in addition, policymakers could create new revenue sources.

This chapter proposes a new progressive, national consumption tax: a broad-based, credit-invoice value-added tax (VAT), sometimes referred to as a “goods and services” tax. The most intuitive way to understand the VAT is that it is like a retail sales tax, but with tax revenue that is collected in parts at each stage of production rather than all at once at the retail level.² Similar to a tax imposed in New Zealand, this VAT would tax a broad base that includes items that other countries’ taxes typically omit: education, health care, financial services, and nonprofits. To maintain parity with the private sector, federal, state, and local government spending would be taxed too, but this taxation of government spending would not raise net revenues, because the federal government cannot raise net revenue by taxing itself and because the proposal would reimburse subnational governments for the VAT they pay. Coupled with a universal basic income that varies with family size and composition, the VAT can raise substantial amounts of revenue in a progressive fashion.

The proposal comes with five important provisions and considerations. First, the VAT proposed here is intended to work in conjunction with other, highly progressive policies, like an ongoing direct wealth tax, capital gains reforms, or other policy changes that raise taxes on well-to-do households. As noted throughout this volume, there are important reasons to raise tax burdens on high-income and high-wealth households relative to others, so this proposal should be read as a complement to—not a substitute for—other ways to raise taxes on the rich.³ This is because taxes on high-income and high-wealth households, by themselves, are not likely to raise sufficient revenue to allow the federal government to control debt, invest in the economy, and provide payments to the elderly (Gale 2019). In addition, pairing a VAT with these policies is likely to make them more effective. One of the easiest ways for higher-income households to avoid wealth taxes or income taxes is to consume more—an avenue that a VAT makes less attractive. Finally, and perhaps most importantly, in light of secular increases in income and wealth inequality, it is inappropriate to ask the middle class to pay the higher taxes a VAT entails without also enacting substantially higher levies on high-income and high-wealth households.

Second, to ensure that the VAT is on balance a progressive reform, it should be coupled with several policies that relieve the burdens on low- and middle-income households. Means-tested government transfers should

be adjusted for any increase in the price level (including the VAT) so that the real after-tax value of these benefits remains unchanged. In addition, Congress should stipulate a one-time change in how Social Security benefits are calculated to counteract what would otherwise be an after-tax benefit reduction imposed on new generations of beneficiaries by the VAT. A VAT with these two adjustments is progressive—it reduces after-tax income of lower-income households by a smaller proportion than it does for higher-income households. The reason is that protected forms of income—Social Security and means-tested transfers—constitute a much larger share of income for lower-income groups.

This policy package can be made even more progressive by using a portion of VAT revenues to provide each household with a universal basic income (UBI) based on family size and composition. This benefit would be provided through quarterly payments to each family, for an annual reimbursement equal to two times the poverty line times the consumption tax rate. For example, with a 10 percent VAT, a family of four would receive about \$5,200 back each year, compensating them for taxes paid on about \$52,000 of consumption.⁴ Families that spend less than two times the poverty line would receive more from the UBI than they would pay in VAT. Families with higher spending would only face a net tax burden when they consume above two times the poverty line. Including the UBI, the VAT is remarkably progressive by conventional standards: after-tax income would *rise* by almost 17 percent in the lowest income quintile, remain virtually unchanged in the middle quintile, and fall by 5.5 percent among the top 1 percent of households.

Third, to avoid the VAT depressing the economy in the short run, most or all of the revenues collected in the years immediately following enactment should be spent on programs that stimulate the economy. For example, revenue from a VAT (after the adjustments described above) could be used to expand the UBI, restructure or reduce other taxes, pay for health care (Burman 2009), fund work incentives (Burman 2019), boost necessary government investments, or provide temporary stimulus, all of which would help offset any demand reduction from the introduction of the VAT. Over time, some of those uses could be scaled back so that revenues from the VAT could be used to reduce the federal debt.

Fourth, in the enabling legislation, Congress should direct the Federal Reserve to accommodate the VAT by allowing the nominal price level to rise by the full extent of the tax. If the price level rises by less than this amount, some of the adjustment to a VAT would take place through declines in nominal wages, which could be a costly and lengthy process.

Fifth, while I am not wedded to a particular tax rate, I use a 10 percent federal VAT in the analysis below. If states converted their existing retail sales taxes to conform with a federal VAT base, they would need to set a VAT rate of 6.6 percent, on average, to raise current levels of revenue in a manner that is more generous to the bottom 40 percent of the income distribution than current sales taxes. The average combined federal-state VAT, 16.6 percent, would be significantly below the 2018 OECD average VAT rate of 19.3 percent.

Taking these five considerations into account, the broad-based credit-invoice VAT this chapter proposes would bring to the United States a progressive and growth-friendly version of the revenue source that so many other nations rely upon. America has never had a national broad-based consumption tax of any kind, but the VAT is the world's most common consumption tax, used by more than 160 countries, including every economically advanced nation except the United States. In 2016, consumption taxes raised just 3.7 percent of GDP in the United States, mainly through state and local sales taxes, compared with 10.5 percent in other OECD countries, mostly through VATs.⁵

VATs are popular for many reasons. First, and most importantly, VATs raise a lot of money. Asked why he robbed banks, Willie Sutton supposedly said, "Because that's where the money is" (Federal Bureau of Investigation 2015). As a tax on a broad measure of consumption, VATs are "where the money is" in tax reform. In other OECD countries, VATs are the third largest revenue source, behind social security and personal income taxes.⁶ A VAT initiated in 2020 at a 10 percent rate would raise \$247 billion, or 1.1 percent of GDP, even after funding a UBI that provides families payments equal to the VAT rate times twice the poverty line. Over the course of 2020–29, the policy would raise \$2.9 trillion. If a UBI were not implemented, the VAT would raise revenue by a whopping \$842 billion in 2020, or about 3.8 percent of GDP.⁷ The 10-year total is about \$10 trillion. The revenue generated by a VAT would provide an enormous pool of resources to address social and economic problems.

Second, VATs are consistent with an efficient and prosperous economy. Future consumption is funded by existing wealth, future wages, or future excess returns on investments. As a result, a consumption tax effectively imposes a one-time implicit lump-sum tax on a broad measure of wealth existing at the time of implementation. The burden of this component of the VAT is imposed immediately upon enactment because the value of wealth changes. This outcome is easiest to see if the consumer price level, which includes the VAT, rises by the full VAT rate. In that case, existing

assets can then be exchanged for less after-tax consumption than before the VAT was imposed.⁸

The burden a VAT places on existing wealth avoids three key pitfalls of a direct wealth tax: The VAT's wealth tax is extremely efficient because it is very difficult to avoid or evade; it does not require explicit valuation of particular assets; and it taxes excess returns, which is not distortionary, rather than taxing all returns, which is. But while this wealth tax is progressive by conventional standards, because the distribution of wealth is skewed toward the top, the burden imposed by the VAT is substantially less progressive than that of a direct wealth tax with a high exemption. While the burden of a VAT on existing wealth is imposed immediately upon enactment through a decline in the purchasing power of existing assets, the explicit tax payments arising from future consumption of existing wealth accrue only over potentially long periods. Still, the present value of long-term revenue from the burden a VAT imposes on wealth is at least equal to—and may well exceed, under plausible assumptions—the 10-year (undiscounted) revenue yield of the wealth tax proposed by Senator Elizabeth Warren.

A VAT also has important efficiency advantages over other types of taxes. Because VATs do not distort saving, investment, or financial decisions, they are more conducive to economic growth than income taxes or wealth taxes are. Because of the unique crediting structure that they employ, VATs are easier to administer and enforce than retail sales taxes. And by using border adjustments that remove taxes on exports but impose taxes on imports, VATs are consistent with other countries' tax systems and avoid creating distortions in international trade.

Critics argue that a VAT could hurt small businesses, low-income households, the elderly, and state and local governments. These concerns are either overblown or easily addressed:

- The United States should exempt small businesses from the tax as most countries do; the administrative burdens of taxing small businesses under a VAT may not be worth the revenue gains.
- Concerns about low-income and elderly households should be addressed by the UBI and by the adjustments to Social Security benefit calculations and means-tested transfers described above.
- No state would have to convert its sales tax to a VAT, but states that convert to a base that conforms with a federal VAT could more effectively tax services and interstate consumer purchases and avoid taxing business purchases, all with reduced administrative costs.

Critics also assert that a VAT would increase government revenues and thus inappropriately raise government spending. Yet in European countries, VATs did not boost government spending much, even when long-term debt was not an issue. Instead, the vast share of VAT revenue went to reducing outdated or poorly working sales and turnover taxes (the latter defined as taxes on transactions of intermediate goods rather than on value added). The United States is most likely to adopt a VAT in the context of a long-term debt reduction agreement that would presumably also impose limits on spending.

Fears about the United States adopting a VAT can be further assuaged by looking at Canada's experience. The Canadian VAT has features to provide progressivity, and it has not swelled the government. Some of the provinces have kept their previous sales taxes, and some have conformed their provincial tax base with the federal VAT; all of the provinces retain the power to set their own rates.

So why don't we already have a VAT? More than 30 years ago Larry Summers summarized the VAT's political prospects by saying that "liberals think it's regressive and conservatives think it's a money machine," predicting that policymakers will enact a VAT only when liberals realize that it is a money machine and conservatives realize that it is regressive (Rosen 1988).⁹ There is no better description of the political problem.

But Summers' statement also holds the key to reaching a political accord. Although liberals fear it would be regressive, a VAT can be part of a progressive strategy. For example, European countries impose VATs but also spend more generously than the United States on social policy priorities like universal health care, paid family leave, assistance for low-income households, and investments in children. And though conservatives fear it's a money machine, the VAT is efficient and can be part of a compromise with liberals that limits spending and highlights the need to pay for any new spending increases (as in Gale 2019).

In recent years the VAT has received support from a variety of quarters. More than 20 years ago, leading legal scholar Michael Graetz proposed a VAT as part of a broader restructuring of the tax system, a proposal recently endorsed by Benjamin Cardin, the Democratic senator from Maryland (Graetz 1997, 2008, 2013; Cardin 2015). Numerous Republican political leaders—including Paul Ryan, Rand Paul, and Ted Cruz—have proposed that the United States adopt a VAT (though they do not call it that) as a way of reforming taxes (Ryan 2008; Paul 2015; Cruz Campaign 2015). The Domenici-Rivlin commission proposed a VAT (called a "debt reduction sales tax") for the purpose of paying down the federal debt (Debt Reduction

Task Force 2010). The key point is that—regardless of how political leaders would like to use the revenue—there is widespread agreement on the value of the VAT: it raises revenue in an efficient, equitable, and administrable manner that is consistent with an open economy. As noted, I do not specify the use of VAT revenues, but to make sure the VAT does not restrict aggregate demand in the short run, a sensible approach would use the revenues to fund economic stimulus, government investment or tax reform, and would only phase in federal debt reduction over longer horizons.

To motivate and justify the proposal for a VAT, the chapter proceeds as follows. The first section discusses the overall fiscal challenge facing the country and why a VAT would be a constructive part of the solution. The second section provides background information on the history and workings of the VAT. The third section outlines a proposed VAT for the United States. The fourth section provides an economic evaluation of the VAT, elaborating on its properties as a tax on wealth and discussing its effects on revenue, growth, distribution, and tax administration. The fifth section addresses questions and concerns, including the money machine argument, the impact of a VAT on the states, the politics of a U.S. VAT, and the Canadian experience.

The Challenge

The justification for a credit-invoice VAT is threefold: (a) the government needs to raise revenues as part of the response to the long-term fiscal outlook, (b) consumption taxes contain attractive features as sources of additional revenue, and (c) the credit-invoice VAT is advantageous relative to alternative consumption taxes.

REVENUES AND THE LONG-TERM FISCAL OUTLOOK

Under the most recent Congressional Budget Office (CBO 2019) projections, the debt-to-GDP ratio will rise steadily from 79 percent today—already the highest in U.S. history except for a few years around World War II—to about 143 percent in 2049, assuming that current laws remain in place (which also imply tax increases that are likely to be politically unrealistic and constrained spending growth). In a more realistic scenario that follows current policy, the debt will rise to 177 percent over that same period (Auerbach, Gale, and Krupkin 2019).¹⁰ At that time, net interest payments, which peaked at 3.2 percent of GDP in 1991, would be 4.6 percent and 5.6 percent of GDP, respectively, under the two scenarios. Under either scenario, debt and interest payments will continue to rise relative to GDP after 2049. These trends occur even though the projections assume that

over the next 30 years the economy will remain close to full employment and government interest rates will remain far below the output growth rate. Rising debt will make it harder to grow the economy, boost living standards, deal with national security challenges, respond to recessions, address social needs, and maintain the country's status as a global leader.

As a matter of accounting, debt is projected to rise because spending will increase faster than revenues. But this does not make rising debt a “spending problem” that must be addressed solely by spending cuts, for two reasons. First, much of the projected increase in spending as a share of the economy is due to rising net interest payments—burdens created by deficits from previous years. These burdens are not obviously better borne by spending cuts than by revenue increases. Second, the rest of the spending increase is due to an aging population and rising health-care costs, which will place more demands on Social Security, Medicare, and Medicaid. Neither source of higher spending is the result of new government programs; rising spending is simply policymakers' earlier commitments coming due, commitments that, to date, they have chosen not to fund with sufficient tax revenues.

In short, the debt problem is not either a spending problem or a tax problem any more than one side of the scissors does the cutting. Rather, the problem is the *imbalance* between spending and revenues. Addressing the debt challenge will require both slowing the spending trajectory and raising taxes.

CONSUMPTION TAXES

Consumption taxes in general—and VATs in particular—can, if properly designed, provide an impressive combination of substantial revenue, progressivity, and efficiency. Policymakers and researchers often consider the tax system's revenue potential separately from its efficiency or progressivity. The issues, however, are closely related. If the overall revenue from the tax system needs to rise, it becomes even more important that the new taxes be efficient and progressive.

The VAT can raise substantial amounts of revenue. Among OECD member countries in 2016, VATs were the third largest source of revenue behind the individual income tax and social security contributions and raised about 7 percent of GDP on average.

Consumption taxes are efficient, relative to other taxes. As discussed later in this chapter, introducing a consumption tax imposes an implicit lump-sum tax on wealth that existed before the introduction of the tax. This implicit

tax on existing wealth tax does not distort behavior, cannot be avoided or evaded, raises substantial revenue over time, and does not require that value be assessed (Altig et al. 2001; Auerbach and Kotlikoff 1987). Unlike income taxes, consumption taxes do not distort the return on new saving or investment: they do not affect the decision to consume today or save for the future. They also do not distort choices related to organizational form, debt or equity financing, or dividend payments. However, like income taxes, consumption taxes do encourage leisure (which is untaxed) at the expense of labor.

Consumption taxes can be part of a progressive reform package, depending on the rate structure of the tax and the presence of offsetting policies like the UBI proposed here or cuts to regressive payroll taxes.

THE CREDIT-INVOICE VAT RELATIVE TO OTHER CONSUMPTION TAXES

Consumption taxes come in many forms (see the appendix). Some are explicitly transaction-based (e.g., the credit-invoice VAT and the retail sales tax). Some are essentially personal consumption taxes—income taxes with an exemption for net saving, such as the USA tax proposed in the 1990s by Senators Sam Nunn (D-GA) and Pete Domenici (R-NM)—that rely on the fact that all after-tax income is either consumed or saved. Some are streamlined business income taxes (e.g., a subtraction-method VAT). Others are a combination of cash-flow business taxes and personal taxes on wages (e.g., the “flat tax” and the X-tax, described in the appendix).

This chapter focuses on a credit-invoice VAT, which offers significant administrative and compliance advantages over other transaction-based taxes (such as the retail sales tax, as discussed further below).

The credit-invoice VAT would also work well as a supplement to the existing tax system, whereas personal consumption taxes, streamlined business income taxes, and cash-flow business taxes are usually proposed as replacements for existing personal and corporate income taxes. In addition, the credit-invoice VAT is a proven revenue mechanism used in 167 countries worldwide. Only Japan uses a system similar to a subtraction-method VAT, and no country uses a large-scale retail sales tax, a flat tax, an X-tax, or a tax similar to the USA tax.

VAT Basics

A business's "value added" is the difference between its gross sales and its purchases of goods and services from other businesses. It is equal to total worker compensation plus cash flow.

Suppose a farmer grows wheat and sells it to a baker for \$40. The baker turns the wheat into bread and sells it to consumers for \$100. The baker's value added is \$60—the difference between sales and purchases. For simplicity, we will assume that the farmer has no input costs, so the farmer's value added is \$40. The total of the values added at each stage of production is equal to the retail sale price of the good, in this case \$100.

Governments can tax value added in different ways. (See box 1 for a brief history of VATs). In the credit-invoice method, each business pays the government the VAT collected on its sales minus a credit for the VAT it pays on its input purchases (see table 1). If the VAT were 10 percent in the previous example,¹¹ the farmer would charge the baker \$44 overall, pay \$4 in VAT to the government, and keep \$40, which is equal to the farmer's value added.¹² The baker would charge consumers \$110, pay \$6 in VAT (the difference between the \$10 the baker owes on sales and the \$4 credit paid to

TABLE 1.

Taxes, Sales, and Value Added Under Alternative Taxes

		(1)	(2)	(3)	(4)	(5)	(6)
		Value added	Tax collected on sales	Total sales (including tax)	Tax credits	Net tax payments (2) – (4)	Net receipts
No taxes	Farmer	40	0	40	0	0	40
	Baker	60	0	100	0	0	60 (i.e., 100 – 40)
Retail sales tax	Farmer	40	0	40	0	0	40
	Baker	60	10	110	0	10	60 (i.e., 110 – 40 – 10)
Credit-invoice VAT	Farmer	40	4	44	0	4	40 (i.e., 44 – 4)
	Baker	60	10	110	4	6	60 (i.e., 110 – 44 – 10 + 4)

BOX 1.

History of Value-Added Taxes

The VAT is a relatively new tax. While tariffs, excise taxes on alcohol, and other taxes have existed for centuries, the VAT was designed in the early 20th century and began to be implemented on a wide scale only about 50 years ago. Wilhelm von Siemens, a German businessman, designed the VAT to resolve problems that arose in implementing sales taxes. Independently and roughly contemporaneously, Thomas S. Adams, an American, conceived of the VAT as a better version of the corporate income tax. In practice, in economically advanced countries, VATs have been introduced largely as improved versions of consumption taxes, replacing excise, turnover, and retail sales taxes, rather than as replacements for the corporate income tax. Almost all advanced countries maintain separate corporate income taxes.

Many European governments adopted VATs in the 1960s and 1970s, motivated by European Economic Community (EEC) directives requiring a harmonized VAT as a condition for entry into the European Union. Several Latin American governments also implemented VATs over this period. Starting in the late 1980s, several economically advanced non-EEC countries, including New Zealand (1986), Japan (1989), Canada (1991), South Africa (1991), Singapore (1994), Switzerland (1995), and Australia (2000), implemented VATs, as did many countries with developing economies.

The VAT now exists in a vast majority of countries and in 2016 accounted for more than 20 percent of OECD tax revenue. The diffusion of the VAT was “the most significant development in the field of taxation in the past 50 years,” according to Sijbren Cnossen, a leading tax expert from Maastricht University in the Netherlands (Cnossen 2011, 34).

the farmer), and keep \$60 (\$110 minus \$44 minus \$6), which is equal to the baker's value added. Consumers pay \$110 for the bread, and the government receives \$10 in taxes.

Consumer payments, tax revenues, and after-tax revenues received by each producer are the same under a 10 percent VAT as under a well-functioning 10 percent retail sales tax (table 1).

The Proposal: Designing an American VAT

An American VAT would retain the signal advantages of the tax—revenue potential, efficiency, and administrability—and add progressivity to that list of qualities. The core elements of an American VAT would be as follows:

- a broad base, including essentially all consumption that is associated with explicit payments;
- a base that includes all government wages and purchases, with state and local government VAT payments rebated to them by the federal government;
- a standard rate that applies to all taxable purchases;
- an exemption for businesses with gross annual revenue below \$200,000, although they would be allowed to opt in;
- adjustments to preserve the real value of federal means-tested transfers and Social Security benefits; and
- a UBI based on household size and composition.

BASE

The VAT should rest on the broadest consumption base possible. Focusing on consumption avoids distorting choices regarding saving, investment, organizational form, financing, and dividend payouts. It also avoids having business taxes “cascade” with each stage of production, which would have the undesirable feature of more heavily taxing goods with more stages of production.

Setting the base as broadly as possible has numerous attractive features. It reduces opportunities for tax avoidance and limits distortions in production and consumption. It reduces wasteful administrative efforts to define which products are taxable—for example, whether a Halloween costume is clothing (which might be exempt) or a toy (which might not be

exempt). It reduces the need and expense for firms to allocate their costs between sales that are and are not subject to VAT. It also reduces political pressure to generate ever more exemptions.

Nevertheless, almost all VATs exclude some goods or services, doing so in one of two ways: zero rating and exemption. When a retail good (food, for example) is zero rated, the seller does not have to pay taxes on the retail sale but still receives credits for the VAT paid on input purchases. This reduces the final sale price of the good compared with what it would have been if the item were taxed at the standard rate. A business that is exempt does not pay tax on its sales, but in contrast to zero rating, it does not receive credits for the VAT it paid on inputs. This breaks the VAT's chain of credits and can end up raising prices, depending on how much of the value added was provided by input suppliers.

Countries tend to zero rate particular goods with the intent of enhancing progressivity and tend to exempt goods that are hard to tax. VATs in the European Union typically exclude hospital and medical care, noncommercial activities of nonprofits, sporting services, cultural services (except radio and television), residential rents, financial services, supply of land and buildings, and other items. As a result, European VATs tax less than 60 percent of overall consumption (OECD 2018). They also do not tax government purchases. In contrast, newer (second-generation) VATs—such as in Australia and New Zealand—tend to tax a broader base. In New Zealand, for example, the base includes essentially all consumption and government spending.

Taxing Consumption

As noted, the VAT should apply to as much consumption as possible. Applying the VAT to food consumed at home is particularly important. Food accounts for a large share of overall spending and, of course, a larger share of the budget of low-income households than of high-income households (U.S. Department of Agriculture 2019). Still, taxing food makes sense for several reasons. First, from an administrative perspective, zero rating food consumed at home leads to difficult line-drawing situations. Table 2 provides examples from the United Kingdom's VAT. Second, from an equity perspective, taxing food and providing universal payments based on household size and composition is more progressive than zero rating food, because food expenditures rise in absolute terms as income rises, even though they decline as a share of spending (Benge, Pallot, and Slack 2013). Third, from a political perspective, if the tax applies to a necessity like food, policymakers will be hard-pressed to make a case for giving other goods preferential treatment.

TABLE 2.

United Kingdom VAT Treatment of Food

Food item	Zero rated	Full VAT
Cakes/cookies	All cakes and some cookies	Cookies covered in chocolate
Chips	Vegetable-based	Potato-based
Chocolate	For cooking and baking	For direct consumption
Dog food	For working dogs	For pets
Drinks	Alcoholic bitters	Alcoholic beverages
Frozen treats	Frozen yogurt, frozen cakes	Ice cream, ice cream cakes
Fruit	Dried fruits for cooking and baking	Dried fruits for snacking
Herbs	For culinary use	For medical use
Hot food	Made on site	Reheated or kept warm
Nuts	Raw, in the shell	Roasted, shell removed
Peanuts	Raw, shell removed	Roasted, shell removed

Source: Her Majesty's Revenue and Customs. Internal Manual, VAT Food 2018.



Education expenses, to which the proposed VAT would apply, are another thorny issue. The case for excluding education is that it is an investment and so could plausibly be excluded from a VAT. On the other hand, not all education expenditures are themselves investments (Gong et al. 2019). Zero rating education expenses would create inevitable line-drawing problems, especially since the VAT does not necessarily give preferential treatment to other consumption that supports human capital—for example, buying a book or an educational toy for a child. In addition, higher-income households consume a disproportionately large share of education, so zero rating its associated expenses would be regressive.¹³ Other policies already subsidize education, so making these policies more generous (with revenues from a VAT), in ways that are targeted to social objectives, would be a better way of supporting human capital investments than excluding education from a VAT. The VAT should apply to the net price of education, not the sticker price. In many cases students receive considerable discounts in the form of financial aid and grants from universities. Taxing the sticker price would ignore the heavy effective price discounts many students receive.

Similar to the treatment of nonprofits in the United Kingdom, Australia, and New Zealand, the activities of nonprofit organizations would be subject to the VAT. Although these organizations are exempt from income taxation in those countries and in the United States, that exemption in itself is not justification for exemption from a VAT (Gendron 2011; Morris

2011). Preferential status under a VAT would generate a strong incentive for individuals to shift their consumption to nonprofits, creating more regulatory and line-drawing difficulties.

Most VATs exempt some or all financial services. Many financial services are provided without explicit fees (e.g., checking account services often are paid for through lower interest rates on the accounts), making it difficult to calculate value added. Exemption of financial services, however, creates the usual line-drawing problems and makes it difficult for firms to allocate costs between exempt and nonexempt transactions. In addition, it overtaxes business-to-business transactions, since it breaks the VAT crediting chain, and it undertaxes business-to-consumer transactions because it imposes no tax on the value added for the consumer (Merrill 2011). To the extent that the creation of financial services uses real resources, those services should be taxed under a VAT, just like any other activity (Auerbach and Gordon 2002). And, for political reasons, if the VAT applies to food, it needs to apply to financial services. New approaches and technology have made it more straightforward to tax financial services, so these methods should be used to assess VAT in the United States.¹⁴

Several countries, including South Africa and Australia, already tax a significant share of financial transactions through a VAT. Alternatively, many countries use a financial transactions tax—which, as a tax on gross turnover, is conceptually different from a VAT—as is proposed by Weiss and Kawano (2020) in this volume and discussed by Burman et al. (2016).

Because a VAT is collected when consumption transactions occur, it cannot easily be applied to consumption that occurs without explicit payments. For example, people who own their home do not pay themselves explicit rent. As a result, most VATs do not tax the implicit rent that owner-occupiers pay themselves. Instead, for administrative reasons, VATs typically adopt the prepayment approach: the VAT is applied to the purchases of *new* owner-occupied housing (which occurs when the house is sold from a business to a household, but not when a household sells a house to another household). Any improvements to owner-occupied housing should also be subject to a VAT. To avoid distorting households' choice to be an owner-occupier versus a renter, the VAT should exempt rental payments as well, and instead charge VAT on the purchases of new housing meant for rental use as well as improvements to rental housing. As discussed later, use of the prepayment method means that when a VAT is imposed, the existing housing stock is excluded from the tax.

The same logic applies to the existing stock of nonhousing durables—cars, boats, furniture, collectibles, and so on. The benefits derived from durables

that already exist would not be taxed under the VAT, but purchases of new assets would be taxed.

Taxing Government

To maintain price parity with the private sector, the VAT would tax federal purchases of goods and services and employee compensation. This avoids creating the (incorrect) appearance that the federal government can make purchases more cheaply than the private sector. However, taxation of federal purchases would not raise any net revenue, since it would raise federal spending by the exact amount that it raises revenues (Gale 2005).

The VAT would tax state and local government purchases of goods and services and employee compensation, again to maintain parity with the private sector. But because the federal VAT should not burden people in their role as state and local taxpayers, it should include a rebate for VAT paid by state and local governments. As a result, taxing state and local governments' purchases and employee compensation would not raise any net revenue.¹⁵ The VAT would also exempt state and local sales taxes, to avoid cascading.

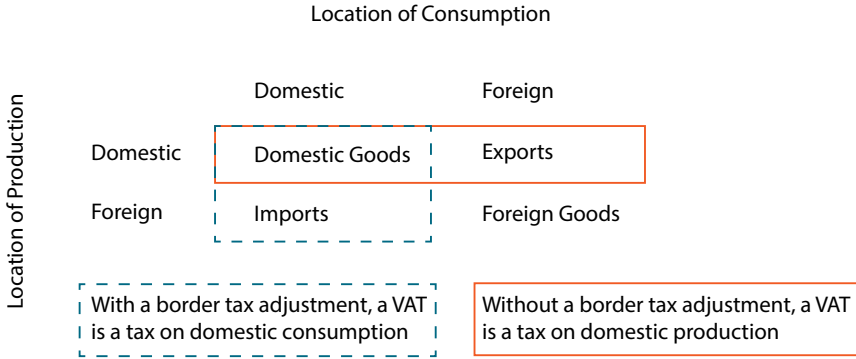
Border Tax Adjustments

The tax should be administered on a destination basis, as is standard practice in the rest of the world. That is, it should tax imports and zero rate exports. These border tax adjustments (BTAs) allow the VAT to operate across countries in a harmonized manner. Contrary to popular belief, BTAs do not subsidize exports (Slemrod 2011). Instead, they allow VATs to function as consumption taxes rather than production taxes. They impose the same tax on all goods consumed in the host country and exclude all goods not consumed in the host country, regardless of where the goods are produced. Figure 1 shows that BTAs convert what would be a tax on domestic production to a tax on domestic consumption. With no BTA, the VAT would tax all goods produced domestically, as shown in the first row of the figure. The BTA eliminates the tax on exports and adds a tax on imports. This results in the VAT taxing all goods consumed domestically, as shown in the first column.

Recent policy discussions about replacing the corporate income tax with a destination-based cash-flow tax (which is shown in the appendix to be simply a subtraction-method VAT that also allows deductions for wages) created controversy. One issue was whether the nominal exchange rate would adjust fully. However, if the Federal Reserve fully accommodates a VAT by allowing prices to rise, the equilibrium nominal exchange rate

FIGURE 1.

Border Tax Adjustments Convert a Production Tax to a Consumption Tax



remains unchanged, leaving cross-border transactions unaffected. A second concern was that exporters would receive large net subsidies under the destination-based cash-flow tax. In contrast, under the VAT, exporters would not be able to deduct wages, so virtually all exporters would have positive value added and be liable for tax.¹⁶

Small Businesses

Most countries exempt some small businesses from value-added taxation but allow them to register if they choose to (Gale, Gelfond, and Krupkin 2016). This is partly because small-business owners form a powerful political constituency and partly because the administrative costs of taxing small businesses are high relative to the revenue they generate. Although the definition varies, a small business is usually defined by gross revenues below a certain level, ranging from close to zero to almost \$120,000 among OECD countries in 2018.

Because the optimal exemption threshold trades off administrative costs and revenue earned, the higher the VAT rate, the lower the exemption threshold should be (Keen and Mintz 2004). The logic supporting this conclusion is that the expected VAT revenue rises as the tax rate rises, while compliance costs for businesses stay constant as the rate rises. For example, Brashares et al. (2014) estimate that the optimal threshold would be \$200,000 under a 10 percent VAT and would fall to \$90,000 under a 20 percent VAT. That exemption would be higher than in most other countries, but the 10 percent rate would be lower than in most other countries.

Exemption is a mixed blessing. It reduces firms' compliance costs and taxes owed on sales but eliminates their ability to claim the VAT they pay on input purchases (and receive accompanying rebates from the government). An exemption may also reduce the demand for a business's product if it sells to other businesses, since other companies prefer to buy their inputs from firms that are in the VAT system so that they can claim credits for the taxes they pay. Evidence suggests that small-business exemptions lead to segmentation of the economy, with VAT-eligible firms tending to conduct business only with other eligible firms and ineligible firms working with other ineligible firms (Gadenne, Nandi, and Rathelot 2019; De Paula and Scheinkman 2010). Finally, an exemption may create increased tax avoidance opportunities. Nevertheless, a 10 percent VAT should provide an exemption for companies with gross revenue under \$200,000 and allow them to opt in if they wish. Estimates indicate that this exemption level would save 43 million businesses from having to file VAT if they chose not to (Brashares et al. 2014).

THE STANDARD RATE

The VAT should have a single standard rate that applies to all purchases under the VAT. European countries often have a variety of preferential rates, a practice that experts have described as "increasingly quaint" (Crawford, Keen, and Smith 2010). Standard VAT rates vary substantially across countries. In the 35 OECD member countries apart from the United States, the average standard rate in 2018 was 19.3 percent but varied widely—from 5 percent in Canada (not counting provincial VATs) to 27 percent in Hungary.

Having a standard rate on all goods and services has several advantages. Taxing different goods at different rates creates opportunities for avoidance, raises administrative costs, and would create an endless stream of arguments in favor of subsidizing additional goods. In contrast, taxing everything at the same rate may miss some opportunities to moderately improve the efficiency of the tax code under ideal circumstances, but it will prove fairer and simpler and will reduce avoidance.¹⁷

SUBSIDIES TO PROTECT THE VALUE OF SOCIAL SECURITY AND MEANS-TESTED TRANSFERS

The VAT will drive a wedge between wages and prices equal to the size of the tax. Either nominal wages will fall, prices will rise, or some combination of the two will occur. Either way, real wages will fall. (As discussed further below, the preferred outcome would be for the Federal Reserve Board to accommodate the VAT and allow prices to rise by the full extent of the tax

so that nominal wages would not have to fall, thus avoiding the wrenching macroeconomic consequences of declining nominal wages).

Higher VAT-inclusive prices will reduce the value of means-tested federal benefits. To avoid this unintended reduction in benefits, Congress should stipulate that those benefits would be adjusted upward to maintain their real purchasing power.

The drop in real wages (i.e., the fact that consumer prices inclusive of the VAT will rise relative to wages) will also have unintended consequences for Social Security. Each birth-year cohort's real Social Security benefits are proportional to the real value of the National Average Wage Index in the year that the cohort turns 60. Thus, without further adjustments, the proposed VAT would cut real benefits for cohorts younger than age 60 at the time the tax was implemented. To maintain real benefits, Congress should require the Social Security Administration to make a one-time adjustment to the National Average Wage Index to offset the reduction caused by the VAT (Carroll and Viard 2012).

UNIVERSAL BASIC INCOME

Almost all countries implement progressive adjustments by providing product-specific subsidies (e.g., by zero rating food or utilities).¹⁸ Since these items represent a greater share of the budget for low-income families than for high-income families, zero rating these goods makes the tax more progressive than it otherwise would be. The effect on progressivity, though, is weaker than it could be, because high-income families spend more in absolute terms on these items than low-income families do.

A per-person or per-family allowance more effectively targets the funds toward low-income households. In the proposal, each family would receive a UBI, paid quarterly and equal to the VAT rate multiplied by twice the poverty line. A family that consumed less than twice the poverty line would thus receive a net benefit under this proposal. A family that consumed at twice the poverty line would pay no net tax once the VAT and UBI are taken into account. Families with higher income would face net tax burdens, but only in proportion to the amount of their consumption above the poverty line. The UBI would vary by family size (as does the poverty line) and be about \$5,200 for a family of four. The average UBI across all households would be just over \$3,400 per year.

THE NET TAX BASE

Table 3 shows the calculation of the VAT effective tax base.¹⁹ Starting from aggregate consumption expenditures, the base is adjusted to reflect the prepayment status of housing. No adjustment is needed to accommodate the prepayment status of durables or collectibles because aggregate consumption expenditures already include new purchases of those items and exclude benefits (i.e., “consumption services”) that flow from those existing assets. The effective tax base—the base available to generate net VAT revenue—is reduced by excluding government spending on health care (which is part of consumption), given that the federal government cannot raise money by taxing itself. Further adjustments are made for state and local sales taxes on final consumption, the small business exemption, avoidance, evasion, and miscellaneous factors. This leaves an aggregate effective tax base of \$9.8 trillion, which equals about 64 percent of aggregate consumption or 44 percent of GDP.

TABLE 3.

Broad VAT Base in 2020

	Level (billions of \$)	Percent of consumption	Percent of GDP
Consumption	15,374.0	100.0	68.9
Less: Government health expenditures	1,795.0	11.7	8.0
Less: Net housing adjustment	1,610.4	10.5	7.2
Less: Imputed rent on owner occupied housing	1,809.5	11.8	8.1
Less: Rental of tenant-occupied housing	660.0	4.3	3.0
Plus: New housing purchases	579.5	3.8	2.6
Plus: Improvements of existing housing	279.6	1.8	1.3
Less: Other adjustments ^a	149.1	1.0	0.7
Equals: Consumption in VAT base	11,819.5	76.9	52.9
Less: State and local general sales taxes on final consumption	294.6	1.9	1.3
Less: Noncompliance/small business exemption	1,728.7	11.2	7.7
Equals: Effective broad VAT base	9,796.1	63.7	43.9
GDP	22,326.1	145.2	100.0

Source: Bureau of Economic Analysis (2019); Congressional Budget Office (2019); and Urban-Brookings Tax Policy Center estimates.

^a Net purchases of used cars and net foreign travel and expenditures by U.S. residents abroad.

Evaluating a VAT

The VAT can raise significant amounts of revenue in a manner that is progressive, administrable, and conducive to growth.

BUDGETARY EFFECTS

Table 4 shows that, with adjustments for Social Security and means-tested transfers, and with a UBI equal to the VAT rate times twice the poverty line, the VAT would raise \$247 billion in 2020 or about 1.1 percent of GDP. Over the 2020–29 period the VAT would generate about \$2.9 trillion in revenues. If the UBI were cut in half, the VAT would raise \$545 billion in 2020 and \$6.5 trillion by the end of 2029 (not shown). With no UBI, the VAT would still be progressive (because of the protection of real Social Security benefits and means-tested transfers, discussed below) and would raise \$842 billion in revenue in 2020, rising to \$10.0 trillion over the next decade.²⁰

THE WEALTH TAX COMPONENT OF A VAT

A consumption tax imposes a burden on wealth that exists at the time the tax is introduced. Households finance their consumption from one of three sources: existing wealth, future earnings, and returns on future

TABLE 4.

Effect of VAT on Federal Revenue, Spending, and Deficit in 2020 with and without Universal Basic Income (UBI)

	VAT (no UBI) (billions of \$)	VAT (with UBI) (billions of \$)
Gross VAT revenues	979.6	979.6
Less: Increase in federal cash transfer payments	137.2	137.2
Less: Rebate (rate × 2 × FPL)	—	595.8
Net revenue, 2020	842.4	246.6
Net revenue, 2020–29	10,023.3	2,934.4

Source: Urban-Brookings Tax Policy Center Microsimulation Model (version 0319-2) and Urban-Brookings Tax Policy Center estimates.

Note: The proposal would introduce a VAT of 10 percent and provide a rebate in the form of a universal basic income for each household equal to 10 percent times twice the federal poverty level. The analysis shows the long-run impact on revenues and spending at 2020 levels of income and consumption. The analysis assumes that the Federal Reserve allows consumer prices to rise and that federal cash transfer benefits are increased to maintain real purchasing power.

investments.²¹ Thus, one component of a pure consumption tax is a tax on all pre-existing wealth, which will be liable for the tax whenever it is used for consumption. Crucially, the consumption tax is capitalized immediately into the value of assets, even if it is paid to the government over a potentially lengthy period. By lowering the after-tax income stream generated by an asset existing at the time the tax is introduced, the consumption tax causes an immediate reduction in its real price.²²

The easiest way to understand this effect is to assume that, after the implementation of a consumption tax, the price level rises by the full extent of the tax. Then existing wealth is worth less; a decrease in wealth will translate into less consumption in the future. For example, if a 10 percent tax on all consumption raised the consumer price level by 10 percent, it would reduce the value of existing wealth by 9.09 percent (10 divided by 110). (In contrast, if the price level remained constant, the entire burden would fall on equity holders and show up as a nominal decline in equity values; the value of nominally denominated debt would not change.)

But, as noted, the proposed VAT would only tax consumption associated with explicit transactions. Under the proposed prepayment approach described above, a VAT would not tax the consumption services that households obtain from existing owner-occupied housing, rental housing, durable goods, or collectibles, though it would tax new purchases (and improvements) of these items. As a result, the VAT would impose an implicit one-time lump-sum tax, not on all pre-existing wealth, but rather on pre-existing wealth not held in housing, durables, or collectibles.

This component of the VAT has enormously positive properties (see box 2). A lump-sum tax on the relevant wealth raises significant amounts of revenue. It is likely to create minimal distortions, avoidance, evasion, and deadweight loss. Because it is not imposed directly, it does not require assessments of the value of specific items of wealth. And it is extremely progressive, given the unequal distribution of existing wealth.²³

LONG-RUN EFFICIENCY AND GROWTH

It is hard to think of a tax that could raise as much revenue as a VAT and have better efficiency effects, except perhaps for other forms of a consumption tax. The implicit lump-sum tax on pre-existing wealth (other than housing and durables) is one reason: a one-time tax on existing wealth can raise considerable revenue without economic distortions (Auerbach and Kotlikoff 1987).²⁴ More generally, a VAT that is levied uniformly over time on all noninvestment goods and services has several key attributes. It does not distort relative prices or consumer choices among taxed goods, nor does

BOX 2.

Comparing a VAT to a Direct Wealth Tax

This chapter views the VAT as a complement, not a substitute, for direct taxes on the well-to-do, such as the wealth tax proposed by Warren (2019) or discussed in Saez and Zucman (2019a). Compared with these other taxes, the VAT has different goals, different efficiency properties, and different distributional effects. Still, comparing the one-time wealth tax embodied in the VAT to an annual wealth tax on extremely wealthy households can help inform the debate.

The VAT's implicit wealth tax has several obvious differences from direct wealth taxes. First, the VAT does not require explicit valuation of assets. Second, the wealth tax imposed by the VAT is essentially a lump-sum tax and would be difficult to avoid. Third, the VAT burdens future excess returns, whereas the direct wealth tax burdens the normal return in addition to excess returns (Guvenen et al. 2019). Fourth, the wealth tax imposed by the VAT would be quite progressive, imposing 21 percent of the burden on the top 0.1 percent of households, 70 percent on the top 5 percent, and 93 percent of the burden on the top quintile.²⁵ But the wealth tax component of the VAT would still be far less progressive than a tax on individual wealth above \$40.6 million, which would be paid only by households in the top 0.1 percent of the wealth distribution.²⁶

The revenue differences between the two taxes are also of interest. The lump-sum wealth tax component of the VAT would fall on all wealth other than existing owner-occupied housing, rental housing, durable goods, and collectibles. A lower bound of the value of such wealth can be obtained by summing the value of financial assets and privately held businesses and subtracting associated debt—about \$70 trillion in 2019.²⁷ Applying a 15 percent adjustment for evasion and avoidance (which is probably an overestimate, due to the difficulty of escaping a VAT), the base would be about \$60 trillion. Since the VAT would apply to about 64 percent of consumption, the effective base would be about \$38 trillion. The VAT would impose the wealth tax at the rate of consumption taxation (10 percent), generating about \$3.8 trillion in revenue in

present value. This is almost exactly equal to the (undiscounted) 10-year revenue gain, \$3.75 trillion, reported by Senator Warren's campaign for her wealth tax (Warren 2019), though estimates for this aspect of the VAT and the wealth tax are both uncertain.²⁸

Comparing the long-term revenue of a VAT and Senator Warren's wealth tax is not simple. The burden on wealth from a VAT would be a one-time source of revenue but would be paid over a potentially extremely lengthy period. In contrast, estimates of the present value of the revenue from a wealth tax as described in Saez and Zucman (2019a, 2019b) or proposed by Warren (2019) could generate a wide range of values, depending on the assumed growth rate of the economy and the appropriate rate of discount. Thus, while the present value of the burden on wealth from the VAT is about 19 times the initial annual revenue collected from the wealth taxes described above, it is more difficult to compare their long-term relative revenue yields.

it affect household saving choices or business investment, organizational, financing, or payout choices. But as with income and payroll taxes, the VAT distorts household labor supply choices because it creates a wedge between what one earns and how much consumption one can afford.

A VAT is designed to operate in an increasingly globalized world. Border adjustability is consistent with world trade agreements and other countries' practices and would not disrupt the global supply chains that modern corporations rely on. Evidence suggests that the VAT does not reduce trade flows (Benartzi and Tazhitdinova 2018).

The effects of a VAT on long-term economic growth depend, of course, on how the revenues are used, and thus quantitative estimates are beyond the scope of this chapter. One use of revenues is to partially replace the income tax. A large literature has addressed this topic, showing positive but generally small long-run effects, especially once personal exemptions and transition relief are included (see Altig et al. 2001). Huntley, Prinsinzano, and Ricco (2019) use the Penn Wharton Budget Model to estimate that a 1 percent VAT, on a base somewhat smaller than that proposed in this chapter, with a refundable tax credit that is substantially smaller than the UBI proposed here, and applied to deficit reduction, would raise GDP by 0.1 percent by 2030 and by 0.8 percent by 2050. More generally, higher tax revenues need not reduce growth: neither time series analysis nor cross-

section samples suggest a strong association between tax revenue levels and growth rates.²⁹

SHORT-RUN EFFECTS

Imposing a VAT would likely depress consumption, at least temporarily (Alm and El-Ganainy 2012; Carroll, Cline, and Neubig 2010). As noted, it may therefore be appropriate, in the short run, to use VAT revenues to fund programs that generate demand in the economy to the greatest extent through stimulus payments, government investments, or reform and restructuring of existing taxes. Over the longer term, as the economy adjusts, the revenues could be used for debt reduction.

An alternative policy not proposed here but worth considering is phasing in the VAT, for example, starting at a 5 percent tax rate and then raising the rate one percentage point a year until it reaches 10 percent. A phase-in would raise the price of consumption gradually over time, giving people and businesses time to adjust their plans and incentives to accelerate consumption spending (to avoid higher tax rates in subsequent years). The increased consumption could provide direct stimulus to the economy, and the funds could also be used to stimulate the economy further (Gale 2019).

If the VAT were to replace an equal-yield retail sales tax, the price level would be a nonissue. However, a VAT created in the absence of other policy changes would drive a wedge between wages and prices: either prices would go up or wages would go down (Gale 2005).

Monetary policy, presumably, will determine whether the adjustment occurs through nominal wages or prices. Congress should stipulate that the monetary authorities should accommodate the VAT and allow for a one-time increase in the consumer price level (which includes the VAT) equal to the VAT rate. If instead, the Federal Reserve aims to keep consumer prices constant before and after the VAT is created, wages will (eventually) fall by the VAT rate, which would likely create significant adjustment costs and job losses.³⁰

Implementing a one-time or gradual price level adjustment to accommodate the introduction of the VAT should not create continuing inflation. Indeed, the presence of an additional revenue source would reduce the likelihood that the Federal Reserve will need to monetize deficits.³¹

LONG-TERM DISTRIBUTIONAL EFFECTS

As noted, the VAT is a combination of a non-distorting tax on (most) pre-existing wealth and future supernormal returns (that is, returns above the normal rate prevailing in the economy) and a distortionary tax on labor income. As a result, the burden of the VAT will change over time, as the implicit tax on wealth is eventually paid off. I focus on the long-term distributional effects, essentially after the tax on wealth has been fully paid. In practice, it would take a long time to reach this situation, so the results should be thought of as bounding the long-term distributional effects. In the lengthy period before the wealth tax revenues are fully collected, the proposal will be *more* progressive than shown below, because taxes on pre-existing wealth will continue to be paid and because pre-existing wealth is clearly distributed more unevenly than wages, which are much larger than supernormal profits.

In the long term, after the initial period of adjustment, a consumption tax's burden falls on wages and on supernormal returns to capital (that is, it exempts the normal return to capital). In contrast, an income tax falls on wages, the normal return, and supernormal returns. As a result, when the rate structure is held constant, a VAT is slightly less progressive than an income tax and more progressive than a payroll tax (Gentry and Hubbard 1996).

To bound the long-term distributional effects of the VAT, I follow Urban-Brookings Tax Policy Center standard protocol. Households are classified according to their annual expanded cash income.³²

Table 5 shows that the VAT without a UBI, with adjustments for Social Security benefits and means-tested transfers, is somewhat progressive. After-tax income falls by 3.7 percent in the bottom quintile versus 6.1 percent in the top quintile. The reason for the smaller decrease for low-income households is that a large fraction—more than one-third—of their income is in the form of Social Security benefits or means-tested transfers and thus is protected from the VAT. Under this specification, the bottom quintile pays about 3 percent of the overall tax, while the top quintile pays more than half of all VAT payments. The middle quintile bears significant net tax burdens in this specification: after-tax income falls by 5.3 percent.

The results become sharply more progressive in the presence of a UBI set at the VAT rate times the poverty level times two. In this case, the bottom quintile sees an *increase* in after-tax income of almost 17 percent, while the top quintile faces a reduction in after-tax income of 4.7 percent. The top quintile bears more than 100 percent of the tax—142 percent, to be

TABLE 5.

Distribution of 10 percent VAT by Income Percentiles, with and without Universal Basic Income (UBI)

Expanded cash income percentile ^{a,b}	Percent change in after-tax income ^c		Share of total federal tax change ^d	
	No UBI	UBI	No UBI	UBI
Lowest quintile	-3.7	16.9	2.9	-46.0
Second quintile	-4.5	4.6	7.4	-26.0
Middle quintile	-5.3	0.1	14.1	-0.8
Fourth quintile	-5.9	-2.4	21.9	30.6
Top quintile	-6.1	-4.7	53.3	142.6
Total	-5.7	-1.7	100.0	100.0
80th–90th percentiles	-6.3	-3.8	15.6	32.9
90th–95th percentiles	-6.3	-4.5	10.6	26.3
95th–99th percentiles	-6.2	-5.1	13.3	37.6
Top 1 percent	-5.8	-5.5	13.8	45.8
Top 0.1 percent	-5.4	-5.3	6.0	20.4

Source: Urban-Brookings Tax Policy Center Microsimulation Model (version 0319-2).

^a Includes both filing and non-filing units but excludes those that are dependents of other tax units. Tax units with negative adjusted gross income are excluded from their respective income class but are included in the totals. For a description of expanded cash income, see Urban-Brookings Tax Policy Center (2019).

^b The income percentile classes used in this table are based on the income distribution for the entire population and contain an equal number of people, not tax units. The breaks are as follows (in 2019 dollars, based on tax year 2020): 20%, \$25,700; 40%, \$51,300; 60%, \$92,300; 80%, \$167,000; 90%, \$245,000; 95%, \$348,000; 99%, \$828,000; and 99.9%, \$3,708,100.

^c After-tax income is expanded cash income less the following: individual income tax (net of refundable credits), corporate income tax, payroll taxes (Social Security and Medicare), estate tax, and excise taxes.

^d The sum shares figures may not add to 100 percent because of rounding errors and other factors.



precise. With the UBI, the households in the middle quintile are essentially unaffected on average—their after-tax income is virtually unchanged.³³

A lingering concern is that imposing a VAT would hurt low- or moderate-income elderly households. In practice, however, to the extent that a VAT raises prices, low-income elderly households will not be affected very much. Social Security, Medicare, and Medicaid, the main sources of income for low- and moderate-income elderly households, are effectively indexed for inflation. Social Security benefits for current retirees—which provide 90 percent of income for a third of the elderly, and more than half of all income for two-thirds of the elderly (Social Security Administration

2016)—would adjust with the consumer price level. Benefits for new retirees would be adjusted on a one-time basis, as described above, so that their inflation-adjusted benefits remain unchanged under the proposal. Unlike Social Security, Medicare and Medicaid cover specific services and would thus be unaffected by the proposal. Finally, everyone would receive the UBI described above. Distributional results (not shown) indicate that both the VAT and the VAT with the UBI are progressive among elderly groups, and that the net burden imposed on elderly households by the VAT plus UBI is essentially zero. Thus, we can inoculate the low-income elderly from the burden of a consumption tax while increasing the burden on the high-income elderly, who can more easily afford it.

TAX ADMINISTRATION

Designing, administering, and enforcing a VAT and issuing regulations would create new burdens for government. It would create new compliance costs for taxpayers as well, but they would likely be far smaller than those associated with the income tax, especially if the VAT has a broad base and taxes all items at the same rate (Bickley 2012). Firms already collect the information needed to file VAT (sales minus input purchases) in the normal operation of business.

A VAT's chain of crediting has administrative advantages over retail sales taxes because it creates a natural audit trail. Under the VAT, in a transaction between two businesses, the seller knows that the buyer is reporting the transaction to claim a credit, so the seller has more incentive to report the transaction and pay its tax. In contrast, a retail sales tax contains no similar incentive to report transactions.³⁴ A retailer responsible for sending its collected sales tax revenue to the government knows that the government may not have a record of the transaction. Also, the retailer cannot always tell whether a buyer is a consumer who should pay the tax or a business that should not—and has little incentive to find out. If the retailer does not impose a sales tax on consumer purchases, it commits tax evasion. If the retailer imposes a tax on business purchases, the tax “cascades,” building up over successive stages of production, raising and distorting prices, depending on the number of stages of production. The VAT avoids cascading by providing a credit for taxes paid. Lastly, when evasion occurs at the retail level, all tax revenue on the sale is lost under a retail sales tax, whereas under a VAT, only the tax on value added by the retailer is lost.³⁵ As a result, most countries, states, and localities have found that retail sales tax rates of 10 percent or higher are not enforceable. All of this helps explain why so many countries have replaced their sales and turnover taxes with VATs (Tanzi 1995).³⁶

VATs are still subject to avoidance and evasion, of course, but these opportunities are limited in a broad-based, single-rate tax. VAT (and sales tax) lore is full of colorful examples of tax avoidance created by zero rating and exemptions.³⁷ Underpayment in a VAT can arise from many sources, including under-reported sales (although this is a bigger problem with a retail sales tax for the reasons noted), misclassification of goods (when rates vary), tax collected but not remitted to the government, and false claims for VAT credits or refunds.³⁸

In European countries, where open borders are a top priority for non-tax reasons, a phenomenon called carousel fraud is a significant problem. It occurs when a good is imported, then is sold domestically by a business that collects VAT and vanishes, and lastly is exported. The fraud exploits the fact that exports are zero rated and import taxes are not due immediately upon importation.³⁹ Carousel fraud is most common with high-value goods sold across borders, such as cell phones and computer chips, and with intangible goods, such as carbon credits and cloud computing (European Parliament 2018).⁴⁰

The adoption of a VAT in the United States would likely not see rampant carousel fraud. International trade is less important here: in 2016, imports and exports summed to 26 percent of GDP in the United States, compared with 84 percent of GDP on average for members of the European Union (OECD 2019). In addition, the United States does not prioritize having open borders the way the European Union does. Several proposed administrative solutions to carousel fraud could easily be adopted by the United States (e.g., making exports zero rated only after the tax has been collected on the import, or not allowing a good to clear customs until taxes have been paid).⁴¹

The overall evasion rate for VATs appears to be lower than for income taxes but varies widely among countries. In 2017, unpaid tax liabilities were about 11 percent of total VAT liability in the European Union, varying within member states from 0.6 percent in Cyprus to 35.5 percent in Romania (Center for Social and Economic Research 2019). The evasion rate would likely be significantly lower under the proposed VAT in the United States both because of the broad-based, single-rate structure and because of the vastly lower prevalence of carousel fraud, which accounts for 29 to 44 percent of all VAT evasion in the European Union (European Parliament 2018).

Finally, businesses under a VAT essentially serve as unpaid tax collectors (Robinson and Saviano 2011). They could be compensated for these services with a small tax credit.

Questions and Concerns

1. Will a VAT fuel growth of government?

Some conservatives and libertarians fear that a VAT will fuel the growth of government. Anti-tax activist Grover Norquist says, “VAT is a French word for ‘big government’” (Cassidy 2005). According to Daniel Mitchell, a conservative tax commentator, giving policymakers a VAT would be like “giving keys to a liquor store to a bunch of alcoholics” (Mitchell 2010).

Critics argue that the VAT is a “hidden tax” buried in the price of a good and that policymakers could raise the rate without public awareness. In fact, some evidence shows that policymakers can more easily raise rates on hidden taxes, and VATs have been “hidden” in some countries in the past (Finkelstein 2009). But they do not need to be hidden. American state sales taxes are reported visibly on receipts, and there has been no massive expansion of such taxes over the years. Policymakers should require that American VAT charges be reported clearly on receipts, as is the practice in Canada, France, and other countries currently.

A related concern is that the creation of a VAT will raise revenues (the tax becomes a “money machine”), encouraging excessive government spending. The argument, essentially, is that the VAT is too efficient, raising revenue with such minimal economic distortion and administrative costs that it prompts the public to demand higher revenue and higher spending (Mitchell 2011). Conservative critics fear that such spending would be damaging and prefer that the process of taxing and spending be less efficient.

The record largely belies concerns that VATs have fueled significantly higher revenue levels. Although overall revenues have risen significantly in European countries with VATs, VATs do not seem to be the main reason. For example, figure 2 shows that tax revenues in OECD countries have risen substantially over time from 24.9 percent of GDP in 1965 to 34 percent of GDP in 2016. But revenue as a share of GDP from all consumption taxes (including VATs, retail sales taxes, and excise taxes, among others) has risen by only 1.6 percentage points over the same period. So while VAT revenue as a share of GDP has risen by 6.1 percentage points, it has been largely offset by a 4.5 percentage point average decline in revenue as a share of GDP from other forms of consumption tax.⁴²

In formal econometric analysis, Keen and Lockwood (2006, 925) find that the “association between the presence of a VAT and total tax revenue is not simple, is not always statistically significant . . . and may in any event

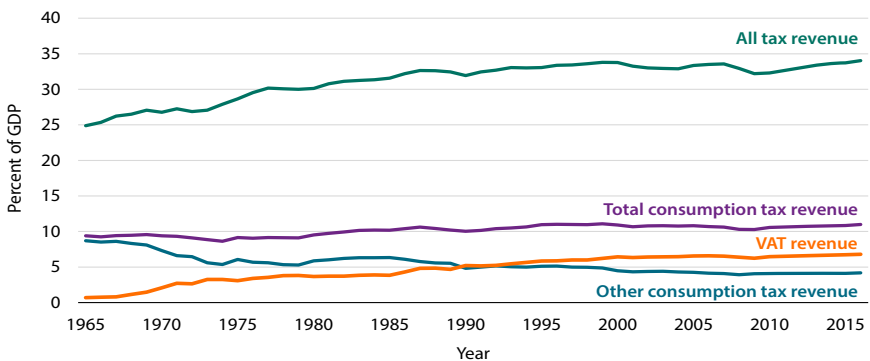
be small.” They do not find evidence that a VAT directly causes growth of government. They point out that any effect of the VAT on total government spending has been diluted substantially by countries choosing to use VAT revenues to reduce other taxes. In addition, some evidence suggests that the causation runs the other way: the public’s demand for higher spending fuels demand for a VAT, an efficient revenue source (Lee, Kim, and Borchering 2013). Thus, the OECD countries’ experiences with a VAT do not suggest that the VAT causes sustained growth in government spending.

The context for implementing a VAT in the United States—namely, that the long-term fiscal shortfall facing the country necessitates tax increases—makes it even more unlikely that an American VAT would simply boost spending.

To be fair, some evidence suggests that the more revenue the government has, the higher spending will be (Becker and Mulligan 2003). But U.S. history suggests that the opposite is more often the case. Every major tax cut of the past 60 years was accompanied or followed by an *increase* in spending, not a reduction.⁴³ In contrast, the budget deals enacted in 1990 and 1993 raised taxes and cut spending at the same time. So, in fact, U.S. policymakers tend to cut taxes and increase spending simultaneously; they also tend to raise taxes and cut spending simultaneously (Bartlett 2007; Gale and Orszag 2004; Romer and Romer 2009). Thus, when policymakers are ready to address the long-term fiscal challenge and create a VAT, they will likely couple it with spending cuts.

FIGURE 2.

OECD Tax Revenue as a Percent of GDP, 1965–2016



Source: OECD Consumption Tax Trends 2018.

Note: Total consumption tax revenue is the sum of the VAT and “Other consumption tax revenue”, which includes retail sales taxes, turnover taxes, and other taxes on goods and services.

2. How would a VAT affect the states?

A national VAT would have significant implications for the sales taxes on which most states and many localities rely, but that is a feature, not a bug. Sales taxes are the second largest state and local revenue source. Some policymakers and experts view consumption taxes as the states' prerogative and express concern that a national VAT would impinge on states' ability to administer their own sales taxes. Their concerns are understandable, though states could retain their current retail sales taxes even in the presence of a federal VAT. But repealing their current sales taxes and replacing them with VATs that conform to a federal VAT base would offer many advantages for states.

Currently, state sales taxes are poorly designed. McLure (2002, 841) refers to the “nutty” world of state sales taxes. The taxes exempt many goods and most services, which makes them unfair and inefficient. Forty-five states and DC have a sales tax; 34 of them exempt food consumed at home, and almost all exempt some component of health-care consumption. Business-to-business transactions should also be exempt (to avoid tax cascading), but these transactions actually constitute around 40 percent of state sales tax revenues (Ring 1989; Phillips and Ibaid 2019; Gale 2005). State and local governments also have difficulty taxing out-of-state, mail-order, or internet purchases made by residents. States that impose their own VATs that conform to the federal VAT could solve these problems. They could raise revenue with minimal economic distortion and vastly reduced administrative costs.⁴⁴

If the federal and state VAT bases were identical, the federal government could even collect revenue on behalf of the state, remit the funds to the state, and relieve the state of most VAT administrative costs altogether. At the least, states could piggyback on federal VAT administration as they currently do with the income tax, easing taxpayer compliance costs and government administrative costs.⁴⁵ If states and localities adopt the federal VAT structure, they could replace existing sales tax revenues and protect the bottom 40 percent of households even more effectively than their current product exemptions do, with an average VAT rate of about 6.6 percent and a UBI equal to the state VAT rate times the federal poverty line.⁴⁶ The combined federal, state, and local average VAT rate, which would be 16.6 percent, would still be lower than the OECD average national rate of 19.3 percent.

The experiences of the European Union member countries and Canada demonstrate that countries can successfully implement multilevel VATs (i.e., encompassing both the national and subnational tax authorities),

but the issue of interstate commerce merits further discussion. Without coordination among states, goods and services would have to be zero rated as an export every time they crossed a state border and then taxed as an import to the new state. Interstate commerce would be cumbersome and confusing. Keen (2001) highlights a simple solution to this problem: tax all business-to-business sales at the federal VAT and let states set their VAT on final sales at whatever rate they would like. This solution would retain the character of the VAT as a sales tax, would eliminate the need to make state-by-state border adjustments for business-to-business transactions, and would allow states to retain control over their own tax rates on final sales.

3. What are the political prospects for a VAT?

The political obstacles to enacting a VAT in the United States are considerable. Policymakers mulled broad-based consumption taxes in the 1930s to plug the budget, in the 1940s to fund World War II, in the 1970s to share revenues with states and localities, and in the 1980s and 1990s as part of overall tax reform—all to no avail. That makes the VAT, as one expert noted, “the most studied tax system that has never been seriously considered by Congress” (Schenk 2011).

Politicians have notoriously long memories, and, consequently, former Democratic House Ways and Means Committee chairman Al Ullman looms large. He proposed a VAT in 1979 and lost his reelection bid a year later. Many factors contributed to his loss—he was often away from his district, where his only residence was a hotel room, and 1980 was a big year for Republican candidates. His experience, though, has served as a warning to politicians who may be considering a VAT. So, too, does the experience of Canada’s Conservative Party, which was decimated in the election after it enacted a VAT.⁴⁷

In that regard, it is somewhat remarkable that leading policymakers of both parties have proposed VATs in recent years. Conservatives may decry the VAT as an instrument of European socialism, but they have proposed VATs themselves, just under alternative names. They speak of the VAT like the wizards in the *Harry Potter* stories speak of Voldemort—careful never to say the name. But the destination-based cash-flow tax that House Speaker Paul Ryan and Ways and Means Committee chair Kevin Brady proposed in the 2016 Republican “Better Way” blueprint is just a VAT with a wage deduction (Ryan and Brady 2016). VATs are embedded in Ryan’s “business consumption tax,” libertarian Kentucky senator Rand Paul’s “Fair and Flat Tax,” 2012 Republican presidential candidate Herman Cain’s “9-9-9” proposal, and Republican senator Ted Cruz’s “Business Flat Tax” (Ryan

2008; Paul 2015; Urban-Brookings Tax Policy Center 2011; Cruz Campaign 2015).

VATs have also been proposed (and renamed) in Senate Finance Committee Democrat Ben Cardin’s “progressive consumption tax” and the Bipartisan Policy Center’s 2010 Domenici-Rivlin commission report, which called it a “deficit reduction sales tax” (Cardin 2015; Debt Reduction Task Force 2010). Although these leading policymakers proposed to use the resulting revenues differently, they all viewed the VAT favorably for three reasons: it raises lots of money, it creates few negative economic incentives, and it is administratively sound.

The Taxpayer Protection Pledge, also known as the “no new taxes” pledge, will be a significant obstacle to enacting a VAT (or any other tax) that raises net revenue. Created by the lobbying group Americans for Tax Reform, which is headed by Grover Norquist, the pledge has been signed by 88 percent of Republicans in the 116th Congress (2019–21), including almost all of the party’s leaders (Americans for Tax Reform 2019). No Democrats have signed on, and only one independent has. But in some situations, the country needs to raise taxes. World Wars I and II come immediately to mind. Even Ronald Reagan saw fit to raise taxes on numerous occasions (Bartlett 2011). The pledge has been criticized by both the right and the left, is unpopular with voters, and makes negotiations about reaching a fiscal solution almost impossible: if one side will not consider tax increases, why should the other side consider spending cuts (Gale 2019)?

4. What can we learn from Canada’s experience?

The VAT operates in 168 countries and raises an average of almost 20 percent of all revenue in OECD member countries, suggesting that many countries find the VAT to be a useful tool. But sometimes a simple example can speak as compellingly as reams of data. For example, we can assuage concerns about regressivity, government growth, transparency, and state-level impacts by focusing attention on Canada’s VAT (Sullivan 2011).

In 1991, Canada implemented a 7 percent national VAT to replace a tax on sales by manufacturers. It was introduced by the Conservative Party, which sought to address concerns about competitiveness and the government’s fiscal situation. To address distributional concerns, Canada applied a zero rate to certain necessities (e.g., groceries, medicines, and rent), and added a refundable credit to the income tax for lower-income people. Transfer payments were already indexed for inflation and highly progressive, which further offset the VAT’s regressivity. As noted, Canada’s VAT is completely transparent: it is listed separately on receipts and invoices, just like state and local sales taxes in the United States.

At least in Canada, fears about a VAT have proved unfounded:

- It did not decimate provincial consumption taxes; some provinces have converted their sales taxes to the VAT base, while others have not. Provinces set their own VAT rates, which either they or the Canadian government can administer. Of Canada's 13 provinces and territories, nine have a provincial sales tax—four administered in addition to the Canadian Goods and Sales Tax (GST) and five harmonized to the GST (Sullivan 2011).
- The rate has not risen inexorably; it has actually fallen over time. Policymakers cut the standard VAT rate to 6 percent in 2006 and then to 5 percent in 2008 (Sullivan 2011).
- It has not fueled government spending; Canada's general government tax revenue and spending have generally fallen as a share of its economy since 1991 (OECD 2017).

The political concerns are partially valid; the Conservative Party took a beating in the election following the creation of a VAT. But the Liberal Party, which had promised to repeal the VAT, did not do so upon taking the reins of power, and the VAT has survived (Sullivan 2011).

Conclusion

The VAT has a lot to offer to policymakers and the American public. The tax can raise revenue in a relatively efficient, relatively progressive, and administrable manner. Given the long-term fiscal shortfalls facing the country and the need for more government investment in crucial social priorities, it seems to be only a matter of time until policymakers will be forced to consider a VAT more seriously than in the past.

Appendix. Alternative Forms of Consumption Taxation

Consumption taxes come in many forms. At a high level of abstraction, the taxes are clearly related (and indeed equivalent in some respects).

For example, in the credit-invoice VAT (sometimes called a goods and services tax), each business pays the government the VAT collected on its sales minus a credit for the VAT it pays on input purchases (as shown in table 1 earlier). The credit-invoice VAT can be thought of as similar to a retail sales tax, with revenue collected at each stage of production rather than in one fell swoop at the retail level. This comparison only holds, though, if

the VAT has two additional features. First, it must allow a full deduction for new investment in the year it was made (“expensing”). Second, it must provide border adjustments. Almost all real-world VATs possess these two features, which make a VAT a destination-based consumption tax, like the retail sales tax.

Recall that a business’s “value added” is the difference between its gross sales and its purchase of goods and services from other businesses. It is equal to cash flow plus total compensation to workers (for simplicity, wages), or

$$\begin{aligned} (1) \text{ Value added} &= \text{Sales} - \text{Purchases} \\ &= (\text{Sales} - \text{Purchases} - \text{Wages}) + \text{Wages} \\ (2) &= \text{Cash flow} + \text{Wages} \end{aligned}$$

Under the subtraction-method VAT (sometimes called a business transfer tax), an alternative way to tax value added, businesses pay VAT on the aggregate difference between their sales to businesses and consumers, and their purchases from businesses, as shown in equation 1. Under many conditions, the subtraction-method VAT gives the same outcomes as a credit-invoice VAT.

Hall and Rabushka (1985) developed the “flat tax” based on the subtraction-method VAT. A flat tax divides the base into two parts. Businesses pay taxes on their cash flow. People pay taxes on their wages at a flat rate with personal exemptions (see equation 2). The X-tax (Bradford 1986) is similar to a flat tax but imposes graduated rates on wages and sets the business tax rate equal to the top tax rate on wages.

Neither the flat tax nor the X-tax contain border adjustments. As a result, they would tax goods produced in the United States rather than goods consumed in the United States (see figure 1 and appendix table 1). Representatives Paul Ryan and Kevin Brady (2016) proposed a destination-based cash-flow tax that is just a VAT with a wage deduction (appendix table 1). It would tax the same business cash-flow base as the flat tax and X-tax and would also implement border adjustments.

The business taxes described above are not so different from the existing corporate tax. If one starts with the flat tax or X-tax business tax structure, the current corporate tax is largely recouped by allowing firms to take deductions for interest payments and by requiring firms to depreciate rather than expense their investments in structures (appendix table 1).

APPENDIX TABLE 1.

Comparison of Tax Bases

	Business base	Individual base	Border adjustment
Subtraction-method VAT	Cash flow + wages	—	Yes
Flat tax	Cash flow	Wages (with exemption)	No
X-tax	Cash flow	Wages (graduated rates with exemption)	No
Destination-based cash flow tax	Cash flow	—	Yes
Current corporate rate	Profits ^a	—	No

^a Profits = cash flow + investment – depreciation – net interest



Acknowledgments

The author thanks Alan Auerbach, Tracy Gordon, Michael Keen, Wojciech Kopczuk, Ryan Nunn, Jim Nunns, Jana Parsons, Jay Shambaugh, Eric Toder, Alan Viard, Hamilton Project staff, and conference participants for helpful comments; Janet Holtzblatt, Chenxi Lu, Gordon Mermin, John Sabelhaus, and Noah Zwiefel for various calculations; and Grace Enda and Claire Haldeman for outstanding research assistance.

Endnotes

1. This paper is adapted from a chapter in *Fiscal Therapy: Curing America's Debt Addiction and Investing in the Future* (Oxford University Press, 2019).
2. As discussed in the appendix, the equivalence between a VAT and a retail sales tax requires a few additional conditions, namely that the VAT expenses current investment and provides border tax adjustments. In practice, virtually all VATs in existence satisfy these requirements.
3. See Batchelder and Kamin (2019), Gale (2019), and Saez and Zucman (2019a, 2019b) for further discussion of taxing the rich.
4. These payments would not be considered in determining eligibility for federal, state, or local government means-tested programs.
5. All references to VAT data from OECD countries are from OECD (2016, 2017, 2018) and are weighted by GDP, unless otherwise noted.
6. OECD (2019) defines social security contributions as “compulsory payments paid to general government that confer entitlement to receive a (contingent) future social benefit. They include

unemployment insurance benefits and supplements, accident, injury and sickness benefits, old-age, disability and survivors' pensions, family allowances, reimbursements for medical and hospital expenses or provision of hospital or medical services. Contributions may be levied on both employees and employers. Such payments are usually earmarked to finance social benefits and are often paid to those institutions of general government that provide such benefits."

7. The proposed tax rates are equivalent to a markup at the cash register, in the same way that retail sales taxes are typically quoted. In technical terms, the proposed VAT rate is a tax-exclusive rate (Gale 2005).
8. If the price level, including the VAT, did not rise, equity holders would bear the full burden of the wealth tax. Holders of nominal debt would not see any change in the value of their assets.
9. Keen (2001, 198) notes that both the liberal and conservative views "are probably wrong."
10. The current policy outcome adjusts CBO's current law projections to show the effects of alternative policies. Major temporary provisions in the tax code are assumed to be permanent, and delayed provisions are assumed to be permanently delayed (i.e., eliminated). The current policy adjustments also allow nondefense discretionary spending, already indexed to increase with inflation, to grow with population as well.
11. This is meant to represent a tax-exclusive tax rate. That is, the VAT would be 10 percent of the price not including the tax. For example, if the good sold for \$100 before the VAT is applied, a 10 percent tax-exclusive VAT would result in a levy of \$10. Any tax can be represented with a tax-exclusive or a tax-inclusive rate. For example, if the good sold for \$100 pre-VAT, a \$10 tax would represent a tax-inclusive rate of 9.1 percent (10 divided by 110).
12. The prices given in this example assume that consumers bear the full incidence of the tax.
13. In 2016, 78 percent of children from the top income quartile enrolled in college, compared with 46 percent of children from the bottom income quartile (Cahalan et al. 2018).
14. One option is to tax financial firms on a cash-flow basis. The International Monetary Fund has proposed a financial activities tax that is essentially a tax on the sum of worker compensation and profits in the financial sector, which is another way to calculate value added (see Keen, Krellove, and Norregaard 2016). Merrill (2011) advocates a tax calculation system that determines VAT liability on an account-by-account basis. Another option is the mobile-ratio approach, which allocates the financial margin of a firm to each financial transaction and hence taxes almost all value added by the financial sector (López-Laborda and Peña 2018).
15. See Gendron (2011) for further discussion.
16. Border adjustment implies that the wealth tax imposed by the VAT is absorbed by Americans. Without border adjustment, foreign wealth holders bear some of the burden of that levy because U.S. exports would include the tax. But, such a process would also make U.S. exports more expensive and possibly harm exporting firms and workers.
17. Taxing everything at the same rate is not always the optimal choice in theory. Under certain assumptions, the Ramsey rule implies that inelastically demanded goods should be taxed at higher rates. Under different circumstances, optimal commodity taxes should be higher for goods that are complements to leisure, which is untaxed. See Corlett and Hague (1953).
18. State sales taxes in the United States also provide product exemptions rather than per-household payments.
19. The table does not include the effects of higher federal government spending or revenues due to the tax the federal government owes to itself. Nor does the table include receipts from state and local government wages and purchases or the rebates those governments would receive from the federal government. All these effects, taken together, would not change the impact of the VAT on the deficit.
20. These figures assume that the monetary authorities accommodate the VAT and let prices rise by the full extent of the VAT (i.e., by 10 percent). If the consumer price level rises by less than the full extent of the VAT, some of the effect would involve lower government spending and a revenue decrease via lower revenues from other taxes. In contrast, when prices rise by the full extent of the VAT, there is no offsetting response in the form of lower revenues from other taxes (see Toder, Nunns, and Rosenberg 2011). In a first-order approximation abstracting from the impact of different price level patterns on the economy, the effect on the federal budget deficit and debt would be the same under any aggregate price level adjustment. The assumption that the nominal price level will rise differs

- from the standard assumption in distributional analyses (of income tax changes) undertaken by the Joint Committee on Taxation, CBO, and the Urban-Brookings Tax Policy Center that nominal prices stay fixed. But it makes more sense in the context of a VAT, since the alternative is that nominal wages have to fall, a process that could trigger an economic downturn.
21. The return to capital can be decomposed into a “normal” return (that is, the return on waiting) and excess or “supernormal” returns, which can consist of the returns on risk, skill, monopoly power, etc. A consumption tax does not burden the normal return because waiting to consume does not affect the present value of consumption. Some households may also finance consumption out of public or private transfers, but those transfers ultimately stem from one of the three sources listed in the text.
 22. This does not require that the wealth be eventually consumed. It just requires that some of the income from the wealth be consumed (i.e., that wealth ultimately grows more slowly than the interest rate). See Auerbach and Kotlikoff (1987) and Auerbach (2006).
 23. An alternative viewpoint rejects the one-time implicit wealth tax and argues instead that “deliberate attempts to impose such unexpected taxes are inappropriate” and “pernicious” (Carroll and Viard 2012, 126–27) See Carroll and Viard (2012) and Kaplow (2008) for a more detailed exposition. One reason a tax on existing wealth is considered inappropriate is the concern that it could be repeated. In this regard, imposing a one-time wealth tax through a consumption tax (rather than, say, through an explicit wealth levy) offers some reassurance, since the consumption tax can only be imposed once (though the tax rate could be raised).
 24. Altig et al. (2001) show that, even in the long term, more than 60 percent of the growth effect of substituting a VAT for the income tax is due to the lump-sum tax on existing wealth.
 25. Urban-Brookings Tax Policy Center calculation.
 26. If the general equilibrium effects of the wealth tax are considered, some of the effects of a direct wealth tax are likely to be borne by households below the top 0.1 percent. A lower capital stock would reduce wages, but a reduced amount of rent-seeking on the part of executives and firms could raise wages. For further discussion, see Penn Wharton Budget Model (2019).
 27. Urban-Brookings Tax Policy Center calculation using data from the 2016 Survey of Consumer Finances aged to 2019 (Board of Governors of the Federal Reserve 2016).
 28. Understanding the avoidance, evasion, administrative, and revenue effects from Warren’s wealth tax is a work in progress. No such tax or anything similar to it has ever been imposed in the United States. A study by the Penn Wharton Budget Model estimates that Warren’s proposal would raise \$2.7 trillion, nearly 30 percent less than the campaign’s claims. Accounting for macroeconomic effects, the Warren wealth tax would bring in \$2.3 trillion (Penn Wharton Budget Model 2019). Some commentators deemed the revenue estimates from a previous version of Warren’s wealth tax to be overly optimistic (see Holtzblatt 2019 and Summers and Sarin 2019). See also Rubin (2019).
 29. See Gale and Samwick (2016) for a more extensive discussion of the relationship between taxes and long-term growth.
 30. Downward nominal wage rigidity can lead to increased employment losses from a negative labor demand shock relative to the losses that would be expected if nominal wages were fully flexible (Devereux and Altonji 2000; Elsby and Solon 2019).
 31. Gale and Harris (2013) note that “research has found only a weak relationship between the VAT and continually increasing prices. In a survey of thirty-five countries that introduced the VAT, Tait (1991) finds that 63 percent exhibited no increase in the consumer price index (perhaps because they were replacing existing sales taxes) and that 20 percent had a one-time price rise. In the remaining 17 percent of cases, the introduction of the VAT coincided with ongoing acceleration in consumer prices, but in Tait’s view, it is not likely that the VAT caused the acceleration.”
 32. Expanded cash income is a broad income measure equal to adjusted gross income plus (1) above-the-line adjustments, (2) employee contributions to tax-preferred retirement accounts, (3) tax-exempt interest, (4) nontaxable Social Security and pension income, (5) cash transfers, (6) the employer share of payroll taxes, (7) imputed corporate tax liability, (8) tax-exempt employee and employer contributions to health insurance and other fringe benefits, (9) employer contributions to tax-preferred retirement accounts, (10) income earned within retirement accounts, and (11) nutrition benefits (food stamps). For further background and explanation, see Urban-Brookings Tax Policy Center (2019).

33. The distributional consequences and characterization of the VAT depend on how taxpayers are classified (consumption or income) and how the tax is allocated—either to sources of income (wages and capital) or uses of income (consumption). The results discussed in this chapter represent a middle ground between alternative ways to estimate the distributional effects. For example, if households were classified by annual income, as they are here, but the tax were allocated on the basis of household consumption (rather than according to wages and supernormal returns on capital), the VAT (without UBI) appears to be very regressive in the long-run steady state. Because the VAT is a proportional tax on consumption, and because lower-income households consume greater shares of their income than do high-income households, the tax burden is a larger share of income for lower-income households than for high-income households (Burman, Gravelle, and Rohaly 2005; Feenberg, Mitrusi, and Poterba 1997). Alternatively, if households were classified by annual consumption and the tax were allocated on the basis of household consumption, the tax is proportional across income groups in the long-run steady state. Likewise, to the extent that current consumption reflects average lifetime income, the VAT is also proportional with respect to lifetime income (Casperson and Metcalf 1994; Metcalf 1994).
34. See Cnossen (2011) and Pomeranz (2015) for discussion of these incentives under a VAT. In the income tax, businesses withhold income and payroll taxes on behalf of workers and send the money to the government. As a result, evasion rates for wage income are quite low (Gale and Holtzblatt 2002). Naritomi (2019) discusses ways to incentivize consumers to report retail sales to the government, which then can use the reports to check whether firms are paying taxes appropriately.
35. A national retail sales tax has other problems (Gale 2005; President's Advisory Panel on Federal Tax Reform 2005). Advocates have argued that a 23 percent national sales tax rate would be sufficient to replace virtually all federal taxes, but the calculation is flawed, and the actual rate would need to be much higher to maintain real government spending and revenues.
36. VATs do have some administrative problems of their own. While tax evasion is typically lower under a VAT than under an income tax, it is not always low; one study estimated a 40 percent evasion rate in the Italian VAT (Tanzi 1995). Informal sectors of the economy, such as tip income or babysitting, will escape a VAT as well as income or sales taxes. Taxing certain sectors, like financial services, has proven difficult under a VAT because it is hard to identify the value added. New types of fraud, involving businesses that collect the VAT on their sales and then disappear with the proceeds, have emerged in recent years in Europe.
37. A famous case in Britain in the 1990s revolved around whether Jaffa Cakes were actually cakes or biscuits (cookies), which were taxed at different rates. More recently in the United Kingdom, the taxation of nuts has become an issue. Nuts are zero rated unless they are roasted, salted, and removed from the shell, in which case they are subject to 20 percent VAT. The rule for peanuts is slightly different: they are zero rated if they are removed from the shell but not roasted or salted. Further complications arise in nut mixtures. A recent court ruling regarding a dark chocolate bar, which could have been treated as a confectionary (taxed) or a baking ingredient (zero rated) hinged in part on the aisle in which the good was placed in supermarkets. These types of rules are recipes for disaster in tax administration. In the United States, differences in sales taxes on pumpkins, depending on their use, and on candies, depending on their ingredients, have attracted attention in recent years. See Kaeding (2019). States' policies for taxing doughnuts highlight the complexity of sales taxes: North Carolina and Washington tax doughnuts sold with eating utensils, and New York and Wyoming tax doughnuts on the basis of the quantity sold. See Erb (2019).
38. Missing trader intra-community fraud, a prevalent form of VAT fraud in the European Union, occurs when a business imports a good, sells it domestically, collects VAT on the sale, and simply never remits it to the government. The business disappears or closes, becoming a "missing trader." In this type of fraud, criminal organizations take advantage of the lag between when VAT is collected (during a sale) and when the tax must be remitted to the government (in periodic tax returns).
39. A simple description of carousel fraud, based on Keen and Smith (2006), is as follows: (1) Firm A, in country 1, sells a widget to company B in country 2 for \$100. Company A appropriately receives a full refund from country 1 of any input VAT it paid. (2) Firm B is not required to pay VAT to country 2 until its next periodic return. Let the VAT rate in country 2 be 10 percent. Firm B sells the widget for \$110 (including VAT) to firm C, also in country 2, showing \$10 as VAT. Firm B does not remit the tax to the authorities. Instead, it disappears before its next periodic return is due, and simply

- keeps the money (this is where the “missing trader” terminology comes from). (3) Meanwhile, the invoice issued to firm C entitles it to a \$10 credit. Firm C sells the widget back to company A in country 1 (the return feature is where the “carousel” terminology comes from) for \$100. Because exports are zero rated, firm C gets a full rebate of its \$10 in VAT payments. (4) The cycle starts over. For each cycle, the loss to the government of country 2 is \$10. There is no value added in country 2, so there should be no net revenue. The government should have received \$10 from firm B and then refunded that amount to firm C. Instead, the government pays the \$10 to firm C but never collects the money from firm B. In practice, of course, the schemes can be much more complex, involving multiple layers of companies (not all in on the scam) located in different countries.
40. Indeed, at one point, a single person appeared to account for 10 percent of worldwide sales of one type of computer chip. In fact, however, he had only a single box that was rapidly making round trips across the Ireland–UK border (Ainsworth 2006).
 41. See the discussion in Keen and Smith (2006).
 42. Among 16 Western European countries from 1965 to 2015, VAT revenue rose by 5.6 percent of GDP, but excise and other sales taxes offset almost all of that change, falling by 5.2 percent of GDP. Indeed, in many instances, policymakers in those countries enacted a VAT with the explicit goal of replacing less efficient sales and other taxes. Total revenue in those 16 countries rose substantially over time—by about 10 percent of GDP—but the VAT increase in excess of other consumption tax reductions (0.4 percent of GDP) was only a tiny fraction of the total tax increase. These figures update calculations in Sullivan (2012), using data from OECD (2017). All 16 countries are included in the analysis, regardless of whether they had a VAT in 1965.
 43. Major cuts were passed in 1964, 1981, 2001, 2003, 2009, and 2017.
 44. In light of *South Dakota v. Wayfair*, states have the authority to collect sales taxes on transactions in which the seller does not have a physical presence in that state, also known as “nexus” (Supreme Court of the United States 2018). If there were a national VAT, states that aligned their own VAT base with the national VAT base would be able to more easily collect tax on sales within their states by businesses that had no nexus.
 45. Of course, a federal VAT would also have direct effects on states if it were to tax purchases by state governments. Nunns and Toder (2015) show, however, that if the federal VAT exempts state and local government spending, as proposed, the effects on state budgets would be either neutral or positive.
 46. With a UBI equal to the poverty line times the VAT rate, the bottom quintile would receive a net increase in after-tax income, and the second quintile would face a net burden of zero (Urban-Brookings Tax Policy Center calculation). Under even the most progressive current state or local sales tax, those two groups would face positive effective tax rates. The 6.6 percent rate is calculated by setting the \$414 billion in state and local sales tax revenue in 2018 (U.S. Census Bureau 2019) equal to gross revenues from the VAT (the \$9,796 billion base times the tax rate) less the cost of the UBI (the tax rate times \$2,975 billion, the cost of the poverty level summed over all tax units). Note that a state VAT that substitutes for existing sales taxes would not affect the price level or other tax burdens.
 47. In 2010, the U.S. Senate went out of its way to disparage the VAT, voting 85–13 to support the statement “The Value Added Tax is a massive tax increase that will cripple families on fixed income and only further push back America’s economic recovery.” Such “sense of the Senate” resolutions, however, are not binding. For example, in 1981 a resolution expressing the sense of the Senate against taxing Social Security benefits passed 98–0. Under the provisions of the Social Security reforms passed two years later, Congress started taxing Social Security benefits (see Avi-Yonah 2011 and Carroll and Viard 2012).

References

- Ainsworth, Richard. 2006. "Carousel Fraud in the EU: A Digital VAT Solution." Working Paper 06-23. Boston University School of Law.
- Alm, James, and El-Ganainy, Asmaa. 2012. "Value-Added Taxation and Consumption." *International Tax and Public Finance* 20 (1) 105–28.
- Altig, David, Alan J. Auerbach, Laurence J. Kotlikoff, Kent A. Smetters, and Jan Walliser. 2001. "Simulating Fundamental Tax Reform in the United States." *The American Economic Review* 91 (3): 574–95.
- Americans for Tax Reform. 2019. "Pledge Database." Accessed December 12, 2019. <https://www.atr.org/pledge-database>.
- Auerbach, Alan. 2006. "The Choice Between Income and Consumption Taxes: A Primer." NBER Working Paper 12307. National Bureau of Economic Research, Cambridge, MA.
- Auerbach, Alan, William Gale, and Aaron Krupkin. 2019. "Revising the Federal Budget Outlook." *Tax Notes*, August 5.
- Auerbach, Alan, and Roger Gordon. 2002. "Taxation of Financial Services under a VAT." *American Economic Review* 92 (2): 411–16.
- Auerbach, Alan, and Laurence Kotlikoff. 1987. "Evaluating Fiscal Policy with a Dynamic Simulation Model." *American Economic Review* 77 (2): 49–55.
- Avi-Yonah, Reuven. 2011. "The Political Pathway: When Will the U.S. Adopt a VAT?" In *The VAT Reader: What a Federal Consumption Tax Would Mean for America.*, Washington, DC: Tax Analysts.
- Bartlett, Bruce. 2007. "'Starve the Beast': Origins and Development of a Budgetary Metaphor." *Independent Review* 12 (Summer 2007): 5–26.
- . 2011. "Reagan's Forgotten Tax Record." February 22. <http://capitalgainsandgames.com/blog/bruce-bartlett/2154/reagans-forgotten-tax-record>.
- Batchelder, Lily, and David Kamin. 2019. "Taxing the Rich: Issues and Options." The Aspen Institute Economic Strategy Group.
- Becker, Gary S., and Casey B. Mulligan. 2003. "Deadweight Costs and the Size of Government." *Journal of Law and Economics* 46 (2): 293–340.
- Benartzi, Youssef, and Alisa Tazhitdinova. 2018. "Do Value-Added Taxes Affect International Trade Flows? Evidence from 30 Years of Tax Reforms." NBER Working Paper 26195. National Bureau of Economic Research, Cambridge, MA.
- Benge, Matt, Marie Pallot, and Hamish Slack. 2013. "Possible Lessons for the United States From New Zealand's GST." *National Tax Journal* 66 (2): 479–98.
- Bickley, James. 2012. "Value-Added Tax (VAT) as a Revenue Option: A Primer." Congressional Research Service, Washington, DC.
- Board of Governors of the Federal Reserve. 2016. "Survey of Consumer Finances." Board of Governors of the Federal Reserve, Washington, DC.
- Bradford, David F. 1986. *Untangling the Income Tax*. Cambridge, MA: Harvard University Press.
- Brashares, Edith, Matthew Knittel, Gerald Silverstein, and Alexander Yuskavage. 2014. "Calculating the Optimal Small Business Exemption Threshold for a U.S. VAT." *National Tax Journal* 67 (2): 283–320.
- Bureau of Economic Analysis. 2019. "Government Current Receipts and Expenditures." *National Income and Product Accounts*. U.S. Department of Commerce, Washington, DC.
- Burman, Leonard. 2009. "A Blueprint for Tax Reform and Health Reform." Urban-Brookings Tax Policy Center, Washington, DC.
- . 2019. "A Universal EITC: Sharing the Gains from Economic Growth, Encouraging Work, and Supporting Families." Urban-Brookings Tax Policy Center, Washington, DC.
- Burman, Leonard E., William G. Gale, Sarah Gault, Bryan Kim, Jim Nunns, and Steve Rosenthal. 2016. "Financial Transaction Taxes in Theory and Practice." *National Tax Journal* 69 (1): 171–216.

- Burman, Leonard, Jane Gravelle, and Jeff Rohaly. 2005. "Towards a More Consistent Distributional Analysis." The Urban Institute, Washington, DC.
- Cahalan, M., Perna, L. W., Yamashita, M., Wright, J., and Santillan, S. 2018. "Indicators of Higher Education Equity in the United States: 2018 Historical Trend Report." The Pell Institute for the Study of Opportunity in Higher Education, Washington, DC.
- Cardin, Ben. 2015. "Progressive Consumption Tax Act." <http://www.cardin.senate.gov/pct>.
- Carroll, Robert, Robert Cline, and Tom Neubig. 2010. *The Macroeconomic Effects of an Add-on Value Added Tax*. Ernst and Young, prepared for the National Retail Federation.
- Carroll, Robert, and Alan D. Viard. 2012. *Progressive Consumption Taxation: The X Tax Revisited*. American Enterprise Institute, Washington DC.
- Casperson, Eric, and Gilbert Metcalf. 1994. "Is a Value Added Tax Regressive? Annual Versus Lifetime Incidence Measures." *National Tax Journal* 47 (4): 731–46.
- Cassidy, John. 2005. "The Ringleader: How Grover Norquist Keeps the Conservative Movement Together." *New Yorker*, August 1.
- Center for Social and Economic Research. 2019. "Study and Reports on the VAT Gap in the EU-28 Member States: 2019 Final Report." Institute for Advanced Studies, Warsaw.
- Cnossen, Sijbren. 2011. "A VAT Primer for Lawyers, Economists, and Accountants." In *The VAT Reader: What a Federal Consumption Tax Would Mean for America*. Washington, DC: Tax Analysts.
- Congressional Budget Office. 2019. Historical Data and Economic Projections. Retrieved from <https://www.cbo.gov/about/products/budget-economic-data#7>.
- Corlett, W.J., and Douglas Hague. 1953. "Complementarity and the Excess Burden of Taxation." *The Review of Economic Studies* 21 (1): 21–30.
- Crawford, Ian, Michael Keen, and Stephen Smith. 2010. "Value Added Tax and Excises." In *Dimension of Tax Design: The Mirrlees Review*, edited by James Mirrlees. Oxford: Oxford University Press.
- Cruz Campaign. 2015. "The Simple Flat Tax Plan." Web page. https://www.tedcruz.org/tax_plan/index.html.
- Debt Reduction Task Force. 2010. "Restoring America's Future: Reviving the Economy, Cutting Spending and Debt, and Creating a Simple, Pro-Growth Tax System." Bipartisan Policy Center, Washington, DC.
- De Paula, Aureo, and José A Scheinkman. 2010. "Value-Added Taxes, Chain Effects, and Informality." *American Economic Journal: Macroeconomics* 2 (4): 195–221.
- Devereux, Paul, and Joseph Altonji. 2000. "The Extent and Consequences of Downward Nominal Wage Rigidity." *Research in Labor Economics* 19: 383–431.
- Elsby, Michael, and Gary Solon. 2019. "How Prevalent in Downward Rigidity in Nominal Wages? International Evidence from Payroll Records and Pay Slips." *Journal of Economic Perspectives* 33 (3): 185–201.
- Erb, Kelly P. 2019. "Free Doughnuts (and Tax Tidbits) on National Doughnut Day." *Forbes*, June 7.
- European Parliament. 2018. "VAT Fraud: Economic Impact, Challenges, and Policy Issues. Policy Department for Economic, Scientific and Quality of Life Policies." Policy Department for Economic, Scientific and Quality of Life Policies.
- Federal Bureau of Investigation. 2015. "Famous Cases & Criminals: Willie Sutton." <https://www.fbi.gov/about-us/history/famous-cases/willie-sutton>.
- Feenberg, Daniel, Andrew Mitrusi, and James Poterba. 1997. "Distributional Effects of Adopting a National Retail Sales Tax." NBER Working Paper 5885. National Bureau of Economic Research, Cambridge, MA.
- Finkelstein, Amy. 2009. "E-Z Tax: Tax Salience and Tax Rates." *Quarterly Journal of Economics* 124 (3): 969–1010.
- Gadenne, Lucie, Tushar K. Nandi, and Roland Rathelot. 2019. IFS Working Paper W19/21. Institute for Fiscal Studies, London.
- Gale, William G. 2005. "The National Retail Sales Tax: What Would the Rate Have to Be?" *Tax Notes* 107 (7): 889–911.

- . 2019. *Fiscal Therapy: Curing America's Debt Addiction and Investing in the Future*. New York, NY: Oxford University Press.
- Gale, William G., Hilary Gelfond, and Aaron Krupkin. 2016. "Entrepreneurship and Small Business under a Value-Added Tax." Brookings Institution, Washington, DC.
- Gale, William G., and Benjamin Harris. 2013. "Creating an American Value-Added Tax." Brookings Institution, Washington, DC.
- Gale, William G., and Janet Holtzblatt. 2002. "The Role of Administrative Factors in Tax Reform: Simplicity, Compliance, and Administration." In *United States Tax Reform in the Twenty-First Century*, edited by George R. Zodrow and Peter Mieszkowski, 179–214. New York: Cambridge University Press.
- Gale, William G., and Peter R. Orszag. 2004. "Economic Effects of Making the 2001 and 2003 Tax Cuts Permanent." Brookings Institution, Washington, DC.
- Gale, William G., and Andrew A. Samwick. 2016. "Effects of Income Tax Changes on Economic Growth." Brookings Institution, Washington, DC.
- Gendron, Pierre-Pascal. 2011. "VAT Treatment of Nonprofits and Public-Sector Entities." In *The VAT Reader: What a Federal Consumption Tax Would Mean for America*. Washington, DC: Tax Analysts.
- Gentry, William, and R. Glenn Hubbard. 1996. "Distributional Implications of Introducing a Broad-Based Consumption Tax." NBER Working Paper 58362. National Bureau of Economic Research, Cambridge, MA.
- Gong, Yifan, Lance Lochner, Ralph Stinebrickner, and Todd R. Stinebrickner. 2019. "The Consumption Value of College." NBER Working Paper 26335. National Bureau of Economic Research, Cambridge, MA.
- Graetz, Michael. 1997. *The Decline (and Fall?) of the Income Tax*. New York: W.W. Norton.
- . 2008. *100 Million Unnecessary Returns: A Simple, Fair, and Competitive Tax Plan for the United States*. New Haven, CT: Yale University Press.
- . 2013. "The 'Competitive Tax Plan' Updated for 2015." Presentation at the National Tax Association, Tampa, FL.
- Güvener, Fatih, Gueorgui Kambourov, Burhanettin Kuruscu, Sergio Ocampo-Díaz, and Daphne Chen. 2019. "Use It or Lose It: Efficiency Gains from Wealth Taxation." NBER Working Paper 26284. National Bureau of Economic Research, Cambridge, MA.
- Hall, Robert E., and Alvin Rabushka. 1985. *The Flat Tax*. Stanford, CA: Hoover Institution Press.
- Her Majesty's Revenues and Customs. 2018. *Internal Manual, VAT Food*. Retrieved from <https://www.gov.uk/hmrc-internal-manuals/vat-food>.
- Holtzblatt, Janet. 2019. "Warren's Wealth Tax Revenue May Not Meet Expectations." Urban-Brookings Tax Policy Center: Washington, DC.
- Huntley, John, Richard Prinsziano, and John Ricco. 2019. "Policy Options: A 1% Value-Added Tax." Penn Wharton Budget Model, Philadelphia, PA.
- Kaeding, Nicole. 2019. "Tax this but not that at Halloween, depending on where you live—there's a lesson here." *Fox Business*, October 31.
- Kaplow, Louis. 2008. *The Theory of Taxation and Public Economics*. Princeton, NJ: Princeton University Press.
- Keen, Michael. 2001. "Preferential Regimes Can Make Tax Competition Less Harmful" *National Tax Journal* 54 (4): 757–62.
- Keen, Michael, Russell Krellove, and John Norregaard. 2016. "Policy Forum: The Financial Activities Tax." *Canadian Tax Journal* 64 (2): 389–400.
- Keen, Michael, and Ben Lockwood. 2006. "Is the VAT a Money Machine?" *National Tax Journal* 59 (4) 905–98.
- Keen, Michael, and Jack Mintz. 2004. "The Optimal Threshold for a Value-Added Tax." *Journal of Public Economics* 88 (3–4): 559–76.
- Keen, Michael, and Stephen Smith. 2006. "VAT Fraud and Evasion: What Do We Know and What Can Be Done?" *National Tax Journal* 59 (4): 861–87.

- Lee, Dungeon, Dongil Kim, and Thomas E. Borchering. 2013. "Tax Structure and Government Spending: Does the Value-Added Tax Increase the Size of Government?" *National Tax Journal* 66 (3): 541–70.
- López-Laborda, Julio, and Guillermo Peña. 2018. "A New Method for Applying VAT to Financial Services." *National Tax Journal* 71 (1): 155–82.
- McLure, Charles E., Jr. 2002. "The Nuttiness of State and Local Taxes—and the Nuttiness of Responses Thereto." *State Tax Notes* 25 (12): 841–56.
- Merrill, Peter R. 2011. "VAT Treatment of the Financial Sector." In *The VAT Reader: What a Federal Consumption Tax Would Mean for America*. Washington, DC: Tax Analysts.
- Metcalfe, Gilbert. 1994. "Lifecycle vs. Annual Perspectives on the Incidence of A Value Added Tax." NBER Working Paper 4619. National Bureau of Economic Research, Cambridge, MA.
- Mitchell, Daniel J. 2010. "VAT Attack." *New York Post*, April 8.
- . 2011. "The Case Against the Value-Added Tax." Cato Institute, Washington, DC.
- Morris, Debra. 2011. "VAT Treatment of Charities and Public Bodies in the United Kingdom." In *The VAT Reader: What a Federal Consumption Tax Would Mean for America*. Washington, DC: Tax Analysts.
- Naritomi, Joana. 2019. "Consumers as Tax Auditors." *American Economic Review* 109 (9): 3031–72.
- Nunns, Jim, and Eric Toder. 2015. "Effects of a Federal Value-Added Tax on State and Local Governments." Urban-Brookings Tax Policy Center, Washington, DC. June 15.
- OECD. 2016. *Consumption Tax Trends 2016*. Paris: OECD Publishing.
- . 2017. "Revenue Statistics—Comparison Tables." *OECD Stat*. Paris: OECD Publishing.
- . 2018. *Consumption Tax Trends 2018*. Paris: OECD Publishing.
- . 2019. Social Security Contributions. Retrieved from <https://data.oecd.org/tax/social-security-contributions.htm>.
- Paul, Rand. 2015. "Blow Up the Tax Code and Start Over." *Fair and Flat Tax Plan*. Retrieved from <https://www.randpaul.com/news/rand-pauls-fair-and-flat-tax>.
- Penn Wharton Budget Model. 2019. "Senator Elizabeth Warren's Wealth Tax: Projected Budgetary and Economic Effects." University of Pennsylvania, Philadelphia, PA.
- Phillips, Andrew, and Muath Ibaïd. 2019. "The Impact of Imposing Sales Taxes on Business Inputs." Ernst and Young LLP and the Council on State Taxation, Washington DC.
- Pomeranz, Dina. 2015. "No Taxation without Information: Deterrence and Self-Enforcement in the Value Added Tax." *American Economic Review* 105 (8): 2539–69.
- President's Advisory Panel on Federal Tax Reform. 2005. "Simple, Fair, and Pro-Growth: Proposals to Fix America's Tax System." President's Advisory Council on Federal Tax Reform, Washington, DC.
- Ring Jr., Raymond L. 1989. "The Proportion of Consumers and Producers' Goods in the General Sales Tax." *National Tax Journal* 42 (2) 167–79.
- Robinson, Philip, and Jeffery Saviano. 2011. "Facilitating Better VAT Compliance." In *The VAT Reader: What a Federal Consumption Tax Would Mean for America*. Washington DC: Tax Analysts.
- Romer, Christina D., and David H. Romer. 2009. "Do Tax Cuts Starve the Beast? The Effect of Tax Changes on Government Spending." *Brookings Papers on Economic Activity*, Spring 2009: 139–214.
- Rosen, Jan M. 1988. "Tax Watch: The Likely New Forms of Taxes." *New York Times*, December 19.
- Rubin, Richard. 2019. "Warren Wealth Tax Would Raise Nearly 30% Less Than Projected, Study Finds." Politics, December 12, *Wall Street Journal*.
- Ryan, Paul. 2008. *Roadmap for America's Future Act of 2008*. 110th Congress, 2nd Session.
- Ryan, Paul, and Kevin Brady. 2016. "A Better Way: Our Vision for a Confident America." Tax Reform Tax Force, United States Congress: Washington, DC.
- Saez, Emmanuel, and Gabriel Zucman. 2019a. "Progress Wealth Taxation." Conference Draft. *Brookings Papers on Economic Activities*, Fall 2019.

- . 2019b. *The Triumph of Injustice: How the Rich Dodge Taxes and How to Make them Pay*. New York, NY: W.W. Norton & Co.
- Schenk, Alan. 2011. "Prior Flirtations with VAT." In *The VAT Reader: What a Federal Consumption Tax Would Mean for America*. Washington, DC: Tax Analysts.
- Slemrod, Joel. 2011. "Does a VAT Promote Exports?" In *The VAT Reader: What a Federal Consumption Tax Would Mean for America*. Washington DC: Tax Analysts.
- Social Security Administration. 2016. "Income of the Population 55 or Older, 2014." Social Security Administration Office of Retirement and Disability Policy, Washington, D.C.
- Sullivan, Martin A. 2011. "VAT Lessons from Canada." In *The VAT Reader: What a Federal Consumption Tax Would Mean for America*. Washington, DC: Tax Analysts.
- . 2012. "Was the VAT a Money Machine for Europe?" Washington, DC: Tax Analysts.
- Summers, Lawrence H., and Natasha Sarin. 2019. "A 'Wealth Tax' Presents a Revenue Estimation Puzzle." Opinion, April 4, *Washington Post*.
- Supreme Court of the United States. 2018. *South Dakota v. Wayfair*. 585 U.S. _____. Washington, DC.
- Tait, Alan. 1991. "Value-Added Tax; Administrative and Policy Issues." IMF Occasional Papers 88, International Monetary Fund.
- Tanzi, Vito. 1995. *Taxation in an Integrating World*. Washington, DC: Brookings Institution.
- Toder, Eric, Jim Nunns, and Joseph Rosenberg. 2011. "Using a VAT for Deficit Reduction." Urban-Brookings Tax Policy Center, Washington, DC.
- Urban-Brookings Tax Policy Center. 2011. "Herman Cain's 9-9-9 Tax Plan." Urban-Brookings Tax Policy Center, Washington, DC.
- . 2019. "Income Measure Used in Distributional Analyses by the Urban-Brookings Tax Policy Center." Urban-Brookings Tax Policy Center, Washington, DC. Accessed 12 December 2019. <https://www.taxpolicycenter.org/resources/income-measure-used-distributional-analyses-tax-policy-center>.
- U.S. Census Bureau. 2019. "2018 Quarterly Summary of State & Local Sales Tax Revenue Tables." U.S. Census Bureau, Suitland, MD.
- U.S. Department of Agriculture. 2019. *Food Expenditure Series*. Economic Research Service, U.S. Department of Agriculture, Washington DC.
- Warren, Elizabeth. 2019. "Ultra-Millionaire Tax." Accessed December 12, 2019. Retrieved from <https://elizabethwarren.com/plans/ultra-millionaire-tax>
- Weiss, Antonio, and Laura Kawano. 2020. "A Proposal to Tax Financial Transactions." In *Tackling the Tax Code: Efficient and Equitable Ways to Raise Revenue*, edited by Jay Shambaugh and Ryan Nunn, Washington, DC: The Hamilton Project.