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THE VALUE ADDED TAX: Too Costly for the United States

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The Value Added Tax: Too Costly for the United States

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-Abstract-

Most developed economies rely on a Value Added Tax (VAT) for a substantial share of their tax revenues, so it is natural that the United States would look toward the possibility of a VAT at a time when huge budget deficits are forecast as far out as the forecasts go. While one can debate the merits of a VAT in other countries, the tax is not a good fit for the United States. It taxes a base that has traditionally belonged to state governments, its introduction would bring with it intergenerational inequities, it has a cumbersome administrative structure that would impose large compliance and administrative costs, and it would slow economic growth. Because of slower economic growth, tax revenues from existing tax bases will fall if a VAT is introduced. This study projects that if a VAT were introduced in 2010, by 2030 the net effect on tax revenues would be small, because revenues collected by the VAT would be mostly offset by declines in revenues from other tax bases. Meanwhile, the introduction of a VAT would slow GDP growth, so government spending as a share of GDP would rise.

Introduction

The Value Added Tax (VAT) generates a substantial share of tax revenues in the European Union countries and in most developed economies throughout the world. Table 1 shows that for the European Union as a whole, the VAT raises about 30 percent of total tax revenues and is the largest single source of tax revenues in the EU. All EU countries have a VAT as a condition of membership, and the VAT has spread to most developed economies and to many less developed economies around the world. The United States is unusual in not having a VAT, which is one reason the possible adoption of a VAT in the United States has been a long-standing issue of US tax policy. The issue is coming further to the forefront of policy debate in 2010 because of the substantial budget deficits that are forecast as far out as forecasts are made. Thus, it is reasonable to ask whether a VAT, which is so common throughout the world, might be a desirable policy option for the United States.

Table 1
Sources of Tax Revenues in the European Union, 2008

Tax	Percentage of Total Tax Revenue
Value Added Tax	30.0%
Income Tax	27.6%
Corporation Tax	10.1%
Excise Taxes	9.5%
Other Taxes	22.8%

Source: www.eapn.ie/eapn/policy/policy-areas/resources-on-taxation/sources-of-tax-revenue

As shown, the VAT is more than just an additional revenue source in the EU: it is the largest single source of tax revenues there. Thus, one should be skeptical that an EU-style VAT could simply be grafted onto the current US tax code. A VAT of that magnitude would require a major overhaul of the entire tax structure, and, indeed, when the VAT was introduced into Europe that is what happened. Another alternative would be to have a smaller VAT added to the current tax code as a revenue enhancer. A problem with that is that there are major administrative and compliance costs that go along with a VAT, and it may not be worthwhile to incur those major costs in exchange for a smaller flow of revenue.

Looking around the world, VAT rates vary substantially among countries. Iceland has the highest VAT rate at 25.5 percent, while Canada is at the bottom of the list with a VAT rate of 5 percent. Table 2 gives standard VAT rates for various countries. While there is a substantial variation, VAT rates most commonly fall in the 17-25 percent range. The EU requires members to maintain a standard VAT rate of at least 15 percent. Denmark, Norway, and Sweden all have 25 percent VAT rates, while the rate in France is 19.6 percent and in Germany is 19 percent. Australia has a 10 percent VAT rate, and Switzerland's rate is 7.6 percent.

Table 2

Value Added Tax Rates for Various Countries

Country	VAT Standard Rate
Australia	10.0%
Austria	20.0%
Belgium	21.0%
Canada	5.0%
China	17.0%
Denmark	25.0%
Finland	23.0%
France	19.6%
Germany	19.0%
Iceland	25.5%
Ireland	21.0%
New Zealand	12.5%
Netherlands	19.0%
Norway	25.0%
Sweden	25.0%
Switzerland	7.6%
United Kingdom	17.5%

Source: www.nationmaster.com/graph/tax_val_add_tax_sta_rat-value-added-tax-standard-rate

The rates shown in Table 2 are “standard” rates, and most countries with VATs have reduced rates of various amounts for certain categories of goods. Belgium, for example, with a standard rate of 21 percent, also has rates of 12, 6, and 0 percent for some goods. France, in addition to its standard rate of 19.6 percent, has 5.5 and 2.1 percent rates. The United Kingdom has rates of 5 and 0 percent in addition to its 17.5 percent standard rate. The UK’s standard rate of 17.5 percent took effect January 1; prior to 2010 the rate was 15 percent. Once a VAT is in place, it is relatively easy to raise the rate to generate more revenue.

One can see from this brief introduction that the VAT is responsible for a substantial share of tax revenues in most countries where it is used, and that typical rates are above 17 percent. When applied to the United States, then, one would want to consider whether the nation would be inclined toward a major tax reform, as occurred in Europe when the EU adopted the VAT, or whether a VAT could be scaled down and applied in the US, perhaps using Canada as the closest example.

The Simple Mechanics of a VAT

To understand the issues involved it is worth reviewing the basic operation of a VAT, including a basic description of the value added that is being taxed, and how the tax system monitors and collects the VAT. Table 3 (taken from Holcombe 2006: 262) shows a hypothetical example of a VAT applied to the manufacture and sale of a baseball bat. In this example a logger sells enough wood to manufacture one bat to a sawmill for \$4. The sawmill then cuts the wood and sells enough lumber to manufacture one bat to a bat manufacturer for \$7. The manufacturer makes the bat and sells it to a sporting goods store for \$15, and the sporting goods store sells the bat to the final customer for \$25. Value added is, as the term implies, the amount of value that is added to the product at each stage of production. For example, the sawmill buys \$4 worth of wood and cuts it into \$7 worth of lumber, so the sawmill adds \$3 (\$7-\$4) to the value of the bat. The bat maker takes \$7 worth of lumber and adds \$8 (\$15-\$7) to the value of the bat, and so forth.

Table 3

A Simple Example of a VAT

Good	Price	Value Added	10% VAT
Logger's Wood	\$4	\$4	\$.40
Sawmill's Lumber	\$7	\$3	\$.30
Bat Maker's Bat	\$15	\$8	\$.80
Sports Store's Bat	\$25	\$10	\$1.00
		-----	-----
TOTALS		\$25	\$2.50

Value added is simply computed as the sales price of a good, minus the value added at earlier stages of production.¹ One might question whether the sporting goods store really adds any value to the bat that has already been manufactured. While one could argue that the store makes buying a bat more convenient, offers a customer some variety to choose from, and so

forth, that is irrelevant from the standpoint of calculating value added for purposes of the tax. The store sold the bat for \$25, and there was \$15 in value added at earlier stages of production, so the value added is computed to be \$10. For purposes of calculating VAT due, value added is an accounting concept.

This example is simplified in many ways, and some complications will be considered below. For one thing, the example leaves out other expenses, which would be incorporated into the computation of the tax. For example, the sporting goods store will buy shelving, cash registers, and other equipment which are inputs from earlier stages of production, so their cost will reduce the store's value added. Likewise, the bat manufacturer will buy lathes and other equipment in addition to wood to make its bats, which reduces the dollar value of the manufacturer's value added. Along the same lines, the lumberjack in this example makes wood with no earlier value added, but the cost of axes and saws, and perhaps planting trees to later be harvested, would reduce the lumberjack's value added.

The computation of the tax is straightforward. The tax rate is applied to the value added, so that in this example where the tax rate is 10 percent, the VAT due is 10 percent of the value added at each stage of production. Note that because the final value of the good is equal to the value added at each stage of production, the total VAT collected is equal to the VAT rate times the retail price of the good. A 10 percent VAT would collect the same amount of revenue as a 10 percent retail sales tax.

VAT Administration and Enforcement

The administration of the VAT provides a mechanism that enables taxpayers to compute the amount they owe, and provides some monitoring and enforcement to increase compliance. When a taxpayer pays the VAT the taxpayer is issued a receipt, which follows the good. The amount of VAT a taxpayer owes, then, is computed as the taxpayer's sales minus value added at earlier stages, which is the sum of value added as indicated by the receipts the taxpayer has from earlier sales.

Consider the example of the baseball bat from the previous section. The logger, having no earlier receipts, has sales of \$4, so pays a VAT of 10 percent of that amount, or \$.40. When the logger sells the wood to the sawmill, that receipt goes with the wood. The sawmill sells the lumber for \$7, which would imply a VAT of \$.70, but the sawmill has receipts showing that the logger already paid \$.40, so the sawmill pays \$.70 - \$.40, or \$.30. Likewise, the bat manufacturer's bat sells for \$15, which implies a VAT of \$1.50, but subtracting out the \$.40 and \$.30 taxes previously paid, for which the manufacturer has receipts, the bat manufacturer pays \$1.50 - \$.40 - \$.30, or \$.80. This mechanism enforces compliance because if one of the earlier producers did not pay the VAT, the later producer would not have the receipt, and thus would be liable for that amount. For example, if the sawmill did not pay its \$.30 VAT, the bat manufacturer would not have the receipt for that amount of tax paid, so would owe \$1.50 - \$.40, or \$1.10. Taxes evaded in earlier stages of production would be due at later stages, which helps enforce compliance.

Even with this simple example one can see that there is a substantial amount of record keeping required for both taxpayers and the government. Taxpayers must maintain records of VAT payments for all purchases, and to audit for compliance the government must be able to match up the payments made by suppliers to the credits for those payments made by subsequent taxpayers.

The Value Added Tax and the Sales Tax

Both the value added tax and the retail sales tax are consumption taxes. A sales tax taxes the final retail sale, whereas the value added tax taxes the value added at each stage of production, which adds up to the retail price of the good, as the baseball bat example illustrates. A VAT taxes the same tax base as a retail sales tax. There are some significant differences, however. One difference is that many more businesses must be involved in remitting the VAT than a retail sales tax. In the baseball bat example, only the final seller, the sporting goods store, collects the tax, whereas with a VAT every business that sells anything, whether retail or

wholesale, must collect and remit the tax. This adds considerably to the administrative and compliance costs of a VAT when compared to a retail sales tax.

The VAT is more costly in another way, because it is considerably more difficult to compute than a retail sales tax. Again looking at the baseball bat example, the only taxpayer in that example with a retail sales tax would be the sporting goods store, and the tax is easily computed as a percentage of the store's sales. With a VAT, the sporting goods store must first find its sales revenue, as with a sales tax, but then must calculate the value added at earlier stages of production, and then subtract the earlier value added from sales to calculate its value added.

The baseball bat example is simple, but illustrates the increased complication in computing the VAT due. For a 10 percent sales tax the retailer calculates $\$25 \times .1 = \2.50 . For the 10 percent VAT the retailer calculates $(\$25 \times .1) - \$.80 - \$.30 - \$.40 = \$1.00$. Now consider that not only does the retail seller have to make this calculation, so do all the other intermediate sellers in the supply chain. Each individual taxpayer faces a more difficult calculation, with more record keeping, than would be the case with a sales tax, and in addition there are many more taxpayers in the system. Thus, the VAT imposes much higher compliance and administrative costs than would a retail sales tax of the same amount. This is illustrated in Table 4, which shows the calculations that must be made by all taxpayers in each case to collect either a 10 percent VAT or a 10 percent retail sales tax.

Table 4

**Calculating a Sales Tax and Value Added Tax for the Bat in
Table 3**

Taxpayer	Sales Tax Calculation	VAT Calculation
Sports Store	$\$25 \times .1 = \2.50	$(\$25 \times .1) - \$.80 - \$.30 - \$.40 = \$1.00$
Bat Maker		$(\$15 \times .1) - \$.30 - \$.40 = \$.80$
Sawmill		$(\$7 \times .1) - \$.40 = \$.30$
Logger		$(\$4 \times .1) = \$.40$
		===
		\$2.50

This example is overly simple because it includes only the inventory as it moves through the supply chain, and does not account for capital equipment such as the bat maker's lathes and the retailer's shelving, cash registers, and other store fixtures. VAT systems require that taxpayers depreciate capital goods, much as is done with income taxation. Thus, the calculation becomes even more complicated when records must be kept for years, depreciation schedules must be figured, and so forth. So while in theory a VAT is a consumption tax like a retail sales tax, in practice tax computation is as complex as a corporate income tax. These administrative and compliance costs will be considered further below. Just this simple example shows that a sales tax requires that many fewer firms collect taxes than with a VAT, and that for those that would remit taxes under both systems the compliance costs in terms of calculation and record-keeping are much higher with a VAT.

Despite the simple example, Table 4 illustrates one of the more serious drawbacks of a VAT when compared to a retail sales tax. In theory the two have the same economic effects and collect the same amount of revenue for the same tax rate. Indeed, a VAT has sometimes been referred to as a national sales tax, with some justification. In practice, the administrative and compliance costs are much higher for a VAT. After some analysis McClure concludes (McClure and Ture, 1972: 68), when comparing a VAT to a sales tax, "I personally would prefer (though not strongly) that the federal government adopt a retail sales tax, if it is to adopt either form of general sales tax. The two taxes should be economically equivalent, so the decision can be made on administrative grounds." The much lower costs of administration and compliance tip the balance for McClure.

Comparing a VAT to a sales tax reveals that a much simpler retail sales tax has many advantages, as Holcombe (1990) notes. Why even consider a VAT, then? There are several reasons. One relates to the audit trail that is created because taxpayers must maintain receipts showing that the VAT was paid by suppliers, or else taxpayers are liable for the taxes unpaid at earlier stages of production. This can help enforce compliance, but in exchange for greater administrative and compliance costs. Another potential advantage is that in its purest form the

VAT taxes all consumption once, but only once. Sales taxes are not exactly consumption taxes because, first, much consumption is untaxed under a sales tax. Many states do not tax services, like haircuts at barbershops or lawn care services, and some explicitly exempt groceries, clothing, and other consumption items. As noted below, however, nations using the VAT also exclude (zero-rate) goods, so this difference is not as substantial as it first appears. Second, all state sales tax structures tax some goods that are not final retail purchases. Ring (1999) notes that for the average state only 59 percent of sales tax collections are actually levied on final goods. The rest comes from the taxation of intermediate goods. The result is tax pyramiding (double taxation) that can occur with sales taxes, but is more rare with the VAT. Double taxation can occur with a VAT when sellers are exempt, as will be discussed further below, but this will not be as common as taxation of intermediate goods under a sales tax.

Another feature of a VAT is that it is more hidden than a retail sales tax. Many citizens will observe that, as in the baseball bat example, a VAT is paid by producers, whereas a sales tax is levied on consumers. While the economic effects are the same, the mistaken perception may be that a VAT is a tax on businesses while a sales tax falls on consumers. While the burden of the two taxes falls on exactly the same taxpayers in the end, this misperception can lower the political resistance to a VAT. Some people favor hidden taxes. If taxes are going to be paid anyway, why not levy them in the way that is least painful to taxpayers? Other people dislike hidden taxes, because they also hide the true cost of government. Whether the more opaque nature of a VAT is an advantage or a disadvantage depends on whether one favors taxes that are easy for taxpayers to see and understand. Despite apparent advantages (and some disadvantages) of a retail sales tax over a VAT, the main reason the VAT is so widely used is only partially related to its intrinsic advantages, and has more to do with the EU's agreement that all member states use it.

The Origins of the Value Added Tax

The widespread use of the VAT began with its introduction into the EU, then called the European Economic Community, starting in the 1960s. As described by Wheatcroft (1973), the VAT was adopted by all EU countries in an effort toward tax harmonization, to set the foundation for the European free trade zone. A frequent argument in support of tariffs, quotas, and other trade restrictions is that the tax structure of foreign countries sometimes subsidizes their producers and gives them an unfair advantage over domestic firms. To mitigate that argument, the EU countries agreed to adopt the same basic tax structure, and that structure called for heavy reliance on the VAT. Prior to that arrangement France had adopted a VAT in 1954, as Balladur and Coutiere (1981) report, but other countries had a variety of transaction-based taxes, including sales taxes and turnover taxes. Dosser (1981) notes that the UK had considered a VAT in the 1960s, but rejected it in favor of other transaction-based taxes that were easier to administer. Subsequently, the UK had to adopt the VAT as a condition of European Economic Community membership.

After the harmonization agreement the VAT was adopted in the EU countries from 1968 through 1973. It was adopted in the EU partly on economic grounds and partly because of the history of taxation in Europe prior to harmonization. There were some efficiency advantages over other taxes then in use—especially turnover taxes,² which are notoriously inefficient—but primarily it was adopted as a result of the agreement to harmonize tax structures.

Once established in the EU, the VAT spread to other countries that followed the EU model. It is often difficult for governments to resist new sources of tax revenue, and indeed that is precisely the motivation VAT supporters in the United States have at present. Note, however, that the motivation for the adoption of a VAT in the EU—tax harmonization—does not apply to the US, and the inefficient taxes the VAT replaced, like turnover taxes, are not a part of the US tax structure.

The Revenue Potential of the Value Added Tax

While the primary motivation at the moment for considering a VAT is its revenue-raising potential, in the past supporters have promoted the VAT as a possible substitute for the federal income tax, either abolishing the income tax altogether and substituting a VAT, or lowering income tax rates and substituting VAT revenues in a revenue-neutral tax reform. Along these lines it is interesting to examine the effect of introducing the VAT into the EU, because most member nations said that they were going to adopt a VAT to redesign their tax structures to comply with the EU regulations, but were going to undertake their reforms in a revenue-neutral manner. In fact, as Holcombe and Mills (1994) report, throughout the EU, tax revenues ratcheted up substantially when the VAT was introduced. The evidence is all the more clear because the VAT introduction was staggered, as EU countries introduced it from 1967 to 1973. Statistical analysis shows a clear ratcheting up in the level of revenue, followed by an increase in the growth rate of revenue, after the introduction of the VAT.

As Aaron (1981: 15-16) notes, "...the proportion of gross domestic product absorbed by taxation in five of the six countries [covered in his book] increased after the value-added tax was adopted....While the value-added tax might be used to reduce other taxes and as a part of a program of fiscal retrenchment in the United States, it is important to recognize that the United States would be blazing a trail for fiscal forbearance not traversed by any of the countries covered in this book." Aaron is saying that regardless of the stated intentions of its advocates, the evidence in countries that have adopted a VAT shows that adopting a VAT brings with it an increase in tax collections. Of course, the motivation of many who advocate a VAT in 2010 is to increase government revenues, but note in the context of Aaron's comment that he is referring to VAT introductions in countries that said the VAT would be revenue neutral, yet turned out to be a substantial revenue enhancer in those countries. Introducing the VAT with the intention of enhancing revenues would suggest that a VAT would raise more in revenues than its proponents initially forecast.

Another issue is that while a VAT will produce an increase in revenues when it is introduced, once established it has the potential to further increase revenues through increases in the VAT

rate after its introduction. It should be obvious that it will be a harder sell to introduce a new tax like a VAT than to increase the tax rate once the tax is in place. One can see from the US experience that once in place, federal income tax rates have been relatively easily changed throughout the history of the income tax, and while rates have adjusted both up and down, the long-run trend has clearly been up. When the federal income tax was introduced in 1913 the highest tax bracket was 7 percent—which is lower than the lowest bracket today.

Table 5 shows the increases in VAT rates in Canada, Japan, and EU countries that have adopted the VAT. Canada stands by itself as the only country that has reduced its VAT rate from the original rate at the time of introduction. The average rate among all countries in the table at the time the VAT was introduced was 9.88 percent, and is now nearly 16 percent. The average percentage change in the rates of the countries in the table is 62.7 percent. Not only did VAT revenues immediately add to the size of government in EU countries when the VAT was introduced, rates were increased substantially over time, adding even more to the growth of government.

Table 5

Changes in VAT Rates Since VAT Introduction, Various Countries

Country	Original Rate	Current Rate	Percent Change
Canada	7%	5%	-28.5%
Denmark	9%	25%	177.8%
France	13.6%	19.6%	44.1%
Germany	10%	19%	90.0%
Italy	12%	20%	66.7%
Japan	3%	5%	66.7%
Spain	12%	16%	33.3%
Sweden	17.7%	25%	41.2%
Switzerland	6.5%	7.6%	16.9%
United Kingdom	8%	17.5%	118.8%
Average	9.88%	15.97%	62.7%

Source: Tax rates from *Wall Street Journal*, April 15, 2010, on-line edition. Percent change calculated by the author.

Politically, the revenue-raising potential of the VAT is a key issue. Proponents of the VAT support it because they see it as a mechanism that can enable government revenues to grow, whereas opponents fear it for the same reason. Both supporters and opponents view the VAT as a tax that will enable a larger government sector. In the political environment of 2010 it is not difficult to frame the debate on the merits of the VAT as a debate between supporters who want a permanently larger federal government and opponents who want to limit the size of the federal government, but the debate over the VAT has been framed this way for decades. Three decades ago Lindholm (1980: 1) advocated a VAT as a method of coordinating "...the relationship between tax reform and the rapidly expanded and expanding level of social expenditures." Two decades ago, Hakken (1993: 94), sounding eerily prescient, concluded, "The most immediate role for a VAT is to fund the revenue gap that would result from an expansion of health care benefits and coverage." Both Lindholm's and Hakken's statements could have been made today. The coupling of a VAT with big government has always been an integral part of the discussion over the desirability of a VAT.

Intergenerational Inequities

The federal income tax, currently the largest source of tax revenue for the federal government, taxes income when it is earned. The VAT, in contrast, taxes consumption at the time the consumption takes place. Thus, if one earns income but saves it, that income would not be taxed under the VAT until it was spent as consumption. Similarly, if one spends by drawing down savings, that previously saved income is taxed by a VAT at the time it is spent. This would result in intergenerational inequities were a substantial VAT implemented to partially replace an income tax.

A simple example can demonstrate the issue. Assume there is a 20 percent income tax on all income, and no VAT. People earn income during their earning years, pay the 20 percent tax, and then when they retire buy things tax-free. Now assume the 20 percent income tax is

replaced by a 20 percent VAT. Under a VAT people earn income and pay no tax on money they are saving for consumption when they retire, but pay a 20 percent VAT on consumption expenditures, including consumption after retirement. If a VAT replaces an income tax, seniors will have paid the 20 percent income tax for their working years, giving them less to retire on, and then will pay the 20 percent VAT on their expenditures after they retire. They will be double taxed when compared to current workers, who will not have the income tax liability during their working years.

The intergenerational inequity is mitigated if a VAT is added to the current tax structure with no change in other taxes. It just amounts to a tax increase. Even so, it will be a tax increase that retirees did not plan on when they were setting aside assets for their retirement years. Younger people would have a chance to build it into their retirement plans. One strategy for introducing a VAT could be to propose it as a part of a more comprehensive tax reform in which the VAT would replace a portion of income tax revenues. This could introduce intergenerational inequities and, as the previous section argued, would result in an increase in overall tax burden no matter how it was being pitched.

Overlapping Tax Bases

The United States has a much more decentralized system of government than most other nations that use the VAT, and the tax base that would be taxed under a VAT—consumption—is a major source of revenue for state governments. A VAT at the federal level would tax that same tax base that states rely on for about 32 percent of their tax revenues. Some states—Alaska, Delaware, Montana, New Hampshire, and Oregon—levy no state sales taxes. States that levy sales taxes have rates that vary from four percent (several states) to 8.25 percent. In addition, many states allow local governments to levy sales tax on top of the state sales tax, so, for example, combined state and local sales taxes are as high as 10.75 percent in California and 10.25 percent in Chicago (but Chicago's rate is scheduled to fall to 9.75 percent on July 1, 2010).

Louisiana has a 4 percent sales tax rate, but New Orleans adds a local tax for a total of 9 percent.

In the EU the VAT was designed as a replacement for other transaction-based consumption taxes like the sales tax, whereas if one were to be introduced into the US it would be added to the existing sales taxes collected by states. The excess burden, or welfare loss, of any tax is determined by its marginal rate, and the welfare loss from a VAT would be larger for any given tax rate because its effect would be compounded by the already-existing state sales taxes.

This point is significant enough to deserve some elaboration. Any tax has a disincentive effect because it discourages the taxed activity. This disincentive effect is variously called the welfare loss of taxation, excess burden of taxation, or deadweight loss of taxation. All these terms mean the same thing. The welfare loss occurs because in addition to the tax taking money from taxpayers (that is, the burden of the tax) it also alters their behavior because taxpayers have an incentive to act to avoid the tax (that is, the excess burden). A tax on consumption, like a sales tax or VAT, gives people an incentive to avoid the tax by buying untaxed goods, or by working less and taking more leisure, for examples. The welfare loss is produced because people are changing their behavior from what they otherwise would prefer, because of the imposition of the tax. Actions undertaken only to avoid paying taxes are inefficient and lower welfare. Because taxes in general are levied on wealth and income-producing activities, this is the reason that higher tax burdens result in lower income and growth.

An appendix to this study illustrates, using a supply and demand framework that will be familiar to students of economics, that the welfare loss of a VAT placed on top of state sales taxes would result in a substantially higher excess burden of taxation than a VAT of the same rate in a tax system without state sales taxes. The analysis in the appendix arrives at two conclusions important when considering levying a VAT in the US, where states already use a sales tax to tax the same tax base. First, even if the initial VAT rate is modest, once imposed, both state governments, with their sales tax rates, and the federal government, with its VAT, will have the tendency to raise rates so that the combined sales tax plus VAT rate will be larger than

would be optimal. The reason for this is that when taxing that tax base to raise revenues, neither level of government has an incentive to consider the effect of its taxes on the revenues raised by the other level of government. The federal government, for example, would set its VAT rate without considering that it would reduce state sales tax collections. Some evidence that this is the case is that even as a federal VAT is now being discussed, its impact on state sales tax collections is rarely considered, and even more rarely viewed as an argument against the VAT. The second important conclusion is that a federal VAT would lower state sales tax collections in any event, so state revenues would suffer if a federal VAT were imposed. The reason for this is that all taxes reduce the economic activities they tax. Adding a VAT on top of state sales taxes would reduce the sales tax base states now rely on for a substantial amount of their revenues.

These conclusions apply to adopting a VAT in the US, where states are already using a sales tax. In the EU, where the VAT takes the place of other taxes on consumption, the arguments made here do not apply. This analysis demonstrates one reason why a VAT is less appropriate to a more decentralized fiscal system like the US, where the VAT base is already being taxed, than in more centralized fiscal systems like the EU countries, which use the VAT in place of sales taxes.

To get an idea of the magnitude of the excess burden of a VAT piggybacked on state sales taxes, the appendix makes a rough calculation, assuming that a 3 percent VAT is placed on top of the 5.75 percent sales tax rate that is the median rate in all states. Those calculations show that tacking a 5 percent VAT onto the existing sales tax produces an excess burden 4.6 times higher than if the 5 percent VAT were applied in the absence of a sales tax. The excess burden of a 3 percent VAT would be 8.6 times as high if piggybacked on top of the current sales tax as it would be if levied by itself. The higher the state sales tax rate, the higher the excess burden of the VAT, so in states like California with high sales taxes, the welfare loss would be many times greater than in states like Oregon, which levy no sales taxes.

While most nations that employ a VAT do not have a retail sales tax, Canada uses both a VAT and has provincial sales taxes. The Canadian VAT rate is currently 5 percent, and Quebec,

for example, has a 7.5 percent sales tax for a combined rate of 12.5 percent. Rushton (1993) and Bird, Mintz, and Wilson (2006) note that while there are some problems and inefficiencies, the system of overlapping tax bases does work tolerably well in Canada. However, the fact that such an overlapping system can work administratively does not take away from the inefficiencies associated with having two governments taxing the same tax base. As Plamondon and Zussman (1998) note, administrative and compliance costs are much higher when taxpayers must separately figure the tax on two different bases. Even though the system works in an administrative sense, the inefficiencies that come with applying both federal and provincial taxes to the same tax base apply, and the arguments in this section (illustrated in the appendix) show why the VAT places an especially heavy burden on the Canadian economy, because it is piggybacked on top of a sales tax.

The ultimate conclusion is that because states already tax consumption through state sales taxes, the imposition of a VAT in the United States would be less desirable than in the EU, where the VAT is used instead of retail sales taxes. The welfare cost of a VAT on top of a sales tax is many times higher than it would be if the VAT were used by itself, as it is in the EU.

Administering and Complying with a Value Added Tax

The VAT is in theory a tax on consumption, but in practice, calculating the amount of VAT due is as complex as calculating the amount of income tax due, as Strachan (1981), a tax administrator in the UK, notes when describing the administration of the UK's VAT. To see how administrative and compliance costs arise, one needs to understand some of the details regarding the way a VAT is administered.

Exempt Suppliers Just as states have exempted some goods from sales taxation, countries that implement a VAT exempt some suppliers. As Tait (1988: 50-53) describes, exempt suppliers do not have to pay a VAT nor keep VAT records. Clearly, this results in some goods being taxed at different rates. Consider again the simple example of the baseball bat manufacturer in Table 3. If the retailer in this example were exempt, then the \$1.00 tax collected

at that stage of production would not be due, and the VAT on the baseball bat would be \$1.50, not \$2.50 as in the table. Even with a single rate, exempt goods and services generate different effective VAT rates.

The effective VAT rate rises if the exemption is for an intermediate supplier. Again returning to the example in Table 3, assume that sawmills are exempt from the VAT. When the bat maker buys the exempt lumber from the sawmill, no VAT records are passed along, so when the bat maker sells the bat for \$15, a VAT of \$1.50 must be paid. Then the retailer pays a VAT of \$1.00 as in that example, but the logger also paid a VAT of \$.40, so the total VAT on the bat is \$2.90 rather than \$2.50, because of the exemption for sawmills.

As these examples show, an exemption for the final seller of the good results in an effective lowering of the VAT rate, whereas an exemption for an intermediate supplier effectively raises the VAT rate. Countries that use the VAT commonly exempt suppliers of medical services, education, rental housing, financial services, and original art, to name a few exemptions.

Zero Rating A good or service that is zero rated allows the seller of the zero rated good or service to claim a credit for the VAT paid in earlier stages of production, so a zero rating means the sales price is completely free of any VAT. Some goods that are commonly zero rated are groceries, medical supplies, and newspapers. Again, return to the example in Table 3 and assume that baseball bats are zero rated. In this case, when the sports store gets the bat in the example, \$1.50 in VAT has already been paid, so the store gets a credit for that amount and the bat is sold VAT-free. Zero rating brings with it the obvious inefficiency that the tax is collected at earlier stages of production only to be rebated later. Thus, the tax has all the administrative and compliance costs of the VAT, but brings in no revenue. Tait (1988: 53) notes that some countries have been especially aggressive in zero rating goods so that in the neighborhood of a third of consumption purchases are zero rated.

Zero rating of intermediate goods would serve little purpose, as the VAT would just be assessed at later stages of production. That did not stop Ireland and Portugal from zero rating fertilizers and animal feed, however. In some cases goods might be purchased both for final

consumption and as inputs into later stages of production. Computers serve as an example. A zero rating is just a special case of a rate other than the standard rate, and as noted earlier, most countries that use a VAT have multiple VAT rates.

Taxpayers For Whom Multiple Rates Apply VAT accounting becomes much more complex when taxpayers engage in transactions that are taxed at different rates. Sellers are supposed to assign goods to the appropriate rate, which may not always be clear-cut. For example, assume that a textile manufacturer buys cotton and manufactures cotton shirts that are taxed at the standard rate and bandages that, as medical supplies, are zero rated. For tax purposes the cotton purchases must then be divided between the shirts and bandages, which first, may not be easy to monitor and second, provides an incentive for evasion because if more cotton is assigned to the shirts the taxpayer gets a larger rebate. For example, assume that the manufacturer buys \$40 worth of cotton to make a \$50 shirt and \$50 worth of bandages. Unrealistically assuming there are no other inputs, if the cotton is divided evenly between shirts and bandages, the value added in shirts is \$30 ($\$50 - \$40/2$) and the value added on bandages, which are zero rated and not taxed, is also \$30. If \$30 worth of cotton is assigned to the shirts and \$10 to the bandages, the value added on shirts goes down to \$20, reducing the VAT due. The value added goes up on the bandages, but because they are zero rated no VAT is due.

With multiple VAT rates the complexity of the tax increases, and Sandford, Godwin, and Hardwick (1989) report that compliance costs are roughly double for firms that pay multiple VAT rates. Also, opportunities for evasion increase. The auditing for a VAT is done primarily by accounting for previous taxes paid, as the receipts for those taxes follow the goods on which the tax is paid. When intermediate purchases go toward final goods that are taxed at different rates—including those that are zero rated—there is no way to verify compliance through accounting alone. Looking at the cotton example in the previous paragraph, even if an examiner were on-site it would not be easy to determine how much cotton went to shirts and how much to bandages simply by observing that periodically the cloth makers took some cotton from inventory, and periodically the bandage makers took some cotton from inventory. While at first it

appears that the design of the VAT allows for an audit trail that assures compliance, this example shows that evasion is possible, and cannot be detected only by looking at the accounting records of taxpayers.

Capital Investment In theory, capital investment could be treated as an expense, in a manner identical to the purchase of inventories. In practice, capital investment is depreciated in a manner similar to the US income tax. It is worth noting, as Hall and Rabushka (1985) do, that investment could also be expensed when calculating US income taxes, but we do not do this, nor is this done in the EU with the VAT. While this would reduce administrative and compliance costs, it is likely that a US VAT would depreciate capital investment as is done in the EU, and as is done in the US with income taxes.

Going back to the simple baseball bat example illustrated in Table 3, that example followed only the inventory as it moved toward the final sale, and assumed away any capital investment made by producers at each stage of production. In fact, the sporting goods store would buy shelving, lighting, cash registers, and other equipment. The bat maker would buy lathes. The logger would buy a saw. If these items were expensed, any firm going into business initially would have far more in VAT-taxed purchases than sales. For example, a new sporting goods store would have paid far more for its fixtures and equipment plus inventory in its first year than its sales. To illustrate with simple numbers, assume a store buys fixtures, business equipment, and so forth for \$500,000 to open its business and buys \$100,000 in inventory. The store sells its inventory for \$200,000. The store's total purchases on which the VAT had previously been paid are \$500,000 + \$100,000, or \$600,000, but the firm had only \$200,000 in sales. The previous value added of \$600,000 is three times the firm's sales, so subtracting its sales from value added in earlier stages gives -\$400,000.

One way to deal with that negative number would be to give a rebate. Another would be to have the firm pay nothing and carry forward that -\$400,000 to offset future sales. In fact, the way VAT countries deal with it is to depreciate the initial investment. To use a simple example, assume that all investment can use straight-line depreciation and be depreciated over 10 years.

The firm then can take \$50,000 of the capital purchases this year, plus the \$100,000 in inventory, or \$150,000. The firm then calculates its VAT on a value added of \$50,000.

This example is much simpler than any real-world taxpayer would face, because in the example all the capital goods were purchased at the same time and all are depreciated the same way, so they all can be placed in a single account. In the real world, separate depreciation schedules would need to be kept for different assets, depreciation schedules are likely to vary for different categories of goods, and capital investments are made continually. How much of this would apply to a US VAT is speculative, because the structure of a US VAT has not even been sketched. The point is that, typically, capital goods are treated differently under a VAT for the same reason they are treated differently under an income tax, and the complications that result are of the same magnitude. While a VAT is sometimes referred to as a sales tax, the way it is calculated is much more complex.

Exports and Imports To maintain tax neutrality, any VAT paid on exported goods is rebated, and imports pay the VAT on 100 percent of their value. If this were not the case, goods produced in a VAT country would bear a substantial tax penalty compared with goods produced in non-VAT countries. For example, Germany has a 19 percent VAT rate. If the tax were not rebated, automobiles produced in Germany and exported to the US would cost 19 percent more than if they had been produced (at the same manufacturing cost) in the US. German automakers already do produce some of their output in the US for the US market, of course, but if they had to pay the VAT on autos manufactured in Germany and exported to the US they surely would produce a much greater percentage of their goods for sale in foreign markets in non-VAT countries. This example shows why tax harmonization was an important part of the EU's move toward eliminating trade barriers within their common market. Different tax structures can indeed give advantages to goods produced in one country over another.

The rebating of VAT payments on exports makes sense from an economic standpoint, but there are substantial administrative and compliance costs associated with the practice. The tax is collected, along with all of the administrative and compliance costs that go with the system, but

then is rebated, so the administrative and compliance costs are incurred but no revenue is raised.

In a symmetrical fashion, the VAT is collected on the full value of imports. This means that whether a good is produced domestically or is imported, the VAT on the good is the same.

The rebating of the VAT on exports opens an opportunity for fraud, because a business can claim to be exporting goods that actually are sold domestically, and claim the VAT credit. As a result, physical checks must be undertaken to ensure that goods claimed to be exported really do leave the country to be sold in foreign markets. This is but one example of the kinds of issues that can come up when a tax, once collected, can be rebated.

The VAT Register Because of the way the VAT is administered, with taxpayers claiming a credit for the VAT paid at earlier stages of production, taxpayers must register with the tax authority (IRS in the United States) to maintain an audit trail. Otherwise, taxpayers could claim credit for previous VAT payments that were not actually made. By only allowing credit for prior VAT payments registered with the government, this provides a mechanism for enforcing payment. As Rushton (1993) notes, "When firms evade taxes by not registering for the [VAT] even though they are legally obliged to, at least the value-added on earlier stages of the production process are taxed." The administrative expense of a VAT is substantial enough that small traders who have infrequent transactions may be exempt, and thus not have to register, but then taxpayers later in the supply chain will be liable for their share. Needless to say, at this stage, details like this have not been worked out in the event that a VAT would be introduced into the US.

Note that if small taxpayers are not required to register, this may prevent them from passing along credit for any purchases they made on which the VAT had previously been paid. Thus, there is a tax disincentive for dealing with any supplier of intermediate goods who is not registered. This gives sellers (except for retailers) an incentive to avoid being exempt, although small business would have to weigh the compliance costs against the tax advantage of being able to pass along credits to their customers. This aspect of the VAT could work against small

businesses, which generate a substantial share of new job growth. Sandford, Godwin, and Hardwick (1989) report that compliance costs are substantially higher for smaller businesses.

Tait (1988: 272) compiled the number of registered taxpayers as a percentage of total population for a number of countries using the VAT for 1987, about a decade and a half after it was introduced into the EU, and Table 6 gives figures for a group of EU countries. The average of those countries is 4.8 percent, so assuming the US adopts a VAT structure similar to that of the EU one could conjecture that a similar number of VAT taxpayers relative to the total population would join the system. With a population of about 310 million, that would imply about 14.9 million registered VAT taxpayers in the US. The ratio of staff to taxpayers to administer the VAT runs about 1/250 in the EU, according to Tait (1988: 250), which would imply adding roughly 60,000 Internal Revenue Service employees to administer an EU-type VAT in the United States.

Table 6

**Registered VAT Taxpayers as a Percentage of the Population,
Various Countries, 1987**

Country	VAT Taxpayers as a Percentage of Population
Austria	5.3%
Belgium	5.7%
Denmark	8.1%
France	5.5%
Germany	3.0%
Netherlands	3.2%
United Kingdom	2.7%
	====
AVERAGE	4.8%

Source: Tait (1988: 272); average calculated by the author.

One of the administrative costs of a VAT is keeping the register up to date. Businesses are continually forming, adding new taxpayers to the register, while other businesses are closing down and have to be removed from the register. The register is necessary because taxpayers deduct the VAT already paid by their suppliers, so to audit the system a check must be made to

see that the VAT credits claimed by a taxpayer match the VAT paid by the taxpayer's suppliers. VAT invoices are as valuable as cash for taxpayers holding them, so a registry is necessary to prevent counterfeiting of invoices. Without a registry that allows the government to track each individual VAT payment, the system would be subject to massive fraud. The registry must be able to verify that previous VAT payments claimed by a taxpayer actually were paid. Still, Agha and Haughton (1996) report that more than two-thirds of VAT returns audited in France result in corrections, mostly for understated final sales.³

With this type of auditing system, the weakest link with regard to potential evasion is at the retail level, because the final consumer ultimately pays the VAT and gets no credit for the VAT paid by producers. The same is true of retail sales taxes in the United States, however, and because the entire tax is paid at the time of the final purchase rather than spread over all stages of production, evasion by retailers under a sales tax system would result in larger losses of tax revenue than under a VAT with the same rate. As Keen and Mintz (2004) note, given the enforcement costs of a VAT it is not cost-effective to require smaller businesses to register and pay the VAT. While they develop a framework for analyzing what the threshold should be for joining the VAT registry, they do not actually come up with an optimal threshold level. Presumably, if a VAT were introduced into the US some businesses would be exempt, just as they are in other countries that use a VAT.

This auditing procedure that requires that taxpayers complete returns so that the VAT credits claimed by one taxpayer can be matched to the VAT payments by others is a complexity that goes beyond the administration of an income tax, because with an income tax the tax due from one taxpayer is not a function of the taxes paid by others. Tait (1988) devotes a chapter to discussing evasion and enforcement of a VAT, and the issues are complex because the tax is complex.

Keen and Smith (2006: 884) estimate that evasion and fraud probably reduce VAT revenues by around 15 percent, and they (2006: 861) suggest that "administrative measures alone may prove insufficient" to combat fraud, and that a redesign of the VAT structure may be in order. The

example of the shirts and bandages made with cotton showed that one could not assure that the tax was being complied with solely by accounting procedures that match up credits claimed and taxes paid. Similarly, a physical check is necessary to assure that when rebates are claimed for exported goods the goods were actually exported.

Administrative and Compliance Costs

Any estimation of administrative and compliance costs of a VAT in the United States is necessarily speculative, because while the possibility of a VAT has been discussed in general terms for decades, the exact structure of a US VAT has never been considered. But it is reasonable to consider that a US VAT would be modeled after the VAT used in other countries, and the VAT structure of the EU has been imitated as the VAT has spread throughout the world.

Looking at studies that have estimated the compliance cost of a VAT in countries that use the tax, Plamondon and Zussman (1998) estimate that compliance costs for the Canadian VAT run between 3.3 percent and 6.6 percent of revenues collected. Sandford, Godwin, and Hardwick (1989) estimate that compliance costs of the VAT in the UK are about 3.7 percent of revenue; Allers (1994) estimates compliance costs to be 6.0 percent of VAT revenues in the Netherlands; and Malmer (1995) estimates compliance costs to be about 2.5 percent of revenues collected in Sweden. In a review of the literature, Vaillancourt, Clemens, and Palacios (2008) find that a number of studies find that compliance costs are in the neighborhood of 3 percent of revenues collected. Estimates fall in the range of about 3-5 percent of VAT revenues collected. For the purpose of estimating the impact of introducing a VAT into the US, this analysis will use the estimate that compliance costs are about 4 percent in countries that now use the VAT, which is around the middle of what studies have found that looked at VAT compliance costs.

These compliance cost estimates are for countries that collect a substantial share of their tax revenues through the VAT. Table 2 noted that VAT rates are higher, on average, than the rates discussed in 2010 for the US. The average VAT rate of the countries listed in Table 2 is 18.4

percent. Keen and Lockwood (2006) examine 29 countries using a VAT and find that VAT revenues as a function of the VAT rate average 52.9 percent in those countries, which means that on average the VAT collects 52.9 percent of the VAT rate times GDP. Thus, the average VAT rate of 18.4 percent would collect only 52.9 percent of that amount times GDP, or 9.7 percent of GDP. If compliance costs are 3 percent of this amount, they would be 0.3 percent of GDP, and if they were 5 percent of revenues raised, the compliance cost would be 0.48 percent of GDP. Compliance costs of 4 percent would be 0.39 percent of GDP. The 2010 *Statistical Abstract of the United States* shows 2008 GDP as \$14,265 billion,⁴ so compliance costs for a VAT would be about \$55.6 billion per year. If a VAT were introduced into the US, nobody is currently talking about implementing it at the rates the EU uses, but the administrative and compliance costs would still be similar regardless of the rate used. It does not cost any less to administer and comply with the same tax if the rate is lower.

To get an idea about the administrative costs associated with the introduction of a VAT, the Government Accounting Office (2008) reports that the Internal Revenue Service (IRS) budget for 2008 is about \$11 billion, and employs about 90,000 people.⁵ Adding an EU-style VAT to the tax system was estimated above to add 14.9 million registered VAT taxpayers to the system, and would require about 60,000 IRS employees to administer the system. Thus, with a current \$11 billion budget, adding another 60,000 employees would increase the IRS to about 150,000 employees and would increase the IRS budget by about \$7.3 billion. The administrative and compliance costs together would be \$62.9 billion a year, or about 0.44 percent of GDP.

This estimate is approximate, because the exact structure of a VAT for the US has not even been sketched out. The estimate is made under the assumption that the US would adopt an EU-style VAT, and that compliance costs would be similar to those in other countries that now employ a VAT. The discussion above regarding the details of a VAT structure shows that a VAT structure is complex in practice, even though the idea behind it is simple in theory. One can see why compliance would be costly, and reading an account like that of Strachan (1981), a British tax collector who describes the administrative complexities of the VAT, reinforces the idea that

the VAT is costly to comply with and to administer. This estimate is as likely to be low as it is to be high. Estimates of the compliance costs for the federal income tax, for example from Hodge, Moody, and Warcholik (2006), suggest compliance costs about double the \$55.6 billion estimate in the previous paragraph for the corporate income tax, and the VAT's structure is similarly complex. Further, one could not piggyback the compliance costs onto the existing compliance costs of the current income tax, because an entirely different process of accounting is used to calculate taxable value added from the process used to calculate taxable income.

The Static Costs of a VAT

The static welfare loss from a tax comes from four sources: (1) the excess burden of the tax, (2) compliance costs that are borne by taxpayers, (3) administrative costs incurred by government, and (4) political costs associated with implementing and affecting tax law. The section on overlapping tax bases showed why the excess burden of a VAT would be higher in the US than in the EU because it would be piggybacked onto the same tax base used by state sales taxes, and showed how to approximately estimate the excess burden of a VAT. The previous section gave a rough calculation of the compliance and administrative costs of a VAT, which would appear to be in the neighborhood of 0.44 percent of GDP. This study does not attempt to measure the political costs associated with a VAT (discussed by Holcombe 2006: 219-220), but those costs are very relevant.

Political costs are incurred by individuals when they expend resources to influence legislation. There are heavy political costs associated with taxation, because taxpayers engage in lobbying efforts to reduce their taxes. With regard to the federal income tax, one can see taxpayers lobbying for lower rates, for tax deductions, credits, exemptions, depreciation schedules, and so forth, to give them favorable tax treatment. The description of the structure of a VAT shows that the same types of opportunities exist there for goods to be exempt, zero rated, or given a differential rate; for depreciation schedules to be adjusted; and so forth. Meanwhile, those in government incur political costs to hold hearings, analyze proposals for changing the

VAT structure, and so forth. One would expect that the political costs of a VAT would be in the neighborhood of the political costs of an income tax. Holcombe (1998) discusses the issue in more detail, but no attempt is made to estimate the political costs here, so the total cost of a VAT is underestimated in this study.

To estimate the excess burden of a VAT the calculation method used in the appendix on overlapping tax bases will be used, but one additional calculation needs to be added. Because of zero ratings as well as other non-standard rates, evasion, and any other reasons the tax is not collected, a VAT rate of a given percentage will not collect that same percentage of GDP. Keen and Lockwood (2006) find that VAT revenues as a function of the VAT rate average 52.9 percent, which means that on average the VAT collects 52.9 percent of the VAT rate times GDP. For example, on average a VAT rate of 10 percent would collect revenues equal to 5.29 percent of GDP.

Looking at the excess burden of a VAT, following the methodology from the appendix, a VAT of 1 percent would have an excess burden of 0.125 percent of taxed consumption, but because a 1 percent VAT collects only .529 percent of GDP, the excess burden would be $0.125 \times 0.529 = 0.066$ percent of GDP. Table 7 calculates the excess burden of a VAT this way for various VAT rates, and then adds the compliance and administrative costs to calculate an estimate for the entire deadweight loss (except for political costs) of a VAT. The welfare cost is shown as a percentage of GDP and in billions of 2010 dollars for 2010 GDP of \$14.8 trillion.

Table 7 shows that the total welfare cost would be about 0.51 percent of GDP, and about \$75.5 billion, for a 1 percent VAT in 2010. A 5 percent VAT would have a welfare cost of 0.88 percent of GDP and \$130 billion.

Table 7

The Excess Burden, Compliance, and Administrative Costs of a VAT as a Percentage of GDP and in Billions of 2010 Dollars, Estimates

VAT Rate	Percentage of GDP		Billions of Dollars
	Excess Burden	Total Welfare Cost	Total Welfare Cost
1%	0.07%	0.51%	\$75.5B
2%	0.14%	0.58%	\$85.8B
3%	0.23%	0.67%	\$99.2B
4%	0.33%	0.77%	\$114.0B
5%	0.44%	0.88%	\$130.2B
7%	0.69%	1.13%	\$167.2B
10%	1.14%	1.58%	\$233.8B

As illustrated in Figure A1 in the appendix, as the tax rate rises the tax base shrinks, so revenues rise less than in proportion to the tax rate. Assuming unitary elasticity of demand and a 2010 GDP of \$14.8 trillion, Table 8 shows the amount of revenue a VAT of various rates would raise and the welfare cost (from Table 7) as a percentage of revenues raised.

Table 8

VAT Revenues and Welfare Loss, 2010 Estimates

VAT Rate	VAT Revenues	Welfare Loss as % of Revenues
1%	\$77.9B	96.9%
2%	\$154.3B	55.6%
3%	\$229.1B	43.3%
4%	\$302.3B	37.7%
5%	\$373.9B	34.8%
7%	\$512.4B	32.6%
10%	\$708.4B	33.0%

Consider the figures in Table 8 in the context of employing a VAT to balance the federal budget. A 3 percent VAT rate would raise about \$229 billion, which would be insufficient to balance the federal budget according to current projections as far out as projections are made. At that rate, a VAT would impose welfare losses on the economy equal to 43 percent of the revenues it raised, so the VAT would be a very costly way of raising revenues at that rate. The reason the welfare loss declines as the rate rises is that at lower rates a substantial share of the welfare losses come in the form of compliance and administrative costs, which will be about the same regardless of the rate.

If one wants to use a VAT to raise about half a trillion dollars, a rate of 7 percent would raise about \$512 billion, and would impose welfare costs of \$167 billion, or 33 percent of the revenues raised, on the economy. A VAT rate of 10 percent would raise about \$708 billion, still insufficient to balance the federal budget under current projections.⁶

Because of the high cost of introducing a VAT, Tait (1988: 402) concludes, "Given the likely complexity of changing to a VAT, the costs can only be justified if the VAT is a major revenue source, and this suggests a standard rate of 10 percent and above." One can see by looking at Table 8 that there are huge welfare losses associated with any VAT, and that at lower rates the welfare costs imposed on the economy are in excess of one-third of any tax revenues collected. Table 8 also illustrates that if one wants to use a VAT to balance the federal budget, under current deficit projections the VAT rate would have to exceed 10 percent, added on top of all current federal taxes.

The Effect of a Value Added Tax on Prices

Calculating the effect of a VAT on prices is straightforward, because a VAT is a cost that adds to the cost of production, and is passed through to the consumer. Consider the effect of a retail sales tax, which has the same economic effects as a VAT. If someone buys an item for \$1 in a state with a 6 percent sales tax, the cashier adds the sales tax to the item and the purchaser pays \$1.06 for the item, including the tax. A 6 percent VAT would have the same effect, and would raise the cost of that same item to \$1.06. Instead of being tacked on at the end where the purchaser can see the total amount of sales tax, the VAT will be more hidden in the final \$1.06 price of the purchase.

The ultimate effect is complicated by the fact that some goods are zero rated under a VAT, some are sold by exempt businesses, and countries with a VAT use multiple rates. Not all purchases will be taxed at the full VAT rate. Using the Keen and Lockwood (2006) calculation that in a sample of VAT countries, VAT revenues were 52.9 percent of the VAT rate times GDP,

a VAT rate of 1 percent, for example, would raise overall prices by 0.529 percent when accounting for the fact that some purchases would not be taxed at all, or taxed at a lower rate.

If a 3 percent VAT were instituted, for example, purchases subject to the full VAT rate would see their prices rise by 3 percent, as this new cost to producers must ultimately be paid by purchasers. Because of zero rating and other factors eliminating or reducing taxes on some purchases, the Consumer Price Index (CPI) would rise by about 1.59 percent as a result of a 3 percent VAT. A 5 percent VAT would raise the price of full-rated purchases by 5 percent, and the overall CPI by 2.6 percent. This assumes an EU-style VAT, where purchases like automobiles would be fully taxed under the VAT, and purchases like groceries and health care would be zero rated.

The Impact of a Value Added Tax on Economic Growth

The impact of a VAT on economic growth would depend on how the tax was implemented, what the VAT rate was, and whether it is introduced as a substitute for other taxes or as a new tax. Beyond a doubt, all taxes stifle economic growth, as Gwartney, Lawson, and Holcombe (2004) discuss. The decision we have to make is whether that growth penalty is worth the economic benefits those tax revenues buy. A substantial literature based on the Gwartney and Lawson (2009) economic freedom index shows that government interference in an economy, whether through taxes, regulation, or other barriers and disincentives to economic activity, lowers a nation's growth rate. Gwartney, Holcombe, and Lawson (1998) present results from an empirical study showing that an increase in government's share of GDP of 10 percent results in a reduction in the rate of economic growth of about 1 percent. If a VAT is used to finance larger government, this can exact a substantial growth penalty on the economy.

Table 9 compares annual economic growth rates of the United States with other countries that use a VAT to see that variations of a percentage point or more in economic growth rates are not unusual. For the period from 1999 to 2004, which contained a mild downturn in 2001, the United States averaged a real GDP growth rate of 3 percent. By comparison, the euro area, in

which all member countries have a VAT, had a GDP growth rate of 2.1 percent during that same period. The two largest euro zone economies, France and Germany, had average annual growth rates of 2.1 percent and 1.2 percent, respectively, during that period. The United Kingdom, which also has a VAT but is outside the euro zone, matched the US growth rate of 3 percent. Japan had a 1.2 percent average annual growth rate during that time period. Japan, which has been plagued with slow economic growth throughout the 1990s and 2000s, introduced the VAT in 1989, shortly before its current period of stagnation.

Table 9
GDP Growth Rates, Various Countries and Regions

Country	1999-2004 Avg.	2009
United States	3.0%	-2.4%
Euro Area	2.1%	-4.0%
France	2.4%	-2.3%
Germany	1.2%	-5.0%
United Kingdom	3.0%	-5.0%
Japan	1.2%	-5.0%

Source: International Monetary Fund Global Indicators.

The Table also shows GDP growth rates for those same countries in 2009, a year of world-wide recession. The US fared relatively well in 2009, with a GDP decline of 2.4 percent. France had a decline of 2.3 percent, about the same as the US, but the other countries in the comparison had much larger declines. This table does not prove anything about the effects of a VAT, but is included just to illustrate the differences in economic growth rates between the US and countries that use a VAT. Differences of more than a percentage point in economic growth rates fall easily within the experience of today's high-income economies.

The effects of a VAT on economic growth would come from two sources. First, adding a VAT to the current tax structure would impose a welfare cost on the economy independent of the

revenues the tax would raise. The previous section estimated that welfare cost for various VAT rates. The VAT is a complex tax, and, regardless of the rate, the compliance and administrative costs would affect economic growth. Second, if the VAT were imposed as an additional revenue source it would divert resources from the private sector to the government, and the larger public sector would also imply lower growth.

Table 10 summarizes the growth effects of a VAT for various VAT rates, first under a “revenue neutral” assumption that the VAT is used to substitute for other taxes, and second, under a “revenue enhancement” assumption that the VAT would bring in additional revenues. In the revenue neutral case, the VAT imposes a growth penalty on GDP equal to the compliance and administrative costs of the VAT, which was estimated as 0.44 percent of GDP. In addition to this GDP penalty imposed by the administrative and compliance costs of the VAT, economic growth would also be 0.44 percent less, so starting from a growth rate of 3 percent, which Table 9 shows was the 1999-2004 US average, the growth rate would fall to 2.987 percent, which the Table rounds to 2.99 percent. The revenue neutral case assumes that as the excess burden of the VAT increases with a higher VAT rate, it is offset by a reduction in the excess burden of other taxes, so the revenue neutral case has no additional net excess burden. As the label implies, the revenue neutral case assumes that the VAT leaves total federal revenues unchanged initially. Because it reduces economic growth, it will have a long-run negative impact on total federal revenues.

Table 10

The Effect of a VAT on Economic Growth

VAT Rate	Projected Growth Rate
No VAT	3.00%
Revenue-Neutral VAT	2.99%
1%	2.94%
2%	2.88%
3%	2.83%
4%	2.79%
5%	2.73%

7%	2.62%
10%	2.46%

The revenue enhancement assumption corresponds with the current political climate of using the VAT to close the deficit gap. In addition to the compliance and administrative costs, the revenue enhancement case includes the impact of the larger public sector that the VAT would finance. Using the Gwartney, Holcombe, and Lawson estimate that an increase in the public sector of 10 percent lowers a nation's growth rate by 1 percent, and recalling that Keen and Lockwood (2006) find that VAT revenues average 52.9 percent of the VAT rate times GDP, each 1 percent increase in the VAT rate would lower the rate of economic growth by 0.0529 percent. This takes account of the compliance and administrative costs, and the reduction in real output that is caused by the excess burden.

The growth rates shown in Table 10 are estimates, and carrying them out to two decimal places suggests more precision than actually is there. The estimates show that even the revenue neutral case, which assumes that the VAT replaces other taxes so that total federal tax revenues remain unchanged, brings with it a small growth penalty. Adding the lower growth rates in the revenue enhancement cases brings with it an even greater penalty. Even a 10 percent VAT rate would leave US growth rates well above the EU rates shown in Table 9. Table 9 was included to show that the growth rates estimated in Table 10 are well within the bounds of the historical experience of countries that have adopted the VAT.

Table 11

Projected GDP Levels for 2020 and 2030 for Various VAT Rates

VAT Rate	2020	2030
No VAT	\$19.9T	\$26.7T
Rev. Neutral	\$19.8T	\$26.6T
1%	\$19.7T	\$26.3T
2%	\$19.6T	\$26.0T
3%	\$19.5T	\$25.8T
4%	\$19.4T	\$25.7T

5%	\$19.3T	\$25.3T
7%	\$19.1T	\$24.7T
10%	\$18.8T	\$24.0T

Table 11 shows the effect of various VAT rates on GDP looking 10 years out and 20 years out. Looking at the revenue neutral case, a VAT that raised no additional revenue would reduce 2020 GDP to \$19.8 trillion from \$19.9 trillion, lowering GDP by about \$100 billion and about half a percent. In the revenue enhancement case, where VAT revenues add to existing sources of tax revenues, a 3 percent VAT would exact a 2.1 percent GDP penalty by 2020 and an 3.7 percent GDP penalty by 2030. A 5 percent VAT rate would bring with it a 3 percent GDP penalty by 2020 and a 5.6 percent GDP penalty by 2030. A 7 percent VAT rate, which as earlier noted would still be insufficient to eliminate the projected deficit, would reduce GDP by 4.1 percent by 2020 and 7.5 percent by 2030.

Table 12 presents these GDP losses in comparison to the revenues that the VAT would be projected to raise for VAT rates of 3 percent, 5 percent, and 7 percent. A 3 percent VAT would reduce 2030 GDP by 3.7 percent, and a 7 percent VAT rate would reduce 2030 GDP by 7.5 percent. The GDP dollar losses are shown in billions of 2010 dollars in the next row of the Table. The next row shows the projected VAT revenues in billions of dollars from each of these VAT rates, and as the projections show, in every case the VAT revenues raised would be far less than the GDP losses from the VAT.

Table 12

**Projected GDP Losses and VAT Revenues
for Various VAT Rates**

VAT Rate	3%		5%		7%	
	2020	2030	2020	2030	2020	2030
Pct. GDP Loss	2.1%	3.7%	3.0%	5.6%	4.1%	7.5%
Dollar GDP Loss	\$412B	\$982B	\$601B	\$1,479B	\$806B	\$2,014B
VAT Revenues	\$309B	\$409B	\$510B	\$668B	\$707B	\$915B

Fed Rev Loss	\$76B	\$182B	\$111B	\$274B	\$149B	\$373B
S&L Rev Loss	\$57B	\$136B	\$83B	\$204B	\$111B	\$278B
Net Tax Rev Inc	\$176B	\$91B	\$316B	\$190B	\$447B	\$264B

Looking out 20 years to 2030 the GDP losses would be more than double the revenues the VAT would take in, but this does not account for reductions in other revenues because the VAT would lower GDP growth. Under the current tax structure federal revenues are about 18.5 percent of GDP, and that has remained roughly constant for decades, despite numerous changes in tax rates. This is because as tax rates change people respond by changing their economic behavior. Higher tax rates cause people to look for tax avoidance measures, whereas when tax rates fall tax avoidance measures are less beneficial, so are used less. Because the VAT will lower GDP, the total effect of a VAT on tax revenues is the amount taken in by the VAT minus the reduced revenues from other tax bases as a result of the decline in GDP.

The next row in the table, labeled Fed Rev Loss, shows the revenue loss from current federal government tax bases if a VAT were added to the tax structure. Assuming other federal taxes take in 18.5 percent of GDP, as they have in the past, the revenue loss from current tax bases will be about 18.5 percent of the decline in GDP attributable to the VAT, and those figures appear in the Fed Rev Loss row. For example, in 2020 a 3 percent VAT would result in a decline of \$76 billion in other federal tax revenues, and a 7 percent VAT in 2030 would result in a \$373 billion decline in other federal tax revenues.

State and local tax collections would be lower also. In 2007 state and local tax revenues were 13.8 percent of GDP. If that ratio remains constant, the decline in GDP growth will lower state and local government tax revenues by that amount, and the next row in the table shows the loss of state and local government tax revenues. The final row in the table subtracts from VAT revenues the losses in federal, state, and local tax revenues to show the net addition a VAT would make to total tax revenues. By 2030 the net new revenue brought in would be well under 15 percent of the GDP loss as a result of a VAT introduction. For example, a 3 percent VAT

would only add \$91 billion in net revenues, but would cause a GDP loss of \$982 billion, so in that case the GDP loss would be more than ten times the net new revenues.

By 2030 a 3 percent VAT would bring in \$91 billion in net new revenues, with an estimated GDP (from Table 11) of \$25.8 trillion. Thus, net new revenues would be 0.35 percent of GDP, in exchange for a decline in GDP of 3.7 percent. A 7 percent VAT would add 1.1 percent of GDP to government revenues in exchange for a 7.5 percent decline in GDP. That seems like a substantial penalty to pay for a meager increase in government revenues. Looked at another way, with federal revenues at about 18.5 percent of GDP and state and local revenues adding another 13.8 percent, total government tax revenues would be about 32.3 percent of GDP. Without a VAT Table 11 estimates 2030 GDP at \$27.6 trillion, so tax revenues would be 32.3 percent of that, or \$8,915 billion. A 3 percent VAT would on net add \$91 billion to that, so would increase tax revenues by 1 percent. A 7 percent VAT would add \$264 billion, or 3 percent, to total tax revenues. Are the GDP losses that would be incurred with a VAT worth adding 1-3 percent to tax revenues? This seems to be an excessive price to pay for a small gain in revenue.

The erosion of state and local tax revenues is another factor to consider, independently of its effect on total tax collections. The federal government is in the process of putting in place health care reforms that will put increasing financial burdens on the states, and if a federal VAT is introduced it will make it that much more difficult for states to raise revenues to pay those costs.

The introduction of a VAT would cause government's share of GDP would grow, but mostly due to the lower level of GDP rather than an increase in tax revenues, as Table 12 shows. While higher VAT rates might seem unlikely upon the introduction of a VAT, Table 5 showed that most countries that introduced a VAT raised the VAT rate substantially after its introduction. If the VAT rate went to 7 percent—which still would be among the lowest VAT rates in the world—net tax revenues would increase by \$264 billion, which is 1.1 percent of projected GDP; meanwhile, GDP would be 7.5 percent lower as a result of the VAT's introduction.

Of course, these numbers are estimated and approximate, so one would not want to put too much stock in what they show to the last dollar. But the estimates are based on empirical studies

about the actual effects of taxes and government spending on the economy so there is good reason to think they are in the ballpark. What they show is that if a VAT were imposed this year, it would produce only a modest gain in tax revenues, but substantial reduction in GDP, in the neighborhood of a 3.7 percent reduction for a 3 percent VAT rate projecting out 20 years, and more than a 7.5 percent GDP reduction for a 7 percent VAT rate.

Are these results implausible, alarmist, or exaggerated? Look back at Table 9, which shows the historical GDP growth rate in the United States to be about a percentage point higher than in the euro area, where all countries use a VAT. Now look back at the projected growth rates in Table 10 that were used for these GDP projections. Even the projected US growth rate for a 10 percent VAT is significantly higher than the actual euro zone growth rate in Table 9. All of these projections still assume a higher future growth rate for the US than the actual growth rate the EU has historically experienced. The results seem eminently reasonable, well within the range of the experience of countries that have a VAT, and show the effect that even small changes in economic growth have over a period of decades. To ensure a prosperous future we need to adopt economic policies that are growth friendly, and the VAT does not qualify.

What Are the Alternatives?

One reason for a renewed interest in a VAT as this is being written in the spring of 2010 is the projection of huge federal budget deficits as far out as projections have been made. The budget projections are cause for alarm, beyond a doubt, and the VAT has been suggested as one way to plug that hole by generating more revenues. One thing this analysis has shown is that the VAT is capable of generating additional revenue in the short run. However, even the revenue it generates is not that substantial in the long run, when one considers the effect a VAT would have on revenues from other tax bases. This analysis has also shown the VAT to be undesirable in a number of dimensions, including the substantial cost it will place on the US economy. In light of the huge impending deficits, what other alternatives are available?

One of the costs that would be imposed by implementing a VAT is the negative impact of the increase in tax revenues and the resulting growth in the size of the federal government. One can argue about the merits of the spending programs that are proposed—and the existing programs that will take an increasing share of GDP—but no matter how one analyzes the merits of the expenditures, an unavoidable cost of this projected course will be lower economic growth, resulting in lower future incomes. An obvious effect will be a lower standard of living for Americans than could have been achieved with a smaller public sector. Less obvious is the loss of influence around the world that comes with such a burden. The United States is a “superpower” today because the nation has sufficient resources to take care of its domestic challenges and has enough left over to extend diplomatic and military clout throughout the world. Even for those who view the United States as excessively involved in world affairs, a weaker economy will give the United States less presence in the world marketplace, which will affect our ability to influence trade agreements, foreign tariffs, and other economic issues worldwide. The best alternative to a VAT is controlling the size of the federal government so that the VAT is not needed as a revenue source.

For those who want to fund larger government, given the structure of the US tax system, a VAT is a costly way to do it. A better alternative would be to use the income tax to raise those revenues. Higher income taxes at the top end are likely to be counterproductive because high-income taxpayers can avoid higher tax bills through a creative use of the tax code. Those creative uses not only limit the amount of revenue that can be raised, but also send money to tax shelters which lower the productivity of the economy. Meanwhile, the bottom 50 percent of taxpayers pay only three percent of total income taxes, and in 2008 more than 36 percent of all tax returns filed resulted in no tax liability at all.⁷ One problem with such a tax structure is that with a majority of voters paying little or no income taxes, they can vote for higher government expenditures without incurring the cost. When additional government expenditures appear to be almost free for a majority of voters in a democracy, political support for bigger government grows. Also, going back to the lessons on the excess burden of taxation illustrated in the

appendix, when people pay little in taxes, their tax rates can be raised without incurring much of an excess burden.

The VAT is a part of a larger discussion about whether Americans want a larger government sector, and if so, how the larger government sector will be financed. The best option is to reduce government spending so additional taxes would not be necessary. But if tax increases are considered, the least destructive way of increasing revenues would be to restructure the income tax so that the bottom half of the income distribution began paying taxes in proportion to the incomes they earn. This would give all Americans—not just high-income Americans—a financial stake in the proposed increases in government's share of the economy, and it would minimize the excess burden of any tax increases.⁸

What Type of Economic System Do We Want?

The idea of using a VAT to enhance federal revenues is alluring for those who would like bigger government, but the bottom line is that ultimately it would not produce a bigger government; it would produce a smaller private sector. Government spending as a share of GDP would go up, but because the private sector would shrink, not because government would be larger. Table 13 lists GDP per capita, government expenditures per capita, and government spending as a percentage of GDP to make an international comparison. Looking at GDP per capita, the United States sits well above any of the other countries on the list. Meanwhile, Sweden tops the list both for government expenditures per capita and government spending as a share of GDP. But while Sweden's government spends over half of GDP, their government spending per person is only 12.6 percent higher than in the United States. In France, where government spending is over half of GDP, their government spending per person is about the same as in the United States, and Germany's government spends less per person than the United States, despite having government spending as a share of GDP well above US levels.

Table 13

GDP, Government Spending, and Government's Share of the Economy, Various Governments, 2009

Country	GDP Per Capita	Govt. Exp. Per Capita	Govt. as % of GDP
Sweden	\$37,467	\$19,670	52.5%
France	\$33,871	\$17,714	52.3%
United States	\$46,695	\$17,464	37.4%
United Kingdom	\$35,831	\$15,765	44.0%
Germany	\$35,323	\$15,612	44.2%
Canada	\$36,036	\$14,090	39.1%

Source: Data from www.heritage.org/index/Ranking.aspx. GDP per capita was calculated from the GDP and population data, Govt. as % of GDP is from the index, and Govt. Exp. Per Capita is calculated by multiplying GDP Per Capita time Govt. as % of GDP.

The figures in Table 13 illustrate that enlarging government's share of GDP will not necessarily allow government to spend more per person, because of the negative effects taxation has on the economy. Of course, we cannot attribute all of the differences in Table 13 to the VAT. The purpose of the table is to show that the effects of introducing a VAT into the US calculated earlier are well within the realm of possibility, and that looking at countries that use the VAT today, the above projections are in line with saying that by adopting tax policies like those countries in the table, we are setting ourselves up for having an economy that performs like theirs in the future. Government will not have the resources to spend more, because the private sector productivity from which all government tax revenue must come will be reduced.

It seems almost surreal that we would be considering fundamental changes to our system of taxation and scope of government that would make our country more like France. With income in the United States so much higher than those countries that use a VAT—and with government expenditures as high also—it would appear that the countries using the VAT would be trying to adjust their policies to become more like the United States, rather than the other way around.

Conclusion

With the federal budget deficit now projected to remain in the neighborhood of \$1 trillion as far out as it is projected, the VAT has been considered as an option for closing at least some of that gap. Indeed, projected deficits are alarming, and it is sobering to note that ten years out, the deficit is projected to be increasing. It is reasonable to look at all options, including a VAT, but an analysis of a VAT shows that for many reasons it would not be wise to add a VAT to the nation's current tax structure. As Robert J. Samuelson (2010: 22) said in *Newsweek*, "Almost every pro-VAT argument is exaggerated, misleading, incomplete, or wrong."

Looking at a VAT as a revenue-enhancer for the United States is not a new issue. Maclaury (1981: vii) says, "Among the hardy perennials of American economics is the question of whether the United States should adopt a value-added tax. At least since the 1960s scattered organizations and elected officials have urged that the United States take the trail blazed by France and later followed by other countries of Europe and elsewhere and adopt this new form of taxation." Stockfish (1985: 547), in a comment made 25 years ago that applies directly today, says, "Large government deficits raise the question of whether new taxes should be introduced. A value-added tax (VAT) is one candidate." Again, in a comment that seems as relevant today as when it was first made, Hakken (1993: 92) says, "The most immediate use for a VAT would be to finance part of the cost of health care reform..." Economists and policy makers have long seen the VAT as a vehicle by which they could finance larger government expenditures. But, as Aaron (1981: 15) notes, "The most important lesson that Americans can learn from European experience with the value-added tax is how different the circumstances under which the six European nations made their decisions were from those in the United States."

Aaron (1981: 15-16) notes that, first, many countries adopted a VAT to replace turnover taxes, which are notoriously inefficient. That is not relevant to the United States. Second, the VAT was adopted as a mechanism to harmonize tax structures in those countries, which is not relevant to the United States. Third, the European countries that adopted the VAT have much more centralized governments than the United States, which is especially problematic

considering that the VAT tax base would attack the sales tax base now heavily used by the states. Fourth, the VAT was intended as a substitute for other taxes in Europe, whereas, both now and when Aaron wrote, it was being proposed as a revenue enhancer. Aaron goes on to note that the VAT was not, in fact, revenue neutral, but was "...a handy instrument at a time when government expenditures were rising."

Proponents of big government have seen the VAT as a potential revenue source for financing government growth for half a century, so the contemporary discussion of the VAT is the resurfacing of a long-running debate. But as Aaron notes, the justifications for adopting a VAT in the EU do not apply to the United States, and indeed, this study has shown how undesirable that option is. Nevertheless, one might wonder whether Hakken (1993: 92) was very farsighted when he said, "Numerous policymakers believe that the VAT's arrival in the United States is inevitable."

The drawbacks of the VAT begin with its complexity, which imposes substantial administrative and compliance costs on taxpayers and the government. The analysis above presented a simple comparison between the relative simplicity of a retail sales tax—that taxes the same tax base—with a VAT. In reality, as the discussion following that simple example showed, the VAT is far more complex to compute, to comply with, and to enforce. Given the substantial administrative and compliance costs a VAT brings with it, Tait (1988: 402) concludes, "Given the likely complexity of changing to a VAT, the costs can only be justified if the VAT is a major revenue source, and this suggests a standard rate of 10 percent and above." Rates that high are not (yet) a part of the contemporary discussion, but at lower rates the costs the tax would bring with it are substantial compared to the revenue it would raise. The welfare cost of a VAT—the cost of the tax over and above the revenues collected—would be about \$100 billion at a tax rate of 3 percent.

Unlike EU countries, where the VAT is the largest single source of tax revenue, the states of the United States already tax the VAT tax base with their sales taxes. Unless there is coordination between the federal government and the states on rates, one result of the overlapping tax bases is that governments will raise rates to inefficiently high levels. Coordination

of tax policies raises additional issues, however, as it would erode the powers of the states relative to the federal government. One problem with adding taxes to the state sales tax base is that state sales tax collections will fall. The VAT has a reputation as a revenue generator, which is an asset in the eyes of those who want to finance larger government but a liability for those who support more limited government. VAT revenues certainly mean that government's share of GDP would grow. Government would not grow as much, however. The growth in the government/GDP ratio would come largely because GDP would fall, rather than because total government revenues would rise. Recall that the level of government spending per capita is about the same in the United States as it is in France. Meanwhile, the introduction of a federal VAT would hurt state government finances.

The welfare costs of a VAT are substantial, and looking long-term, its potential to generate revenue is limited by the negative effects it would have on economic growth. Projections show that if a VAT of 3 percent were added to the current tax structure, GDP in 2020 would be 2.1 percent below what it would be without the VAT. Meanwhile, total tax revenues would increase by 1.1 percent of GDP. Is it worthwhile to reduce GDP by 2.1 percent to allow government to take another 1.1 percent in taxes? The cost in terms of lost GDP would be about double the revenues raised. Because of the slower economic growth, by 2030 a VAT at any rate would raise a small amount of revenue, because the reduced revenues from other sources due to slower economic growth would approximately offset the amount collected by a VAT. A VAT of 3 percent in 2030 would increase total tax revenues by 0.35 percent of GDP, but would reduce GDP by 3.7 percent. The GDP loss would be 11 times as great as the revenues raised. A VAT of 7 percent in 2030 would increase total tax revenues by 1.1 percent of GDP, but would lower GDP by 7.5 percent.

The introduction of a VAT would immediately inject tax revenues into the Treasury, but at a substantial cost to the economy that will slow economic growth. That substantial tax revenue increase would slow to a trickle in ten years, and by 2030 the negative effects of the costs imposed on the economy would be overwhelmingly larger than the revenues it would raise. Despite its short-run appeal, the VAT is not a viable long-run solution to the huge projected

federal government deficits. If the growth effects of a VAT posited here seem implausible, remember that the slower economic growth this study projects for the United States is higher than the actual rate of economic growth has been in the EU. It is not implausible to think that if the US adopts a tax structure like the EU, economic growth in the US will also be similar to that in the EU. Looking just two decades ahead, a VAT would add almost nothing to tax revenues; it would just make Americans poorer.

Appendix: Calculating the Excess Burden of a VAT

The effect of adding a VAT to the existing sales tax structure can be illustrated in Figure A1, which uses a supply and demand framework to show the marginal excess burden of a tax. With no tax in this market, the price will be P^* and the quantity exchanged will be Q^* . Now assume that a VAT with rate T is placed on this market. That shifts the supply curve up to $S+2T$. The amount of tax collected is the rate per unit, T , times the number of units taxed, which is Q' . In Figure A1 the distance between P^* and P^*+T is T , so, recalling that the area of a rectangle is base times height, the amount of tax collected is represented by the areas $B+T$ in the diagram.

[Figure A1 about here.]

Without the tax, quantity Q would have been sold of this good, but the tax discourages purchasers, so Q' is produced. Because at that quantity the demand curve, which measures the value of the good to consumers, is above the supply curve, which measures the opportunity cost of producing the good, the tax causes an excess burden of the difference between the value of the good and the cost of supplying it—which is the difference between demand and supply—which is equal to the triangular area A in Figure A1. So, with a tax rate T the tax collected is $T+B$ and the excess burden, or welfare cost, of the tax is A .

Now assume tax rate T is already in place and the government wants to add another tax of the same amount, which will raise the tax rate to $2T$. The supply curve shifts up to $S+2T$. The quantity of output falls to Q'' , the amount of tax collected is now $T+U$, and the excess burden of the tax is now $A+B+C$. The amount of tax collected is less than twice as much as before—tax revenue increases by $U-B$ —but the excess burden of $A+B+C$ is four times as large as the excess burden A (assuming for simplicity that both supply and demand are straight lines).

This graphical example shows the economic effects of placing a VAT on goods that are already taxed under a sales tax, because both are consumption taxes. Revenue from the VAT will be lower, and the excess burden of the tax placed on the economy will be higher. One might, for example, propose a modest VAT rate, like 3 percent. When placed on top of a sales tax rate of 10 percent, for example, the negative economic effects would be the same as raising a 10

percent VAT to 13 percent. A VAT of any given rate will place a much bigger drag on the US economy than the same rate in an EU country, because in the US that rate would be piggybacked on top of a sales tax that already taxes that tax base, whereas in the EU the VAT replaced other transaction-based taxes.

Compare the imposition of a VAT both with and without a preexisting sales tax, within the context of Figure A1. Assume the VAT rate and the sales tax rate are the same, and note that area T in the Figure equals area U. Without a sales tax a VAT would collect revenues T+B, but on top of an existing sales tax it would collect additional revenues T-B, where B is the loss of sales tax revenues due to the introduction of the VAT. Without a sales tax the excess burden of the VAT is A; with an existing sales tax the excess burden is A+B+C. This revenue and excess burden comparison is summarized in Table A1. Imposing a VAT in the US would be more costly than the VAT used in EU countries, and would raise less revenue, because it would be piggybacked on top of the existing state sales tax structure that already taxes that tax base.

Table A1

A Comparison of VAT Revenue and Excess Burden

	Revenue	Excess Burden
Without a Sales Tax	T+B	A
With a Sales Tax	T-B	A+B+C

Another issue with regard to the VAT tax base overlapping the sales tax base is that when two governments tax the same tax base, they tend to raise rates inefficiently high. As explained by Flowers (1988) and Sobel (1997), when looking at the welfare cost of taxation, each government views the tax levied by other governments as given and beyond their control, so in setting their tax rates they do not consider the excess burden they are placing on other governments. Figure A1 can again be used to illustrate this point. If one government already levies tax rate T in this market, and another government imposes the same tax rate to make the

total tax rate 2T, the second government can raise revenues equal to area U by imposing the tax, but does not have the incentive to consider that by doing so revenues to the first government will fall by area B. For example, in the current discussion of the VAT, there is little if any discussion of the fact that introducing a VAT will reduce state sales tax collections.

To get an idea of the magnitude of the excess burden of a VAT piggybacked on state sales taxes, start with the U.S. median sales tax rate of 5.75 percent.⁹ Doing a rough calculation assuming a unitary elasticity of demand for taxed goods,¹⁰ the excess burden of the tax is equal to about 0.33 percent of taxed consumption.¹¹ Now assume a 3 percent VAT adds to that sales tax to bring the sales tax plus VAT rate up to 8.75 percent. The excess burden rises to 0.77 percent of taxed consumption, and the marginal excess burden is 0.44 percent. The marginal excess burden of a 3 percent VAT is higher than the excess burden of a 5.75 percent sales tax without a VAT. If the VAT rate is 5 percent the excess burden rises to 1.16 percent of taxed consumption, and the marginal excess burden is 0.83 percent.

A 5 percent VAT rate by itself would have an excess burden of only 0.25 percent of taxed consumption, so tacking a 5 percent VAT onto the existing sales tax produces an excess burden 4.6 times higher than if the 5 percent VAT were applied in the absence of a sales tax. A 3 percent VAT by itself would have an excess burden of only 0.09 percent of taxed consumption, so the excess burden of a 3 percent VAT would be 8.6 times as high if piggybacked on top of the current sales tax as it would be if levied by itself.

Footnotes

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¹ This method of computing value added for tax purposes is called the credit or invoice method, and is the focus of the discussion here because that is how value added is calculated in the EU. Essentially, it is a “subtraction method,” because value added is calculated as sales minus previous value added. It could also be calculated by the “addition method,” in which the taxpayer computes value added as the sum of wages, rent, interest, net profit, and depreciation. See Fehr, Rosenberg, and Wiegard (1995: 26-30) for a more complete discussion.

² Turnover taxes are assessed on every transaction, whether retail purchases or intermediate goods. It taxes the same transactions as a VAT, but without giving credit for taxes paid at earlier stages of production. This creates tax pyramiding, as inputs taxed at earlier stages of production are taxed again and again as they move through the production process. Turnover taxes create an inefficient incentive for vertical integration, because if a firm produces inputs for itself, it can avoid buying them from a supplier and avoid paying the taxes on that transaction. Because some final goods will have more intermediate stages than others, goods with many intermediate transactions in the production process ultimately will be taxed more than those with fewer transactions.

³ Agha and Haughton (1996: 304) report in their Table 2 the various types of corrections that resulted from audits, showing that two-thirds of audited returns had understated sales (of which 16 percent were deemed to be fraud, 41 percent claimed deductions for ineligible goods, and **missing percent here?** listed a variety of other causes for corrections). The table does not show the percentage of returns on which at least one correction was made, so two-thirds is a lower bound on audited returns deemed to require corrections.

⁴ *Statistical Abstract of the United States*, 2010 ed., Table 651. 2008 was used because it is the most recent year for which the *Statistical Abstract* reports income tax data.

⁵ www.usnews.com/usnews/biztech/best-placed-to-work/sub-agencies/tr93_at-a-glance.htm

⁶ Current Congressional Budget Office projections call for the deficit to dip below \$800 billion in 2014, and rise to more than \$1 trillion in 2019.

⁷ "Tax Fairness Reaches a Tipping Point," *Investors Business Daily*, March 16, 2010.

⁸ Lower-income taxpayers already face high marginal tax rates because of phaseouts in programs such as the earned income tax credit. If programs like these were eliminated, the excess burden of taxation would go down, and tax revenues would rise. This is a rare case where a tax increase would reduce the excess burden of taxation and increase economic efficiency. While eliminating a program like the earned income tax credit would mean lower-income taxpayers would pay more, examining such alternatives would seem a reasonable way to address looming deficits intended to finance programs that give taxpayers more.

⁹ This rate is for January 1, 2010, from the Federation of Tax Administrators, www.taxadmin.org/fta/rate/vendors.pdf.

¹⁰ Unitary elasticity of demand means that the percentage decrease in the quantity demanded equals the percentage increase in the price. If all goods increased in price by the same percentage, and income (expenditure) remained the same, the percentage decrease in quantity would have to equal the percentage increase in price, so the assumption of unitary elasticity is reasonable when looking at a large group of consumption goods.

¹¹ This is an approximate calculation. With $P \cdot Q$ remaining the same before and after the tax with unitary elastic demand, the excess burden of the tax is $.0575P \cdot .0575Q/P \cdot Q$, which equals $.0033$, or 0.33 percent.

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