EFFECTS OF A FEDERAL VALUE-ADDED TAX ON STATE AND LOCAL GOVERNMENT BUDGETS

Jim Nunns and Eric Toder

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ABSTRACT

A longstanding concern of state and local governments is that a federal value-added tax (VAT) could shrink sales tax bases. But a federal VAT could have even bigger effects on other revenues and spending through changes in incomes, relative prices, and asset values. To illustrate the range of budgetary effects of a VAT, we examine both a broad and narrow based VAT, with no change and an increase in the price level, and both short- and long-run time horizons. We find that, in some circumstances, a federal VAT could even improve the fiscal position of states and localities.

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I. INTRODUCTION

Growing dissatisfaction with the federal tax system and projections showing unsustainable long-run federal deficits have spurred a continuing interest in enacting a value-added tax (VAT) as a new source of federal revenue. Recent examples include the Business Flat Tax proposal of presidential candidate Senator Ted Cruz (R-TX), which is a form of VAT that would replace the corporate income tax and payroll taxes, and the Progressive Consumption Tax proposed by Senator Ben Cardin (D-MD), which would introduce a VAT and use the revenues to exempt most households from the federal individual income tax.

Adoption of a federal VAT, whether to finance tax reform, reduce deficits, or both, would have significant effects throughout the economy. There are two widely expressed concerns about the effects of a federal VAT on state and local general sales taxes. One is how the design and administration of state and local sales taxes would be coordinated with that of a federal VAT. McLure (2010) and Duncan and Sedon (2010) have carefully examined this concern and provide very useful guidance on how these taxes might be coordinated. The other concern is that a federal VAT could shrink sales tax bases, reducing current state and local revenues and requiring larger rate increases to raise any given level of additional revenues in the future. Under standard revenue estimating procedures and assumptions, a federal VAT would shrink sales tax bases, so this concern is well founded. But it is too narrowly focused; a federal VAT could affect state and local revenues even more from sources other than sales taxes, and could also affect state and local spending. These broader budgetary effects have received little attention, which is somewhat surprising because potential effects on other revenue sources and on spending are a direct consequence of how a VAT would affect incomes, relative prices, and the value of existing assets. Taking all these effects into account, a federal VAT could even improve, rather than worsen, the fiscal position of states and localities. This paper examines all of the effects of a federal VAT on state and local budgets.

To illustrate the possible range of effects of a federal VAT on state and local budgets, we examine two VAT bases. One is a comprehensive base that includes nearly all household consumption and all government spending, the other a narrow base that excludes nearly all government spending as well as a significant share of household consumption. We set rates so that both variants of the VAT would reduce the federal deficit by the same amount. We also examine the effects of the federal VAT under alternative assumptions about whether or not the Federal Reserve Board (the "Fed") accommodates the introduction of the VAT through policies that allow the consumer price level to increase, and whether the short-run effects of a VAT are being considered or the effects in the long run, after the economy has fully adjusted to the VAT.

In order to isolate the effects of the VAT from potential legislative responses of state and local governments, we analyze these impacts holding constant the design of revenue structures and the real level of state and local spending.

Our main findings, totaled across all states, are summarized in Table 1.

TABLE 1

Effects of a Federal VAT on Total State and Local Revenues, Spending, and Budget Balances in 2012

Percentage of Total State and Local Revenues under Current Law

	Price Level Unchanged		Price Level Rises	
	Comprehensive VAT Base (Rate of 2.4%)	Narrow VAT Base (Rate of 5%)	Comprehensive VAT Base (Rate of 2.4%)	Narrow VAT Base (Rate of 5%)
Short-Run Effects				
Change in revenues	-0.8	-0.9	0.5	0.5
Change in spending	0.2	-1.3	2.2	0.7
Change in budget balances[1]	-1.0	0.4	-1.7	-0.2
Long-Run Effects				
Change in revenues	-0.7	-0.8	0.5	0.5
Change in spending	-0.1	-1.5	2.0	0.6
Change in budget balances[1]	-0.7	0.7	-1.5	0.0

Note: Detail may not add to totals due to rounding.

[1] Positive amounts mean the combined 2012 state and local budget deficit of $43.3 billion would be reduced; negative amounts that this deficit would be increased.

- If the VAT base was comprehensive and included most government spending, the federal VAT would worsen state and local budget balances in every state fairly significantly, in both the short and long run, whether or not the price level increased.
- If the VAT base excluded most government spending and the price level was unchanged, the federal VAT would improve budget balances in every state, in both the short and long run. Budget balances would improve because the level of spending required to supply the current level of public services would fall significantly. If the price level increased, budget balances in each state would be harmed relatively little (if at all).
- The significant reduction in revenues if the price level was unchanged comes mainly from reductions in income and property tax receipts. Effects on receipts from general sales taxes are less important.
- Differences among states in effects on budget balances are primarily due to differences in revenue structures, rather than differences in spending patterns.

These findings are only illustrative. They do not take into account possible macroeconomic effects, changes in household consumption patterns, or legislative responses of state and local governments to the adoption of a federal VAT. We also do not attempt to model the detailed provisions of state and local revenue and spending programs. Nevertheless, these findings should help inform the discussion of a federal VAT by clarifying the nature and range of potential effects on the budget position of state and local governments.

The remainder of the paper is organized as follows. In Section II, we describe the design of the federal VAT variants we examine. We then organize the examination of the effects of the federal VAT variants into three combinations of assumptions: long-run effects with no accommodation by the Fed (Section III of the paper); long-run effects with full accommodation by the Fed (Section IV); and short-run (transitional) effects, with and without accommodation by the Fed (Section V). In each section, we first describe and analyze the effects of both variants of the federal VAT on incomes, relative prices and asset values for the assumed time period and response by the Fed. We then identify and analyze the impact of these effects on each major source of state and local revenues and each major category of state and local spending. Finally, we use our analytical results and Census data on state and local finances for FY2012 to estimate state-by-state effects of both variants of the federal VAT on state and local revenues, spending, and budget balances.

II. VARIANTS OF THE FEDERAL VAT

The federal VAT we examine is assumed to be "credit-invoice," the form of VAT used in over 150 countries around the world. Businesses collect VAT on all of their sales receipts, but receive a credit for any VAT included in their purchases from other businesses. This collection mechanism makes credit-invoice VATs self-enforcing, so they have high rates of compliance. In addition, we assume the VAT applies only to domestic consumption so is "destination-based" with border adjustments (i.e., imports are taxed while tax is removed from exports).

To isolate the effects of the federal VAT, we assume it is strictly an add-on source of federal revenue, and that no other changes are made to existing federal revenue structures or to the design of federal spending programs. We also assume that the nominal amount of federal grants to state and local governments are held constant (whether or not the price level increases).

We examine two quite different VAT bases in order to illustrate the possible range of effects of a federal VAT on state and local budgets. One base is very comprehensive, covering virtually all household consumption and all government spending on purchases of goods and services and compensation of employees. We estimate the size of this base as $11.2 trillion in 2012, nearly 70 percent of GDP.

The other base is much narrower; it excludes nearly all government spending and many categories of household consumption, including medical services, housing, education, and food consumed at home. We estimate the size of this base as $4.3 trillion in 2012, just 27 percent of GDP. A more detailed description of each of these bases and estimates of their size in 2012 is provided in Appendix A.

For comparability of results, we set rates so that the same level of federal deficit reduction would be achieved using both bases, under the assumption that real and nominal GDP are fixed and there is no change in the price level.[1] As discussed in more detail below, under these assumptions the VAT would reduce incomes, which in turn would reduce federal revenues from individual and corporate income taxes as well as payroll taxes. Spending would also be reduced (holding the real quantity of federal provision of goods and services constant) because wages of federal workers and (pre-VAT) prices of federal purchases would fall. Our estimates of the effects on federal deficits of both VAT variants take into account these revenue and spending "offsets".[2] A VAT with the narrow base and a 5 percent (tax exclusive)[3] rate would have reduced the federal deficit by an estimated $210 billion in 2012. The rate required for the comprehensive base to reduce the federal deficit by $210 billion in 2012 is 2.4 percent.

III. LONG-RUN EFFECTS IF THE PRICE LEVEL IS UNCHANGED

In this section, we examine the long-run effects on state and local budgets of a federal VAT with either a comprehensive or narrow base under the assumption that the Fed did not accommodate the introduction of the VAT so the level of consumer prices is unchanged.

A. Effects on Incomes, Relative Prices, and Asset Values

The introduction of a federal VAT would have wide-ranging economic effects. A VAT applies to all the goods and services consumed by households that are included in the VAT base. The prices that households pay for taxed goods and services exceed the amount that producers receive for them by the amount of the VAT; the VAT, like sales and excise taxes, creates a "wedge" between consumer and producer prices. The average size of this wedge depends on the share of spending included in the VAT base and the VAT rate. If the Fed did not allow average consumer prices (i.e., the consumer price index) to rise when the VAT was introduced, average producer prices would

[1] These are the assumptions generally used by federal agencies in preparing official estimates of federal revenue and spending changes.
[2] See Toder, Nunns and Rosenberg (2011) for a detailed description of how we estimate the federal revenue and spending offsets of a VAT. The revenue offsets amount to about 25 percent of gross VAT revenues, regardless of the breadth of the base. The size of the spending offset varies with how much federal spending is included in the base.
[3] *Tax exclusive* rates apply to amounts in the tax base that exclude the tax. This is the standard way that VAT and sales tax rates are expressed. In contrast, income tax rates are *tax inclusive*, with the rate applied to amounts that include the tax. The tax inclusive rate that corresponds to a 5 percent tax exclusive rate is .05/(1+.05) = 4.76 percent.

have to fall at all stages of production and distribution of goods and services by the average VAT rate on total consumption.

The wedge between consumer and producer prices created by the VAT would appear immediately upon introduction of the VAT. Producers' sales proceeds would now have to be split between VAT payments and compensation of factors of production, labor and capital, so the amount available for compensation of factors would decline immediately (and permanently).

1. Labor Income

Labor compensation consists broadly of wages and fringe benefits. The reduction in labor compensation might not fully occur in the short run due to fixed labor contracts and other institutional factors that make wages downwardly rigid. But in the long run, labor compensation would fully adjust. Further, even though both VAT bases exclude exports and the narrow VAT base excludes a range of consumption items as well as most government spending, workers in untaxed sectors would eventually be affected to the same extent as workers in taxed sectors as labor market competition equalized compensation across employees with the same skill levels. For this reason, we expect a VAT with either base to reduce the labor income of all workers, including employees in sectors not directly subject to VAT.

We estimate that in order for consumer prices to remain constant, nominal labor income must decline by 2.12 percent for the VAT with a comprehensive base and rate of 2.4 percent. The reduction in labor income is less than the VAT rate because the VAT base includes pre-retail unit excise taxes that are unchanged by the VAT, and some consumption is removed from the base by the allowance for a small business exemption and noncompliance.[4] The VAT with a narrow base and rate of 5 percent must create the same wedge between consumer and producer prices to achieve the same reduction in the federal deficit. So the reduction in labor income would also be 2.12 percent for the narrow-based VAT.

2. Capital Income

Capital income broadly consists of interest (the return to bond holders and other lenders) and profits (the return to the equity owners of businesses). Interest generally represents only the (risk-adjusted) compensation for waiting, the "normal" return to capital. However, some capital produces "supernormal" returns – economic rents, infra-marginal returns, and returns to successful risk taking – that equity owners earn in addition to the normal return.[5]

A VAT would reduce the amount available from producers' sales that could be used to pay returns to capital. But a VAT also allows a credit for purchases of investment goods. In the long

[4] See Appendix A for a description of these allowances.
[5] A portion of supernormal returns to capital may be viewed as returns in the form of profits to the labor of extraordinarily talented individuals who develop new products, services and production processes.

run therefore, when all capital is "new," the VAT wedge on capital income in part is simply the repayment of the VAT credits received when investments were made (plus the normal return on those credits). As a result, a VAT does not reduce the normal return, so we would not expect a VAT to affect nominal (or real) interest rates.[6] Likewise, normal returns to equity would be unaffected. However, supernormal returns, which research indicates are more than half of total returns to equity, are reduced by a VAT.[7]

We use 60 percent as the share of total equity returns that are supernormal. With the price level unchanged, supernormal returns fall by the same factor as labor income, 2.12 percent.

3. Cash Transfer Payments

Most cash transfer payments are based directly or indirectly on the level of wages. For example, initial Social Security retirement and disability benefits are determined by formulas based on workers' prior earnings histories. Because a VAT would reduce wages, Social Security benefits for future beneficiaries would also be reduced. If governments wished to prevent this, they would need to enact legislation to adjust the benefit formulas for Social Security and other cash transfer payments or provide a supplemental benefit such as a rebate. We assume that the federal government does not adjust the benefit formulas for its cash transfer benefits, so these benefits fall as lower wages enter the benefit formulas, and are reduced by 2.12 percent in the long-run. The effect of the VAT on cash transfer payments made by state and local governments is included in the discussion below of state and local spending on these payments.

4. Relative Prices

Prices of taxed consumption items would reflect the VAT and rise relative to the prices of any untaxed goods. With the price level unchanged, VAT-exclusive prices of all goods would fall, but the VAT-inclusive price of taxed goods would rise for the narrow base and be unchanged for the comprehensive base because there are no untaxed items of consumption. Other potential effects of a VAT on relative prices are discussed below in the context of effects on state and local general sales tax bases.

5. Asset Values

We consider any effect of a federal VAT on the value of existing assets as one of its short-run or transitory effects. However, we do consider the effect of the VAT on property values in the discussion below of effects on property tax revenues.

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[6] Whether real interest rates would change in response to adoption of a federal VAT is, however, an unsettled question in the economics literature. See, for example, Feldstein (1998).

[7] Gentry and Hubbard (1997) estimated that supernormal returns represent 60 percent of the total returns to equity. Toder and Rueben (2007) derive an estimate that only 32 percent of corporate equity returns are normal, implying that 68 percent are supernormal.

B. Effects on State and Local Revenues[8]

The long-run effects of a federal VAT on incomes and relative prices would affect the long-run size of state and local revenue bases. We examine these effects holding constant the definition of revenue bases, the level and structure of rates, and other parameters of state and local revenue systems.

1. Income Taxes

The reduction in wages and supernormal returns would reduce the base of state and local individual income taxes, and the reduction in supernormal returns the base of corporate income taxes. These base reductions, and the associated reductions in revenues, would be permanent.

The base of corporate income taxes is returns to equity, so the reduction in corporate income tax bases is the reduction in supernormal returns of 2.12 percent times the 60 percent supernormal share of total equity returns, or 1.27 percent. We assume that the change in corporate income tax revenues is proportional to the change in the base, so are also reduced by 1.27 percent. In the individual income tax base, dividends and virtually all capital gains represent equity returns, so these sources of income would be reduced by 1.27 percent. A portion of the net income reported by pass-through entities (sole proprietorships, partnerships, subchapter S corporations, rents and royalties) represents a return to labor, and the remainder a return to equity. We treat the portion of income from pass-through entities that is subject to Social Security and Medicare taxes[9] as the labor portion, and the remainder as a return to equity. The labor portion would be reduced by 2.12 percent, the same reduction that would apply generally to wages and wage-related cash transfers and retirement income. The equity portion would be reduced by the same 1.27 percent that would apply to corporate equity returns. To estimate the effect of these reductions on state individual income tax revenues, we applied the reductions to the affected sources of income in each state with an income tax in TPC's state income tax simulation models and calculated the percentage reduction in individual income tax revenues for each state.[10]

[8] The following discussion follows the classifications of the Governments Division of the Bureau of the Census. The Census classifications are used in part because Census is the primary source of data used to develop state-by-state estimates of the effects of a federal VAT shown in Sections III - V. In addition, the Census classifications of revenues and spending align better with state and local budget concepts than the classifications used in the National Income and Product Accounts (NIPA). Differences between Census and NIPA treatments of various items are noted as appropriate because NIPA data and concepts are used to develop estimates of the two federal VAT bases (see Appendix A).

[9] Self-employed individuals pay these taxes under SECA, the Self Employment Contributions Act.

[10] The average reduction in state income tax revenues across all states is 2.88 percent, ranging from a reduction of 0.98 percent in Tennessee to 3.82 percent in New Mexico. (Seven states – Alaska, Florida, Nevada, South Dakota, Texas, Washington, and Wyoming – have no state income tax.) Note that for all other revenue and spending changes we used the same change factor for all states.

2. Payroll Taxes

Unemployment insurance (UI) taxes are the major payroll tax for state governments, but represent a relatively small share of total state revenues.[11] The wage base of UI taxes in many states is set at a very low level. For example, in 2012 the base was the first $7,000 of wages in Arizona and California, $7,700 in Louisiana, and $8,000 in Alabama, Kansas, Pennsylvania and Virginia.[12] Although with no change in the price level a VAT would lower wages, it would not lower wages for most workers in most states to an annual amount that is below the wage base for state UI taxes. We therefore do not include any change in UI revenues in our estimates.[13]

3. General Sales Taxes

State and local general sales taxes apply to the retail value of goods and services included in the tax base. These retail values are the sum of value added – payments to labor and capital – in the entire chain of production and distribution through the retail level. In addition, retail values include the amount of any general sales taxes levied at pre-retail stages of production and distribution that are passed on ("pyramided") in higher prices to consumers, and federal, state and local excises and similar taxes that are levied on goods and services, generally on a per-unit basis and at pre-retail stages of production and distribution (indirect business taxes).[14] We assume that the VAT would be excluded from the base of state and local general sales taxes.[15] With the price level unchanged, state and local general sales tax bases would permanently shrink as prices net of the federal VAT fell along with labor and capital income. But state sales tax bases would decline somewhat less than labor and capital income because the amount of pre-retail unit taxes in the bases would generally not be affected by the federal VAT.[16] We estimate that the decline in state and local sales tax bases would be 2.08 percent (compared to 2.12 percent for factor incomes).

There are other potential changes to state and local sales tax bases that our estimate does not take into account. One is the potential effects of the federal VAT on sales tax compliance. The VAT would increase the tax rate on retail sales, which would increase the incentives for avoidance and evasion. This reduction in compliance would reduce sales tax bases. But a federal

[11] In 2012, UI taxes represented 3.5 percent of total state tax revenues. Note that Census classifies state and local unemployment taxes as part of trust fund revenues, and NIPA treats the unemployment system as entirely federal.
[12] These amounts are from the American Payroll Association, http://www.americanpayroll.org/members/stateui/state-ui-2/ accessed December 19, 2011.
[13] Our estimates may therefore underestimate the effect of a federal VAT on revenues in states with high UI bases, such as Georgia ($38,800 in 2012) and Washington ($38,200), if there is no change in the price level.
[14] These include, for example, excises on motor fuels, alcoholic beverages, and tobacco products. Indirect business taxes also include general sales taxes levied on sales to households, which are not part of the sales tax base. NIPA includes indirect business taxes in "taxes on production and imports".
[15] Current state and local sales tax bases generally exclude federal excises that are imposed on the retailer and separately stated (Due and Mikesell, page 44). Presumably a federal VAT would be separately stated, so given federal excise tax treatment and excluded from sales tax bases.
[16] All pre-retail state and local indirect taxes would effectively be included in the VAT base, absent a special exclusion for them at subsequent stages of production and distribution, through the retail level. If levied on an ad valorem basis, they would decline along with labor and capital income, but unit taxes would be unchanged unless household consumption patterns were affected by the VAT.

VAT would also provide state tax administrators an additional set of enforcement tools, such as a comprehensive register of businesses and the results of federal VAT enforcement efforts, and these tools could improve sale tax compliance. The net effect on compliance with state retail sales taxes is unclear, but we do not believe it would be large.

Our estimate also does not take into account possible shifts in household consumption patterns under the narrow VAT base due to higher relative prices for items subject to VAT. Some of any shift could be out of items subject to VAT but not sales taxes, and some of the shift into items not subject to VAT could be to items subject to sales taxes. Only shifts from items subject to both VAT and sales taxes to items subject to neither would reduce sales tax bases. The net effect on sales tax bases of any shifts in household consumption patterns is therefore ambiguous, and the detailed modeling that would be required to estimate these net effects on a state-by-state basis is beyond the scope of this paper. We have no reason to think, however, that any such shifts would be significant.

4. Property Taxes

We take into account the general transitory effects of the introduction of a VAT on "old" capital through effects on the value of financial assets (see Section V). But because business and residential properties are so long-lived and property tax revenues are such an important revenue source for state and local governments, we consider here the "transitory" effect of the VAT on the value of existing properties as well as its effect on investments in new properties.

Business properties

With the price level unchanged, reduced payments to labor and capital would lower the cost of producing investment goods. Because VAT is removed from the price of investment goods through the credit allowed to purchasers, lower production costs would flow through to lower prices for businesses purchasing investment goods. The value of business properties in existence prior to introduction of a VAT would also have to fall because they can only earn the same rate of return (net of VAT) as new business investments.[17] So with the price level unchanged, the business property tax base would decline when the VAT was introduced (assuming assessed values track market values) and remain lower than it would have been in future years. Business property tax revenues, holding rates constant, would likewise be permanently reduced. These declines would be the same as the decline in factor incomes, 2.12 percent.

[17] This is part of the capitalization effect into asset values of the introduction of a VAT discussed in Section V.

Residential properties

Residential properties, whether occupied by owners or tenants, are capital goods that provide housing services over multiple years. Tenants pay rent for the housing services provided by their landlords (i.e., the owners of residential rental properties). Rents paid by tenants are a component of consumption included in the NIPA estimate of household consumption. Owner occupants are effectively both their own tenants and landlords, but make no actual rent payments for the value of the housing services they provide to themselves. In order to include the consumption of housing services by owner occupants, NIPA includes an imputation for the amount of rent that homeowners would have paid for comparable rental housing.

Because there are no actual rent transactions for owner-occupied housing and because of the practical difficulties involved in attempting to estimate and tax imputed rents, we exclude these rents from both VAT bases.[18] However, the comprehensive VAT base includes spending on new housing and improvements to existing housing, which is equivalent (in expected present value) to taxing the rental services of new (post-VAT) housing and improvements. This approach is referred to as the "prepayment" method of taxing the rental value of a durable good. For consistency of treatment and ease of administration, the comprehensive VAT base also applies the prepayment method to tenant-occupied housing, with tenant rents excluded and sales of new tenant-occupied housing and improvements included.[19] With the price level unchanged, the VAT would not raise the VAT-inclusive price of new housing under the comprehensive base. The value of existing housing would also be largely unchanged, because sales of existing housing are not in the base.[20] With the value of new and existing housing unchanged, this portion of the property tax base, and the associated property tax revenues, would be unaffected in both the short and long run.

Like the comprehensive VAT base, the narrow base excludes both imputed rents on owner-occupied housing and tenant rents. But unlike the comprehensive base, the narrow base also excludes (through zero rating)[21] all spending on new housing and improvements to existing housing. With the price level unchanged, tenant rents and the price of new housing (and improvements) would fall, driving down the value of existing housing and permanently lowering residential property tax revenues. As with business properties, these declines would be the same as the decline in factor incomes, 2.12 percent.

[18] It would be very difficult to determine reasonable estimates of imputed rents for each and every owner-occupied residence in the United States. And even if reasonable estimates could be determined, taxing imputed rents directly would require every homeowner to make periodic (at least annual) VAT payments based on the estimated value of their imputed rent.
[19] Note that only the amount of rent paid for the housing space (i.e., excluding any amounts included in rents that pay for other services such as utilities, amenities, and rental management services) would (in principle, at least) be excluded from the VAT base. Exempting rents (i.e., not taxing rents but also not allowing a credit for VAT included in landlords' purchases) would be necessary to achieve this result, and to avoid allowing landlords a VAT credit for purchases of new tenant-occupied housing and improvements. Note also that tenant-occupied housing typically excludes "transient" housing, such as hotels and motels (the services of which would be included in both VAT bases).
[20] Note that unlike owners of existing business capital, owners of existing homes would bear no VAT burden on their homes.
[21] Zero rated items are technically subject to VAT (at a zero rate), but the seller receives a credit for VAT included in purchases, so VAT is completely removed from the sale.

5. User Charges

User charges are government revenues from the sale of goods and services to households and businesses.[22] Examples are tuition charged by state colleges and universities, charges for medical services provided by government hospitals, and charges for water and electricity supplied by government-owned utilities.[23] Charges for goods and services provided to households by governments are included in NIPA consumption. We assume that the charge-financed activities of governments (and nonprofits) are treated as a business for VAT purposes, so the charges would be subject to VAT if the corresponding item of consumption is taxed. The comprehensive base covers all consumption items provided by governments at a charge, so all state and local government user charges would be subject to the 2.4 percent VAT rate for this base. The narrow VAT base excludes (through zero rating) all medical services, sales of new housing and improvements to existing housing, and education, and also excludes residential rents, so only state and local user charges for other items (such as electrical and water services) would be subject to the 5 percent VAT rate for this base.

With the price level unchanged, the VAT-exclusive level of all state and local user charges would fall due to the reduction in factor incomes. We therefore estimate that with the narrow VAT base, user charges for excluded items would fall by the reduction in factor incomes, 2.12 percent, while user charges for taxed items would increase by [(1 - .0212) x 1.05 – 1] = 2.77 percent. For the comprehensive base, all user charges would increase by [(1 - .0212) x 1.024 – 1] = .23 percent.

6. Employee Retirement Revenues

These revenues are from two sources: contributions and earnings on fund balances.[24] Holding contribution rates fixed, the effect of a VAT on contributions would be the same as the effect on labor compensation generally.[25] Contributions would therefore fall if the price level was unchanged. Earnings on fund balances are returns to capital that could also be affected by a VAT. In the long run, there is no VAT burden on the normal return to capital, but supernormal returns would be reduced if the price level was unchanged. The estimated change for both contributions and the supernormal portion of equity earnings on fund balances is therefore a reduction of 2.12 percent.

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[22] As defined here, charges include amounts classified as "utility revenue" and "liquor store revenue" by Census. In the NIPA, some of these charges are considered revenues of enterprises and included in government revenues net of associated expenditures, and remaining charges are removed from revenues consistent with the treatment of associated expenditures as "sales to other sectors". In the federal budget, charges are generally netted against associated spending as "offsetting receipts".

[23] Census excludes from charges medical vendor payments made by state and local governments to public institutions, but these amounts are included in "sales to other sectors" in the NIPA.

[24] Census excludes employer (state and local government) contributions to their own retirement funds. NIPA includes these contributions in compensation of employees, but pension funds are treated as part of the private sector (so, contributions are simply a form of saving and earnings are included in the income of households).

[25] We assume, as is generally the case, contribution rates are set as a percentage of wages.

7. Other Own Source Revenues

For state and local governments these revenues are primarily from excises on gasoline, cigarettes and tobacco, and licenses. To the extent they are based on units rather than value and licenses have set nominal values, revenues from these sources would be unaffected by a VAT (other than possible changes in household consumption patterns with the narrow base due to changes in relative prices). Remaining own source revenues are mainly from interest earnings on investment of state balances (aside from retirement funds) that would be largely unaffected by a VAT. We therefore do not include any change in these revenues in our estimates.

8. Intergovernmental Grants

Intergovernmental grants are a source of revenue for recipient governments, but a form of spending for the granting government. Here, we consider only state and local government revenues in the form of grants from the federal government.[26] As noted above, our estimates of the effects of a VAT on the federal deficit held the nominal level of federal grants to state and local governments constant. So nominal federal grants are unchanged under either base.[27]

C. Effects on State and Local Spending

The effects of a federal VAT on incomes and relative prices would also affect the cost of inputs required to provide state and local government services. Conceptually, we examine these effects holding constant the quantities of goods and services (i.e., real output) provided by state and local governments. But because many of these outputs are unobservable, in practice we hold constant labor inputs and real purchases from businesses. Spending effects are considered in several broad categories generally based on Census classifications.

1. General Government

Spending by state and local governments on public goods, such as police and fire protection, education and highways, is included in "general expenditures" by Census and considered "general government consumption" in the NIPA. This spending is entirely financed by taxes (or borrowing) in NIPA; any spending that is financed by charges (such as higher education spending paid by tuition charges) is considered household consumption (see discussion below). The effects of a VAT on general government spending include the effects of the VAT on user charges and any VAT included in purchases from business or paid on compensation of employees.

All general government spending is included in the comprehensive VAT base. With the price level unchanged, pre-VAT levels of this spending for purchases from businesses would fall

[26] See the section below on spending for a discussion of state grants to local governments.
[27] This means that with the price level unchanged, federal grants would purchase a larger amount of real goods and services not subject to VAT under the narrow base, but somewhat reduced amounts if the goods and services are subject to VAT. The reductions are the same as discussed above for user charges subject to VAT.

due to the reduction in factor incomes, but all of this spending would be subject to the 2.4 percent comprehensive VAT rate. Similarly, pre-VAT spending on compensation of employees would fall due to the reduction in labor income, but would also be subject to the 2.4 percent VAT rate.[28] So we estimate that under the comprehensive base this spending would rise by .23 percent.

All general government spending is excluded from the narrow VAT base. Business sales to government would be zero rated, and employee compensation would simply be treated as outside the scope of the VAT. Because both purchases from businesses and compensation of employees would fall due to the reduction in factor incomes if the price level was unchanged, this spending could *fall* by 2.12 percent while providing the same real level of general government services.

2. Charge-Financed and In-Kind Transfer Spending

We consider any deficit in charge-financed spending (i.e., spending in excess of related charges) to be general government spending, and any surplus to be a reduction in general government spending. So spending on activities funded by user charges would change in the same direction, and in the same amount, as the related tax-inclusive charges. Over three-fourths of in-kind spending is for Medicaid and other medical assistance; this spending would change in the same direction as consumption of medical services.[29]

With the price level unchanged, under the comprehensive base and 2.4 percent rate we estimate that all of this spending would increase by the same factor as general government spending, .23 percent. Under the narrow base and 5 percent rate, charge-financed spending on items subject to VAT would increase by 2.77 percent, but the remainder of this spending (including Medicaid spending) could decline by 2.12 percent with no reduction in the level of real services provided.

3. Cash Transfer Payments and Retirement Benefits[30]

The effect of a federal VAT on state and local government cash transfer spending is the counterpart of its effect on cash transfer receipts of individuals. For this spending, we assume that benefit formulas (rather than the real income of recipients) are held constant.

In the long run, with the price level unchanged nominal spending on cash transfer payments that are based on wages, such as unemployment compensation, would fall due to the

[28] Note that purchases from business include investment goods, so government consumption of purchased new investment goods is taxed on a prepayment basis. Likewise, consumption of new self-constructed investment goods is taxed on a prepayment basis because employee compensation is subject to VAT.
[29] Using data from NIPA Table 3.12, we calculate that in 2012 about 77 percent of state and local spending on in-kind transfers (referred to as "social benefits" in NIPA) was for Medicaid.
[30] Neither cash transfers nor retirement benefits are compensation for current production, so are not included in the NIPA measure of national income. Both are included in NIPA personal income, however.

reduction in labor income. For the same reason, nominal spending on retirement benefits would also fall in the long run.[31]

For our estimates we treat all state and local cash transfer spending as based on wages, so this spending as well as spending on retirement benefits are reduced by 2.12 percent in the long run under both variants of the federal VAT.

4. Interest on Debt

We do not expect a federal VAT to change interest rates, so nominal spending on interest on debt would not change (in the short or long run).

5. Intergovernmental Grants

State governments make significant grants to local governments, but any change in state grants would be offset by changes in local revenues, so would have no net effect on combined state and local budgets. We also assume that there would be no change in the nominal level of the small grants that state governments make to the federal government. Our estimates therefore do not include any change in this spending.

D. Estimated Effects on State and Local Budgets

In this section, we apply our results from the preceding sections to make state-by-state estimates of the long-run effects of both variants of the federal VAT on state and local revenues, spending, and budget balances assuming the price level is unchanged. Our estimates are based on Census data on state and local finances for FY2012, with some supplemental data from other sources. And as noted above, in making these estimates we hold constant the design of revenue structures and spending programs.

For each state, we estimated the change in each major source of revenue and each major category of spending discussed above. The estimates are for nominal changes in revenues and spending, and we use the nominal change in budget balances (or this change relative to the current level of revenues) as a summary measure of the effect of the federal VAT variants on the fiscal position of state and local governments. Nominal changes in budget balances properly indicate whether governments are better or worse off, even if (as in Sections IV and V) the price level is assumed to increase, because we hold the real level of state and local government services constant in all circumstances. Further, this measure provides straightforward guidance for potential state and local responses to a federal VAT, because budgets are formulated and enacted using nominal levels of revenues and spending.

[31] Note that these are the same assumptions we followed in computing the effect of the VAT on federal spending for these items.

Assuming the price level does not change when it is introduced, the estimated long-run effects of a federal VAT would raise the aggregate deficit of all state and local governments by $20.9 billion (at 2012 levels) if the VAT base is comprehensive and *reduce* this deficit by $23.0 billion if the VAT base is narrow (Table 2). The deterioration in budget balances under the comprehensive VAT base is due almost entirely to changes in tax revenues, which on net decline by $22.6 billion. Revenues from individual and corporate income taxes, general sales taxes, and business property taxes would all decline, as would revenues from employee retirement contributions and (supernormal) equity earnings. These declines are all due to the reduction in factor incomes. Note that income tax revenues would decline more (by nearly $9.5 billion in total) than revenues from general sales taxes (which would decline by $6.5 billion). The small net decline in spending of $1.7 billion comes from the combination of lower spending on cash transfer payments (-$2.9 billion) and retirement benefits (-$4.9 billion), and higher spending on general government ($3.8 billion) and charge-financed and in-kind transfer spending ($2.3 billion). Note that the higher charge-financed portion of this increase in spending is fully offset by higher revenues due to the imposition of VAT on associated charges.

An increase of 0.7 percent in aggregate state and local revenues would be required to offset the $20.9 billion increase in aggregate state and local deficits under the comprehensive base. If the federal government were to compensate states and localities for these net budgetary losses with increased grants, the net reduction in the federal deficit from the VAT would be about 10 percent smaller ($189.1 billion rather than $210 billion).

The improvement in budget balances under the narrow VAT base is the net effect of lower revenues (which fall by $24.3 billion) and much lower spending (which falls by $47.3 billion, primarily as a result of the exclusion of most spending from the narrow base combined with the reduction in factor incomes). Revenues would decline more than under the comprehensive base for several reasons. Property tax revenues from residential properties would decline, whereas they would be unchanged under the comprehensive base. Charges from education, hospitals and housing would be reduced, whereas there would be an increase in revenues from these charges under the comprehensive base. Partially offsetting these revenue reversals would be a much larger increase in "other" charges. The much larger decline in net spending under the narrow base is due primarily to a reduction of $35.5 billion in spending on general government, a $39.3 billion swing from the $3.8 billion increase in spending under the comprehensive base. There would be a similar swing in Medicaid spending (-$8.3 billion vs. $0.9 billion) and swings in charge-financed spending that mirror the revenue changes.

TABLE 2

Effects of a Federal VAT on Total State and Local Budgets in 2012

Long-Run Effects Assuming No Change in Price Level ($ billions)

	Comprehensive VAT Base (Rate of 2.4%)	Narrow VAT Base (Rate of 5%)	ADDENDUM Total Revenue in 2012
Change in revenues, total	-22.6	-24.3	3,108.4
Taxes	-20.8	-25.5	1,438.5
Individual income	-8.8	-8.8	307.3
Corporate income	-0.6	-0.6	49.0
Payroll	0.0	0.0	50.4
General sales	-6.5	-6.5	314.8
Property - business	-4.8	-4.8	228.5
Property - residential	0.0	-4.6	217.6
Other (excises, licenses and other taxes)	0.0	0.0	270.9
Charges	1.3	4.3	586.9
For education, hospitals, and housing	0.6	-5.2	244.6
Other	0.8	9.5	342.2
Employee retirement:	-3.1	-3.1	246.9
Contributions	-1.6	-1.6	77.1
Earnings on fund balances	-1.5	-1.5	169.8
Equity -- normal returns	0.0	0.0	47.7
Equity -- supernormal returns	-1.5	-1.5	71.5
Bonds (all normal returns)	0.0	0.0	50.6
Other own-source revenues	0.0	0.0	251.6
Earnings on non-retirement fund balances	0.0	0.0	80.8
Other	0.0	0.0	170.8
Federal grants	0.0	0.0	584.5
Change in spending, total	-1.7	-47.3	3,151.7
General government	3.8	-35.5	1,672.8
Charge-financed and in-kind transfer spending	2.3	-4.0	980.0
Medicaid	0.9	-8.3	393.2
Education, hospitals and housing, etc.	0.6	-5.2	244.6
Other	0.8	9.5	342.2
Cash transfer payments	-2.9	-2.9	136.4
Retirement benefits	-4.9	-4.9	233.2
Interest on debt	0.0	0.0	125.1
Intergovernmental grants (to federal govt.)	0.0	0.0	4.2
Change in budget balances[1]	-20.9	23.0	-43.3
Addendum			
Change as a percent of total revenues in:			
Total revenues	-0.7%	-0.8%	
Total spending	-0.1%	-1.5%	
Budget balances	-0.7%	0.7%	

Notes: All estimates are based on data from Census (2014) except business property taxes are from Philips, et al. (2013) and Medicaid spending from the National Association of State Budget Officers (2014). We include unemployment payroll taxes in taxes, although they are classified as insurance trust revenue by Census. We also include utility and liquor store revenues in "other" charges.

[1] Positive amounts mean the combined 2012 state and local budget deficit would be reduced; negative amounts that this deficit would be increased.

1. State-by-State Estimates

In the long run, with no change in the price level the adoption of a federal VAT with a comprehensive base and a rate of 2.4 percent would reduce combined state and local surpluses (or increase combined deficits) in all states (Table 3). The sources of the worsening of fiscal positions are revenue declines in all states, with much smaller declines in spending in some states and spending increases in others. The decline in the net surplus (increase in deficit) as a share of revenues ranges from 0.2 percent in Alaska to 1.0 percent in the District of Columbia (DC). The differences mostly reflect differences in sources of revenue. DC relies heavily on individual income and business property taxes for revenue, sources adversely affected by the federal VAT. In contrast, Alaska relies heavily on severance taxes and royalties from oil production, which would not be affected by the VAT.

If the federal VAT had a narrow base with a 5 percent rate, the fiscal position of every state would improve. The range of improvements is from 0.5 percent of revenues in Kansas and Nebraska to 1.1 percent in Alaska, Delaware, Louisiana and Montana.

IV. LONG RUN EFFECTS IF THE PRICE LEVEL RISES

If the Fed fully accommodates the introduction of the VAT to keep nominal incomes from falling, the level of consumer prices would rise by the amount of the VAT. We assume the initial rise in the price level would not set off a wage-price spiral, so the rate of inflation going forward would be unaffected.

We estimate the one-time increase in consumer prices as measured by the index for personal consumption expenditures (the PCE) in NIPA as the VAT rate times the percentage of consumption subject to VAT. For the comprehensive VAT base with a 2.4 percent rate, the estimated change in the PCE is 1.84 percent, while for the narrow VAT base with a rate of 5 percent, the estimated change in the PCE is 2.03 percent. We also estimate the change in the consumer price index (CPI), because it is used to index income tax parameters and various government benefits. To estimate the change in the CPI, we multiply the change in the PCE by the ratio of the growth rate in the CPI to the growth rate in the PCE over the past 15 years (1999-2014). This ratio is 1.232, so the estimated change in the CPI for the comprehensive base is 2.27 percent and for the narrow base is 2.50 percent.

TABLE 3

Effects of a Federal VAT by State on Combined State and Local Budget Balances as a Percent of Revenue in 2012

Long-Run Effects Assuming No Change in Price Level (Percent)

	Comprehensive VAT Base (Rate of 2.4%)	Narrow VAT Base (Rate of 5%)	ADDENDUM Total Revenue in 2012 ($ Billions)
All States	-0.7	0.7	3,108.4
Alabama	-0.6	0.9	40.7
Alaska	-0.2	1.1	18.7
Arizona	-0.8	0.6	53.5
Arkansas	-0.8	0.8	24.7
California	-0.7	0.6	428.4
Colorado	-0.7	0.6	49.1
Connecticut	-0.7	0.6	40.6
Delaware	-0.5	1.1	10.0
DC	-1.0	1.0	12.9
Florida	-0.6	0.8	156.1
Georgia	-0.8	0.7	75.6
Hawaii	-0.9	0.7	14.5
Idaho	-0.8	0.6	12.1
Illinois	-0.6	0.8	124.4
Indiana	-0.8	0.7	54.7
Iowa	-0.7	0.7	32.3
Kansas	-0.9	0.5	26.8
Kentucky	-0.6	0.9	36.9
Louisiana	-0.7	1.1	44.2
Maine	-0.9	0.8	12.3
Maryland	-0.9	0.7	57.9
Massachusetts	-0.7	0.8	74.5
Michigan	-0.6	0.8	87.2
Minnesota	-0.8	0.6	57.7
Mississippi	-0.7	0.8	27.9
Missouri	-0.7	0.7	50.8
Montana	-0.6	1.1	9.2
Nebraska	-0.7	0.5	20.6
Nevada	-0.6	0.9	22.9
New Hampshire	-0.4	0.9	11.1
New Jersey	-0.6	0.7	97.1
New Mexico	-0.7	1.0	20.9
New York	-0.8	0.7	302.7
North Carolina	-0.7	0.6	86.0
North Dakota	-0.5	0.7	11.2
Ohio	-0.6	0.8	115.0
Oklahoma	-0.7	0.7	33.5
Oregon	-0.5	0.8	40.0
Pennsylvania	-0.5	1.0	122.4
Rhode Island	-0.6	0.8	11.6
South Carolina	-0.6	0.6	41.1
South Dakota	-0.6	0.9	7.2
Tennessee	-0.5	0.8	55.4
Texas	-0.6	0.8	218.7
Utah	-0.7	0.8	24.6
Vermont	-0.8	0.9	7.0
Virginia	-0.8	0.7	69.4
Washington	-0.5	0.9	71.7
West Virginia	-0.6	1.0	17.0
Wisconsin	-0.7	0.6	57.7
Wyoming	-0.5	0.8	10.1

Note: Positive amounts mean a state's combined 2012 state and local budget surplus would be increased or the state's combined deficit reduced; negative amounts that the state's combined surplus would be reduced or the combined deficit increased.

A. Effects on Incomes, Relative Prices, and Asset Values

1. Incomes

With full accommodation by the Fed, nominal labor compensation and returns to equity would be unchanged, but real incomes would decline, reflecting the increase in consumer prices. With no change in nominal labor compensation, nominal cash transfer payments based on wages, such as initial Social Security benefits, would also be unchanged in the long run.

2. Relative Prices

Prices of taxed goods would rise while prices of untaxed goods would be unchanged. The tax-exclusive portion of items subject to sales and excise taxes would rise by the VAT rate, but the portion of the price that reflects current sales or excise taxes at the retail level would be unchanged, since these taxes are not included in either VAT base. The relative prices of such items would therefore increase by less than the VAT rate.

3. Asset Values

We consider changes in asset values in Section V, except for the effects on existing residential property values discussed below.

B. Effects on State and Local Revenues

With nominal wages and profits unchanged, (nominal) revenues from corporate income taxes, payroll taxes, general sales taxes, business property taxes, and employee retirement contributions and earnings would not change. However, nominal revenues from some sources would be affected.

Individual income tax revenues would be permanently reduced in states that automatically index income tax parameters (such as rate brackets and personal exemptions) to changes in the price level by piggybacking on federal parameters that are indexed, or through separate indexing provisions. To estimate the size of this effect, we first ran TPC's microsimulation model to estimate the percentage change in federal individual income tax receipts from a 5 percent increase in the CPI, which is -1.8 percent. We then divided this result by five and multiplied it by our estimates of the percentage change in the CPI for each base given above, and further adjusted by 1/2 to account for the flatter rate schedules in state and local income taxes and other differences from the federal income tax. The resulting estimates are a reduction in individual income tax revenues due to indexing of 0.41 percent for the comprehensive base and 0.45 percent for the narrow base. We apply these estimates in all states

with an individual income tax, not taking into account the specific indexing (or lack of indexing) provisions in each state.[32]

New housing purchases are included in the comprehensive VAT base, so prices of new housing would increase. Higher new home prices lead to increases in the prices of existing homes. So revenues from residential property taxes would increase under the comprehensive base. We use the change in the PCE to estimate this effect. Charge revenues would increase on items included in each VAT base by the respective VAT rates of 2.4 and 5 percent.

C. Effects on State and Local Spending

With nominal income unchanged, all items of spending subject to VAT would increase by the VAT rate. For the comprehensive base, this means that spending on general government, charge-financed and in-kind transfer spending would all increase by 2.4 percent. For the narrow base, the 5 percent increase would only apply to "other" charge-financed spending.

D. Estimated Effects on State and Local Budgets

Assuming the Fed fully accommodates the introduction of a federal VAT by allowing the consumer price level to rise by the amount of the VAT, the VAT's estimated long-run effects on the 2012 aggregate deficit of all state and local governments combined are for an increase in this deficit under both VAT bases, but with a large increase ($46.8 billion) if the VAT base is comprehensive, and a quite small increase ($1.4 billion) if the VAT base is narrow (Table 4). The deterioration in budget balances under the comprehensive VAT base is due entirely to changes in spending; revenues increase on net by $16.8 billion. Revenue increases are from residential property taxes ($4.0 billion) and charges ($14.1 billion). The only reduction in revenues (-$1.3 billion) is due to the effects of indexing individual income tax parameters. All spending subject to VAT increases: general government ($40.1 billion), Medicaid ($9.4 billion), and all other charge-financed spending ($14.1 billion), for a total increase in spending of $63.7 billion. Note that all of the increase in other charge-financed spending is offset by increases in associated revenues.

Under the narrow base, revenues from charges subject to VAT increase by $17.1 billion, but this is fully offset by an increase in related spending (i.e., the payment of VAT liabilities to the federal government). The entire net decline in the budget balance of $1.4 billion is attributable to the reduction in individual income tax revenues from indexing.

[32] The inflation indexing modules of TPC's state microsimulation models had not been fully implemented and tested when the estimates for this paper were made, so we could not make estimates specific to each state.

TABLE 4

Effects of a Federal VAT on Total State and Local Budgets in 2012

Long-Run Effects Assuming The Price Level Rises ($ billions)

	Comprehensive VAT Base (Rate of 2.4%)	Narrow VAT Base (Rate of 5%)	ADDENDUM Total Revenue in 2012
Change in revenues, total	16.8	15.7	3,108.4
Taxes	2.8	-1.4	1,438.5
Individual income	-1.3	-1.4	307.3
Corporate income	0.0	0.0	49.0
Payroll	0.0	0.0	50.4
General sales	0.0	0.0	314.8
Property - business	0.0	0.0	228.5
Property - residential	4.0	0.0	217.6
Other (excises, licenses and other taxes)	0.0	0.0	270.9
Charges	14.1	17.1	586.9
For education, hospitals, and housing	5.9	0.0	244.6
Other	8.2	17.1	342.2
Employee retirement:	0.0	0.0	246.9
Contributions	0.0	0.0	77.1
Earnings on fund balances	0.0	0.0	169.8
Equity -- normal returns	0.0	0.0	47.7
Equity -- supernormal returns	0.0	0.0	71.5
Bonds (all normal returns)	0.0	0.0	50.6
Other own-source revenues	0.0	0.0	251.6
Earnings on non-retirement fund balances	0.0	0.0	80.8
Other	0.0	0.0	170.8
Federal grants	0.0	0.0	584.5
Change in spending, total	63.7	17.1	3,151.7
General government	40.1	0.0	1,672.8
Charge-financed and in-kind transfer spending	23.5	17.1	980.0
medicaid	9.4	0.0	393.2
education, hospitals and housing, etc.	5.9	0.0	244.6
Other	8.2	17.1	342.2
Cash transfer payments	0.0	0.0	136.4
Retirement benefits	0.0	0.0	233.2
Interest on debt	0.0	0.0	125.1
Intergovernmental grants (to federal govt.)	0.0	0.0	4.2
Changes in Budget Balences[1]	-46.8	-1.4	-43.3
Addendum			
Change as a percent of total revenues in:			
Total revenues	0.5%	0.5%	
Total spending	2.0%	0.6%	
Budget balances	-1.5%	-0.04%	

Notes: All estimates are based on data from Census (2014) except business property taxes are from Philips, et al. (2013) and Medicaid spending from the National Association of State Budget Officers (2014). We include unemployment payroll taxes in taxes, although they are classified as insurance trust revenue by Census. We also include utility and liquor store revenues in "other" charges.

[1] Positive amounts mean the combined 2012 state and local budget deficit would be reduced; negative amounts that this deficit would be increased.

1. State-by-State Estimates

In the long run, with a rise in the price level the adoption of a federal VAT with a comprehensive base and a rate of 2.4 percent would reduce combined state and local surpluses (or increase combined deficits) in every state by amounts equivalent to over 1 percent of revenues (Table 5). In all states, higher revenues would only partially offset higher spending. The net budget position worsens by amounts ranging from 1.2 percent of revenues in North Dakota to 2.1 percent of revenues in DC.

Under the narrow base with a rate of 5 percent, the fiscal position of states would essentially be unchanged, with the largest deterioration in any state's budget balance equal to only 0.1 percent of revenues.

V. SHORT-RUN EFFECTS WITH AND WITHOUT A CHANGE IN THE PRICE LEVEL

In this section, we examine the short-run effects on state and local budgets of a federal VAT with either a comprehensive or narrow base under the assumptions that the Fed does, and does not, accommodate the introduction of the VAT so the level of consumer prices rises or is unchanged. The estimated short-run effects on the PCE and CPI if the Fed accommodates the introduction of the VAT are the same as the estimated long-run effects discussed in Section IV.

A. Effects on Incomes, Relative Prices and Asset Values

1. Incomes

As noted in Section III, with the price level unchanged it is possible that in the very early stages of the transition following introduction of a VAT some of the VAT on value added by labor would be absorbed by returns to equity. This possibility, however, is not taken into account in this paper.[33] For purposes of our analysis, we assume the adjustment of wages across all sectors if the price level is unchanged occurs quickly, and therefore is reflected in the transitional estimates.[34] If the price level rises, nominal labor income is unchanged in the short run as well as the long run. So the short-run effects of a VAT on labor income are the same as the long-run effects.

Interest payments from existing debt contracts are fixed over the term of the debt, so the introduction of a VAT would not affect nominal interest payments and income whether or

[33] Another possibility that we do not consider is a rise in unemployment that might occur if the VAT was not phased in and the Fed did not allow the price level to rise.
[34] Note that the illustrative VAT rates we consider are relatively low; with higher VAT rates wages would adjust more slowly.

TABLE 5

Effects of a Federal VAT by State on Combined State and Local Budget Balances as a Percent of Revenue in 2012

Long-Run Effects Assuming The Price Level Rises (Percent)

	Comprehensive VAT Base (Rate of 2.4%)	Narrow VAT Base (Rate of 5%)	ADDENDUM Total Revenue in 2012 ($ Billions)
State	-1.5	0.0	3,108.4
All States	-1.5	0.0	40.7
Alabama	-1.4	0.0	18.7
Alaska	-1.4	0.0	53.5
Arizona	-1.7	0.0	24.7
Arkansas	-1.5	-0.1	428.4
California	-1.4	0.0	49.1
Colorado	-1.5	-0.1	40.6
Connecticut	-1.7	-0.1	10.0
Delaware	-2.1	-0.1	12.9
DC	-1.4	0.0	156.1
Florida	-1.6	0.0	75.6
Georgia	-1.7	0.0	14.5
Hawaii	-1.5	0.0	12.1
Idaho	-1.5	-0.1	124.4
Illinois	-1.5	-0.1	54.7
Indiana	-1.5	0.0	32.3
Iowa	-1.5	0.0	26.8
Kansas	-1.7	-0.1	36.9
Kentucky	-1.8	0.0	44.2
Louisiana	-1.8	-0.1	12.3
Maine	-1.8	-0.1	57.9
Maryland	-1.6	-0.1	74.5
Massachusetts	-1.4	0.0	87.2
Michigan	-1.5	-0.1	57.7
Minnesota	-1.6	0.0	27.9
Mississippi	-1.6	0.0	50.8
Missouri	-1.7	0.0	9.2
Montana	-1.3	0.0	20.6
Nebraska	-1.5	0.0	22.9
Nevada	-1.4	0.0	11.1
New Hampshire	-1.4	-0.1	97.1
New Jersey	-1.7	0.0	20.9
New Mexico	-1.6	-0.1	302.7
New York	-1.4	-0.1	86.0
North Carolina	-1.2	0.0	11.2
North Dakota	-1.4	-0.1	115.0
Ohio	-1.5	0.0	33.5
Oklahoma	-1.4	-0.1	40.0
Oregon	-1.6	-0.1	122.4
Pennsylvania	-1.4	0.0	11.6
Rhode Island	-1.3	0.0	41.1
South Carolina	-1.6	0.0	7.2
South Dakota	-1.4	0.0	55.4
Tennessee	-1.5	0.0	218.7
Texas	-1.5	0.0	24.6
Utah	-1.7	0.0	7.0
Vermont	-1.5	-0.1	69.4
Virginia	-1.4	0.0	71.7
Washington	-1.7	0.0	17.0
West Virginia	-1.4	-0.1	57.7
Wisconsin	-1.4	0.0	10.1
Wyoming	0.0	0.0	0.0

Note: Positive amounts mean a state's combined 2012 state and local budget surplus would be increased or the state's combined deficit reduced; negative amounts that the state's combined surplus would be reduced or the combined deficit increased.

not the Fed allowed the price level to rise. Nominal equity returns would be unchanged in the short run, just as they would be unchanged in the long run, if the price level did rise. However, if the price level was unchanged nominal equity returns generated by the existing capital stock would have to fall sufficiently to absorb the entire VAT on value added by capital. The short run reduction in equity returns would therefore be larger than the reduction in labor income.

If the price level was unchanged, nominal cash transfer payments would be unchanged in the short run. If the price level did rise, nominal cash transfer payments would also be unchanged in the short run if benefits are not indexed for inflation, but would increase if benefits are indexed.

2. Relative Prices

Apart from any lags in price adjustments following the introduction of a VAT (which we do not consider), the relative price effects of a VAT are the same in the short run as in the long run.

3. Asset Values

The effects of the introduction of a VAT on income from "old" capital would be capitalized into corresponding asset values. If the Fed did not allow the price level to rise, as noted above nominal equity returns but not nominal interest would be reduced, so only equity values would fall. If the price level did rise, nominal returns to both equities and bonds would not be reduced so the nominal value of these assets would not change, but real returns would be reduced and so would the real value of these assets.

B. Effects on State and Local Revenues

The only difference between the short-run and long-run effects of a VAT on state and local revenues with either VAT base is due to the reduction in equity values held in retirement accounts if the price level is unchanged. These equity holdings will be used to pay retirement benefits to current retirees and the currently vested benefits of current employees. We therefore annualize the reduction in equity values by converting it into a (negative) annuity over the period these benefits will be paid, which we assume will be 30 years. This negative annuity is equivalent to a 7.0 percent reduction in current equity returns in state and local retirement accounts.[35]

[35] In the calculation of this negative annuity, we use a total return on equities of 8.25 percent, but only the reduction in the normal 40 percent portion of this return affects equity values so the rate of return used is 3.3 percent. We also use a rough estimate of 50 percent for the equity portion of total returns to capital, so the reduction in equity values is twice the reduction in labor income, or 4.24 percent. We use a discount rate of 3.5 percent.

C. Effects on State and Local Spending

Under both VAT bases, there is a difference between short-run and long-run effects on spending for cash transfer payments and retirement benefits if the price level does not change. Spending in these two categories would be unchanged in the short run, whereas they both decline (by the reduction in labor income) in the long run. The only other difference between short-run and long-run effects is on spending for retirement benefits if the price level rises. In the short run, indexing of retirement benefits is estimated to increase this category of spending by the change in the CPI, which as noted above is 2.27 percent under the comprehensive base and 2.50 percent under the narrow base. In the long run, spending for retirement benefits would be unchanged.

Note that unlike sales of businesses, general government spending (as measured by Census and standard government budgeting) does not include a return to existing capital.[36] So even under the comprehensive base the VAT would not apply to the consumption of the existing capital stock of state and local governments.

D. Estimated Effects on State and Local Budgets

If the price level is unchanged, state and local revenues would be lower and spending higher in the short run than in the long run. If the price level rises, state and local revenues would be the same in the short run and the long run, but spending would be higher in the short run. So compared to the long-run effects on the 2012 aggregate deficit of all state and local governments shown in Tables 2 and 4, the short run effects (Table 6) are a greater worsening of the deficit (with the comprehensive base) or a smaller reduction in the deficit (with the narrow base).

These aggregate results carry over to every state (compare Tables 3, 5 and 7). The range of effects on fiscal positions is generally larger in the short run for both bases and assumptions about the price level, and the states least and most affected change in some instances. For the comprehensive base with a rate of 2.4 percent, increases in the deficit as a share of revenues range from 0.4 percent in Alaska to 1.3 percent in Maryland with no change in the price level, and from 1.3 percent in North Dakota to 2.1 percent in DC if the price level rises. For the narrow base with a rate of 5 percent, the deficit declines from between 0.1 percent of revenues in Wisconsin and 0.9 percent of revenues in Alaska with no change in the price level and increases from between 0.1 percent and 0.3 percent of revenues in a number of states if the price level rises.

[36] NIPA does include "consumption of fixed capital" in general government spending (consumption), but this represents only depreciation (no return on capital is included).

VI. CONCLUSIONS

Our analysis and estimates show that from a budgetary perspective states would prefer a narrow VAT base that excludes at least most government spending rather than a comprehensive VAT base. In addition, with both comprehensive and narrow VAT bases state budgets would fare better if the Fed prevented consumer prices from rising (so factor incomes fell), than if the Fed accommodated the VAT with a higher price level.

These are only illustrative results, however, for one year (FY2012) and are based on hypothetical federal VAT bases. Further, while the estimates do capture differences in the composition of revenue sources and spending categories among states, they do not reflect important differences among states within revenue sources and spending categories. Finally, the estimates are "static" in that they do not take into account any macroeconomic effects, changes in the composition of households' consumption of goods and services, or potential legislative responses of state and local governments to the adoption of a federal VAT. Nevertheless, we believe these estimates will help inform the discussion of a federal VAT by illustrating how changes in tax bases and costs of government purchases that a VAT produces can affect state and local government budgets.

TABLE 6

Effects of a Federal VAT on Total State and Local Budgets in 2012

Short-Run Effects Assuming both No Change in the Price Level and that the Price Level Rises
($ billions)

Source of Revenue or Category Spending	Comprehensive VAT Base (Rate of 2.4%)		Narrow VAT Base (Rate of 5%)		Addendum
	No Change in Price Level	Price Level Rises	No Change in Price Level	Price Level Rises	Total Revenue in 2012
Change in revenues, total	-26.0	16.8	-27.6	15.7	3,108.4
Taxes	-20.8	2.8	-25.5	-1.4	1,438.5
Individual income	-8.8	-1.3	-8.8	-1.4	307.3
Corporate income	-0.6	0.0	-0.6	0.0	49.0
Payroll	0.0	0.0	0.0	0.0	50.4
General sales	-6.5	0.0	-6.5	0.0	314.8
Property - business	-4.8	0.0	-4.8	0.0	228.5
Property - residential	0.0	4.0	-4.6	0.0	217.6
Other (excises, licenses and other taxes)	0.0	0.0	0.0	0.0	270.9
Charges	1.3	14.1	4.3	17.1	586.9
For education, hospitals, and housing	0.6	5.9	-5.2	0.0	244.6
Other	0.8	8.2	9.5	17.1	342.2
Employee retirement:	-6.5	0.0	-6.5	0.0	246.9
Contributions	-1.6	0.0	-1.6	0.0	77.1
Earnings on fund balances	-4.9	0.0	-4.9	0.0	169.8
Equity -- normal returns	-3.3	0.0	-3.3	0.0	47.7
Equity -- supernormal returns	-1.5	0.0	-1.5	0.0	71.5
Bonds (all normal returns)	0.0	0.0	0.0	0.0	50.6
Other own-source revenues	0.0	0.0	0.0	0.0	251.6
Earnings on non-retirement fund balances	0.0	0.0	0.0	0.0	80.8
Other	0.0	0.0	0.0	0.0	170.8
Federal grants	0.0	0.0	0.0	0.0	584.5
Change in spending, total	6.1	69.0	-39.5	23.0	3,151.7
General government	3.8	40.1	-35.5	0.0	1,672.8
Charge-financed and in-kind transfer spending	2.3	23.5	-4.0	17.1	980.0
Medicaid	0.9	9.4	-8.3	0.0	393.2
Education, hospitals and housing, etc.	0.6	5.9	-5.2	0.0	244.6
Other	0.8	8.2	9.5	17.1	342.2
Cash transfer payments	0.0	0.0	0.0	0.0	136.4
Retirement benefits	0.0	5.3	0.0	5.8	233.2
Interest on debt	0.0	0.0	0.0	0.0	125.1
Intergovernmental grants (to federal govt.)	0.0	0.0	0.0	0.0	4.2
Change in budget balances[1]	-32.1	-52.1	11.8	-7.2	-43.3
Addendum					
Change as a percent of total revenues in:					
Total revenues	-0.8%	0.5%	-0.9%	0.5%	
Total spending	0.2%	2.2%	-1.3%	0.7%	
Budget balances	-1.0%	-1.7%	0.4%	-0.2%	

Notes: All estimates are based on data from Census (2014) except business property taxes are from Philips, et al. (2013) and Medicaid spending from the National Association of State Budget Officers (2014). We include unemployment payroll taxes in taxes, although they are classified as insurance trust revenue by Census. We also include utility and liquor store revenues in "other" charges.

[1] Positive amounts mean the combined 2012 state and local budget deficit would be reduced; negative amounts that this deficit would be increased.

TABLE 7

Effects of a Federal VAT by State on Combined State and Local Budget Balances as a Percent Revenue in 2012

Short-Run Effects Assuming both No Change in the Price Level and that the Price Level Rises
(Percent)

	Comprehensive VAT Base (Rate of 2.4%)		Narrow VAT Base (Rate of 5%)		ADDENDUM
	No Change in Price Level	Price Level Rises	No Change in Price Level	Price Level Rises	Total Revenue in 2012 ($ Billions)
All States	-1.0	-1.7	0.4	-0.2	3,108.4
Alabama	-0.8	-1.7	0.6	-0.2	40.7
Alaska	-0.4	-1.5	0.9	-0.1	18.7
Arizona	-1.1	-1.6	0.3	-0.2	53.5
Arkansas	-1.1	-1.8	0.5	-0.2	24.7
California	-1.2	-1.7	0.2	-0.3	428.4
Colorado	-1.1	-1.6	0.2	-0.2	49.1
Connecticut	-1.1	-1.7	0.2	-0.3	40.6
Delaware	-0.8	-1.9	0.8	-0.2	10.0
DC	-1.2	-2.1	0.8	-0.1	12.9
Florida	-0.8	-1.6	0.6	-0.1	156.1
Georgia	-1.1	-1.7	0.4	-0.2	75.6
Hawaii	-1.2	-1.8	0.3	-0.2	14.5
Idaho	-1.1	-1.6	0.3	-0.2	12.1
Illinois	-1.1	-1.8	0.3	-0.3	124.4
Indiana	-1.0	-1.6	0.5	-0.2	54.7
Iowa	-1.0	-1.6	0.4	-0.2	32.3
Kansas	-1.1	-1.6	0.3	-0.2	26.8
Kentucky	-1.0	-1.9	0.6	-0.3	36.9
Louisiana	-1.0	-2.0	0.8	-0.2	44.2
Maine	-1.2	-1.9	0.5	-0.2	12.3
Maryland	-1.3	-1.9	0.3	-0.2	57.9
Massachusetts	-1.0	-1.8	0.4	-0.3	74.5
Michigan	-0.9	-1.6	0.4	-0.3	87.2
Minnesota	-1.1	-1.7	0.3	-0.2	57.7
Mississippi	-0.9	-1.7	0.5	-0.2	27.9
Missouri	-1.1	-1.7	0.4	-0.2	50.8
Montana	-0.9	-1.9	0.7	-0.2	9.2
Nebraska	-0.9	-1.4	0.3	-0.1	20.6
Nevada	-0.9	-1.6	0.5	-0.2	22.9
New Hampshire	-0.6	-1.5	0.7	-0.1	11.1
New Jersey	-1.1	-1.6	0.3	-0.3	97.1
New Mexico	-1.0	-1.9	0.6	-0.2	20.9
New York	-1.2	-1.8	0.3	-0.3	302.7
North Carolina	-1.0	-1.5	0.3	-0.2	86.0
North Dakota	-0.7	-1.3	0.5	-0.1	11.2
Ohio	-1.1	-1.7	0.3	-0.3	115.0
Oklahoma	-1.0	-1.6	0.5	-0.2	33.5
Oregon	-1.0	-1.6	0.3	-0.3	40.0
Pennsylvania	-0.9	-1.8	0.6	-0.3	122.4
Rhode Island	-1.0	-1.6	0.3	-0.3	11.6
South Carolina	-0.8	-1.4	0.4	-0.2	41.1
South Dakota	-1.0	-1.7	0.6	-0.1	7.2
Tennessee	-0.7	-1.5	0.6	-0.1	55.4
Texas	-0.9	-1.6	0.5	-0.2	218.7
Utah	-0.9	-1.6	0.5	-0.2	24.6
Vermont	-0.9	-1.8	0.8	-0.1	7.0
Virginia	-1.1	-1.7	0.4	-0.2	69.4
Washington	-0.8	-1.5	0.5	-0.1	71.7
West Virginia	-0.9	-1.8	0.7	-0.2	17.0
Wisconsin	-1.2	-1.6	0.1	-0.3	57.7
Wyoming	-0.7	-1.5	0.6	-0.1	10.1

Note: Positive amounts mean a state's combined 2012 state and local budget surplus would be increased or the state's combined deficit reduced; negative amounts that the state's combined surplus would be reduced or the combined deficit increased.

APPENDIX A: DETAILED DESCRIPTION OF THE COMPREHENSIVE AND NARROW VAT BASES

A1. Comprehensive Base

The comprehensive base is meant to cover all consumption, given administrative constraints. We start with the measure of consumption shown in NIPA of $11.1 trillion in 2012 (Table A-1). We subtract imputed rent of owner-occupied housing and tenant rents ($1.57 trillion)[37] and add back sales of new housing and improvements to existing housing of $0.4 trillion (the prepayment method of taxing housing consumption). We then add back expenditures in the United States by foreigners for nondurables (including the cost of travel departing from the United States) and subtract corresponding overseas expenditures by U.S. citizens and residents, for a net adjustment of -$32 billion. Finally, we subtract state and local general sales taxes on final (retail) sales of $0.2 trillion from the VAT base. This leaves $9.8 trillion of household consumption in the base.

We then add in all general government spending to the comprehensive VAT base.[38] This may seem an unlikely component of a federal VAT base, in part because this spending is typically excluded from state and local sales tax bases. But including this spending is consistent with federal and state individual and corporate income tax bases, which apply to incomes generated from government activity (with the exception of interest on state and local government bonds). The current payroll tax base also includes federal and nearly all state and local wages, as well as the wages of employees of businesses selling to these governments.

There are also precedents for including government services in the base of a national consumption tax. Several countries, most notably New Zealand, include government spending in their VAT bases.[39] Beyond these precedents, proposals for a flat tax and an X-tax would include all wages and business cash flow in the base, so the base would include all value added by governments.[40] A proposal by Michael Graetz (2010) to replace much of the current income taxes with revenues from a federal VAT would include all government spending in the VAT

[37] We assume that the imputed rent of owner-occupied housing would simply be outside the scope of the VAT, and that rents for tenant-occupied housing would be excluded (see discussion of the property tax in Section III).
[38] NIPA classifies government expenditure for charge-financed activities and in-kind transfers as household consumption (all of which are included in this comprehensive base) and state spending for unemployment benefits as federal spending. Retirement benefits are not a payment for current labor services, so excluded from national income.
[39] The designers of New Zealand's VAT recognized there would be no net fiscal effect from including government budgets in the VAT base; additional costs to government agencies from paying the tax would exactly offset the increased revenue received. But the reformers nevertheless wanted to include government activity in the base on an equal footing with the private sector so that government budgets would accurately reflect the cost of public services.
[40] See Hall and Rabushka (1985) and Carroll and Viard (2012).

base.[41] And the subtraction method VAT recently proposed by Senator Cruz would also include wages paid by governments in the VAT base.[42]

There are several policy arguments for including general government spending in the base of a federal VAT. This spending is intended to directly or indirectly meet individuals' wants and needs, just like household consumption. Further, to ensure that consumption choices are not distorted by differential tax treatment of the public and private-sector providers, government-provided goods and services that can be provided by for-profit businesses or nonprofits (e.g., private security firms, private schools) should be taxed in the same way. And failure to include general government spending in the VAT base would make the relative size of the government sector appear smaller than it really is, because government spending would exclude VAT, while private spending would include it.[43]

We include in the comprehensive VAT base government spending (as measured in NIPA) for compensation of general government employees, purchases of intermediate goods, and gross investment spending (less own-account investment and sales to other sectors). For the federal government, this spending was $1trillion in 2012, while for state and local governments it was $1.7 trillion.

Following the experience of other countries, in practice we would expect a VAT to allow an exemption for administrative reasons for businesses below a certain threshold.[44] In addition, we anticipate that noncompliance would reduce the tax base below the amount of consumption reported in the national accounts, as it does in other countries. We assume that the adjustments for noncompliance and a possible small business exemption would amount to 15 percent of household consumption otherwise included in the base, or about $1.3 trillion.[45]

This comprehensive VAT base was nearly 70 percent of GDP and 102 percent of household consumption in 2012.

[41] Senator Cardin introduced a legislative variant (S. 3005) of the Graetz proposal in 2015. See Toder, Nunns and Rosenberg (2012b) for a description and analysis of a specific variant of the Graetz proposal, and Nunns and Rosenberg (2013) for an updated analysis of this variant with some further modifications.
[42] See Cruz Campaign (2015).
[43] In contrast, both government spending and private spending measures include income taxes paid on factor incomes.
[44] An exemption would reduce VAT collections at the retail level, but increase net collections from intermediate sellers because of the losses of VAT credits on their purchases. We would anticipate, however, that exempt small businesses would be allowed to voluntarily register for VAT if that is to their advantage.
[45] The 15 percent figure is based on IRS estimates of noncompliance with the current income tax and estimates of VAT noncompliance in the United Kingdom. It is also the figure used by the U.S. Treasury for VAT estimates included in the President's Advisory Panel on Federal Tax Reform (2005).

TABLE A-1

Comprehensive VAT Base in 2012

	Level ($ Billions)	Percent of Consumption	Percent of GDP
NIPA consumption	11,083.1	100.0	68.6
Less: Imputed rent on owner-occupied housing	1,138.8	10.3	7.0
Less: Rental of tenant-occupied housing	430.7	3.9	2.7
Plus: New housing and improvements to existing	442.3	4.0	2.7
Equals: Net housing adjustment	-1,127.2	-10.2	-7.0
Less: Net foreign travel and expenditures abroad	-32.4	-0.3	-0.2
Less: State and local general sales taxes on final sales	181.4	1.6	1.1
Equals: Household consumption in VAT base	9,806.9	88.5	60.7
Plus: Federal purchases of goods and services[1]	623.3	5.6	3.9
Plus: Federal employee compensation[2]	411.1	3.7	2.5
Equals: Federal spending in the VAT base	1,034.4	9.3	6.4
Plus: State and local purchases of goods and services[1]	518.2	4.7	3.2
Plus: State and local employee compensation[2]	1,180.7	10.7	7.3
Equals: State and local spending in the VAT base	1,698.9	15.3	10.5
Less: Adjustment for small business exemption and noncompliance	1,295.0	11.7	8.0
Equals: Effective comprehensive VAT base	11,245.2	101.5	69.6
ADDENDUM:			
Gross domestic product (GDP)	16,163.2	145.8	100.0

Source: U. S. Department of Commerce, Bureau of Economic Analysis, National Income and Product Accounts (NIPA), and TPC estimates.

[1] Excludes purchases for activities provided for a fee or charge and included in NIPA consumption.

[2] Excludes employee compensation to produce goods and services provided for a fee or charge and included in NIPA consumption.

A2. Narrow Base

The narrow base also starts with NIPA consumption of $11.1 trillion, but then excludes many items of household consumption and does not add in any government spending (Table A-2).[46] The base excludes all private health expenditures ($2.4 trillion), education spending ($0.3 trillion), spending on behalf of households by nonprofit institutions ($0.4 trillion), all housing rents ($1.6 trillion), food consumed at home ($0.7 trillion), financial services provided without payment ($0.3 trillion), state and local sales taxes on retail sales ($0.2 trillion) and some miscellaneous items (less than $0.1 trillion, shown in "other adjustments" in Table A-2).[47] With these exclusions, and a 15 percent reduction in the tax base for a small business exemption and noncompliance, the narrow VAT base was only 27 percent of GDP and 39 percent of household consumption in 2012.

[46] Excluded items would generally be zero rated. Note that exports are zero rated under both VAT bases. For the narrow base, business sales to governments and nonprofits (except sales to be used in commercial activities that are included in the VAT base) would also be zero rated. See the discussion of the comprehensive base for how housing rents would be excluded.

[47] For a more detailed discussion of this base, see Toder, Nunns and Rosenberg (2012a).

TABLE A-2

Narrow VAT Base in 2012

	Level ($ Billions)	Percent of Consumption	Percent of GDP
NIPA consumption	11,083.1	100.0	68.6
Less: Government health expenditures	1,173.7	10.6	7.3
Less: Private health expenditures	1,250.7	11.3	7.7
Less: Education spending	265.2	2.4	1.6
Less: Religious and nonprofit expenditures	436.0	3.9	2.7
Less: Imputed rent on owner-occupied housing	1,138.8	10.3	7.0
Less: Rental of tenant-occupied housing	430.7	3.9	2.7
Less: Food consumed at home	732.5	6.6	4.5
Less: Financial services provided without payment	291.8	2.6	1.8
Less: State and local general sales taxes on final sales	163.3	1.5	1.0
Less: Other adjustments	64.0	0.6	0.4
Equals: Household consumption in VAT base	5,299.7	47.8	32.8
Less: Adjustment for small business exemption and noncompliance	795.0	7.2	4.9
Equals: Effective narrow VAT base	4,341.4	39.2	26.9
ADDENDUM			
Gross domestic product (GDP)	16,163.2	145.8	100.0

Source: U. S. Department of Commerce, Bureau of Economic Analysis, National Income and Product Accounts (NIPA), and TPC estimates.

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