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

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ESTIMATED SHORT-RUN EFFECTS WITH AND WITHOUT A CHANGE IN THE CONSUMER PRICE LEVEL

In this supplement, we examine the short-run effects on state and local budgets of a federal VAT with either a narrow or comprehensive base under the assumptions that the consumer price level increases by the full amount of the VAT and that the level of consumer prices does not change. The estimated short-run effects on the PCE if the consumer price level rises are the same as those estimated for long-run effects, as discussed in Section III of the paper.

A. Effects on Incomes, Relative Prices and Asset Values

1. Incomes

If the consumer price level increased by the full amount of the VAT nominal labor income would be unchanged in the short run as well as the long run. If the consumer price level did not change, it is possible that in the very early stages of the transition following introduction of the VAT some of the tax on value added by labor would be absorbed by returns to equity. This possibility, however, is not taken into account in this paper.[1] For purposes of our analysis, we assume the adjustment of wages if the level of consumer prices does not change would occur quickly across all sectors, and therefore is reflected in our short-run estimates.[2]

[1] 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 consumer prices to fully adjust.
[2] Note that the VAT rates we consider are relatively low; with higher VAT rates wages could be expected to adjust more slowly.

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 not the consumer price level changed. Nominal equity returns would be unchanged in the short run, just as they would be unchanged in the long run, if the consumer price level did rise. However, if the consumer price level did not change 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. Assuming half of returns to capital are from debt and half from equity, equity returns would fall by twice the reduction in returns to labor, or by 3.81 percent for the narrow-based VAT and 3.48 percent for the comprehensive-based VAT.

If the consumer price level increased, we assume nominal cash transfer payments would be unchanged in the short run because they are not indexed for inflation, but retirement benefits would increase — by the change in the CPI[3] — because we assume they are fully indexed. If the consumer price level did not change, nominal cash transfer payments and retirement benefits would be unchanged in the short run.

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 consumer price level increased, nominal

[3] As noted in Section III of the paper, we assume the CPI changes by the same percentage as the PCE.

returns to both equities and bonds would be unchanged so the nominal value of these assets would also be unchanged, although real returns would be reduced as would the real value of these assets. If the consumer price level was unchanged, as noted above nominal equity returns but not nominal interest would be reduced, so only equity values would fall.[4]

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 did not change. 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 6.3 percent reduction in current equity returns in state and local retirement accounts for the narrow VAT base, and a 5.7 percent reduction for the comprehensive VAT base.[5]

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 consumer price level did 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 consumer

[4] Equity values could be expected to fall by the same percentage as equity returns under each VAT base.
[5] 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 for each base, as noted above. We use a discount rate of 3.5 percent.

price level increases by the full amount of the VAT. 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 in the paper is 1.96 percent under the narrow VAT base and 1.74 percent under the comprehensive VAT base, while in the long run spending for retirement benefits would be unchanged.

Note that unlike sales by businesses, general government spending — as measured by Census and standard government budgeting — does not include a return to existing capital.[6] 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 consumer price level increased by the full amount of the VAT, 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 under both VAT bases. If the consumer price level did not change, state and local revenues would be lower and spending higher in the short run than in the long run under both VAT bases. Compared to the long-run effects on the 2012 aggregate deficit of all state and local governments shown in Tables 3 and 4 of the paper, the short run effects (Table 5 below) are a greater worsening or a smaller reduction in the deficit under the narrow VAT base, and a greater worsening of the deficit under the comprehensive VAT base.

These aggregate results carry over to every state — compare Table 4 in the paper and Table 6 below. The range of effects on fiscal positions is generally larger in the short run for both VAT bases and assumptions about changes in the consumer price level, and the states least and most affected change in some instances. Under the narrow VAT base, the increase in the

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

deficit as a percent of revenues ranges from between 0.1 percent (in a number of states) and 0.3 percent (in Illinois and Ohio) if the consumer price level increased by the full amount of the VAT, and the decline as a percent of revenues ranges between 0.1 percent (in Wisconsin) and 0.8 (in Alaska) if the consumer price level did not change. Under the comprehensive VAT base, the increase in the deficit as a share of revenues ranges from 1.2 percent (in Nebraska and North Dakota) to 2.0 percent (in DC) if the consumer price level increased by the full amount of the VAT, and from 0.5 percent (in Alaska) to 1.3 percent (in Maryland) if there were no change in the consumer price level.

Table 5

Effects of a Federal VAT on Total State and Local Budgets in 2012
Short-Run Effects Assuming both that the Consumer Price Level Rises and that it Does Not Change
($ Billions)

Source of Revenue or Category of Spending	Consumer Price Level: Rises — Narrow VAT Base (rate of 5%)	Consumer Price Level: Rises — Comprehensive VAT Base (rate of 2.27%)	Consumer Price Level: Does Not Change — Narrow VAT Base (rate of 5%)	Consumer Price Level: Does Not Change — Comprehensive VAT Base (rate of 2.27%)	ADDENDUM Total Revenue in 2012 ($ billions)
Change in revenues, total	16.0	17.3	-23.5	-18.3	3,108.4
Taxes:	-1.1	4.0	-22.9	-16.0	1,438.5
Individual income	-1.1	-1.0	-7.9	-7.3	307.3
Corporate income	0.0	0.0	-0.6	-0.5	49.0
Payroll (unemployment insurance taxes)	0.0	0.0	0.0	0.0	50.4
General sales	0.0	0.0	-5.9	-5.4	314.8
Property - business	0.0	0.0	-4.4	-4.0	228.5
Property - residential	0.0	4.9	-4.1	1.1	217.6
Other (excises, licenses, other taxes)	0.0	0.0	0.0	0.0	270.9
Charges:	17.1	13.3	5.3	3.0	586.9
For education, hospitals, and housing	0.0	5.6	-4.7	1.3	244.6
Other (water, electricity, etc.)	17.1	7.8	9.9	1.8	342.2
Employee retirement:	0.0	0.0	-5.8	-5.3	246.9
Contributions	0.0	0.0	-1.5	-1.3	77.1
Earnings on fund balances:	0.0	0.0	-4.4	-4.0	169.8
Equity -- normal returns	0.0	0.0	-3.0	-2.7	47.7
Equity -- supernormal returns	0.0	0.0	-1.4	-1.2	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
Intergovernmental grants (from federal government)	0.0	0.0	0.0	0.0	584.5
Change in spending, total	21.7	64.3	-34.1	13.7	3,151.7
General government	0.0	38.0	-31.9	8.6	1,672.8
Charge-financed and in-kind transfer spending:	17.1	22.2	-2.2	5.0	980.0
Medicaid	0.0	8.9	-7.5	2.0	393.2
Education, hospitals, and housing	0.0	5.6	-4.7	1.3	244.6
Other (water, electricity, etc.)	17.1	7.8	9.9	1.8	342.2
Cash transfer payments	0.0	0.0	0.0	0.0	136.4
Retirement benefits	4.6	4.1	0.0	0.0	233.2
Interest on existing debt	0.0	0.0	0.0	0.0	125.1
Intergovernmental grants (to federal government)	0.0	0.0	0.0	0.0	4.2
Change in budget balances[1]	-5.7	-47.0	10.6	-31.9	-43.3
Addendum					
Change as a percent of total revenues in:					
Total revenues	0.5	0.6	-0.8	-0.6	
Total spending	0.7	2.1	-1.1	0.4	
Budget balances	-0.2	-1.5	0.3	-1.0	

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 6

Effects of a Federal VAT on Combined State and Local Budget Balances as a Percent of Revenue by State in 2012
Short-Run Effects Assuming both that the Consumer Price Level Rises and that it Does Not Change
(percent)

	Consumer Price Level				
	Rises		Does Not Change		ADDENDUM
State	Narrow VAT Base (rate of 5%)	Comprehensive VAT Base (rate of 2.27%)	Narrow VAT Base (rate of 5%)	Comprehensive VAT Base (rate of 2.27%)	Total Revenue in 2012 ($ billions)
All States	-0.2	-1.5	0.3	-1.0	3,108.4
Alabama	-0.2	-1.5	0.5	-0.9	40.7
Alaska	-0.1	-1.4	0.8	-0.5	18.7
Arizona	-0.1	-1.4	0.3	-1.1	53.5
Arkansas	-0.1	-1.7	0.5	-1.1	24.7
California	-0.2	-1.5	0.2	-1.2	428.4
Colorado	-0.2	-1.4	0.2	-1.1	49.1
Connecticut	-0.2	-1.5	0.2	-1.1	40.6
Delaware	-0.2	-1.7	0.7	-0.9	10.0
DC	-0.1	-2.0	0.7	-1.2	12.9
Florida	-0.1	-1.4	0.5	-0.9	156.1
Georgia	-0.2	-1.6	0.3	-1.1	75.6
Hawaii	-0.2	-1.7	0.3	-1.2	14.5
Idaho	-0.1	-1.5	0.3	-1.1	12.1
Illinois	-0.3	-1.6	0.3	-1.0	124.4
Indiana	-0.1	-1.5	0.4	-1.0	54.7
Iowa	-0.1	-1.5	0.4	-1.0	32.3
Kansas	-0.1	-1.4	0.2	-1.1	26.8
Kentucky	-0.2	-1.7	0.5	-1.0	36.9
Louisiana	-0.2	-1.9	0.7	-1.1	44.2
Maine	-0.2	-1.8	0.4	-1.2	12.3
Maryland	-0.2	-1.7	0.3	-1.3	57.9
Massachusetts	-0.2	-1.6	0.4	-1.0	74.5
Michigan	-0.2	-1.5	0.4	-0.9	87.2
Minnesota	-0.2	-1.5	0.3	-1.1	57.7
Mississippi	-0.2	-1.6	0.5	-1.0	27.9
Missouri	-0.2	-1.6	0.3	-1.1	50.8
Montana	-0.2	-1.7	0.7	-0.9	9.2
Nebraska	-0.1	-1.2	0.3	-0.9	20.6
Nevada	-0.1	-1.5	0.5	-1.0	22.9
New Hampshire	-0.1	-1.3	0.6	-0.6	11.1
New Jersey	-0.2	-1.4	0.2	-1.0	97.1
New Mexico	-0.2	-1.7	0.6	-1.1	20.9
New York	-0.2	-1.6	0.2	-1.1	302.7
North Carolina	-0.1	-1.4	0.3	-0.9	86.0
North Dakota	-0.1	-1.2	0.5	-0.7	11.2
Ohio	-0.3	-1.5	0.2	-1.0	115.0
Oklahoma	-0.1	-1.5	0.4	-1.0	33.5
Oregon	-0.2	-1.4	0.3	-1.0	40.0
Pennsylvania	-0.2	-1.6	0.5	-1.0	122.4
Rhode Island	-0.2	-1.4	0.3	-1.0	11.6
South Carolina	-0.2	-1.3	0.4	-0.8	41.1
South Dakota	-0.1	-1.6	0.5	-1.0	7.2
Tennessee	-0.1	-1.4	0.5	-0.8	55.4
Texas	-0.1	-1.5	0.5	-0.9	218.7
Utah	-0.1	-1.5	0.4	-1.0	24.6
Vermont	-0.1	-1.7	0.7	-0.9	7.0
Virginia	-0.2	-1.5	0.3	-1.1	69.4
Washington	-0.1	-1.3	0.4	-0.8	71.7
West Virginia	-0.2	-1.7	0.7	-0.9	17.0
Wisconsin	-0.2	-1.4	0.1	-1.2	57.7
Wyoming	-0.1	-1.4	0.6	-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.