The Distributional Case Against a VAT

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Some reasons for adopting an add-on VAT may be justified (to meet ballooning revenue requirements); some reflect faulty reasoning (to increase international competitiveness); and some are just silly (everyone else has a VAT). The revenue need is real and may justify a VAT if the income tax cannot be increased sufficiently. Many economists support consumption taxes in principle because they do not distort investment and savings decisions.

That said, there are two potentially serious barriers to adopting a VAT: transitional effects and distributional effects. The latter concern — the regressivity of a VAT compared with the income tax — is probably the more frequently mentioned obstacle to any serious consideration of a VAT in the United States, and is the focus of this essay. The discussion also includes some broader issues of equity in the U.S. tax system.

This essay will not attempt to defend progressivity. We presume that a progressive tax system is an objective of federal tax policy. Although payroll taxes are not progressive at the upper end of income distributions, our overall tax system is progressive,[1] so that American voters have displayed a preference for a progressive federal tax. Moreover, a progressive tax may be justified by the objective of maximizing welfare when there is a declining marginal utility of income; by a willingness to pay for public goods by those with more income and property to protect;

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[1] *See* Tax Policy Center, Table T10-0027, which shows the effective rate ranging from -25.9 percent at the 10th percentile of the bottom quintile to 33.9 percent at the top (90th percentile of the top 0.1 percent). http://www.taxpolicycenter.org/numbers/display atab.cfm?DocID=2620&topic2ID=40&topic3ID=41&DocTypeID=2

and by viewing income redistribution as a public good that benefits the high-income donors.[2]

Table 1 illustrates the dramatically different distributional patterns for an income tax and a VAT of equal yield, allocating the VAT based on consumption. Were this the end of the story, one could rest the case. Compared with our major revenue source — the income tax — a VAT completely reverses the distribution of taxes, excessively burdening low-income individuals while imposing a negligible burden on the wealthy.

Table 1. Tax as a Percentage of Income, Income Taxes and VATs, VAT Allocated by Consumption				
Income Percentile	**Income Tax With Bush Tax Cuts (2008)**	**VAT of Equal Yield**	**Income Tax Without Bush Tax Cuts (2012)**	**VAT of Equal Yield**
Bottom Quintile	-8.1	41.6	-4.2	53.8
Second Quintile	-3.1	20.2	1.6	26.1
Third Quintile	3.3	13.7	6.6	17.8
Fourth Quintile	6.6	10.4	9.8	13.4
Top Quintile	15.0	5.9	17.3	7.6
Total	9.5	9.5	12.3	12.3
Top 10%	9.8	4.9	12.6	6.4
Top 1%	18.3	2.4	21.8	3.1
Top 0.1%	18.0	1.2	22.8	1.6
Source: Distribution of Income Taxes from Tax Policy Center, Tables T09-0366 and Table T08-0079, http://www.taxpolicycenter.org/numbers/displayatab.cfm?DocID= 1818&topic2ID=40&topic3ID=81&DocTypeID=2, http://www.taxpolicycenter.org/ numbers/displayatab.cfm?DocID=2441&topic2ID=40&topic3ID=81&DocTypeID=2 Distribution of VAT based on Leonard Burman, Jane Gravelle, and Jeffrey Rohaly, "Towards a More Consistent Distributional Analysis," November 2005, scaled to reflect the same aggregate tax. http://www.taxpolicycenter.org/UploadedPDF/ 411480_Towards_Consistent.pdf.				

Two factors account for the dramatically different distributional effects: the flat rate structure of a VAT and the declining ratio of consumption to income. The flat rate by itself would lead to a proportional tax burden even if the consumption-to-income ratio were constant. The declining ratio of consumption to income is primarily what leads to the VAT being a regressive tax.

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[2]These issues are discussed in Jane G. Gravelle and Maxim Shvedov, "Distribution of the Tax Burden Across Individuals: An Overview," Congressional Research Service Report RL32693, Jan. 7, 2010.

Several factors could contribute to this pronounced decline in the consumption-to-income ratio as income rises. First, there may be some expectation of a declining ratio from life-cycle components, since individuals vary consumption relative to income. Second, when individuals have low transitory income (for example, from a job loss), they are likely to maintain consumption levels through drawing down assets, and these individuals will generally fall in lower-income classes. Third, people have different levels of permanent income, and high-income individuals are more likely to accumulate wealth without spending it during their lifetime, leaving bequests to heirs when they die. At the same time, there are many concerns about the reliability of data in the Consumer Expenditure Survey (CES), which is the main source of data on consumption patterns.

As a result of those concerns, there have been challenges to the standard method of allocating taxes based on consumption data from the CES, which leads to a highly regressive pattern. We will discuss these conceptual issues, comparing the tax with a consumption base using a different allocation method and questioning the reliability of survey data.

Conceptual Issues

The use of consumption rather than income to classify those in the distribution would simply lead to a proportional tax rate (with a higher average, since income is larger than consumption). But there are two important reservations to this approach. A comparison to other taxes that are measured relative to income would not be possible if the base were consumption. Moreover, if one views income as reflecting the capacity to pay taxes, then consumption is only one use of that income; income can also be used to accumulate capital.

In 1998 the U.S. Treasury Department changed its method of allocating excise taxes from consumption to allocating it like an income tax.[3] This method was applied to the analysis of a VAT in

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[3]Julie Ann Cronin, *U.S. Treasury Distributional Analysis Methodology*, Office of Tax Analysis Working Paper 85, U.S. Department of the Treasury, 1999, http://www.ustreas.gov/offices/tax-policy/library/ota85.pdf.

a recent study by Toder and Rosenberg.[4] The aggregate VAT naturally falls into two parts: a tax on wages and a tax on cash flow of businesses, the latter of which looks similar to a profits tax. The alternative approach allocates the wage part based on wages and the cash flow share based on the share of capital income. Neither Treasury nor the Toder-Rosenberg study provides a detailed rationale for this approach. The motivations appear to include both data issues and the problems with taking a one-year snapshot when annual income and consumption may differ from permanent income.

In Table 2, the burden of the consumption tax based on this allocation is derived from the patterns reported in a study by Burman, Gravelle, and Rohaly, scaled to be the same revenue as the income tax.[5] This distribution differs dramatically from the consumption distribution, with an inverted U pattern: The burden first rises and then falls.

Is this a reasonable conceptual depiction of the burden of a VAT because of discrepancies between permanent income and an annual snapshot? This differential could occur because of transitory issues, but Cronin and also Burman, Gravelle, and Rohaly provide evidence that transitory income effects are of minor importance.[6] Thus, a justification of this nature would reflect life-cycle effects.

To investigate this argument, consider a simple life-cycle model in which one old cohort consumes at the level referred to as "Co," and one young cohort consumes at the level referred to as "Cy." The old cohort is no longer working, but lives on assets saved when young. There are no bequests.

To illustrate the link between uses and sources, consider a tax-inclusive tax at rate t. This is a tax that is applied to income,

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[4]Eric Toder and Joseph Rosenberg, "Effects of Using a Value-Added Tax to Replace Payroll Taxes or Corporate Taxes," March 18, 2010, http://www.taxpolicycenter.org/UploadedPDF/412062_VAT.pdf.
 [5]Leonard Burman, Jane Gravelle, and Jeffrey Rohaly, "Towards a More Consistent Distributional Analysis," Nov. 2005, http://www.taxpolicycenter.org/UploadedPDF/411480_Towards_Consistent.pdf, also published in the *National Tax Association Proceedings, 89th Annual Conference 2005*, Washington, D.C., National Tax Association, 2006, pp. 223-236.
 [6]Ibid., and Cronin, U.S. Department of Treasury Distributional Methodology, op. cit.

Table 2. Tax Rate as a Percentage of Income, Alternative Measures, Percentage			
Income Percentile	Income Tax	Allocated by Consumption, Consumer Expenditure Survey	Allocated by Wages and Assets
Bottom Quintile	-4.2	53.8	9.1
Second Quintile	1.6	26.1	10.8
Third Quintile	6.6	17.8	12.6
Fourth Quintile	9.8	13.4	12.9
Top Quintile	17.3	7.6	12.2
Total	12.3	12.3	12.3
Top 10%	12.6	6.4	11.9
Top 1%	21.8	3.1	10.1
Top 0.1%	22.8	1.6	8.7

Source: Allocations in columns (2) and (3) from Table 1; allocation in column 4 based on data in Burman, Gravelle, and Rohaly, "Towards a More Consistent Distributional Analysis," op cit.

similar to how an income tax is described, but different from the way a normal VAT or sales tax is stated, which is a tax-exclusive rate.[7]

To state these equations with a tax-exclusive rate of v, the consumption on the left-hand side would be multiplied by 1+v.

(1) $Co = (1+R)K(1-t)$

(2) $Cy = (WL - (1+G)K)(1-t)$

For the purpose of these equations: R is the rate of return, K is the capital stock, W is the wage, L is the labor supply, and G is the growth rate of the economy.

Adding (1) and (2) produces the source-side tax base assigned by Treasury:

(3) $Co + Cy = (WL + (R-G)K)(1-t)$

The total sum of consumption is $Co + Cy$, and the base is wages plus a cash flow tax on (R-G)K.

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[7]As a simple example, if a tax-exclusive rate is applied to a dollar of sales at 33 percent, the consumption plus the tax will be $1.33. The tax-inclusive rate will be $0.33 divided by $1.33 or 25 percent. In general, a tax-inclusive rate is equal to $v/(1+v)$ where v is the tax-exclusive rate.

The two cohorts are alive at the time the tax is imposed. It is clear that the tax on the old cohort relative to income is $t(1+R)K/RK$, a tax rate that is higher than the statutory tax-inclusive rate. The tax rate on the young cohort relative to income is $t(WL-((1+G)K)/WL$, which is lower than the statutory rate. If the old cohort has less average income than the young, the tax will be regressive.

The Treasury allocation method would result in a tax rate on the old cohort of $t(R-G)K/RK$ that is less than the statutory rate and a tax rate on the young cohort of t. Thus, Treasury's allocation reverses the pattern of effective tax rates.

As a snapshot measure, the Treasury allocation is clearly incorrect. What about a lifetime measurement? The older person's lifetime in this simple example is the same as the snapshot; allocating by consumption properly measures the burden, and the Treasury approach significantly misrepresents it. The younger individual, however, has two periods of lifetime. When the young person becomes old, consumption will be the same as the old person's multiplied by $(1+G)$, but discounted (both consumption and resources when old divided by $(1+R)$). Adding the two, the young person's present value of consumption (this period and the next discounted) will be equal to the wages, and the effective tax rate based on lifetime consumption and income will be equal to the statutory rate.

In fact, these relationships are the reasons economists sometimes characterize a consumption tax as a tax on old capital, plus a tax on wages.

This two-period example is highly simplified. There are many cohorts of individuals, and earnings tend to peak during middle age, with both the young and old having lower incomes. Does Treasury's tax rate measure do a better job than the consumption method at measuring lifetime burden? To explore this question, Figure 1 presents the results of a more sophisticated life-cycle

Figure 1. Annual Effective Tax Rates for a
Consumption Tax: Life Cycle Model
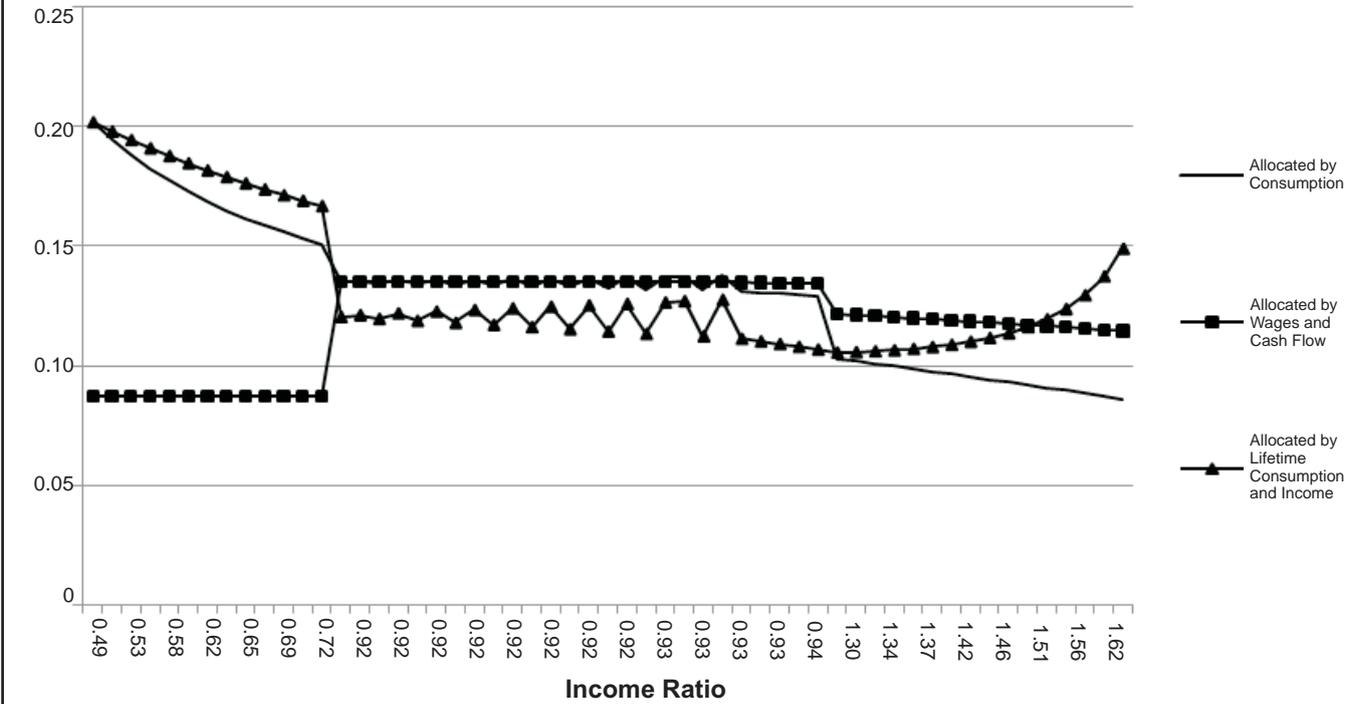
model designed to reflect the characteristics of the economy and having 55 generations, from ages 22 to 76.[8] The model is scaled to the same revenue as in Table 2.

To match this model's aggregates (such as capital stock) to the economy, it is necessary to incorporate bequests. In the model, the lowest-income individuals (on an annual basis) are the elderly retired (with the oldest individual having half the average income), followed by the young individuals up to the age the bequest is inherited (48) who have income close to the average, followed by older but not retired individuals who have growing capital incomes as well as wages. Except at the very highest incomes, the consumption allocation matches the lifetime burden and does so much more closely at the lower income levels.

This diagram suggests that the Treasury allocation should be ruled out as a superior method of matching the lifetime burden of the population when the tax is imposed. Moreover, the mismatch with the consumption allocation arises because these individuals would not be high (remaining) lifetime income earners, because they are about to retire. The highest-income person in this life-cycle distribution will fall in the lowest income group the very next year and move to lower and lower incomes in the next few years. Thus, the pattern of the burden of the tax on a lifetime basis is regressive if ordered by remaining average lifetime income. Neither method captures the burden on unborn generations, which is constant and reflects the burden of the youngest member.

It should also be clear from this figure that life-cycle elements cannot account for the observed distribution of income and consumption in the economy. In this model, the highest income is slightly over 3 times the lowest; the bottom of the highest quintile is twice the top of the lowest quintile. In the distribution in Table 1, the bottom of the highest quintile is 6 times the top of the lowest quintile; incomes at the 99th percentile are 33 times

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[8]This model is described in Burman, Gravelle, and Rohaly, "Towards a More Consistent Distributional Methodology," op. cit.

incomes at the top of the lowest quintile. Clearly, the main variation in income is not from life-cycle effects, but from differences in lifetime incomes.

Differences in permanent lifetime income that are many times larger than life-cycle effects also suggest that younger individuals entering adulthood after the tax is imposed will likely differ, since higher-income individuals are much more likely to save and leave bequests than lower-income individuals. Moreover, evidence indicates that there is a high correlation between permanent income classifications and annual ones, especially for the very rich and very poor. Sabelhaus and Groen find that 70 percent of those in the lowest and highest annual decile of the income distribution are also in the permanent (10-year) distribution. They also found that savings rates within income classifications did not appear to vary substantially by age. These results suggest that in principle, life-cycle concerns may be overstated and that the change in the ratio of consumption to income should tell us something about the distribution of a VAT, not only for the individuals alive at the time the tax is imposed, but also in the long run.[9]

Data Reliability

Sabelhaus and Groen raise concerns about the very high ratios of consumption to income (in excess of 2 in the lowest decile) reported in the CES data set, which cannot be sustained permanently. They suspect income in the lowest levels is significantly underreported.

When they adjust the annual income distribution to permanent income (defined as income over 10 years), they find smaller ratios, which range from 1.21 at the lowest decile to 0.74 at the highest decile, as compared with 2.30 to 0.64 for the annual data. They also find some inconsistencies with wealth-to-income ratios reported in other data sets in the lowest deciles. Yet they find income reported in other data surveys consistent with the CES.

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[9]Sabelhaus, John and Jeffrey Groen, "Can Permanent-Income Theory Explain Cross-Sectional Patterns?" *Review of Economics and Statistics*, col. 82, August 2000, pp. 431-438. Burman, Gravelle, and Rohaly, "Towards a More Consistent Distributional Analysis," op. cit, also discuss evidence that permanent and current income classifications are highly correlated.

They conclude that the most likely explanation of high consumption-to-income ratios is a general tendency toward underreported income that may be more prevalent at lower income levels. It is highly unlikely, however, that this revision would be sufficient to reverse the pattern of falling consumption to income. Moreover, evidence on education level, which is highly correlated with permanent income, indicates that savings rates and ratios of assets to income rise with education.[10]

We may conclude that, although the tax may not be as regressive as depicted in Table 2, it is nevertheless likely to be regressive.

Conclusions

This analysis suggests that despite the issues raised regarding the distributional methods and the data set, a VAT is regressive. Concerns about regressivity don't just apply to lower income levels. In some ways, it is the regressivity at the higher end of the distribution (or even lack of progressivity) that is more problematic, since it cannot be addressed easily with offsetting benefits (such as an increase in transfer payments or earned income tax credits).

A VAT by its nature is, at a minimum, proportional because its rate is flat. There is no real way to address the lack of flexibility in such a tax for obtaining progressivity in the middle- and upper-income ranges. Since most income and most consumption are not in low incomes but in higher ones, this inability to achieve progressivity in the middle- and upper-income levels is a serious drawback of the VAT. All of this assumes, of course, that one is concerned about distributional issues. ∎

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[10]See Dean Maki and Michael G. Palumbo, ''Disentangling the Wealth Effect: A Cohort Analysis of Household Savings in the 1990,'' Federal Reserve Board, Finance and Economics Discussion Series, 2001-21. http://www.federalreserve.gov/pubs/feds/2001/200121/200121pap.pdf. Their purpose was to explore the decline in savings rates (as measured by giving up consumption) after asset values increased dramatically in the late 1990s, but they also report data for a more normal period, 1992.