Leviathan Unbound: The VAT?

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Executive Summary

The value-added tax (VAT) has emerged as a central feature of the debate over the future of U.S. federal tax policy. In addition to its attributes from the perspective of economic efficiency, fairness, and administrative burden, a key aspect of this debate is its political-economic consequences. Specifically, critics argue that the VAT is a "money pump" that causes government to grow too large. Defenders argue that any correlation between a VAT and the size of government is spurious.

We examine these claims in a parsimonious empirical framework with two key results found using data from the OECD:

- A strong, indisputable, positive relationship between use of a VAT and government spending as a fraction of GDP; both across countries and within the same country over time; and

- Statistical evidence that an increase in the current VAT tax rate causes government spending (as a fraction of GDP) to grow larger in the future, even after controlling for the existing size of government, cultural factors, and worldwide economic trends.

These results suggest that concerns over links between a VAT and growth of government are not easily dismissed, if not conclusively proven.

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The emergence of large, persistent budget deficits has revived discussion of a federal value-added tax (VAT) in the United States. Proponents argue that a new source of federal revenue is needed, that it is desirable to tax a consumption base, and that the VAT has the capacity to raise the substantial federal revenues needed to close the current and future budget gap.

In contrast, opponents point out that while it is desirable to reform the existing federal revenue system (notably the personal and corporation income taxes), there are better consumption-based taxes, and – perhaps most importantly – that the VAT would lead to more government spending and thus undercut attempts to close the budget deficit. In this view, the efficiency and non-transparency of the VAT are powerful features that permit government to grow larger; perhaps too large.

In the end, the degree to which a VAT leads to larger government is an empirical issue. The purpose of this paper is to examine the historical record to discern the relationship between the VAT and the size of government. We take advantage of the fact that VATs have been around for decades, and are now imposed in approximately 136 countries (including every OECD country except the United States).

VATs provide a significant amount of revenue. For example, in 2003, for those countries with a VAT, it accounted for approximately 18 percent of total tax revenues. In 2005, tax revenues from a VAT ranged from just over 10 percent of total receipts in Canada to more than 23 percent in New Zealand.

But do these significant revenues cause government spending to grow larger? Or is it the case that adoption of a VAT is evidence of the desire for a larger government so that the causal arrow runs from a taste for Leviathan to a VAT, and not the reverse?

The next section reviews previous literature related to this issue. In section 3 we describe the data used to investigate this question and present the empirical findings. The final section is a summary and conclusions.

To anticipate the results, we find a statistically significant dynamic relationship between the rate of VAT taxation and the size of government. Although no single study is definitive, this is the first rigorous evidence that a VAT causes government to grow larger. At a minimum, it seems safe to say that a VAT enables larger government.

Literature Survey

Several studies have assessed the impact of the VAT on the growth of government, employing a variety of measures to proxy for the "size" of government. Among the most common are the overall tax burden, tax rates, tax revenues, and total spending outlays.

Furchtgott-Roth (1990) measured government size as, alternatively, the overall tax burden and government spending. She found that countries with a VAT did not appear to have higher levels of taxes and spending than countries without a VAT, either before or after a VAT was imposed.

Alverson (1986) computed growth rates of government outlays and receipts relative to gross domestic product (GDP) in countries with and without a VAT. He reported that government spending grew 45 percent faster in VAT countries than in non-VAT countries. He also found that

the tax burden grew 34 percent faster in VAT countries.

Nellor (1987) measured government revenue as a fraction of GDP and found that, on average, a country introducing a VAT exhibited a higher tax ratio than countries without a VAT.

Cato Institute scholar Dan Mitchell documented that value-added taxes (VATs) are associated with both higher overall tax burdens and more government spending. In a *Wall Street Journal* op-ed, Mitchell noted that by 2006, the OECD reported that the average tax burden for EU-15 nations had climbed to 39.8 percent of GDP from 27.7 percent of GDP in 1965. On the spending side, in 1965, according to European Commission figures, government spending in EU-15 nations averaged 30.1 percent of GDP, but in 2007, government spending consumed 47.1 percent of GDP in the EU-15, significantly higher than the 35.3 percent burden of government in the United States.

To summarize, previous research has largely documented a positive association between the presence of a VAT and the level and/or growth of measures of government spending and taxation. The evidence is not, however, unambiguous, and the degree of causality associated with the correlation is unresolved.

Data Sources

The data underlying our empirical analysis are drawn from the Organization for Economic Co-operation and Development (OECD)[1] and the European Commission's Taxation and Customs Union[2]. Our empirical model requires information on the rate of value-added taxation, nominal government spending, and nominal GDP. The data cover the years 1970 to 2009 and include 30 countries.

Complete data for every country in every year were not available. The OECD does not collect or publish data for countries before their membership. We were also limited by the fact that VAT-specific data, such as rates and revenues, were available for a limited number of differing years. This limits the ultimate sample size.

We choose as our measure of the "size of government" the ratio of government spending to GDP. As shown in Table 1 this ranges from 17.1 in Korea in 1987 to 70.9 in Sweden in 1993. An important feature of the data is that it combines spending at all levels of government. Thus, for example, in the United States it includes the activities of state and local governments. While it might be desirable to undertake separate investigations of the various levels of government, this initial attempt is confined to the available data.

The second key variable is the VAT itself. The VAT rates in our sample begin at 0 percent in countries before adoption and in the United States for the entire time period. The rate ranges from 3 percent in Japan in the early 1990s to 35 percent in Ireland in 1983. VAT revenues are similarly $0 before adoption, or without a VAT entirely. For countries with a VAT in place, revenues range from $46 million in Luxemburg in 1970 to $1.7 trillion in Australia in 2000.

[1]http://stats.oecd.org/index.aspx

[2]http://ec.europa.eu/taxation_customs/index_en.htm

Table 1 Summary Statistics					
Variable	N	Mean	Standard Deviation	Minimum	Maximum
Spending as a share of GDP	536	42.5	9.49	17.2	70.9
VAT Rate	536	11.3	9.74	0	35

To begin our investigation, we show in Chart 1 and Table 2 the raw relationship in our data between a VAT and the size of government. Chart 1 shows the relationship between a country's average VAT rate since 1970 and their average size of government – defined here as the ratio between government spending and GDP – for the same time period. Table 2 shows that two types of comparisons are possible. The first is between those countries with a VAT and – as it turns out – the one country without a VAT, the United States. The former devoted 46.5 percent of GDP to government spending compared to 35.4 in the United States. This is the comparison that lies at the heart of the concerns in the United States over adoption of a VAT.

In thinking about adoption, however, a more relevant comparison is the size of government before and after a VAT is adopted. As Table 2 displays, the average size before the VAT took effect was 36.0 (strikingly close to the U.S. value), which rose to 46.5 after the introduction of the VAT. Thus, countries that adopted a VAT did in fact experience, on average, a 29 percent increase in the size of government.

Table 2 Sample Relationship between VAT and Size of Government		
	Size of Government (Government spending/GDP)	
United States (no VAT)	35.4	
	Before VAT	After VAT
VAT Countries	36.0	46.5

To sharpen our understanding, we turn in Table 3 to a regression framework. Specifically, the first column shows the result of regressing the natural logarithm of the size of government on an indicator variable that is equal to one if the country has in place a VAT in the sample year, and a zero otherwise. The estimated coefficient of 0.262 indicates that adopting a VAT is associated with larger government. This estimate is statistically significant. Note that the estimated impact of 26 percent is quite close to the raw relationship in Table 2.

The remainder of the columns show the impact on our estimates of adding controls for year-specific effects (column 2) and country-specific fixed effects (column 3). At each step, the estimate remains positive and precisely estimated. However, controlling for both sources of variation reduces the estimated impact by roughly 50 percent.

Table 3 Regression Analysis of Size of Government			
Dependent variable: natural logarithm of (government spending/GDP)			
	Basic	Control for Year Effects	Control for Year And Fixed Effects
VAT Adopted	0.262 (0.020)	0.279 (0.026)	0.131 (0.0189)
Numbers in parenthesis are estimated standard errors.			

In effect, Table 3 documents the solidity of the association between a VAT regime and a larger government. Specifically, the estimated value of 0.131 means that adopting a VAT is associated with a 13 percent increase in the size of government. For example, it implies that if the U.S. had a VAT, the traditional federal spending of 20 percent of GDP would rise to 22.6 percent. Importantly, because the estimate controls for

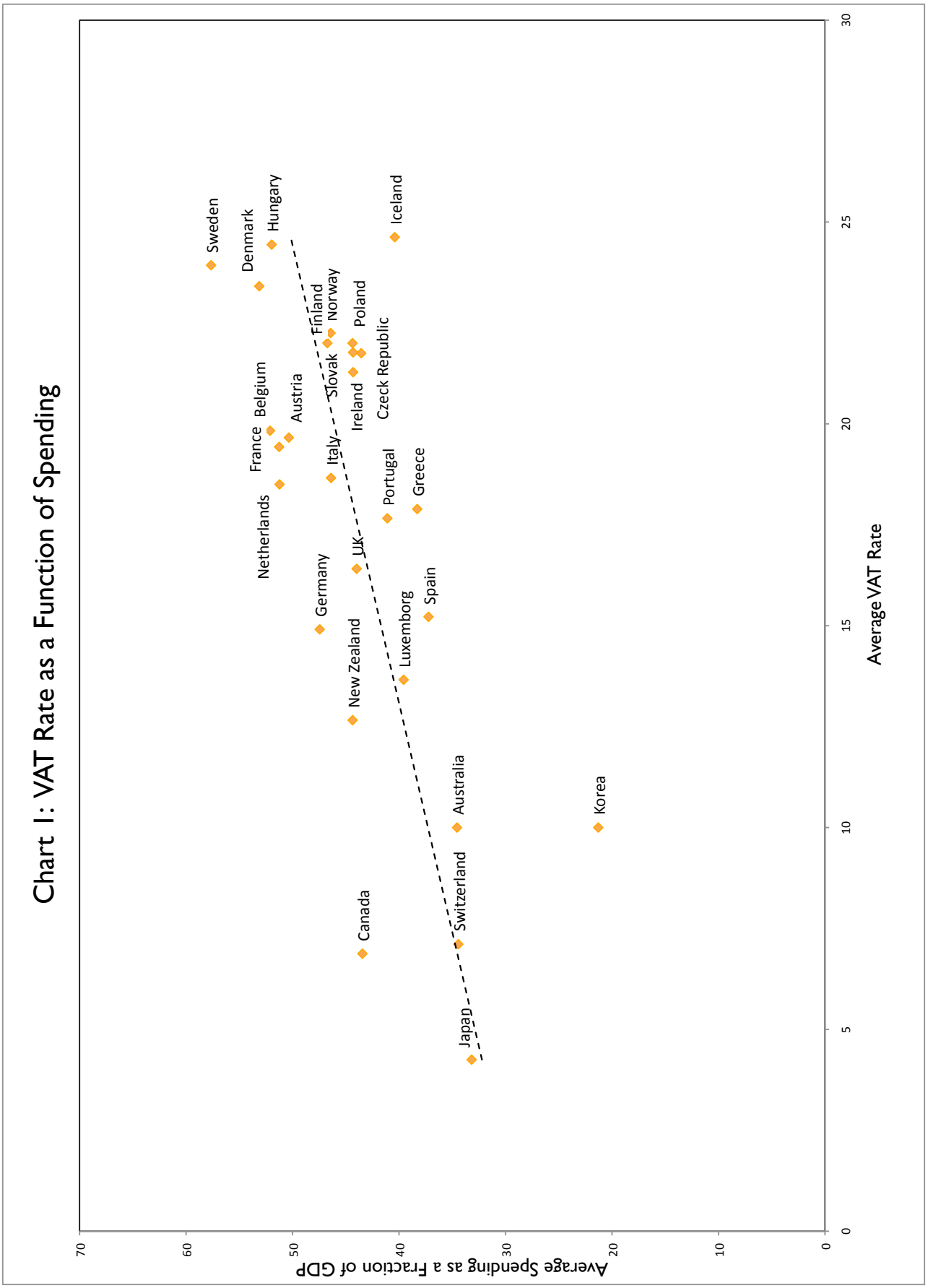
Chart 1: VAT Rate as a Function of Spending
Average Spending as a Fraction of GDP
Average VAT Rate
0
10
20
30
40
50
60
70
0
5
10
15
20
25
30
Sweden
Denmark
Hungary
Iceland
Finland
Norway
Poland
Slovak
Czeck Republic
Ireland
Belgium
Austria
France
Italy
Portugal
Greece
Netherlands
UK
Germany
Spain
New Zealand
Luxemborg
Australia
Korea
Switzerland
Canada
Japan

those unique aspects for each country, such as its history, structure of governance, and culture, this is the contribution above and beyond those factors.

In Table 4, we exploit more variation – variation in the rate of VAT taxation itself – and move toward a causality framework. Specifically, column 1 shifts to examining the relationship between past values of the rate of VAT taxation and the lagged value of government size, thus transforming the model into a vector auto regression – the framework needed to test for Granger causality (see Granger (1969)). The intuition behind Granger's approach is to first control for the past size of government (hence the lagged value). The next step is to examine whether increases or decreases in the VAT rate predict increases or decreases in the future size of government – above and beyond that which would be predicted based on the historical size of government. Thus, the estimate of interest is the coefficient on the lagged VAT rate. In Table 4, if taken at face value, the estimate suggests that an increase in the VAT lowers the size of government.

Unfortunately, the estimates suffer from well-known defects that require more elaborate statistical methods.[3] We display the changes needed to correctly test for causation in two steps. First, following the approach outlined in Holtz-Eakin, Newey, and Rosen (HNR, 1988) we first difference the data; that is we look at changes in the size of government and changes in the VAT rate. This has the effect of eliminating from the analysis anything that does not change over time, i.e. the country-specific effects. This is shown in column 2, which indicates a positive relationship between past VAT rates and the future size of government, even after controlling for the lagged size of government.

The next step is to re-estimate the relationship using the "instrumental variables" technique outlined by HNR.[4] These results are shown in the final column of Table 4. The lagged value of the VAT rate is positive and precisely estimated with the interpretation that increasing the VAT causes the government to grow in the future. How big is the estimated effect? The coefficient indicates that a 10-percentage point rise in the VAT will grow government by 9 percent. That is, taken at face value this estimate suggests that if the U.S. were to adopt a 10 percent VAT tax, the level of government spending would rise from the traditional 20 percent of GDP to 21.8 percent of GDP.

Table 4
Does a VAT Increase the Size of Government?

Dependent variable: natural logarithm of (government spending/GDP)

	Control for Year And Fixed Effects	OLS Estimate in First Differences	IV Estimate In First Differences
Lagged VAT Rate	-0.0004 (0.001)	0.0002 (0.0011)	0.009 (0.004)
Lagged Size	0.954 (0.0282)	-0.0099 (0.00037)	-0.0015 (0.0004)

[3] Specifically, as demonstrated by Nickell (1981) the presence of unobserved country-specific effects and conventional fixed-effects estimators leads to biased and inconsistent parameter estimates.

[4] Instrumental variables are necessary because the lagged difference in government size is correlated with the differenced error term. We use twice lagged levels of government size and the VAT rate as instrumental variables.

Conclusion

We use OECD data to examine whether a VAT tax fuels the growth of government. Our results suggest a strong positive relationship between the existence of a VAT and the size of government, both in the raw data and after controlling for common effects across countries and over time within each nation. Further investigation reveals a strong dynamic relationship between VAT tax rates and the size of government consistent with Granger causality. Although no single econometric study of a complicated issue like this one can ever be conclusive, we think that our results shift the burden of proof to those who deny that VATs fuel increases in the size of the public sector.

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