

Efficiency Gains from Comprehensive Sales Tax Reform

André J. Barbé and George R. Zodrow

April 29, 2015

Abstract

In the United States, 47 states rely on general sales taxes for at least 20% of their tax revenues (Tax Policy Center, 2014). However, despite their popularity, these taxes have a number of features that suggest that they are relatively inefficient tax instruments. In a widely cited article, Ring (1999) estimates as much as 40 percent of sales tax revenues come from taxes on intermediate inputs. Taxing intermediate inputs results in “tax cascading” — multiple applications of the statutory tax rate at various stages of the production process, implying that the final effective tax rate on a consumption good or service can be significantly higher than the stated statutory rate. Taxing intermediate inputs leads to productive inefficiency by distorting input prices and thus violating the well-known production efficiency theorem derived by Diamond and Mirrlees (1971), results in arbitrarily varying effective tax rates on final goods that distort consumption patterns, and creates incentives for inefficient vertical integration. In addition, sales taxes typically are not assessed uniformly on all consumption goods, as exemptions for health care, education, food, many services, and other consumption goods are common, further reducing the efficiency of the tax. For these reasons, although a sales tax is ostensibly a tax on final goods, it may be substantially less efficient than a truly comprehensive consumption tax. Indeed, proposals for the reform of state tax structures almost uniformly call for a broadening of the tax base to include many currently exempt consumer goods and services (without extending the tax to services consumed by businesses, which would exacerbate the cascading problem). These reforms may be coupled with a lower general sales tax rate, an expansion of revenues, or reductions in other taxes and, in many cases, include the use of a state income tax credit to reduce or eliminate the additional tax burden on lower income groups associated with the broadening of the tax base.

In this paper, we compare the relative efficiency of a comprehensive consumption tax to that of a typical state general sales tax. The simulated sales tax includes intermediate input taxation, tax cascading, and exemptions for items such as health care, education, and many services. Since we want to analyze the effects of the taxation of intermediate inputs, accurate modeling of firm production, and especially the potential for firm substitution among intermediate inputs, is critical. Our general equilibrium model addresses this issue by disaggregating production into 21 different industries and analyzing the extent of tax cascading within and across these industries. To better capture potential substitution among inputs due to tax distortions, we follow the work of Jorgenson (2008) and others and use the translog functional form for the production function in each of the 21 industries, rather than the more restrictive constant elasticity of substitution (CES) functional form. Similarly, the effects of consumption distortions under the two taxes are captured by using the translog formulation for the consumer’s expenditure function. Our model also allows for technological progress and changes in the importance of particular inputs over time. Following Jorgenson, most of the parameters of the model are estimated econometrically using time series data over many years

rather than obtained by using a calibration process for a single year. Within this context, we simulate the relative efficiency costs of the imposition of equal-yield versions of a comprehensive consumption-based sales tax and a variety of typical and far less comprehensive general sales taxes.

Our work builds on and extends two previous analyses of similar issues by Russo (2005) and Hawkins (2002), who also examined the efficiency of various state sales tax reforms. Russo (2005) compared reforms such as broadening the base of the sales tax, replacing the sales tax with a true consumption tax, and replacing the sales tax with higher income taxes. However, in each case he used a general equilibrium Ramsey model that had only two consumption goods and one intermediate good and was thus limited in the extent to which it could capture the inefficiencies of the typical sales tax. Although Hawkins (2002) used the Almost Ideal Demand System for consumer demand (which is similar to our translog expenditure function) to evaluate the efficiency cost of tax distortions of consumer purchasing decisions under different sales tax structures, his analysis was partial equilibrium in nature and ignored production. Thus, our analysis extends this literature by examining the movement to a comprehensive sales tax in the context of a fully specified general equilibrium model with a much more detailed production and demand structure than previous studies.

References

- Diamond, Peter A., and James A. Mirrlees. 1971. "Optimal Taxation and Public Production I: Production Efficiency." *The American Economic Review* 61(1): 8–27.
- Hawkins, Richard R. 2002. "Popular Substitution Effects: Excess Burden Estimates For General Sales Taxes." 60(4): 755–70.
- Jorgenson, Dale, and Daniel T. Slesnick. 2008. "Consumption and Labor Supply." *Journal of Econometrics* 147(2): 326–35.
- Ring, Raymond. 1999. "Consumers' Share and Producers' Share of the General Sales Tax." *National Tax Journal* 52(1): 79–90.
- Russo, Benjamin. 2005. "An Efficiency Analysis of Proposed State and Local Sales Tax Reforms." *Southern Economic Journal* 72(2): 443–62.
- Tax Policy Center. 2014. "State Tax Collection Shares by Type 2000-2013." <http://www.taxpolicycenter.org/taxfacts/displayafact.cfm?DocID=404&Topic2id=90&Topic3id=92> (April 28, 2015).