

The SSTP and Technology: Implications for the Future of the Sales Tax

Abstract - *Technological advances have impacted the sales tax more than any other tax imposed in the U.S. Technology creates new problems and sales tax evasion and avoidance opportunities, but also may provide business and governments with the tools to solve them. We discuss how technological developments operating in tandem with the Streamlined Sales Tax Project (SSTP) can enhance administration and compliance. We also evaluate how economic efficiency and tax revenues are likely to be affected by technology and the SSTP. Workable solutions to the practical problem of collecting sales tax on remote sales are within reach, but political realities make durable solutions less certain.*

INTRODUCTION

The technological advances of the last several decades may have greater implications for the sales tax than for any other tax imposed in the U.S. The implications go far beyond how taxes are administered and complied with to include such things as changes in the form and types of intermediate and final products that are purchased and the ways in which these products are distributed. Both the private and public sectors are struggling to accommodate the sales tax, which owes its heritage primarily to the 1930s' environment of mom-and-pop stores selling tangible goods, to today's modern business environment and the shift towards services and intangible products. Tax is often uncollected on rapidly growing mail-order and online sales, and new types of products, such as electronically delivered movies and music and various telecommunications services, pose new sourcing and tax-enforcement issues. Advances in technology create new problems, but also may provide businesses and governments with the tools to solve them. This paper focuses on one aspect of this evolving puzzle—how recent technological advances affect compliance and administration. Further, we examine the implications of this changing environment for the vendors tasked with the burden of collecting and remitting sales and use taxes and the state and local governments that assess them.¹

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¹ Use tax operates as a complement to the sales tax in cases where the tax is not paid at purchase and is the tax that would have been owed if the same good had been purchased in the state of residence. All subsequent references to sales taxes refer to both sales and use taxes.

In analyzing this puzzle, the emphasis is on how technologies can operate through developments in the Streamlined Sales Tax Project (SSTP) to enhance administration and compliance.

The paper is divided into four sections after this introduction. The first section briefly summarizes the sales tax structure and current compliance costs and practices. The second section describes the SSTP, the way it influences compliance and administration, and the outlook for the SSTP. The third section examines how economic efficiency and tax revenues are likely to be affected by technology and the SSTP. The final section is a brief conclusion.

U.S. SALES TAXES

Structure, Complexity and E-Commerce

The share of state taxes generated by the sales tax has been largely stable at just over 32 percent since the mid-1980s, leaving the sales tax just below the individual income tax in its contribution to state finance.² State sales tax revenues have declined slightly from their peak of about 1.84 percent of GDP in 1996 to 1.75 percent in 2007, although rates rose steadily during that period. Base erosion has taken place because of the growth of often untaxed services and electronic commerce, and expanding legislated exemptions. Forty-five states and the District of Columbia (D.C.) impose sales taxes, which is more than the 41 states and D.C.

that levy the personal income tax. Local governments in 35 states also impose sales taxes, but the tax is a very distant second to the property tax and only raised 11.2 percent of local tax revenues in 2005.³

Wide variation exists in the structure and operation of sales taxes across U.S. states (see Due and Mikesell (1994)), which creates compliance challenges especially for multistate firms. Thus, the potential for technology to lessen the complications that arise from imposing such a non-uniform tax is certainly appealing. Sales taxes vary according to basic legislative structures, with some states levying the tax on purchases by individuals, some levying it on vendors' gross receipts and others using a combination of these two approaches. Similarly, breadth of the base, tax rates,⁴ filing requirements and nearly every other aspect of the structure varies significantly across states. All states impose a use tax on items purchased out of state for use in the state and on items purchased for exempt purposes that are later changed to taxable purposes, though the specific details of use taxes vary.⁵

As a general rule, goods are broadly taxed and a relatively narrow set of services is taxed, though there are dramatic differences, with some states, such as Hawaii and New Mexico, taxing nearly all services, and others, such as Illinois and Rhode Island, taxing very few.⁶ New business exemptions are commonly offered by the states, as are exemptions for consumer purchases. Food for consumption at home has been one area of relief

² See <http://www.taxadmin.org/fta/rate/06taxdis.html>.

³ See http://www.census.gov/govs/estimate/0500ussl_1.html.

⁴ The highest average combined state and local tax rate, at 9.35 percent, is levied by Tennessee state and local governments (see <http://www.taxch.com/STRates.stm>). Maximum rates reach 11.5 percent in Arkansas and 11.0 percent in Alabama (see http://www.taxadmin.org/fta/rate/sl_sales.html).

⁵ The State of Washington estimated that non-compliance with the use tax by registered businesses is the largest of any state tax, at 27.1 percent (see http://dor.wa.gov/Docs/Reports/Compliance_Study/compliance_study_2003.pdf). Except for a few commodities such as automobiles, consumer compliance with the use tax is very low, even among the 20 states that allow individuals to report their liability as part of their individual income tax return.

⁶ See <http://www.taxadmin.org/fta/pub/services/services.html> for a summary of state taxation of services.

for individuals. Thirty states now offer a complete food exemption, though with many definitional differences as to what constitutes food, and seven states tax food at a rate below the general rate. Sales tax holidays have been a particularly frequent set of recent exemptions, creating unique compliance problems for firms. Sixteen states and the District of Columbia offered sales tax holidays during 2008.⁷ All of these factors complicate the structure of the sales tax and raise the costs of compliance, especially for firms with a multistate presence.

E-commerce has aggravated the initial remote sales problem created by mail order transactions. E-commerce continues to expand very rapidly and is estimated to have totaled \$2.40 trillion in 2006, including all sales by manufacturers, wholesalers, service providers and retailers, or 12.5 percent of all such sales.⁸ Many discussions of taxation of e-commerce focus on sales by retailers, which were only \$136 billion in 2007.⁹ However, consumers may purchase from non-retail vendors, and many business-to-business purchases are taxable, so the broader measure of all e-commerce sales is a better indicator of the direction and magnitude of e-commerce and its implications for the sales tax. Evasion and avoidance through e-commerce are likely smaller problems than had originally been anticipated because of the greater propensity of major multi-channel retailers, relative to pure e-commerce players, to make online sales and because many firms have been more prone to voluntarily comply or to accept that they have nexus rather than litigate

over the question.¹⁰ Still, the losses from untaxed e-commerce sales are large and growing, and by one measure equaled \$14 billion, or nearly five percent of total sales tax collections in 2006.¹¹

Technology can play only a limited role in lessening tax base erosion and in many ways may exacerbate base erosion. Technology does nothing to lessen the political forces leading to new exemptions, and probably gives taxpayers arguments for additional economic development exemptions because of the ability of out-of-state vendors to deliver an increasing number of goods and services remotely. Similarly, technology is expanding the set of potentially nontaxable transactions, many of which may not be in the legislated tax base either because they are digital services or products or because they were never anticipated by state legislatures. Thus, technology is likely to accelerate shifts from taxable goods to nontaxable transactions. Technology may also facilitate noncompliance, such as through the fraudulent use of sales suppression software that facilitates sales understatement, but also by facilitating often untaxed digital transactions. At the same time, technological and communications advances can dramatically reduce some of the costs of compliance and may yield cost savings to revenue agencies as well. These advances have taken place largely independent of the sales tax streamlining initiative.

Firm Compliance Process

The sales and use tax compliance issues facing multi-state vendors are signifi-

⁷ See http://www.taxadmin.org/fta/rate/sales_holiday.html.

⁸ Authors' totals based on <http://www.census.gov/eos/www/2006/2006tables.html>.

⁹ <http://www.census.gov/mrts/www/data/pdf/07Q4.pdf>.

¹⁰ Nexus describes the minimum degree of business activity that must be present before a taxing jurisdiction has the right to impose a tax on an out-of-state taxpayer. For sales and use tax purposes, physical presence is required for sales tax nexus.

¹¹ See Bruce and Fox (2004). Also see See Goolsbee and Zittrain (1999) for estimates of lost revenue from e-commerce sales.

cant given the disparity in structure and administrative procedures across states and localities. Table 1 provides a brief overview of the steps involved in the sales tax compliance process and shows how technology and streamlining might affect this process. A comprehensive review of all difficulties lies beyond this paper, but examples are given to illustrate the many complexities in each step of the compliance process. Further discussion of each item follows.

Situs the Transaction

Direct purchases of goods and services have generally been sitused on a point-of-purchase basis, which in many instances coincides with the appropriate situs under a destination-based sales tax. Exceptions include purchases by exempt buyers (see below) and nonresidents (i.e., cross-border shoppers). In the latter case, the principle of destination taxation is violated.

Situsing of remote sales has traditionally been made using the five-digit zip code and, more recently, a nine-digit zip code. However, zip codes do not accurately correspond to local taxing jurisdictions and have been the subject of several class action lawsuits. Digitized products have been an issue because determining the location of use is difficult for a product that can be so easily transferred from computer to computer, or stored in one location, but accessed from many other points.

Determine Whether Firm Has Nexus

Nexus requires retailers to have some form of physical presence in the taxing jurisdiction. Beyond this general statement, practice has varied across time and across states. Some states have pushed the nexus envelope to draw more firms into the tax net using broad approaches such

as economic nexus, affiliate nexus and agency nexus. For example, a retailer may be deemed to have nexus if the firm has significant economic presence (without physical presence)¹² and one of the firm's affiliates or agents has physical presence in the taxing jurisdiction and performs certain tasks on behalf of the business. The different and evolving nexus standards have created uncertainty if not anxiety on the part of retailers because of the risk of audit and assessment of back taxes should they be retroactively assigned nexus in a legal proceeding.

Determine Which Transactions Are Taxable

Goods are generally taxable, but states grant a number of exemptions, with the precise definition often varying by state (e.g., "food" for home consumption, non-prescription "drugs"). Furthermore, definitions within a category (e.g., soft drinks, candy) also vary among states. Many of these questions can be resolved through universal product codes (UPCs) and information systems that can be programmed to determine the taxability of transactions. Services are enumerated for taxation by the states, with the scope of service taxation varying widely. The tax status of bundled transactions—for example, repair services and repair parts—is also often state specific as well.

Determine the Tax Status of Buyer

Transactions that might otherwise be taxable can be exempt from sales tax for two main reasons. The most common is qualified business transactions that are exempt from both sales and use taxes. Exempt business purchases include those of retailers that make purchases for resale and manufacturing firms that convey some or all of the purchased input into the final manufactured product. Also, other transactions can be exempt from

¹² For example, see Oregon DOR Rule 151-317.010 and Florida Technical Assistance Advisement 07C1-007 (October, 2007).

TABLE 1
SUMMARY OF COMPLIANCE ISSUES AND SOLUTIONS

Compliance Issue	Challenge for Vendors	Technology Developments*	SSTP Solutions
1 Siting transactions	<ul style="list-style-type: none"> • Taxing on a destination basis for cross-border shoppers. • Inaccuracy of zip codes. • Digitized products. 	<ul style="list-style-type: none"> • Electronic address-based jurisdictional data files from private vendors. 	<ul style="list-style-type: none"> • State-run destination based regime. • Address-based database assigns jurisdictions.
2 Nexus determination	<ul style="list-style-type: none"> • Activities that establish that presence vary among states. • Do related entities and agents create nexus? 	<ul style="list-style-type: none"> • Internet enables market penetration absent a physical presence that would establish nexus. 	<ul style="list-style-type: none"> • Uniform definitions of categories. • Uniform base throughout state. • Improved software to link to firm's information system. • Define approach to bundling.
3 Taxability of transaction	<ul style="list-style-type: none"> • Is the category (e.g., food) exempt? • In which category is the item assigned? Varies by state. • Treatment of bundled transactions. 	<ul style="list-style-type: none"> • Sales suppression software can effectively eliminate cash transactions and facilitate noncompliance. • UPC tags and scanners with management information systems that determine taxability. 	<ul style="list-style-type: none"> • Direct pay permits. • Cross checking direct pay permits to use tax filings.
4 Buyer's tax status	<ul style="list-style-type: none"> • Identifying qualified exempt business purchasers. • Retailers purchasing goods for resale or manufacturer purchasing inputs. • Identifying purchases subject to use tax but exempt from sales tax. 	<ul style="list-style-type: none"> • Online filing as exempt buyer with individual states. • Online filing for MTC uniform sales and use tax exemption certificate applicable in 38 states. 	<ul style="list-style-type: none"> • Common definitions of goods. • Common base for entire state. • Approved software to assign goods to categories and assign rates. • Require timely updates for rate changes. • Limit the number of rates per state.
5 Tax rate determination	<ul style="list-style-type: none"> • Thousands of different rate-setting jurisdictions. • Different rates for different categories of goods. 	<ul style="list-style-type: none"> • Electronic taxability matrices and boundary files available from private vendors. 	<ul style="list-style-type: none"> • Caps and thresholds are not allowed under the SSTP (with a few exceptions). • Vendors file only with the state and state sends money to local governments (common forms and filing dates). • Certified technology solutions. • Certified third-party sales tax administrators.
6 Applying applicable tax ceilings and exemptions	<ul style="list-style-type: none"> • Different ceilings and exemptions for goods. 	<ul style="list-style-type: none"> • Electronic registration, reporting and filing systems with individual states, including electronic fund transfers for tax remittance. 	<ul style="list-style-type: none"> • Joint audits. • Certified software/service providers.
7 Assessing, collecting, and remitting the tax	<ul style="list-style-type: none"> • Filing requirements, deadlines, forms, remittance procedures differ by jurisdiction. 	<ul style="list-style-type: none"> • Universal product codes and management information systems: the focus of tax audits. 	
8 Assessing audit risk	<ul style="list-style-type: none"> • Firms are subject to multiple audits for the same time period. 		

*This is not intended to be a comprehensive list of technology but rather a summary of the developments discussed in this paper.

sales tax but are subject to use tax in another state. Examples include both business and consumer purchases that could otherwise be subject to the sales tax but where delivery is made to an out of state user and the use tax is to be paid at the place of consumption. The states have made it easier for vendors to register as exempt buyers; the Multistate Tax Commission has an approved sales and use tax exemption form that can be applied in 38 states.

Determine the Appropriate Tax Rate

Sellers must know both the jurisdiction and the appropriate rate for the item in the locale where tax is due. With thousands of taxing jurisdictions, and the wide variations in the tax base and rates applicable to various categories of goods and services, the task can be daunting for a multi-state vendor.¹³ But, jurisdictional boundary files that identify tax jurisdictions can be linked electronically to the appropriate tax rate for a good, service or digital product. Various vendors supply software and data files that contain information on the specific characteristics of each state's tax structure.

Consider Tax Ceilings or Exemptions

Many jurisdictions either provide for a sales tax maximum per transaction, exempt from tax the purchase price over or under a certain threshold, or provide for a different rate of tax over a threshold amount.¹⁴

Assess, Collect and Remit Tax Payments

Firms must file a sales and use tax return and remit tax to each state (and potentially local jurisdiction) where nexus has been established. Many aspects of states' filing requirements differ, includ-

ing due dates, filing frequency, forms, and vendor compensation. Many of these processes are now in electronic form—including electronic funds transfers for tax remittance—facilitating the compliance process absent streamlining.

Face Audit Risk in Each Taxing Jurisdiction

Firms with a multijurisdictional presence face the risk of audit in each jurisdiction. In some instances (e.g., Alabama), firms may face the risk of audit by local governments as well as the state.

Compliance Costs and Administrative Enforcement

Undertaking the steps outlined above can be costly for firms and can create practical compliance obstacles. These costs must be borne by all firms that clearly have nexus and potentially could be voluntarily incurred by other firms that comply, perhaps because they are uncertain whether they have nexus. For example, under current law large vendors without clearly established nexus, especially those with potentially nexus creating activities through related corporations, may elect to collect sales tax to avoid the risk of large audit assessments on past sales. The difficulty and cost of compliance across multiple state and local taxing jurisdictions, especially for small businesses, proved to be the primary obstacle in the eyes of the courts and Congress to the expansion of the scope of tax collection requirements for remote vendors.

Technology has certainly reduced firms' costs relative to those that prevailed when the *National Bellas Hess* decision was handed down in 1967, and possibly since the *Quill* case was decided in 1992. Still, estimates of compliance costs from the small body

¹³ For example, the District of Columbia uses five different tax rates within its sales tax.

¹⁴ For example, for automobile/truck purchases in Tennessee, the state rate applies to the entire purchase. However, local rates apply only to the first \$1,600 of the sales price.

of existing literature generally line up with more recently developed estimates of compliance costs. A PriceWaterhouseCoopers 2006 study reviewed the existing literature on these compliance costs.¹⁵ The study shows that firms' average compliance costs as a share of collections were 4.4 percent prior to 1984 and 3.5 percent after 1990. The PriceWaterhouseCoopers study also developed independent compliance cost estimates through a national survey of retailers, showing average compliance costs as a share of tax collections to be 3.9 percent in 2003 across all firms, though compliance costs were significantly higher for small firms than for large firms.¹⁶

Sales and use tax enforcement takes place largely through the examination of tax returns and formal audits of businesses. States and some localities audit sales tax vendors, while little effort is expended to combat use tax noncompliance on the part of individuals.¹⁷ The states have found audits of registered sales tax vendors to be very productive sources of revenue. Most of the noncompliance uncovered through business audits is viewed as accidental rather than intentional and occurs through inappropriate application of exemption certificates and failure to pay use tax on taxable purchases. In the Washington (2003) compliance study, for sales and excise taxes combined, accounting errors represented 56.9 percent of the noncompliance gap, while fraud represented only 5.7 percent of the gap. A sales tax gap study undertaken by Iowa

found that 18.8 percent of the gap was from inappropriate exemptions (Fox and Murray, 2004).

TECHNOLOGY AND THE STREAMLINED SALES TAX PROJECT

Technology makes it easier to evade the sales/use tax, and to the extent technology increases interstate transactions, it may also lead to more noncompliance because of tax complexity.¹⁸ On the other hand, technology enhances the capacity of firms to comply with the range of state sales tax laws, potentially lowering compliance and administration costs of collecting the tax on remote transactions. For example, the use of UPC tags and scanners is a technological solution that is assisting overall compliance, audit, and enforcement as well as improving reporting accuracy of the sales and use tax.¹⁹ With UPC tags and scanners, compliance switched from the hands of the cash register operator to the hands of the information system. The SSTP is an attempt to further harness available technological (and other) solutions to address some of the issues facing vendors and governments in the modern economy.

In the following section, we discuss the SSTP and related technological improvements that enhance the compliance and administration of the sales and use tax. We begin with a brief overview of the SSTP, followed by a description of the SSTP technology, and then discuss these

¹⁵ http://www.streamlinedsalestax.org/DOCUMENTS/Cost%20of%20Collection%20Study/JCCS_Part_I_%20Final_Report_Vol%20I_20060407.pdf.

¹⁶ The survey did not consider use tax compliance costs associated with vendors' purchases of sales taxable items for their own use. The State of Washington compliance study (2003) found a use tax compliance gap of over 27 percent. Though now dated, Due and Mikesell (1994) report substantial use tax assessments as a share of total audit assessments in some states, including a high of 40 percent in Illinois.

¹⁷ Cornia, Sjoquist, and Waters (2005) note that local governments in six states—Alabama, Alaska, Arizona, Colorado, Mississippi and California—conduct individual sales tax audits.

¹⁸ This includes taxpayers who do not know they have a use tax responsibility and firms that may make more errors as the number of jurisdictions they trade with increases.

¹⁹ While UPC tags and scanners have been installed for reasons other than sales tax compliance, the technology has had a profound impact on overall compliance and administration.

improvements in the context of the steps in the compliance process.

SSTP Background

The SSTP is a voluntary organization of states that seeks to improve the sales and use tax system in the U.S. By establishing common definitions of taxable and non-taxable items and by streamlining the collection and remittance process as well as facilitating audits, the SSTP hopes to reduce compliance burdens for vendors and to eventually extend the sales tax collection by vendors to remote sales.²⁰ The SSTP is not a congressionally sanctioned compact and hence it cannot bind its members to any particular law or policy.

Because of the complexity of the U.S. sales tax system,²¹ the Supreme Court held in two cases involving mail order that a state cannot require an out-of-state vendor to collect the state's sales and use tax unless the vendor has nexus in the state, which the court defined as physical presence.²² The National Governors Association and the National Conference of State Legislators created the SSTP in March 2000. The SSTP's strategy is to first simplify and modernize the collection and administration of sales and use taxes through the creation of a multi-state sales tax agreement. Once a system is in place that facilitates the efficient collection of use tax by remote vendors, Congress

would be in a position to reconsider requiring such collection.

Today 44 states and D.C. have joined the SSTP as "participants" indicating their general support for sales tax simplification. Of those, 22 states, consisting of 19 full members and three associate members, have passed all or most of the required Streamlined Sales and Use Tax Agreement (SSUTA) simplification recommendations.²³ A Governing Board, comprised of representatives of each full-member and associate-member state, oversees SSUTA administration. For the period October 1, 2006 through June 30, 2008, voluntary vendor participants in the SSTP have remitted sales/use tax collections of approximately \$231 million to the 22 participating states, which compares with \$282.2 billion in sales tax collected by all state and local governments in fiscal year 2005.²⁴ Voluntary collections are currently running just over \$100 million per year.

The SSTP's efforts have already rekindled some Congressional interest in extending required sales and use tax collection to remote vendors. Several bills have been introduced in Congress to get its consent to the SSUTA.²⁵ However, none of the bills have been brought to a vote primarily due to concerns about the compliance burden on small businesses and Internet businesses, and the potential adverse impacts on some local governments that lobby-

²⁰ Bird (2005) discusses administration and compliance aspects of the VAT in an era of electronic commerce and emerging technologies. As one would expect, many of the issues on the VAT parallel those encountered with the retail sales tax.

²¹ The Supreme Court believed that it would have been an overwhelming task for a mail order vendor to apply the correct tax treatment to sales in each of the 6,277 sales and 4,452 use tax jurisdictions.

²² *National Bellas Hess, Inc. v. Illinois Department of Revenue*, 386 U.S. 753 (1967) and *Quill Corp. v. North Dakota*, 504 U.S. 298 (1992).

²³ A full member state is in full compliance with SSUTA. Associate member states have achieved compliance with the SSUTA in large part but not necessarily with each provision.

²⁴ This figure does not include all voluntary collections because the numbers are self-reported by the states and some states have not reported for the most recent quarter.

²⁵ For example, see S.1736, S.2152 and S.2153 and H.R. 3184. S. 34 and H.R. 3396 were both introduced in 2007, but remain in committee at this writing.

ists argue will bear significant revenue losses from destination-based intrastate sales sourcing and the removal of local authority over telecommunications taxes. There is also significant concern that the costs to implement the rules will outweigh the increase in revenues, though there is no hard evidence on this point.

SSTP Technology Provisions

The modern task of knowing the taxable category of a good or service, the destination of the product sold, and the correct tax rate to apply at a reasonable cost is simplified by technological advances in hardware and software. The SSUTA technology provisions include (1) electronic filing and remittances, (2) central electronic registration, (3) state approved databases and a product matrix, and (4) tax collection and remittance models. Under the agreement, sellers can either electronically file simple and uniform returns developed by the SSTP (i.e., no local returns) or choose to file the current state form. All states signing the SSUTA agree to a central electronic registration. A seller must use the central online registration system to take advantage of both monetary allowances and any available amnesty provisions. The online registration system must also be used when a seller who is not registered in all member states chooses to voluntarily comply. States agree to provide and maintain (in downloadable format) an address-based jurisdiction database and a rate database. These databases match the appropriate rate to every jurisdiction and identify exempt products and taxable products.

The SSUTA provides for the certification of automated systems and service providers and classifies vendors in three categories

based on what systems a vendor uses to comply with its remote sales and use tax obligations. Using the state-provided data bases (e.g., rates and product matrix), the systems properly apply rules and calculate transaction taxes, provide for appropriate returns, and handle exempt transactions.

Sellers can select one of three models for calculating, collecting and remitting tax. Model 1 sellers contract with a certified service provider (CSP) to perform all of the seller's sales and use tax functions, including remitting the tax to the appropriate authorities. Model 2 sellers use a certified automated system (CAS), essentially software approved by the SSTP Governing Board, to calculate and track sales and use tax obligations, but retain the responsibility to remit the tax and file returns. Model 3 sellers are large (more than \$500 million in annual sales), multi-state businesses that use proprietary software to perform the required tasks. In addition to these three models for tax determination and remittance, firms can continue to report to each individual state using each state's unique reporting requirements. Sellers following this latter model are not granted audit relief under the streamlining agreement, unlike Model 1-3 sellers.²⁶

As of this writing, the SSTP Governing Board has recognized four companies as Certified Service Providers: Avalara, ADP Taxware, Exactor, and SpeedTax. In addition, SpeedTax and ADP Taxware have been certified as a Certified Automated System. The software converts the addresses to "taxing jurisdiction codes," determines the taxing location pursuant to the sourcing rules, applies the appropriate tax rate, and applies special rules such as exemptions.

SSTP representatives have worked extensively with TIGERS (Tax Implemen-

²⁶ Amnesty will not protect a firm from fraudulent activities or ongoing audits.

tation Group for E-commerce Requirements Standardization), jointly founded in 1994 by the Federation of Tax Administrators (FTA), the Internal Revenue Service (IRS), and a working group of the American National Standards Institute (ANSI). TIGERS is part of a broad cooperative effort between the states and national agencies to develop common software standards for a wide variety of tax filings (personal income, sales, motor fuel, corporate income, etc.). The TIGERS SSTP Technology Standards Group has the responsibility to develop Extensible Markup Language (XML) schema for reporting requirements and to define technology infrastructure for data exchange using XML.²⁷ TIGER's participation is open to any affected tax agencies, including the IRS, the Social Security Administration, and state tax agencies, as well as private software developers and tax service providers such as payroll processing firms.

Under the current state sales tax regime, 26 states offer some form of vendor discount.²⁸ The Federation of Tax Administrators reports a median range for vendor compensation of 1.5–1.9 percent. The SSUTA provides for transitional compensation (i.e., “monetary allowances”) to help accommodate the costs of moving to the new assessment and reporting system. Model 1 CSPs will receive ongoing assistance based on the value of processed taxable transactions. In addition, transitional assistance will be provided based on revenue generated from a seller's non-nexus states. Voluntary Model 2 sellers will receive, in addition to any existing vendor compensation in nexus states, compensation

equal to 1.5 percent of the revenue that is reported to non-nexus states for up to 24 months. A similar structure applies to Model 3 and other sellers. Generally it is assumed that state vendor compensation systems will be continued following implementation of the streamlining agreement.

SSTP and Technology Improvements Versus Current Practice

The SSTP would lead to many changes to the way in which firms comply with the sales tax. The solutions proposed by the SSTP are integrated with technology and are presented together in the following section. Table 1 provides a summary, isolating key technological advances and showing how streamlining as well depends on technology.

Situsing Transactions

The SSTP requires state-level administration and uniform sourcing rules, which generally require that sales be sourced to the destination of the customer.²⁹ To effectively administer destination-based taxes, states are required to cooperate in the development of an address-based system. Electronic boundary files on zip codes and taxing jurisdictions are now available from state departments of revenue and private vendors that facilitate the allocation of sales to specific jurisdictions.

Several states with origin sourcing of the local sales tax have delayed full adoption of the SSUTA, though the SSTP governing Board approved origin sourcing as an alternative for local taxes and is currently deciding on origin treatment

²⁷ XML is a language that facilitates the sharing of structured data across different information systems.

²⁸ See http://www.taxadmin.org/fta/rate/sale_vdr.html.

²⁹ Certain items, such as software and computer-related services, present sourcing challenges because they are highly mobile and can be used simultaneously from multiple locations. The SSUTA presents alternative sourcing rules in Section 310 of the Agreement.

of intrastate remote transactions.³⁰ Destination sourcing introduces additional complexity. Unlike origin sourcing that requires knowledge of a single tax rate for every origin location, destination sourcing requires business to know the tax jurisdiction and tax rate of each delivery address. States are particularly concerned about how small business is affected by the complexity and resulting costs. Also, some local jurisdictions will lose revenue to “destination” localities, and in-state businesses would now be required to collect tax for the many jurisdictions in their state, regardless of their (lack of) physical presence in those jurisdictions.³¹

Nexus Determination

The SSTP does not directly change the nexus threshold. However, the SSTP improves incentives for businesses in borderline cases to agree to nexus by providing safe harbor mechanisms for assessing and remitting sales tax.

Taxability of the Transaction

One of the SSTP’s most difficult but important tasks was to establish uniform definitions across all state and local jurisdictions for key broad categories of tangible goods,³² such as “food” and “drugs.” For example, while states can still decide whether to tax or exempt “food for home consumption,” participating vendors need only determine whether an item qualifies as “food for home consumption” once, and it will apply to all sales to participating states. Furthermore, the tax

base must be identical in all jurisdictions within a state (e.g., “food” must be either taxable or exempt in every jurisdiction within a state).

Technology has also led to significant improvements in the ability to define the taxability of goods and services through electronic files obtained from revenue agencies and private vendors that delineate the tax status of specific transactions. These files can be linked to retailers’ information management systems through UPCs and scanners, facilitating ongoing business activity as well as tax compliance. Retailers’ information systems can be audited to determine whether or not firms are in compliance.

In practice, technology that determines taxability has proven to be a two-edged sword. Sales suppression (or “zapper”) software has been developed that can re-write information management systems, cleanse systems of records of taxable transactions, and renumber receipts to support cash skimming that facilitates sales and income tax noncompliance (Ainsworth, 2008). The zapper leaves no audit trail or evidence that it has been used and reduces records of gross sales and inventory by the amount of cash received, thereby threatening the accurate reporting of gross receipts in an entirely new manner.

Exempt Buyers and the Use Tax

The SSTP requires that each participating state offer firms direct pay permits that allow businesses to make purchases

³⁰ For example, Tennessee, Washington, and Ohio have delayed full adoption of the SSUTA because of concerns with destination sourcing and are associate members. Texas has stopped implementation because of the destination sourcing issue.

³¹ For example, see Fox, Gustafson, and Marshall (2005), which estimated a net revenue increase for the state of Tennessee for a change from origin sourcing to destination sourcing. While 82 counties may expect to experience net inflows, 13 counties could expect to experience net outflows from destination sourcing. The overall revenue gain results because destination counties have higher rates on average than origin counties and because several statute changes required for Tennessee to conform with the SSTP generate additional revenues.

³² Currently there is no definition for services. Agreement was recently reached on a general methodology for accommodating digital products.

without paying use tax; firms then directly remit use tax on taxable purchases. The reporting mechanism for direct pay permits should enhance compliance to the extent it offers opportunities for cross-verification of transactions among firms participating in the SSTP. But firms may still make extensive purchases from vendors who are not a party to the streamlining agreement and there may be no record within the streamlining states of these transactions. Firms will then have to determine the tax status of these purchases and self-report tax liabilities. Taxability matrices should help identify which of the transactions are taxable. Accurate compliance is apparently a greater concern with self-reported liabilities, even for businesses, as evidenced by the State of Washington (2003) audit.

Nothing in the SSTP improves incentives for individuals to self-assess use tax liabilities. Aside from not reporting use taxes, there is little evidence consumers engage in other active forms of sales tax evasion under the existing sales tax system by, for example, falsely registering as a retailer or inappropriately using an exemption certificate. There is no reason to believe that these and other forms of noncompliance will expand under the SSTP, though they could become more feasible because of technological advances.³³

A potentially growing problem under the SSTP is the incentive for individuals to seek out non-registered remote vendors who are not required to collect use tax on their sales. One could envision a new online search engine designed for comparison price and quality shopping (i.e., a shop bot) emerging that scoured product prices and product taxability across the

states, helping consumers identify vendors not required to collect tax. A binding compact among all states—including those states without a sales tax (perhaps an unlikely event)—would largely alleviate this problem. But problems would remain for some transactions, in particular, entertainment services and digitized products. This in turn raises the specter of growth in international transactions, something that the SSTP does not and cannot address. Growth in international transactions may be mitigated by the consumer's limited recourse regarding issues such as credit card abuse and product quality, but this is an issue that transcends the taxation sphere.

Appropriate Tax Rate

Rate determination is simplified through common base definitions and the requirement that states make a concerted effort to alert vendors to rate changes. States are not allowed to have more than one state tax rate, aside from a rate of zero on food products and drugs. A single local rate is allowed for each jurisdiction and this rate must apply to both the sales and use tax.

Tax Ceilings and Floors

Neither caps nor thresholds are allowed on state and local sales and use tax rates. Some limited exceptions apply for items such as automobiles and mobile homes. These exceptions fall generally under the umbrella of administration application of tax as opposed to retailer application of tax.

Assessment, Collection and Remittance

Advances in computer hardware and software technology have greatly facilitated the ability of firms to comply with

³³ For example, an individual could use Digicash to purchase products anonymously online and have the products shipped to a Mailboxes Etc. facility in a low- or no-tax state. The same store could then forward packages to the final consumer in a SSTP state and allow the consumer to avoid sales and use tax. But this intentional act is time consuming, potentially expensive, and represents outright tax fraud.

the differing state sales tax structures. Technology has also influenced the remittance process whereby firms can both file returns and pay their sales and use tax obligations electronically. Electronic fund transfer systems that can be directly linked to a firm's information management system are now commonly used. Rather than mailing a check a couple of weeks after the end of the month to either a lockbox or the revenue department, payment must be sent electronically within days of the end of the period. This eliminates other problems, including float time and bad checks.

The SSTP simplifies compliance by having returns filed and tax remitted only to a state-level entity. Further, the SSTP provides approved mechanisms, including certified software and service providers (discussed previously), that will assign the appropriate tax rate to goods sold in any participating jurisdiction and remit the proper tax to appropriate authorities. The state provides for the appropriate distribution of revenues to local jurisdictions.

Audit Risk in Each Taxing Jurisdiction

The SSUTA provides for the possibility of joint audits across states. These might be done through the Multistate Tax Commission, which currently conducts joint audits for sales and corporate income taxes, through a separate body approved by the Governing Board, or by the states themselves. This aspect of streamlining, however, is largely consistent with current practice. Furthermore, generous amnesty programs have provided audit closure for prior years.

From the states' perspectives, the SSUTA should improve sales and use tax enforcement in a number of ways. First, certified systems for tax assessment, along with reduced rate and base variations, should help diminish the scope of firm reporting errors and improve voluntary compliance. The same systems might also reduce zipper fraud to the extent the certified systems are integrated with the firm's

information management system. Second, information sharing across the states on business taxpayers will improve the ability of individual states to enforce the sales tax through examinations and audits. As noted above, these activities will be important because firms will continue to submit use tax on their own purchases.

Assessment of the SSTP

Technology will play a vital role in making the SSTP a success. To be sure, reaching agreement on a number of important matters such as category definitions and sourcing rules required much effort on behalf of the states and SSTP representatives. But a factor that makes the long-term SSTP success a possibility is the ability to reduce those agreements into a technological solution that is accessible to both large and small retailers and allows them the ability to cost-effectively apply agreed-upon rules to hundreds of thousands of unique products. It would be a practical impossibility to comply with the requirements of the SSTP without modern software and the ability to electronically transmit secure data. The work with TIGERS helps ensure that the approved sales and use tax solutions can be adapted to existing e-commerce software.

Still, the SSTP faces some political challenges to its success. As with any voluntary compact, there are incentives to drop out or deviate from the Agreement. For example, the Governing Board recently ruled that New Jersey, which was previously fully in compliance with the SSTP, was noncompliant. Whether justified or not, such decisions could affect state willingness to participate. Further, the frequent changes that are being made in the Agreement must be enacted by all participating states. States are already becoming reluctant to go along with changes that are being developed by a group that legislators often view as simply state employees rather than as policymakers. A mechanism

must be found to limit the number of changes and the frequency with which the changes are enacted.

Technology has implications for each aspect of a good tax system, including revenues, efficiency, compliance and administration and fairness. Effects on administration and compliance have been discussed above, and some additional concerns are raised below. Vertical and horizontal equity are influenced as the set of potentially taxable transactions and potentially administrable items is altered. Though equity effects are interesting, they are not considered further here.

Compliance and Administration Costs

The states will encounter transitional costs in adopting and implementing the SSUTA. New automated systems will need to be put in place and these systems will need to have the capacity to communicate with the external certified systems as well as with existing internal accounting and information systems. These new technologies will run in tandem with existing systems for those taxpayers who continue to use existing state reporting systems. State departments of revenue will also be involved in the process of verifying boundary databases and taxability matrices. These are actions that must be undertaken with the current system, but under streamlining will occur in a different manner. Presumably the certified providers will be subject to examination and audit, adding to the costs of administering the sales tax. Ultimately, the SSTP should lower administration costs somewhat, but could increase costs during the transition from the existing structure to one where all firms have developed the capabilities to take advantage of benefits offered from the SSTP and where essentially all states are in full compliance.

The detailed findings of the Price-WaterhouseCoopers compliance study (discussed above) offer some important insights regarding the possible compli-

ance cost consequences of the SSTP. First, for both small firms and medium-sized firms, return preparation and documentation of exempt sales were the highest compliance cost categories. Under the SSTP, return preparation will benefit from the automated systems that determine tax liabilities, uniform forms and procedures and the single point of return submission. Importantly, these new procedures preclude the requirement of submitting returns to local taxing jurisdictions. The automated systems, standard forms and greater comparability of bases also will facilitate documentation of exempt sales across jurisdictions.

Finally, small multistate vendors generally encounter disproportionately higher compliance costs because of the relatively high fixed accounting costs associated with penetrating another market state. The SSTP will reduce these costs through various uniformity provisions and the automated systems for tax determination.

Efficiency versus Revenue

This section addresses the efficiency and revenue effects that result from technological advances. The impacts are intertwined, since these effects arise primarily because technology influences the ability to comply with and administer sales taxes. The basic approach is to separate the discussion into analysis of the final goods tax base and of the intermediate goods tax base.

Business to Consumer Sales

States are more likely to tax *services* on an origination basis, using legislation with wording that generally emphasizes where the greatest performance of the service takes place. Further, consistent with origination-basis treatment, states often do not impose use tax on service consumption. The current system is effectively destination based only if all services are produced and consumed in the same

state, but technology likely expands the opportunities for producing services at remote locations, so greater economic distortions from relying on origin taxation of services can be expected. The origination approach means technology offers fewer administration and compliance benefits for tax imposed on services relative to tax imposed on goods. The SSTP seeks to offset the disadvantages of origin taxation by requiring states to use destination sourcing for services but has not defined what this means. Services have received less attention at least in part because there are fewer benefits to states working together given the lesser tendency to include them in the base.

A key issue is whether the SSTP and technology enhance the ability to enforce destination taxation of goods (and at some point services), since, as described below, destination taxation has important efficiency benefits. The presumption in this discussion is that a destination tax can be enforced more effectively with vendor compliance than with voluntary compliance by the buyer, so the issue comes down to whether technology allows better vendor compliance. Presumably technology makes it easier for firms to exploit states' economies remotely but also easier to administer and comply with the tax (as described above). But technology does not alter the Supreme Court imposed nexus restrictions on states, so the increased potential for remote sales means technology reduces the legal capacity to impose a destination tax. On the other hand, anecdotal evidence suggests there is a strong tendency for multi-channel vendors to be dominant players in the market for remote sales (Amazon is obviously an exception), meaning many remote goods and service providers will have nexus by virtue of their bricks and mortar presence. This suggests the physical presence nexus rules limit the ability

to enforce destination taxation less than if single channel firms were more dominant, but it seems unlikely that destination taxation is becoming easier to enforce on net. In any event, either Congressional action or a new Supreme Court ruling that allows states to require remote firms to collect their sales tax is necessary for technology to broadly expand the potential to enforce destination situsing of the sales tax. Compliance methodologies make it easier to require firms to comply on an economic presence basis, but they do nothing to lessen the political factors inhibiting Congressional action. The following discussion investigates the effects that technology has on efficiency and revenues assuming nexus is not a limitation.

Technology's effects on efficiency have two dimensions: those arising from horizontal competition and those arising from taxation of remote goods versus local goods in the same consumer market. This distinction simply means there are implications across multiple jurisdictions and within a single jurisdiction. Previous papers related to e-commerce have primarily focused on the latter, but there is also a growing literature on horizontal competition.³⁴ Technology offers the potential for a more efficient sales tax structure on goods sold to final consumers if it allows states to enforce destination taxation more effectively. In terms of horizontal competition, destination taxation is preferred on efficiency grounds because it lowers the opportunities for horizontal tax competition and tax planning. Mintz and Tulkens (1986) and Kanbur and Keen (1993) both emphasize that tax competition arises from the inability to enforce destination taxation. Of course, the public choice view is that the loss of horizontal competition encourages Leviathan tendencies, and can result in inefficiencies from excessive government. But destination based taxation is also more closely

³⁴ See Bruce, Fox and Murray (2003) and Zodrow (2006).

tied to benefits received and, thus, desirable on public choice grounds.

Destination taxation also enhances states' ability to generate revenue, so there may be no tradeoff between revenues and efficiency. Effectively enforced destination taxation allows states to have maximum control over their tax base and rate because states do not need to worry about base erosion associated with consumers avoiding or evading taxes by purchasing remotely. The tax liability is the same regardless of where items are purchased and base erosion only results from consumers substituting non-taxed goods (or simply reducing consumption) for taxed goods. Thus, greater tax revenues are possible with destination taxation than when horizontal competition can occur. The bottom line is that efficiency losses are greater (smaller) and less (more) revenue is collected if technology reduces (increases) the ability to enforce destination taxation.

Following similar logic, technology reduces efficiency and revenues when services are brought into consideration. Technology presumably enhances the potential for purchasers in states that levy an origination sales tax on services to obtain services remotely from states that levy a lower sales tax rate or are unable to enforce a destination based tax on services, so further base erosion can occur. Thus, the combination of greater ability to sell remotely and origin taxation expands the potential for horizontal tax competition. Every state has an incentive to lower its taxation of services to restrict the loss of economic activity that would arise from services being produced remotely, though the reaction function can be upward sloping, downward sloping or flat (see Mintz and Tulkens (1986)). Further, states' potential to tax is not protected by transportation costs (high transportation costs are a means of enforcing destination taxation, as argued by Kanbur and Keen (1993)), which are presumably near zero for remotely purchased services. Of course,

services are lightly taxed so the magnitude of efficiency and revenue issues is modest under the existing tax structure.

The interaction of sales taxes and technology has implications for efficiency in the taxation of remote goods versus local goods inside a single jurisdiction. Bruce, Fox and Murray (2003) and Zodrow (2006) remind us of the Corlett and Hague (1954) conclusion that in a second-best world taxation of goods that are complementary with leisure increases efficiency. This suggests the differential tax structure that exists today with local goods taxed more effectively than remote goods is preferred if local goods are more complementary with leisure. A Ramsey-type argument may also be applied if items purchased remotely are viewed differently from the otherwise same goods purchased locally. Differential taxation is preferred if the own price elasticities differ, with the current structure preferred if the own price elasticity for local goods is lower than for remotely purchased goods (see Goolsbee and Zittrain (1999)). Recognizing these potential factors, Zodrow simulates the optimal tax rates for local versus remote goods using various parameter values and concludes that uniform taxation of remote and local sales is "much more likely to be desirable." Further, he finds that the case for uniform taxation grows as the high cost of collecting tax on remote sales falls, meaning that technology enhances the case for uniform taxation. Thus, allowing states to move towards destination based and, therefore, more uniform taxation of goods should be efficiency enhancing.

The presumption in the previous discussion is that efficiency gains result from the movement towards destination taxation. In this second-best world it is possible that efficiency gains do not increase linearly with greater ability to enforce destination taxation. Further, the ability to enforce destination taxation will remain limited, even with Congressional

action because purchasers will still have other means to avoid or evade the tax. The effects of technology on the ability of firms to collect the sales tax may be swamped by the increased options for consumers to purchase remotely and to evade the tax, so that destination taxation may be elusive. Consumers can physically cross state borders and take possession of goods in a lower tax jurisdiction or purchase from firms that have de minimus activity in a state (which presumably means they would not be required to collect the tax).

In all likelihood services can be easily sold across national borders and the tax avoided, though the potential for imposition of the VAT by the producing country could overwhelm any sales tax effects. Purchasing goods outside the U.S. to avoid sales taxes is also possible, though transportation costs and customs control may make this a less effective option for many types of transactions. As discussed above, consumers have options such as moving to lower tax jurisdictions or having goods shipped to a zero tax location before being forwarded to the buyer.

Intermediate Transactions

The effects of better enforcement of a destination sales tax on input purchases are equally difficult to discern. Estimates suggest that intermediate inputs represent about 40 percent of the sales tax base (Ring, 1999) and as much as 90 percent of remote purchases and 70 percent of taxable remote transactions (Bruce and Fox, 2004). Purchases of intermediate goods are normally taxable except for two broad sets of exemptions: purchases for resale and items that become component parts of manufactured goods. In addition, states legislate additional exemptions seemingly every year. The sales tax is already

closer to a destination basis on businesses (but an origin basis on the goods they produce) since compliance with the use tax is much better than for consumers, though use tax compliance is weak for businesses as well.³⁵ Presumably, better technology means a somewhat more even tax structure on input purchases because it makes it easier for states to audit firms and reduces the extent to which firms self assess their use tax.

Taxation of intermediate inputs under a consumption tax is usually regarded as inefficient as long as final goods are taxed efficiently, raising the issue of whether better enforcement is preferred for an inefficient tax. But taxation of intermediate goods can improve efficiency in two circumstances: when imposed on industries subject to increasing returns to scale and when imposed in cases where constraints exist on the ability to levy output taxes (see Bruce, Fox, and Murray (2003)). Political and administrative constraints have limited the extent of service taxation, meaning input taxation could be efficiency enhancing if it effectively substitutes for the inability to tax service outputs. Bruce, Fox and Murray (2003) argue that sales taxation of business inputs as it occurs under most state statutes is roughly consistent with greater taxation of industries where final transactions are untaxed, such as many services. Thus, in such a second-best world, more uniform taxation of intermediate transactions is preferred to the extent that their anecdotal guidance is accurate, and technology may have modest benefits for efficiency in the taxation of intermediate transactions.

CONCLUSION

The sales and use tax faces challenges on a number of fronts. Largely untaxed

³⁵ See the State of Washington study at http://dor.wa.gov/Docs/Reports/Compliance_Study/compliance_study_2003.pdf.

services comprise a growing percentage of the economy, and use taxes on remote (e-commerce and mail-order) transactions often go unpaid because vendors without physical presence are not required to collect from individual customers. The SSTP attempts to address the issue of untaxed remote sales using the same technology that in part contributes to the problem and enhances firms' capacities to comply with the tax. Progress so far is promising, but the SSTP still needs Congressional action (or the U.S. Supreme Court reversing its earlier rulings) to reach its goals, and such prospects are uncertain. However, even if the SSTP and technology in general are successful in allowing better sales tax administration and compliance, significant concerns with the sales tax remain that cannot be directly addressed by technology. Existing broad exemptions for most services is still perhaps the dominant issue threatening sales and use tax receipts, and solving that will prove politically and practically difficult, including addressing sourcing issues in the electronic age. Narrowing of the sales tax base through frequent new legislated exemptions remains a major concern. Furthermore, sales and use taxes paid on business inputs cause pyramiding and related economic distortions. Taxing inputs when the output (increasingly services) is untaxed might be a second-best solution in some cases, but the extent of input taxation is much broader and ad hoc. It is clear that there is much scope for reform of sales taxation in the US, and that technology is likely to facilitate—but not guarantee—such reform.

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REFERENCES

- Ainsworth, Richard Thompson.
 "Zappers and Phantom-Ware: A Global Demand for Tax Fraud Technology." BU School of Law Working Paper No. 08-20. Boston, MA: Boston University, June 2, 2008.
- Bird, Richard M.
 "Taxing Electronic Commerce: The End of the Beginning?" *Bulletin for International Fiscal Documentation* 59 ITP No. 0502 (January, 2005): 130-40.
- Bruce, Donald, and William F. Fox.
 "State and Local Sales Tax Revenue Losses from E-commerce: Estimates as of July 2004." *State Tax Notes* 33 No. 7 (August 16, 2004): 511-8.
- Bruce, Donald, William F. Fox, and Matthew N. Murray.
 "To Tax or Not to Tax? The Case of Electronic Commerce." *Contemporary Economic Policy* 21 No. 1 (January, 2003): 25-40.
- Corlett, Wilfred J., and Douglas C. Hague.
 "Complementarity and the Excess Burden of Taxation." *Review of Economic Studies* 21 No. 1 (January, 1953): 21-30.
- Cornia, Gary C., David L. Sjoquist, and Larry C. Waters.
 "Sales and Use Tax Simplification and Voluntary Compliance." *State Tax Notes* 36 No. 13 (June 27, 2005): 989-1009.
- Due, John E., and John L. Mikesell.
Sales Taxation: State and Local Structure and Administration. Washington, D.C.: The Urban Institute Press, 1994.
- Fox, William F., Ransom Gustafson, and Julie Marshall.
 "Revenue Implications of the Streamlined Sales Tax Project in Tennessee." *State Tax Notes* 35 No. 13 (March 28, 2005): 935-51.
- Fox, William F., and Matthew N. Murray.
 "Sales Taxation in a Global Economy." In *Taxing the Hard-to-Tax*, edited by James Alm, Jorge Martinez-Vazquez, and Sally Wallace, 221-4. Amsterdam: Elsevier Press, 2004.
- Goolsbee, Austan, and Jonathan Zittrain.
 "Evaluating the Costs and Benefits of Taxing Internet Commerce." *National Tax Journal* 52 No. 3 (September, 2004): 413-28.

Kanbur, Ravi, and Michael Keen.

“*Jeux Sans Frontières: Tax Competition and Tax Coordination When Countries Differ in Size.*” *American Economic Review* 83 No. 4 (1993): 877–92.

Mintz, Jack, and Henry Tulkens.

“Commodity Tax Competition Between Member States of a Federation: Equilibrium and Efficiency.” *Journal of Public Economics* 29 No. 2 (March, 1986): 133–72.

PriceWaterhouseCoopers and National Economic Consulting.

“Retail Sales Tax Compliance Costs: A National Estimate.” Volume 1, Main Report. Washington, D.C., April 7, 2006.

Ring, Raymond J.

“Consumers’ Share and Producers’ Share of the General Sales Tax.” *National Tax Journal* 52 No. 1 (March, 1999): 81–92.

Zodrow, George R.

“Optimal Commodity Taxation of Traditional and Electronic Commerce.” *National Tax Journal* 59 No. 1 (March, 2006): 7–31.

