SALES TAXES IN AN E-COMMERCE GENERATION[*]

David R. Agrawal and William F. Fox[†]

August 1, 2015

ABSTRACT

Rapid growth in e-commerce has altered the ability of U.S. states to enforce sales taxes on a destination basis. This results in different effective tax rates depending on the way in which goods and services are purchased and the characteristics of both the products and the sellers. We discuss how optimal tax research identifies conditions under which differential tax rates are preferred, but these are unlikely to defend low effective rates on e-commerce. This paper studies how recent technological changes, growth in online shopping and digital products, and decentralization of the commodity tax system might affect whether taxes should be collected at destination or origin. We discuss current institutional structures and analyze various approaches being considered to enforce the destination principle on online and digital purchases in the United States and relate these recent issues to countries utilizing Value Added Taxes.

Keywords: destination taxation, origin taxation, commodity taxes, online shopping, e-commerce, tax competition, digital products

JEL Codes: H2, H7, L81, R5

---

[*] The authors are grateful to Nathan Anderson, Richard Bird, Jeffery Hoopes, and Matthew Murray, for comments on earlier drafts of the paper. The authors are responsible for all remaining errors.

[†] Contact information: Agrawal: University of Kentucky, Martin School of Public Policy and Department of Economics, Lexington, KY 40506-0027. Email: dagrawal@uga.edu. Agrawal is also an Affiliate Member of CESifo. Fox: University of Tennessee Center for Business & Economic Research, 715 Stokely Management Center, Knoxville, Tennessee 37996-0570. Email: BillFox@utk.edu.

I. Introduction

Issues of cross-border shopping and mail order catalogs have long challenged administration of indirect taxes on the basis of the buyer's location (destination taxation).[1] However, rapid growth in online transactions and the expansion of digital products, such as mp3s, place new pressures on subnational transaction taxes that are structured on a destination basis, like state and local retail sales and use taxes in the United States. For example, it is difficult to define the location of consumption and the location of sale for digital products and imperfect enforcement capacity allows many transactions from remote vendors to effectively escape taxation because they are not taxed at origin or destination. Sales taxes are uncommon around the world but new technologies and digital products challenge the design of decentralized commodity taxes in other countries as well. Canada operates a Goods and Services Tax (GST) with federal and provincial rates; Value Added Tax (VAT) rates vary within the European Union; and India and Brazil levy state-level rates through their tax systems. Even highly centralized tax systems are not immune to the pressures of e-commerce. For example, New Zealand's Prime Minister recently indicated that the country is losing significant revenue associated with online and digital transactions and efforts will be made to enhance enforcement.[2]

Enforcement problems for destination based sales taxes are not new, but robust e-commerce growth has heightened attention to the issue and expanded the potential for tax competition, thereby lowering revenue and increasing the locational sensitivity of vendors. On the other hand, Slemrod (2015) observes that technology enhancements may benefit tax authorities. For example, tax authorities can potentially use credit card data for enforcement (see Slemrod et al., 2015). At the same time, of course, businesses can use "zappers" and other

[1] See U.S. Advisory Commission on Intergovernmental Relations (1994).
[2] See "Retailers Back GST for Online Overseas Shopping," *New Zealand Herald*, March 18, 2015.

technologies that randomly delete transactions as a way to reduce sales tax liabilities (Ainsworth, 2008). Little guidance exists for how to solve the e-commerce challenges despite recent trends and technological changes; we aim to fill this gap in the literature.[3]

The economics' literature devotes considerable attention to whether transactions taxes should be levied on a destination or an origination basis (Keen, Lahiri, and Raimondos-Møller, 2002). The destination principle has frequently been chosen in the U.S., but e-commerce and other emerging technologies could ultimately cause this decision to be reconsidered. Existing practices leave governments in the U.S. and European Union (EU) potentially unable to effectively use either origin or destination taxes and can result in an odd combination of both (depending on such things as size of sales) for e-commerce transactions. For example, U.S. states cannot use vendors to enforce destination taxes for cross-state e-commerce transactions when the vendor does not have physical presence in the buyer's state and states must resort to attempts to collect the tax from buyers. The EU collects commodity taxes on a destination basis for digitized transactions, though the ability to enforce a collection responsibility on remote vendors, and particularly those located outside the EU, appears questionable. For remote goods, the tax operates on either a destination or origination basis depending on the size of vendor's sales to a particular country and the characteristic of the good (digital or physical). We study the effects of changes in these regimes – or proposed changes to their enforcement – with an emphasis on optimal tax system design in the United States.

We examine how the rapid growth in e-commerce has exacerbated state and local governments' difficulties in collecting sales taxes on a destination basis, with a particular focus on how current policies and outcomes align with the optimal tax literature and research on the

[3] Goolsbee (2001) discusses the policy implications of electronic commerce.

design of tax systems. In particular we evaluate various recent proposals designed to tax electronic sales based on the buyer's location in terms of an optimal tax systems perspective. We first provide a brief description of e-commerce in the U.S. and discuss institutional features of the sales tax system related to e-commerce. We then examine the relationship between e-commerce and research on optimal tax rules, tax administration and compliance costs, and destination versus origination taxes. In the final section we analyze recent state policy efforts to enforce the sales tax more effectively on a destination basis.

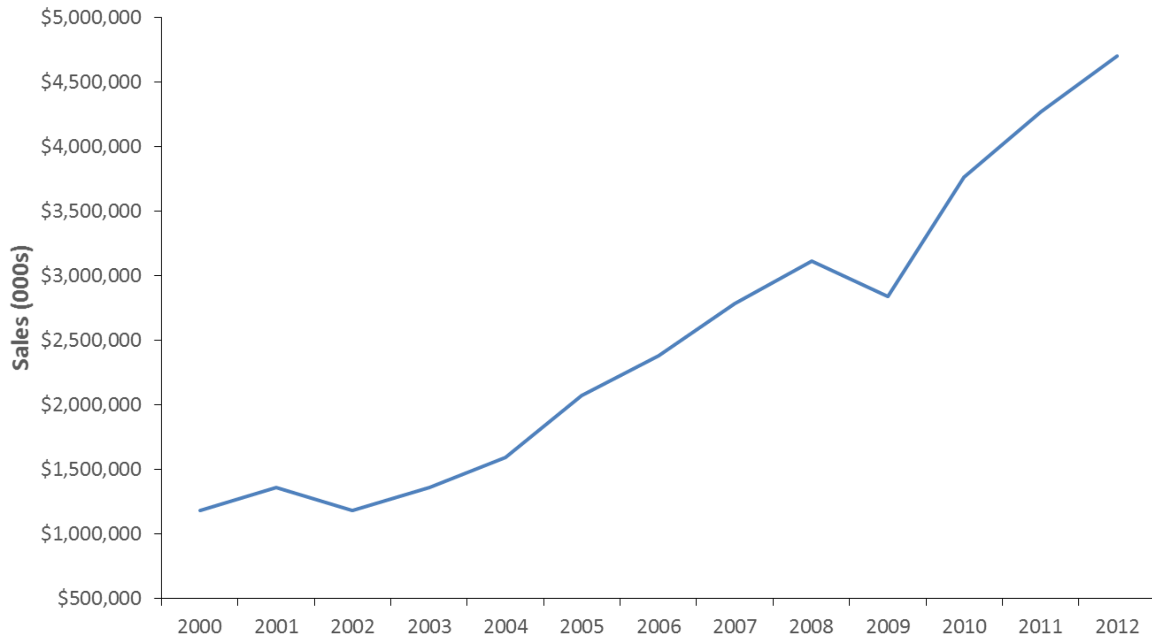
II. E-Commerce in the United States

E-commerce has grown rapidly in the U.S. as it has in many countries. The U.S. Census Bureau reports that e-commerce sales totaled $1.06 trillion in 2000 and grew at a compound annual rate of about 14 percent until 2013 when they reached $5.14 trillion (see Figure 1).[4] Much of e-commerce is intermediate goods sales.[5] About 87 percent of e-commerce sales are made by manufacturers and wholesalers, with retailers and service firms accounting for the rest. Most, but not all, sales by manufacturers and wholesalers are intermediate transactions and some sales by retailers are to other businesses, so intermediate sales probably dominate e-commerce.

---

[4] Authors calculations using data from http://www.census.gov/econ/estats/2013/all2013tables.html
[5] Sales taxes are often imposed on intermediate transactions. See Wildasin (2001) and Bruce, Fox and Luna (2009).

FIGURE 1: U.S. E-Commerce Sales



Source: U.S. Bureau of the Census and Author's calculations

Retail e-commerce now overshadows other remote retail sales, and specifically mail order. E-commerce accounts for 66.9 percent and mail order only 33.1 percent of the $389.4 billion in 2013 remote retail sales. Einav, Knoepfle, Levin and Sundaresan (2014) show that approximately 11 percent of business to consumer e-commerce transactions occurred on eBay while 13 to 19 percent are estimated to have occurred on Amazon.com.

Significant components of e-commerce transactions are subject to the sales tax (almost all purchases that are taxable when bought in bricks and mortar stores and other traditional channels are also taxable when purchased online), and in all likelihood, most of the tax that is due is being collected. Still, estimates are that about $12 billion in sales taxes went uncollected in 2012, and the revenue loss has grown in the intervening years (see Bruce, Fox and Luna, 2009). Although

many transactions occur on tax free-websites,[6] Hortaçsu, Martinez-Jerez, and Douglas (2009) show that a disproportionally high fraction of e-commerce transactions occur between same-city sellers and buyers; when the buyer are seller are located in the same state, the seller has an obligation to remit state and local sales taxes. Buyers also remit some tax. We discuss the potential for non-compliance further below.

Many studies (Goolsbee, 2000; Ballard and Lee, 2007; Ellison and Ellison, 2009; Alm and Melnik, 2010; Goolsbee, Lovenheim, and Slemrod, 2010; Alm and Melnik, 2012) analyze the sensitivity of e-commerce to sales taxation. Although the estimated elasticities vary across the papers, the majority of this literature finds large responses of online transactions to sales taxation suggesting that sales taxes and e-commerce have important economic interactions.

III. Institutions: Sales Taxes in the United States and Comparisons Abroad

Sales taxes are levied by 45 U.S. states and local governments in at least 38 states. Sales taxes were introduced at different times between the 1930s and 1970s and with different legal structures. Some states, such as Hawaii, New Mexico, and Tennessee, impose the tax on firm revenues, though some states explicitly permit, but do not require, the tax to be shifted forward to buyers (Due and Mikesell, 1994). Other states, such as Georgia, levy the tax on buyers' purchases, but with sellers collecting most of the tax from buyers and remitting on their behalf. These differences have some legal importance but do not necessarily alter the tax incidence.

A. State Sales Tax

States differ to a considerable degree in the importance of the sales tax and the specifics of their tax bases and rates, but some generalities can be drawn. Sales taxes are the second

[6] The tax is due but not collected by the vendor.

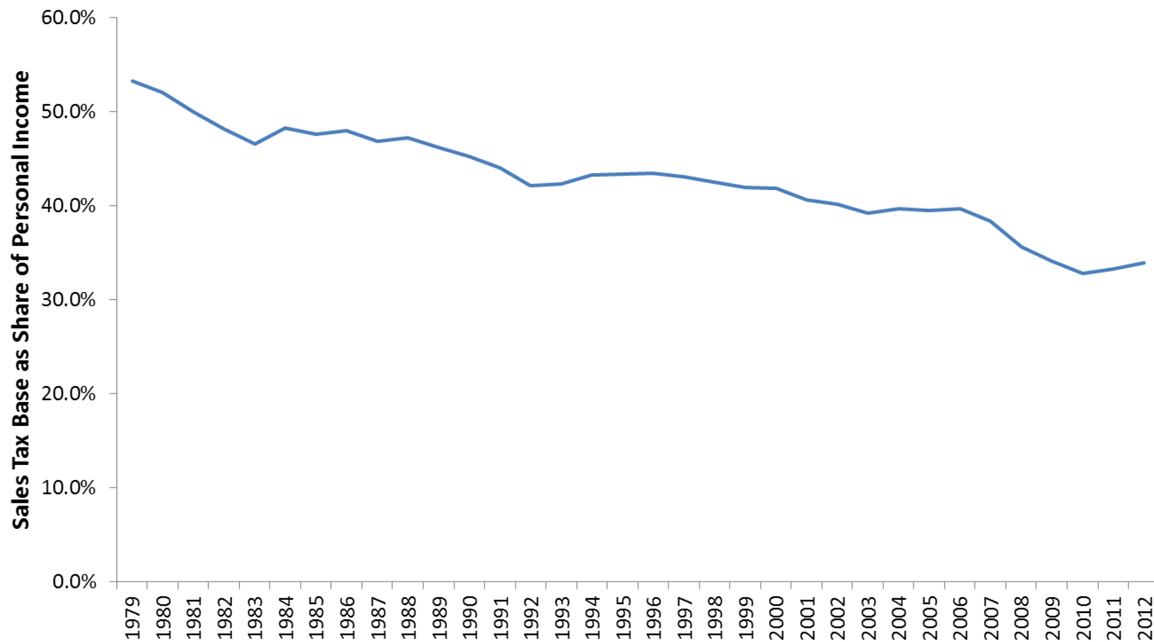
largest U.S. state tax source, providing 31.2 percent of total state tax revenue,[7] and are the second largest local tax source, though generating only 11.3 percent of total local own-source tax revenue. The reliance on sales taxes has varied substantially across time and across states. Differential rates across commodities are relatively uncommon, but differences arise for goods in some states, such as for food, parking, and liquor.[8] Vendors can only be required to remit the sales tax for states where they have the minimum Constitutional presence necessary, referred to as nexus. Nexus is not specifically articulated in the Constitution, but must be inferred. The U.S. Supreme Court established the physical presence requirement in a 1992 ruling (*Quill Corp v. North Dakota* (504 US 298 (1992))). Supreme Court Justice Kennedy recently argued that the decision should be reconsidered (*Direct Marketing Association v. Brohl*, 134 S. Ct. 2901 (U.S. 2014)). We discuss expansive definitions of nexus below.[9]

The aggregate sales tax base across all states has diminished since at least 1979, with large declines during recession years and only partial recovery during expansion years (see Figure 2).[10] The general propensity to tax goods but only a limited set of services is one cause of base erosion (see Fox, 2012). Taxable services in most states do not include the faster growing services, such as health care, other professional services, and contractor services. As goods consumption has risen more slowly than non-taxable services, the base has fallen relative to personal income. State policies to exempt new items, including food in many states, clothing in several states, and tax holidays, are a second cause of eroding sales tax share. Third, rapidly increasing remote sales on which the sales tax is not collected have exacerbated the problem.

---

[7] http://www.taxadmin.org/fta/rate/14taxdis.html
[8] At least 31 states have more than one rate, though usually the non-standard rate applies to a small set of items.
[9] Nexus issues also arise with respect to the corporate income tax (Becker and Fuest, 2012) and movement to destination taxation has been a recent change to corporate income tax policy in the United States (Fox and Yang, 2015). Nexus may have implications for tax enforcement (Stöwhase and Traxler, 2005).
[10] Taxable sales are calculated for each state by dividing sales tax revenues by the standard sales tax rate. Sales tax revenues have been adjusted for some cross state differences in the categorization of taxes (see Mikesell, 2011).

FIGURE 2: Sales Tax Base as Percentage of Personal Income, 1979-2012



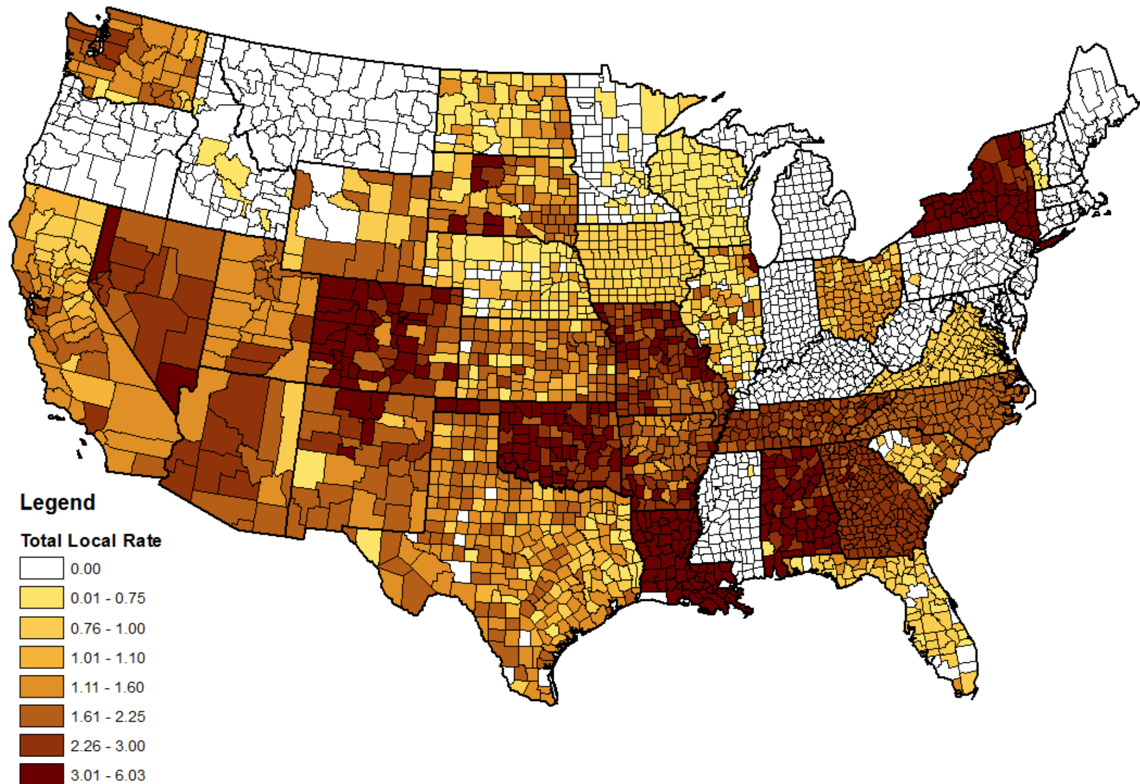
Source: Authors' calculations

B. Local Sales Taxes

Sales taxes are also the second largest *local* tax source, and as with state sales taxes, local reliance varies radically across states. Taxing authority generally comes from the state, but it may be either by Constitution or by statute. Local governments in many states control the local sales tax rate, but in some, such as Virginia, the rate is set by the state for all local governments (although it is not set uniformly). At the other extreme is Louisiana, where local governments control their base, rate and administration. The maximum local rate also differs across states.[11] Figure 3, shows the across county variation in the population weighted combined municipal, county sales, and district sales tax rate.[12]

[11] Some states impose maximum tax rates on their localities, in which case, maxing out by the local governments is common (Luna, Bruce, and Hawkins, 2007).
[12] The tax data are merged to population data by name merging jurisdictions to Census places and counties. Bigger towns are given more weight in line with their population when aggregating up the tax data to the county level.

FIGURE 3: Population Weighted Total Local Tax Rate by County



In some states, the tax base can vary across localities adding substantial complexity to the tax system. Administration of the local sales tax is by the state in some places (Tennessee) and is by local governments in others (Louisiana). Private firms are often hired to administer the tax in places where local governments are responsible for administration. Mikesell (2010) provides a comprehensive survey of local sales tax institutions.[13]

C. Destination Structure

Because Census places do not correspond one-for-one to towns, this introduces some error and, indeed, some counties may show a zero tax rate simply because no town matches occur within that county. See Agrawal (2014) for additional data and a discussion of these possibilities.

[13] Local sales taxes are studied in Burge and Piper (2012), Burge and Rogers (2011), Burge and Rogers (2013), Luna (2003), Luna, Bruce, and Hawkins (2007), Sjoquist, Smith, Walker, and Wallace (2007), and Agrawal (2015b).

Vendors generally collect and remit sales taxes (though this is limited by the physical presence requirement), but two additional tax rules are necessary to move it closer to a tax on consumption at destination. These rules have been in place for decades and generally apply both to sales over e-commerce and through other channels. First, every sales taxing state subsequently enacted a corresponding use tax. Use taxes shift responsibility for tax remittance from the seller to the buyer in cases where the tax was not collected by the seller.[14] Use taxes are even imposed in states where the sales tax is legally on the seller. The use tax[15] is levied when (1) out-of-state purchases are taxable in the destination state, (2) the items are brought into the destination state for use or storage and (3) the sales tax was not paid or was paid at a lower rate in another state.[16] Both households and businesses owe use tax when sales taxes were not collected.

Second, tax is collected at point of purchase when possession is taken place, regardless of residence or where consumption actually occurs.[17] Correspondingly, items are exempt in the origin state when they are shipped out of state by common carrier (the vendor must collect for the destination state if it has taxable presence in the destination state), but they are subject to the use tax in the recipient state. This applies both to items ordered via remote means and when buyers in a store have the item shipped.

Situsing[18] at least some sales on a destination basis is problematic with e-commerce, and strong rules-based administrative efforts could generate new distortions. For example, clearly

[14] Put differently, if use taxes are perfectly enforced and equal to the sales tax rate, then use taxes paid by the consumer on remote transactions will equal the tax paid for an identical purchase from a brick-and-mortar firm in the consumer's home town.
[15] Purchases made via e-commerce are frequently subject to use tax rather than sales tax. Use tax should be collected and remitted by the e-commerce firm in the event it has nexus. Otherwise the buyer is generally required to file a use tax return for all taxable purchases.
[16] Use taxes are also imposed when a firm makes exempt intermediate purchases, such as for resale, but converts the item to a taxable use.
[17] The buyer will pay the tax in the state where possession is taken, but may also owe use tax if the state of use has a higher rate than the state of purchase.
[18] Situsing refers to the place where the sale is located for tax purposes.

defining the places of sale and use for digitized products can be difficult and e-commerce often shifts tax compliance from the vendor to the buyer facilitating tax revenue leakages. Behavioral responses and distortions can be large. For example, buyers have the incentive to self-report receipt in low tax jurisdictions. Destination could be determined by billing address of a credit card, but this is easily evaded with electronic cash and other mechanisms.[19] Such problems are not new to the sales tax, because consumers have long had the incentive to travel across jurisdiction lines to make purchases at lower tax rates or to have goods shipped with no tax included but e-commerce facilitates the evasion.

States differ in how they impose use tax for local governments. As already noted, destination is often presumed to be where possession is taken, so store location often defines destination for local taxes, independent of where buyers live, when the purchases are made over-the-counter (but not when the item is delivered or shipped).[20] In many cases local use taxes arise when goods are purchased from out of state, online or when goods are shipped from one location to another in the state, though exceptions exist. Some states (Illinois, Missouri, and Tennessee for example) do not collect on a destination basis inside the state, but instead collect an origin local tax rate at point of sale even when the goods are shipped from one in-state jurisdiction to another. Presumably origin situsing of local taxes limits compliance costs compared with costs of applying multiple tax rates at destination.

State and local use tax compliance is regarded as extremely weak, particularly for households. States report that very few tax returns are filed and little revenue is collected.

---

[19] Initially shipping goods to a low-tax jurisdiction and reshipping them to evade the tax, causes transportation costs to rise with enforcement (see Fox, Luna, and Schaur, 2014), though this problem will not arise with digitized goods.
[20] The New York Department of Taxation writes, "even though New York State and local sales tax may have been collected where you purchased an item, if the local tax was collected at a rate that is lower than the rate at the location where you live and use the item, you will owe the difference in use tax." See http://www.tax.ny.gov/pubs_and_bulls/tg_bulletins/st/use_tax_for_individuals.htm

Vehicles, boats and planes provide an exception because they must be licensed. Some evasion occurs when buyers plan the location of where to house these licensed items, but this type of evasion is likely modest. A series of random audits conducted by the state of Washington (2010) determined that business compliance with the use tax is the weakest of any state tax imposed on business. Non-compliance is estimated to be 23 percent (compared with one percent for the sales tax), and to be as great for large firms as for small.

State level policies may enhance compliance rates though this area needs further investigation. The 25 or more states that allow individuals to file their use taxes along with their personal income tax returns (perhaps even using a formula to calculate liability) may expand compliance relative to states that require individuals to remit use taxes using separate forms (Manzi, 2012). States also differ in whether they have de minimus exemptions and whether individuals are required to declare zero use tax liability or not. The relationship between state policy and use tax compliance has not been carefully investigated.

In sum, the inability to enforce the use tax successfully on e-commerce and digitized goods likely results in lower effective tax rates than for goods and services purchased locally, even though the same tax rate is generally statutorily levied on similar goods and services regardless of the channel through which they are purchased.

D. Origin and Destination Principle in Europe with Respect to e-Commerce

Countries that have adopted a VAT or Goods and Service Taxes, including those in the European Union, also have expressed concerns about electronic commerce and digital products.[21] Several possibilities arise as to whether the origin or destination principle applies when the supplier and customer are located in different countries within the European Union and

[21] See McLure (2003) for discussion of some VAT related issues in the European Union.

the goods are sent to the customer.[22] The origin principle applies to cross-country sales by smaller firms except for digitized services. However, if sales in a particular member state exceed a threshold (that varies by the destination country) or if the suppliers opt to do so (likely if the firm locates in a very high VAT country), then taxes are assessed on a destination basis. Suppliers of digital services that are located in countries outside of the European Union as well as those inside the EU are expected to assess value added taxes based on the destination principle when they make sales in the EU.[23]

V. State Tax Policy and E-Commerce

With perfect enforcement, the combination of sales and use taxes imposes uniform statutory levies on transactions consummated via e-commerce and via local shopping.[24] Absent perfect enforcement, differences between the taxation of in store and e-commerce sales arise through administrative practices and compliance behavior, meaning preferential treatment for e-commerce occurs because buyers are better able to evade taxes on remote than on in store purchases. Vendor audits are much more common and effective than consumer use tax audits, making the sales tax harder to evade than the use tax. Of course, many retailers operate through multiple channels, so the potential for evasion depends on who the buyer is and where the buyer is located.[25] We proceed by discussing: i) whether identical effective tax rates should be imposed

[22] See the European Commission's discussion of "Mail order and distance purchasing" available at http://ec.europa.eu/taxation_customs/taxation/vat/consumers/mail_order_distance/index_en.htm

[23] Some jurisdictions in the United States have also extended taxing authority to products streamed to businesses and consumers (the so called "cloud tax"). See "Chicago Extends Taxing Power to Online Movies, Music, More," *Chicago Tribune*, July 2, 2015.

[24] This statement is not strictly true since some differences exist as state statutes have been slow in adapting to changing technologies. For example, digitized transactions such as music or video may not be taxable in some states while the tangible version of the same content (CDs, DVDs, etc.) is taxable. Mazerov (2013) summarizes some of these differences. Also, as noted above, local use taxes are not always equal to local sales taxes.

[25] Fox, Luna and Schaur (2014) find that more transactions take place from a greater distance at higher sales tax rates, apparently evidencing the greater capacity for evading the use tax as distance from the destination state rises.

for purchasing the same item via e-commerce versus in local stores,[26] ii) how compliance/administration issues alter optimal tax rules, iii) how e-commerce affects tax competition, and iv) whether destination taxes are preferred to origin taxes.[27]

A. Optimal Tax Rules and E-commerce

Optimal commodity tax rules were developed for different goods, so consideration of efficiency begins with determining whether two otherwise identical goods are different when obtained through dissimilar retail channels. In other words, is a smartphone obtained at a local store the same good as one acquired online, with potentially differing prices, or are they different goods? Using a Gorman-Lancaster characteristics based approach (Gorman, 1980; Lancaster, 1966; Lancaster, 1975; Gillitzer, Kleven, and Slemrod, 2014) goods can be decomposed into their characteristics and a case can be made that the characteristics of a good include the time to receive it, the channel through which it is ordered, location of sale, interaction (or not) with sales clerks and so forth. These diverse characteristics likely vary across commodities, so the similarity between goods obtained through the different channels could fluctuate widely. Different characteristics are surely more important when digitized products (music, books, video, etc.) are compared with physical versions of the products. Alternatively, the means of acquiring goods could be seen as part of the price for the goods that potentially varies across channels (travel costs, time, shipping and handling, and so forth).

When are preferential tax rates for online transactions – perhaps resulting from imperfect enforcement – optimal? The optimal tax literature can be drawn on if the goods are seen as

[26] This section draws from Bruce, Fox and Murray (2003). Also, see Zodrow (2006).

[27] Our focus is distinctly on e-commerce though a literature exists on efficient taxation and cross border shopping (Kessing and Koldert, 2013). For example, Trandel (1992) demonstrates that although enforcement of the destination principle may eliminate "bad" tax competition, the welfare implications of enforcement policies are not as clear cut as the implications for tax rates and revenue. Enforcement of the use tax discourages cross-border shopping and reduces the incentive of firms in the neighboring state to lower their price to attract cross-border shoppers. Thus, enforcement of the use tax might imply higher prices, which can reduce welfare.

different. Optimal tax rules generally do not indicate identical commodity tax rates for either final or intermediate goods, though uniform taxes are optimal under certain conditions (Hatta, 1986). But, it would be coincidental for differences in demand and other characteristics across e-commerce and in store sales to parallel the conditions for differences in optimal tax rates. Effectively, the optimal tax rates would need to vary with the propensity for vendors to have taxable presence in a state and the propensity for the purchaser to have the capacity to and choose to evade the use tax (because these determine the differences in effective tax rates).

The conditions for differing tax rates can be couched in terms of the Ramsey rule. E-commerce should be preferentially taxed if the own-price demand elasticities for e-commerce commodities are higher than for in store goods.[28] The theoretical logic is that taxes on e-commerce have a greater distortionary effect than taxes on in store sales, so a lower tax on e-commerce is necessary to ensure equiproportionate changes in compensated demands. For these differences in elasticities to arise, the characteristics of online goods must be different than in-store goods. Einav, Knoepfle, Levin and Sundaresan (2014, p. 12) estimate the elasticity of online goods to be greater than 1.5 in absolute value for most online commodities and in excess of 4 for electronics. Compared to the most recent estimates of cross-border elasticities – approximately unity (Tosun and Skidmore, 2007) – the responsiveness of online goods seems to be larger. However, such a comparison is likely inappropriate because these elasticities partially capture substitution from one online platform to another and thus cannot be used to directly determine the optimal tax rates for online products; the type of goods being analyzed also differ across the studies.

[28] We are not aware of any empirical evidence on this issue.

Much of the reasoning is that the inability to tax leisure means that efficiency loss is not minimized by taxing all goods uniformly because the substitutability between leisure and various goods differs. The optimal second best tax systems rest on taxing goods that are complementary with leisure more heavily (Slemrod, 1990), so the case for tax-favoring e-commerce must be based on a presumption that e-commerce is more highly substitutable with leisure than in-store sales. Zodrow (2006) demonstrates the somewhat more stringent condition that the case for preferential taxation of e-commerce requires that it yield a net increase in the supply of labor. Zodrow (2006) also finds that preferential rates for e-commerce are harder to justify with equity concerns in the model and when higher income people purchase more heavily via e-commerce.

Similarly, optimal tax rules do not argue for an identical zero tax on all intermediate transactions, but are consistent with differential factor taxes when markets are imperfect or when there are limitations on commodity taxes. Inelastically supplied inputs or inputs used in production with low elasticities of substitution should face the highest rates. Market concentration or output tax limitations could result in higher taxes on inputs purchased through one channel versus another, but it seems very unlikely that market conditions would indicate that inputs purchased in stores should be taxed more heavily on this basis. Further, the case for disparities in taxation for the same input obtained in stores versus e-commerce relies on firms viewing these goods as different so that the elasticities of substitution are altered between them. Presumably, producers are less likely than consumers to have qualitative linkages to how goods are obtained, and generally purchase based on lowest total costs though even businesses may be inclined to think of digitized products as different from physical ones.

B. Optimal Taxation and Compliance and Administration

Several papers (see Kaplow, 1990; Mayshar, 1991; Yitzhaki, 1979) evidence that administration and compliance costs as well as excess burdens should enter decisions of whether and how to tax e-commerce.[29] Difficulties in administering differential rates and the propensity to adopt politically motivated rather than efficiency motivated differential rates enhance the case for uniform rates across remote and brick-and-mortar purchases. Zodrow (2006) finds two conflicting effects from administrative costs. First, the seemingly unexpected result is that higher taxes should be imposed on e-commerce if it entails relatively large administrative costs in order to increase demand for goods where administration is less costly. Second, lower taxes on e-commerce are preferred if it is more substitutable with leisure. Zodrow (2006)'s simulations suggest that the second effect is larger than the first. But, overall Zodrow (2006) concludes that the case is much stronger for uniform taxation than for exemption of e-commerce.

Little empirical evidence exists on the compliance costs associated with requiring all companies to collect the sales tax in every destination state, though some information on compliance costs is provided below. Relatively few new companies should be added in aggregate to the total number of businesses filing returns as most companies are already complying for at least one state. All firms located in at least one of the 45 sales taxing states should be remitting sales taxes (though there is likely some non-reporting) on instate sales and in any other states where they have nexus. So, the added compliance costs for most firms are associated with collecting sales tax for additional states, and not with first time collection.[30] Firms could be

[29] Mayshar (1991) suggests that administration and compliance costs may exceed the excess burdens of taxation, though the analysis is not based on e-commerce and sales taxes. Research has also considered the role of uncertainty and tax evasion in optimal tax decisions. Slemrod and Yitzhaki (1987) observe that optimal administration occurs when the marginal costs of administration equal the marginal reduction in excess burden. In the current context, weak enforcement capacity for use taxes on e-commerce sales could entail high excess burdens and uncertainty.

[30] Only nine firms in the 2012 sample of 293 relatively large firms selling via e-commerce (and often through other channels as well) in a survey used by Bruce, Fox and Luna (2015) do not have a sales tax collection responsibility in any state. The nine firms operate from non-sales taxing states.

required to comply across all 45 sales taxing states if steps were taken to enhance compliance, so a significant increase could occur in the number of states where many firms comply.[31] Some economies of scale might be expected as a firm collects for additional states, but both the bases and rates differ across jurisdictions, which adds to the compliance burden. States can simplify compliance by adopting common practices, returns, filing dates, and so forth. Any agreement in the U.S. Congress that would allow states to require remote vendors to collect the sales tax would probably require simplifications in state sales tax systems, which should lessen the compliance burdens. The discussion about the Streamlined Sales Tax Governing Board below addresses current approaches to limiting compliance costs.

The sales tax is operated separately by each state (and in some cases by local governments), which would need to administer significantly more taxpayers if firms complied in every destination state. On the other hand, greater sales tax compliance should reduce use tax (buyer) compliance to the extent that returns are being filed. So, some compliance and administration offset will result as the role for buyer compliance is significantly lowered. Costs would also fall since the uncertainty of being audited would be reduced for buyers.

Relatively little is known about sales tax compliance costs but some data are available from PriceWaterhouseCoopers (2007), which estimated that sales tax compliance costs were 13.5 percent of tax revenues for small retailers, 5.2 percent for medium retailers, and 2.2 percent for large retailers. Bruce and Fox (2013) find the vast majority of e-commerce firms are small, suggesting significant compliance costs, though firms with over $1 million in sales account for about 57 percent of business-to-consumer e-commerce. PriceWaterhouseCoopers finds that

[31] The data in Bruce, Fox and Luna (2015) include 164 firms with nexus in fewer than 10 states and only 69 firms with nexus in more than 40. Dollars of e-commerce sales and a count of number of states where nexus exists are positively correlated so the current tendency towards nexus in a small number of states would be much larger for the population of e-commerce firms, which would include a much greater concentration of small e-commerce firms.

local sales taxes raise costs further, with one jurisdiction increasing costs by 38.7 percent and two or more adding 70.7 percent. Technology improvements have surely eased the burdens for both administration and compliance during intervening years. Tax compliance software can be purchased and firms may be able to comply at much lower cost today. For example, Amazon.com provides fulfillment services for firms operating on its platform, including sales tax compliance for a relatively low percentage of tax revenues.

Indeed the issue of compliance costs is centrally important to the basis of the *Quill* Supreme Court decision. As a result, Gamage and Heckman (2012) argue that under *Quill*, "a state desiring to subject remote vendors to its use tax should only need to adequately compensate the remote vendors for the compliance and reporting costs thereby imposed." Of course, states generally provide limited vendor compensation under the sales tax, so this would be a significant change from current practice.

The literature has focused on few aspects of how sales tax practice imposes additional costs as it alters the structure of market participants, though early expectations were that companies would organize themselves to avoid a sales tax responsibility (see Fox and Murray, 1997). Compliance costs and excess burdens are incurred as these behavioral changes occur. Bruce, Fox, and Luna (2015) addressed factors leading companies to determine where to create nexus in a state, and found sales tax rates to be less important than market size. Other behavioral responses could take place such as buyers accepting deliveries in a lower tax state rather than their state of residence, companies engaging in entity isolation in attempts to avoid creating nexus (as Amazon did with some of its entities), and so forth.

C. Preferential Tax Regimes and Tax Competition

Issues relating to the preferential taxation of particular mobile factors (Keen, 2001; Bucovetsky and Haufler, 2007; Haupt and Peters, 2005; Janeba and Peters, 1999; Janeba and Smart, 2003) are extensively discussed in the literature on tax competition for capital. The question is how does an effectively lower rate for online commerce affect tax rates when jurisdictions compete with each other for a mobile sales tax base?

When the use tax can be easily evaded, the Internet acts in some ways like a tax haven that may have both positive and negative effects on state and local sales tax rates. The literature studying tax havens is divided on whether the presence of low-tax jurisdictions is parasitic or welfare enhancing. When tax havens are parasitic, elimination of tax havens will improve social welfare in other jurisdictions because they are able to raise tax rates that were previously selected in order to compete with the tax haven for mobile resources (Slemrod and Wilson 2009). However, tax havens may be beneficial when countries are asymmetric because tax havens make it less attractive to compete for mobile factors and their presence may induce low-tax (but not tax haven) countries to become high-tax countries (Johannesen, 2010).

Agrawal (2015a) studies the effects of the Internet on tax competition and tax rates. The Internet is different from tax havens in the sales tax context for two reasons. One, the Internet is not a government and cannot set its own tax rate. Two, tax is collected for online transactions if the seller is an in-state vendor. Agrawal (2015a) shows that when consumers have the choice of buying online, buying from their home town and buying from a neighboring town, the Internet will put downward pressure on tax rates if the online transactions are tax free, and this downward pressure will be most pronounced in larger (bigger population) jurisdictions. If, on the other hand, online transactions are taxable, an increase in Internet usage will raise tax rates in all

jurisdictions because the online firm remits taxes on the basis of the destination principle.[32] The first of these two extreme scenarios dominates in Agrawal's (2015a) empirical research, with a one standard deviation increase in Internet penetration lowering local tax rates by approximately 10 percent of the average rate.[33]

Given the existing evidence, the Internet need not be parasitic and it is not clear that more actively enforcing the destination principle will allow *all* jurisdictions to raise their tax rates especially if other tax-free opportunities exist (perhaps from online vendors abroad).

D. Destination and Origin Taxation

The comparison of origin and destination based tax regimes has long been studied in the public finance literature with an emphasis on deriving conditions (taxes are uniform within a country, all prices are flexible, and factors are supplied inelastically) under which the two regimes are equivalent and have no real effects. Lockwood, de Meza, and Myles (1994) show that these conditions are fairly general under perfect competition and Sinn (1990) considers the welfare effects when equivalence between the two principles fails; de Meza (1994) considers the case of imperfect competition.[34] Given that uniform commodity taxes are not implemented in practice, Lockwood (1993) shows that when taxes are set competitively, neither origin nor destination taxation is superior as the welfare effects depend on the conditions of the model.[35]

---

[32] In reality, some buyers who fail to comply with the use tax will be caught but others will not. However, the model does not have a probability of detection and simply assumes that all online transactions are tax-free or taxable.

[33] In ongoing work, Agrawal and Wildasin (2015) consider a tax competiton model where consumers buy specialized goods from a large jurisdiction with a point of agglomeration (the city) and non-specialized goods which can be purchased anywhere (the city and a small town). In this model, when the specialized good is available online and is taxable, equilibrium taxes rise in the small town and fall in the city. Intuitively, this asymmetry from online shopping arises because the Internet erodes the city's agglomeration advantage.

[34] Lockwood (2001) provides a thorough review of this literature.

[35] For the non-competitive case, Diamond and Mirrlees (1971) suggests that the destination principle is preferred. However, with imperfect competition, Keen and Lahiri (1998) show that the presumption in the literature in favor of the destination principle may be misplaced. Furthermore, Keen, Lahiri, and Raimondos-Møller (2002) evidence that harmonization of taxes may be Pareto improving under the destination principle but is definitely Pareto worsening when the preferences of the countries are identical and taxes are levied under the origin principle.

The origin and destination principle may also have important equity concerns across space. Extending the model of Behrens, Hamilton, Ottaviano, and Thisse (2007), which features internationally mobile firms, Behrens, Hamilton, Ottaviano, and Thisse (2009) show that the origin principle intensifies tax competition and reduces tax revenues relative to the destination principle. However, the origin principle also results in a more spatially equal distribution of economic activity. Intuitively, the switch from the destination to the origin principle provides firms with an incentive to locate in low-tax regions and the effect is amplified by the fact that under the origin principle these lower rates apply for all consumers to which the product is sold (while for the destination principle, the low tax rate only applies to local consumers); this reduces excessive agglomeration. For a federal system such as the United States, how e-commerce transactions are taxed may also have important equity concerns across big cities and smaller municipalities. Thus, the decision of origin versus destination regimes must trade off tax revenue with spatial equality of economic activity and compliance costs of the tax system.

As noted in Keen and Wildasin (2004), the destination principle is usually viewed as superior to the origin principle but this need not be true with non-cooperative tax setting (Lockwood, 1993), imperfect competition (Keen and Lahiri, 1998), and a lack of revenue transfers.[36] Does e-commerce create an additional exception to the standard view that destination taxation is superior? Although origin taxation will eliminate use tax compliance issues by shifting tax remittance on remote sales from consumers to firms, origin taxation could trigger intense tax competition for remote firms. While the distribution of firms may be more equal, tax revenues may be lower under the origin principle (Behrens, Hamilton, Ottaviano, and

[36] Fox and Yang (2015) use the state corporate income tax apportionment formula to demonstrate that movement towards destination taxation enhances economic growth and tax revenues, though the economic effects are concentrated in the manufacturing sector.

Thisse, 2009). However, we agree with Keen and Hellerstein (2010) that the case for destination taxation remains strong on production efficiency grounds and recent reform in the European Union on the taxation of digital products suggests that many policymakers share in this view. Indeed many of the caveats above that make the destination principle less preferred could be better addressed by interjurisdictional transfers and anti-trust policy than by a switch to the origin principle.[37] Tax complexity issues that arise under the destination principle can also be addressed by simplifications to the tax system.[38]

VI. Efforts to Enforce Destination Taxation

Economists have recognized the importance of enforcing destination taxation to reduce "harmful" tax competition for shoppers (Mintz and Tulkens, 1986; Kanbur and Keen, 1993; Hafluer, 1996). Origin based taxes will shift the focus to competition for sellers,[39] which may be more mobile than buyers making zero-tax states more attractive.[40] Policy changes in most states and the EU focus on improving means of enforcing destination taxation, both to raise revenues and to protect in-state retailers. A range of different approaches to enhancing destination taxation through better enforcement have been adopted or proposed in recent years, spurred by rapidly rising e-commerce. These include expanding the definition of nexus, requiring third party information, seeking passage of the Marketplace Fairness Act, encouraging large e-tail firms to

[37] In the presence of fiscal competition, Lockwood (1993) indicates that there are examples when the destination regime is preferred – though this need not always be the case.

[38] One example is the "mini one-stop shop" established in the European Union that we discuss later in the paper.

[39] Bruce, Fox, and Luna (2015) provide evidence that higher sales tax rates reduce the tendency to create nexus in a state, but that size of the market is the most important factor in determining the states where firms choose to locate.

[40] Such a policy in the United States is likely to have many different winners and losers so that it is unlikely such an agreement would take place. Nonetheless, Congressman Bob Goodlatte, Chairman of the U.S. House of Representatives Judiciary Committee, has proposed an origin based tax on online sales. The tax would be collected by the origin state at the origin state's rate, but the revenues would be distributed to the destination state. See for example http://www.taxrates.com/blog/2015/01/15/online-sales-tax-twist-origin-sourcing/

locate within the state or voluntarily remit taxes, and requiring use tax reporting on individual income tax returns. Each of these is briefly discussed below.

A. Do Nothing or Encourage Firms to Locate in State

Large companies like Amazon.com have begun entering into more markets (for example, as of October 2014, Amazon collects sales taxes in 23 states).[41] One reason for this is Amazon believes that consumers place a high value on the time taken to receive the goods. If this characteristic of goods is important, it suggests that remote vendors may find it more profitable to establish physical presence in large states (consistent with Bruce, Fox and Luna, 2015) and states that provide strategic transportation hubs. Under this model, firms would explicitly establish physical presence in more markets over time, which will facilitate tax collection even if the states or federal government do nothing.

Allowing firms to collect tax based only on where they have physical presence has two main disadvantages. First, the strategy of entering into many state markets is likely only profitable for large companies that have sufficient funds to finance the fixed costs of doing so or for companies that are already present in many states by virtue of having a bricks and mortar channel through which they operate. Many small firms will continue collecting for few states (and likely the state where they startup). Second, small states and states that are not on important transportation networks would see very little change. This raises serious concerns for the revenue raising capacity of small states and possibly serious equity concerns.

As an alternative to the explicit passivity of doing nothing, states might create incentives to try to lure e-tail companies to locate in their state. While lowering the sales tax rate might

[41] Amazon is collecting in some of these states because of changes in state laws and in others because of strategic decisions on the part of Amazon. See the article "Which States Make You Pay an Amazon Sales Tax," *Wall Street Journal*, October 1, 2014.

have some effect, other explicit mechanisms exist to target firms – often times specific firms. For example, some companies have lobbied for tax exemptions in exchange for building a site in a particular state. Amazon agreed to build distribution centers in Indiana, California, South Carolina, Tennessee and New Jersey in exchange for delays in the requirement to collect sales taxes. Although this increases taxable transactions in the state in the long-run, it is a form of fiscal competition ("bidding for firms" as in Black and Hoyt (1989)) where states compete for a firm by offering it an incentive to locate there.

B. Nexus Rules

Quill limits states to imposing a collection responsibility on firms that have nexus within the state. Nexus is the minimum contact a firm needs with a state to create taxable presence, but does not have a precise definition. The Supreme Court concluded in 1992 that requiring firms without physical presence to collect the sales tax violated the dormant Commerce Clause as it placed an undue burden on remote firms because of compliance costs associated with managing multiple state and local tax systems. The notion was that a remote firm might be required to collect tax for many states (and possibly thousands of local governments) and could bear higher compliance costs than a local firm that must comply only with the administrative procedures for a single state. The Supreme Court determined that physical presence is a necessary component of nexus for the sales tax, though it did not define physical presence and thus many states have created statutes defining physical presence. Nexus within a state also implies nexus for all local taxes throughout the state.

Many efforts to enforce destination taxation emanate from states defining physical presence broadly. Nexus is clearly created by owning or leasing property in a state, but a number of states have sought much more expansive nexus rules. The presence of employees in a state

(such as salespeople), sometimes for modest periods of time, is presumed to create nexus by some states. Storing goods in a warehouse, shipping in process inventory for further processing or having vehicles in the state establish nexus in many places. More expansive definitions adopted by some states include nexus being established by firms being in the local phone book, having a local phone number or having a local bank account.

Attributional nexus has been the next wave of expansive nexus laws. Attributional nexus arises when states assert nexus over a firm because it has a relationship with another firm that has physical presence in the state. Use of the same trademark or name, such as Walmart and Walmart.com may be an example, with Walmart.com presumed to have nexus because Walmart stores are present. Another example is when nexus is asserted over companies because they use in-state firms to install or maintain the remote firm's product in the state.

"Click-through-nexus" or so called "Amazon Laws" have been enacted in about 20 states. These laws assert nexus over e-commerce companies that have affiliates with nexus in the state that direct sales to the e-commerce firm's website and receive a percentage of the sales price in return. As an example, Amazon might place an online advertisement on Firm Z's website and if Firm Z has physical presence, then Amazon may also have nexus under click-through nexus laws. New York's law has been upheld by the state Supreme Court. An Illinois law was disallowed by the courts, but on procedural grounds and not on the basis of whether click-through-nexus is sufficient to meet the required constitutional minimum.[42] Amazon has reportedly stopped its affiliate relationships in some states that have enacted click-through-nexus.

[42] The ultimate decisions on whether these alternative measures are constitutionally sufficient to create taxable presence can be decided by the courts. However, Gamage and Heckman (2012) note that many of these measures are described as "unconstitutional, ineffective, or both."

In other states, such as Georgia, Amazon.com began collecting sales taxes after initially making threats to pull affiliates.[43]

It is important to remember that the dormant Commerce Clause is also a constraint on states' abilities to define nexus. Only remote vendors with sufficient contacts as defined by federal law and the courts can be required to collect a state's sales tax. Thus, the various expansive definitions of nexus potentially test the boundaries of nexus and are subject to potential review through the courts; the Supreme Court in the *Quill* case recognized this but noted the controversy and confusion associated with making such determinations.[44] Remote vendors can challenge the nexus definitions but this is an expensive and risky endeavor because the court may affirm the definition.

Changes to nexus definitions may also target specific firms without resolving the fundamental issue of tax collection because individuals may simply substitute their purchases to other "tax-free" websites. Using detailed credit card data, Baugh, Ben-David and Park (2014) find that expenditures on Amazon.com fall by 9.5 percent, brick-and-mortar sales increase 2 percent, and competing online retailers' purchases increase 19.8 percent after Amazon Laws go into effect. This result suggests that online purchases of the same product from different websites are likely to be strong substitutes and consumers are more interested in product attributes than characteristics of the vendor. Although these click-through nexus laws trigger small gains for in-state brick-and-mortar sellers, the tax revenue implications for the state are perhaps not as large as expected because of the relatively elastic response to alternative online platforms not captured under the Amazon law. This would be evidence in support of a more

---

[43] Minnesota is an example. See "Amazon dumps Minnesota affiliates to avoid collecting online state sales tax," *Pioneer Press*, June 18, 2013.

[44] We are grateful to Nathan Anderson for emphasizing these points.

consistent way of defining nexus rather than designing a law that targets a particular firm or set of firms.

C. Information Reporting

A few states require information reporting when they cannot require tax collection. With information sharing legislation, the state requires vendors without nexus to provide third party information on the total amount of sales by their customers but do not require the vendor to determine taxability or remit the tax. For example, Amazon agreed to send information to every Tennessee purchaser on the dollar amount of sales during the year and to note that the purchases may be subject to the use tax. Such a policy is designed to reduce the transaction cost for consumers to identify their online purchases for use tax filing and potentially to provide information that the state can use to audit buyers. The agreement lasted for three years until Amazon began collecting the tax on behalf of Tennessee.[45] Colorado's law requires firms that do not collect the sales tax to report the dollar amount of sales to the state revenue department, which can use the third party information during an audit in an effort to identify buyers who may owe use tax. The statute has been challenged in court and one element of the case was recently decided by the U.S. Supreme Court (specifically, whether the case could be heard in a federal as opposed to a state court), in an infrequent consideration of a state tax case by the national court (*Direct Marketing Association v. Brohl*, 134 S. Ct. 2901 (U.S. 2014)).

Information is important for any tax system where evasion is possible. In the Tennessee based system, the information is provided by an unrelated seller to the buyer of the product in order to help with use tax compliance. If non-compliance with the use tax is a result of a lack of

[45] Tennessee and Amazon agreed that the presence of several fulfillment centers would not be used to establish nexus for three years, after which Amazon would begin to collect the tax on Tennessee purchasers. Initial analysis suggests an increase in use tax returns in each month when the emails were sent, but erosion in the number in subsequent months.

information by the taxpayer about their online purchases and whether they need to file use taxes on them, then requiring firms to educate taxpayers by informing them of their purchases can be beneficial to the tax authority.[46] The literature on providing individual income tax information to taxpayers is much larger, but some studies have analyzed information about the use tax. For example, Anderson (2014) had the state of Nebraska randomly mail postcards to taxpayers reminding them about the use tax and providing information on the types of transactions that need to be reported. He finds small positive effects, though ones that are just large enough to cover the full cost of selecting and mailing the postcards. This suggests that when the costs are incurred by the vendor, as in the Tennessee case, the potential exists to increase tax compliance.

In the case of the Colorado law, information is provided to both the tax authority and the consumer. Again, the principle at work here is analogous to the mechanism for the individual income tax system; Paramonova (2014) presents a theory of information reporting. Tax evasion rates for sources of income subject to third-party information reporting are much lower than for sources of income not subject to third-party reporting (Slemrod, 2007). For a given amount of resources allocated to tax audits of use tax returns, third-party reporting would increase the risk of being detected and increase compliance. Naritomi (2014) provides evidence that third-party reporting of receipts facilitates Value Added Tax compliance in Brazil. Under the Value Added Tax, firms report their tax liability to the state; if the firm does not issue a receipt to the customer, no third party reporting exists and the firm might evade some taxes. Sao Paulo Brazil implemented a program, "Nota Fiscal Paulista," that provided consumers with monetary incentives if they asked for a receipt and uploaded it to a website. The program is estimated to

[46] Giving information to taxpayers is common with respect to the individual income tax. For example, the tax authority releases tax instruction booklets to help facilitate tax compliance and accuracy. Taxpayers can also search for a wealth of information online that helps with tax planning (Hoopes, Reck, and Slemrod, 2015).

increase revenue in the retail sectors by 22 percent. In the Brazilian case, the consumer acts as a tax auditor by making sure that a paper trail exists for the tax authority. The Colorado law is similar in that it requires the firm to act as a third-party provider of information, which should increase compliance by consumers.

D. Income Tax Filing

Thirty-eight states levy both a state income tax and a state sales tax. Twenty-five states allow individuals to report their use tax liability on their income tax return. Vermont was the first to provide a line on the income tax return allowing payment of use tax liability. Most recently Illinois and Nebraska began including the line on 2010 returns. Several additional states provide information on use tax liability in their income tax instruction booklet.

According to Manzi (2012), relatively few taxpayers use the income tax return as an opportunity to file their use tax liability, and most simply do not comply with the law. States try a variety of mechanisms to enhance compliance through the income tax return. Some require taxpayers to explicitly indicate "0" liability if a positive value is not reported, some provide tables to look up the liability associated with various estimates on taxable purchases on which the use tax may be due, and some provide compliance education. These efforts have not been studied rigorously, but casual examination suggests they may contribute modest additional revenue and that their effectiveness varies across states.

E. Streamlined Sales Tax Governing Board

In 2000, a group of states began debating the need for destination taxation for remote sales and the best means of enforcing destination tax. The discussions ultimately led to creation of an organization comprised of 24 states labelled the Streamlined Sales Tax Governing Board. The Governing Board has adopted a series of tax structure, compliance, and administrative rules

to which all participating states must conform. The rules include common tax returns, similar definitions of exemptions (though not the same exemptions), a single tax collector for each state, a state-provided database of all local tax rates, and other steps that reduce compliance costs. Some firms have chosen to voluntarily comply with the Governing Board and take advantage of the compliance mechanism. As a result states have accumulated several billion dollars that would otherwise not have been collected. No research has taken place into why firms voluntarily comply through the Governing Board for some states, but the staff report that complying firms have nexus in many member states (generally ones where the firms have most of their sales) and as a result the firms choose to comply in all member states. Voluntary compliance minimizes the chance that the firms could be later determined to have nexus in states for which they were not collecting.

F. Marketplace Fairness Act of 2013

In the ruling *Quill Corp v. North Dakota*, the Court specifically reaffirms that Congress has the authority to legislate what constitutes an undue burden on cross border transactions and can define when a state can impose tax on remote sales (subject to due process considerations). Congress can enact legislation that allows states to require remote firms to remit taxes and the Supreme Court encouraged Congressional action to create a bright line for nexus in the *Quill* decision (and more recently in Justice Kennedy's statements mentioned above). Either federal legislation allowing states to require remote vendors to collect the sales tax or a new U.S. Supreme Court decision reversing the *Quill* case is necessary if states are to require all U.S. firms

selling into the state to collect the sales tax.[47] All other approaches will fall short of requiring broad compliance on the basis of the destination principle.

The U.S. Senate passed the Marketplace Fairness Act of 2013 that would have permitted states to require remote vendors to collect the sales tax on their behalf.[48] The bill is at least the fourth version introduced in Congress in recent years, but is the first to pass the Senate. Under the bill, states would be required to adopt a series of simplifications including, a single state tax rate across various commodities for each state (except for food), common definitions of exemptions, a single sales tax administrator for the state and all local governments within each state, destination sourcing[49] and access to free tax compliance software. All of these simplifications track the Streamlined Sales and Use Tax Agreement and states that are members of the Agreement are assumed to already have undertaken these steps. The intent is to link lower compliance costs to easing of the restriction on requiring remote vendors to collect the tax. The U.S. House of Representatives failed to pass the legislation and it died with the new Congress. Subsequently, the "Remote Transactions Parity Act of 2014" has been written but not introduced for hearings and a new version of the Marketplace Fairness Act, now of 2015, has been written.

Under the Marketplace Fairness Act, firms with less than $1.0 million in U.S. e-commerce sales would be exempt from the collection responsibility; this creates a notch (Slemrod, 2013; Kleven and Waseem, 2013; Sallee and Slemrod, 2012). The Remote Transactions Parity Act of 2014 has a $10 million dollar small seller threshold in the first year,

[47] Given that the states have not made a serious attempt as yet to get the Court to reverse *Quill*, we focus on the enactment of federal legislation. Gamage and Heckman (2012) propose an alternative mechanism to collect taxes consistent with *Quill* by compensating remote vendors.
[48] Hoopes, Thornock and Williams (2015) use stock market returns and find a competitive advantage for e-commerce firms that could be eroded through passage of legislation such as the Marketplace Fairness Act.
[49] Sales are sourced to the location indicated by instructions for delivery, and if these are not available, to the consumer's address or location for payment. The sale is sourced on an origin basis if none of this information is available to source on a destination basis.

$5.0 million in the second year, and $1.0 million in the third year. Most firms' sales fall below the small seller thresholds. Bruce and Fox (2013) estimate that the $1.0 million threshold would exclude millions of small e-commerce firms and leave fewer than 2000 firms subject to the tax. Thresholds on the basis of firm size might also create incentives for firms to bunch on the tax-favored side of the threshold. However, this bunching would likely only be economically meaningful if a significant number of firms are located in the region of the threshold. Given the numbers reported in Bruce and Fox (2013), this seems unlikely to be a concern unless new small firms arise because of a desire by households to purchase goods from smaller firms. However, firms may seek to divide themselves into several informally linked businesses to avoid a collection responsibility (this is prohibited by the law but appears difficult to enforce).

Passage of this law by Congress, if it were to have a much lower small seller exemption, will likely improve tax compliance on online transactions by shifting the burden of tax remittance away from consumers to firms. Of course, how much tax compliance improves likely depends on the willingness of firms to correctly comply with the law. For large vendors that are frequently audited, compliance rates would likely be high, but for smaller vendors subject to the law, simply moving the compliance burden away from the household to the firm need not significantly reduce tax evasion. The empirical evidence in Baugh, Ben-David and Park (2014), suggests that households *may* substitute away from large online vendors subject to the act to smaller vendors not subject to the act. Whether or not these smaller vendors would be profitable or could offer products at competitive prices remains an open question.

The Marketplace Fairness Act requires that a single audit of a remote seller take place for all governments within each state, but says nothing about whether each remote firm could be

subject to audit by all sales taxing states. The need for coordination by the states could be important to limit both compliance and administration costs.

G. Policy Reforms Abroad

Reforms of the origin and destination principle have been addressed and studied in Europe (Genser, Haufler and Sørensesen, 1995; Genser and Haufler, 1996; Keen and Smith, 1996) and in other federal states with decentralized tax systems such as India (Burgess, Howes, and Stern, 1995), Brazil (Mintz, 1992) and Canada (Mintz, 1995; Bird, 2012).[50]

A search of recent newspaper articles discussing online transactions in countries other than the United States demonstrates the concerns that e-commerce raises. Appendix Table 1 evidences that recent surges in e-commerce and digital products have motivated other countries to reconsider their commodity tax structures. Many countries with VAT systems previously required consumers to self-assess taxes on e-commerce transactions; in other countries, e-commerce transactions were exempt if under a certain value. Appendix Table 2 surveys newspaper articles that suggest companies may have reduced both VAT and corporate income tax liabilities by funneling digital products through low-tax rate countries. Thus, prior to the reforms, corporate tax havens (Hines, 2010), such as Luxembourg, provided firms like Amazon with a dual benefit because of the favored VAT rate on items such as e-books.

Many remote transactions occurring within the European Union were previously taxed on the basis of the supplier's location. In 2003, digital suppliers outside of the Union were required to comply with VAT based on the consumer's location, but digital providers such as Amazon

[50] Bird (2012) notes, "Quebec is the only subnational jurisdiction in the world to operate a destination-based VAT." Bird and Gendron (1998) argue that destination based VATs are possible in a federal system and may help alleviate cross-border trade problems when accompanied with a federal VAT. Bird, Mintz and Wilson (2006), Bird (2015), and McLure (2000) discuss implementing a subnational VAT in the United States although local sales tax systems would create substantial challenges (McLure, 2005).

began to cluster in Luxembourg, which has a reduced rate for e-books. Corporate taxes also provided incentives for these companies to locate within Europe. In 2008, the European Union required that the taxes on *digital* products be assessed on the basis of the destination principle for the majority of *digital* transactions occurring *within* the Union. It has been reported that firms like Netflix have begun to change their business model in response.[51]

A main source of opposition to collecting taxes on digital products based on the destination principle was added complexity for firms that would need to comprehend and collect taxes for several nation-states. To overcome this complexity, the EU adopted a "mini one-stop shop" (MOSS) that allows firms to submit a single quarterly return to the tax authority of the country where the supplier is located. This country then redistributes the tax revenue appropriately to other member states of the EU on a destination basis and in accordance with the return filed by the firm. In addition to the simplicity of filing only one return, companies are only required to register for VAT in the home country, which saves on administrative costs.

The policy reform to digital products had winners and losers, with Luxemburg likely the largest loser. However, to be implemented, the proposal required no member states to object. In order to overcome this obstacle, in the short-run Luxemburg is being compensated with relatively large additional redistributive grants.

The lessons of the European Union experience suggest that it is (1) administratively possible to tax digital products based on the destination principle even in a decentralized "federation" and (2) politically feasible if "losing" member states are provided some compensation in the transition to the new regime. Lessons from the European changes and from

[51] The rules for remote sales of non-digital products remain governed based on the origin principle if remote sales to a particular member country are sufficiently small and based on the destination country if sufficiently large.

recent other reform proposals highlighted in Appendix Table 1 may provide evidence on how U.S. policy should respond to recent technological changes facilitating e-commerce.

VII. Conclusion

The digital economy and technological advances that facilitate remote transactions are raising new and important policy questions in federations with decentralized commodity taxation, including the U.S. retail sales taxes and Value Added Taxes and Goods and Service Taxes in some countries. One key issue is whether transactions should be taxed on an origin or destination basis, which has been discussed in the prior economics literature. In the United States, most reforms are aimed at destination taxation and we evaluate various reforms designed to cover electronic transactions on this basis. A second key issue is whether favored effective tax rates should apply to remote e-commerce transactions, and if not, how can enforcement be enhanced if effective tax rates are to equal those on in-store commerce. We examine each of these issues and how they interact with destination taxation. Considerable empirical research is needed before definitive conclusions can be reached, but the strongest case currently is for similar taxes on these two channels of commerce.

Tax collection in multiple states has the potential to create administrative complexities for firms needing to comply with legal statutes in several states. These administrative complexities have been addressed and simplified in the EU for digital products, but the ability to enforce the rules and the effects of the new margins created by the simplifications are yet to be seen. For physical products, the ability to ship remotely creates unique incentives for firms to strategically pick states for which they desire to establish a physical presence.

Digital products, such as mp3s, can lack a place of product origin and a clear place of use because they can be sold through a subsidiary or a headquarters in a low-tax country. Situsing where taxes should be paid and at what rate is an increasing challenge for digitized products regardless of whether countries use origin or destination taxes. As digital products continue to grow, additional issues with regard to the assessment of commodity taxes will also arise.

Rapidly changing technologies may present unforeseen challenges for state and local governments in the coming years. As they do, we hope this paper provides policymakers with guidance on how to approach these new challenges.

References

Agrawal, David R. 2014. "LOST in America: Evidence on Local Sales Taxes from National Panel Data," *Regional Science and Urban Economics*, 49: 147-163.

Agrawal, David R. 2015a. "The Internet as a Tax Haven? The Effect of the Internet on Tax Competition," SSRN Working Paper.

Agrawal, David R. 2015b. "The Tax Gradient: Spatial Aspects of Fiscal Competition," *American Economic Journal: Economic Policy,* 7 (2): 1-29.

Agrawal, David R. and David Wildasin. 2014. "Sales Taxes, Agglomeration, and the Internet." Work in Progress.

Ainsworth, Richard. 2008. "Zappers and Phantom-ware: The Need for Fraud Prevention Technology," *Tax Notes International*, June 23, p. 1017-1029.

Alm, James and Mikhail I. Melnik. 2010. "Do eBay Sellers Comply with State Sales Taxes?" *National Tax Journal*, 63 (2): 215-236.

Alm, James and Mikhail I. Melnik. 2012. "Cross-border Shopping and State Use Tax Liabilities: Evidence from eBay Transactions," *Public Budgeting & Finance*, 32(1): 5-35.

Anderson, John. 2014. "Paying the State Use Tax: Is a 'Nudge' Enough? Working paper.

Ballard, Charles L. and Jaimin Lee. 2007. "Internet Purchases, Cross-border Shopping and Sales Taxes," *National Tax Journal*, 55 (4): 711-725.

Baugh, Brian, Itzhak Ben-David and Hoonsuk Park. 2014. "The Amazon Tax: Empirical Evidence from Amazon and Main Street Retailers," NBER Working Paper.

Becker, Johannes and Clemens Fuest. 2012. "The Nexus of Corporate Income Taxation and Multinational Activity," *FinanzArchiv / Public Finance Analysis*, 68 (2): 1-21.

Behrens, Kristian, Jonathan Hamilton, Gianmarco Ottaviano, and Jacques-Francois Thisse. 2007. "Commodity Tax Harmonization and the Location of Industry," *Journal of International Economics*, 72: 271-291.

Behrens, Kristian, Jonathan Hamilton, Gianmarco Ottaviano, and Jacques-Francois Thisse. 2009. "Commodity Tax Competition and Industry Location under the Destination and Origin Principle," *Regional Science and Urban Economics*, 39: 422-433.

Bird, Richard. 2012. "The GST/HST: Creating an Integrated Sales Tax in Federal Country," *SPP Research Papers*, 5 (12): 1-38.

Bird, Richard M. 2015. "Below the Salt: Decentralizing Value-Added Taxes," in Ehtisham Ahmad and Georgio Brosio (eds.), *Handbook of Multilateral Finance*, Edward Elgar: Cheltenham UK, pp. 291-333.

Bird, Richard M. and Pierre Pascal Gendron. 1998. "Dual VATs and Cross-Border Trade: Two Problems, One Solution?" *International Tax and Public Finance*, 5: 429-442.

Bird, Richard M., Jack M. Mintz, and Thomas A. Wilson. 2006. "Coordinating Federal and Provincial Sales Taxes: Lessons from the Canadian Experience," *National Tax Journal*, 59 (4): 889-903.

Black, Dan A. and William H. Hoyt. 1989. "Bidding for Firms," *American Economic Review*, 79 (5): 1249-1256.

Bruce, Donald, and William F. Fox. 2013. "An Analysis of Internet Sales Taxation and the Small Seller Exception," Office the Advocacy, Small Business Administration, November.

Bruce, Donald, William Fox and LeAnn Luna. 2015. "E-Tailer Sales Tax Nexus and State Tax Policies," forthcoming, *National Tax Journal*.

Bruce, Donald, William Fox and LeAnn Luna. 2009. "State and Local Sales Tax Revenue Losses from E-commerce," *State Tax Notes*, May 18, 2009.

Bruce, Donald, William Fox and Matthew Murray. 2003. "To Tax or Not to Tax: The Case of Electronic Commerce," *Contemporary Economic Policy*, 21: 25-40.

Bucovetsky, Sam and Andreas Haufler. 2007. "Preferential Tax Regimes with Asymmetric Countries," *National Tax Journal*, 60 (4): 789-795.

Burge, Gregory S. and Brian Piper. 2012. "Strategic Fiscal Interdependence: County and Municipal Adoptions of Local Option Sales Taxes," *National Tax Journal*, 65 (2): 387-416.

Burge, Gregory, and Cynthia Rogers. 2011. "Local Option Sales Taxes and Consumer Spending Patterns: Fiscal Interdependence Under Multi-tiered Local Taxation," *Regional Science and Urban Economics*, 41: 46-58.

Burge, Gregory S. and Cynthia Rogers. 2014. "Identifying Leaders and Followers in Models of Local Tax Competition," University of Oklahoma Working Paper.

Burgess, Robin, Stephen Howes, and Nicholas Stern. 1995. "Value-added Tax Options for India," *International Tax and Public Finance*, 2(1): 109-141.

Diamond, Peter A. and James A. Mirrlees. 1971. "Optimal Taxation and Public Production I: Production Efficiency," *American Economic Review*, 61 (1): 8-27.

Due, John F. and John L. Mikesell. 1994. *Sales Taxation: State and Local Structure and Administration*, Second Edition, The Urban Institute Press: Washington DC.

Einav, Liran, Dan Knoepfle, Jonathan Levin, and Neel Sundaresan. 2014. "Sales Taxes and Internet Commerce," *American Economic Review*, 104 (1): 1-26.

Ellison, Glenn and Sara Fisher Ellison. 2009. "Tax Sensitivity and Home State Preferences in Internet Purchasing," *American Economic Journal: Economic Policy*, 1 (2): 53-71.

Fox, William F. 2012. "Sales and Excise Taxes," in Robert Ebel and John E. Petersen (eds.) *Oxford Handbook on State and Local Finance*, Oxford University Press: New York.

Fox, William F., LeAnn Luna, and Georg Schaur. 2014. "Destination Taxation and Evasion: Evidence from U.S. Inter-state Commodity Flows," *Journal of Accounting and Economics*, 57: 43-57.

Fox, William F. and Matthew Murray. 1997. "The Sales Tax and Electronic Commerce: So What's New," *National Tax Journal*, 50(3): 473-492.

Fox, William F. and Zhou Yang. 2015. "Destination Taxation: Road to Economic Success?" Working Paper.

Gamage, David and Devin J. Heckman. 2012. "A Better Way Forward for State Taxation of e-Commerce," *Boston University Law Review* 92: 483-534.

Genser, Bernd and Andreas Haufler. 1996. "Tax Competition, Tax Coordination and Tax Harmonization: The Effects of EMU," *Empirica*, 23 (1): 59-89.

Genser, Bernd, Andreas Haufler, and Peter Birch Sørensesen. 1995. "Indirect Taxation in an Integrated Europe: Is There a Way of Avoiding Trade Distortions without Sacrificing National Tax Autonomy?" *Journal of Economic Integration*, 10 (2): 178-205.

Gillitzer, Christian, Henrik Jacobsen Kleven, and Joel Slemrod. 2014. "A Characteristics Approach to Optimal Taxation: Line Drawing and Tax-Driven Product Innovation." Working Paper.

Goolsbee, Austan. 2000. "In a World Without Borders: The Impact of Taxes on Internet Commerce," *Quarterly Journal of Economics*, 115 (2): 561-576.

Goolsbee, Austan. 2001. "The Implications of Electronic Commerce for Fiscal Policy (and Vice Versa)," *Journal of Economic Perspectives*, 15 (1): 13-24.

Goolsbee, Austan, Michael F. Lovenheim, and Joel Slemrod. 2010. "Playing with Fire: Cigarettes, Taxes and Competition from the Internet," *American Economic Journal: Economic Policy*, 2 (1): 131-154.

Gorman, William M. 1980. "A Possible Procedure for Analysing Quality Differentiation in the Egg Market," *Review of Economic Studies*, 47 (5): 843-856.

Haufler, Andreas. 1996. "Tax Coordination with Different Preferences for Public Goods: Conflict or Harmony of Interest?" *International Tax and Public Finance*, 3 (1): 5-28.

Haupt, Alexander and Wolfgang Peters. 2005. "Restricting Preferential Tax Regimes to Avoid Harmful Tax Competition," *Regional Science and Urban Economics*, 35 (5): 493-507.

Hatta, Tatsuo. 1986. "Welfare Effects of Changing Commodity Tax Rates Towards Uniformity," *Journal of Public Economics*, 29: 99-112.

Hines, James R., Jr. 2010. "Treasure Islands," *Journal of Economic Perspectives*, 24 (4): 103-126.

Hoopes, Jeffrey L., Daniel H. Reck and Joel Slemrod. 2015. "Taxpayer Search for Information: Implication for Rational Attention," *American Economic Journal: Economic Policy*, forthcoming.

Hoopes, Jeffrey L., Jacob R. Thornock and Braden M. Williams. 2015. "Is Use Tax Evasion a Competitive Advantage for E-tailers?" working paper, July 10.

Hortaçsu, Ali F., Asís Martínez-Jerez, and Jason Douglas. 2009. "The Geography of Trade in Online Transactions: Evidence from eBay and MercadoLibre," *American Economic Journal: Microeconomics*, 1 (1): 53-74.

Janeba, Eckhard and Wolfgang Peters. 1999. "Tax Evasion, Tax Competition and the Gains from Nondiscrimination: The Case of Interest Taxation in Europe," *Economic Journal*, 109 (452): 93-101.

Janeba, Eckhard and Michael Smart. 2003. "Is Targeted Tax Competition Less Harmful than Its Remedies?" *International Tax and Public Finance*, 10 (3): 259-280.

Johannesen, Niels. 2010. "Imperfect Tax Competition for Profits, Asymmetric Equilibrium, and Beneficial Tax Havens," *Journal of International Economics*, 81 (2): 253-264.

Kanbur, Ravi and Michael Keen. 1993. "Jeux Sans Frontières: Tax Competition and Tax Coordination When Countries Differ in Size," *The American Economic Review*, 83 (4): 877-892.

Kaplow, Louis. 1990. "Optimal Taxation with Costly Enforcement," *Journal of Public Economics* 43: 221-36.

Keen, Michael. 2001. "Preferential Regimes Can Make Tax Competition Less Harmful," *National Tax Journal*, 54 (4): 757-762.

Keen, Michael and Walter Hellerstein. 2010. "Interjurisdictional Issues in the Design of VAT," *Tax Law Review*, 63 (2): 359-408.

Keen, Michael and Sajal Lahiri. 1998. "The Comparison Between Destination and Origin Principles Under Imperfect Competition," *Journal of International Economics*, 45: 323-350.

Keen, Michael, Sajal Lahiri, and Pascalis Raimondos-Møller. 2002. "Tax Principles and Tax Harmonization Under Imperfect Competition: A Cautionary Example," *European Economic Review*, 46: 1559-1568.

Keen, Michael and Stephen Smith. 1996. "The Future of Value Added Tax in the European Union," *Economic Policy*, 11 (23): 373-420.

Keen, Michael and David Wildasin. 2004. "Pareto-Efficient International Taxation," *American Economic Review*, 94 (1): 259-275.

Kessing, Sebastian and Bernhard Koldert. 2013. "Cross-border Shopping and the Atkinson-Stiglitz Theorem," *International Tax and Public Finance*, 20 (4): 618-630.

Kleven, Henrik and Mazhar Waseem. 2013. "Using Notches to Uncover Optimization Frictions and Structural Elasticities: Theory and Evidence from Pakistan," *Quarterly Journal of Economics* 128: 669-723.

Lancaster, Kelvin J. 1966. "A New Approach to Consumer Theory," *Journal of Political Economy*, 74 (2): 132-157.

Lancaster, Kelvin, J. 1975. "Socially Optimal Product Differentiation," *American Economic Review*, 65 (4): 567-585.

Lockwood, Ben. 1993. "Commodity Tax Competition Under Destination and Origin Principles," *Journal of Public Economics*, 52 (2): 141-162.

Lockwood, Ben. 2001. "Tax Competition and Tax Coordination Under Destination and Origin Principles: A Synthesis," *Journal of Public Economics*, 81: 279-319.

Lockwood, Ben, David de Meza, and Gareth D. Myles. 1994. "When Are Origin and Destination Regimes Equivalent?" *International Tax and Public Finance*, 1: 5-24.

Lopez-Garcia, Miguel-Angel. 1996. "The Origin Principle and the Welfare Gains from Indirect Tax Harmonization," *International Tax and Public Finance*, 3: 83-93.

Luna, LeAnn. 2003. "Local Sales Tax Competition and the Effect on County Governments' Tax Rates and Tax Bases," *Journal of American Taxation Association*, 26 (1): 43-67,

Luna, LeAnn, Donald J. Bruce, and Richard R. Hawkins. 2007. "Maxing Out: An Analysis of Local Option Sales Tax Rate Increases," *National Tax Journal*, LX (1): 45-63.

Manzi, Nina. 2012. "Use Tax Collection on Income Tax Returns in Other States," Policy Brief, Minnesota Department of Representative, Research Department, April.

Mayshar, Joram. 1991. "Taxation with Costly Administration," *Scandinavian Journal of Economics*, 93: 75-88.

Mazerov, Michael. 2013. "States Should Embrace 21st Century Economy by Extending Sales Taxes to Digital Goods and Services," State Tax Notes, 35-52, January 7.

McLure, Charles E. 2000. "Implementing Subnational Value Added Taxes on Internal Trade: The Compensating VAT (CVAT)," *International Tax and Public Finance*, 7 (6): 723-740.

McLure, Charles E. 2003. "The Value Added Tax on Electronic Commerce in the European Union," *International Tax and Public Finance*, 10: 753-762.

McLure, Charles E. 2005. "Coordinating State Sales Taxes with a Federal VAT: Opportunities, Risks and Challenges," *State Tax Notes*, 36 (12).

Mikesell, John L. 2010. "The Contribution of Local Sales and Income Taxes to Fiscal Autonomy," In Ingram, Gregory K. and Yu-Hung Hong (eds.), *Municipal Revenues and Land Policies*, Lincoln Institute of Land Policy.

Mikesell, John. 2011. "State Sales Taxes in 2010: Collections Still in Recession," *State Tax Notes*, June 6.

Mintz, Jack M. 1992. "Tax Assignment and Brazilian Fiscal Reform," Working Paper.

Mintz, Jack M. 1995. "The Business Transfer Tax as a Consumption Tax," *Tax Notes International*, 10(1): 75-86.

Mintz, Jack and Henry Tulkens. 1986. "Commodity Tax Competition Between Member States of a Federation: Equilibrium and Efficiency," *Journal of Public Economics*, 29, 133-172.

Naritomi, Joana. 2014. "Consumers as Tax Auditors," Working Paper.

Paramonova, Yulia. 2014. "The Optimal Deterrence of Tax Evasion: The Trade-off Between Information Reporting and Audits," University of Michigan Working Paper.

PriceWaterhouseCoopers. 2007. "Retail Sales Tax Compliance Costs: A National Study," Joint Cost of Collection Study, June 1.

Sallee, James and Joel Slemrod. 2012. "Car Notches: Strategic Automaker Responses to Fuel Economy Policy," *Journal of Public Economics*, (11-12): 981-999.

Sinn, Hans-Werner. 1990. "Tax Harmonization and Tax Competition in Europe," *European Economic Review*, 34 (2-3): 489-504.

Sjoquist, David L, William Smith, Mary Beth Walker, and Sally Wallace. 2007. "An Analysis of the Time to Adoption of Local Sales Taxes: A Duration Model Approach," *Public Budgeting & Finance*, 27 (1): 20-40.

Slemrod, Joel. 1990. "Optimal Taxation and Optimal Tax Systems," *Journal of Economic Perspectives*, 4: 157-178.

Slemrod, Joel. 2007. "Cheating Ourselves: The Economics of Tax Evasion," *Journal of Economic Perspectives*, 21 (1): 25-48.

Slerod, Joel. 2013. "Buenas Notches: Lines and Notches in Tax System Design," *eJournal of Tax Research*, 11 (3): 259-283.

Slemrod, Joel. 2015. "Tax Administration and Tax Systems," IEB Working Paper 2015/13.

Slemrod, Joel B., Brett Collins, Jeffrey L. Hoopes, Daniel H. Reck, and Michael Sebastiani. 2015. "Does Credit Card Information Reporting Improve Small-Business Tax Compliance," working paper, June 16.

Slemrod, Joel and John D. Wilson. 2009. "Tax Competition with Parasitic Tax Havens," *Journal of Public Economics*, 93 (11-12): 1261-1270.

State of Washington. 2010. "Department of Revenue Compliance Study," Research Report No. 2010-4, August 20.

Tosun, Mehmet S. and Mark L. Skidmore. 2007. "Cross-Border Shopping and the Sales Tax: An Examination of Food Purchases in West Virginia," *The B.E. Journal of Economic Analysis & Policy,* 7(1): 1-18.

Trandel, Gregory. 1992. "Evading the Use Tax on Cross-Border Sales: Pricing and Welfare Effects," *Journal of Public Economics*, 49 (3): 313-331.

U.S. Advisory Commission on Intergovernmental Relations. 1994. "Taxation of Interstate Mail Order Sales: 1994 Estimates," SR-18, May.

Wildasin, David E., 2001. "Sales Taxation in Kentucky: Problems and Prospects," In: Wildasin, David E., Childress, Michael T., Hackbart, Merl, Lynch, Lawrence K., Martie, Charles W. (Eds.), *Financing State and Local Government: Future Challenges and Opportunities*. Kentucky Long Term Policy Research Center, pp. 27–38.

Yitzhaki, Shlomo. 1979. "A Note on Optimal Taxation and Administrative Costs," *American Economic Review* 69 (3): 475-80.

Zodrow, George. 2006. "Optimal Commodity Taxation of Traditional and Electronic Commerce," *National Tax Journal*, 59, 7-31.

Appendix: For Online Publication Only

Table 1: Articles Pertaining to VAT and GST Concerning Online Transactions (Physical and Digital Products)		
Article	Country	Subject
"Tax mulled on Internet purchases," *The Nelson Mail*, March 15, 2015.	New Zealand	-GST is not charge on imported digital products. -Physical goods purchased on line escape the tax if the combined tax and duty is less than $60. -Estimate costs 200 to 300 million in lost revenue. -Government believes tax treatment of digital products is an important issue.
"Retailers back GST for online overseas shopping," *New Zealand Herald*, March 18, 2015.	New Zealand	-Prime Minister plans to increase collection of GST on online purchases. -Collecting the tax on digital products will be easier than for physical products purchased online.
"G20 global tax debate vital for NZ," *New Zealand Herald*, December 4, 2013.	Australia	-Digital economy makes it difficult to determine value added. -Prime Minister designated tax avoidance by digital companies as the subject of the G20 meetings.
"Digital tax increase to take effect in Europe," *The New York Times*, January 1, 2015.	European Union	-Under new rules, taxes of digital services are determined based on where the customer lives rather than the company headquarters. -Important because many digital companies locate in Luxembourg where the VAT is as low as 3 percent for e-books.
"E-books and iTunes to face price hike as EU tax rules enter into force," *EU Observer*, January 2, 2015.	European Union	-Change in EU VAT rules on digital products is an effort to discourage companies like Amazon and Apple from routing digital sales through Luxembourg. -Rule gained support of Luxembourg because they will be paid up to 1.1 billion euros in compensation.
"VAT on digital goods to be levied locally under new EU rules," *The Irish Times*, December 29, 2014.	European Union	-To collect the tax, digital suppliers need only register to their home country that will in turn distribute tax revenue appropriately.
"New VAT rules for online sales," *European Voice*, December 18, 2014.	European Union	-Worry with tax reform was that it would be administratively complex for sellers that would have to deal with multiple VAT regimes. -Thus, adopted the 'mini one-stop shop' (MOSS) procedure that allows for submission of a single quarterly return to the tax office of the home country with tax revenues redistributed to the member states.
"Luxembourg the big loser in EU VAT Reform," Taxamo, *May 7, 2014*.	Luxembour g	-To address possible revenue deficit from tax reform, VAT rate was raised 2 percentage points.

“European VAT: 10 things online sellers need to know about taxes on digital goods and services.” *Forbes*, May 15, 2014.	European Union	-Since 2003, USA firms selling digital products are required to pay VAT on these transactions. -EU tax change of digital products has important implications for USA sellers of digital products, who can no longer set sales subsidiaries.
“VAT loophole on digital sales costs UK more than Olympics,” *The Guardian*, December 3, 2012.	United Kingdom	-UK is losing 1.6 billion pounds per year of tax revenue on digital services. -Goods coming from the Channel Islands are due on import unless they are less than 18 British pounds.
“Gravy-train of Jersey VAT loophole about to be derailed,” Birmingham Post, March 1, 2006.	United Kingdom	-The Channel Islands are in the EU for Customs purposes and outside it for VAT.
“Budget to clamp down on internet VAT dodge,” *The Guardian*, March 11, 2011.	Wales	-New rules debated to eliminate loophole whereby VAT could be avoided on DVDs and CDs shipped via the Channel Islands.
“Tax collectors to set sights on e-commerce operators,” *The Nation*, March 11, 2015	Thailand	-Responsibility of Thai customer to pay VAT on physical products arriving into Thailand. -The same is true for digital products purchased from operators abroad. -Paper books are VAT-exempt, but e-books are not.
“Treasury bids to level e-commerce playing field,” *Business Day*, July 25, 2013.	South Africa	-Law written to compel foreign e-commerce suppliers to register for VAT if they supply goods to South African residents. -Previously, purchasers of e-commerce products were required to self-assess VAT, but compliance rates are very low.
“VAT due on digital products,” *Korea Times*, June 12, 2001.	South Korea	-As early as 2001, South Korea debated requiring foreign e-commerce sellers to register for VAT in South Korea.
“10% VAT in Korea to hit top e-commerce companies on July 1,” *International Tax Review*, March 25, 2015.	South Korea	-Regardless of physical presence, firms selling to South Korea residents are responsible VAT for all transactions.
“Punishment for buying Canadian downloads,” *National Post*, September 25, 2014.	Canada	- Digital downloads of movies escape Canadian taxes if they are from companies like Netflix, but are taxed from Canadian companies. - Canadian taxes on books, movies, and music amounts to $331 million.
“Tax man wants to level the digital playing field,” *The Toronto Star*, January 24, 2015.	Canada	- Proposal is to levy taxes on digital transactions from foreign country which shifts away from the current system of self-reporting by consumers. -Some companies threaten to boycott selling within Canada.

"E-commerce eluding tax net; Ottawa finding it difficult to collect," *The Globe and Mail*, April 4, 2002.	Canada	-e-commerce allows businesses ability to hide transactions through encryption and to move the address of businesses to provinces that are lower.
"Governments want e-commerce levy; Canada and U.S. worry they're losing tax dollars," *Hamilton Spectator*, December 11, 2000.	Canada	-Customs agents can help collect taxes on distant transactions when they cross-Canadian border. -But, more concerning and difficult to enforce are taxes on transactions that cross provincial borders.
"In an increasingly wired world, whose doorbell should the tax man ring?" *Nelson Daily News*, March 20, 2000.	Canada	-Inter-Canadian web sales are large source of provincial revenue losses. -Raises questions for auditors because whether computer servers are physical presence are disputed and servers and Web sites are not always linked to the same nation or province.

Table 2: VAT Locations May Interact with Corporate Tax		
Article	Country	Subject
"Amazon funnels £10bn to tax haven," The Sunday Times, May 26, 2013.	United Kingdom	-"The web-based retailer minimises its British corporation tax by routing sales through Amazon EU SARL, its European headquarters in Luxembourg. This company then pays the British arm a fee to deliver online orders, with profits taxed at Luxembourg's rock-bottom corporation tax rate."
"Amazon expected to revel cash pile of up to $9 bnt after record Christmas," The Guardian, January 27, 2013.	United Kingdom	-Apple and Amazon are reputed to have amassed large amounts of profits in cash havens, questioning whether the transfer prices charged were fair.
"France claims Amazon owes $252 m in tax," The Irish Times, November 14, 2012.	France	-France reports that Amazon and Google have funneled profits through Luxembourg and Ireland.
"Fancy tax break? Try an Irish coffee and a Dutch sandwich," Sunday Independent, November 18, 2012.	Ireland	-Amazon, Google and Starbucks are suspected of funneling profits through tax havens.

"Google and sordid reality of tax avoidance," Daily Mail, April 6, 2012.	United Kingdom	-Online companies such as Google, Facebook, and Amazon reduce corporate tax liability through tax havens. -Article superficially mentions that Amazon also "also uses tax dodges to reduce VAT payments to Her Majesty's Revenue and Customs, with VAT on its e-books payable at the Luxembourg rate of just 3 per cent, rather than the rate here of 20 per cent."