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Working Paper

Taxing Goods and Services in a Digital Era

CESifo Working Paper, No. 8708

Provided in Cooperation with:
Ifo Institute – Leibniz Institute for Economic Research at the University of Munich

Suggested Citation: Agrawal, David R.; Fox, William F. (2020) : Taxing Goods and Services in a Digital Era, CESifo Working Paper, No. 8708, Center for Economic Studies and Ifo Institute (CESifo), Munich

This Version is available at:
https://hdl.handle.net/10419/229526

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CESifo WORKING PAPERS

8708
2020

November 2020

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CESifo

Impressum:

CESifo Working Papers
ISSN 2364-1428 (electronic version)
Publisher and distributor: Munich Society for the Promotion of Economic Research - CESifo GmbH
The international platform of Ludwigs-Maximilians University's Center for Economic Studies and the ifo Institute
Poschingerstr. 5, 81679 Munich, Germany
Telephone +49 (0)89 2180-2740, Telefax +49 (0)89 2180-17845, email office@cesifo.de
Editor: Clemens Fuest
https://www.cesifo.org/en/wp
An electronic version of the paper may be downloaded
· from the SSRN website: www.SSRN.com
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Taxing Goods and Services in a Digital Era

Abstract

Taxing consumption in the digital economy poses unique challenges for fiscal authorities. Recent institutional reforms, such as states changing remittance rules for the sales and use tax following the Supreme Court decision in South Dakota v. Wayfair, were enacted in order to increase tax revenue collections and create a more neutral tax system. Although these reforms induced more remote vendors to remit taxes on a destination basis, the revenue gains were modest, consistent with most large online vendors remitting taxes prior to the reforms. Instead, following the recent large shock to online shopping from the Covid-19 pandemic, the shift to destination-based taxation has redistributed revenues between large and small local jurisdictions. Increased online shopping raises revenue growth in small jurisdictions while contracting revenues in large jurisdictions. But, Wayfair is not the end of the story: technological changes that induce new consumption patterns, promise new challenges for fiscal authorities. Critical challenges for the next decades include limiting administrative and compliance costs of enforcing taxes in a digital world, determining filing thresholds, dealing with online marketplaces and facilitators, and taxing the consumption of digital services from two-sided platforms. With respect to digital services, we discuss whether consumption taxes should be imposed on both monetized platforms and non-monetized platforms such as social media, and the mechanisms for doing so.

JEL-Codes: H200, H700, K300, L800, R500.

Keywords: sales tax, e-commerce, online shopping, enforcement, compliance, South Dakota v. Wayfair, consumption tax, digital services, platforms.

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I. INTRODUCTION

Many classic problems in public finance concern the breadth of the tax base, the scope for tax evasion, administrative and compliance costs, the behavioral responses of firms and individuals, and the equity of the distribution of revenues across local governments. Online shopping and the consumption of digital services, which pose many challenges for fiscal systems around the world, are interesting applications of these classic problems.

Consumption taxes on goods and services such as the value added tax are common around the world. However, the U.S. systems of consumption taxation generally has a narrower base, mainly taxing the retail sales of tangible goods and limited services, though the value added tax (VAT) base falls short of taxing all consumption. Although the retail sales tax in the United States was the largest source of state revenue for decades and the second largest source for local governments, it has stagnated in its revenue raising capability, as recent tax increases were not sufficient to offset the narrowing of the tax base.

In this article, we focus on two critical reasons for the decline of the retail sales tax base: the shift of consumption away from goods towards services and technological change that has spurred online shopping and the creation of new digital services. Relative to the income tax base, the sales tax base is generally smaller: partly because consumption is less than income, but partly because of the historical application of the retail sales tax to tangible goods. Unlike the income tax, where legislators started with a relatively broad base and may shrink it over time through various deductions or exemptions, the sales tax starts with a relatively narrow base that must attempt to keep up with real-time changes in consumption patterns and new types of products. This is a daunting challenge.

Technological change can be a double-edged sword. Technological change that lowers the cost of moving people, factors, and goods, may negatively affect tax systems by heightening tax competition for mobile factors. At the same time, technological change may create opportunities for governments by allowing them to enforce taxes better by using computerized systems and comprehensive digital records.

With respect to the retail sales tax, this is not the first time that states have had to grapple with these issues. Indeed, this is an apt time to review the future of the sales tax given the publication of this article marks the 100th anniversary of a U.S. state introducing a tax resembling the retail sales tax (Hines, 2007). When states first began to adopt general sales taxes in the Great Depression, services represented approximately 25 percent of consumption. Starting in the 1950s, this share – which was previously stagnant – began growing, reaching approximately 50 percent of consumption by 2000 (Buera and Kaboski, 2012). As of 2017, services represent 69% of personal consumption expenditures. Technological change has been critical to the growth of many service sectors such as health care. Despite this rapid growth in services, states generally failed to respond to these technological changes. As services become more important than the

consumption of goods, states attempted to offset the narrowing base by raising rates. Some states expanded the base to include services, but this happened selectively.

More recently, technological change spurring the advent of remote catalog sales and eventually, online purchases, raised new and important issues for state and local governments. For years, states were restricted by a Supreme Court ruling in *Quill Corp v. North Dakota* (preceded by *National Bellas Hess v. Department of Revenue of Illinois*) that only allowed states to require remote vendors to remit sales taxes if the vendor had physical presence in the state. With Congress unwilling to intervene and remote sales growing extensively over time, this substantially eroded the sales tax base in the early days of the internet.[1]

The issue of online shopping highlights the importance of remittance rules in the design of optimal tax systems (Slemrod, 2019). *Quill* effectively designated millions of online shoppers as the remitting party when the vendor did not have presence in the consumer's state. Thus, extremely high administrative costs of tracking these purchases or auditing millions of individual purchases effectively left many online purchases tax-free. In this way, the internet acted as a tax haven that facilitated consumer tax evasion and avoidance strategies, much like cross-border shopping did earlier. However, such a problem is mitigated – although not eliminated – if, instead, large vendors are the remitting parties.

More recently, technological changes to business models and supply chains provided some hope of counteracting declining revenues from e-commerce. Large vendors such as Amazon established physical presence in more and more states to get goods quicker to market, thus triggering the requirement to remit state and local taxes. And more recently, evolving institutions, following the Supreme Court's recent *South Dakota v. Wayfair* decision, now allow states to adopt an economic nexus standard instead of a physical presence standard with respect to tax remittance. In particular, taxation by vendors with economic presence follows the destination principle, meaning that the vendor remits the taxes due to the state and locality where the consumer lives. Indeed, there are many theoretical arguments for taxing consumption on a destination basis. For example, destination-based taxation eliminates competition for mobile cross-border shoppers (Agrawal and Mardan 2019). Moreover, as discussed in McLure (1998) and McLure (1999), destination-based taxes are more likely to reflect the provision of benefits of public services and are less likely to be exported inappropriately to residents of other jurisdictions.

Policy commentators have been overjoyed at states' newfound ability to effectively require remote vendors to remit taxes based on the destination principle. Will the Court ruling open the floodgates, resulting in large gains of tax revenue from previously untaxed online purchases? Given the massive shock to online shopping because of Covid-19, does destination-

[1] Bruce and Fox (2000) estimated sales tax losses of approximately $20 billion by 2003.

based taxation of online sales affect the distribution of sales tax revenue across counties and localities? What are the costs to states and firms of this new economic nexus standard and will the added revenue outweigh the administrative and compliance costs? Given the persistence of institutions and the historical choices of how states define the tax base, does the Court ruling help states address future digitization of consumption via both monetized services and non-monetized services like Netflix, Uber, Airbnb, Facebook, Google, and Twitter?[2] We attempt to answer these questions in this article, while also providing guidance to policymakers for how to proceed for the future of taxing consumption. While the first two questions truly hinge on *Wayfair*, many of the answers to the remaining questions apply even in the absence of the Supreme Court ruling. For this reason, we view the Court ruling as both an impetus to some economic effects, but also a point in calendar time from which we can evaluate the future of consumption taxes going forward. Moreover, the answers to the questions on digital services apply to other countries around the world.

Using data on Tennessee state and local tax revenue and information about remote sales, we first document, following *Wayfair* and adoption of an economic nexus standard, how tax revenues increased from new vendors previously not remitting state and local taxes. This increase in revenue was modest. Newly registered vendors represented 2.5% of local tax revenue. The relatively small increase is likely a result of most large online vendors already remitting state and local taxes, including many apparently on a voluntary basis.

However, the distribution of revenue across counties, which levy local sales taxes in Tennessee, was critically affected by the new economic nexus standard. Consistent with the theoretical evidence in Agrawal and Wildasin (2020), immediately following the economic nexus reform, we document a slight increase in revenue in small counties and either a flat or a declining share of revenue in the largest counties. In part, this is because prior to reforms following *Wayfair*, remote vendors with nexus in Tennessee had the option to remit taxes using a common local rate or on a destination-basis, but needless to say, many vendors elected the former simpler approach for which the formula to distribute the revenues advantaged larger population jurisdictions. Then, following the massive shock resulting from Covid-19, where many households switched to online shopping, tax revenue from the sales tax dramatically grew in small jurisdictions despite the economic downturn, but fell in large jurisdictions. The institutional rules regarding economic nexus were critical for the distributive effects of this massive shock to online shopping on the allocation of revenues across counties.

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[2] The recent GAFA Tax (Google, Amazon, Facebook and Apple Tax) in France attempts to tax sufficiently large companies' income at a flat rate. However, these digital taxes are usually focused on the challenge of taxing corporate income in market countries given international agreements rather than including digital goods and services in consumption tax structures.

The basic intuition is as follows. Theoretically, assuming that the fall in demand was similar across jurisdictions, a shock that increases online shopping implies that rural consumers are no longer driving to jurisdictions with shopping malls and retail agglomerations. Prior to the Covid-19 shock, revenues would have accrued to the town containing the shopping mall. But, with destination-based taxation of online shopping, the tax revenue accrues to the smaller hometown. As an example, consider a resident in a small rural community outside of Tulsa, Oklahoma. Previously, this resident may have driven to shopping malls in Tulsa and its suburbs because their small hometown may not have any big box retailers; tax revenue accrues to Tulsa or its suburbs. During Covid-19, this resident may be more inclined to buy online, which generates tax revenue to the small home community.[3] In this way, *Wayfair* redistributes revenues of taxing goods from large jurisdictions to small jurisdictions. Even in the absence of Covid-19, ignoring the issues of adding services to the tax base, we would have likely seen such a pattern, but it would have been more gradual as consumers continue to gradually switch from shopping malls in relatively large jurisdictions to online shopping as technological change lowers the relative cost of buying online.

The ruling will have important implications on the tax system as a whole. In practice, we show that the *Wayfair* ruling does not significantly broaden the definition of what is in the tax base, but rather changes the remittance rules of the sales and use tax system.[4] By shifting the remitting party to the online vendor, economic nexus lowers administrative (enforcement) costs of raising an equivalent amount of revenue. Rather than needing to audit many small individuals with little hope of detecting online purchases, the government can now audit firms, which raises the cost effectiveness of spending an extra dollar on enforcement. Of course, states may still experience large administrative costs as they seek to audit many small out-of-state firms, depending on the states' compliance thresholds and on the extent of coordination with other states. Even so, the new administrative costs of enforcing the tax code via audits of out-of-state firms are not clear and effective enforcement may require coordination across multiple state governments.

The compliance costs to firms are potentially non-trivial. Although many states have simplified tax systems, some states delegate authority over the tax base and filing responsibilities

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[3] Given the small community has few large-scale shopping opportunities, why does it have a sales tax in the first place? Although small communities are void of big-box retailers, they may have small stores or sales by firms providing non-exportable services.

[4] Even prior to *Wayfair*, online sales of tangible property were subject to taxation. The issue is that for sales from vendors without nexus, the remitting party was the consumer who was legally obliged to remit consumer use taxes, but tax evasion on these purchases was rampant. In this way, *Wayfair* simply changes who remits the tax and facilitates government enforcement of taxes on the same taxable base.

to municipalities. This was presumably, part of the reason why sufficiently small firms were exempt from the tax. Moreover, the tax authority must be cognizant that added enforcement may yield modest success (Johannesen, Langetieg, Reck, Risch, and Slemrod, 2020). In particular, the shift of the remitting party to the vendor may induce new evasion or avoidance strategies: firms may attempt to bunch under the economic nexus filing threshold, firms may use multiple platforms and marketplaces to conceal sales or firms may just hope that enforcement is not yet established and simply evade taxes. We discuss the effect of the ruling from a compliance costs and administrative cost perspective.

Finally, we discuss the future of the sales tax in the context of continued technological changes. As consumption continues to shift toward services, the sales tax becomes less effective at raising revenue. Path dependence and slow moving institutions have often led states to only incrementally expand the tax base to services. But this is not only a problem for the sales tax, as many value added taxes often do not tax some major service sectors. The shift towards the consumption of services is increasingly to platform-based technologies. The taxation of digital services raises interesting challenges for policymakers, especially when the consumption services provided by platforms are non-monetized. In some cases, these services, such as Netflix or Uber, are not currently taxed in some states relative to more traditional services such as cable television or taxicabs subject to the retail sales tax. Furthermore, many platforms, especially social media firms, raise a majority of revenue through the sale of advertising with consumption of the service being unpriced to the consumer. We discuss the arguments for expanding the sales tax to include these types of consumption, emphasizing efficiency arguments. Regardless, finding ways to broaden the base, not only selectively, will be critical for the future of the tax.

Although the retail sales tax has stagnated as a source of revenue in recent years, the *Wayfair* decision provides opportunities for states to begin long-overdue reforms. Many economists and policymakers see consumption taxation as a desirable policy goal. Given the U.S. lacks a broad-based federal tax on consumption, the existing state and local retail sales taxes provide a means to tax consumption. But, to be successful, these states must look beyond the economic nexus reforms recently passed in almost every state. In many ways, *Wayfair* and the resulting state reforms may have been too late. But, as we discuss, with appropriate and comprehensive reforms, the sales tax can be an important tax for the next one hundred years and not just a legacy of the last century.

To summarize, the *Wayfair* ruling has only modest implications for the design of sales tax structures, as it only affects the ability to enforce taxation on a particular set of goods. *Wayfair* lowers compliance costs and makes destination-based taxation more feasible, so it has already had significant impact on sales tax practice. However, we caution against viewing *Wayfair* as settling issues with respect to the base erosion of the sales tax. Traditional goals of tax design, including neutrality, fairness, efficiency, and low compliance and administration costs, should still be employed to determine the sales tax's breadth. Some resulting specific policy counsel for the sales tax includes: a) the tax should be levied against a broad consumption

base, b) the tax should generally be levied on final and not intermediate transactions, c) the channel or the form through which consumption is obtained should be irrelevant to taxability unless compliance or administrative costs are excessive for some channels, and d) the tax should be levied on a destination basis.

II. BRIEF HISTORY

In this section, we discuss the history of retail sales taxation in the United States, including recent Court decisions that have influenced the design of the tax system.

A. Background to Sales Taxation

As already previewed in the introduction, state sales taxes were the largest source of state tax revenues for decades, but the tax has eroded as a share of both GDP and total state tax revenues over the past 15 years (Figure 1). The sales tax's revenue share stabilized between 1995-2005 and was first surpassed by the personal income tax in 1997. Frequent sales tax rate increases since the 1970s maintained the sales tax share for many years but ultimately the rate increases were not sufficient to offset narrowing of the base. Personal income taxes have mostly lowered the share of revenue from unit based selective sales taxes on tobacco products, alcohol and motor fuels, which have not seen nearly enough quantity growth to sustain their revenue share in light of infrequent rate hikes. In total, the income tax share of state revenues has nearly doubled over the past 50 years while the sales tax share has remained approximately constant.

Inability to enforce the sales tax effectively on remote sales has been an important reason that the sales tax has declined in importance recently. As buyers shifted many in-store purchases to online vendors, tax collection was often complicated and not enforced.[5] Other factors include the propensity of sales taxes to be levied more broadly on goods than services, as the latter have grown much more rapidly as a share of the economy (health care, for example, has grown from 5 percent of GDP in 1960 to 12 percent in 1990 and 18 percent in 2018). Table 1 shows the growth in services as a share of total expenditures. State decisions to exempt items, such as food at home, and to implement tax holidays, have further eroded the base. In addition, states' slow response to taxing new technologies, new goods, and consumption via new distribution channels has the same effect as exempting certain items from tax. Other taxes' bases, such as the personal income tax, are often broad enough and structured in a way that accommodates emerging technologies, but the sales tax's historical structure limits its ability to stay current. This is discussed in more detail below.

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[5] See Fox (2016) for further discussion of sales tax growth over time.

B. Online Shopping

As is well known, e-commerce has grown substantially over the last decade, rising to 10 percent of total retail trade. In particular, sales from e-commerce retailers amounted to approximately $520 billion in 2019, relative to total retail sales of $5,270 billion. Given retail sales are the bulk of the base for the sales taxes in the United States, the growth in online shopping created many concerns for state and local governments as the internet facilitated tax avoidance. These concerns were heightened by numerous studies showing that online shopping patterns are sensitive to the tax treatment of brick-and-mortar purchases relative to online purchases (Ballard and Lee, 2007; Baugh, Ben-David and Park, 2018; Einav, Knoepfle, Levin and Sundaresan, 2014; Ellison and Ellison, 2009; Goolsbee, 2000; Goolsbee, Lovenheim, and Slemrod, 2010).

C. The Influence of the Court: *Quill* and *Wayfair*

A critical element of the U.S. sales tax system is the remittance rules that govern whether firms or buyers remit taxes to the government. From an enforcement perspective, requiring vendors to remit the tax is more effective than requiring many consumers to remit the tax. A series of judicial decisions shaped these remittance rules and initially limited states abilities to enforce tax compliance in the online era.

Quill Corp. v. North Dakota[6] required that firms have physical presence in a state before they could be compelled to remit the state's sales tax.[7] This ruling effectively meant that each consumer must remit taxes on online sales when the online vendor did not have physical presence in the state. Under this regime, states were reliant on consumers remitting use taxes rather than vendor compliance to collect tax on many remote transactions. Individual compliance with the use tax is widely believed to be very poor, at least in part because little if any auditing of individual use tax returns takes place. Business use tax compliance is also weak, though some auditing occurs in this case. For example, with respect to businesses, Smith (2018) finds 14.9 percent non-compliance with the Washington State use tax compared with 0.9 percent for the sales tax. Still, Smith (2018) found much better business use tax compliance than in earlier studies conducted over the previous several decades by Washington.

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[6] *Quill Corp. v. North Dakota*, 504 U.S. 298 (1992). Technically, the physical presence requirement was established *National Bellas Hess, Inc. v. Department of Revenue*, and *Quill* simply reiterated the holding. Several justices concurred solely based on the doctrine of *stare decisis.*

[7] See Stark (2021) for detailed discussion of previous and current Supreme Court rulings on states' ability to enforce compliance responsibilities on remote firms.

Over time, many states were aggressive in defining physical presence (see Agrawal and Fox, 2017), but the earlier *Quill* decision hampered and delayed enforcement and resulted in significant base erosion. The potential for revenue losses in the *Quill* era was mitigated by evolving business practices and supply chains, whereby large online vendors established physical presence in many states in order to get goods to consumers quickly. Thus, in the average state by 2012, more than half of the sales from the 300 largest online vendors had the tax remitted (Bruce, Fox and Luna, 2015).

South Dakota v. Wayfair[8] offers the opportunity to reverse some of the base erosion resulting from rampant tax evasion of the use tax on online purchases by enhancing states' ability to collect sales taxes on remote transactions. The *Wayfair* decision reversed the physical presence requirement by allowing states to determine nexus based an economic rather than physical presence. While the Court did not provide a definitive statement on what triggers economic nexus, it is widely recognized that an online vendor must have a significant number of transactions or a significant amount of sales into a state. Effectively, *Wayfair* altered states' ability to compel compliance, which significantly improves the ability to enforce tax on a destination basis.

D. State Reactions to *Wayfair*

States responded very rapidly to *Wayfair*, with some passing legislation prior to the Supreme Court decision (see Table 2).[9] Given the opportunity offered by *Wayfair*, all states except Florida and Missouri enacted legislation requiring remote firms to remit the sales tax.[10] The effective dates ranged from in 2018 to Texas in October 2020. States generally exempt firms with a sufficiently small number of transactions or value of sales into the state. [11] State collection thresholds range from $100,000 to $500,000, with Kansas saying that no threshold may apply. Many states also have a threshold for the number of transactions, which can operate with either both thresholds required or either being sufficient to trigger remittance responsibility for the vendor. The quantity and dollar valued thresholds allows two different views of what it means to exploit a state's economy, but they are simply measurable standards and not theoretically derived

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[8] South Dakota v. Wayfair, Inc., 585 U.S. ___ (2018).

[9] Alabama and Tennessee were among other states that faced court challenged during the same period as the *South Dakota v. Wayfair* case.

[10] See also Afonso (2019) and Mikesell and Ross (2019) for a discussion of state reforms and the role of the use tax after *Wayfair*.

[11] Most states, such as Wisconsin, have a requirement of either the dollar or the transactions threshold, but New York requires both thresholds to be met.

measures of presence. States continue to develop their economic nexus legislation. For example, several states, including Tennessee, have already lowered their dollar threshold and several have eliminated their transaction threshold.

Recently, states have also begun to enact reforms related to the remittance rules with respect to online marketplace facilitators. [12] A marketplace facilitator is defined as a marketplace that contracts with third party sellers to promote their sale of physical property, digital goods, and services through the marketplace. Digital Commerce 360 reports $552 billion in marketplace sales in 2019. Following Pennsylvania, Rhode Island, and Washington in 2018, at least 42 states have legislation requiring marketplace facilitators to collect taxes on behalf of individual firms. Marketplace facilitator laws "require third-party marketplace platforms that advertise or sell goods on behalf of others (marketplace sellers) to collect and remit tax on behalf of marketplace sellers" (Kranz, 2020). These laws shift marketplace facilitators from having the option to collect tax for third parties operating on their site to being required to collect for them.[13] Marketplace facilitator laws lessen state problems of identifying individual sellers and potentially reduce the number of tax returns. As with economic nexus laws, state statutes vary widely and are often very general, leaving the implementation details to revenue departments. Many states are still developing the details of how the laws will operate and many challenges likely remain unforeseen. Firms have a number of concerns, such as how the tax on product returns is treated, the liability that facilitators have for determining tax on many detailed goods and services that are sold by others, and whether local governments will enact their own facilitator legislation. It also remains uncertain as to which taxes, in addition to the sales tax, that facilitators must collect.

E. Technological Change and the Future

Broadening the sales tax base to include emerging technologies and goods is the sales tax's challenge for the future. The accelerating speed with which new channels for delivering services develop, new products are created, and the pace at which users adopt them pressure states to modernize or restructure their tax systems. States must respond by accelerating their modernization pace given rapidly changing business and consumer behavior. Unless the structure evolves with the economy, the sales tax will continue eroding and burdening traditional consumption relative to new alternatives.

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[12] Much of this paragraph draws from Kranz (2020).

[13] Firms such as Amazon and Walmart were already required to collect and remit taxes on transactions on their own account.

Autonomous vehicles are one example of new technologies and changing channels for meeting consumer tastes. Fox (2020)[14] discusses how development of autonomous vehicles could reduce state transportation tax revenues by around 60 percent in a number of states, given the interaction between electric autonomous vehicles and existing state tax structures. Loss of fuel tax revenue explains much of the decline as vehicles are increasingly electric, but reduced sales tax on selected taxable vehicle services and vehicle sales may be even larger as the number of vehicles falls. Fox (2020) argues that dedicated companies (such as Uber or Lyft) are likely the providers of mobility in the future and transportation services should be taxed rather than various transportation inputs, such as the vehicles.[15] The sales tax is one instrument that could be used for this purpose, though the service is unlikely to be automatically accommodated within most states existing statutes. Other examples of new technologies include, for example, digital services such as streaming services, social networking platforms, and cloud storage spaces.[16] An interesting distinction that perhaps influences the political feasibility of tax base reforms is whether the new technology replaces other physical goods that were previously taxed versus new technologies that are completely new consumption goods. In the former case, including the new technologies in the tax base compensates for lost revenue due to product substitution, while the latter case expands the set of products that is taxable.

Historically, most state sales taxes were created as taxes on tangible personal property, which limit the breadth of the tax base and require services and some new goods to be separately articulated in state tax law as they develop. Gross receipts based sales taxes levied in some states, such as in Hawaii, do not suffer from this weakness to the same extent. Similarly, a value added tax often does not require legislative action as new goods and services are created unless particular types of sales fall under previously exempted or zero-rated categories. Income tax bases are generally structured much more broadly and include new forms of income.[17] The challenge with the sales tax is that legislative action is likely needed in most states to effectuate the base expansions. History is not encouraging. The 1986 Florida base expansion experience[18]

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[14] Also, see Fisher (2020) and Clark (2020) for discussion of autonomous vehicles.

[15] Other options for replacing lost vehicle taxes include a gross receipts tax on transportation services and vehicle miles travelled fees.

[16] In the presence of lines that delineate high-tax and low-tax products, technological change can facilitate tax-driven product innovation as new products are developed to avoid the higher tax rate (Gillitzer, Kleven, and Slemrod 2017). But, often time, new products are not developed for tax avoidance reasons.

[17] Carried interest is an exception which is characterized as capital income when it is better described as labor income.

[18] See, Hellerstein (1988) for discussion of the experience.

and paucity of sales tax base expansions despite widespread discussion,[19] suggest that states will remain slow in responding. The result will be a tax system that relatively penalizes traditional commerce (particularly goods consumption) and benefits emerging goods and technologies. Obviously, this raise numerous efficiency issues, especially if the physical goods are close substitutes with the new digital services.

Later in the paper, we discuss several potential remedies that tackle issues related to the consumption taxation of multi-sided platforms. But more generally, legislative remedies must either substantially expand the definition of the sales tax base in ways that include emerging technologies or states must enact piecemeal expansions. Historical efforts to significantly broaden the base have generally failed, offering limited hope that states will seek broad solutions.

III. EVIDENCE ON THE REVENUE EFFECTS OF *WAYFAIR*

In this section, we study the tax revenue effects of the *Wayfair* decision. We focus on one state, Tennessee, for several reasons. First, Tennessee publicly releases monthly revenue data at both the state and local level. Second, we have obtained information on tax revenues remitted by remote vendors – data not readily available in most other states. To study the revenue effects, we collect monthly data on tax revenues at the state and local level.

A. A Case Study of the Institutional Reforms in Tennessee

Prior to the passage of economic nexus rules in Tennessee, remote vendors that were remitting taxes had a choice over how to remit local taxes. Historically, remote vendors could elect to remit county taxes based on the consumer's destination or remote vendors with no physical presence in Tennessee were able to apply a uniform 2.25% local option sales tax rate. Under the latter approach, the vendor did not need to keep track of local sales tax rates or situs sales in local jurisdictions and instead could remit the state rate plus the uniform local rate. Then, any local taxes from out-of-state dealers not using destination sourcing were distributed to counties based upon the ratio of local tax collections in the county over total local tax collections in all counties. Unlike most other states, Tennessee applies an origin sourcing rule for intrastate e-commerce sales, even if the purchase is delivered to a home address.

The timeline of events in Tennessee was as follows. In October 2016, Sales and Used Tax Rule 1320-05-01-.129 Subparagraph 2 – informally, Rule 129(2) – was proposed by the Tennessee Department of Revenue. This rule, similar to South Dakota's law said that remote vendors with more than $500,000 of sales to consumers in the state have nexus for sales and use

[19] See Fox and Murray (1988) for an early discussion of the case for sales taxing services.

tax purposes. The Rule states that by March 2017, these vendors should register with the state and begin remitting taxes starting on July 1, 2017. As with South Dakota's law, this was met with legal challenges. More problematic, the Tennessee state government enacted Public Charter 452 in May 2017, which prohibited the Department of Revenue from collecting taxes under the rule even if permitted under a court ruling until Rule 129(2) was approved by the legislature. The Wayfair ruling was handed down in June 2018. Then, the state passed Public Chapter 429 in May 2019. This authorized the Department of Revenue to begin enforcing Rule 129(2) to collect sales tax from remote vendors without physical presence but who have more than $500,000 of sales into the state of Tennessee. Firms that met Tennessee's threshold by July 31, 2019 were expected to begin collecting sales taxes no later than October 1, 2019.

Although Public Chapter 429 allowed for collection from remote vendors without physical presence, these vendors still had the ability to use the uniform local tax rate option. Public Chapter 491, which was effective October 1, 2019, required these remote vendors to apply and remit the specific local sales tax rate in the city or county to which the good was delivered. After October 2019, any local taxes from out-of-state dealers not using destination sourcing will be based upon the local tax collections in the county from dealers with no location in the state that can be identified by situs over the total local tax collections in all counties from dealers with no location in the state that can be identified by situs. However, this formula should apply to very little revenue because the vendors are required to remit at destination and the formula would only be applied if the vendor did not provide sufficient information with respect to destination-sourcing. Note that the effective date of Public Chapter 491 is the same as the date as when firms were expected to first begin collecting taxes under Public Chapter 429. Thus, although we will reference Public Chapter 491 as the October date for simplicity, all our empirical results should be interpreted as the joint effect of both laws.

B. The Amount of Tax Revenue from Remote Vendors Following Economic Nexus Reforms

Against this backdrop, we study the effect of these events on tax revenue. As background, for fiscal year 2017-2018, the Tennessee state sales tax raised $8.9 billion and local taxes in the state collected $2.6 billion. Thus, in the fiscal year prior to the June 2018 Court decision, the state collected on average $741 million per month and local governments collected $217 million per month.

It is often difficult to evaluate the revenue impacts of nexus rules because states do not publicly release data on revenue collected from remote vendors specifically. However, the state of Tennessee provided us access to two unique data series. The first represents the revenue remitted by remote vendors without a physical presence in the state of Tennessee. Because the data only cover vendors without a physical presence, this should not be construed as the total revenue resulting from online shopping, as it does not include online sales from instate vendors like Walmart. Nonetheless, this is the best data to evaluate the effect of *Wayfair* and economic nexus on the amount of additional tax revenue. The second dataset is the revenue raised from

vendors that are newly registered as remote sellers since June 2018, i.e., since the decision in *Wayfair*. The information on remote vendor status self-reported and possibly subject to underreporting.

To study these effects, we present a series of figures. The vertical lines in the graph, and in subsequent figures, show the month prior to *Wayfair* and implementation of Public Chapter 491. The latter event also corresponds to the month prior to when vendors with economic nexus were required to begin remitting taxes under Public Chapter 429.

The solid line in Figure 2 shows the total revenue remitted to *localities* from remote vendors, adjusted for month fixed effects.[20] Given the higher tax rate, the remittances to the state are likely three times as large. Prior to *Wayfair*, sales tax revenue from out-of-state vendors represented approximately 14 percent of local tax revenue, suggesting that online purchases from remote vendors is critical to financing local public services. However, the court decision and subsequent passage of economic nexus and the abolition of the uniform local rate option, seem to have had minimal effects, with the $40 million from remote vendors after *Wayfair* representing a similar share of total local revenue.

The dashed line in Figure 2 reinforces this result. This series is constructed based upon answers to questions in the filing data from taxpayers who have registered as remote sellers since June 2018, i.e., since the decision in *Wayfair*. As can be seen, newly registered vendors contributed only $5 million in local sales tax revenue per month by 2020. This is approximately 2.5 percent of local monthly sales tax revenue. [21] This small effect likely results from several factors. First, Tennessee's threshold for economic nexus is relatively high compared to other states. Second, as shown in Bruce, Fox, and Luna (2015), many of the largest online vendors were already remitting taxes at the state and local level even as early as 2012. Third, several large vendors (such as *Wayfair*) appear to have begun voluntary compliance after the Supreme Court decision.

The evidence on the effects of economic nexus in other states is limited. Using multiple states, Fox, Hargaden, and Luna (2020) estimate that state sales tax revenues rose about 3.5 percent from imposing economic nexus requirements and a comparable amount from marketplace facilitator legislation. Mikesell and Ross (2019) find that remote vendor

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[20] Given our main analysis will focus on the distribution of revenues, we focus on the revenue impact to local governments.

[21] The results are likely a lower bound because the Tennessee revenues analyzed here are based on firms self-identifying as remote firms. Further, some remote firms may have been remitting revenues on a destination basis, even before it was required. Marketplace sales are also not included because Tennessee only recently passed legislation for the marketplaces.

registrations tripled in Indiana after the passage of economic nexus, but the impacts on state tax revenues were modest.

The dashed series in Figure 3 shows the amount of local revenue from newly registered (after *Wayfair*) remote vendors without a physical presence as a share of total local revenue from all remote vendors without a physical presence. As can be seen, these new vendors represent a bit more than 10% of revenue from remote vendors. Given remote vendors without physical presence raise approximately 14 percent of total local revenue, consistent with the prior figure, newly registered vendors contribute only a small increase to total revenue.

However, the solid line in Figure 3 shows a potential redistribution of local revenue. Recall that prior to Public Chapter 491 any local taxes from out-of-state dealers not using destination sourcing were distributed to counties based upon the ratio of local tax collections in the county over total local tax collections in all counties. Given the formula is based upon local tax revenue for physical goods (where the goods sell), the formula does not well-approximate destination sourcing and advantages large jurisdictions with many retail agglomerations. Theoretically, large jurisdictions are potentially advantaged for two reasons. First, the bulk of physical sales occur in places with retail agglomerations. Second, in standard tax competition models (Kanbur and Keen 1993) large jurisdictions set higher tax rates than smaller jurisdictions, potentially raising more revenue all else equal.[22]

As can be seen by the solid line in Figure 3, immediately following the passage of Public Chapter 491, the number of vendors applying destination-sourcing to local sales increases dramatically. By the middle of 2020, almost one hundred percent of remote vendors without a physical presence have switched to destination sourcing.

B. The Distribution of Revenues Across Counties After Economic Nexus Reforms

While the prior section focused on the amount of new revenue, Figure 3 also suggests that the distribution of revenues may have changed. Public Chapter 491 affects not just the amount of revenue, but also the distribution of revenue. In Tennessee, this may have occurred because of movement away from a formula that favored large jurisdictions and because online sales from new vendors or resulting from shocks that encourage online shopping relative to brick-and-mortar shopping, are now sourced at destination.

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[22] In Tennessee, this second reason is likely to play a minimal role because jurisdictions often max out at the highest possible county sales tax rate (Luna, Bruce, and Hawkins 2007). Further, small rural jurisdictions may primarily sell nontraded goods, such as in small restaurants, and can set tax rates with minimal concern for cross border competition. But such an effect might arise in other states or at a finer municipal level where there is potentially more variation in tax rates.

With respect to the latter channel, Covid-19 provides one such shock to online shopping. Because of the rapid spread of Covid-19 starting in March 2020, many state governments began to shut down and placed substantial limitations on what businesses could remain open. Therefore, many individuals switched a substantial fraction of their retail purchases from brick-and-mortar purchases to online purchases.

Agrawal and Wildasin (2020) provide a theoretical model that allows us to think about the effects of such a shock. This dramatic shift to online purchases, combined with economic nexus regulations that require online vendors to remit taxes on a destination-basis, erodes the tax base of large agglomerated jurisdiction while increasing the tax base of smaller jurisdictions. Intuitively, prior to the Covid-19 shock, individuals living in more remote and rural jurisdictions needed to travel to suburban or urban jurisdictions for many of their purchases. Driving to these retail shopping centers meant that they contributed tax revenue to these large jurisdictions. As a result of the Covid-19 shock, these individuals no longer purchased goods at shopping malls located outside of their hometowns and instead made the purchases online, which given the sales are taxed at destination, contributed tax revenue to their home community. Thus, Covid-19 should provide a shock that erodes agglomeration benefits of large towns and redistributes revenue from large to small jurisdictions.[23] Critically, this redistribution would have been dampened without the *Wayfair* ruling and appropriate state reforms.

In this section, we present compelling visual evidence on the distributional effects on tax revenues across local governments as a result of the *Wayfair* ruling, the passage of economic nexus, and due to the massive shock to online shopping from Covid-19. To do this, we split the sample of 95 counties in Tennessee into three groups: the largest counties, the smallest counties, and all other counties. While subjective, for purposes of this paper,[24] we define the largest counties as the four counties housing the principal cities (Memphis, Nashville, Knoxville, and Chattanooga) in Tennessee's main metropolitan areas. All four of these counties have more than 350,000 people living in them. The smallest counties are defined as counties in the bottom 50% of counties based on population size. This threshold corresponds to counties with less than 32,000 people. Population acts as an exogenous proxy for economic activity.

While population is not a measure of retail agglomeration, it is correlated with agglomeration. As shown in Figure 4, in normal times, the four largest counties raise approximately 42 percent of all state and local sales tax revenue – more than proportional than

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[23] Covid-19 also triggers an economic shock, potentially reducing demand for retail purchases. Thus, in our analysis below, we assume that any negative demand shock is similar in large and small jurisdictions. Given we seek to analyze this issue descriptively, such an assumption is plausible.

[24] Results are similar if we use other definitions of large and small counties.

their share of the state's population. The bottom 50 percent of counties contain 12 percent of the state's population and are approximately 9 percent of the state's personal income but raise only 6 percent of total tax revenue. Given large counties raise proportionally more revenue than their populations and small counties raise proportionally less revenues than their populations, this highlights the spatial asymmetry of retail shopping opportunities. Critically, from Figure 4 we can already see that the share of revenue raised in small counties has increased substantially during the recent Covid-19 pandemic.

Note that any response immediately after the *Wayfair* decision should be due entirely to voluntary compliance, as Tennessee did not change the compliance responsibility until October 2019, corresponding to the effective date of Public Chapter 491. For simplicity, we omit a line for Covid-19, which led to many states closing non-essential businesses in March/April 2020.[25]

To study the effects of Wayfair, Public Chapter 491, and Covid-19 on the distribution of tax revenues, Figure 5 plots tax revenue in the largest and smallest counties. Then, in Figure 6, we plot the year-over-year growth rate (e.g., March 2019 relative to March 2018). Graphs involving tax revenue levels are smoothed by removing month fixed effects and plotting a moving average with equal weight to the given month, month prior and month later. Year over year growth rate graphs (March 2019 / March 2020) do not remove month fixed effects and simply plot a moving average.

Keeping in mind that Figure 5 removes seasonality using month fixed effects, in level terms, the *Wayfair* ruling has no noticeable effect on tax revenues of small and large jurisdictions, consistent with the number of newly registered out-of-state vendors being minimal. However, in the few months after passage of Public Chapter 491, the level of revenues accruing to small counties increases by several million dollars. Following the start of the Covid-19 shock, which induced a dramatic shift to online purchases, revenues in small jurisdictions continue to rise despite the negative economic shock from the virus. At the same time, revenues fall in large jurisdictions following the shutdown of economic activity.

These effects are more noticeable in the year-over-year growth rates in Figure 6, which because the year-over-year changes reduce seasonality, we do not adjust for month fixed effects. Following the passage of Public Chapter 491, the growth rate increases in small counties more so than in large counties. This is consistent with a shift from vendors using a single uniform rate toward destination-based taxation. The online shopping shock induced by Covid-19 amplifies the growth, with revenue in small jurisdictions rising 15 percent, while in large jurisdictions it turns

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[25] The Governor of Tennessee issued various executive orders, including restrictions on mass gatherings on March 13, a request for business to shift to "alternative business models" on March 22, "safer at home" guidelines on March 30, and Executive Order No. 23 requiring Tennesseans to stay at home except for essential activities on April 2, 2020.

to negative 15 percent. Certainly, the economic shock to Covid-19 is likely larger in urbanized areas, and we do not claim these are the causal effects of a pure shift to online shopping. But critical for us is that the growth rates in cities and more rural communities are opposite in *sign*, which can only be explained by a shift to online shopping.[26]

With respect to the external validity of these results, the effect identified may be even greater in other states. Several states, including Tennessee, apply an origin sourcing rule for intrastate e-commerce sales, even if the purchase is delivered to a home address. In these nine states,[27] the online vendor applies tax to the product based on the point of origin (the "ship from address") for all transactions within the same state. In this way, if Amazon provides fulfilment services for a local Tennessee firm, the tax revenue will go to the locality where the inventory was stored. However, online transactions fulfilled by out-of-state remote vendors with nexus are to be sourced at destination.

In states that do not have an origin sourcing rule, online sales are sourced at destination regardless of whether they are intrastate or interstate. In these cases, the effects we identify would apply to both intrastate sales and interstate sales. Given within state e-commerce transactions are a nontrivial share of e-commerce (Hortaçsu, Martínez-Jerez, and Douglas, 2009), we thus view the results in Tennessee as providing a lower bound on the shift of revenue from large to small jurisdictions in purely destination sourcing states.

C. Local Sales Tax Issues of the Future

The prior analysis suggests an interesting redistribution of revenues following a massive shock to online shopping. But the sign of the effects would also apply to smaller – and more gradual – shocks that might arise from the cost of online shopping falling relative to the cost of brick-and-mortar shopping. Costs may decline gradually as shipping costs fall, as aggregator websites make it easier for consumers to find goods, as consumers become much more accustomed to online shopping for more and more goods, or as retail-shopping locations become further away due to store closures.

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[26] This assumes that Covid-19 does not induce individuals in smaller counties to switch from larger urban places to local physical shopping (corner stores, etc.) According to the Department of Commerce and Chetty, Friedman, Hendren, Stepner, and the Opportunity Insights Team (2020), online purchases increased by 37% from the first to the second quarter of 2020, suggesting the effect to online shopping represents a first-order effect especially as many goods are likely not available at smaller local stores.

[27] Two other states apply a hybrid sourcing rule where origin sourcing applies on some intrastate e-commerce sales.

Overtime, such shocks will shift consumer purchases away from retail agglomerations toward online purchases, which given economic nexus, can be taxed at the place of residence. This will erode the taxable agglomeration rents of large jurisdictions with retail agglomerations and fill the revenue coffers of smaller – more remote – jurisdictions. Thus, the sign of the effects we identify in response to the Covid-19 shock may be similar to more gradual shocks from technological change in the coming decades. In turn, in the future twenty years from now, *Wayfair* may create winners and losers as online shopping costs continue to fall. Although *Wayfair*, provides agglomerated jurisdictions with a way to tax their resident online purchases, their tax bases may decline as they no longer may be able to engage in tax exporting to cross-border shoppers who previously drove to shopping malls in large jurisdictions simply because they had no retail centers nearby. In this way, even with economic nexus, the tax base remains footloose, which in turn might encourage these jurisdictions to lower their tax rates, as they can no longer take advantage of their agglomerations. But smaller jurisdictions benefit from online shopping and destination sourcing, which lowers consumer mobility, perhaps encouraging them to raise their tax rates.

Interestingly, as discussed in Agrawal and Wildasin (2020), as online shopping transfers tax revenue from large to small jurisdictions, total local tax revenue may fall. If small jurisdictions traditionally levy lower tax rates than large jurisdictions (Kanbur and Keen, 1993), an online sale from a resident of a rural community is likely to be taxed at a lower rate than an equivalent bricks-and-mortar purchase from an urban or suburban jurisdiction. In the nationally representative dataset from Agrawal (2019), the average town plus sub-municipal district tax rate in states allowing for local taxes is 1.16 percent for the top quartile of towns on the basis of population and 0.70 for towns in the bottom three quartiles based on population.

The basis of the sales tax is often *de facto* defined as the place where receipt of goods or services is taken. Consumers going into another state to cross border shop presumably create issues similar to an e-commerce sale when a firm delivers goods to the consumers' homes, even though this issue has received little attention. In-state local taxes could also be altered in those states that grant legal taxing authority of local sales taxes on a destination basis.

With respect to local tax competition, even if online sales are taxed under the destination-principle, tax competition will still exist.[28] As long as some goods (or services), need to be purchased from a physical store, tax-induced incentives for cross-border shopping will persist. Moreover, even though online vendors are required to remit taxes at destination, physical stores and service providers still remit based on the origin principle. Moreover, jurisdictions may also

[28] For studies of local tax competition, see Agrawal (2015), Agrawal (2019), Burge and Piper (2012) and Burge and Rogers (2011).

compete for online shoppers: agglomerated jurisdictions may adjust their tax rates in order to discourage online shopping. In the very long term, we could imagine a world where the cost of online shopping is extremely low relative to brick-and-mortar sales and *all* purchases are online. Only then will economic nexus *eliminate* inefficient tax competition for cross-border shoppers. But, such a world may create other types of competition as individuals might then migrate to avoid a purely destination-based sales tax, much like they may to avoid local income taxes (e.g., Schmidheiny 2006; Martinez 2019).

Finally, in most states, vendors file their local tax returns with the state government, and they need not file returns in each locality. The future of local sales taxes may also be influenced by the presence of six home rule states.[29] Home rule states are those where local governments (either county, town, districts or tribal governments) may collect and administer taxes independently of the state government. However, the amount of independence varies across states. Following *Wayfair*, the states also differ in how they are applying economic nexus rules for localities. We discuss compliance costs in the next section, but generally abstract from the added compliance costs imposed by home rule localities, which may be substantial.

IV. ADMINISTRATIVE AND COMPLIANCE ISSUES

A. Administrative Issues for Sourcing

States and businesses must settle on the meaning of "destination" and "origin," particularly in states where instate sales are taxed at origin and out of state sales at destination for local tax purposes. The courts may also impose constraints on these decisions as shipments to a particular location from out of state may result in both different compliance costs and different tax rates than for shipments intrastate to the same location. As demonstrated above for Tennessee, these decisions can have large distributional effects as revenues move from large to small counties. The range of issues[30] is likely to evolve with supply chains, development of channels for obtaining goods and services, digitization of products and so forth. For example, at what rate is tax imposed and which county receives the revenues for a sale by an out of state vendor that is fulfilled through an instate location of a third-party facilitator? What if fulfillment takes place from an out of state location for an in-state vendor? Such decisions potentially require detailed information on which inventories are used for fulfillment and where the inventories are held. Third party vendors could be required to separate the same product

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[29] These states include Alabama, Alaska, Colorado, Idaho, and Louisiana. In addition, Arizona administers local jurisdictions' sales taxes, but home rule applies for local tribal governments.

[30] Interestingly, discussion has often focused traditionally on the difficulty of identifying destination for indirect taxes. The concerns we raise suggest that determining origin can also be very complicated as means of fulfillment transition over time.

according to specific ownership as they trace products to their origin or destination. Conclusions on where origin and destination are located may offer tax planning opportunities for vendors.

B. Compliance Costs, the Filing Notch, and Audits

The *Quill* ruling created a characteristic notch based on geography and physical presence. Firms without physical presence in a state could not be compelled to collect sales tax, though as noted above, buyers were still expected to remit use tax. The notch existed because of differential enforcement capacity for the sales tax relative to the use tax and not by an explicit statute. *Wayfair* narrowed the notch by allowing states to require remote firms to collect and remit sales tax, but all states (potentially except Kansas) include a small seller exception in their economic nexus statutes. Thus, compliance is required for larger but not smaller remote firms. Both large and small in-state firms are required to collect tax.[31]

Each state created a complex set of notches in its *Wayfair* economic nexus statute regarding collection and remittance of tax by remote firms. The effective notches potentially depend on the size of the state, the minimum threshold for a collection responsibility, the channels added together to measure whether the threshold is met, and the frequency with which the thresholds are calculated. As discussed above, states established compliance thresholds ranging from $100,000 to $500,000 in yearly sales into the state (see Table 2), with some states also having a requirement based on the number of transactions during the year. Other differences exist across states. For example, some states base the threshold on the previous year's sales and others have a rolling threshold based on the most recent 12 months. Generally, these thresholds are forward looking and either apply to the next calendar year or the next 12 months. Some states may seek to assert that firms have taxable presence going forward once the threshold is met, but the specific administrative rules are still being developed and generally have not been tested through the legal system. These thresholds likely mean that much smaller firms are more likely to be required to collect tax in large market states (high population/income) than in small market states. For example, a firm selling evenly in proportion to population across the country would need only $4.2 million in national sales to have a collection responsibility that met California's $500,000 threshold, but the same firm would need $37.1 million in sales to meet South Dakota's much lower $100,000 threshold.

Many firms sell through multiple channels including their own website and one or more marketplaces. States differ in how and which sales are aggregated to determine whether the threshold is met. As noted above, most states with economic nexus legislation also require collection by marketplaces. The marketplaces may calculate and collect the tax but they

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[31] Some exceptions may exist for very low activity levels and differences often exist in required frequency of filing tax returns.

generally do not remit the tax on behalf of vendors, which must file their own tax returns or hire someone to do it for them. Some states sum all of these channels in determining whether the threshold is met and others do not. Table 2 identifies states that include marketplace sales in determining if the threshold is met.

The notches discussed above could increase compliance and administration costs and cause bunching below the threshold. Firms cannot alter their current year compliance responsibility by bunching in states that determine presence based on prior year sales, though they potentially can influence nexus in the following year. Compliance burdens exist for those firms that have a collection responsibility, but also for firms that need to track their sales to determine whether they have sufficient economic presence to create nexus. Voluntary compliance may be greater in states that determine nexus based on the most recent 12 months of sales. Firms may be unsure whether they have a compliance responsibility may then voluntarily comply to reduce their risks of failing to comply or to avoid certain compliance costs.

Different thresholds and approaches to measuring total sales across states add to the compliance burdens as firms must understand the requirements for collecting for each state in addition to measuring destination-based remote sales. The problem is exacerbated when firms operate through multiple channels and need to aggregate data from different information systems to determine whether thresholds are met and the associated tax liabilities. Further, states do not always require destination situsing for instate sales even though they require it for out-of-state sales, adding additional burdens as firms may situs some sales on a destination basis and other on an origin basis.

The notches may be effectively larger than their legislated structure because states can find it difficult to identify potential taxpayers and determine whether they are appropriately complying with the law. The result could lead to significant evasion if states are unable to convincingly audit firms. States will likely use multiple means to identify these firms, including audits and data that is collected from related firms. Several vendors are also seeking to sell software to states, that among other things, identifies firms that are believed to meet the thresholds. Absent such third part reporting, some coordination across states may be necessary.

Although the notches could also cause bunching as firms seek to remain just under the threshold, several factors reduce this possibility. Decentralization of thresholds to the state level likely reduces bunching relative to a larger national threshold. Moreover, complexity of state thresholds and collection by marketplaces makes bunching more difficult and perhaps not worthwhile. But, in the extreme example, firms may seek to limit compliance by dividing into multiple separate legal entities providing different products into states and targeting advertising by geography. The costs and benefits of seeking legal ways to remain under thresholds may cause firms to risk non-compliance as the means of avoiding a compliance responsibility.

V. TAXING DIGITAL SERVICES

A. Introduction to Taxation of Digital Services

In this section, we discuss several policy issues of the future in the context of technological change creating new types of consumption patterns. Although the health care sector is one of the fastest growing sectors in the economy, we exclude discussion of taxation of health services given that such proposals are not politically feasible, and moreover, because many broad-based consumption taxes around the world exempt the health care sector. Instead, we focus on major issues most closely relating to online purchases and the digital economy. We also emphasize base expansions that are of current interest to policymakers.

This section focuses on digital goods and services (as illustrated in Table 3) and not on digital transaction platforms used to obtain goods and services. Airbnb, Uber, Amazon and others are transaction platforms are marketplaces for obtaining goods and services and are not the goods or services directly consumed, though as discussed below, they clearly add value by allowing efficient access to these goods and services. Obviously, if a broad base is desired, final goods and services obtained through these mechanisms should be subject to sales tax. The marketplace or channel will generally be the most cost-effective means to collect and remit tax. In particular, platforms like Airbnb and Uber can collect and remit tax more efficiently than the myriad providers of transient housing and mobility.[32] Moreover, these types of platforms are not subject to the same types of externalities that are challenging for taxing two-sided platforms.

B. Digital Services

The policy prescriptions at the end of the introduction offer direction for expanding sales tax structures as technological changes and digitization create new goods, services and consumption channels. *Wayfair* reflects the Court's understanding and allowance of taxation that is neutral with respect to distribution channels, with small seller exceptions to limit the compliance costs arising from sales into multiple markets. However, *Wayfair* only addresses nexus issues associated with remote sales of taxable goods and services and does not speak to the problem of sales tax laws that are too narrowly construed and out of date with respect to current consumption behavior. Frequent updates of the sales tax base are imperative if states are to tax evolving forms of consumption. Alternatively, states could entirely restructure their sales tax laws to broadly tax consumption, which would generally incorporate new forms of consumption

[32] See for example, Bibler, Teltser and Temblay (2020).

in the base, rather than the current approach often requiring piecemeal addition of services. However, given recent history, such a broad reform is unlikely.

1. Current State Practice for Taxing Digitized Transactions

Taxing digitized transactions is not a new issue for states and remains a key next step for many states to take given the rapid movement toward digitized goods and services. State statutes vary widely in their coverage of digital goods and services and the sales tax in most states would benefit from base expansions. Table 3 identifies the propensity of states to tax selected digital and media services.[33] Neutrality and equity, usually argue for taxing goods and services when provided to consumers in digitized (as well as tangible) form to move the sales tax closer to a consumption base. Further, the sales tax's revenue elasticity will be greater if the tax base includes evolving and rapidly growing components of consumption. The imperative of taxing digitized services grows if very similar services are taxed in physical form.

States generally created their sales taxes as levies on tangible personal property (DVDs, landline telephones, etc.) and services and digitized transactions have been added through a variety of means, though often to a limited extent and with substantial variation across states. Several states, including Hawaii, New Mexico[34] and South Dakota tax many digitized services and most consumer services (with a few exceptions). On the other hand, Garrett and Nulle (2020) observe that Georgia, Nevada and Oklahoma are at the other extreme with little or no taxation of digital transactions. Specific statutes were enacted in some states to expand the base to select services,[35] but in some cases without consideration of digitization. Some other states have interpreted certain digitized transactions as the transfer of tangible personal property and imposed tax through existing statutes. For example, 28 states define tangible personal property to include prewritten computer software (see Garrett and Nulle, 2020), though they differ on definitions of prewritten software. The problems of modernizing tax systems are complicated in

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[33] State taxation of services is taken from the Federal of Tax Administrators' Services Tax Survey for 2017. In some cases, the tax is imposed at a rate that differs from the general sales tax. In other cases, states levy a tax other than the sales tax, such as in Delaware, which taxes many of the services through gross receipts taxes and does not have a general sales tax, and in Washington, which levies tax through its Business and Occupations Tax (potentially in addition to the sales tax).

[34] Hawaii and New Mexico's sales taxes are gross receipts taxes on business revenues (with certain exemptions), which often avoid the need to articulate specific services.

[35] For example, North Carolina added digital newspapers, magazines, photographs and greeting cards to the sales tax base in 2019 and updated the definitions of a number of digital products. See N.C. Gen. Stat. § 105-164.3(#) and others.

states, such as Missouri, which have passed constitutional amendments to prohibit taxation of new services. Constitutional bans, which surely have been enacted on political rather than economic grounds, may include newly digitized goods requiring these states to use increasingly inefficient tax structures.

At least 12 states define certain digital products, such as prewritten software, so that the method of delivery is irrelevant but this is not the norm across the range of digital transactions.[36] Nine states only tax prewritten software if delivered through tangible medium (see Garett and Nulle, 2020). In addition, Rosen and Haffield (2016) observe that every state taxes tangible recordings (such as DVDs and music CDs), but digital analogues are often not taxed. Only 27 states tax downloaded videos and 18 tax streaming of video. Twenty-eight states tax e-books; states seldom tax magazines and newspapers, whether in physical or digital form.

2. Challenges for Taxing Digitized Transactions

Garrett and Nulle (2020) observe that state sales tax decisions on digital transactions appear to be determined by whether the transactions are a digital product or a digital service, whether software is different from digitally delivered content, whether the purchases are downloaded or merely accessed, or whether they are live or recorded content. These distinctions may fit taxation into existing statutes, but fail to address taxation of digital products in term of goals for good tax policy in the presence of continually evolving consumption patterns. Generally, the base should be determined by efficiency issues[37] such as whether the purchase is for final consumption and is fundamentally equivalent to other taxable transactions, administrative concerns such as if transaction can be sourced to the destination, and the compliance costs on firms.

Opponents of taxing digitized services (and services more broadly) often contend that many transactions are intermediate purchases and expansion to services simply increases distortionary effects of taxing inputs and pyramiding. States often have failed to enact

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[36] Texas defines prewritten software very broadly to include all forms but California does not tax the electronic transfer since it is not the transfer of tangible personal property (see Rosen and Haffield, 2016).

[37] Long ago states imposed flat rates on all taxable transactions (with notable exceptions such as transient accommodations, and even then often through separate taxes) or complete exemption and ignored Ramsey rule efficiency concerns. See Sadka (1977) for conditions where uniform tax rates are efficient. VAT policy is similar, with flat rates on a wide range of transactions.

exemptions for business purchases of services in the same manner as for goods,[38] and in cases where they have, it is likely difficult for the vendor to distinguish between final and intermediate transactions (Phillips and Ibaid, 2019).[39] We have little empirical evidence on the fraction of digital goods and services that are business purchases, but there is some evidence for physical goods (Ring 1989; Ring 1999; Wildasin 2001).

Big data and new technologies often allow services to be sitused either explicitly or implicitly on a destination basis, but unique problems exist. Administrative issues arise as consumers travel and purchase digital services on their own devices, such as on demand video, at locations other than where they live or are billed for the service. It may be technically possible to remit tax at the rate and location where each unit of service is used, but decisions must be made on whether this level of preciseness is necessary to create a substantially destination-based tax.[40]

Vendors of digital goods may have some information on consumers, such as an email addresses, but may not have geographic information on the buyer or consumer.[41] The use tax can be imposed on buyers, but will suffer from poor compliance as discussed above. A differing problem arises for digital goods and services simultaneously consumed in multiple locations. Rosen and Haffield (2016) explain a proposal for taxing difficult to source transactions at origin rather than destination. Of course, this fails to reap the benefits of destination taxation. Apportionment of the tax base has been suggested for products consumed at multiple locations, consistent with state corporate tax practice.

Taxing digital services on a destination-basis is not just an issue for the U.S. sales tax system, but creates similar challenges for the value added tax systems in the European Union.

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[38] Sales for resale and component parts of manufactured goods are examples of exemptions that generally apply to goods but not services.

[39] Mazerov (2009) provides policy discussion of the problems with imposing tax on intermediate transactions. D'Annunzio, Mardan and Russo (2020) discuss a case where taxation of an intermediary service provider is efficiency enhancing. These authors assume that one unit of intermediate service needs to be consumed in order to consume the final good.

[40] The issue of how precisely to determine the destination for taxes is not new. For example, consider the case of cross border shoppers. The buyers' tax rate could be linked to the place where their credit card is billed, for example. In the case of consumption of digital services while travelling, IP addresses could technically be used, but spoofing possibilities exist. Similar issues also would arise in the apportionment of tax base discussed below for two-sided platforms.

[41] Taxing services on a destination basis can be more difficult than for goods since a delivery address is not likely to exist. We return to further complications due to the system of local taxation subsequently.

Against this backdrop, OECD (2014, 2015) proposed guidelines on how to structure a destination-based value added tax on digital services. In particular, OECD (2015) suggests that consumption of digital taxes need not be taxed precisely where consumption occurs, but rather the digital supplier should use all the available information, including address, credit card details, and even IP address as proxies for the location of consumption (Hellerstein, 2016). In the U.S. decentralized tax setting where consumers may have address information and credit card information in different jurisdictions, potentially using out-of-town post office boxes for their billing information, this might pose challenges. For further details on taxation of digital services under the value added tax, see Agrawal and Fox (2017).

3. Taxation with Multi-sided Platforms

Recent years have seen amazing growth in the use of social media platforms, online streaming services, and web-based information engines. Facebook, Google, Twitter, Instagram, YouTube, Hulu, Pandora, Spotify and others potentially operate with two-sided – or more generally, multi-sided – platforms characterized by two (or more) distinct sets of users.[42] They provide significant services to consumers, provide carefully targeted advertising, and potentially sell data collected on the site to third parties. Social media consumers and advertisers do not directly interact with each other, but externalities exist across the two sides of the platform. For example, the value to advertising rises with the number of consumers and, assuming advertising is viewed as a bad by the consumer,[43] the consumption value of social media falls with more advertising on the platform. The consumption value includes the benefits from allowing users access to an attractive framework for connecting with a network of others. The platform can generate revenue from one or both sides of the platform. These two-sided digital platforms operate with indirect network externalities that create complex administrative tax issues for state and local governments, particularly since much of the consumption value is not monetized to the consumer though considerable value appears to exist for consumers.[44] Failure to tax social media

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[42] The discussion focuses on two-sided platforms and not transactional platforms offering services to consumers and advertisers and is not addressing taxation of marketplace facilitators and other digital platforms that primarily provide exchanges between buyers and sellers, such as Uber, Airbnb and others. The latter set of firms often fail the definition of two-sided platforms (see Koethenbuerger, 2020) and do not pose the same sales tax issues discussed in this section. Consumer purchases of goods and services obtained through these transaction platforms should generally be subject to tax.

[43] So, both sides of the platform may enter consumer utility functions.

[44] See Kind, Koethenbuerger, and Schkelderup (2008), Koethenbuerger (2020), Kind and Koethenbuerger (2018), Lassmann, Liberini, Russo, Cuevas, and Cuevas (2020), and Russo (2019) .Koethenbuerger (2020) is primarily addressing corporate taxes in a case where relatively little labor and capital is used in the source country to produce a service, which depends

appropriately runs the risk of continued erosion of the sales tax base. Discussion in the previous sections suggests that the monetized sales to final consumers should be included in the sales tax base, but two-sided platforms raise a number of other issues, especially when the service is not monetized to the consumer. Although the value added tax has some advantages, platforms also present issues for value added taxes.

In contrast to two-sided platforms, firms defined as transactional platforms are required to collect and remit tax for individual sellers in most states, as described above, and it is most efficient for firms such as Uber and Airbnb to collect and remit the tax for their many providers even if they do not fit marketplace facilitator legislation. Marketplaces provide consumer value by providing efficient means for consumers to obtain goods and services. However, the value of the service is already included in the consumer price and a portion of which is retained or transmitted to the marketplace to pay for the service. The important point is that the sales tax is imposed on the entire consumer purchase, which includes the portion of the price remitted to the vendor and the portion retained by the platform. Amazon provides a marketplace to connect buyers and sellers but also provides other services, such as video and audio, and in this sense may be both a marketplace and a two-sided platform.

Returning to the issue of two-sided platforms, pricing models for social media firms range across the spectrum from only pricing advertising services (and perhaps the sale of digital data) to only pricing the service to the consumer to hybrids of these two extremes. Netflix[45] only prices to consumers and Facebook only prices to advertisers. Newspapers generate revenues from both sides. Thus, social media firms differ widely regarding whether they monetize services to consumers. Marginal cost on both sides of the platform may be nearly zero (with high fixed

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primarily on intellectual property. These papers are generally addressing international taxation of digital services when international agreements complicate imposition of direct taxes. Bourreau, Caillaud, and DeNjis (2018) examine the effects of adding a small tax on data offered through two-sided markets in the presence of a VAT.

[45] An argument can be made that Netflix is not a platform because it generates content and may purchase the rights of other content, pricing it to the consumer. We are simply viewing Netflix as at the consumer pricing edge of the pricing continuum of digital services that crosses from complete consumer pricing to complete advertising pricing. If Netflix used just a small amount of advertising, then it would clearly be a platform. Companies such as Facebook, on the other hand, are essentially at the all-advertising end of the continuum. The content on Facebook and Youtube can be thought of as being provided by the users but the firms may pay some content providers and certainly impact the content through the framework that is provided for accessing and viewing the content. So, the distinctions from Netflix are at best only by a small degree.

costs),[46] which means firms maximize revenues across the two sides of the platform. In general, price exceeds marginal cost to the social media firm on the priced sides of the platform if – as is generally the case – marginal cost is sufficiently low.[47] Maintaining consumption tax bases is challenging in markets where companies are able to shift revenues between the two sides of the platform. Among others, a neutral tax policy should be neutral with respect to consumption decisions, social media companies' internal business pricing models, and for business purchasers of social media services. A key margin on the advertising side is competition with other intermediate transactions purchased by the buyers.

Consider distortions along three margins on the consumer side of the platform: social media monetized to the consumer offered by one company competing with social media not monetized to the consumer offered by another, the same company providing both monetized and non-monetized versions of the service, and non-monetized media services versus all other consumption. Netflix prices to consumers, which competes with TikTok that is not priced to consumers, as the latter generates revenues from other sides of the platform. Netflix services are taxed in states that include video streaming in the base, so the tax distorts the choice of Netflix versus Facebook or TikTok, but is neutral with respect to other taxed goods and services (such as cable TV).

Pandora, Spotify and YouTube offer services with advertising and no-fee or alternatively with a fee and no advertising, presumably to allow consumers with sufficient distaste for advertising to purchase the service. These firms presumably separate their consumers into those who pay for the service and those who receive service with advertising (though consumers may shift from one group to another) as pricing decisions are made. Consumers are induced to select services with advertising whenever the priced versions without advertising are subject to tax.[48] The externality of advertising's value rises with the number of consumers who receive advertising and this further encourages firms to raise consumer prices for the version of the service without advertising in order to increase the number who accept advertising. Of course, at the extensive margin, raising the price risks consumers who cannot be induced to accept

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[46] In this sense, social media companies have similarities to natural monopolies with marginal cost much lower than average cost.

[47] Prices may not exceed social marginal cost if consumers regard advertising as a negative, which is (at least to some extent) internalized to the social media firm if consumers reduce usage of the media.

[48] The problems discussed here are somewhat different with a VAT, which is generally paid on both sides of the platform – on the purchase of social media services and the purchase of advertising. A credit is given to advertisers for tax paid on purchases, so no distortion arises in intermediate markets.

advertising to switch to other social media platforms. A clear understanding of consumer preferences could permit social media companies to maximize revenues by setting the consumer and advertiser prices based on willingness to pay for the social media service, consumer distaste for ads that helps determine whether consumers can be moved from the priced to the advertising side of the product, and the effects of the number of consumers on advertising revenues. The key point is that a tax only on priced consumer services or only on advertising distorts the decision.

When platforms have various pricing options, taxing the consumer side but not the other sides of the platform encourages social media firms to engage in tax avoidance strategies by generating more revenue from the advertising side of the platform, so the tax distorts internal pricing decisions and business models.[49] Shifting revenue generation to the advertising side presumably lowers revenues raised from consumers (though this depends on consumers' willingness to pay for social media without advertising), raises the number of users (to the extent that users prefer ads to prices at the margin), and makes advertising more valuable (if there are more users opting for advertising). Similarly, a tax on the advertising side but not on the consumer side could lead to greater reliance on consumer revenues.

4. Policy Options for Taxing Social Media

Several policy options are available to tackle these distortions, but each only addresses some of the distortions arising from taxation and neutrality in intermediate transactions, neutrality across different consumer services, and intra-firm social media choices. The options are not mutually exclusive but are discussed separately. Each option improves the sales tax revenue elasticity and horizontal equity.

Tax the implicit value of non-monetized consumer services. First, tax could be levied on the implicit value of non-priced consumer services. Many other areas of non-priced consumption exist and remain untaxed, but social media is distinct by virtue of its massive size and growth.[50] Under this proposal, the social media company must remit any implicit tax on the value of consumer services as no financial relationship exists with non-monetized users. This equalizes the initial incidence of the consumer side tax from the social media company's perspective. However, consumers of platforms like Spotify still have the incentive to reduce

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[49] Although not studying digital services, Elschner (2013) shows how taxes may distort organizational form.

[50] Similar issues arise with income taxes. Taxation of some fringe benefits under the individual income tax provide evidence of non-monetized values being taxed to limit avoidance through receipt of non-monetized fringe benefits. Another perhaps more directly relevant example is attempts to tax banking services that are "paid for" with lower interest rates.

purchased services unless the social media company shifts some or all of the implicit tax to the consumer by increasing the extent of advertising. Implicit taxes could also be imposed on non-priced social media (Facebook), which equalizes the consumer's decisions versus priced services if (some of) the tax is forwarded shifted to consumers through more ads.

Valuing the non-monetized service to consumers is a key issue. The price charged to those purchasing the service for firms such as Spotify provides a benchmark[51] for value to other consumers. However, no obvious means exists as a benchmark for social media that is never priced. Kothenbuerger (2020) observes that there generally are no good external markets to use as benchmarks, though his comments also refer to advertising.

Sales tax practice has not expanded broadly to taxing non-monetized transactions, though examples exist.[52] Promotional gifts given to customers are taxed as inventory when withdrawn from nontaxable purposes and transferred to taxable purposes. Sales tax is levied on meals provided to employees' families in Virginia offers another example.[53] In these cases, the tax is based on cost to the providers. Taxation on non-monetized transactions obviously raises administrative costs to the tax authority, may create evasion opportunities, and the valuation is likely to lead to considerable controversy.[54]

Tax the non-consumer side of the platform. Levying sales tax on the non-consumer sides of the platform is a second policy option.[55] Most likely such a tax would be imposed on

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[51] Of course, revealed behavior suggests that those accepting the service without fee do not value the service equal to the fee.

[53] See "Virginia Tax Commissioner Explains Tax on Restaurant's Complimentary Meals" in *Tax Notes*.

[54] The is an interesting parallel to the debate over whether income or expenditures should be used as the tax base. Interestingly, Haig ranked utility, consumption expenditures, and accreditation income as possible tax bases (Wildasin 1990), but he ends up as being credited as a proponent of taxing income. This arose because he simply asserted that the measurement of consumption expenditures was administratively infeasible. But, in part, technological change likely reversed the view on the measurability of consumption expenditures in more recent times. It remains to be seen how future technology may change the administrative burden of measuring digital services consumption.

[55] Maryland legislated a tax on advertising services in 2019, but it was subsequently vetoed by the Governor.

both the consumer and non-consumer sides of the platform.[56] Advertising has often paid for or defrayed prices to consumers with historic two-sided platforms, such as with television, radio, magazines, and newspapers, so the issue of services provided to consumers at subsidized or zero price is new only to some degree. The magazines and newspapers may be sales taxed, but without tax on the subsidized component of the price. Moreover, broadcast television is not taxed. Florida sought to tax advertising services as part of its sales tax base expansion in 1986, and this was likely an important reason for the base expansion's rapid demise.

Four arguments for taxing advertising and consumer sales are provided. First, and the strongest argument, advertising revenues could operate as a surrogate for the implicit value of consumer services discussed above. Advertising can be thought of as a proxy for the marginal social media user's value (in the sense that she would cease using the platform if another dollar of advertising is added), but would be a lower bound for value for other consumers. No additional tax on the implicit value is necessary if this is the basis for taxing advertising. Second, a tax on both sides of the platform substantially reduces firm incentives to engage in tax avoidance in their pricing decisions. Effectively, a gross receipts tax is levied on all firm revenues, similar to the gross receipts based sales tax used in states like Hawaii.[57] The tax would also be similar to a VAT that is imposed on all taxpayer sales, though the credit-invoice system neutralizes VAT on intermediate sales. Third, a gross receipts tax on all social media firm revenues ensures that firms not monetizing the entire service to consumers are subject to some sales tax. Equity and revenue criteria justify some sales tax on firms providing significant consumer services. Finally, advertising revenues are economic rents if price is well above marginal cost, so the sales tax is extracting rents.

The gross receipts tax would be on some intermediate inputs, though a portion of ads are for political, not-for profit and other purposes rather than being on intermediate transactions. Non-business purchasers of advertising can be regarded as final consumers for sales tax purchases. A tax on intermediate purchases of advertising only distorts choices between advertising on social media and other intermediate inputs and only cascades if it is forward shifted to buyers. The tax borne by social media firms may not create similar distortions. The tax likely is not forward shifted to purchasers if social media companies are maximizing marginal

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[56] Revenues from both sides of the platform belong in calculations of a profits tax, VAT, and gross receipts tax discussed by Koethenbuerger (2020). Problems similar to including tax at destination can arise for both these taxes and sales taxes.

[57] The Hawaii tax offers preferred rates for many intermediate transactions.

revenue minus zero marginal cost.[58] Social media firms would not generate more profits by shifting advertising prices if a percent of pure profits is extracted.

Sales taxes based on consumer priced services are sourced to the consumers' destination but the gross receipts base on advertising revenues is national or international in scope. The base can be shared across the relevant subnational governments within the U.S. (or between countries). The geographic location of users offers the best base for apportionment between state and local governments. The number of users in a state, frequency of use, or depth of use (such as time on the social media) provide options for apportionment across states.[59] Presumably, IP addresses could determine the consumer's geographic location, although spoofing technology may create challenges. Sales tax apportionment is already used for certain transactions, such as when a company employs taxable software in multiple states simultaneously.

Significant potential revenue exists from taxing the non-consumer side of the platform; Facebook offers an example of the potential tax base. North American Facebook revenues from 2019 Q2 through 2020 Q1 totaled $35.5 billion. Comparing this to the $5,270 billion of total retail sales, indicates that size of the portion of consumption from Facebook alone represents 0.6 percent of total retail sales and a slightly smaller percent of total consumption. Thus, this would raise a non-trivial amount of tax revenue. States taxing these revenues from Facebook at the 6 percent median state tax rate would generate $1.9 billion.[60] In practice, the specific revenues would be determined at each state's tax rate and based on the apportionment of the base using measures of consumption as described in the previous paragraph.

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[58] The discussion here assumes enforced destination taxes regardless where the firms are located. Lassmann, Liberini, Russo, Cuevas, and Cuevas (2020) find evidence of forward shifting of corporate income taxes into advertising prices and argue that the same could apply to gross receipts taxes. However, their argument for shifting is in an economy with source-based taxation and multiple countries where only domestic companies are subject to the tax. Russo (2019) discusses research on forward shifting of the sales tax to final consumers, but the tax offered here is levied on intermediate services provided by firms with significant market power and very low marginal costs. Thus, prior research on sales tax incidence is not likely to apply here.

[59] This differs from apportioned corporate income taxation in several ways. First, the intent is to tax consumption, not profits, so the base is revenues with no deduction for costs. Second, apportionment would be based on a measure of users and would not include a combination of payroll, property, or sales (since there is no sale to the consumer) as with the traditional corporate income tax. It should be noted that corporate taxation increasingly focuses on apportionment to the destination by overweighting sales.

[60] Total North American Facebook revenues were adjusted down assuming the taxable share of revenues is proportional to the share of population in U.S. states with sales taxes relative to the total U.S. and Canada population. Thus, the potential tax base was reduced by 12.56 percent.

Although taxation of digital services appears daunting, we hope that the above analysis will provide states with a policy guide to be able to discuss the pros and cons of various policy options. As well, many of the policy issues discussed above are also informative for countries around the world that may be considering how to tax digital services under the value added tax. Now is the time to modernize our tax systems for the future.

VI. CONCLUSION

Throughout recent history, technology has rapidly evolved. This technical change affects the way people buy goods, the business model of retail firms, and the types of goods that are consumed. Initially, technological change lowered the cost of getting goods to market. For example, the invention of the automobile and refrigeration gave rise to new shopping patterns that allowed chain stores to drive out smaller mom-and-pop stores. Catalog sales then allowed consumers to buy goods from remote vendors. The recent decade has proven no exception: the continued rise of e-commerce and online giants such as Amazon allow consumers to buy goods from near and far. But technological change has also affected how and what we consume. More recently, the rise of marketplace facilitators has spurred new competition from smaller remote vendors while platforms like Airbnb and Uber have shocked the hotel and taxicab industries. Finally, the rise of digital services such as Twitter, Facebook, and Google provide new types of consumption that were unimaginable fifty years ago.

At the same time, the institutions that structure our political system evolve incrementally and provide links between the past and the present (North, 1991). This means that institutions may yield policies that are state dependent, whereby past policies influence the probabilities of future outcomes. This can lead to path dependence whereby those state dependent outcomes converge to an equilibrium. In the case of fiscal systems, institutions shape the breadth of the tax bases we have, the patterns of tax rates, and the enforcement mechanisms we design. Certainly, current day fiscal policies are not preordained, but they are highly dependent on the historical design of early fiscal systems and therefore evolve gradually. And, these fiscal policies influence development of new technologies, as in the case of ecommerce, where growth was likely initially spurred by inability to enforce destination-based taxes on remote sales as firms were incentivized to remain remote to avoid requirements to collect and remit the sales tax.

Rapid technological change and incremental evolution of fiscal systems are at tension with one another. The speed at which technology evolves is much more rapid than how quickly our institutions adapt to those changes, which means that our fiscal systems are often inconsistent or out of step with current day business models, patterns of consumption, and means of tax avoidance or evasion. Certainly, this is true with the retail sales tax, which has been significantly influenced by its roots in the Great Depression where state governments established the tax on retail sales of goods and not services. This historical choice was due to retail sales

being a high share of consumption and concerns about difficulties of enforcing the tax on services, where many service providers were small (Mikesell, 2018). These historical choices continue to shape the structure of the sales tax today, despite services rising as a share of consumption and despite improved enforcement abilities on service providers. The pace with which technology is developing and being adapted has accelerated, increasing the tension with incremental institutional change and likely exacerbating problems for efficient market development.

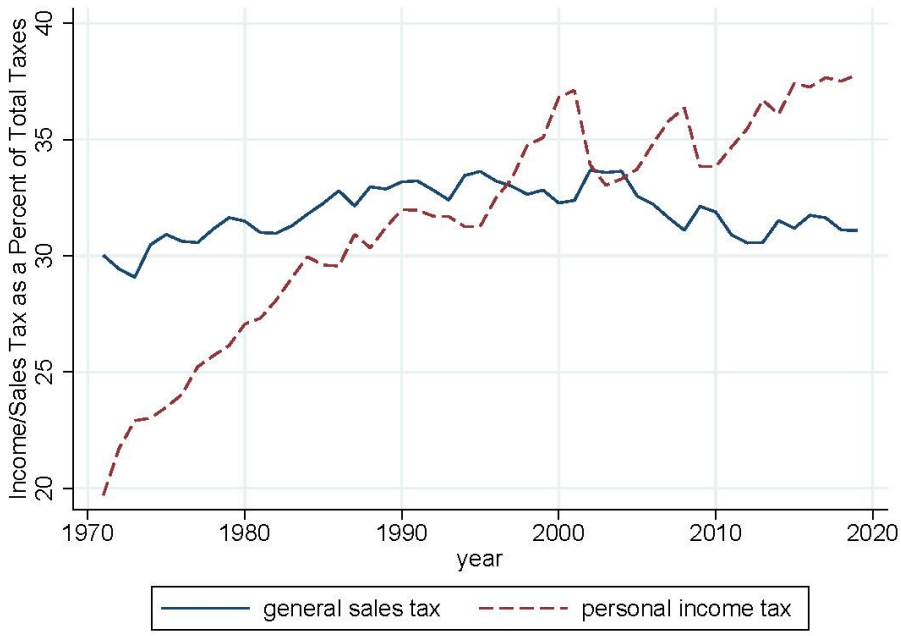
In recent years, the states demonstrated a willingness to make some changes, especially with respect to nexus questions for remote vendors. In this case, it was not the state-level institutions that made change incremental, but rather the constraints imposed by federal judicial rulings and the unwillingness of Congress to take action with respect to those rulings. Congress failed to act so that states could compel online vendors to remit taxes without having a physical presence, despite widespread support from state governments. Why would Congress be at odds with so many state legislatures? Because the sales tax is a decentralized tax, Congress would have borne all the political costs (e.g., lobbying from large online vendors and discontent from online purchasers) but realized none of the benefits (e.g., increased tax revenue), although support from state governments might be a small offset. Thus, when thinking about what the sales tax will look like thirty years from now, it is important to remember that the hands of state policymakers are constrained by federal actions (Stark, 2021).

At the same time, technological change can become so rapid or higher-level reforms or Court decisions like *Wayfair* may be so powerful, that they provide an impetus to begin systemic reforms or make the absence of reform less important as local distribution centers became more important. Certainly, recent years may provide such a policy window for governments to broaden their tax bases. While it is likely that this broadening will be incremental, even small amounts of tax base broadening may generate substantial revenues for state and local governments and lessen distortions from uneven taxation.

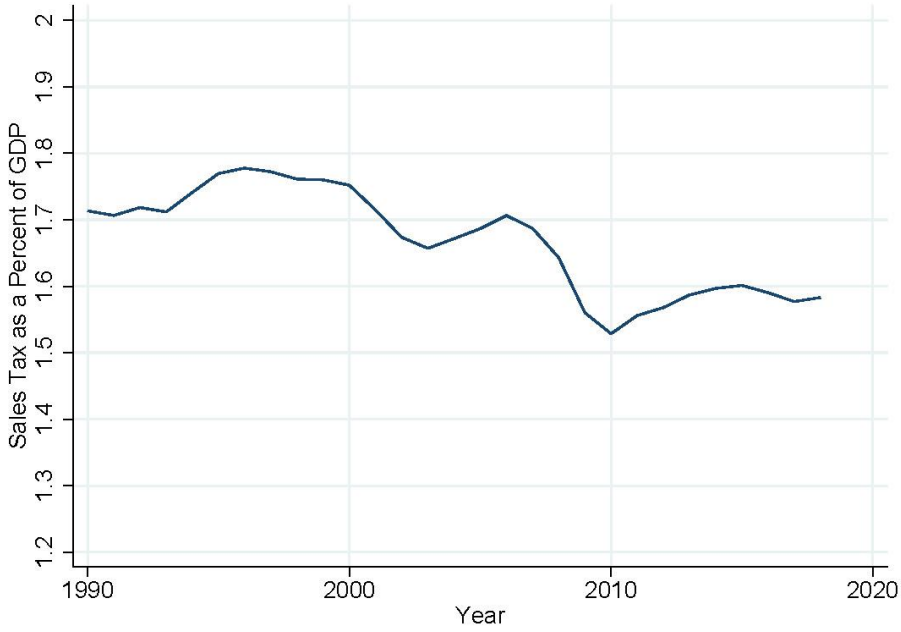
In theory, a value added tax and a sales tax on a commodity are equivalent. But, economists are often quick to advocate for a value added tax due to its self-enforcing properties and more tractable treatment of intermediate purchases. Recent research has challenged the conventional wisdom of the self-enforcing properties due to vulnerabilities on enforcement of the VAT (Keen, 2007; Waseem, 2020). Moreover, much of the discontent with the sales tax comes from the way the sales tax has been historically operationalized in the United States – a narrow base with possible cascading elements and problematic enforcement of destination taxation. But, these need not be defining characteristics of a sales tax. Recent expansions by the states to selective services suggest a desire to broaden the sales tax base. The recent *Wayfair* decision makes some progress at effective destination sourcing in a decentralized tax system that is arguably more difficult to achieve under a value added tax (Keen 2000).

Figure 1: Tax Revenue as a Percent of Total Taxes or GDP

Panel A: Income and Sales Tax Revenue as a Percent of Total Tax Revenue

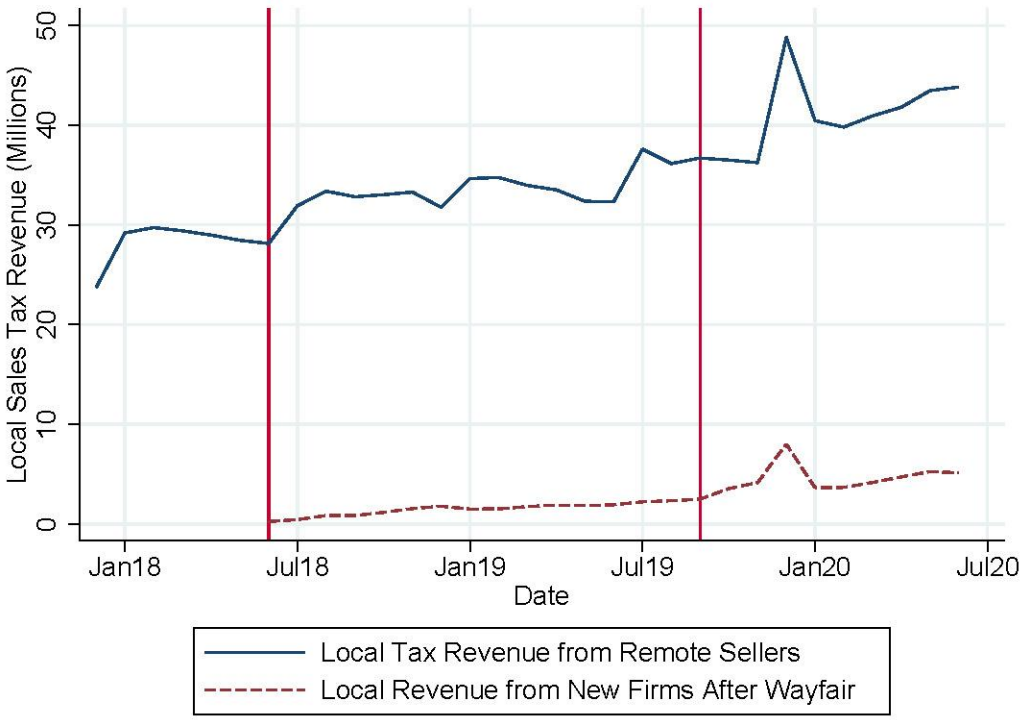


Panel B: General Sales Tax Revenue as a Percent of GDP



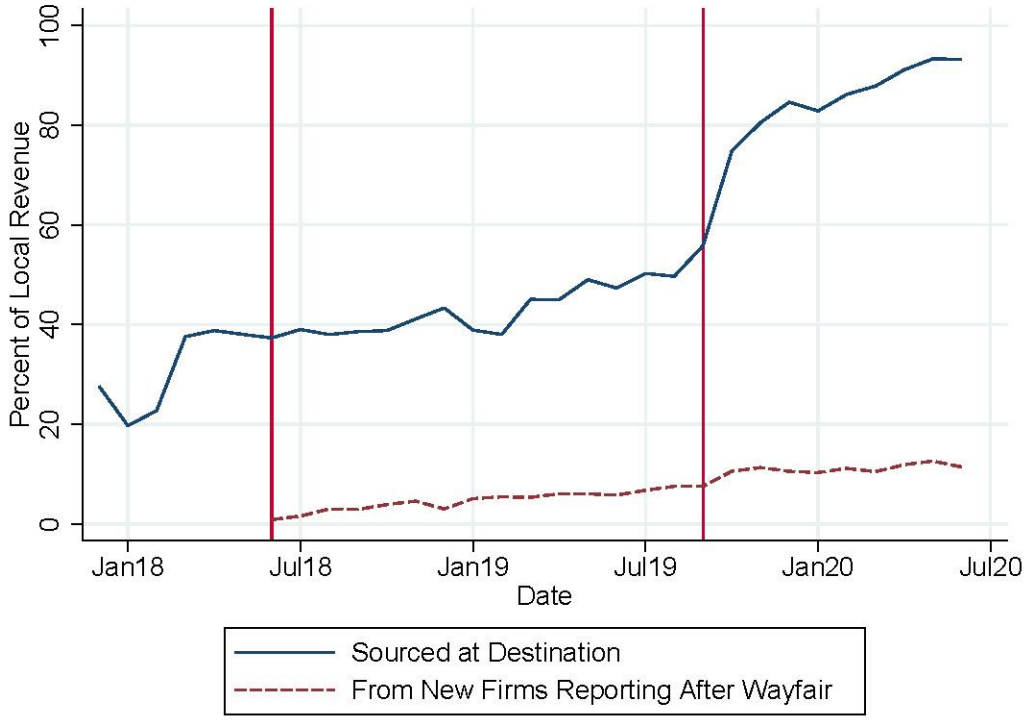
Note: Panel A shows U.S. general state sales tax revenue and income tax revenue as a share of total own source tax revenue. Panel B shows U.S. general state sales tax revenue as a percent of GDP. Source: U.S. Bureau of the Census, Quarterly Survey of State and Local Tax Revenue.

Figure 2: Local Tax Revenue from Remote Sellers in Tennessee



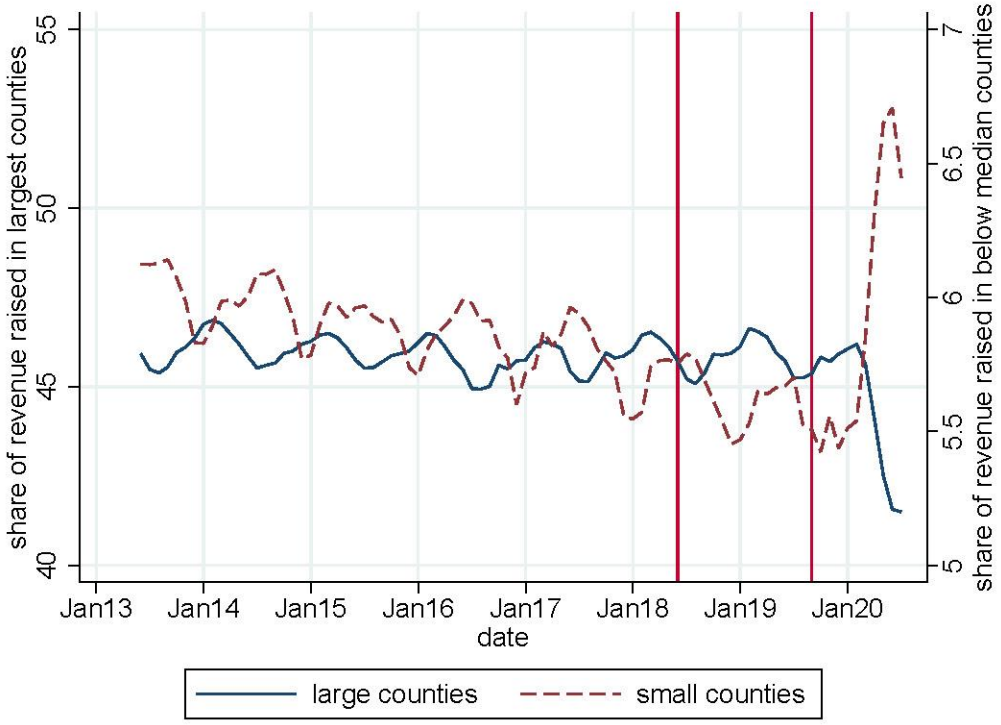
Note: This figure shows the total amount of local sales tax revenue from remote sellers and the total amount of local sales tax revenue from newly registered vendors after the *Wayfair* decision in Tennessee. Both series rely on on self-reported information by the vendor. Local sales tax revenue from remote sellers is adjusted by removing month fixed effects. The first vertical line corresponds to the *Wayfair* decision. The second vertical line corresponds to the month prior to Public Chapter 491 going into effect and firms with economic nexus being required to remit under Public Chapter 429. Source: Tennessee Department of Revenue.

Figure 3: Percent of Local Revenue from Remote Sales that Is Sourced at Destination or from New Vendors



Note: This figure shows the percent of local sales tax revenue from remote vendors that is sourced at destination in Tennessee. Prior to Public Chapter 491, remote vendors could source local taxes using a single rate or based on the destination rate. This figure does not include data for online vendors making within state sales. Additionally, the figure shows the percent of local sales tax revenue from remote vendors that is collected from vendors that newly register after *Wayfair*. The first vertical line corresponds to the *Wayfair* decision. The second vertical line corresponds to the month prior to Public Chapter 491 going into effect and firms with economic nexus being required to remit under Public Chapter 429. Source: Tennessee Department of Revenue.

Figure 4: Share of Total Revenue Raised in Large and Small Counties



This figure shows the percent of local sales tax revenue raised in large and small counties over time in Tennessee. Large counties are defined as the four counties housing the four largest principal cities (Memphis, Nashville, Knoxville, and Chattanooga) of Tennessee's metropolitan areas. Small counties are defined as the smallest 50 percent of counties based on population size. The first vertical line corresponds to the *Wayfair* decision. The second vertical line corresponds to the month prior to Public Chapter 491 going into effect and firms with economic nexus being required to remit under Public Chapter 429. Covid-19 began to shut down state economies in March/April 2020. Source: Tennessee Department of Revenue.

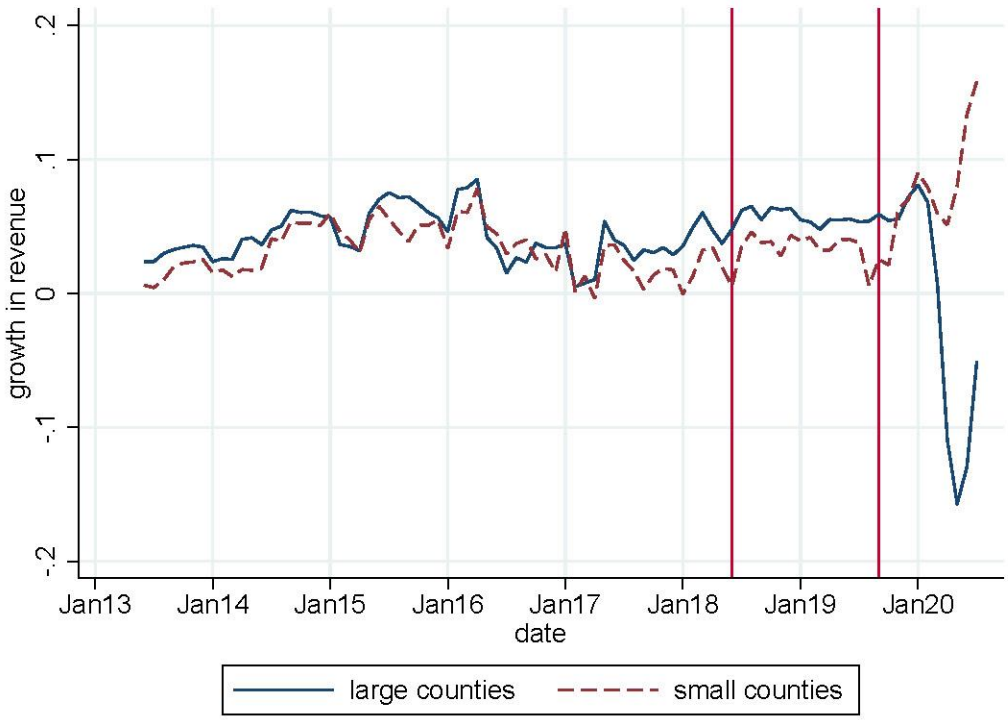
Figure 5: Tax Revenue Raised in Large and Small Jurisdictions

Panel A: Small Counties

Panel B: Large Counties

This figure shows the amount of local sales tax revenue in large and small counties over time in Tennessee. Large counties are defined as the four counties housing the four largest principal cities (Memphis, Nashville, Knoxville, and Chattanooga) of Tennessee's metropolitan areas. Small counties are defined as the smallest 50 percent of counties based on population size. To remove volatility, we remove month fixed effects, adding back in the value in the month prior to Public Chapter 491, and then plot a moving average of this series. The first vertical line corresponds to the *Wayfair* decision. The second vertical line corresponds to the month prior to Public Chapter 491 going into effect and firms with economic nexus being required to remit under Public Chapter 429. Covid-19 began to shut down state economies in March/April 2020. Source: Tennessee Department of Revenue.

Figure 6: Tax Revenue Growth in Large and Small Jurisdictions



This figure shows the year-over-year growth in tax revenue in large and small counties over time in Tennessee. Large counties are defined as the four counties housing the four largest principal cities (Memphis, Nashville, Knoxville, and Chattanooga) of Tennessee's metropolitan areas. Small counties are defined as the smallest 50 percent of counties based on population size. We plot a moving average of this series. The first vertical line corresponds to the *Wayfair* decision. The second vertical line corresponds to the month prior to Public Chapter 491 going into effect and firms with economic nexus being required to remit under Public Chapter 429. Covid-19 began to shut down state economies in March/April 2020. Source: Tennessee Department of Revenue.

Table 1: Personal Consumption Expenditures By Category

	1979	2019
Durable Goods	14.3%	10.5%
Autos	5.7%	3.6%
Furniture and Household	4.1%	2.5%
Other Durables	4.5%	4.5%
Nondurable Goods	32.3%	20.5%
Food and Beverage	13.8%	7.1%
Other Nondurables	18.5%	13.4%
Services	53.5%	69.0%
Total Expenditures	100%	100%

This table indicates the percent of total expenditures that is spent on durable goods, nondurable goods, and services over time in the United States. Source: Bureau of Economic Analysis.

Table 2: State Nexus Rules

State	Notes	Effective Date	Threshold	Transactions	Marketplace Sales
Alabama		October 1, 2018	$250,000		0
Alaska	Local Rules Apply				
Arizona		October 1, 2019	$200,000		0
		2020	$150,000		0
		2021	$100,000		0
Arkansas		July 1, 2019	$100,000	200	0
California		April 1, 2019	$500,000		1
Colorado		December 1, 2018	$100,000	200	0
		April 14, 2019	$100,000		0
Connecticut		December 1, 2018	$250,000	200	1
		July 1, 2019	$100,000	200	1
Delaware	N/A				
District of Columbia		January 1, 2019	$100,000	200	1
Florida	Proposed	July 1, 2020	$100,000	200	
Georgia		January 1, 2019	$250,000	200	1
		January 1, 2020	$100,000	200	1
Hawaii		July 1, 2018	$100,000	200	1
Idaho		June 1, 2019	$100,000		1
Illinois		October 1, 2018	$100,000	200	0
Indiana		October 1, 2018	$100,000	200	0
Iowa		January 1, 2019	$100,000	200	1
		July 1, 2019	$100,000		1
Kansas	Proposed	October 1, 2019	$100,000		
Kentucky		October 1, 2018	$100,000	200	1
Louisiana		July 1, 2020	$100,000	200	0
Maine		July 1, 2018	$100,000	200	0
Maryland		October 1, 2018	$100,000	200	1
Massachusetts		October 1, 2017	$500,000	100	0
		October 1, 2019	$100,000		0
Michigan		October 1, 2018	$100,000	200	1
Minnesota		October 1, 2018	$100,000	100	1
		October 1, 2019	$100,000	200	1
Mississippi		September 1, 2018	$250,000		1
Missouri	Proposed	January 1, 2021	$100,000		
Montana	N/A				
Nebraska		April 1, 2019	$100,000	200	1
Nevada		November 1, 2018	$100,000	200	1
New Hampshire	N/A				
New Jersey		November 1, 2018	$100,000	200	1
New Mexico		July 1, 2019	$100,000		0
New York		June 21, 2018	$300,000	100	1
		June 24, 2019	$500,000	100	1
North Carolina		November 1, 2018	$100,000	200	1
North Dakota		October 1, 2018	$100,000	200	0
		December 31, 2018	$100,000		0
Ohio		January 1, 2018	$500,000		1
		August 1, 2019	$100,000	200	1
Oklahoma		November 1, 2019	$100,000		0
Oregon	N/A				

Pennsylvania		July 1, 2019	$100,000		1
Rhode Island		July 1, 2019	$100,000	200	1
South Carolina		November 1, 2018	$100,000		1
South Dakota		November 1, 2018	$100,000	200	1
Tennessee		October 1, 2019	$500,000		0
		October 1, 2020	$100,000		1
Texas		October 1, 2019	$500,000		1
Utah		January 1, 2019	$100,000	200	0
Vermont		July 1, 2018	$100,000	200	1
Virginia		July 1, 2019	$100,000	200	0
Washington		October 1, 2018		200	1
		March 14, 2019	$100,000		1
West Virginia		January 1, 2019	$100,000	200	1
Wisconsin		October 1, 2018	$100,000	200	1
Wyoming		February 1, 2019	$100,000	200	0

This table shows the adoption date of economic nexus rules by state along with any thresholds (in sales or number of transactions) necessary to trigger economic nexus. The marketplace sales column includes a 1 if marketplace facilitator revenues are included in calculations of whether the threshold is met and a 0 otherwise. Source: Sales Tax Institute, Economic Nexus State Guide

Table 3: State Taxation of Services

Services	Number of States Taxing the Services
Intrastate Telephone - Industrial	41
Interstate Telephone - Industrial	25
Cellular - Industrial	42
Electricity - Industrial	36
Intrastate Telephone - Residential	41
Interstate Telephone - Residential	27
Cellular - Residential	43
Electricity - Residential	22
Newspaper	4
Magazine	4
Telemarketing Services	18
Canned Software	46
Modifications to Canned Software	27
Custom Software - Material	19
Custom Software - Prof Services	13
ISP - Dialup	8
ISP - Broadband	9
Information Services	14
Data Processing	10
Mainframe Computer Access	19
Online Data Processing	10
Software - Downloaded	33
Books - Downloaded	28
Music - Downloaded	28
Rental of video for home	45
Movies/video - Downloaded	27
Other electronic downloaded	23
Streaming music/audio	16
Streaming video	18
Cable TV	28
Direct Satellite	25
Software as a Service - Generally	14
Remote Access to Hosted Software - Individual	13
Remote Access to Hosted Software- Business	15
Remote Access to Hosted Software - Business Custom	7
Infrastructure as a Service - Generally	7
Personal Cloud Storage - Backup	7
Business Cloud Storage - Backup	8
Business Data Warehouse	9
Provision of Virtual Computing Capacity	8

This table shows the number of states taxing each service as of 2017. Source: Federation of Tax Administrators, Survey of Services Taxation, 2017

DISCLOSURES

The authors have no financial arrangements that might give rise to conflicts of interest with respect to the research reported in this paper.

ACKNOWLEDGEMENTS

We thank Donald Bruce, Naomi Feldman, Mohammed Mardan, Scott Peterson, Iuliia Shybalkina, Kirk Stark, David Wildasin, and George Zodrow for comments.

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