

To Tax or Not To Tax?

The Case of Electronic Commerce

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ABSTRACT: Despite the intensifying debate over the taxation of internet commerce, the relevant issues have not been given a systematic treatment in the context of the literature on optimal taxation. We present such an analysis, and investigate separately the taxation of business purchases of intermediate goods, the taxation of consumer purchases of final goods and services, and the various issues of administration and compliance costs as they apply to the development of e-commerce. We conclude that, generally, the optimal tax literature can not be used in support of a blanket tax exemption for internet purchases. Certain conditions could lead to the optimality of an exemption, but those conditions are not likely to be met in practice.

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Introduction

The sales tax treatment of goods and services purchased via the internet has attracted attention far beyond that normally afforded to issues of state and local taxation. The discussion is motivated by widely different objectives, with some looking at the issue as how to create the best tax structure, others as a means to reduce the size of government, and others as a way to give preferential tax treatment to a particular industry.

A number of the participants in the debate have made claims, apparently based on optimal tax theory, about the appropriateness of taxing transactions through e-commerce. It is somewhat surprising, then, that the question of internet taxation has not received a thorough and systematic treatment in the context of the diverse body of optimal tax literature. This paper seeks to add to the discussion by examining what contributions the optimal tax literature provides for design of sales taxes on electronic commerce. We note which arguments are and are not supported by optimal tax theory, and the rather unlikely conditions under which an exemption for internet commerce might be warranted.

The paper is divided into five sections. The first provides a brief overview of the current sales and use tax system and a summary of the Internet Tax Freedom Act (ITFA). The next two are an examination of business-to-business and business-to-consumer transactions in light of the optimal tax literature. The next is an evaluation of the administrative and compliance aspects in the optimal tax environment. The final section is a summary of the implications of the optimal tax literature for taxation of remote commerce.

The Current Sales and Use Tax System and the ITFA

Our analysis is based on the sales tax as it operates institutionally in the U.S. and not on the basis of a stylized consumption tax. For example, it is recognized that the existing sales tax is

imposed on many intermediate transactions, is levied at rates that vary geographically across the country but are fairly uniform within each location, and exempts significant components of consumption.

It is important to note how the current sales and use tax system in the U.S. treats local and remote purchases differently. In most cases, either the sales tax or the use tax is imposed on items included in the tax base regardless of where the goods are acquired.¹ The sales tax is levied on items purchased in state for use in state and the use tax is imposed on goods that are stored, used or consumed in state but purchased out of state. However, use tax collection often relies on voluntary compliance, which increases the opportunity for tax evasion.² A major source of evasion arises as firms and consumers fail to report that taxable items purchased out of state are used in state. Not surprisingly, the limited available evidence indicates that use tax compliance is much weaker than sales tax compliance.³

Under the Internet Tax Freedom Act (ITFA) of 1998 and its pending extension through 2006, no new or discriminatory taxes may be levied on internet sales and taxes on access to the internet are prohibited, except for eight states where access taxes have been grandfathered. States are permitted to apply existing sales and use taxes to internet and other remote sales, but may not enact any new taxes that are explicitly targeted at internet sales.

¹ This, structure, that imposes use taxes and allows exemption from sales taxes for many sales to out-of-state buyers, is used to create an overall system of destination taxes.

² Vendors cannot be required to collect the use tax from the buyer and remit it to the destination state unless the vendor has substantial nexus in the destination state. The Supreme Court has ruled that firms must have physical presence in a state before they can be regarded as having substantial nexus (see *Quill v. North Dakota*, 112 U.S. 298 (1992)).

³ Both taxpayers and tax collectors generally agree that use tax compliance is much poorer than sales tax compliance, though there is little empirical evidence to support this contention. One exception is a study of registered businesses in Washington State that uses 1991 data. The study finds use tax non-compliance of 19.9 percent versus sales tax non-compliance of 1.5 percent. The study understates the extent of use tax non-compliance on remote sales because it combines non-compliance on remote sales with non-compliance by firms that purchase a taxable commodity with an exemption certificate and then conclude that tax should have been paid. Use tax

Sales Taxes and Business to Business Transactions

The internet tax debate is not entirely focused on consumer purchases. Business-to-business (B2B) e-commerce is projected to represent over 90 percent of the total by 2003 and nearly 70 percent of the projected sales and use tax revenue losses in that year (Bruce and Fox, 2000).⁴ Indeed, it is well recognized that the sales tax is levied on certain intermediate goods in addition to being imposed on many final goods, though the specific set of taxable goods varies by state and in some cases by local jurisdiction. No precise estimates are available on the extent to which intermediate goods are taxed, but one places the intermediate share at 41 percent of total sales tax revenues (see Ring, 1999). As a general rule, taxation of intermediate goods, like taxation of final goods, applies mostly to tangible commodities. Taxation of services is generally limited, though there are wide variations by state. States such as Hawaii, New Mexico, and Iowa tax services relatively broadly and states such as Virginia and Illinois tax services lightly (see Federation of Tax Administrators, 1996).

The base is structured to prevent the sales tax from being purely a turnover levy, despite the wide taxation of intermediate goods. Exemptions are broadly available for goods purchased for resale by retailers and for intermediate goods that become component parts of manufactured goods.⁵ Equipment used directly in manufacturing processes is often exempt as well. Both retailers and manufacturers are normally taxed on many other intermediate goods.⁶ The broad exemptions are generally not available for service producers, meaning they are taxed on many of their inputs without taxation of their output.

compliance on remote sales is probably weaker because it is more difficult to identify. Also, non-compliance is surely greater for non-registered firms, which were not included in the study.

⁴ These calculations were based on proprietary data provided by Forrester Research, Inc.

⁵ Though most states' tax structures allow certain exclusions from the base (items not defined within the base), omission of transactions from the base, whether for intermediate or final goods, is normally accomplished by granting exemptions.

⁶ Every state provides a wide array of other exemptions for intermediate goods that are probably better understood in political rather than in economic terms.

Should Intermediate Transactions Be Taxed?

A key issue in the debate regarding the taxation of e-commerce is whether the advent of remote sales, and e-commerce in particular, is efficiency enhancing because it is expected to reduce taxation of intermediate inputs as it generally reduces sales tax collections. A similar argument has been that some services should not be brought into the sales tax base because they are consumed heavily by business. Review of the optimal tax literature provides little direct support for the a priori contention that elimination of existing taxes on intermediate goods increases efficiency. In fact, the literature concludes that under a variety of circumstances efficiency can be improved through appropriate taxation of intermediate goods. First, it should be noted that because of the use tax, failure to impose taxes on transactions through e-commerce will not eliminate taxation of all intermediate goods, even for remotely purchased inputs. E-commerce will, however, make it easier for firms to engage in tax evasion and avoidance.

Much of the failure to collect taxes on e-commerce will be evasion since the use tax is due. However, the sale of digitized goods and services via e-commerce provides an additional opportunity for tax avoidance. Following from the history of their development, state sales tax laws generally are written so that tangible goods are taxable unless otherwise specified and services are taxable only if specifically enumerated. This structure provides one means of avoidance in some states. All states currently tax canned software, but they have gotten software into the base through different means. Some states amended their tax laws to enumerate that sales of software and information processing are taxable events. Other states relied on the existing tax structure and argued that diskettes are tangible property that is taxable unless otherwise exempted. Therefore, in 16 states the sale of canned software in tangible form is taxable but the sale of digitized canned software is not taxable, allowing firms to determine the taxability of this intermediate input by varying the means of delivery.

Diamond and Mirrlees (1971, 1972) determined that under very limiting assumptions, including perfect competition and constant returns to scale, optimal taxation would result in no taxes on intermediate goods.⁷ A 100 percent profits tax is necessary for this result to hold in the presence of decreasing returns to scale. But, Stiglitz and Dasgupta (1971) and Myles (1989) have demonstrated that differential factor taxation can be appropriate when markets are imperfect, a likely characteristic of many input and output markets. Myles (1995) notes that with imperfect competition, taxation of intermediate inputs is appropriate even when profits taxes are used.

Stiglitz and Dasgupta (1971) indicate that differential factor taxes are appropriate when there are limitations on commodity tax rates or when taxation of particular goods is not possible. Higher rates on intermediate goods should be imposed when the elasticity of substitution is smaller so that distortions in factor use are limited. Also, higher rates should be imposed on inputs with small factor shares. Konishi (1990) concludes that higher taxes should be imposed on inelastically supplied intermediate goods – a production side Ramsey Rule.

In summary, this literature indicates two situations where taxes on intermediate inputs can be efficiency enhancing. Sales taxes on intermediate goods should remain to the extent that the existing structure results in taxes consistent with these principles. Taxes on intermediate transactions could be efficiency enhancing if they are imposed more heavily on inputs used in industries that operate in highly non-competitive industries. Specifically, positive taxes should be imposed in industries where there are decreasing returns to scale. Also, the taxes could be efficiency enhancing if they are offsetting the inability to impose efficient taxes on final goods. If a positive revenue constraint was imposed when starting from a zero tax environment, input taxes would improve efficiency if non-taxable outputs were more complementary with leisure than potentially taxable outputs (Corlett and Hague, 1954). Starting from the existing system of

⁷ Later research allowed relaxation of the constant returns to scale assumption (see Mirrlees, 1972).

taxes, the non-taxable outputs do not need to be more complementary with leisure, the only requirement is that indirect taxation of untaxed or undertaxed outputs (through taxation of inputs) moves the overall tax structure to a pattern more consistent with efficiency. Higher taxes should be imposed on inputs to the extent that they are inelastically supplied,⁸ used in production with small substitution elasticities, and comprise small factor shares.

Are Existing Taxes Efficiency Enhancing?

The question remains whether the seemingly haphazard manner in which sales taxes are imposed on intermediate inputs (made more haphazard by e-commerce) is efficiency enhancing. Unfortunately, we have relatively little guidance on this issue, but it is equally clear that the case against taxation of all inputs cannot be easily asserted. A case can certainly be made for taxation of intermediate goods based on two sets of restrictions on sales tax rates. The first arises because of the political problem of broadening the base to include services.⁹ Indeed, attempts to extend tax bases to any currently untaxed goods or services run into serious political obstacles. During the 1980's, many states made aggressive efforts to extend the base to services, but were unable to sustain significant expansions.¹⁰ The net result was broadening of the bases to include a few minor services, with Florida, the one state that initially enacted extensive broadening, backing off after six months.¹¹ Second, for administrative/compliance¹² and political reasons each state has limited itself to a small number of tax rates.¹³ There are a few exceptions, such as the District

⁸ Analysis of the elasticities is complicated by imposition of taxes at the sub-national level. The open economy setting may dramatically increase the supply elasticities for those intermediate goods and outputs that can be traded at low cost across wide geographic ranges.

⁹ States encounter stiff political objections when trying to expand the sales tax base to services because the need to enumerate the services galvanizes the potentially taxed industry to fight the base expansion while there are few advocates for expansions.

¹⁰ See Fox and Murray (1988).

¹¹ Massachusetts also passed significant base broadening, but the legislation was repealed before it was implemented.

¹² Firms must maintain records by tax rate for audit purposes, must be able to distinguish between taxable and non-taxable goods and must be able to determine what rate is imposed on each taxable item, and so forth.

¹³ Sadka (1977) and Hatta (1986) derive conditions under which uniform taxes are optimal.

of Columbia which has five rates (see Due and Mikesell, 1995), but even there the majority of goods are taxed at a single rate.

As already noted, taxability varies by type of intermediate input and by industry. Labor is generally exempt in all industries, though purchase of labor through temporary employment agencies is taxable in a few states, such as Ohio and Pennsylvania.¹⁴ Services used as intermediate goods are normally exempt (as they are for final consumers), though utility services are often taxable. The manufacturing and retail industries are granted broad exemptions for component parts of what they produce or sell. In many states, manufacturing firms also receive an exemption for capital used directly in the manufacturing process. As a result, the taxation of intermediate goods is limited to certain produced goods and capital in some industries.

The system of intermediate goods taxation imposes a tax as a percentage of receipts that is higher on service industries than on retail trade or manufacturing industries. Sales taxes on intermediate inputs as a percentage of gross receipts for two-digit SIC manufacturing industries are estimated to be between 0.9 (tobacco) and 8.1 (primary metals) percent (see Table 1).¹⁵ Intermediate input taxes for trade industries are estimated to lie in the same range. Taxes for service industries, which are often not taxed at the final consumer level, are much higher. For example, museums are subject to taxes on purchases equal to 18.1 percent of their receipts, membership clubs equal to 18.9 percent, and auto repairs equal to 35.4 percent. Thus, the general propensity is for the implicit tax imposed through intermediate transactions to be greater in areas where no sales tax is imposed on the output. However, taxes imposed indirectly through intermediate goods are levied on an origination rather than a destination basis, so the tax rate

¹⁴ Also, labor may be taxed in a limited number of other cases unless separately stated on the bill, such as when labor is an input in the production of repair services.

¹⁵ Taxable amounts for intermediate inputs are estimated based on taxability in a typical state and each industry's specific input expenditures as recorded in the Census data.

implicit in the sale may differ from that imposed on other sales in each market, and the revenues are owned by the state of origination.

Further, the main effect of e-commerce on taxation of intermediate transactions is to create two classes of identical goods based on how the goods are acquired: goods purchased locally that are taxable and goods purchased remotely that because of evasion and avoidance are either untaxed or only partially taxed. Differential taxation of these two classes can only be justified if the factor demand elasticities and substitution elasticities for seemingly identical inputs differ depending on how and where the inputs are ordered. Disparity in the elasticities relies on firms viewing the goods as different (even though they are identical at the firm gate). For example, it is possible that inputs would be seen as different because of the greater risk that inputs will be shipped late when they are coming from a wider geographic area. To the extent that locally purchased and remotely purchased inputs are viewed as different, higher taxes on local inputs can be justified only if the demand elasticity is higher for remote purchases. Differential taxation cannot be justified if they are viewed as identical inputs.

Effects on Business Location

Locational incentives, arising both from court determined nexus provisions that limit the ability to enforce destination taxes and from origination taxation of inputs, can potentially arise for e-commerce vendors in both their input and output markets and the resulting distortions can also create production efficiency losses. Available technologies allow e-commerce vendors to locate their back office facilities, such as order processing, computer support and so forth, at nearly any site, permitting the location decision to be made to minimize production costs in the face of very low transportation costs. .

Taxes on intermediate goods either encourage firms to locate their production facilities in the lowest tax rate states or to evade use taxes. Taxes in the output markets encourage firms to

locate back office facilities in small population states or even outside the US to limit the number of people for whom they must collect and remit sales and use taxes. For example, Amazon.com has admitted that one of the reasons for its location in Washington State is to limit the percentage of sales on which it must collect taxes. Efficiency losses are incurred to the extent that tax induced locations differ from those that minimize total production and distribution costs.¹⁶ Even in cases where the cost savings from locating warehouses and other production facilities nearer people overcome tax considerations, the facilities can be sited in the smallest population state that is near large population centers.

The literature on effects of state and local government taxes on the location of production generally concludes that taxes have a small but significant effect on the siting of businesses (Wasylenko, 1997). However, these studies are normally based on profits or property taxes, which are a much smaller percentage of business revenues than sales taxes. Sales taxes, imposed on both input and output markets at rates ranging up to 10 percent,¹⁷ have the potential to cause much larger location distortions than have generally been found in the literature. Further, the studies have generally been conducted in situations where transportation costs were much greater than for many e-commerce firms. The importance of taxes in the location decision will grow as the role of transport costs diminishes.

¹⁶ Depending on court rulings with regards to issues such as affiliate nexus, firms may be able to avoid collecting taxes in their output market through careful design of the corporate structure. For example, Dell potentially can divide its activities into a production company and a sales company, and reduce the number of states where its sales company has nexus if the courts ruled that the two companies do not have nexus through their affiliation. Thus, the additional location costs imposed by the sales tax may only be the costs of identifying and establishing an appropriate corporate form. These practices would increase the number of cases where states must rely on use tax compliance.

¹⁷ Combined state and local sales tax rates reach 10 percent at some locations in Alabama and Louisiana.

Sales Taxes and Consumer Purchases

A primary theme in the internet taxation debate is the presumed ideal of tax neutrality. Those opposed to a tax-free internet have argued that sales of similar—indeed, identical—goods should be taxed in a uniform manner regardless of how they are obtained for final consumption. It may come as some surprise, then, that uniform commodity taxation is not typically optimal in the context of traditional optimal tax theory. Conversely, theory does not provide a blanket endorsement of the non-taxation of B2C e-commerce. Of course, the optimal tax literature has not yet considered the possibility of differential taxation on the basis of how consumer goods are obtained for final consumption.

On the surface the ITFA appears to be equitable (aside from the prohibition of taxes on internet access), as it protects the internet from unfair taxation. Nonetheless, such treatment is inefficient if the optimal tax system implies differential treatment of internet sales. As already noted, one requirement of theoretically optimal systems is that no restrictions be placed on the set of possible taxes (and tax rates).

A primary effect of the ITFA is to sustain the states' difficulty in collecting use tax on their residents' remote purchases. Despite the statutory non-discrimination inherent in the ITFA, the act implicitly supports the Court-determined definition of nexus requiring physical presence before firms can be obligated to collect the use tax, which means the effective tax rate on remote sales is likely to be lower than on local sales.¹⁸ Of course, use tax payments are due even if the firm does not collect them, but consumer compliance is historically low.¹⁹

¹⁸ Unfortunately, a clear definition of physical presence has not emerged; stores, manufacturing facilities, web sites, data stored on PCs or servers, or delivery operations within a state may or may not necessarily constitute nexus.

¹⁹ No studies are available on use tax compliance by individuals, but the extent must be very small. The Federation of Tax Administrators surveyed nine states that require individuals to report their use tax liabilities on their individual income tax returns. Wisconsin, the state with the highest amount collected voluntarily, received a total of \$1.4 million with fewer than one percent of taxpayers reporting a liability, even though compliance has been made easy and individuals are signing tax returns indicating that they have little or no tax liability.

The tax wedge between local and remote purchases, which actually began with catalog sales in earlier decades, means shoppers can buy locally and pay sales tax, or they can buy remotely and, more often than not, avoid paying sales or use tax on the purchase. The tax differential can amount to a discount of up to 10 percent, everything else equal.

This tax differential can be a powerful incentive to shop remotely, and those who defend the ITFA have frequently voiced this theme. Not enforcing use tax liability on remote purchases may be an appropriate economic incentive (based on a network externality), intended to foster the growth and development of remote purchasing mechanisms—most importantly, of the internet. As e-commerce becomes more and more common, however, this argument gradually falls by the wayside and it can no longer be argued that the internet is a fledgling industry that must be nurtured and protected.²⁰ Faced with this situation, proponents of a tax-free internet have turned to arguments that are apparently based on optimal tax theory.

Should Local and Remote Purchases of Final Goods and Services Be Taxed Differently?

Despite the large number of papers in the optimal tax literature that have addressed the issue of neutral commodity taxation, none have addressed the idea of non-neutral taxation of two units of the same good which are obtained for final consumption via different modes of purchase. To be sure, the bulk of the optimal tax literature was developed before catalog (and certainly before internet) commerce became an everyday occurrence. To explore this question, then, it is important to examine the various assumptions and conclusions of the commodity tax neutrality literature as they were originally formulated.

Sadka (1977), Atkinson and Stiglitz (1980), Deaton (1979 and 1981) and Besley and Jewitt (1990) outline the various necessary restrictions that lead to the optimality of uniform commodity taxation. These conditions hinge on the separability of leisure and consumption in

consumer utility. Summarizing this literature, Myles (1995, p. 127) notes that “the conditions implying uniform taxation are restrictive and there is no reason why they should be satisfied in practice.”

To expand this reasoning, recall that the first-best tax system involves lump-sum taxes on all taxpayers. Ruling this out, consider the outcome of a uniform tax on all commodities. Rational consumers would tend to shift away from taxed goods toward the lone untaxed commodity, leisure. As this would involve the inefficient over-consumption of leisure, optimal second-best tax systems tend to be focused more on taxing complements to leisure (e.g., yachts and video games) more heavily than substitutes for leisure (e.g. office supplies and uniforms).²¹

Regarding internet commerce, it is not clear whether goods purchased online are relatively more complementary to leisure than those that are purchased locally. In fact, some of the more popular categories of e-commerce—computers, software, books, and travel—could be both complements and substitutes. It is certainly safe to assume, however, that goods purchased online are not universally substitutable with leisure. In other words, a universal tax exemption for e-commerce is probably not warranted on this basis.

On the other hand, failing to tax remote sales might actually be consistent with the famous Ramsey (1927) rule of optimal commodity taxation. As formalized by Diamond and Mirrlees (1971), the Ramsey rule requires that commodity taxes be set in such a way as to equalize the tax-induced percentage reductions in compensated demands for all taxable goods. Some additional restrictions yield the more intuitive result that goods should be taxed in inverse proportion to their demand elasticities; more price-elastic goods should be taxed less heavily.

²⁰ Goolsbee and Zittrain (1999) discuss the potential arguments in favor of subsidizing the internet, which include the possibility of network or information externalities. The authors argue that such externalities (and the justification for the subsidy) are short-lived.

²¹ Slemrod (1990) provides further elaboration on these points.

To return to our earlier point, applying the Ramsey rule to e-commerce is inappropriate unless the same good obtained by two different purchasing channels can truly be treated as two separate goods. Transactions costs associated with remote purchases, which may include shipping and handling costs and time costs due to delivery lags, are merely one element of the good's total price. Local purchases also involve similar transaction costs, such as travel, parking, and shopping time. In general, it would appear that the differences between the two "goods" are just price differences, and consumer demand schedules will determine how the actual good is obtained.

It is not unfathomable that the same final good could represent two distinct consumption goods depending on how it is obtained for final consumption. At the heart of this is the notion that the act of consuming the good—and not just its price—may be inherently different depending on how it is purchased. This is similar to Lancaster's (1966) argument that it is a good's attributes, not the good itself, that is actually desired by consumers. A shirt purchased at the local mall may provide different set of attributes than the same one purchased via an online vendor.

Therefore, it may still be enlightening to consider the situation in which it is possible to distinguish goods on the basis of how they are obtained. As with the taxation of business-to-business transactions, the optimal tax treatment would then depend on relative demand elasticities, which are expanded to account for the unpriced elements of (local and remote) consumption. In this framework, one possibility is that the demand for remote goods is relatively more price elastic than the demand for local goods. Although empirical evidence is not yet available, consumers may be more likely to respond to price changes when shopping online than when shopping in a local store. One reason for this is that in an online purchase, as noted above, there may be some uncertainty regarding whether or not the correct good will

actually be shipped on time. If these arguments hold, goods for which consumer demand is relatively less price-elastic (most notably, necessities) will typically be purchased more frequently from local vendors. These notions, inherently based on the Ramsey rule, have fueled the general argument that local sales should be taxed relatively more heavily than remote sales. Of course, this assumption about relative demand elasticities is not based on fact. It might well be assumed that remote purchases are less price elastic than local purchases. The fact that most B2C e-commerce takes place through the top 50 firms seems to indicate that consumers may indeed be relatively price inelastic in their online shopping.

Regardless, the conclusions surrounding the Ramsey rule are based on a number of rather restrictive assumptions. Perhaps the most important of these is the requirement that all consumers are identical. This assumption simplifies the analysis of the optimal tax problem by removing any discussion of vertical or horizontal equity. If the Ramsey rule is to apply to e-commerce, it must be true that those who purchase locally are virtually the same as those who make purchases online or by catalog. This assumption is probably not appropriate given recent survey evidence, which shows that those who buy online tend to be better educated and have higher income and wealth than those who buy strictly from local merchants.²²

The significant differences between local and remote purchasers will undoubtedly erode as the internet expands and becomes a more important component of consumer life. Regardless, the Ramsey rule should probably not be used in defense of tax-free internet commerce. Its restrictive assumptions may not hold, and its frame of analysis may not apply to the same good obtained via multiple channels.

There is much more to the optimal commodity tax literature, however, and this discussion would not be complete without a consideration of the so-called “many-person Ramsey rule”

²² See, for example, Goolsbee (2000a and 2000b).

developed by Diamond and Mirrlees (1971), Diamond (1975), and Mirrlees (1975). According to this more general arm of the optimal tax literature which allows for consumer heterogeneity and equity considerations, commodity taxes should be higher on those goods for which demand is inversely related to the social marginal utility of income. As it is popularly interpreted, goods that are consumed more heavily by households with higher incomes (and lower social marginal utilities of income) should be taxed at a higher rate than goods that are consumed relatively more by lower-income households.

Unlike the homogeneous-consumer Ramsey rule, this conclusion is apparently inconsistent with the non-taxation of e-commerce, at least in the immediate term. Since internet and catalog purchases are typically made by higher-income households (with computers, credit cards, and lower marginal utilities of income), they should be taxed relatively more heavily than local purchases. Thus, even if the various assumptions of the many-person Ramsey rule are satisfied, it cannot be used as a defense of the current differential tax treatment of local and remote sales. Lower-income households would have to become the dominant group of online purchasers in order for an internet tax exemption to be justified on the basis of the many-person Ramsey rule. This is highly unlikely, even in the very long run. If no meaningful distinction exists between local and online buyers, then, no differential tax treatment is warranted.

To summarize, two themes emerge from the consideration of business-to-consumer e-commerce in the context of the theory of optimal commodity taxation. First, the fundamental optimal tax rules were developed under assumptions that do not hold in practice, especially in the presence of e-commerce as we know it. Second, even if the various assumptions were to hold, the single and many-person Ramsey rules cannot be used as arguments in support of the non-taxation of e-commerce because of the nature of final consumers.

Despite this and the apparent non-optimality of uniform commodity taxation, political and administrative feasibility concerns and equity issues have resulted in a system of commodity taxation in the U.S. that is characterized by a (location-specific) single rate. Hatta (1986) provides further evidence in support of the presumed ideal of neutrality or uniformity: in the presence of pre-existing tax distortions, tax reform measures that move in the direction of greater neutrality can improve welfare. Hence, a discussion of the optimal tax treatment of business-to-consumer e-commerce should consider the relevant institutional and administrative framework. These issues are addressed in greater detail below.

Efficiency Effects of Untaxed B2C E-Commerce

Continued inability to collect use taxes certainly has the power to distort consumer behavior in much the same way that it can distort producer behavior, and an outright ban on internet taxation would go even further. Many of the relevant details (especially those regarding the efficiency costs of distorted production location decisions) were discussed above, so only a few additional points are made here.

First, in the presence of untaxed e-commerce, consumer decisions of where to make purchases are more likely to be made on the basis of differential taxation than on such things as relative price or service quality. Given identical prices and shopping costs, the rational consumer will buy from the retailer that charges the lowest (or no) sales tax. If some remote purchases would otherwise have been made locally, an efficiency loss is the end result. This is based on the notion that goods that are fairly highly substitutable should arguably be taxed in a similar manner in order to reduce efficiency losses.

Second, many consumer purchases—especially of services—are exempt from sales taxation. In fact, Bruce and Fox (forthcoming) report that the sales tax base in the average sales-taxing state fell as a share of personal income from 51.4 percent in 1979 to 42.8 percent in 1998.

The non-taxation of e-commerce would represent a further reduction in the set of goods and services that are taxable, which may or may not be efficiency-enhancing.

The Role of Administration and Compliance Costs

The basic principles of sales tax administration and compliance apply equally to electronic commerce and other types of commerce. Revenues are derived primarily from firm collection and remittance of tax on behalf of buyers.²³ Individuals pay tax at point of acquisition when items are purchased from firms with nexus or are obligated to pay use tax in the state of residence should taxable items be purchased tax free or at reduced rates in another jurisdiction.

The sales tax treatment of firms depends on the nature of business activity. Some firms, such as government entities and nonprofit organizations, are generally exempt from sales taxation on input purchases. In other instances, tax on inputs is collected at point of sale (again from firms with nexus) or through use tax returns submitted directly by the firm making a purchase. Tax returns normally are submitted on either a monthly or quarterly basis. Exemptions may be enumerated for specific purchases or granted through direct use, component part or similar rules. Buyers must show an exemption certificate (or provide equivalent information) to enjoy tax relief on purchases. The burden rests on sellers to ensure that exemption certificates are legitimate. Firms with a single-state presence have only one tax system to comply with, while multi-state firms encounter as many tax systems as there are states that they do business with.

There is only limited evidence on the compliance costs of the sales tax. One conclusion is that compliance costs are disproportionately higher for smaller establishments. Larger firms likely enjoy some economies of scope in complying with multiple taxes and the information used

²³See Due and Mikesell (1994) for a comprehensive discussion of the subject.

to comply with the sales tax may be essential to other aspects of the business's operations, including valuing and situsing of transactions. A number of states provide vendor compensation to help offset compliance costs, typically in the range of 2 percent of the volume of taxes collected.

Collection, enforcement and administrative adjudication are the responsibilities of the tax administration. Critical to the administration and enforcement of any tax is the ability to observe, directly or indirectly, the nature of any taxable activities. In practice, observability and enforcement have traditionally rested on paper trails maintained by vendors. Such paper trails are not available from firms without nexus. As with compliance costs, the costs of administering the current sales tax are not well documented. One reason is that sales tax administration is often conducted jointly with the administration of other taxes. For example, a state may have a single audit division focusing on taxpayers, as opposed to tax auditors for each specific state tax. Similarly, there may be one management information system supporting an array of taxes and isolating the costs of the sales tax may be difficult.

The burden of tax compliance and the question of administrability have been central to the debate over the taxation of electronic commerce. These concerns are quite valid, especially in the context of multistate vendors. Vendors must comply with numerous state/local sales tax systems, each with its own unique rate and base structure, and reporting requirements, while the tax administration must disentangle myriad firm records to enforce the tax. But the reality is that achieving a transfer of resources from the private sector to the public sector via any tax instrument will entail costs in addition to the revenue collected. This problem has long been recognized in the formalized analysis of excess burden and optimal tax theory, as discussed above. Yet practical tax policy has, over an even longer span of time, recognized the important role of administration and compliance costs as well. Heller and Shell (1971) note the practical

nature of real world tax policy in their initial formalization of the optimal tax problem with costly administration and compliance. For example, the early development of the sales tax recognized the relative ease of administration and compliance when tax fell on wholesalers and tangible goods. In a relative sense, the tax base in this instance is readily observable and the technology of compliance and administration is simplified considerably.

Clearly, policy decisions on taxation of electronic commerce must hinge in part on administrative feasibility and compliance costs. Yet the question needs to be properly framed. For some, the level of government spending (and hence revenue needs) is predetermined, and the proper question is: Which revenue source can fund government spending at the lowest social cost, inclusive of excess burden *and* administration and compliance costs? For others, government spending is viewed as part of--or simply *the*--collective choice problem. Becker (2000), for example, argues that not taxing electronic commerce can be a means to reign in government spending. Summers (1987) notes that the *level* of taxation may be more important to the efficiency question than any uneven pattern of taxation. The theme for many, whether stated explicitly or implicitly, is that government spending has reached a point where the marginal benefits of public expenditures simply fall short of the marginal social costs of funding government.

There are several strands of literature which have sought to build a bridge between costs of administration and compliance and optimal tax theory. In general, by recognizing the broader social costs of taxation and the full array of potential tax instruments, no taxes can be ruled out *ex ante*. In practice this means that taxes on electronic commerce cannot be dismissed simply because they give rise to costs above the revenue collected. Instead, choice of tax structure becomes endogenous, depending on excess burdens, administration and compliance costs, and in the more general case, the marginal benefits of public spending as well. As in the discussion of

B2B and B2C transactions above, this literature does not allow one to make many definitive statements regarding tax policy toward electronic commerce. Yet it does yield a framework that can capture most elements of the broad debate over taxation of internet transactions and points to the factors that must be considered in the design of tax policy. The excess burden literature emphasizes the importance of preferences in dictating the magnitude of distortionary substitution effects, as well as impacts on production decisions (including location) and efficiency. Adding administration and compliance points to the additional role of taxpayer and tax collection technologies in optimal tax design.

Introducing the Technology of Administration and Compliance

Heller and Shell (1971) first formalized the important role of administrative technology in the choice of the tax system. Their analysis reinforces the conclusion that a blanket exemption of electronic commerce is not necessarily consistent with optimal tax policy. The Heller and Shell framework is quite broad, accounting for the optimizing behavior of individuals, firms and government, and allowing for consideration of a broad array of tax instruments, including firm-specific levies, taxes on intermediate goods and output taxes. The social costs of taxation are defined to include both traditional excess burdens as well as administrative costs of achieving a resource transfer to the public sector. Heller and Shell conclude that maximization of social welfare does not necessarily require pure production efficiency, leaving the door open--at least conceptually--for sales taxation of business-to-business transactions. For example, depending on the nature of administrative (and compliance) technologies, there may be lower transactions costs of taxing both inputs and outputs, without making a distinction between firms and consumers.

Yitzhaki (1979) examines simplified administrative technologies and different preference structures in the analysis of the optimal tax system. He examines the choice of the number of

taxed commodities and the uniform tax rate, where each element of the tax base is assumed to entail constant administrative costs. The assumption on technology, coupled with a Cobb Douglas utility function and the absence of labor-leisure choice, dictate the optimality conditions. First, at an optimum, marginal administrative costs must be equated to marginal excess burdens.²⁴ As the tax base is expanded, the extent of excess burden is diminished via fewer substitution effects; at the same time, administrative costs increase as more costly elements are added to the base. Because of the Cobb-Douglas assumption, administrative costs--not utility--constrain the scope of the tax base. This highlights the potential importance of administrative (and compliance) costs in the design of tax policy toward electronic commerce. Second, the (utility) cost of raising marginal revenue from base expansion must equal the cost of raising revenue from higher tax rates, pointing to the importance of two margins in the design of optimal tax structure. Hence, extending the sales tax base to include electronic commerce must be weighed against raising revenue from sales tax (or other) rate increases.²⁵

Heller and Shell, Yitzhaki and Wilson (1989) note compliance costs, but these play no substantive role in their work. Mayshar (1991), on the other hand, highlighted compliance costs, as well as the importance of the benefits of government spending. He defined the social costs of taxation as consisting of four parts: excess burden, administrative costs, noncompliance effort and compliance effort. An important general implication of Mayshar's work is the many margins that must be considered in the broader optimal tax problem. Mayshar also offers

²⁴This conclusion can be contrasted with models of optimal enforcement where the optimization problem is narrowed to the efficient use of auditing resources within a revenue agency; excess burden and compliance costs are thus irrelevant. See, for example, Reinganum and Wilde (1985). The general conclusion of this line of inquiry is that enforcement should be pushed to the point where marginal administrative costs equal marginal recoveries from taxpayers. Slemrod and Yitzhaki (1979) place the enforcement issue in the broader optimal tax context. Mayshar (1991) considers an *absolute* government which seeks to maximize spending (i.e., the marginal benefit of public spending is infinite). Here optimality requires pushing marginal enforcement costs to zero. Also see the discussion of Kaplow (1999) below.

numerical simulations that suggest that administrative and compliance costs may represent a greater burden than costs arising from substitution effects and resultant excess burdens. While Mayshar's approach is general and insightful, it provides only general guidance on optimal tax policy and electronic commerce. Ultimately, empirical evidence is needed on the costs of complying with and administering the sales tax, and the costs of any additional levies that might be imposed on internet transactions. There is a similar paucity of evidence on the question of excess burden costs of the sales tax. One thing that is clear from the work of Mayshar and others, is no a priori argument can be made in support of a moratorium on taxing electronic commerce.

The Optimal Tax Problem with Uncertainty

There is inherent uncertainty associated with the tax compliance-tax enforcement game in general, as well as in the specific context of electronic commerce. Taxpayers may choose not to report, or may choose to understate their tax liabilities, based on attitudes toward risk and perceptions of enforcement parameters; the tax administration may choose to audit taxpayers, and if an audit takes place, noncompliance may be observed in part or in whole. Some tax avoidance strategies may be similarly linked to uncertainty. These same aspects of uncertainty also are present in the context of the sales taxation of electronic commerce. Remote sellers may have uncertainty regarding nexus and hence tax reporting/remittance obligations, while buyers may have uncertainty over any use tax liabilities. The absence of nexus for many sellers may reduce compliance costs, but it also limits the tax administration's capacity to observe taxable transactions, compromising enforcement efforts. And federal government policy, as reflected in the ITFA, may reshape attitudes towards compliance and the perception of risk associated with remote buying and selling.

²⁵ Wilson (1989) sought a more general resolution of the question of optimal tax structure and not very surprisingly found that the optimal tax structure is driven by preferences and substitution elasticities, as in the standard optimal tax problem.

The role of uncertainty was explicitly introduced into the optimal tax problem by Yitzhaki (1987) and Slemrod and Yitzhaki (1987). Yitzhaki examines the excess burden of tax evasion, simplifying the problem by assuming away some key substitution margins and relying on what is (at least initially) a lump sum tax. In this context, the traditional notion of excess burden, which reflects substitution effects, does not exist; instead, excess burden results from the uncertainty and risk associated with playing the noncompliance game. In general, less enforcement (i.e., a lower probability of audit and detection) translates into greater risk and uncertainty, and hence a greater excess burden, just as with a traditional lottery. Moreover, optimality requires that the marginal administrative cost of raising revenue from higher enforcement must equal the marginal excess burden of raising revenue via the tax rate.²⁶

Slemrod and Yitzhaki use the risk-based measure of excess burden to examine the optimal size of the tax administration apparatus. Individuals choose labor supply and the extent of underreporting; the government chooses the resource-consuming probability of auditing (where an audit leads to complete detection) and the tax rate used to fund government services, with the objective of maximizing the expected utility of a representative household. The key optimality result is that the marginal costs of tax administration should be equated to the marginal reduction in excess burden. While this result was derived for individuals, it can be applied to risk averse, utility maximizing businesses. In this case, one implication is that the weaker is the ability to enforce taxes on electronic commerce, the greater may be the extent of excess burden. Thus,

²⁶When the analysis is extended to include the labor-leisure choice, using the assumption of separability between leisure and income, the substitution-based excess burden is shown to be additive with the uncertainty measure of excess burden. Mayshar (1991) and Kaplow (1990) provide a more general treatment of the link between these two concepts of excess burden.

current limited definitions of nexus, which limit states' ability to enforce the sales tax may increase the uncertainty measure of excess burden.²⁷

The optimal tax problem was linked more generally to tax evasion and tax enforcement by Kaplow (1990). He addresses optimal commodity taxation where individuals choose (untaxed) labor supply and consumption across two commodities; tax on one good can be evaded. There is no role for taxes imposed on business-to-business transactions. Higher administrative costs arise from a broader base and higher rates; government confronts an exogenous revenue constraint. Kaplow develops several variants of the model, using the standard Ramsey tax problem as the point of departure. Putting his findings in the electronic commerce context (assuming this is fair in light of the omission of firms from the analysis), the optimal sales tax rate should be lower when evasion increases rapidly with the rate, the revenue from the tax grows (and hence more revenue is evaded) and the share of the population that is subject to the tax on electronic commerce diminishes. Optimal enforcement will be higher the greater is the marginal benefit of government spending, the greater is the total revenue collected and the greater is the evasion response to the tax. None of these findings support a general no-tax policy toward electronic commerce.

One rather obvious conclusion of Kaplow's extended framework is the inverse relationship between the degree of diminishing returns to administrative observability and the resources expended on enforcement. In the electronic commerce case, there is essentially no capacity to observe business-to-consumer transactions for vendors without nexus, and in practice, it is unlikely that states would make any effort to collect taxes on such transactions. Assuming nexus could be asserted for remote firms (even without physical presence), there remains the practical

²⁷ For individuals and many small businesses, which likely perceive no risk of being detected when evading the use tax (and on whom little administrative effort is being expended), greater enforcement may represent increased risk, and therefore greater excess burden from increased uncertainty. However, the net effect could be lower total excess burden as pre-existing distortions arising from distorted behavior are reduced.

problem of situsing sales. Using credit card information and shifting responsibilities to third-party payers is one option that has been discussed. However, opposition is strong due to concerns over compliance costs, uncertain audit liabilities and precedent. Moreover, such a policy move would likely be met by the expanded use of more invisible e-currency on the part of buyers (though buyers could be hesitant to buy expensive items without traceable records to prove payment).

The situation is not nearly the same for business-to-business transactions, even absent nexus. States can audit and enforce use tax liabilities for in-state firms, providing adequate information is available on taxable input purchases. The increased reliance on electronic versus old-fashioned papers trails may, however, hamper these same enforcement efforts. An example is the corporate purchase card versus more traditional paper invoicing/payment mechanisms.²⁸

The uncertainty dimension of electronic commerce does not relate to random tax policy per se, although this may be the perspective of certain tax policy critics. Instead, it relates to relatively lower probabilities of detection and the uncertain prospects of future taxability of purchases, especially those of businesses. These uncertainties are present, to a greater or lesser extent, in all taxes. Other uncertainties exist as well. One example is the potentially important timing issue related to asset acquisition, as businesses may choose to acquire inputs today rather than risk higher detection probabilities and higher effective tax rates in future periods. A similar problem may arise in the context of the corporate income tax and policy changes. In general, there is little support in the literature for promoting any form of tax policy uncertainty.²⁹

²⁸ There have been proposals to ease firm compliance burdens and better enable the application of sales tax to electronic transactions (through, for example, streamlined reporting procedures). These initiatives could provide some administrative relief as well, although states might find themselves instead effectively administering a *new* sales tax applied only to electronic transactions in tandem with the current sales tax. The reason is that firms may be treated differently for otherwise analogous transactions involving the internet versus other means of input acquisition (though this is not the perspective of those involved in the streamlining initiatives on the sales tax, nor of the authors).

²⁹ There is another strand of literature on uncertainty that is relevant here. The uncertainty about the current tax status of e-commerce, coupled with the uncertain policy of the future, raises questions regarding investment and

Conclusions

The question of whether or not electronic commerce should be subject to taxation at the state and local level cannot be fully resolved by the existing conceptual work on optimal taxation. The literature does, however, point to the factors that should be considered in making tax policy decisions regarding electronic commerce, and emphasizes that the question is relative, not absolute. A particularly useful way of capturing these factors is to draw upon research that has examined the marginal costs of funding government activity, originally developed by Browning (1976), and extended by Usher (1986) and Mayshar (1991) to account for administration and compliance. Usher, for example, looks at optimal evasion, optimal enforcement and optimal provision of public goods and shows that the costs of concealing taxable activity impacts the marginal costs of funds in a fashion analogous to excess burden. Mayshar's work is more general and points to the broader set of margins that must be considered in fiscal design (including the level of government spending). Applying this to the electronic commerce question shows that tax policy hinges on excess burden, administrative costs, compliance and noncompliance costs, the benefits of public spending and the marginal cost of generating funds from alternative tax instruments. This framework links traditional optimal tax theory with other factors relating to optimal fiscal structure and has the capacity to account for all economic arguments regarding tax policy and electronic commerce.

The practical issue remains as to whether electronic commerce should be favored through tax policy, and the assessments presented here suggest it is a particularly difficult case to make. The locational effects of allowing taxation on an origination rather than a destination basis are

other behavioral choices, and the consequences this has for social welfare. For example, Bizer and Judd (1989) argue that, despite claims on the importance of stable tax policies, uncertain (i.e., random) tax policies have only small efficiency consequences for the economy. Skinner (1988) estimates that the removal of all uncertainty from the tax system would yield an efficiency gain equal to 0.4 percent of national income. Alm's (1988) conceptual model yields little certainty on the implications of uncertain tax policy. Finally, Hassett and Metcalf (1999) note that uncertainty can easily encourage economic activity, but it generally can't be used to increase tax revenue.

likely to be heavily distorting. A case for not taxing electronic commerce because the vast majority of purchases will be made by businesses cannot be justified. Optimal tax theory suggests circumstances in which inputs should be taxable, including when there are constraints on the set of commodity tax rates that can be imposed and when the industries are characterized by high degrees of imperfect competition. The widespread exemption of consumer purchases and the inability to levy product specific rates suggest a role for taxation of some inputs. State policies toward exempting inputs appear to some degree to be consistent with likely optimal tax policy.

Regarding B2C e-commerce, optimal tax theory indicates that differential tax rates should be imposed on commodities. But the pattern of differential rates resulting from the inability to collect sales taxes on many remote products is very unlikely to be consistent with optimal tax theory. Indeed, the findings are more likely to suggest greater rather than lesser taxation of electronic commerce.

Finally, there are issues of administration and compliance. There is no question that application of the sales tax to electronic commerce poses many challenges and will give rise to additional administration and compliance costs. But other taxes, including the corporate income tax and the personal income tax also entail substantial enforcement and compliance costs. Optimal tax theory requires an assessment of the *relative* costs of generating revenue from alternative tax instruments. There is simply no evidence that the changes in excess burden plus administration and compliance costs of taxing electronic commerce are sufficiently high to warrant a blanket exemption of all transactions, or indeed, are higher than alternative ways of generating funds.

Table 1: Taxes on Intermediate Goods as a Percent Of Gross Receipts by Industry, 1992

| Services | Taxable Amount Percent Receipts | Trade | Taxable Amount Percent Receipts | Manufacturing | Taxable Amount Percent Receipts |
|-----------------|--|-----------------|--|----------------------|--|
| Auto repair | 35.4 | Eating | 7.2 | Primary metals | 8.1 |
| Research | 24.1 | Fuel | 6.6 | Stone, clay, glass | 7.9 |
| Memberships | 18.9 | Apparel | 6.3 | Printing | 6.1 |
| Museums | 18.1 | Furniture | 5.8 | Paper | 6.0 |
| Hotels | 17.7 | Building | | Apparel | 5.8 |
| | | Materials | 4.7 | | |
| Amusement | 17.1 | Misc. excluding | | Chemicals | 4.8 |
| | | Drug & liquor | 4.5 | | |
| Libraries | 16.9 | Food | 4.3 | Textiles | 4.6 |
| Social services | 16.4 | Non-store | 3.6 | Lumber | 4.4 |
| Health | 16.2 | Drug | 3.2 | Rubber | 4.2 |
| Business | 15.0 | General | | Fabricated | |
| | | merchandise | 3.0 | metals | 4.2 |
| Personal | 13.5 | Auto and gas | 2.5 | Petroleum | 3.8 |
| Motion pictures | 13.3 | Liquor | 2.2 | Leather | 3.2 |
| Management | 12.9 | | | Miscellaneous | 3.1 |
| Correspondence | | | | Industrial | |
| Schools and | | | | machinery | 3.0 |
| Vocational | | | | | |
| Schools | 12.7 | | | | |
| Accounting | 11.7 | | | Electronic | |
| | | | | equipment | 3.0 |
| Engineering | 11.7 | | | Furniture | 2.7 |
| Miscellaneous | | | | Instruments | 2.6 |
| Repair | 11.2 | | | | |
| Legal | 9.5 | | | Transportation | |
| | | | | equipment | 2.3 |
| | | | | Tobacco | 0.9 |

Source: Authors' calculations based on U.S. Bureau of the Census, 1992 Census of Services, 1992 Census of Retail Trade and 1992 Census of Manufactures.

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