



Tulane Economics Working Paper Series

## Cross-border Shopping and State Use Tax Liabilities: Evidence from eBay Transactions

James Alm  
Department of Economics  
Tulane University  
New Orleans, LA  
jalm@tulane.edu

Mikhail I. Melnik  
Department of Business  
Administration  
School of Engineering Technology  
and Management  
Southern Polytechnic State  
University  
Marietta, GA  
mmelnik@bellsouth.net

Working Paper 1205  
July 2012

### Abstract

Online commerce presents consumers with a convenient way of shopping outside of their local jurisdiction, and this online purchase decision is capable of affecting in significant ways the sales and use tax collections of state governments. However, the actual revenue impact has proven difficult to estimate. There is considerable work that examines the revenue impact of seller compliance with sales taxes. However, there is little work on buyer compliance with use taxes. In this paper we investigate the potential impact of cross-border shopping on state use tax liabilities of buyers, using data from the largest online consumer-to-consumer and business-to-consumer marketplace, eBay.com. We collect our own data on actual cross-border shopping transactions from eBay, focusing upon a “representative” commodity classification and a “typical” day; these data consist of nearly twenty-one thousand eBay listings generated by roughly seven thousand individual sellers with over nine thousand buyers. These data allow us to examine the extent of actual, not estimated, cross-border shopping by buyers, and the subsequent potential impact of this cross-border shopping on state use tax liabilities. Our results indicate that cross-border shopping is highly prevalent on eBay, with out-of-state purchases accounting for on average 94 percent of the volume of a states purchase transactions. Even so, given the limited volume of eBay-based transactions relative to total sales transactions, the likely impact of cross-border transactions on state use tax revenue streams is quite low, at least at present, typically less than one percent of actual state sales tax revenues.

Keywords: online commerce, sales taxes, nexus, tax evasion  
JEL: H71, H73

# Cross-border Shopping and State Use Tax Liabilities: Evidence from eBay Transactions

JAMES ALM and MIKHAIL I. MELNIK

Online commerce presents consumers with a convenient way of shopping outside of their local jurisdiction, and this online purchase decision is capable of affecting in significant ways the sales and use tax collections of state governments. However, the actual revenue impact has proven difficult to estimate. There is considerable work that examines the revenue impact of seller compliance with sales taxes. However, there is little work on buyer compliance with use taxes. In this paper we investigate the potential impact of cross-border shopping on state use tax liabilities of buyers, using data from the largest online consumer-to-consumer and business-to-consumer marketplace, eBay.com. We collect our own data on actual cross-border shopping transactions from eBay, focusing upon a “representative” commodity classification and a “typical” day; these data consist of nearly twenty-one thousand eBay listings generated by roughly seven thousand individual sellers with over nine thousand buyers. These data allow us to examine the extent of actual, not estimated, cross-border shopping by buyers, and the subsequent potential impact of this cross-border shopping on state use tax liabilities. Our results indicate that cross-border shopping is highly prevalent on eBay, with out-of-state purchases accounting for on average 94 percent of the volume of a state’s purchase transactions. Even so, given the limited volume of eBay-based transactions relative to total sales transactions, the likely impact of cross-border transactions on state use tax revenue streams is quite low, at least at present, typically less than one percent of actual state sales tax revenues.

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James Alm, Department of Economics, 208 Tilton Hall, Tulane University, New Orleans, LA 70118 (phone +1 504 862 8344; email [jalm@tulane.edu](mailto:jalm@tulane.edu)).

Mikhail I. Melnik, Department of Business Administration, School of Engineering Technology and Management, Southern Polytechnic State University, 1100 South Marietta Parkway, Marietta, GA 30060 – 2896 (phone +1 678 915 7439; email [mmelnik@bellsouth.net](mailto:mmelnik@bellsouth.net)).

We are grateful to the editor and to two anonymous referees for helpful comments. We are also grateful to Robert Buschman and Andrew Chupp for the great amount of work they put into collecting, processing, and verifying the accuracy of the data that we use in our study.

## INTRODUCTION

One implication of the dramatic increase in the use of the internet is its potential impact on the sales and use tax collections of state (and local) governments. The emergence of online commerce has significantly increased the ability of the local population to shop from sellers located outside of the state. Under current practice, the collection of a typical sales tax on an internet transaction is the responsibility of the seller, but only when the seller has legal “nexus” (or generally a physical presence) in the state.<sup>1</sup> As a result, it is believed that many such transactions escape state sales taxes. Even so, all states with a general sales tax also impose a use tax at the same rate as the sales tax. A use tax is due on a transaction in which the sales tax is not collected and in which the item is used in the resident’s jurisdiction. If the use tax was in fact paid by the buyer, then online commerce should in principle have no impact on combined sales and use tax collections because online transactions would be subject to the state’s use tax even if they escape the state’s sales tax. Given that most observers conclude that buyer use tax compliance is exceedingly low (Due and Mikesell, 1995, Manzi, 2010), use tax collections seem unlikely to be a very good substitute for sales tax collections.<sup>2 3</sup> In this paper we investigate the potential impact of cross-border shopping on state use tax liabilities of buyers, by estimating buyer use tax liabilities from the cross-border transactions.

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<sup>1</sup> See the U.S. Supreme Court decision in the case of *Quill vs. North Dakota*, 504 U.S. 298 (1992).

<sup>2</sup> John F. Due and John L. Mikesell, *Sales Taxation – State and Local Structure and Administration* (Washington, D.C.: The Urban Institute Press, 1995); and Nina Manzi, *Use Tax Collection on Income Tax Returns in Other States*, Policy Brief, Research Department, Minnesota House of Representatives (Minneapolis, MN: 2010).

<sup>3</sup> Note that the “Streamlined Sales Tax Project” was established in 2000 to address various issues regarding state sales taxes (including but not limited to online sales taxes). The broad goal of the “Streamlined Sales and Use Tax Agreement” is “...to simplify and modernize sales and use tax administration in order to substantially reduce the burden of tax compliance”, via such policies as increasing the uniformity of state and local sales tax bases and rates, increasing electronic registration, and simplifying tax administration. To date, 24 states have adopted simplification measures in the Agreement. See the website of the Streamlined Sales Tax Governing Board, Inc. available online at <http://www.streamlinedsalestax.org/>. See also: William F. Fox, LeAnn Luna, and Matthew N. Murray, “The SSTP and Technology: Implications for the Future of the Sales Tax,” *National Tax Journal* 61, No. 4, Part 2 (2008): 823–841.

There is a large and related literature that attempts to estimate the impact of online commerce on state sales tax revenues, most of which has focused on tax avoidance and tax evasion of sales taxes. This literature has employed several approaches. One approach uses a somewhat indirect procedure based on estimates of consumer responses to sales tax rates to estimate the likely impact of the revenue loss if online sales were subject to sales taxes (Goolsbee, 2000; Alm and Melnik, 2005; Scanlan, 2007; Ballard and Lee, 2007).<sup>4</sup> Another indirect approach examines tax-induced cross-border shopping (Walsh and Jones, 1988; FitzGerald, 1992; Gordon and Nielson, 1997; Ferris, 2000; Garrett and Marsh, 2002; Nelson, 2002; Tosun and Skidmore, 2007).<sup>5</sup> There are especially large literatures on cross-border shopping to avoid/evade sales taxes on cigarettes (Coats, 1995; Thursby and Thursby, 2000; Stehr, 2005; Chiou and Muehlegger, 2008; Lovenheim, 2008; Merriman, 2010; Goolsbee, Lovenheim, and Slemrod, 2010),<sup>6</sup> and also to avoid/evade taxes or other limitations on alcohol

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<sup>4</sup> Austan Goolsbee, "In a World without Borders: The Impact of Taxes on Internet Commerce," *Quarterly Journal of Economics* 115, No. 2 (2000): 561-576; James Alm and Mikhail I. Melnik, "Sales Taxes and the Decision to Purchase Online," *Public Finance Review* 33, No. 2 (2005): 184-212; Charles L. Ballard and Jaimin Lee, "Internet Purchases, Cross-Border Shopping, and Sales Taxes," *National Tax Journal* 60, No. 4 (2007): 711-725; and Mark A. Scanlan, "Tax Sensitivity in Electronic Commerce," *Fiscal Studies* 28, No. 4 (2007): 417-436.

<sup>5</sup> Michael Walsh and Jonathan Jones, "More Evidence on the Border Tax Effect: The Case of West Virginia, 1979-84," *National Tax Journal* 41, No. 2 (1988): 261-265; John D. FitzGerald, "The Distortionary Effects of Taxes on Trade in Border Areas: The Republic of Ireland-UK Border," in Georg Winckler (ed.), *Tax Harmonization and Financial Liberalization in Europe* (New York, NY: St. Martin's Press, 1992: 39-56); Roger H. Gordon and Soren Bo Nielson, "Tax Evasion in an Open Economy: Value-added vs. Income Taxation," *Journal of Public Economics* 66 No. 2 (1997): 173-197; J. Stephen Ferris, "The Determinants of Cross Border Shopping: Implications for Tax Revenues and Institutional Change," *National Tax Journal* 53, No. 4, Part 1 (2000): 801-824; Thomas A. Garrett and Thomas L. Marsh, "The Revenue Impacts of Cross-Border Lottery Shopping in the Presence of Spatial Autocorrelation," *Regional Science and Urban Economics* 32, No. 4 (2002): 501-519; Michael Nelson, "Using Excise Taxes to Finance State Government: Do Neighboring State Taxation Policy and Cross-Border Markets Matter?" *Journal of Regional Science* 42, No. 4 (2002): 731-752; and Mehmud S. Tosun and Mark L. Skidmore, "Cross-Border Shopping and the Sales Tax: An Examination of Food Purchases in West Virginia," *The B.E. Journal of Economic Analysis & Policy* 7, Issue 1 (Topics) (2007): Article 63.

<sup>6</sup> Morris R. Coats, "A Note on Estimating Cross-Border Effects of State Cigarette Taxes," *National Tax Journal* 48, No. 4 (1995): 573-584; Jerry G. Thursby and Marie C. Thursby, "Interstate Cigarette Bootlegging: Extent, Revenue Losses, and Effects of Federal Intervention," *National Tax Journal* 53, No. 1 (2000): 59-77; Mark Stehr, "Cigarette Tax Avoidance and Evasion," *Journal of Health Economics* 24, No. 2 (2005): 277-297; Lesley Chiou and Erich

(Beard, Gant, and Soba, 1997; Baughman, Conlin, and Pepper, 2001; Stehr, 2007; Kreft and Epling, 2007; Lovenheim and Slemrod, 2010).<sup>7</sup> All of these studies conclude that taxes (and other sources of price differentials) have a significant impact on consumer choices and, by implication, that sales tax revenue losses are likely to be important, even though most of these studies do not actually estimate these revenue losses.

Several other studies provide such estimates of the sales tax revenue loss from online sales. For example, Bruce and Fox (2000, 2001, 2004) estimate the time trend reduction in state government sales tax bases that occurred independently of e-commerce, and they also estimate the additional revenue loss from e-commerce.<sup>8</sup> They conclude that total sales tax revenues fell in 2003 by over \$13 billion from the trend line of revenues (or nearly 2 percent of actual revenues in that year) and that e-commerce caused an additional reduction in sales tax revenues of nearly \$11 billion (1.5 percent of revenues). More recent estimates by Bruce, Fox, and Luna (2009) estimate somewhat larger annual national state and local sales tax losses from

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Muehlegger, "Crossing the Line: Direct Estimation of Cross-Border Cigarette Sales and the Effect on Tax Revenue," *The B.E. Journal of Economic Analysis & Policy* 8, Issue 1 (Contributions) (2008): Article 48; Michael F. Lovenheim, "How Far to the Border? The Extent and Impact of Cross-Border Casual Cigarette Smuggling," *National Tax Journal* 61, No. 1 (2008): 7–33; David Merriman, "The Micro-Geography of Tax Avoidance: Evidence from Littered Cigarette Packs in Chicago," *American Economic Journal: Economic Policy* 2, No. 2 (2010): 61–84; and Austan Goolsbee, Michael F. Lovenheim, and Joel Slemrod, "Playing with Fire: Cigarettes, Taxes, and Competition from the Internet," *American Economic Journal: Economic Policy* 2, No. 1 (2010): 131–154.

<sup>7</sup> Randolph T. Beard, Paula A. Gant, and Richard P. Saba, "Border-crossing Sales, Tax Avoidance, and State Tax Policies: An Application to Alcohol," *Southern Economic Journal* 641, No. 1 (1997): 293–306; Reagan Baughman, Mike Conlin, and John Pepper, "Slippery When Wet: The Effects of Local Alcohol Access Laws on Highway Safety," *Journal of Health Economics* 20, No. 6 (2001): 1089–1096; Mark Stehr, "The Effect of Sunday Sales Bans and Excise Taxes on Drinking and Cross-Border Shopping for Alcoholic Beverages," *National Tax Journal* 60, No. 1 (2007): 85–105; Steven F. Kreft and Nancy M. Epling, "Do Border Crossings Contribute to Underage Motor-vehicle Fatalities? An Analysis of Michigan Border Crossings," *Canadian Journal of Economics* 40, No. 3 (2007): 765–781; and Michael F. Lovenheim and Joel Slemrod, "The Fatal Toll of Driving to Drink: The Effect of Minimum Legal Drinking Age Evasion on Traffic Fatalities," *Journal of Health Economics* 29, No. 1 (2010): 62–77.

<sup>8</sup> Donald Bruce and William F. Fox, "E-commerce in the Context of Declining State Sales Tax Bases," *National Tax Journal* 53, No. 4, Part 3 (2000): 1373–1388; Donald Bruce and William F. Fox, "E-commerce and Local Finance: Estimates of Direct and Indirect Sales Tax Losses," *Municipal Finance Journal* 22, No. 3 (2001): 24–47; and Donald Bruce, Donald, and William F. Fox, "State and Local Sales Tax Revenue Losses from E-Commerce: Estimates as of July 2004," *State Tax Notes* 33 (7) (2004): 511–518.

e-commerce.<sup>9</sup> Even so, this general approach is still largely an indirect one,<sup>10</sup> and the resulting estimates have also not gone unchallenged.<sup>11</sup>

Importantly, however, all of these studies concentrate (implicitly or explicitly) on seller compliance with sales taxes. The potential revenue impact of the likely low buyer compliance with use taxes remains largely unexamined and unknown. It is this issue that we investigate here.

Specifically, we estimate the potential impact of online commerce on state use tax liabilities using data on cross-border online shopping from the largest online consumer-to-consumer and business-to-consumer marketplace, eBay.com. We collect our own data on cross-border shopping transactions from eBay, focusing upon a “representative” commodity classification and a “typical” day; these data consist of nearly twenty-one thousand eBay listings generated by roughly seven thousand individual sellers with over nine thousand buyers. These data allow us to examine the extent of actual, not estimated, cross-border shopping, and the subsequent likely impact of this cross-border shopping on buyer use tax liabilities. Our results indicate that cross-border shopping is highly prevalent on eBay, with out-of-state purchases accounting for on average 94 percent of the volume of a state’s purchase transactions. Even

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<sup>9</sup> Donald Bruce, William F. Fox, and LeAnn Luna, “State and Local Government Sales Tax Revenue Losses from Electronic Commerce,” Working Paper, Center for Business and Economic Research (Knoxville, TN: The University of Tennessee, 2009).

<sup>10</sup> Also, for broader discussions about the taxation of electronic commerce, see: William F. Fox and Matthew N. Murray, “The Sales Tax and Electronic Commerce: So What’s New?” *National Tax Journal* 50, No. 3 (1997): 573-592; and Austan Goolsbee and Jonathan Zittrain, “Evaluating the Costs and Benefits of Taxing Internet Commerce,” *National Tax Journal* 52, No. 3 (1999): 413-428.

<sup>11</sup> See, for example, various studies by the Direct Marketing Association (DMA), available online at <http://www.the-dma.org/index.php>. In its words, the DMA is “...the leading global trade association of business and nonprofit organizations using and supporting multichannel direct marketing tools and techniques”. The DMA studies by Johnson (2003, 2008) conclude that the revenue losses are likely to be significantly smaller than the estimates of Bruce and Fox (2000, 2001, 2004) and Bruce, Fox, and Luna (2009). See: Peter A. Johnson, “A Current Calculation of Uncollected Sales Tax Arising from Internet Growth,” Direct Marketing Association (2003); and Peter A. Johnson, “Setting the Record Straight: The Modest Effect of Ecommerce on State and Local Sales Tax Collections,” Direct Marketing Association (2008).

so, given the limited volume of eBay-based transactions relative to total sales transactions, we estimate that the potential impact of cross-border transactions on state revenue streams is quite low, at least at present, typically less than one percent of actual state sales tax revenues. Of course, if online commerce and its use in cross-border shopping continue to grow, these impacts will become more significant over time.

## STATE SALES AND USE TAXES

All states in the U.S. derive revenues from some form of sales taxes on goods and services, and all but five states employ “general sales or gross receipts taxes”. These latter taxes are typically imposed at a single rate on the value of transfers of goods and services or on gross receipts, often subject to some exemptions (e.g., food, prescription drugs). As shown in Table 1 for the year 2007 (the same year as our data), states derived on average nearly one-half of their total tax revenues from some form of sales taxes.<sup>12</sup> Within this broad sales tax category, general sales or gross receipts taxes constitute the bulk of revenue dollars. On average, U.S. state governments collected 60.2 percent of their sales taxes in the form of general sales and gross receipts taxes in 2007. Other years, including more recent years, tell a similar story.<sup>13</sup>

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<sup>12</sup> U.S. Census Bureau, *State Government Finances* (Washington, D.C.: 2008), available online at <http://www.census.gov/govs/state>.

<sup>13</sup> More precisely, the U.S. Census Bureau includes as some form of a sales tax:  
“Taxes, including: ‘licenses’ at more than nominal rates, based on volume or value of transfers of goods or services; upon gross receipts, or upon gross income; and related taxes based upon use, storage, production (other than severance of natural resources), importation, or consumption of goods. Dealer discounts of ‘commissions’ allowed to merchants for collection of taxes from consumers are excluded.”  
The Census Bureau also makes the following distinctions within this overall classification of a sales tax:  
“General sales or gross receipts taxes – Sales or gross receipts taxes which are applicable with only specified exceptions to all types of goods and services, or all gross income, whether at a single rate or at classified rates. Taxes imposed distinctively upon sales or gross receipts from selected commodities, services, or business are reported separately under categories one through eight below.

As noted earlier, all states with a general sales tax also impose a use tax at the same rate as the sales tax. It is through the use tax that states could collect revenues on items for which the sales tax is not collected, at least in principle.

States clearly recognize the importance of cross-border shopping, and several states attempt to collect use taxes under the state individual income tax (Due and Mikesell, 1995). In 2007, the year of our data collection, 23 states that impose the individual income tax included a line on the individual income tax return forms providing their residents with an option to declare the value of out-of-state purchased goods for the purpose of tax collection. (In some states like New York, compliance with this line is not optional but required.) Even so, use tax compliance rates most likely remain quite low. Evidence on use tax compliance rates is somewhat elusive, but Manzi (2010) estimates that on average only 2.1 percent of residents actually declare any out-of-state purchases on these individual income tax returns; see Table 2. It is of course possible that individuals are not widely participating in online commerce.<sup>14</sup> However, as discussed below, evidence on the extent of online transactions suggests that e-commerce is in fact a large and growing presence; specifically, there is strong evidence that eBay.com transactions are large and growing. The very low participation rate for state use tax declarations on state income tax returns is therefore consistent with significant underreporting of use tax obligations.

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Selective sales and gross receipts taxes – Sales and gross receipts taxes imposed on sales of particular commodities or services or gross receipts of particular businesses, separately and apart from the application of general sales and gross receipts taxes.”

Our focus here is on “general sales or gross receipts taxes”. This information is available online at <http://www.census.gov/govs/statetax/definitions.html>.

<sup>14</sup> Also, web retailers sometimes engage in sophisticated tax planning so that their consumers are not required to pay sales and use taxes. One such strategy includes “entity isolation,” in which a retailer incorporates a separate affiliate company in order to shelter the parent company from sales and use tax collection obligations that are imposed in states where the parent firm has a physical presence. For example, see: Arthur J. Cockfield, “Walmart.com: A Case Study in Entity Isolation,” *State Tax Notes* 25, No. 9 (26 August 2002): 633-640.



As discussed earlier, there have been numerous studies that have attempted to estimate the magnitude of tax-induced cross-border shopping, often focusing on specific taxes (e.g., on cigarettes or on alcohol). The underlying premise of this research is that consumers respond to differentials in sales tax rates, lottery payoffs, regulations, and/or exchange rates between neighboring jurisdictions, by crossing the relevant border and purchasing items in the lower-cost jurisdiction (just as they do by purchasing online rather than from traditional vendors). Most all of these studies conclude that taxes and other sources of price differentials have a significant impact on consumer choices. By implication, these studies also suggest that revenue losses from e-commerce are likely to be significant. However, most of these studies do not estimate the actual extent of cross-border transactions, and so they cannot estimate the revenue impact of these transactions. Also, none of these studies examines state use taxes. Our methodology allows us to generate the potential revenue impact on state use tax liabilities. Specifically, we collect data that allow us to examine the extent of cross-border shopping, and the subsequent impact of this cross-border shopping on state use tax liabilities. The next section presents our methodology for measuring both the extent and the use tax liabilities impact of cross-border transactions.

## **METHODOLOGY AND DATA**

eBay.com is easily the largest single online marketplace in the United States for consumer-to-consumer e-commerce. In addition, eBay is much more than an outlet for individual consumers reselling items that they no longer need. A large portion of eBay transactions is generated by businesses, small and large alike, in business-to-consumer and business-to-business e-commerce transactions. For example, as we discuss in more detail later,

our dataset includes items sold by small businesses as well as items sold by national retail chains such as BestBuy. Bailey et al. (2008) argue that this unique characteristic of eBay as a market place within online business-to-business commerce facilitates entry by small businesses.<sup>15</sup>

According to the U.S. Census Bureau (2010), the size of total retail online commerce constituted \$137 billion in 2007 and \$142 billion in 2008.<sup>16</sup> For eBay, annual gross merchandise trade in those years, including both U.S. and international transactions, constituted \$48 billion in 2007 and \$59 billion in 2008 (eBay, Inc., 2008, 2009).<sup>17</sup> If we conservatively assume that the proportion of U.S. to international sales for eBay during this period was near its most recent level, then the U.S. e-commerce contribution of eBay would have been \$23 billion in 2007 and \$28 billion in 2008.<sup>18</sup> Note that this is a conservative estimate as the international business of eBay has expanded significantly over the past few years, suggesting that the U.S. component played a much greater role in 2007 and 2008. Even with this conservative estimate, the importance of eBay relative to the rest of online retail commerce cannot be overstated. Other

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<sup>15</sup> Joe Bailey, Gordon Gao, Wolfgang Jank, Mingfeng Lin, Hank Lucas, and Siva Viswanathan, "The Long Tail is Longer than You Think: The Surprisingly Large Extent of Online Sales by Small Volume Sellers," Working Paper, The Robert H. Smith School of Business (College Park, MD: University of Maryland, 2008).

<sup>16</sup> U.S. Census Bureau, *E-Stats* (Washington, D.C.: 2010), available online at <http://www.census.gov/econ/estats/2008/2008reportfinal.pdf>.

<sup>17</sup> eBay, Inc., *Fourth Quarter and Full Year 2008 Financial Results* (San Jose, CA: 2008), available online at [http://investor.ebay.com/financial\\_releases.cfm](http://investor.ebay.com/financial_releases.cfm); and eBay, Inc. *Third Quarter 2009 Financial Results* (San Jose, CA: 2009), available online at [http://investor.ebay.com/financial\\_releases.cfm](http://investor.ebay.com/financial_releases.cfm). For comparison, the U.S. sales of Amazon.com, another large online market place, constituted \$8.095 billion in 2007 and \$10.228 billion in 2008. See Amazon.com Inc., *2008 Annual Report* (2009), available online at <http://phx.corporate-ir.net/phoenix.zhtml?c=97664&p=irol-reportsAnnual>.

<sup>18</sup> Starting with its 2010 second quarter release, eBay began to break down the volume of gross merchandise traded on eBay and its various affiliates into U.S. and international transactions; for all previous quarters this level of detail was not reported. In 2010:QII, total eBay transactions were \$12.531 billion, of which \$4.801 billion were total U.S. transactions and \$7.730 billion were total international transactions. See eBay, Inc., *2010 Second Quarter Financial Release* (San Jose, CA: 2010), available online at <http://investor.ebayinc.com>.

estimates suggest that eBay transactions constitute an even larger share of online commerce (U.S. Census Bureau, 2009).<sup>19</sup>

Furthermore, eBay's unique status as a "market place" that brings together buyers and sellers of all types, rather than simply as a retail outlet, enables us to examine the behavior and sales patterns of all agents who list their items on eBay, including both online retail businesses and more casual sellers. Recall that, even though eBay is a consumer-to-consumer business, many eBay sellers are in fact small, medium, and large retail businesses, as seen by the volume of sales generated by these individual sellers, and these retail businesses tend to dominate online commerce.<sup>20</sup>

To examine the size of cross-border shopping one needs to observe transactions and to be able to identify the locations of the buyer and the seller. Fortunately, this information is available, or at least was available during the period of our data collection in 2007.

The large volume of total transactions on eBay makes it difficult to get a clear picture of total sales tax compliance in the entire online community, given especially the different tax status of these transactions. eBay is not the seller of the product, and its role is limited mainly to that of a market facilitator. As a result, eBay has no responsibility for sales tax collecting, and eBay does not report any tax-related statistics in any of its news releases.

However, eBay provides sellers with an option to apply state sales taxes at the time of the listing of the item, and many sellers in fact select this option.<sup>21</sup> If a seller selects to use the eBay option, then the seller can specify the applicable state(s), and eBay will automatically add

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<sup>19</sup> U. S. Census Bureau, *Quarterly Retail E-commerce Sales Report* (Washington, D.C.: 2009).

<sup>20</sup> See Alm and Melnik (2010), who find that more "established" eBay sellers (e.g., larger retail businesses) account for the vast bulk of online commerce and that more "casual" eBay sellers (e.g., smaller businesses) are prevalent in numbers but small in retail sales.

<sup>21</sup> The seller also has an option to specify the exact sales tax rate.

the applicable sales taxes to the buyer's invoice. For example, a California seller can select to have eBay add the applicable sales taxes on any purchases made by California buyers. In our dataset nearly one in five sellers collected sales taxes, and 93 percent of those sellers selected the eBay-offered option of indicating sales taxes. However, this appears to be the full extent of eBay's role in the tax collection process. Business-to-consumer transactions on eBay are subject to any applicable state and local sales taxes, and sellers who have a nexus in any sales tax state are required to collect the sales tax from any in-state transactions that originate on eBay, just as they would had those transactions been in their "brick and mortar" stores.<sup>22</sup> Sales tax collection, much like any other terms of the transaction, has to be included in the listing, as the listing information acts as a binding contract between the buyer and the seller on eBay.

The setup of the eBay sales tax option is quite simple. At the time the listing is submitted by the seller, the seller can select to apply state sales taxes to the winning bid. If this option is selected by the seller, then the seller must select the state for which the sales tax will be collected, and a message stating the sales tax rate and applicable state will automatically be included by eBay in the payment/shipping section of the listing. Alternatively, a seller who chooses to collect sales taxes may simply include this information as a message in the item description text of the auction. For sellers, the eBay-provided option may serve as a better mechanism because the sales tax information will be included in the eBay payment notification email sent to the buyer, thereby making it part of a binding contract between the buyer and the seller, as based on eBay's rules.

Since eBay does not provide information on sales tax compliance, we conduct a limited survey of the transactions on eBay as a means of investigating cross-border commerce on eBay.

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<sup>22</sup> For sellers who specified they have nexus in several states, we define "In-state Sellers" as sellers with transactions in which the buyer is located in any one of the seller's nexus states.

We limit our investigation to items listed in most of the subcategories of the “Consumer Electronics” category that closed on eBay on Friday, 27 July 2007, hereafter referred to as the “sample date”. We focus on the Consumer Electronics category in large part because the products sold in this category do not appear to be tax exempt or subject to any excise taxes in any of the sales tax states (Bruce, Fox, and Luna, 2009). Furthermore, there were no sales tax holidays on the sample date, which might cause state differences in the tax treatment of these products.

Consumer Electronics is one of 35 major categories on eBay. On the sample date, it ranked 9<sup>th</sup> in all listings and also 9<sup>th</sup> in U.S. listings only, behind such categories as: eBay Motors; Clothing, Shoes, and Accessories; Collectables; Jewelry, and Watches; and Sport Memorabilia, Cards, and Fan Shop.

At the time of our data collection in 2007, the category of “Consumer Electronics” was comprised of seventeen subcategories. Since then the category has undergone small changes. In 2008 the category was renamed to simply “Electronics”, and the number of categories was expanded to 20, as three new categories were introduced (Marine Audio, Pro Audio and Stage Effects, and Other). Even so, data generated from our sample date have remained representative of the category.<sup>23</sup>

We followed several steps in our data collection. eBay generally removes all auctions from the search page that is visible to the public two weeks after their completion, which effectively constrains any data identification process. Although these listings generally remain accessible to the public for up to 90 days after their completion, their lack of appearance on the search page makes locating them impossible without their eBay-assigned listing identification

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<sup>23</sup> For example, listings in the Electronics category from our sample date (27 July 2007) are similar to those from a more recent period (1-7 May 2009), as well as from other dates (6 January 2007, 7 January 2008).

numbers. Our data collection therefore consisted of two steps. In the first step, we collected the individual listing IDs and auction variables of all listings completed on the collection day. Because this information remained available on the public section of the eBay site for only two weeks and also because there were many listings, we employed Web Content Extractor Version 4.1, published by Newprosoft, to collect these data. After obtaining the individual listing IDs we had to wait up to 90 days to access the listing pages. Accordingly, in the second step of data collection, we examined these listings individually to verify the accuracy of the information.

Table 3 presents the detailed summary by subcategory of the observations collected on the sample date. We were able to collect data on eleven of the seventeen subcategories of Consumer Electronics on eBay mainly because the data were only available for a period of two weeks (see the discussion below). The data consist of 20,831 individual eBay “Listings”, defined as a contract between the seller and eBay where eBay agrees to display the seller’s item(s) for sale. Each listing results in a unique page on eBay, with a unique listing ID assigned by eBay. However, many sellers employ multi-item listings, where one listing is employed to sell multiple items of the same product. Therefore a multi-item listing can result in more than one buyer, and each buyer is capable of purchasing one or more units of the product; indeed, in most instances the buyer can select the quantity. Because such listings can result in more than one transaction, they may generate more than one “Observation” (defined here as a listing, or, in the case of multi-item listings, each individual transaction generated by such listing). Our data have 22,451 observations. Thus, the difference between the number of listings and the number of observations can be accounted by the multiple transactions (multiple buyers) in multi-item listings. However, not all eBay listings result in “Transactions”, and in many cases a listing ends with no buyer activity at all and results in an observation with no transaction. The observations

collected in our data set resulted in 10,319 transactions, and were generated by 6,888 individual sellers and 9,261 buyers, all taking place in a 24-hour period in one category of the U.S. eBay website.

Table 4 presents basic summary statistics. If a listing only has one item for sale, then it can only result in one transaction; however, for a multi-item listing, it is possible to have multiple winning buyers.<sup>24</sup> For example, if a best-offer listing results in one buyer purchasing one unit at \$10 and another buyer buying two units at \$9 each, we count these as two separate transactions, one valued at \$10 and another at \$18, even though the listing itself is counted only once by eBay and by us. This procedure enables us to identify the size of transactions between buyers and sellers and hence to measure the size of in-state and out-of-state commerce generated on eBay in the categories represented in our dataset. Note that, if a listing receives no bids, it is still included as an observation because it contains information about the seller's choice of tax policy.

Table 4 also presents information on seller and buyer composition. When collecting the data, we specifically limit the search to only those listings that originate in the United States; eBay provides this option on its search page. Even so, a number of foreign sellers are still included in our data because these sellers stated in the auction description that the item offered for sale was located in the United States. In total there are 33 foreign sellers in the dataset, and we are unable to establish the location of 32 sellers. For buyers, we could not identify the location of 494 buyers. Note that "Price" represents the price at the time of the closing of the auction, and represents the before-tax price; if the seller collects the sales tax,

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<sup>24</sup> eBay offers various selling mechanisms to its sellers: standard English auction format, which may include multiple items but has a single buyer; buy-it-now format, which may include multiple items and may have multiple buyers all paying the same price; and best offer option, which may include multiple items and may have multiple buyers with prices that may differ across buyers.

then the sales tax is added to the price. We report the price for the entire dataset and also separately for the successfully completed segment only; the average price (all listings) was \$65, and the average price (sold items only) was \$73. “Sold” is a binary variable that assumes the value of one if the item sold and zero otherwise. “Observations Per Seller” refers to the number of observations generated by a seller. On average, each seller generates 3.28 observations, with one seller generating 306 observations; due to the very large number of sellers attempting to sell a single item, the median number of observations per seller is only 1 observation. Sellers with multiple observations in our 24-hour dataset are likely to be business entities. For instance, there are 156 sellers with more than 20 observations.

Alm and Melnik (2010) use these data to examine whether sellers comply with state sales taxes.<sup>25</sup> Here we use these data to examine a different set of issues: what is the extent of cross-border shopping, and what is the impact of cross-border shopping on potential state use tax liabilities via buyer compliance. The next section presents our results.

## RESULTS

Before we examine the extent of cross-border shopping and its impact on use tax liabilities, we first analyze the determinants of participation in online commerce, using various measures of participation at the state level. Table 5 presents these estimation results. In our 24 hour dataset, we find 2.8 buyers for every 100,000 in state population. A similar result is seen in the number of transactions and in the volume of purchases. These results suggest that the state’s exposure to ecommerce is directly proportional to its population size. We find little

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<sup>25</sup> James Alm and Mikhail I. Melnik, “Do eBay Sellers Comply with State Sales Taxes?” *National Tax Journal* 63, No. 2 (2010): 215-236.



evidence that the state's median income, its educational attainment levels, or its sales tax rate have a statistically significant impact on the various indicators of participation.

The full set of results on all cross-border transactions in all states is reported in Appendix Tables. In those tables, the rows represent the location of the buyer and the columns represent the location of the seller. Tables 6 and 7 summarize the main results from these Appendix Tables.

Table 6 presents by buyer location (state) the total value of cross-border transactions and its percentage composition. For example, the buyers who listed Alabama as their location purchased merchandise with gross value of \$6795.02. Out of this total, they spent 1.067 percent (or \$72.51) on merchandise purchased from multi-state sellers who listed Alabama as one of the states of their presence. Generally, "Multi-state Sellers" are defined as sellers who assert in their listings that they collect sales taxes on behalf of more than one state. It appears that the growing popularity of eBay has attracted attention of even some large national retailers. One example is the Best Buy Outlet Store, listing on eBay under the id *Best\_Buy\_Outlet* and collecting the sales taxes on behalf of forty-six states and the District of Columbia. (Note that some sellers in our dataset stated that they collect sales taxes on behalf of all states that employ sales taxes.) Since the multi-state sellers can clearly be defined as business entities, the multi-state sellers demonstrate the lowest boundary on the degree of adaptability of eBay by retail businesses, further underscoring the role of the eBay marketplace in the online retail activity.

Table 6 also shows that Alabama purchasers spent 0.074 percent (or \$5.00) on purchases from "In-state Sellers," identified as transactions where the seller's state is the same as that of the buyer. Note that multi-state sellers who listed Alabama as one of their locations

are classified separately. Also, transactions from “Out-of-state Sellers” are defined as any transactions where the buyer and the seller are located in different states; these also include any transactions between buyers and multi-state sellers, as long as the state of the buyer is not one of the states listed by the multi-state seller as one of the states for which the seller collects sales taxes. In the case of Alabama, nearly all purchases (98.611 percent) came from out-of-state sellers.

Table 6 also presents the share of all state transactions in our dataset by the buyer’s location. Populous states tend to dominate the eBay marketplace, as is also evident from Table 5. California buyers account for 11.365 percent of the total volume of transactions in our dataset. New York, Florida, and Texas follow with the corresponding percent rates of 7.550, 6.458, and 5.919. The smallest shares are for the District of Columbia (0.076 percent) and Wyoming (0.112 percent). The average state share is 1.659 percent.

These data show clearly that cross-border shopping represents the overwhelming majority of all transactions. As shown in Table 6, on average 94.088 percent of all purchases by in-state buyers are from out-of-state sellers. In seven states, generally smaller and less populous states (Alaska, Idaho, Maine, North Dakota, South Dakota, Vermont, and Wyoming), and in the District of Columbia, we observe 100 percent cross-border shopping, and in 40 of the 50 states the percent of cross-border shopping exceeds 90 percent. The lowest rate of cross-border purchases is in Hawaii (62.458 percent). Purchases from in-state sellers constitute on average only 3.809 percent of a state’s purchase transactions. There are two clear outliers in this latter category: Hawaii with 37.542 percent and California with 23.259 percent. The low rate of in-state purchases in Hawaii is likely due to the additional shipping costs associated with out-of-state purchases stemming from the state’s geographical location; California may be

explained by the fact that it has the largest concentration of in-state sellers in our dataset. Purchases from multi-state sellers average 1.425 percent, with New Hampshire having the highest rate (13.004 percent). Cross-border commerce clearly dominates in eBay transactions, with the rate of cross-border transaction tending to increase with a decline in the size of the state's population.

In Table 7 we report similar results only for larger and more established sellers on eBay. Here we focus exclusively on the top one-third of all sellers in our dataset as based on their eBay "Rating," and we define this top one-third as "Established Sellers". An eBay "Rating" is a measure of reputation for eBay members that is unique to eBay, constructed as the difference between positive and negative comments posted by unique eBay users who participated with this member in transactions.<sup>26</sup> A larger rating is therefore indicative of a seller who has participated in larger number of transactions and so who is more likely to be an established seller. Our dataset includes 6882 individual sellers, of whom 2291 (or 33.3 percent) have ratings in excess of 812 points; these sellers account for 14828 observations, or about two-thirds of the observations in our data. We define an "Established Seller" as a seller in this top one-third rating category. Thus, in Table 7 we focus on eBay sellers who had previously engaged in transactions with more than 812 unique eBay users. In most cases, these transactions can be considered as business-to-consumer transactions.

Table 7 indicates that on average 46.176 percent of purchases are generated by these established sellers. The proportion varies from a little over 14 percent in Hawaii to nearly 76

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<sup>26</sup> Comments can only be posted after a transaction. If two members have multiple transactions with each other and post multiple comments, these comments will count only as a single rating point, since the rating is based on comments left by unique eBay users.

percent in Wyoming. The volume of transaction activity with out-of-state buyers remains essentially the same as in the overall dataset, at 94.180 percent.

Recall that our data are comprised of listings completed within a 24-hour period in the summer of 2007 for one category of eBay transactions. It is of interest to estimate the total amount of cross-border shopping for all categories of eBay for more recent transactions. To compute the eBay contribution to total 2010 yearly cross-border shopping, we make several assumptions.

First, we estimate the total amount of U.S. purchases on eBay. As noted earlier, eBay Corporation began in the second quarter of 2010 to break down the volume of gross merchandise traded into U.S. and international transactions. In the second quarter of 2010, the volume of gross merchandise traded on eBay sites was \$12,531 million, of which \$4,801 million (or 38.31 percent) represented U.S. transactions (eBay, 2010). During the four quarters ending in the second quarter of 2010, the gross merchandise traded on eBay website was \$52,328 million. Assuming that the U.S./international ratio in 2010:QII (or 38.31 percent) was representative of the entire year, then we can estimate the annualized volume of gross merchandise traded on the U.S. eBay website to be about \$20,050 million. Second, we assume that the behavior that we observe in our dataset in 2007 remains the same in 2010. Finally, we assume also that the behavior of the Electronics category is representative of cross-border shopping in all categories of eBay. With these assumptions, we can estimate the total annual amount of cross-border shopping by state. These results are reported in Table 8.

Table 8 shows estimated purchases made by buyers from each state during the annualized period 2009:QIII-2010:QII, including the volume of out-of-state purchases for each state. We estimate that out of the \$20,050 million of gross merchandise trade on the U.S.

website of eBay, \$15,290 million was in the form of cross-border trade (excluding multi-state sellers).

Table 8 also shows the impact of these cross-border purchases on potential use tax liabilities, on the assumption that all cross-border purchases are subject to the state use tax. It is important to note that seller tax compliance with state sales taxes in these cross-border transactions is irrelevant because these sellers are not required to collect sales taxes on behalf of a state where they have no nexus. Thus, sales and use tax compliance in these transactions falls on the buyer via the use tax. Using the actual state sales and use tax rates and assuming that all cross-border purchases by buyers are subject to the state use tax, we compute the buyer state use tax liability for each state in dollars; we also express this liability as a percentage of the state's total tax revenues and as a percentage of the state's general sales tax revenues. These estimates exclude any local government sales tax component because we do not know the precise local location of eBay buyers. It is important to remember that these calculations assume that all of the observed transactions are subject to use tax, when in fact some transactions are not legally taxable. As a result, these calculations are an upper bound on potential use tax undercollection.

Although eBay is a significant component of the overall e-commerce, as is evident from the earlier Census numbers for 2007-2008, the size of online commerce appears at present to be small relative to the overall retail commerce in the U.S. Consequently, the potential use tax undercollection does not exceed even 1 percent of the actual general sales tax revenues in any state, and is an even smaller percentage of actual total tax revenues. The average potential undercollection is only 0.34 percent (0.20 percent) of the general sales tax revenues (total tax

revenues), with the largest impact in both cases being observed in North Dakota. Again, these results are an upper estimate of potential use tax undercollection.

## **CONCLUSIONS**

Our results indicate that cross-border shopping is highly prevalent on eBay, with out-of-state purchases accounting for on average 94 percent of the volume of a state's purchase transactions. Even so, given the limited volume of eBay-based transactions relative to total sales transactions, the impact of current cross-border transactions on state revenue streams is quite low, typically less than one percent of actual state sales tax revenues. These results show that at present online commerce poses only a limited danger to a state government's ability to generate revenues. However, given the high degree of prevalence of cross-border shopping in online commerce, any significant expansion of online commerce may well develop over time into a more serious threat to the ability of state governments to rely on the general sales and use tax for revenue purposes.

**TABLE 1 STATE RELIANCE ON GENERAL SALES OR GROSS RECEIPTS TAXES**

State	Total Tax Revenue (000's of \$)	Sales Tax Revenues (000's of \$)	General Sales or Gross Receipts Tax Revenues (000's of \$)	Sales Tax Revenues as Percent of Total Tax Revenue	General Sales or Gross Receipts Tax Revenues as Percent of Sales Tax Revenues	General Sales or Gross Receipts Tax Rate (%)
Alabama	8,868,314	4,390,386	2,278,027	49.51	51.89	4
Alaska	3,688,447	235,797	0	6.39	0	NA
Arizona	14,404,976	8,289,660	6,612,350	57.55	79.77	5.6
Arkansas	7,391,778	3,854,708	2,904,401	52.15	75.35	6
California	114,736,981	40,503,828	32,669,175	35.30	80.66	7.25
Colorado	9,216,983	3,450,208	2,196,193	37.43	63.65	2.9
Connecticut	13,271,789	5,316,797	3,030,353	40.06	57.00	6
Delaware	2,905,905	459,209	0	15.80	0	NA
Florida	38,818,707	30,615,783	22,848,990	78.87	74.63	6
Georgia	18,253,216	7,854,746	5,915,521	43.03	75.31	4
Hawaii	5,090,499	3,227,965	2,557,644	63.41	79.23	4
Idaho	3,536,574	1,668,798	1,277,533	47.19	76.55	6
Illinois	30,065,517	14,914,827	7,817,291	49.61	52.41	6.25
Indiana	14,198,709	7,942,905	5,423,501	55.94	68.28	6
Iowa	6,469,752	2,767,626	1,786,668	42.78	64.56	5
Kansas	6,893,359	3,057,029	2,242,025	44.35	73.34	5.3
Kentucky	9,895,207	4,590,295	2,817,636	46.39	61.38	6
Louisiana	10,973,115	5,481,652	3,481,242	49.96	63.51	4
Maine	3,696,065	1,688,712	1,054,812	45.69	62.46	5
Maryland	15,094,183	5,811,886	3,447,828	38.50	59.32	5
Massachusetts	20,691,368	6,005,944	4,075,549	29.03	67.86	5
Michigan	23,848,753	11,602,093	7,983,098	48.65	68.81	6
Minnesota	17,768,434	7,302,090	4,470,596	41.10	61.22	6.5
Mississippi	6,481,876	4,178,190	3,155,622	64.46	75.53	7
Missouri	10,705,687	4,814,498	3,272,919	44.97	67.98	4.225
Montana	2,319,992	530,159	0	22.85	0	NA
Nebraska	4,122,427	2,003,650	1,484,170	48.60	74.07	5.5
Nevada	6,304,752	5,126,064	3,212,848	81.30	62.68	6.5
New Hampshire	2,175,057	734,894	0	33.79	0	NA
New Jersey	29,487,862	12,180,803	8,609,639	41.31	70.68	7
New Mexico	5,527,217	2,646,901	1,936,640	47.89	73.17	5
New York	63,161,582	19,505,685	10,879,888	30.88	55.78	4
North Carolina	22,612,798	8,866,005	5,202,423	39.21	58.68	4.25
North Dakota	1,782,990	808,706	484,341	45.36	59.89	5
Ohio	25,697,905	12,447,998	7,750,543	48.44	62.26	5.5
Oklahoma	8,140,573	2,939,995	1,964,098	36.12	66.81	4.5
Oregon	7,742,862	782,874	0	10.11	0	NA
Pennsylvania	30,837,657	14,482,543	8,661,711	46.96	59.81	6
Rhode Island	2,766,046	1,356,587	875,619	49.04	64.55	7
South Carolina	8,688,935	4,577,312	3,233,632	52.68	70.64	5
South Dakota	1,265,925	1,020,081	711,321	80.58	69.73	4
Tennessee	11,390,037	8,363,985	6,772,468	73.43	80.97	7
Texas	40,314,714	31,811,384	20,434,675	78.91	64.24	6.25
Utah	6,075,590	2,625,037	1,953,643	43.21	74.42	4.75
Vermont	2,563,506	844,977	334,413	32.96	39.58	6
Virginia	18,666,687	6,095,942	3,634,588	32.66	59.62	5
Washington	17,705,980	13,851,911	10,861,327	78.23	78.41	6.5
West Virginia	4,642,230	2,213,341	1,129,531	47.68	51.03	6
Wisconsin	14,482,624	6,037,081	4,158,611	41.68	68.88	5
Wyoming	2,025,090	825,964	698,437	40.79	84.56	4
<b>Average</b>				<b>46.26</b>	<b>60.22</b>	

Source: U.S. Census Bureau, *State Government Finances* (Washington, D.C.: 2008).

**TABLE 2 INDIVIDUAL USE TAX PARTICIPATION RATES ON STATE INDIVIDUAL TAX RETURNS**

State	Participation Rate (%)	State	Participation Rate (%)
California	0.3	North Carolina	2.6
Idaho	1.2	Ohio	0.8
Indiana	0.9	Oklahoma	3.6
Kansas	2.2	Rhode Island	0.2
Kentucky	1	South Carolina	0.6
Louisiana	0.5	Utah	0.5
Maine	11.3	Vermont	8.4
Massachusetts	1.5	Virginia	0.5
Michigan	2.3	West Virginia	0.3
New Jersey	0.3	Wisconsin	1
New York	4.9	<b>Average</b>	<b>2.1</b>

Source: Nina Manzi, *Use Tax Collection on Income Tax Returns in Other States*, Policy Brief, Research Department, Minnesota House of Representatives (Minneapolis, MN: 2010).

**TABLE 3 LISTINGS BY SUBCATEGORIES**

Category	Observations	Transactions (Number)	Transactions (%)	Transactions (\$)	Average Price (\$)	Standard Deviation of Price (\$)	Price Range (Sold Items Only) (\$)
Apple iPod, MP3 players	3,905	2,404	61.55	237,783	99	81	0 – 1,280
A/V accessories & cables	6,114	2,038	33.33	55,134	27	58	0 - 760
Batteries & chargers	271	81	29.78	1,584.	20	46	0 - 408
DVD & home theater	1,797	898	49.98	119,533	133	177	1 - 999
Gadgets & other electronics	2,219	975	43.93	54,970	56	86	0 - 910
Home audio	2,642	1,319	49.93	153,73	117	155	0 - 999
Portable audio/video	749	396	52.91	18,399	46	56	0 - 480
Radios: CB, ham, shortwave	1,852	927	50.05	62,762	68	108	0 - 950
Satellite radio	738	340	46.01	9,804	29	32	0 - 234
Satellite, cable TV	1,248	501	40.12	27,475	55	97	0 - 987
Telephones & pagers	916	441	48.15	14,730	33	54	0 - 849
<b>Total</b>	<b>22,451</b>	<b>10,319</b>	<b>45.96</b>	<b>755,905</b>			

Source: Calculations by authors.



**TABLE 4 DESCRIPTIVE STATISTICS**

<b>Sellers</b>	
Total	6,888
US sellers (state known)	6,791
US sellers (state unknown)	33
US sellers from states with sales taxes	6,596
Sellers (Puerto Rico)	5
Sellers (outside US and Puerto Rico)	28
Sellers (location unknown)	31
<b>Buyers</b>	
Total	9,261
US buyers (state of residence known)	7,955
US buyers (state of residence unknown)	424
Canadian buyers	408
Puerto Rico	51
Rest of the world	353
Buyer (location kept private or unknown)	70
<b>Transactions</b>	
	<b>Average (Standard Deviation)</b>
Price (all listings)	\$65 (\$112)
Price (sold items only)	\$73 (\$108)
Percent of Items Sold	46.0%
Observations per Seller	3.28 (10.51)

Source: Calculations by authors.

**TABLE 5 STATE CHARACTERISTICS AND THE DECISION TO PURCHASE ONLINE <sup>a</sup>**

<b>Independent Variable</b>	<b>Dependent Variable</b>		
	<b>Buyers (number)</b>	<b>Transactions (number)</b>	<b>Purchase Volume (\$)</b>
Population (in 000,000)	28.001 (54.52)	31.301 (46.29)	23.600 (32.73)
Median Income (in 000)	0.756 (1.19)	0.793 (0.95)	57.00 (0.64)
Bachelor's Degree	0.472 (0.54)	0.723 (0.62)	105.464 (0.86)
Sales Tax Rate	0.201 (0.11)	0.263 (0.10)	-62.963 (0.24)
Sales Tax Revenues as Percent of Total Revenues	0.022 (0.27)	0.079 (0.27)	-10.852 (0.35)
Constant	-63.213 (2.32)	-77.402 (2.16)	-6472.263 (1.69)
Adjusted R <sup>2</sup>	0.9856	0.9802	0.9608
Observations	51	51	51

<sup>a</sup> t-values are reported in parentheses.

Source: Calculations by authors.

**TABLE 6 CLASSIFICATION AND DISTRIBUTION OF PURCHASES (IN DOLLARS)**

Buyer Location	State's Total Purchases (\$)	Category as Percent of State's Total Purchases (%)				State's Share of Total State Purchases (%)
		From In-state Multi-state Sellers <sup>a</sup> (%)	From In-state Sellers (%)	From Out-of-state Sellers (%)	From Sellers with Undisclosed or Foreign Location (%)	
Alabama	6795.02	1.067	0.074	98.611	0.248	0.899
Alaska	2023.47	0	0	100	0	0.268
Arizona	11669.11	0.281	2.339	95.666	1.714	1.544
Arkansas	2690.32	0	1.634	98.366	0	0.356
California	86331.53	1.668	23.259	74.571	0.501	11.422
Colorado	8572.23	1.196	0.117	98.688	0	1.134
Connecticut	6108.96	0.999	0.921	95.637	2.443	0.808
Delaware	2242.88	0	6.998	93.002	0	0.297
District of Columbia	575.98	0	0	100	0	0.076
Florida	49074.10	0.841	9.737	88.888	0.535	6.493
Georgia	17011.8	2.058	4.97	92.972	0	2.251
Hawaii	2248.13	0	37.542	62.458	0	0.297
Idaho	2250.37	0	0	100	0	0.298
Illinois	27011.65	0.746	6.673	92.022	0.559	3.574
Indiana	10030.52	3.094	3.401	92.797	0.708	1.327
Iowa	4881.26	0	0.02	99.98	0	0.646
Kansas	6355.88	0.016	0	95.941	4.043	0.841
Kentucky	7362.20	3.369	5.026	85.507	6.099	0.974
Louisiana	5899.09	0	0.135	99.865	0	0.780
Maine	3115.87	0	0	100	0	0.412
Maryland	12659.73	3.083	6.9	90.017	0	1.675
Massachusetts	10749.99	2.339	0	96.14	1.521	1.422
Michigan	19165.20	0.472	1.128	96.156	2.244	2.536
Minnesota	15989.89	1.487	8.949	89.435	0.128	2.116
Mississippi	4162.90	4.864	0	95.136	0	0.551
Missouri	8786.74	0	0.057	93.992	5.952	1.163
Montana	2631.37	0.57	0	99.43	0	0.348
Nebraska	2480	2.198	0	97.802	0	0.328
Nevada	6582.61	3.73	1.815	94.455	0	0.871
New Hampshire	2399.24	13.004	0.208	86.788	0	0.317
New Jersey	20803.59	1.072	8.953	89.099	0.876	2.752
New Mexico	4003.44	0	0	99.701	0.299	0.530
New York	57241.06	1.069	8.566	90.052	0.314	7.573
North Carolina	17365.20	1.09	2.505	96.338	0.067	2.298
North Dakota	2903.73	0	0	100	0	0.384
Ohio	23576.97	1.099	3.238	95.52	0.144	3.119
Oklahoma	5490.10	0.437	0.747	98.816	0	0.726
Oregon	8450.12	0.367	5.952	93.68	0	1.118
Pennsylvania	29875.72	3.407	5.266	89.604	1.722	3.953
Rhode Island	960.31	11.417	4.165	84.418	0	0.127
South Carolina	6335.13	0.135	0.474	99.391	0	0.838
South Dakota	1053.46	0	0	100	0	0.139
Tennessee	12891.33	0.475	2.939	96.284	0.303	1.706
Texas	44938.98	1.049	9.595	88.911	0.445	5.946
Utah	7775.69	0.11	1.498	95.164	3.228	1.029
Vermont	1434.90	0	0	100	0	0.190
Virginia	17582.08	2.958	3.509	93.533	0	2.326
Washington	19055.42	0.286	9.68	89.772	0.262	2.521
West Virginia	1581.00	0	0.478	99.522	0	0.209
Wisconsin	12159.67	0.613	4.809	94.369	0.21	1.609
Wyoming	845.29	0	0	100	0	0.112
Total (Buyer State Known)	644181.23					84.616
Buyer ID Undisclosed	8251.66					1.092
US Buyer (State Unknown)	30655.03					4.056
Foreign Buyer	77367.20					10.236
<b>Total</b>	<b>755829.84</b>					<b>100</b>
<b>State Average</b>	<b>12631.00</b>	<b>1.425</b>	<b>3.809</b>	<b>94.088</b>	<b>0.678</b>	<b>1.659</b>

<sup>a</sup> "Multi-state sellers" are identified as those sellers who list in their listing that they collect sales taxes on behalf of more than one state.

Source: Calculations by authors.

**TABLE 7 PURCHASE ACTIVITY FROM ESTABLISHED SELLERS<sup>a</sup>**

Buyer Location	State's Total Purchases from Established Sellers		Category as Percent of State's Total Purchases from Established Sellers (%)		
	(\$)	(% of Total Purchases Generated by In-state Buyers)	From In-state Sellers <sup>b</sup> (%)	From Out-of-state US Sellers (%)	From Sellers with Undisclosed or Foreign Location (%)
Alabama	4791.68	70.518	1.618	98.382	0.000
Alaska	419.98	20.755	0.000	100.000	0.000
Arizona	5301.93	45.436	3.182	96.818	0.000
Arkansas	1349.68	50.168	3.256	96.744	0.000
California	36696.42	42.506	25.861	73.393	0.745
Colorado	3839.86	44.794	2.929	97.071	0.000
Connecticut	3183.35	52.110	2.301	93.898	3.801
Delaware	666.01	29.694	0.000	100.000	0.000
District of Columbia	307.66	53.415	0.000	100.000	0.000
Florida	20574.68	41.926	6.334	93.457	0.209
Georgia	10139.42	59.602	6.697	93.303	0.000
Hawaii	315.31	14.025	2.851	97.149	0.000
Idaho	1138.44	50.589	0.000	100.000	0.000
Illinois	12622.44	46.730	6.676	93.324	0.000
Indiana	4253.77	42.408	5.546	94.454	0.000
Iowa	2418.22	49.541	0.000	100.000	0.000
Kansas	2270.20	35.718	0.000	99.956	0.044
Kentucky	4210.02	57.184	5.891	83.444	10.665
Louisiana	2852.13	48.349	0.000	100.000	0.000
Maine	2161.95	69.385	0.000	100.000	0.000
Maryland	6470.01	51.107	5.542	94.458	0.000
Massachusetts	5361.51	49.875	1.641	98.359	0.000
Michigan	7531.10	39.296	2.436	92.452	5.112
Minnesota	5907.53	36.945	18.752	81.257	0.000
Mississippi	2422.11	58.183	8.360	91.640	0.000
Missouri	3442.35	39.177	0.000	94.191	5.809
Montana	1070.90	40.697	1.307	98.693	0.000
Nebraska	1044.99	42.137	5.215	94.785	0.000
Nevada	4143.90	62.952	6.070	93.930	0.000
New Hampshire	1441.47	60.080	21.991	78.009	0.000
New Jersey	11546.20	55.501	14.681	84.427	0.893
New Mexico	2034.69	50.824	0.000	99.411	0.589
New York	20217.96	35.321	15.644	84.356	0.000
North Carolina	7795.00	44.889	6.918	93.082	0.000
North Dakota	844.25	29.075	0.000	100.000	0.000
Ohio	11399.51	48.350	8.030	91.672	0.298
Oklahoma	3784.64	68.936	0.000	100.000	0.000
Oregon	4488.59	53.119	11.898	88.102	0.000
Pennsylvania	12445.23	41.657	9.544	88.278	2.178
Rhode Island	585.44	60.964	0.726	99.274	0.000
South Carolina	1884.55	29.748	0.454	99.546	0.000
South Dakota	305.99	29.046	0.000	100.000	0.000
Tennessee	6027.75	46.758	5.006	94.994	0.000
Texas	20266.22	45.097	8.695	91.278	0.027
Utah	2249.67	28.932	5.178	93.666	1.156
Vermont	397.91	27.731	0.000	100.000	0.000
Virginia	8643.07	49.158	10.783	89.217	0.000
Washington	9052.81	47.508	19.408	80.592	0.000
West Virginia	749.89	47.431	1.008	98.992	0.000
Wisconsin	4129.27	33.959	2.755	97.124	0.121
Wyoming	639.79	75.689	0.000	100.000	0.000
<b>State Average</b>	<b>5643.87</b>	<b>46.176</b>	<b>5.200</b>	<b>94.180</b>	<b>0.621</b>

<sup>a</sup> "Established Sellers" are sellers whose eBay rating exceeds 812.

<sup>b</sup> These include "Multi-state Sellers," identified as those sellers who list in their listing that they collect sales taxes on behalf of more than one state.

Source: Calculations by authors.

**TABLE 8 ESTIMATED ANNUALIZED PURCHASES AND USE TAX EFFECTS OF CROSS-BORDER PURCHASES**

Buyer Location	Annualized Purchases (000's of \$)	Annualized Cross-Border Purchases (000's of \$)	State Use Tax Liability on Out-of-State Transactions		
			Total Use Tax Liability (000's of \$)	Percent of State Tax Revenues (%)	Percent of General Sales Tax Revenues (%)
Alabama	179,805.43	177,308.54	7,092.34	0.16	0.31
Alaska	53,676.86	53,676.86	NA	NA	NA
Arizona	304,242.89	291,058.29	16,299.26	0.20	0.25
Arkansas	71,366.48	70,200.61	4,212.04	0.11	0.15
California	2,278,655.14	1,699,223.71	123,193.72	0.30	0.38
Colorado	227,396.70	224,412.93	6,507.97	0.19	0.30
Connecticut	158,093.50	151,195.98	9,071.76	0.17	0.30
Delaware	59,497.18	55,333.48	NA	NA	NA
District of Columbia	15,279.10	15,279.10	878.55	0.07	0.10
Florida	1,294,835.34	1,150,952.02	69,057.12	0.23	0.30
Georgia	451,274.31	419,556.88	16,782.28	0.21	0.28
Hawaii	59,636.45	37,247.81	1,489.91	0.05	0.06
Idaho	59,695.87	59,695.87	3,581.75	0.21	0.28
Illinois	712,536.35	655,689.13	40,980.57	0.27	0.52
Indiana	264,197.26	245,167.62	14,710.06	0.19	0.27
Iowa	129,485.84	129,459.58	6,472.98	0.23	0.36
Kansas	161,786.34	155,219.82	8,226.65	0.27	0.37
Kentucky	183,387.39	156,808.90	9,408.53	0.20	0.33
Louisiana	156,485.96	156,274.00	6,250.96	0.11	0.18
Maine	82,655.10	82,655.10	4,132.76	0.24	0.39
Maryland	335,826.36	302,299.51	15,114.98	0.26	0.44
Massachusetts	280,829.51	269,988.70	13,499.43	0.22	0.33
Michigan	496,991.44	477,888.65	28,673.32	0.25	0.36
Minnesota	423,622.16	378,868.12	24,626.43	0.34	0.55
Mississippi	110,429.81	105,058.06	7,354.06	0.18	0.23
Missouri	219,214.67	206,043.19	8,705.32	0.18	0.27
Montana	69,802.71	69,405.06	NA	NA	NA
Nebraska	65,787.29	64,341.57	3,538.79	0.18	0.24
Nevada	174,617.78	164,934.85	10,720.77	0.21	0.33
New Hampshire	63,644.96	55,236.13	NA	NA	NA
New Jersey	547,026.39	487,396.60	34,117.76	0.28	0.40
New Mexico	105,881.73	105,564.62	5,278.23	0.20	0.27
New York	1,513,675.18	1,363,089.77	54,523.59	0.28	0.50
North Carolina	460,342.35	443,486.56	18,848.18	0.21	0.36
North Dakota	77,027.64	77,027.64	3,851.38	0.48	0.80
Ohio	624,527.80	596,547.32	32,810.10	0.26	0.42
Oklahoma	145,636.62	143,912.36	6,476.06	0.22	0.33
Oregon	224,157.47	209,991.19	NA	NA	NA
Pennsylvania	778,868.51	697,900.98	41,874.06	0.29	0.48
Rhode Island	25,474.27	21,504.75	1,505.33	0.11	0.17
South Carolina	168,052.85	167,029.70	8,351.48	0.18	0.26
South Dakota	27,945.28	27,945.28	1,117.81	0.11	0.16
Tennessee	340,935.49	328,266.37	22,978.65	0.27	0.34
Texas	1,186,797.75	1,055,193.04	65,949.57	0.21	0.32
Utah	199,608.47	189,955.97	9,022.91	0.34	0.46
Vermont	38,063.79	38,063.79	2,283.83	0.27	0.68
Virginia	466,402.21	436,241.65	21,812.08	0.36	0.60
Washington	504,159.34	452,594.67	29,418.65	0.21	0.27
West Virginia	41,939.40	41,738.85	2,504.33	0.11	0.22
Wisconsin	321,885.03	303,758.65	15,187.93	0.25	0.37
Wyoming	22,423.12	22,423.12	896.92	0.11	0.13
Total (Buyer State Known)	16,965,586.85				
Buyer ID Undisclosed	218,892.90				
US Buyer (State Unknown)	813,190.11				
Foreign Buyer	2,052,330.14				
Total	20,050,000.00	15,290,112.95	839,391.17		
State Average	332,658.57	299,806.14	18,247.63	0.20	0.34

Source: Calculations by authors.

**APPENDIX TABLE 1A CROSS-BORDER TRANSACTIONS (\$)**

Buyer	Seller									
	AL	AK	AZ	AR	CA	CO	CT	DE	DC	FL
AL	5.00	0.00	244.50	0.00	863.23	0.00	15.50	0.00	0.00	152.79
AK	0.00	0.00	0.00	0.00	209.48	45.00	0.00	0.00	9.00	410.49
AZ	0.00	76.00	272.96	0.00	1995.22	52.37	0.00	0.00	39.98	798.55
AR	0.00	0.00	23.95	43.95	396.33	14.99	0.00	0.00	0.00	87.45
CA	242.01	16.50	1832.90	142.97	20080.28	818.43	604.93	80.00	60.47	5327.04
CO	0.00	0.00	57.46	0.00	2674.57	9.99	0.00	75.50	0.00	260.36
CT	0.00	0.00	241.51	0.00	675.77	0.00	56.26	50.00	0.02	150.97
DE	0.00	0.00	147.95	19.99	52.24	0.00	0.00	156.96	0.00	0.99
DC	0.00	6.50	0.00	0.00	164.96	0.00	0.00	0.00	0.00	19.55
FL	443.88	0.00	984.16	317.50	8466.71	123.01	83.00	10.98	59.98	4778.19
GA	0.00	0.00	111.75	64.00	2705.22	516.08	0.00	41.00	0.00	570.08
HI	0.00	0.00	18.59	0.00	384.26	0.00	0.00	0.00	0.00	69.99
ID	1.99	0.00	10.00	0.00	164.92	0.00	0.00	0.00	0.00	141.97
IL	27.50	0.00	603.90	18.50	4267.94	579.95	317.93	0.00	49.98	926.50
IN	26.95	0.00	578.84	0.00	1996.92	0.00	53.50	0.00	89.94	595.43
IA	9.99	0.00	0.00	0.00	602.65	280.00	0.00	0.00	0.00	35.86
KS	0.00	0.00	173.35	0.00	705.01	259.45	0.00	0.00	0.00	162.90
KY	0.00	0.00	222.67	0.00	1601.88	48.00	32.99	0.00	0.00	800.01
LA	0.00	0.00	514.99	51.00	566.71	248.50	0.00	0.00	0.00	774.94
ME	0.00	0.00	11.95	0.00	205.68	0.00	1289.25	0.00	0.00	172.89
MD	9.99	0.00	954.85	0.00	1111.38	85.44	267.45	0.00	30.00	697.82
MA	5.00	0.00	92.25	8.00	1753.29	0.00	0.00	0.00	24.99	179.12
MI	30.00	0.00	101.64	100.00	2537.40	350.24	0.00	85.51	24.98	754.72
MN	0.00	0.00	340.80	0.00	2542.49	0.00	275.00	0.00	0.00	1198.43
MS	0.00	0.00	12.00	0.00	596.04	0.00	0.00	0.00	79.99	109.99
MO	6.00	0.00	385.37	56.55	809.25	119.40	94.99	0.00	0.00	146.94
MT	0.00	0.00	180.39	0.00	783.93	0.00	0.00	0.00	0.00	0.00
NE	0.00	0.00	46.07	0.00	113.40	131.50	0.00	0.00	0.00	333.96
NV	5.00	154.49	41.78	0.00	984.38	549.00	30.99	0.00	0.00	91.98
NH	0.00	0.00	189.99	200.00	44.97	0.00	0.00	0.00	0.00	162.52
NJ	8.90	0.00	431.92	2.75	2433.69	212.50	233.49	0.00	0.00	2667.30
NM	0.00	0.00	0.00	143.97	567.61	107.50	0.00	0.00	0.00	69.76
NY	588.55	0.00	957.79	213.98	7196.13	1109.94	898.93	229.50	0.00	4611.80
NC	38.50	0.00	385.68	40.00	2484.50	296.83	0.00	0.00	0.00	1231.61
ND	0.00	0.00	127.50	0.00	28.83	0.00	0.00	0.00	0.00	0.00
OH	101.00	0.00	884.63	89.50	3279.39	0.00	208.00	12.50	0.00	1667.69
OK	0.00	0.00	35.20	0.00	608.59	14.99	5.01	0.00	0.00	289.47
OR	10.50	0.00	216.91	27.01	1487.55	48.49	35.00	0.00	0.00	862.33
PA	0.00	0.00	948.42	0.00	4363.22	403.02	569.99	47.53	29.98	1714.90
RI	0.00	0.00	0.00	0.00	96.00	0.00	0.00	0.00	0.00	26.45
SC	227.52	0.00	16.58	0.00	1540.36	0.00	0.00	112.50	0.00	241.94
SD	0.00	0.00	45.00	0.00	142.50	0.00	29.99	0.00	0.00	0.00
TN	59.98	0.00	169.60	55.00	1871.26	0.00	32.99	15.25	0.00	673.68
TX	161.01	151.00	585.76	49.99	9737.04	57.00	104.99	49.95	254.98	4027.43
UT	0.00	208.00	9.95	0.00	2164.96	131.27	200.00	0.00	0.00	139.97
VT	0.00	0.00	2.00	0.00	85.95	0.00	0.00	0.00	0.00	0.00
VA	0.99	0.00	747.34	177.50	2317.54	9.00	0.00	19.99	0.00	470.23
WA	0.00	689.99	363.59	46.00	2535.45	257.96	162.50	0.00	0.00	505.31
WV	0.00	0.00	174.70	29.91	103.69	0.00	0.00	0.00	0.00	347.95
WI	0.00	0.00	278.53	148.00	2430.02	89.90	0.00	0.00	0.00	277.89
WY	0.00	0.00	194.99	0.00	256.47	6.50	0.00	0.00	0.00	15.50
Total	2010.26	1302.48	14972.66	2046.07	105787.26	6976.25	5602.68	987.17	754.29	39753.64

**APPENDIX TABLE 1B CROSS-BORDER TRANSACTIONS (\$)**

Buyer	Seller									
	GA	HI	ID	IL	IN	IA	KS	KY	LA	ME
AL	98.32	26.88	0.00	372.95	70.97	0.00	0.00	0.00	0.00	0.00
AK	510.00	0.00	0.00	200.00	105.00	0.00	0.00	0.00	0.00	0.00
AZ	240.98	5.51	0.98	1017.04	201.44	41.98	102.98	0.00	167.50	19.99
AR	22.00	0.00	0.00	125.98	0.00	0.00	0.00	0.00	17.99	0.00
CA	1402.15	25.05	171.42	5703.44	1467.56	496.21	877.98	331.54	152.99	442.56
CO	47.93	0.00	400.00	366.67	77.96	1.99	92.99	0.00	0.00	0.00
CT	252.50	0.00	0.00	411.22	125.95	0.00	60.00	0.99	0.00	0.00
DE	0.00	0.00	0.00	94.99	0.00	0.00	0.00	125.02	0.00	0.00
DC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	35.02	0.00
FL	1465.43	0.00	130.48	1571.57	871.31	301.99	584.46	633.65	7.99	55.95
GA	845.52	100.00	0.00	845.94	340.42	22.16	210.01	229.24	0.00	0.00
HI	0.00	843.99	0.00	188.81	0.00	0.00	0.00	29.95	0.00	0.00
ID	10.51	0.00	0.00	13.95	0.00	56.00	0.00	0.00	0.00	58.00
IL	668.50	0.00	43.90	1802.54	412.58	153.50	244.99	271.49	14.99	0.00
IN	58.50	0.00	209.00	639.68	341.10	0.00	5.99	0.06	20.00	54.95
IA	72.98	0.00	0.00	158.97	0.00	0.99	10.00	0.00	9.99	0.00
KS	149.49	0.00	0.00	629.47	1.25	26.00	0.00	0.00	217.50	0.00
KY	109.00	0.00	47.99	131.99	158.72	0.01	21.50	370.00	0.00	36.00
LA	74.95	0.99	0.48	463.84	143.24	21.49	0.00	39.94	7.99	0.00
ME	0.00	0.00	0.00	20.00	0.00	55.46	59.95	54.01	0.00	0.00
MD	873.99	0.00	0.48	569.58	181.95	41.01	210.04	318.95	0.00	19.99
MA	447.49	0.00	24.99	862.36	176.84	29.98	221.49	0.00	0.00	48.00
MI	502.43	0.00	0.00	1290.85	370.95	101.59	0.00	52.01	0.00	0.00
MN	521.27	0.00	0.00	2025.98	718.55	0.00	171.49	0.00	0.00	0.00
MS	44.95	0.00	30.00	615.00	12.99	0.00	119.00	0.00	0.00	7.50
MO	314.25	0.00	125.99	371.89	178.89	0.00	112.99	221.50	0.00	370.00
MT	135.00	0.00	0.00	227.45	0.00	0.00	0.00	0.00	0.00	0.00
NE	15.51	0.00	0.00	0.00	9.99	0.00	17.50	9.95	0.00	115.00
NV	0.00	0.00	0.00	72.49	342.01	0.00	0.00	0.00	0.00	0.00
NH	25.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NJ	289.93	0.00	33.94	1186.28	300.48	100.25	0.00	130.87	99.69	0.00
NM	0.00	0.00	0.00	320.49	6.50	14.98	61.00	0.00	116.00	0.00
NY	1739.83	115.00	60.98	3407.63	222.40	776.52	3350.01	170.95	798.05	175.00
NC	104.99	58.00	61.47	2969.04	118.47	15.49	755.02	182.50	27.99	0.00
ND	80.00	0.00	0.00	0.00	51.95	9.99	0.00	0.00	20.99	0.00
OH	415.01	0.00	25.93	1442.38	464.14	75.99	180.99	207.50	279.65	92.50
OK	168.99	0.00	0.00	712.48	62.00	0.00	0.00	0.00	41.00	0.00
OR	247.99	137.50	9.97	362.79	77.00	0.00	16.99	107.51	0.00	0.00
PA	413.48	0.00	30.91	1258.51	707.89	30.49	540.46	109.16	84.98	0.00
RI	0.00	0.00	0.00	0.00	0.00	0.00	0.00	36.00	0.00	0.00
SC	206.99	0.00	0.00	365.93	0.00	0.00	0.00	82.95	0.00	0.00
SD	0.00	0.00	0.00	147.50	0.00	18.99	0.00	0.00	0.00	0.00
TN	1586.48	0.00	75.00	558.01	185.23	119.00	134.97	0.99	113.99	0.00
TX	1141.64	112.98	0.48	1089.62	802.00	682.24	737.49	103.01	7.99	190.00
UT	0.99	0.00	0.00	200.00	47.95	0.00	0.00	39.99	0.00	0.00
VT	15.50	0.00	0.00	375.00	39.99	0.00	0.00	0.00	0.00	0.00
VA	84.50	0.00	0.00	260.00	574.23	0.00	851.50	172.49	211.03	0.00
WA	1261.22	0.00	81.21	162.06	1139.98	9.99	167.99	250.00	0.00	42.99
WV	8.25	0.00	0.00	59.99	0.00	19.97	0.00	71.00	0.00	0.99
WI	2248.40	0.00	0.00	106.00	184.39	36.49	246.00	127.49	0.00	0.00
WY	0.00	0.00	0.00	94.99	0.00	0.00	0.00	0.00	0.00	0.00
Total	18922.84	1425.90	1565.60	35873.35	11294.27	3260.75	10165.78	4480.71	2453.32	1729.42

**APPENDIX TABLE 1C: CROSS-BORDER TRANSACTIONS (\$)**

Buyer	Seller									
	MD	MA	MI	MN	MS	MO	MT	NE	NV	NH
AL	35.00	99.99	0.00	554.00	0.00	30.44	0.00	101.95	0.00	229.49
AK	0.00	0.00	170.00	189.00	0.00	0.00	0.00	0.00	0.00	0.00
AZ	143.99	416.02	209.98	494.55	0.00	366.49	0.00	30.99	52.15	30.44
AR	0.00	48.50	0.00	89.17	0.00	50.49	0.00	89.99	0.00	16.50
CA	587.37	456.04	1586.10	1699.54	42.99	1425.50	31.00	380.99	259.98	1092.33
CO	635.99	0.00	22.00	76.00	22.99	275.00	0.00	9.99	0.00	0.00
CT	87.50	0.00	272.00	0.00	0.00	56.99	0.00	55.99	0.00	0.00
DE	0.00	0.00	76.00	202.99	31.99	0.00	0.00	54.95	0.00	0.00
DC	0.00	86.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FL	1592.97	461.46	1838.41	814.39	187.50	476.48	22.99	194.93	31.80	220.99
GA	549.99	11.78	353.47	113.47	49.99	316.29	27.00	237.49	0.00	429.94
HI	0.00	0.00	0.00	0.00	0.00	29.45	0.00	0.00	0.00	0.00
ID	0.00	0.00	142.99	91.00	0.00	0.00	0.00	0.00	0.00	42.00
IL	543.92	198.99	790.23	139.00	60.00	162.58	0.00	20.50	72.94	379.59
IN	26.00	0.00	72.44	221.00	0.00	16.06	3.01	26.00	0.00	129.50
IA	321.00	167.00	264.89	0.00	0.00	77.95	0.00	0.00	0.00	32.08
KS	579.72	42.00	116.99	305.00	0.00	118.99	0.00	0.00	0.00	77.48
KY	0.00	0.00	75.07	70.68	36.00	329.50	5.00	0.00	0.00	0.00
LA	0.00	77.00	41.29	190.00	14.50	20.00	0.00	0.00	3.99	0.00
ME	0.00	0.00	0.00	0.00	0.00	16.00	0.00	24.99	0.00	0.00
MD	873.51	359.94	353.79	16.35	0.00	81.00	0.00	0.00	49.99	0.00
MA	256.51	0.00	237.99	120.99	0.00	0.00	0.00	81.00	27.00	152.50
MI	476.98	744.50	216.18	85.24	0.00	519.95	23.00	0.00	20.49	295.98
MN	625.00	627.51	28.00	1430.99	0.00	0.00	0.00	66.00	11.00	280.50
MS	0.00	0.00	0.00	0.00	0.00	9.99	0.00	0.00	0.00	0.00
MO	233.50	12.22	203.19	41.00	31.00	5.00	0.00	0.00	492.47	0.00
MT	0.00	0.00	39.99	0.00	0.00	0.00	0.00	24.99	0.00	0.00
NE	0.00	203.50	76.01	0.00	0.00	50.99	0.00	0.00	0.00	0.00
NV	0.00	0.00	390.00	242.01	0.00	0.00	0.00	1344.52	119.46	9.50
NH	0.00	47.01	0.00	0.00	0.00	29.00	0.00	0.00	0.00	5.00
NJ	187.47	354.88	173.26	213.96	0.00	403.81	63.52	89.99	4.99	27.99
NM	117.95	0.00	0.00	0.00	0.00	189.49	0.00	25.50	0.00	104.99
NY	281.69	1807.33	1214.91	1507.00	95.34	782.88	0.00	299.99	423.57	328.99
NC	201.31	349.96	54.97	10.51	0.00	11.25	0.00	24.99	0.00	0.00
ND	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
OH	269.21	162.50	853.46	644.50	0.00	103.72	0.00	0.00	55.09	574.00
OK	0.00	85.99	40.88	539.00	0.00	85.28	0.00	20.50	0.00	0.00
OR	682.49	9.99	187.73	0.00	184.95	0.00	0.00	0.00	217.48	185.00
PA	681.00	510.99	573.30	757.25	51.00	458.48	49.58	14.99	160.45	189.99
RI	0.00	14.99	29.99	22.50	0.00	0.00	0.00	26.00	0.00	0.00
SC	22.95	56.99	40.00	99.00	3.00	80.00	28.50	0.00	0.00	60.00
SD	0.00	0.00	8.00	249.78	0.00	0.00	0.00	0.00	0.00	0.00
TN	177.98	200.00	42.99	19.99	0.00	0.00	51.13	0.00	117.50	83.99
TX	317.00	177.49	734.23	2368.88	2.00	414.06	20.50	0.00	539.00	831.25
UT	41.00	16.97	844.94	0.00	0.00	0.00	17.51	30.98	0.00	0.00
VT	0.00	0.00	515.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VA	512.48	116.99	292.27	138.00	0.00	81.00	86.00	29.98	48.79	0.00
WA	302.75	170.00	333.50	80.99	0.00	652.30	0.00	102.50	5.99	14.99
WV	40.00	0.00	24.49	0.00	0.00	5.50	0.00	16.50	0.00	0.00
WI	0.00	593.99	27.98	89.59	0.00	417.50	0.00	42.99	230.00	81.00
WY	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	11404.23	8688.52	13569.41	13927.32	813.25	8149.41	428.74	3470.18	2944.13	5906.01

**APPENDIX TABLE 1D: CROSS-BORDER TRANSACTIONS (\$)**

Buyer	Seller										
	NJ	NM	NY	NC	ND	OH	OK	OR	PA	RI	SC
AL	254.06	0.00	695.93	192.48	0.00	27.50	0.00	0.00	217.47	0.00	0.00
AK	0.00	0.00	46.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AZ	249.50	4.95	1162.01	0.00	0.00	779.44	27.49	31.32	126.94	0.00	61.00
AR	198.99	0.00	243.90	0.00	0.00	356.49	0.00	62.49	100.00	0.00	0.00
CA	2271.19	731.00	7277.95	1169.74	9.99	2285.97	747.29	393.43	2354.82	818.99	259.00
CO	197.55	5.50	807.16	165.49	0.00	120.00	0.00	0.00	347.16	0.00	0.00
CT	38.01	0.00	326.67	14.98	0.00	253.84	54.99	0.00	337.50	0.00	0.00
DE	33.00	0.00	318.35	0.00	0.00	124.97	80.00	0.00	379.99	0.00	0.00
DC	0.00	0.00	32.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FL	1880.90	20.50	4767.07	693.91	0.00	949.82	116.57	1135.97	2061.37	76.00	1131.11
GA	663.97	261.00	899.37	341.29	0.00	634.48	11.28	10.23	825.48	80.07	180.00
HI	354.33	0.00	0.00	0.00	0.00	56.77	0.00	50.00	15.00	0.00	0.00
ID	0.00	205.50	671.44	0.00	0.00	0.00	45.25	0.00	183.46	0.00	0.00
IL	954.44	15.50	1739.38	589.03	0.00	888.46	193.00	109.71	671.31	0.00	79.95
IN	244.51	0.00	1742.56	96.79	0.00	658.41	0.00	121.60	444.96	9.99	0.00
IA	576.00	0.00	363.92	46.03	0.00	111.01	0.00	56.99	501.88	0.00	0.00
KS	1000.20	0.00	534.89	94.47	0.00	130.49	0.00	0.00	247.00	0.00	43.02
KY	331.43	40.00	267.41	15.00	0.00	187.94	0.01	25.00	119.50	0.00	0.00
LA	105.15	0.00	725.61	0.00	0.00	10.00	0.00	29.99	314.49	0.00	199.00
ME	185.00	0.00	144.87	0.00	0.00	0.00	0.00	8.50	645.49	0.00	0.00
MD	16.96	0.00	1129.39	644.96	0.00	265.99	85.98	0.01	874.06	0.00	9.95
MA	541.94	224.50	676.79	358.49	0.00	56.51	8.48	15.25	730.31	0.00	899.99
MI	904.40	219.51	1369.55	326.19	0.00	865.50	234.54	408.10	895.92	0.00	1.99
MN	282.94	0.00	825.17	2.75	0.00	75.75	607.49	281.50	327.60	0.00	39.95
MS	339.95	0.00	108.99	119.50	0.00	200.00	3.98	8.50	720.95	0.00	0.00
MO	72.99	0.00	594.75	108.00	0.00	163.50	98.00	39.95	556.53	0.00	46.11
MT	29.99	0.00	560.69	0.00	0.00	23.00	0.00	0.00	0.00	0.00	260.00
NE	539.96	0.00	54.94	0.00	0.00	199.74	7.49	0.00	38.99	249.00	0.00
NV	133.00	0.00	290.49	159.40	0.00	249.94	0.00	199.94	41.87	0.00	0.00
NH	219.99	0.00	18.99	17.50	0.00	19.50	0.00	0.00	499.50	0.00	0.00
NJ	1862.48	0.00	2028.33	74.39	0.00	898.79	175.99	64.89	1262.46	0.00	38.00
NM	33.50	0.00	972.77	130.00	0.00	0.00	114.26	0.00	99.95	0.00	0.00
NY	1510.17	0.00	4903.08	629.39	0.00	1158.80	109.97	1055.70	1144.64	309.00	1038.90
NC	359.53	0.00	2085.99	435.01	0.00	481.85	26.00	208.93	1006.10	0.00	100.00
ND	0.00	0.00	0.00	0.00	0.00	1364.04	0.00	0.00	553.48	0.00	0.00
OH	1184.48	0.00	2748.18	1230.31	0.00	763.31	96.78	370.00	331.07	43.24	24.00
OK	266.62	0.00	1036.98	12.01	0.00	185.86	41.00	88.79	260.52	0.00	0.00
OR	186.00	106.75	381.20	106.99	0.00	328.82	0.00	502.99	184.00	0.00	232.51
PA	938.97	40.00	3964.35	864.47	0.00	573.57	254.77	106.46	1573.38	102.50	9.99
RI	75.79	0.00	103.94	0.00	0.00	125.49	0.00	0.00	125.99	40.00	0.00
SC	64.05	0.00	1206.21	280.53	0.00	20.49	29.98	314.00	266.16	69.99	30.02
SD	2.26	0.00	0.00	8.50	0.00	0.00	0.00	269.99	39.97	0.00	9.99
TN	379.02	0.99	2037.05	315.80	0.00	993.93	98.00	13.49	1166.49	84.35	0.00
TX	1054.43	6.50	4070.00	1213.26	0.00	1965.54	108.97	330.31	1855.84	0.00	221.99
UT	0.00	0.00	546.48	418.48	0.00	523.99	213.10	40.89	396.80	0.00	0.00
VT	0.00	0.00	147.99	0.00	0.00	0.00	0.00	25.49	0.00	0.00	0.00
VA	1471.57	0.00	2151.53	301.81	0.00	99.13	1064.14	495.48	161.77	0.00	206.00
WA	180.98	55.23	1525.14	187.50	0.00	39.95	20.00	785.25	687.76	0.00	82.89
WV	51.00	0.00	35.99	0.00	0.00	0.00	0.00	0.00	41.00	0.00	0.00
WI	170.61	100.00	812.64	139.78	0.00	366.94	80.00	150.36	681.20	0.00	36.00
WY	0.00	0.00	11.90	0.00	0.00	50.00	0.00	0.00	0.00	0.00	0.00
Total	22411.81	2037.43	59166.84	11504.23	9.99	19635.52	4754.80	7811.50	26418.13	1883.13	5241.36



**APPENDIX TABLE 1E: CROSS-BORDER TRANSACTIONS (\$)**

Buyer	Seller SD	TN	TX	UT	VT	VA	WA	WV	WI	WY	TOTAL
AL	0.00	1052.00	763.13	12.95	0.00	431.54	187.51	0.75	24.99	0.00	6761.32
AK	0.00	10.50	119.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2023.47
AZ	0.00	1034.05	343.06	41.61	0.00	3.21	420.58	0.00	205.88	0.00	11269.13
AR	0.00	68.00	341.54	0.00	0.00	290.12	0.00	1.50	0.00	0.00	2690.32
CA	397.94	2966.36	9175.39	447.62	142.50	2378.86	2953.64	121.48	725.10	0.00	85466.53
CO	0.00	810.92	201.13	5.99	0.00	649.00	139.99	0.00	14.95	0.00	8572.23
CT	0.00	179.85	1048.80	26.79	0.00	0.00	688.00	0.00	343.32	0.00	5810.42
DE	0.00	0.99	233.48	0.00	0.00	108.03	0.00	0.00	0.00	0.00	2242.88
DC	0.00	0.00	0.00	4.95	0.00	73.00	153.15	0.00	0.00	0.00	575.98
FL	13.00	1378.85	2567.32	208.86	15.57	1231.31	2645.49	104.87	818.71	0.00	48549.36
GA	51.00	825.04	1810.02	79.98	0.00	215.50	607.50	0.00	824.75	0.00	17011.80
HI	0.00	188.75	9.99	0.00	0.00	0.00	8.25	0.00	0.00	0.00	2248.13
ID	0.00	36.92	82.97	0.00	0.00	0.00	217.98	0.00	73.52	0.00	2250.37
IL	93.00	1361.98	3297.58	69.89	0.00	951.96	2693.02	176.98	51.05	0.99	26709.67
IN	0.00	159.99	304.61	5.99	0.00	220.50	634.72	0.00	79.00	0.00	9888.50
IA	0.00	469.55	177.01	0.00	0.00	282.02	252.50	0.00	0.00	0.00	4881.26
KS	0.00	0.00	190.26	10.00	0.00	0.00	0.00	0.00	26.99	0.00	5841.92
KY	0.00	0.00	552.45	0.00	0.00	127.49	413.41	212.50	75.05	0.00	6464.20
LA	0.00	0.00	840.52	0.00	0.00	0.00	408.50	0.00	9.99	0.00	5899.09
ME	0.00	0.00	221.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3115.87
MD	5.00	103.59	1476.90	0.00	0.00	24.99	665.45	0.00	249.00	0.00	12659.73
MA	0.00	541.88	401.03	167.95	189.00	321.11	497.99	42.00	0.00	0.00	10423.01
MI	0.00	662.58	1881.74	57.00	0.00	307.59	732.99	652.98	100.00	0.00	18305.22
MN	0.00	456.96	348.42	461.47	0.00	842.11	514.77	0.00	0.00	19.00	15948.89
MS	0.00	17.11	426.48	0.00	0.00	74.99	55.00	0.00	450.00	0.00	4162.90
MO	0.00	189.52	566.16	118.50	0.00	25.29	756.15	43.00	30.00	0.00	7740.84
MT	0.00	0.00	365.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2631.37
NE	0.00	0.00	136.50	0.00	0.00	0.00	130.00	0.00	0.00	0.00	2480.00
NV	0.00	174.38	397.62	55.87	0.00	329.00	173.49	0.00	0.00	0.00	6582.61
NH	0.00	7.57	510.72	74.95	0.00	0.00	139.98	0.00	187.05	0.00	2399.24
NJ	0.00	789.50	1874.50	167.09	0.00	264.97	658.47	9.99	617.48	0.00	20439.19
NM	0.00	329.99	64.75	0.00	0.00	0.00	0.00	0.00	388.50	0.00	3979.46
NY	6.50	2331.38	3271.50	2649.33	99.00	647.01	2504.81	93.49	54.36	0.00	56881.72
NC	0.00	671.38	959.09	115.05	0.00	613.82	233.50	0.00	622.75	0.00	17342.08
ND	0.00	0.00	216.95	450.00	0.00	0.00	0.00	0.00	0.00	0.00	2903.73
OH	0.00	716.51	2137.44	4.95	0.00	470.01	1114.44	85.00	99.99	0.00	23508.99
OK	0.00	27.67	686.25	0.00	0.00	2.99	162.03	0.00	10.00	0.00	5490.10
OR	0.00	217.00	579.19	106.50	0.00	65.50	297.49	0.00	40.00	0.00	8450.12
PA	8.50	1330.88	2364.09	109.00	0.00	1058.00	596.79	0.99	250.00	0.00	28846.68
RI	0.00	49.00	182.67	0.00	0.00	0.00	0.00	0.00	5.50	0.00	960.31
SC	0.00	85.98	332.65	268.28	0.00	69.99	75.60	0.00	35.99	0.00	6335.13
SD	0.00	61.00	0.00	0.00	0.00	19.99	0.00	0.00	0.00	0.00	1053.46
TN	0.00	378.84	467.13	102.50	0.00	139.98	155.25	0.00	135.50	0.00	12813.33
TX	5.50	863.80	4311.87	120.35	0.00	1040.83	1400.32	153.02	365.50	0.00	44539.04
UT	0.00	213.99	225.00	116.49	0.00	21.50	387.50	0.00	74.99	0.00	7273.69
VT	0.00	49.99	177.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1434.90
VA	0.00	1114.30	2043.75	87.76	57.00	616.97	161.26	65.00	282.76	0.00	17582.08
WA	0.00	653.47	571.67	273.01	0.00	2293.81	1844.51	0.00	414.99	0.00	18955.42
WV	0.00	0.00	240.00	0.00	0.00	302.51	0.00	7.56	0.00	0.00	1581.00
WI	0.00	613.57	485.33	0.00	0.00	101.87	129.48	0.00	584.75	0.00	12108.69
WY	0.00	0.00	95.95	39.00	0.00	79.99	0.00	0.00	0.00	0.00	845.29
Total	580.44	23195.59	50078.87	6459.68	503.07	16697.36	25811.51	1771.11	8272.41	19.99	

Source: Calculations by authors.