

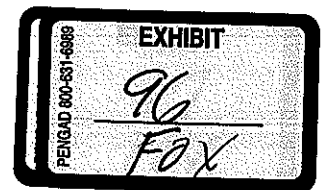
State and Local Government Sales Tax Revenue Losses from Electronic Commerce¹

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April 13, 2009



¹ The authors are grateful to Scott Peterson of the Streamlined States Governing Board and an advisory committee including Lorie Brown, Bart Hildreth, and Jerry Johnson. We also thank Charlie McClure for his helpful comments.

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State and Local Government Sales Tax Revenue Losses from Electronic Commerce

EXECUTIVE SUMMARY

The development of new technologies and digital processes has had a profound effect on the U.S economy as e-commerce sales have grown from \$995.0 billion in 1999 to \$2,385 billion by 2006. The rapid growth in e-commerce affects state and local economies in several important ways. First, state and local governments continue to lose sales and use tax revenues because of the inability to collect taxes that are due. Second, firms change their best business practices to avoid creating a collection responsibility in certain states. Firms choose to locate their selling or warehousing activities to avoid creating nexus rather than locating where they can operate most efficiently. Also, local vendors face a competitive disadvantage to e-commerce competitors as consumers browse in shops on Main Street but then make their purchases online to evade the tax. Finally, there may be distributional consequences if lower-income consumers are more likely to make purchases in local stores where the tax is collected.

We estimate state and local sales tax losses arising from e-commerce for 46 states and the District of Columbia using both a baseline forecast and an optimistic forecast for e-commerce growth. B2B (business-to-business) sales account for approximately 93 percent of total e-commerce. In the baseline case, we estimate that annual national state and local sales tax losses on e-commerce will grow to \$11.4 billion by 2012 for a six-year total loss of \$52 billion. The more optimistic growth case estimates losses to reach \$12.65 billion by 2012 and an aggregate loss of \$56.3 billion.

We view our estimates as lower bounds on the expected sales tax revenue losses. First, we use a conservative methodology for forecasting e-commerce. Second, we did not seek to account for the additional losses associated with non-registered vendors operating in the states. Third, we assume that the taxability of e-commerce transactions is the same as for overall commerce, even though we suspect that the ability to evade the tax should shift the mix of e-commerce more towards taxable sales.

Changing the law to require remote vendors to collect sales and use taxes would recover a significant portion of the estimated losses, although we acknowledge that some noncompliance would remain. More importantly, our estimates are revenue losses associated with e-commerce and not all remote sales, and yet the proposed legislation covers other types of remote commerce, such as mail order, telephone orders, and deliveries made across state lines by unregistered businesses. Estimating the sales tax revenue losses associated with all remote commerce is beyond the scope of this study, but we believe the revenue implications are much larger than for e-commerce alone. For example,

applying the methodology we used to estimate e-commerce losses, we estimate losses relating only to the B2C (business-to-consumer) component of mail orders sales to be \$6.8 billion by 2012. As a result, total revenue gains from requiring various forms of remote vendors to collect sales and use tax will be significantly larger than what we estimate in this report for e-commerce.

INTRODUCTION

The advent and remarkable development of digital technologies and e-commerce have had profound effects on the U.S. economy. New products and innovative ways to sell, deliver and receive goods and services have developed. New technologies are affecting almost every aspect of business processes and every industry, dramatically enhancing productivity of the U.S. economy. Both pre-existing and new firms have benefited from integrating digital technologies into production processes and the advances have been an important factor in the country's economic growth since at least the mid-1990s.

Specifically, using new technologies and digital processes to facilitate remote commerce have been a visible benefit to a wide range of businesses and their customers. E-commerce sales have grown at a vigorous pace for nearly 10 years and we believe that the tempo will remain very strong. According to the U.S. Bureau of the Census, e-commerce sales grew from \$995.0 billion in 1999 to \$2,385 billion by 2006, a 13.3 percent compound annual growth rate.²

Past and expected future performance of e-commerce sales are illustrated in Figure 1 (including our baseline forecast from 2007 through 2012). We expect e-commerce sales to continue rising through the 2012 forecast horizon. E-commerce activity slowed during the recession at the beginning of the decade and is likely to slow again along with the rest of the economy during the current recession. Nonetheless, it should be noted that despite the current recession, the initial analysis of *Internet Retailer* suggests that 2008 e-commerce sales expanded 21.4 percent from the previous year.³ We are forecasting a sound, though less vibrant, 9.0 percent annual increase from 2006 through 2012. Most e-commerce sales continue to be business to business (B2B) transactions.⁴ B2B represented 92.8 percent of e-commerce sales in 2003, and rose slightly to 93.3 percent in 2006. The balance is of course business to consumer (B2C) sales. These findings evidence that the greatest implications of e-commerce to date have been on the ways that businesses work with each other rather than the ways that businesses relate to final consumers.

² See <http://www.census.gov/eos/www/2006/all2006tables.html>.

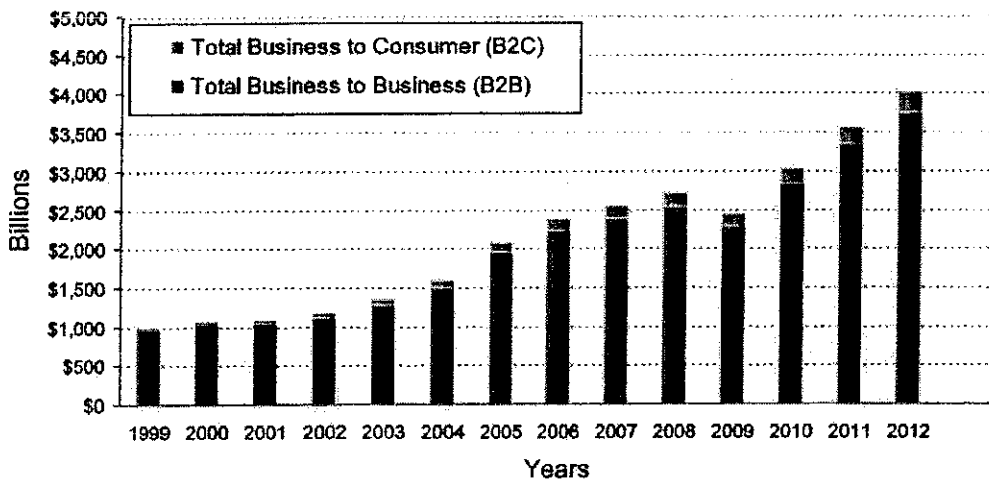
³ See <http://www.internetretailer.com/dailyNews.asp?id=29389>.

⁴ For general discussion purposes in this report, B2B sales are those made by manufacturers and wholesalers and B2C sales are those made by retailers. We recognize that manufacturers and wholesalers sell to individual consumers and retailers sell to businesses but we have no data allowing us to provide a detailed analysis of individual buyers. Sales by service providers are split evenly between B2B and B2C.

IMPLICATIONS FOR SALES TAX REVENUES

Concerns about state and local governments' ability to collect sales taxes on remote commerce have been expressed at least dating back to the writings of John Due in the 1960s. Much of the collection problem arises because states are unable to require remote vendors to remit the tax given the nexus restrictions arising from *Quill v. North Dakota*.⁵ Perhaps the biggest consequence is that the US economy is harmed as firms change their best business practices to avoid creating a collection responsibility in certain states. For example, firms choose where to locate their sales or warehousing operations to avoid creating nexus rather than locating where they can operate most efficiently. We all lose from the higher economic costs associated with these decisions. Also, local vendors face a competitive disadvantage as consumers browse in shops on Main Street but then make their purchases online to evade the tax. There might also be distributional consequences if lower income consumers are more likely to make purchases in local stores where the tax is collected. Lost sales tax revenues have been an increasingly important issue as catalog sales grew and more recently with the dramatic rise in electronic commerce.

Figure 1: Estimated Total E-Commerce Sales



*Sales-taxing states only.

Several inclusive study groups have been formed during the past decade to investigate wide dimensions of e-commerce transactions and the relationship with state-local taxation, including whether e-commerce transactions should be incorporated into the sales tax base and if so how best to integrate these

⁵ *Quill Corp. v. North Dakota*, 504 U.S. 298 (1992).

transactions into the base. The National Tax Association's *Communications and Electronic Commerce Project* was one of the first careful investigations into e-commerce tax implications. It was followed closely by the congressionally-initiated *Advisory Commission on Electronic Commerce*. More recently and more comprehensively, the *Streamlined Sales Tax Project* has tackled these issues through the operations of the Streamlined Sales Tax Governing Board and associated activities.

At the same time, a number of studies have been conducted on the revenue losses associated with the inability of state and local governments to enforce sales and use tax collections on transactions conducted through e-commerce. Among the earlier studies are three performed by us (Bruce and Fox, 2000, 2001, and 2004). These studies were based on the available information of the day, but were constrained by very limited experience with the extent of e-commerce and its taxability. This study updates estimates of the amount of sales and use taxes that states are unable to collect because of transactions that take place through e-commerce. The current analysis benefits from much richer history and data on the levels of e-commerce activity, the industries in which e-commerce transactions are conducted, and the taxability of these transactions.

The remainder of the report is broken into three sections. The first provides our estimates of the sales tax losses by state and the aggregate for the nation through 2012. The second provides several extensions of our analysis, including the effects of proposed legislation with a small seller exemption. The final section discusses our methodology in significant detail.

FINDINGS

National Findings

Estimated state and local sales tax revenue losses are reported in Table 1 for every sales-taxing state including Alaska,⁶ using both a baseline forecast and an optimistic forecast for the economy.⁷ The only difference between these two cases is the rate of economic growth, which results in a more vigorous forecast of e-commerce sales in the optimistic scenario. Details of the methodology used to prepare the e-commerce estimates are provided below.

Figure 2 shows actual e-commerce growth for the period 1999-2006 and our baseline and optimistic estimates for 2007-2012.⁸ In the baseline case we forecast e-commerce sales to rise from \$3.0 trillion in 2010 to \$4.0 trillion in 2012. The national state and local sales tax loss on these transactions is

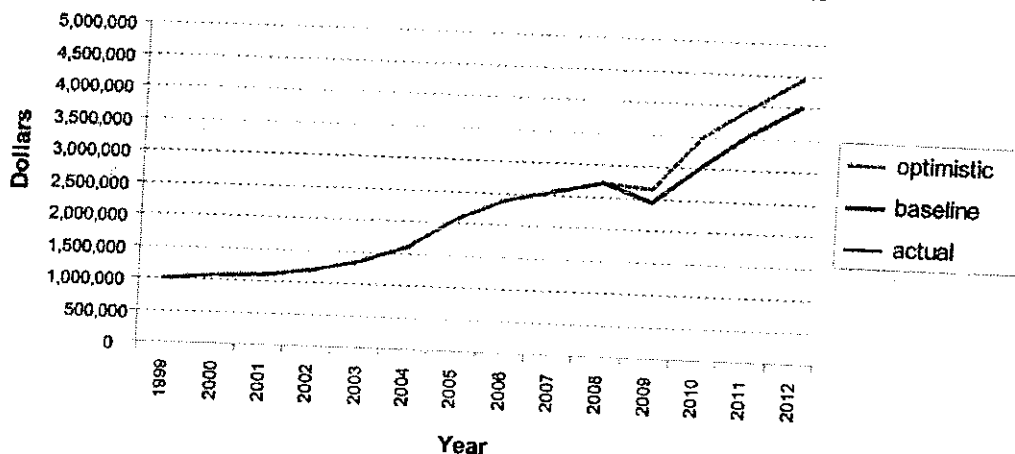
⁶ Alaska has no state sales tax but has local sales taxes. Thus, the aggregate of Alaska local governments is included in our estimates for sales taxing jurisdictions.

⁷ As we note in the methodology section, we believe the estimates presented are the lower bounds of the sales tax revenue losses from e-commerce based on two different forecasts of e-commerce growth.

⁸ Our forecast horizon must begin at the end of the Census data, even though the first two years have already occurred.

expected to grow from \$8.6 billion in 2010, the first year following the recession, to \$11.4 billion in 2012. The losses total \$52.1 billion over our six year forecast horizon. These losses are equal to what states would collect if they could achieve 100 percent compliance on the sales and use taxes due on e-commerce sales and arise because states are unable to enforce collection, particularly because of limitations such as those imposed by *Quill v. North Dakota*. The losses arise because 25 percent of taxes due on e-commerce go uncollected. The revenue losses associated with a more optimistic estimate of e-commerce growth are about 10 percent higher. It is important to realize that the estimated sales and use taxes that are currently collected on these transactions are much greater than our estimates of the loss. We estimate sales tax collections on e-commerce transactions to rise from about \$26.1 billion in 2010 to \$34.5 billion in 2012.

Figure 2: E-Commerce History and Forecasts



To be sure, the revenue losses in Table 1 are not necessarily what states would stand to collect if Congress permitted states to require remote vendors to collect and remit taxes. Our estimates also depend on whether the legislation includes a small vendor exception. Some noncompliance would remain after such a policy change, but several facets of our methodology lead us to view our estimates as lower bounds on the expected revenue losses. First, we used a conservative methodology for forecasting e-commerce. Second, we did not seek to account for the additional losses associated with non-registered vendors operating in states. Third, we assumed that the taxability of e-commerce transactions is the same as for overall commerce even though we suspect that the ability to evade the tax should shift the mix of e-commerce more towards taxable sales.

More importantly, our estimates are revenue losses associated with e-commerce and not all remote sales. We rely on U.S. Census definitions of e-

commerce which begin with data from the Bureau's various surveys. One example is the survey underlying the 2006 Annual Retail Trade Report, which employs the following definition, "E-commerce sales and other operating receipts are sales of goods and services where an order is placed by the buyer; or price and terms of the sale are negotiated over an Internet, extranet, EDI network, electronic mail or other online system. Payment may or may not be made online."⁹ Thus, sales that are consummated or negotiated via telephone or the mail are not included in our analysis but federal legislation allowing states to require remote vendors to collect the tax would also apply to these transactions. Further, vendors that sell to businesses and residents in surrounding states (and other non-registered vendors operating in the states) are not likely to collect the tax on many sales that are delivered to the other states. Again, the legislation would apply to these transactions. Proposed legislation may also pertain to taxation of telecommunications and this is not considered in this report.

Estimating the sales tax revenue losses associated with all remote commerce is beyond the scope of this study, but we believe the revenue implications are much larger than for e-commerce alone. One indication is the revenue loss associated with non-e-commerce sales by non-store retailers,¹⁰ which are one category of B2C transactions. These non-store retailers had \$115.6 billion in 2006 sales beyond their \$75.2 billion in electronic commerce sales, evidencing that e-commerce only comprises 40 percent of the sales of non-store retailers. These are the B2C sales by retailers that operate without a store front, and this amount does not include similar B2B sales. Given that B2B dominates the e-commerce side, the B2B remote sales conducted in means other than e-commerce are presumably much larger than B2C.¹¹

To get some sense of the additional revenue impact of federal legislation on non-e-commerce sales, we forecasted the non-e-commerce sales forward to 2012. We then added the non-e-commerce remote sales (for example, catalog sales by retailers with stores) by retailers with stores (except for the sales of motor vehicles), which are a little less than one-tenth as large as the non-store retailers. We then applied the same methodology as we describe below for e-commerce and estimated that states are losing \$6.8 billion in sales tax collections on these transactions. This loss in tax revenues for the non-e-commerce sales is very large, and it is more than one half as large as our total estimates of losses from e-commerce sales (which amounted to \$11.4 billion in 2012). It is important to keep in mind that the \$6.8 billion estimate does not include two other forms of non-e-commerce remote transactions that we believe account for even larger tax revenue losses: remote B2B sales other than e-commerce and non-registered vendors and other activity along state borders.

⁹ See <http://www.census.gov/svsd/retlann/pdf/06sa44c.pdf>.

¹⁰ These are large and small retailers that sell through various channels that include online, catalog, and television, but do not sell through retail stores. The specific firms categorized as non-store retailers are determined through the Census survey process but could include retailers such as Amazon, Zappos, and 1-800-flowers. The Census separately categorizes the online sales from the other types of sales for these vendors.

¹¹ Unfortunately, the Census does not report comparable sales for B2B.

Our approach is described in detail in the methodology section beginning on page 13. This paragraph provides an overview of some aggregate results. In general, state sales taxes apply to sales of tangible goods unless the state otherwise exempts them, but apply only to specifically identified services. States vary widely to the extent that they exempt goods and impose the sales tax on services. Using the (non-DC) average taxability for each NAICS category along with each category's share of total e-commerce, we find that 18.2 percent of e-commerce transactions is taxable, with a range from 9.0 percent in Michigan to over 20 percent in a number of states (see Table 2).¹² Thus, we estimate that five-sixths of e-commerce sales are not taxable under current statutes. Determination of taxability is described in greater detail below. We estimate a compliance rate of about three-fourths (75.1 percent) on the taxable sales, with non-compliance on the remaining taxes that are due. Combined, we estimate that taxes are uncollected on a little more than four percent of e-commerce.

¹² See discussion on taxability of e-commerce sales starting on page 15.

Table 1: National Total State and Local E-Commerce and Revenue Losses (\$millions)

	2007	2008	2009	2010	2011	2012
Baseline E-Commerce Growth Scenario						
Total Business-to-Business E-commerce	2,325,701	2,480,011	2,231,283	2,767,010	3,253,412	3,656,856
Total Business-to-Consumer E-commerce	168,081	179,233	161,257	199,975	235,128	264,285
Total E-Commerce	2,493,782	2,659,244	2,392,540	2,966,985	3,488,540	3,921,140
Estimated Taxes Due	29,177	31,113	27,992	34,713	40,815	45,877
Estimated Taxes Collected	21,931	23,386	21,041	26,093	30,679	34,484
Estimated Total State and Local Revenue Loss	7,246	7,726	6,951	8,620	10,136	11,393
Optimistic E-Commerce Growth Scenario						
Total Business-to-Business E-commerce	2,325,701	2,486,222	2,408,247	3,184,050	3,634,500	4,060,293
Total Business-to-Consumer E-commerce	168,081	179,682	174,047	230,115	262,669	293,442
Total E-Commerce	2,493,782	2,665,904	2,582,294	3,414,165	3,897,170	4,353,735
Estimated Taxes Due	29,177	31,191	30,212	39,945	45,596	50,938
Estimated Taxes Collected	21,931	23,445	22,710	30,025	34,273	38,288
Estimated Total State and Local Revenue Loss	7,246	7,748	7,503	9,920	11,323	12,650

Table 2: Overall Taxability of Electronic Commerce

State	Percent Taxable
Arkansas	11.61
Arizona	18.14
Colorado	16.16
Connecticut	10.59
District of Columbia	22.89
Florida	16.83
Illinois	23.28
Kansas	21.60
Kentucky	17.84
Louisiana	22.89
Massachusetts	18.71
Michigan	8.97
Minnesota	21.01
North Carolina	14.40
North Dakota	11.86
Nebraska	16.45
New Jersey	10.49
Nevada	22.38
Ohio	15.43
Oklahoma	15.45
Pennsylvania	19.08
Rhode Island	14.01
South Carolina	18.32
South Dakota	15.53
Tennessee	16.33
Texas	11.80
Vermont	16.39
Washington	12.59
West Virginia	19.24
Non-DC Average*	18.24

*Note: This value is assigned to all non-responding states.

State Findings

State level calculations are provided in Tables 3 through 6. These tables contain our estimates for the combination of state and local governments under the baseline scenario.¹³ Results for the optimistic scenario are in Appendix A.¹⁴ Table 3 provides our estimates of the tax revenue that are due on taxable e-commerce transactions given our estimates of taxability and our forecasts of e-commerce purchases by residents and businesses within each state. We anticipate that \$34.7 billion in sales taxes will be due in 2010, and this amount will rise to \$45.9 billion by 2012. The amounts vary radically across states depending on the size of each state's economy and characteristics of each state's sales tax structure. For example, \$5.8 billion will be due in California alone in 2010.

Table 4 reports our estimates of the sales taxes that are actually collected on e-commerce for each state. Again, the collections vary dramatically by state with over \$2.1 billion expected to be collected in New York alone in 2010. Table 5 contains our estimates of the uncollected taxes, or the losses associated with the inability to collect taxes that are due. The losses are equal to the values that are due as reported in Table 3 minus those that are collected, as reported in Table 4. We estimate that California will fail to collect more than \$1.4 billion in 2010 and more than \$8.7 billion over our six year forecast horizon¹⁵ because of limitations arising from nexus and other restrictions on administrative options. Finally, to better illustrate the overall budgetary impact of the estimated e-commerce revenue losses, we show e-commerce sales tax revenue losses as a percent of the 2007 adjusted state and local sales tax revenues from all sources in each state in Table 6. We find that the losses average 2.9 percent of collections in 2010, and 3.8 percent of collections in 2012. The lowest percentage loss is estimated to occur in Michigan (excluding Alaska) and the highest in Louisiana. The differences in the relative loss arise because of variation in the state tax structures including tax rates and the share of transactions that are taxable.

We also estimated the revenue losses for New York City and Chicago (Cook County). The losses attributable to these cities, which include losses for both state and local taxes, account for nearly half of their respective states' totals (see Table 7). For example, New York City will lose \$433 million in 2012 and Chicago will lose \$254 million in 2012.

¹³ The loss is based on the state rate plus the weighted average local rate. The weighted average local rate is calculated as local sales tax collections divided by the state sales tax base. The loss allocated to local governments can be calculated by using the ratio of the weighted average local rate to the total rate.

¹⁴ While the revenue losses under the optimistic scenario are larger than the loss under the baseline scenario, the revenues collected would also be higher under the optimistic scenario.

¹⁵ Of course, California has already foregone the revenue in 2007 and 2008, two years that were important to development of a large fiscal gap that necessitated a higher sales tax rate among other policy responses.

Table 3: Total State and Local Sales and Use Taxes Due on E-Commerce (\$millions)

	Baseline Scenario						Total
	2007	2008	2009	2010	2011	2012	
Alabama	429.7	458.2	412.3	511.2	601.1	675.7	3,088.2
Alaska	3.8	4.0	3.6	4.5	5.3	6.0	27.3
Arizona	928.2	989.8	890.5	1,104.3	1,298.5	1,459.5	6,670.8
Arkansas	285.5	304.4	273.9	339.7	399.4	448.9	2,051.7
California	4,898.3	5,223.3	4,699.5	5,827.8	6,852.3	7,702.0	35,203.2
Colorado	438.0	467.0	420.2	521.1	612.7	688.6	3,147.5
Connecticut	161.3	172.0	154.7	191.9	225.6	253.6	1,159.0
District of Columbia	90.1	96.0	86.4	107.2	126.0	141.6	647.3
Florida	2,056.0	2,192.4	1,972.5	2,446.1	2,876.1	3,232.7	14,775.7
Georgia	1,043.5	1,112.8	1,001.2	1,241.5	1,459.8	1,640.8	7,499.6
Hawaii	149.5	159.4	143.4	177.9	209.2	235.1	1,074.5
Idaho	117.1	124.9	112.4	139.3	163.8	184.2	841.7
Illinois	1,299.9	1,386.1	1,247.1	1,546.5	1,818.4	2,043.9	9,341.8
Indiana	497.2	530.2	477.0	591.5	695.5	781.8	3,573.3
Iowa	223.0	237.8	214.0	265.3	312.0	350.7	1,602.7
Kansas	380.0	405.2	364.6	452.1	531.6	597.5	2,731.2
Kentucky	291.5	310.9	279.7	346.9	407.8	458.4	2,095.3
Louisiana	989.1	1,054.7	948.9	1,176.8	1,383.6	1,555.2	7,108.4
Maine	80.6	85.9	77.3	95.9	112.7	126.7	579.1
Maryland	467.3	498.3	448.3	556.0	653.7	734.7	3,358.3
Massachusetts	331.7	353.7	318.3	394.7	464.0	521.6	2,384.0
Michigan	360.0	383.9	345.4	428.3	503.6	566.1	2,587.3
Minnesota	590.1	629.3	566.2	702.1	825.5	927.9	4,241.1
Mississippi	338.4	360.9	324.7	402.7	473.4	532.2	2,432.3
Missouri	534.9	570.4	513.2	636.4	748.3	841.1	3,844.4
Nebraska	153.9	164.1	147.6	183.1	215.3	242.0	1,105.9
Nevada	431.3	460.0	413.8	513.2	603.4	678.2	3,099.9
New Jersey	513.4	547.5	492.6	610.9	718.3	807.3	3,690.0
New Mexico	304.0	324.1	291.6	361.6	425.2	477.9	2,184.4
New York	2,334.3	2,489.1	2,239.5	2,777.2	3,265.4	3,670.3	16,775.8
North Carolina	545.7	581.9	523.6	649.3	763.4	858.1	3,921.9
North Dakota	39.9	42.6	38.3	47.5	55.9	62.8	287.1
Ohio	783.0	834.9	751.2	931.6	1,095.3	1,231.2	5,627.2
Oklahoma	354.6	378.2	340.2	421.9	496.1	557.6	2,548.7
Pennsylvania	871.2	929.0	835.8	1,036.5	1,218.7	1,369.9	6,261.2
Rhode Island	72.0	76.7	69.0	85.6	100.7	113.1	517.1
South Carolina	315.0	335.9	302.2	374.7	440.6	495.2	2,263.5
South Dakota	72.2	77.0	69.3	85.9	101.0	113.5	519.0
Tennessee	1,047.7	1,117.2	1,005.1	1,246.5	1,465.6	1,647.3	7,529.3
Texas	2,230.4	2,378.3	2,139.8	2,653.6	3,120.0	3,506.9	16,029.1
Utah	224.8	239.7	215.7	267.4	314.5	353.4	1,615.5
Vermont	60.7	64.7	58.2	72.2	84.9	95.4	436.1
Virginia	528.1	563.1	506.7	628.3	738.8	830.4	3,795.4
Washington	753.3	803.2	722.7	896.2	1,053.7	1,184.4	5,413.6
West Virginia	126.0	134.3	120.9	149.9	176.2	198.1	905.4
Wisconsin	360.1	384.0	345.5	428.5	503.8	566.2	2,588.1
Wyoming	70.5	75.2	67.7	83.9	98.7	110.9	506.9
TOTAL	29,176.8	31,112.6	27,992.3	34,713.2	40,815.2	45,876.6	209,686.7

Table 4: Total State and Local Sales and Use Tax Collections on E-Commerce Sales (\$millions)

	Baseline Scenario						Total
	2007	2008	2009	2010	2011	2012	
Alabama	321.4	342.7	308.3	382.3	449.6	505.3	2,309.6
Alaska	2.8	3.0	2.7	3.4	4.0	4.5	20.4
Arizona	693.0	739.0	664.9	824.5	969.5	1,089.7	4,980.5
Arkansas	213.1	227.2	204.4	253.5	298.1	335.0	1,531.2
California	3,687.1	3,931.7	3,537.4	4,386.7	5,157.9	5,797.5	26,498.4
Colorado	328.1	349.9	314.8	390.4	459.0	515.9	2,358.0
Connecticut	120.7	128.7	115.8	143.6	168.9	189.8	867.5
District of Columbia	67.5	71.9	64.7	80.3	94.4	106.1	484.8
Florida	1,544.8	1,647.3	1,482.0	1,837.9	2,161.0	2,428.9	11,101.8
Georgia	782.6	834.5	750.8	931.1	1,094.8	1,230.5	5,624.4
Hawaii	111.4	118.7	106.8	132.5	155.8	175.1	800.3
Idaho	87.6	93.5	84.1	104.3	122.6	137.8	629.8
Illinois	977.5	1,042.4	937.8	1,163.0	1,367.4	1,537.0	7,025.2
Indiana	373.0	397.7	357.8	443.8	521.8	586.5	2,680.5
Iowa	166.6	177.7	159.9	198.2	233.1	262.0	1,197.5
Kansas	289.1	308.3	277.4	344.0	404.5	454.6	2,077.9
Kentucky	221.6	236.3	212.6	263.7	310.0	348.5	1,592.7
Louisiana	737.3	786.2	707.4	877.2	1,031.4	1,159.3	5,298.9
Maine	60.2	64.2	57.7	71.6	84.2	94.6	432.6
Maryland	350.2	373.4	336.0	416.6	489.9	550.6	2,516.7
Massachusetts	248.2	264.7	238.2	295.3	347.3	390.3	1,784.0
Michigan	270.0	287.9	259.1	321.3	377.7	424.6	1,940.6
Minnesota	440.5	469.7	422.6	524.1	616.2	692.6	3,165.7
Mississippi	252.7	269.4	242.4	300.6	353.4	397.3	1,815.8
Missouri	400.9	427.5	384.6	477.0	560.9	630.4	2,881.4
Nebraska	114.9	122.5	110.2	136.7	160.7	180.6	825.6
Nevada	323.9	345.4	310.8	385.4	453.1	509.3	2,327.8
New Jersey	384.7	410.2	369.1	457.7	538.1	604.8	2,764.5
New Mexico	227.3	242.4	218.1	270.5	318.0	357.5	1,633.9
New York	1,783.8	1,902.2	1,711.4	2,122.3	2,495.4	2,804.9	12,820.1
North Carolina	409.8	436.9	393.1	487.5	573.2	644.3	2,944.8
North Dakota	30.2	32.2	29.0	35.9	42.2	47.5	217.0
Ohio	587.2	626.1	563.3	698.6	821.4	923.2	4,219.7
Oklahoma	265.1	282.7	254.3	315.4	370.8	416.8	1,905.2
Pennsylvania	651.2	694.4	624.8	774.8	911.0	1,024.0	4,680.3
Rhode Island	53.5	57.0	51.3	63.6	74.8	84.1	384.4
South Carolina	235.7	251.4	226.2	280.5	329.8	370.7	1,694.3
South Dakota	53.3	56.8	51.1	63.4	74.5	83.8	382.9
Tennessee	786.4	838.6	754.5	935.6	1,100.1	1,236.5	5,651.6
Texas	1,676.8	1,788.1	1,608.7	1,995.0	2,345.7	2,636.5	12,050.8
Utah	168.5	179.7	161.7	200.5	235.8	265.0	1,211.2
Vermont	44.7	47.7	42.9	53.2	62.5	70.3	321.3
Virginia	396.5	422.8	380.4	471.7	554.6	623.4	2,849.3
Washington	574.0	612.0	550.7	682.9	802.9	902.5	4,124.9
West Virginia	93.8	100.0	90.0	111.6	131.2	147.5	674.0
Wisconsin	269.7	287.6	258.8	320.9	377.3	424.1	1,938.4
Wyoming	52.3	55.8	50.2	62.3	73.2	82.3	376.1
TOTAL	21,931.2	23,386.3	21,040.8	26,092.7	30,679.5	34,483.9	157,614.4

Table 5: Total State and Local Sales and Use Tax Revenue Losses from E-Commerce Sales (\$millions)

	Baseline Scenario						Total
	2007	2008	2009	2010	2011	2012	
Alabama	108.3	115.5	103.9	128.9	151.6	170.4	778.6
Alaska	1.0	1.0	0.9	1.1	1.3	1.5	6.8
Arizona	235.2	250.8	225.6	279.8	329.0	369.8	1,690.3
Arkansas	72.4	77.2	69.5	86.2	101.3	113.9	520.4
California	1,211.2	1,291.6	1,162.1	1,441.1	1,694.4	1,904.5	8,704.8
Colorado	109.9	117.1	105.4	130.7	153.7	172.7	789.5
Connecticut	40.6	43.2	38.9	48.3	56.7	63.8	291.5
District of Columbia	22.6	24.1	21.7	26.9	31.6	35.5	162.5
Florida	511.2	545.1	490.4	608.2	715.1	803.8	3,673.9
Georgia	260.9	278.2	250.3	310.4	365.0	410.3	1,875.2
Hawaii	38.2	40.7	36.6	45.4	53.4	60.0	274.2
Idaho	29.5	31.4	28.3	35.1	41.2	46.4	211.9
Illinois	322.3	343.7	309.3	383.5	450.9	506.8	2,316.6
Indiana	124.2	132.5	119.2	147.8	173.8	195.3	892.8
Iowa	56.4	60.1	54.1	67.1	78.9	88.7	405.3
Kansas	90.9	96.9	87.2	108.1	127.1	142.9	653.2
Kentucky	69.9	74.6	67.1	83.2	97.8	109.9	502.5
Louisiana	251.8	268.5	241.6	299.6	352.2	395.9	1,809.5
Maine	20.4	21.7	19.6	24.3	28.5	32.1	146.6
Maryland	117.1	124.9	112.4	139.3	163.8	184.1	841.6
Massachusetts	83.5	89.0	80.1	99.3	116.8	131.3	600.0
Michigan	90.0	96.0	86.3	107.1	125.9	141.5	646.7
Minnesota	149.6	159.6	143.6	178.0	209.3	235.3	1,075.3
Mississippi	85.8	91.5	82.3	102.1	120.0	134.9	616.5
Missouri	134.0	142.9	128.6	159.4	187.5	210.7	963.0
Nebraska	39.0	41.6	37.4	46.4	54.6	61.3	280.4
Nevada	107.4	114.6	103.1	127.8	150.3	168.9	772.1
New Jersey	128.8	137.3	123.5	153.2	180.1	202.5	925.5
New Mexico	76.6	81.7	73.5	91.1	107.2	120.5	550.5
New York	550.4	586.9	528.1	654.9	770.0	865.5	3,955.7
North Carolina	136.0	145.0	130.4	161.8	190.2	213.8	977.1
North Dakota	9.8	10.4	9.4	11.6	13.6	15.3	70.1
Ohio	195.8	208.8	187.9	233.0	274.0	307.9	1,407.5
Oklahoma	89.5	95.5	85.9	106.5	125.3	140.8	643.5
Pennsylvania	220.0	234.6	211.0	261.7	307.7	345.9	1,580.9
Rhode Island	18.5	19.7	17.7	22.0	25.8	29.0	132.7
South Carolina	79.2	84.5	76.0	94.2	110.8	124.5	569.3
South Dakota	18.9	20.2	18.2	22.5	26.5	29.8	136.1
Tennessee	261.3	278.6	250.7	310.9	365.5	410.8	1,877.7
Texas	553.6	590.3	531.1	658.6	774.4	870.4	3,978.3
Utah	56.3	60.0	54.0	66.9	78.7	88.5	404.3
Vermont	16.0	17.0	15.3	19.0	22.3	25.1	114.8
Virginia	131.6	140.4	126.3	156.6	184.1	207.0	946.0
Washington	179.3	191.2	172.0	213.3	250.8	281.9	1,288.7
West Virginia	32.2	34.3	30.9	38.3	45.0	50.6	231.4
Wisconsin	90.4	96.4	86.7	107.6	126.5	142.1	649.7
Wyoming	18.2	19.4	17.5	21.6	25.4	28.6	130.7
TOTAL	7,245.6	7,726.3	6,951.4	8,620.4	10,135.8	11,392.7	52,072.2

Table 6: Total State and Local Sales and Use Tax Revenue Losses from E-Commerce Sales as a Percentage of 2007 Sales and Use Tax Collections

	Baseline Scenario					
	2007	2008	2009	2010	2011	2012
Alabama	2.67	2.84	2.56	3.17	3.73	4.19
Alaska	0.56	0.59	0.53	0.66	0.78	0.87
Arizona	3.00	3.20	2.88	3.57	4.19	4.71
Arkansas	1.92	2.05	1.84	2.29	2.69	3.02
California	2.96	3.16	2.84	3.52	4.14	4.65
Colorado	2.25	2.39	2.15	2.67	3.14	3.53
Connecticut	1.34	1.43	1.28	1.59	1.87	2.10
District of Columbia	2.77	2.95	2.65	3.29	3.87	4.35
Florida	2.22	2.37	2.13	2.65	3.11	3.50
Georgia	2.50	2.67	2.40	2.97	3.50	3.93
Hawaii	1.56	1.66	1.50	1.86	2.18	2.45
Idaho	2.31	2.46	2.21	2.75	3.23	3.63
Illinois	3.53	3.76	3.39	4.20	4.94	5.55
Indiana	2.29	2.44	2.20	2.73	3.20	3.60
Iowa	2.44	2.60	2.34	2.90	3.41	3.83
Kansas	3.05	3.25	2.93	3.63	4.27	4.79
Kentucky	2.16	2.30	2.07	2.57	3.02	3.39
Louisiana	3.76	4.01	3.60	4.47	5.26	5.91
Maine	1.93	2.06	1.85	2.30	2.70	3.04
Maryland	2.30	2.45	2.20	2.73	3.21	3.61
Massachusetts	1.97	2.10	1.89	2.35	2.76	3.10
Michigan	1.13	1.20	1.08	1.34	1.58	1.77
Minnesota	2.95	3.14	2.83	3.50	4.12	4.63
Mississippi	2.71	2.89	2.60	3.23	3.79	4.26
Missouri	2.57	2.74	2.47	3.06	3.60	4.05
Nebraska	2.25	2.40	2.16	2.67	3.14	3.53
Nevada	3.19	3.40	3.06	3.79	4.46	5.01
New Jersey	1.54	1.65	1.48	1.84	2.16	2.43
New Mexico	2.73	2.91	2.62	3.25	3.82	4.29
New York	2.79	2.97	2.68	3.32	3.90	4.39
North Carolina	1.83	1.95	1.75	2.17	2.56	2.87
North Dakota	1.45	1.54	1.39	1.72	2.03	2.28
Ohio	2.12	2.26	2.03	2.52	2.96	3.33
Oklahoma	2.59	2.76	2.48	3.08	3.62	4.07
Pennsylvania	2.48	2.64	2.38	2.95	3.47	3.90
Rhode Island	2.11	2.25	2.02	2.51	2.95	3.32
South Carolina	2.37	2.53	2.28	2.82	3.32	3.73
South Dakota	1.84	1.96	1.76	2.18	2.57	2.89
Tennessee	3.04	3.24	2.91	3.61	4.25	4.78
Texas	1.89	2.02	1.81	2.25	2.64	2.97
Utah	2.29	2.44	2.19	2.72	3.20	3.60
Vermont	2.56	2.73	2.45	3.04	3.58	4.02
Virginia	2.38	2.54	2.28	2.83	3.33	3.74
Washington	1.92	2.05	1.84	2.28	2.68	3.02
West Virginia	2.47	2.64	2.37	2.94	3.46	3.89
Wisconsin	2.04	2.18	1.96	2.43	2.86	3.21
Wyoming	2.03	2.16	1.94	2.41	2.83	3.19
TOTAL	2.43	2.60	2.33	2.90	3.40	3.83

Note: 2007 Collections are actually the adjusted 2007 state base multiplied by the sum of the state and local sales and use tax rates. The lone exception is Alaska, for which actual 2007 collections are used.

Table 7: Total State and Local Sales and Use Tax Revenue Losses from E-Commerce Sales (\$millions) Chicago and New York City

	Baseline Scenario					
	2007	2008	2009	2010	2011	2012
Illinois Total	322.3	343.7	309.3	383.5	450.9	506.8
Chicago	145.6	155.3	139.7	173.3	203.7	229.0
Non-Chicago Illinois	176.7	188.4	169.5	210.2	247.2	277.9
New York Total	550.4	586.9	528.1	654.9	770.0	865.5
New York City	248.4	264.9	238.3	295.5	347.5	390.6
Non-NYC New York	302.0	322.1	289.8	359.3	422.5	474.9
	Optimistic Scenario					
Illinois Total	322.3	344.6	333.8	441.3	503.7	562.8
Chicago	145.6	155.7	150.8	199.4	227.6	254.3
Non-Chicago Illinois	176.7	188.9	183.0	241.9	276.2	308.5
New York Total	550.4	588.4	570.0	753.6	860.2	960.9
New York City	248.4	265.5	257.2	340.1	388.2	433.7
Non-NYC New York	302.0	322.9	312.7	413.5	472.0	527.3

Effects of a *de minimis* Rule in the Context of Enhanced Vendor Compliance

A federal law permitting states to require remote vendors to collect the sales and use taxes has been proposed in various formats. In some cases, a *de minimis* rule has been included as one aspect of the legislation. We estimated the reduction in revenues that states could expect to collect with federal legislation that did not impose a collection responsibility on firms with e-commerce sales below certain thresholds. The *de minimis* rule would have a different effect if it is based on total sales of the vendor, since their total sales could be much greater than their e-commerce sales. Also, the effects would be very different if the *de minimis* rule applied to all firms with sales under the threshold and not only to remote vendors.

The effects are relatively large based on the expectation that a significant share of e-commerce is conducted by small vendors. Specifically, we find that a *de minimis* threshold of \$1 million would lower expected state collections by \$2.6 billion in 2010, after taking into account use tax collection paid by buyers. The amount would rise to nearly \$3.4 billion by 2012. This means, for example, that the price tag for a \$1 million small vendor exception is 30.0 percent as large as our estimate of losses in 2012. As shown in Table 8, the impact on expected collections varies with the chosen *de minimis* threshold.

Table 8: Effects of de minimis Rules on Potential Revenue Gains from Enhanced Vendor Compliance (\$millions)

<i>de minimis</i> Threshold	2007	2008	2009	2010	2011	2012
Below \$500,000	1,489.7	1,588.6	1,429.3	1,772.4	2,084.0	2,342.4
Below \$1,000,000	2,173.6	2,317.8	2,085.3	2,586.0	3,040.6	3,417.6
Below \$5,000,000	2,670.4	2,847.6	2,562.0	3,177.2	3,735.7	4,198.9

Note: Entries represent reductions in the potential revenue gains at various levels of the *de minimis* threshold.

COMPARISON WITH PREVIOUS FORECASTS

Some concerns have been raised over the years about our earlier estimates. The primary issue has regarded inclusion of B2B e-commerce in our analysis. We believe that it is imperative to include B2B, and in fact do not understand any argument for excluding these transactions from a comprehensive study. Our goal is to measure the inability to collect sales and use taxes that are due on e-commerce transactions, and B2B represents over 90 percent of e-commerce sales. As shown below, about 13.0 percent of B2B e-commerce transactions are taxable. Further, we have both anecdotal evidence from state Departments of Revenue and the Washington State Compliance studies¹⁶ evidencing that significant shares of use taxes go unpaid on business purchases of taxable goods and services. Therefore, we believe the B2B sales must be included in any comprehensive analysis of sales tax losses.

The estimates of sales tax revenue losses presented here are lower than our previous estimates. One reason for this reduction is that, as documented below, we have sought to provide a lower bound to the revenue losses that will result. The actual losses could be even greater. The lower revenue loss estimates occur despite a much higher current forecast for aggregate e-commerce sales than we previously anticipated. For example, we now believe that 2008 e-commerce transactions will total \$2.7 trillion, up markedly from our previous estimate of \$1.7 trillion (see Bruce and Fox, 2004). The key difference in the forecast of total transactions is that the Census data evidence a much larger baseline of e-commerce transactions than was used in our earlier analysis. In fact, the Census Bureau reports 2006 e-commerce sales as \$2.4 trillion, well above our previous estimate for 2008, but Census also reports much higher e-commerce in earlier years, such as 1999, than when we made in our earlier forecasts.

The lower revenue loss results primarily because B2B sales have grown faster and remained a more dominant share of e-commerce than we had previously expected. B2C transactions are somewhat lower than those used in our earlier forecasts. This has two key effects on our results. First, a much smaller share of the transactions is taxable, since B2B is less likely to be taxable than B2C. Based on survey responses from state revenue departments, we

¹⁶ See http://dor.wa.gov/Docs/Reports/Compliance_Study/compliance_study_2008.pdf.

expect that 13.0 percent of B2B e-commerce transactions are taxable versus 69.6 percent of B2C transactions. Second, use tax compliance for B2B is much better than for B2C, so more of the taxes that are due are collected. Indeed, compliance is generally much better than was anticipated in our earlier work. We believe that the Streamlined Project has been an important cause of better compliance, both because it has drawn attention to the taxes that are due and because the simplification provisions have facilitated collection and remittance of the tax. The combination of lower taxability and higher compliance over the last five years works together to reduce the revenue loss estimates.

METHODOLOGY

We develop estimates of the tax revenue losses associated with e-commerce using a six-step process. The steps involve differing degrees of complexity. Our analysis begins with a forecast of e-commerce activity for the years 2007 through 2012. Second, we distribute e-commerce sales to the states to yield the potential amount of taxable transactions in each state. Third, we determine the degree to which e-commerce transactions are taxable in each state. Fourth, we estimate the sales tax revenues that are due using state-specific estimates of e-commerce transactions and taxability alongside current state and local tax rates. Fifth, we determine the expected sales and use tax compliance on e-commerce transactions and therefore the expected tax collections on these transactions. Sixth and finally, we subtract the taxes collected from the taxes that are due to yield the uncollected taxes, the main goal of the study.

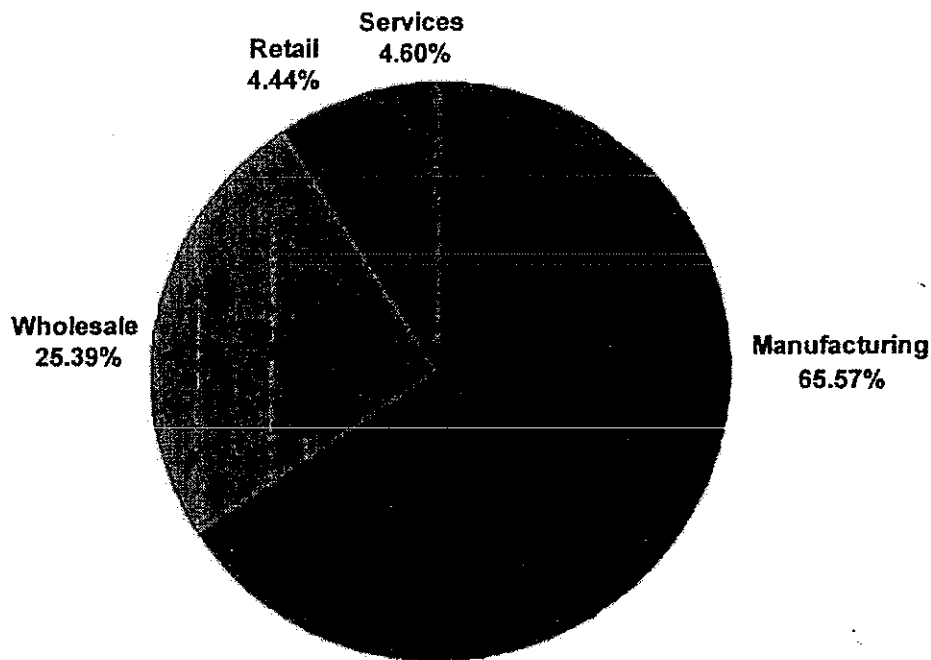
Forecasting E-Commerce Sales

E-commerce sales are available from the U.S. Bureau of the Census E-Stats data for multiple NAICS industries from 1998 through 2006. The industries are not fully consistent across the history of data, but include approximately 21 manufacturing, 19 wholesale, 18 services, and 12 retail industry groupings. These data serve as the basis for forecasts for e-commerce sales from 2007 through 2012.

We first develop a relationship between aggregate e-commerce sales and the economy by regressing the log of e-commerce shipments on the log of nominal GDP and the real GDP growth rate for 1999 through 2006. The resulting coefficients are used together with Global Insight's November 2008 baseline and optimistic forecasts for GDP and the real GDP growth rate to prepare both baseline and optimistic forecasts for aggregate e-commerce sales from 2007 through 2012. The history of e-commerce sales plus our forecasts for the baseline are illustrated in Figure 1 above.

E-commerce sales by industry are necessary to maximize the usefulness of the forecasts because taxability is best determined at the industry level rather than in aggregate. We calculated the distribution of e-commerce sales by industry for 2006 and assumed that it would remain the same over the forecast horizon. These shares are illustrated for the broad industry groupings in Figure 3, though our analysis is undertaken for more disaggregated industry categories.¹⁷

Figure 3: Industry Share of E-Commerce 2006



Distribution of E-Commerce Sales to the States

No consistent data are available on the geographic distribution of e-commerce purchases, and specifically by state, so it was necessary to develop a methodology to approximate the state-level allocations. First, we assume that the percent of purchases by residents and businesses in non-sales-tax states (Delaware, Montana, New Hampshire, and Oregon) is identical to these states' share of total national personal income. Thus, 2.17 percent of e-commerce sales

¹⁷ We considered forecasting varying industry shares through 2012 but discarded this idea. The constant industry data series available to prepare the forecasts lasts only from 2002 through 2006 and the growth paths of the shares was heavily influenced by commodity price increases. Escalation of commodity prices has been substantially wrung out of the economy by the recession and our judgment is that the forecast based on this history is less reliable than simply accepting the 2006 shares.

is allocated to non-sales taxing states and the remaining 97.83 percent to sales taxing states.

Second, e-commerce transactions for sales-taxing states were distributed across states in proportion to the percentage of national aggregate adjusted state and local sales tax revenues collected in each state. This approach allows the e-commerce share to rise with the size of the state economy, breadth of the adjusted tax base, and level of sales tax rates. The estimated e-commerce share is positively related to the tax rate because the incentives for businesses and people to shop online rise with the tax rate.¹⁸ The adjusted tax base is drawn from estimates developed by John Mikesell (2008), as we discuss below.

Taxability of E-Commerce Sales

Uncollected sales tax revenues cannot be estimated without first approximating the sales taxes that are due. Thus, we must have estimates of the share of e-commerce sales that are taxable in each state. For this purpose it is necessary to approximate the share of e-commerce transactions that is taxable and *not* the share on which taxes are collected. The task is made more complex because the taxability of transactions can depend on the purchaser¹⁹ but the e-commerce sales data are available by vendor industry.

For purposes of determining taxability, we categorize as sales taxes all taxes that operate in a similar fashion. Thus, a number of states, such as Kentucky, North Dakota, and South Carolina, collect a tax on motor vehicle transactions but do not consider the collections as part of their sales taxes. However, for our purposes these are considered as sales taxes. A paper by John Mikesell (2008) details the propensity for states to have sales-tax-like taxes that are categorized in other pots and is used as the basis for including these related taxes.

We relied on the insights of research staffs in individual state Departments of Revenue and Taxation to estimate taxability. We asked each Department to provide detailed estimates of the expected shares of transactions in each NAICS code that are likely to be taxable in their respective state. A detailed survey instrument was sent to each Department asking them to approximate the share of sales for 51 vendor industries that would be taxable in their state. The survey instrument, provided in Appendix B, was distributed to the states through the cooperation of the Federation of Tax Administrators.²⁰

¹⁸ For example, see Goolsbee (2000) and Ellison and Ellison (2006).

¹⁹ For example, purchases by governments and some by not-for-profits are exempt in many states.

²⁰ We thank Jim Eads and Ron Alt of the FTA, and respondents from 29 states plus DC (listed in Appendix 3), for their generous support of this survey effort. A conference call was held to allow states to ask questions about the survey and we participated with state officials in a number of individual calls and emails to enhance the quality of responses.

Twenty-nine states plus the District of Columbia responded to the survey, though some states did not fill in every element of the survey.²¹ States were more likely to respond to the B2C portions of the survey than to the B2B, but most sought to respond with information for both types of transactions. Based on our discussions with state officials, we recognize that the best they can do is to approximate taxability of e-commerce sales for the many categories that we requested. We indicated to the states that we would use their responses as guidance but would make adjustments as appropriate. We believe that the survey provides a broad perspective on the degree of taxability and the qualitative differences across states but also believe that adjustments are appropriate in some cases. Average values from the survey are used for non-responding states and for responding states with missing values. Further, we place an upper limit on the weighted average taxability in each state to tighten the distribution of responses. This assumption, which affected two places, served to lessen our estimates of the revenue losses.

We asked states whether they used data or professional judgment in determining their answers. About two-thirds of the states relied upon data they have for gross sales (either through compliance based on tax returns or from the Economic Census) and for taxable sales. In these cases, states determined taxability by dividing the taxable sales by the gross sales. These calculations are imprecise on the portion of sales that are taxable for a number of reasons including that the categories used in state data files and the Census NAICS data may not be the same. More importantly, these calculations can at most measure taxes *collected* and not taxes that are *due*.

We believe there are three reasons that the survey responses based on data understate the actual tax that is due on e-commerce transactions. These were recognized in advance of collecting survey responses and the appropriate adjustments were discussed early on. First, actual sales tax collections reported for a particular NAICS code (the numerator in the states' calculations) in state data files normally do not include the use tax payments made on sales from the industry, so the actual sales tax collections understate the total revenues collected on transactions from the industry. Adding use tax collections associated with transactions from each industry to the sales tax collections will yield all of the taxes that are actually collected on sales from a particular industry. Second, actual sales and use tax collections do not include the amount of vendor and use tax non-compliance. Since the non-compliance also represents taxes that are due, revenue implications of non-compliance must be added to actual collections to yield taxes due as opposed to taxes collected. Third, differences between the taxability of the average *e-commerce* transaction and the average across all transactions by vendors may differ because of the mix of items sold online versus in bricks-and-mortar stores. Thus, a correction is appropriate for differences in the taxability across the mixes of transactions.

²¹ Responding states are those listed in Table 2.

We corrected for the failure to include use tax collections in the survey responses and for revenues associated with non-compliance. Data reported in Due and Mikesell (1994) suggest that use tax receipts represent about 10 percent of combined sales and use tax collections.²² We estimated the appropriate adjustments using this estimate of use tax collections along with the State of Washington's 2008 compliance study indicating 74.5 percent business compliance with the use tax and 98.3 percent compliance with the sales tax.²³ Further, we assumed 5 percent use tax compliance by consumers except for automobiles, where we assume 100 percent compliance. The result is an estimate that the tax due should be 1.226 times greater than the state estimates provided in the survey responses for those states developing their estimates with data. This approach is supported by the observation that the adjusted average taxability for states whose responses were based on data is very similar to the unadjusted average for those whose responses were based on judgment.

We chose not to make further adjustments to account for differences in the mix of transactions. We have no information on the difference in mix of goods and services sold between e-commerce and all transactions, though we suspect e-commerce transactions are more likely to be taxable because people have a greater incentive to buy taxable transactions online if they believe the sales and use taxes can be evaded. This is consistent with our attempts to develop estimates that are on the lower bound of the revenue loss.

Based on the methodology described in this section we find that 13.0 percent of B2B transactions are taxable sales in the average state and 69.6 percent of B2C transactions are taxable in the average state. State-by-state calculations are included in Table 2. These state-specific percentages are multiplied by the state e-commerce estimates to develop estimates of the sales tax base for e-commerce.

Taxes Due

The taxes that are due are calculated by multiplying each state's general sales tax rate plus its average local sales tax rate by the estimated e-commerce sales tax base. The state tax rates are taken from the Sales Tax Clearinghouse, while local tax rates are calculated as local collections divided by the state sales tax base (which itself is state sales tax collections divided by the state sales tax rate).²⁴

²² Use tax collections are surely a much larger share of receipts today because of increasing amounts of remote sales and growth in the global economy, so the older data result in an understatement of taxability.

²³ The sales and use tax compliance estimates for registered vendors only, so they are underestimates of all non-compliance by businesses. Further, we think the tendency for non-registered firms to operate in states is relatively large. We believe that use tax non-compliance by non-registered vendors is more likely to be a problem than sales tax non-compliance. Thus, we expect that the potential revenue gain from expanding sales tax collections responsibilities would be relatively greater than would occur for registered vendors and is another reason our estimates are on the low side.

²⁴ <http://www.thestc.com/STrates.stm>.

Sales and Use Tax Compliance

In our analysis, compliance has two components, vendor remittance of the tax and use tax compliance by the purchaser. We estimate use tax compliance separately for B2B and B2C sales. Vendor compliance exists when the seller collects the sales or use tax and remits the tax liability directly to the tax authorities. Use tax compliance exists when the purchaser remits the tax that is due directly to the tax authorities.

Vendor compliance is presumed to take place first, and use tax compliance is the propensity to pay taxes on the portion not collected by vendors. We assume that vendors collect the tax that is due (less sales tax non-compliance), but only for states where the vendor has nexus or has agreed to collect the tax. The vendor tax compliance was informed using results from the University of Maryland Long Tail study (Bailey et.al. 2008). The study evidences that 37 percent of e-commerce is conducted by large vendors, 20 percent by medium size vendors that generally maintain their own website and have annual gross receipts between \$1 million and \$10 million, and 43 percent by vendors that operate on a platform other than their own and have sales under \$1 million.²⁵ Compliance is estimated as a weighted average of the compliance for these groups of firms. We assume that the mid-size firms comply only in the state where they are located, which means an average compliance rate of two percent. We assume that small vendors only comply part of the time even within their home state, so we assume 1 percent compliance.

We estimated large vendor compliance by selecting 100 firms from Internet Retailer's *Top 500 Guide, 2007 Edition*. Specifically we use the largest 50 firms and a random sample of 50 more firms.²⁶ We examined each firm's website to determine the states for which the firm collects and remits the sales and use tax. We then calculated a weighted average compliance rate for purchases from large vendors, where the 2007 e-commerce sales by firm serve as the weights. We assume that large firm vendor compliance in cases where they appear to collect based on their website is consistent with the Washington compliance study, which estimates 98.3 percent compliance for the sales tax. The average compliance for the large vendors for each state is given in Table 9. We estimate compliance by large vendors to be between 46.1 percent in Vermont and 89.3 percent in New York. Compliance is much better than existed when we developed our earlier estimates, and we believe that the Streamlined effort is an important cause.

We assume that half of B2B faces vendor compliance, and apply the above weighted average vendor compliance. The portion of this first half of B2B

²⁵ The small and medium size vendors may be much larger firms than is implied by these categories since only their e-commerce is included in these categorizations.

²⁶ Two firms were omitted from the 100 that we had randomly selected because no website could be found. Thus, our survey is based on 98 firms. For more details, see <http://www.internetretailer.com/top500/>.

on which vendors do not collect sales tax is assumed to be subject to use tax. The second half of B2B is assumed to only face use tax compliance.²⁷ B2B use tax compliance is estimated based on the Washington compliance study which provides compliance estimates derived from tax audits for a sample of registered firms. The study concludes there is 74.5 percent compliance with the use tax, so we assume this level of compliance on the taxes due on B2B sales that were not collected by vendors, though this includes no adjustment for non-registered businesses. Little data are available on individual use tax compliance except for a clear understanding that individuals seldom comply even when they are offered the opportunity to pay through their individual income tax return. Compliance for automobiles will be much better. We assume 5 percent use tax compliance by individuals for non-auto purchases and 100 percent compliance for autos.

Tax Losses

The tax losses, or uncollected taxes, are calculated as the taxes due minus the compliance.

²⁷ Note that this implicitly assumes that one half of B2B transactions is subject to direct reporting rather than vendor compliance.

**Table 9: Compliance Rate for Large Retailers
B2C Transactions**

State	Compliance Rate	State	Compliance Rate
Alaska*	65.3%	Missouri	66.1%
Alabama	63.5%	Nebraska	61.3%
Arizona	61.5%	Nevada	68.4%
Arkansas	61.1%	New Jersey	65.6%
California	71.2%	New Mexico	63.7%
Colorado	65.6%	New York	89.3%
Connecticut	64.5%	North Carolina	68.3%
District of Columbia*	65.3%	North Dakota	76.0%
Florida	69.0%	Ohio	66.7%
Georgia	66.8%	Oklahoma	63.0%
Hawaii	58.6%	Pennsylvania	63.0%
Idaho	64.2%	Rhode Island	56.5%
Illinois	70.1%	South Carolina	64.5%
Indiana	67.1%	South Dakota	47.6%
Iowa	62.4%	Tennessee	67.9%
Kansas	84.0%	Texas	69.7%
Kentucky	82.9%	Utah	66.5%
Louisiana	59.7%	Vermont	46.1%
Maine	62.0%	Virginia	68.1%
Maryland	65.9%	Washington	85.7%
Massachusetts	64.3%	West Virginia	58.1%
Michigan	67.0%	Wisconsin	65.3%
Minnesota	61.3%	Wyoming	54.3%
Mississippi	61.4%		

*Compliance rates represent the median of all other states.

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APPENDIX A

Appendix A Table 1: Total State and Local Sales and Use Taxes Due on E-Commerce (\$millions)

	Optimistic Scenario						Total
	2007	2008	2009	2010	2011	2012	
Alabama	429.7	459.4	445.0	588.3	671.5	750.2	3,344.1
Alaska	3.8	4.1	3.9	5.2	5.9	6.6	29.5
Arizona	928.2	992.3	961.2	1,270.8	1,450.6	1,620.5	7,223.5
Arkansas	285.5	305.2	295.6	390.8	446.1	498.4	2,221.7
California	4,898.3	5,236.4	5,072.2	6,706.2	7,654.9	8,551.7	38,119.7
Colorado	438.0	468.2	453.5	599.6	684.4	764.6	3,408.2
Connecticut	161.3	172.4	167.0	220.8	252.0	281.6	1,255.0
District of Columbia	90.1	96.3	93.3	123.3	140.7	157.2	700.9
Florida	2,056.0	2,197.9	2,128.9	2,814.8	3,213.0	3,589.4	15,999.9
Georgia	1,043.5	1,115.5	1,080.6	1,428.7	1,630.8	1,821.8	8,120.9
Hawaii	149.5	159.8	154.8	204.7	233.6	261.0	1,163.5
Idaho	117.1	125.2	121.3	160.3	183.0	204.5	911.4
Illinois	1,299.9	1,389.6	1,346.0	1,779.6	2,031.4	2,269.3	10,115.8
Indiana	497.2	531.5	514.9	680.7	777.0	868.0	3,869.3
Iowa	223.0	238.4	230.9	305.3	348.5	389.3	1,735.5
Kansas	380.0	406.3	393.5	520.3	593.9	663.5	2,957.4
Kentucky	291.5	311.7	301.9	399.1	455.6	509.0	2,268.8
Louisiana	989.1	1,057.4	1,024.2	1,354.1	1,545.7	1,726.8	7,697.3
Maine	80.6	86.1	83.4	110.3	125.9	140.7	627.1
Maryland	467.3	499.5	483.9	639.7	730.3	815.8	3,636.5
Massachusetts	331.7	354.6	343.5	454.1	518.4	579.1	2,581.5
Michigan	360.0	384.9	372.8	492.9	562.6	628.5	2,801.7
Minnesota	590.1	630.9	611.1	807.9	922.2	1,030.3	4,592.4
Mississippi	338.4	361.8	350.5	463.3	528.9	590.9	2,633.8
Missouri	534.9	571.8	553.9	732.4	836.0	933.9	4,162.9
Nebraska	153.9	164.5	159.3	210.7	240.5	268.7	1,197.6
Nevada	431.3	461.1	446.6	590.5	674.1	753.0	3,356.7
New Jersey	513.4	548.9	531.7	702.9	802.4	896.4	3,995.7
New Mexico	304.0	324.9	314.7	416.1	475.0	530.6	2,365.4
New York	2,334.3	2,495.4	2,417.1	3,195.8	3,647.9	4,075.2	18,165.6
North Carolina	545.7	583.4	565.1	747.1	852.8	952.7	4,246.8
North Dakota	39.9	42.7	41.4	54.7	62.4	69.7	310.8
Ohio	783.0	837.0	810.8	1,072.0	1,223.6	1,367.0	6,093.4
Oklahoma	354.6	379.1	367.2	485.5	554.2	619.1	2,759.8
Pennsylvania	871.2	931.3	902.1	1,192.8	1,361.5	1,521.0	6,779.9
Rhode Island	72.0	76.9	74.5	98.5	112.4	125.6	560.0
South Carolina	315.0	336.7	326.1	431.2	492.2	549.9	2,451.0
South Dakota	72.2	77.2	74.8	98.9	112.9	126.1	562.0
Tennessee	1,047.7	1,120.0	1,084.9	1,434.3	1,637.2	1,829.1	8,153.1
Texas	2,230.4	2,384.3	2,309.5	3,053.5	3,485.5	3,893.8	17,357.0
Utah	224.8	240.3	232.8	307.8	351.3	392.4	1,749.3
Vermont	60.7	64.9	62.8	83.1	94.8	105.9	472.2
Virginia	528.1	564.6	546.8	723.0	825.3	922.0	4,109.8
Washington	753.3	805.3	780.0	1,031.3	1,177.2	1,315.1	5,862.1
West Virginia	126.0	134.7	130.5	172.5	196.9	219.9	980.4
Wisconsin	360.1	385.0	372.9	493.0	562.8	628.7	2,802.5
Wyoming	70.5	75.4	73.0	96.6	110.2	123.1	548.8
TOTAL	29,176.8	31,190.6	30,212.3	39,945.1	45,596.1	50,937.9	227,058.8

**Appendix A Table 2: Total State and Local Sales and Use Tax Collections
on E-Commerce Sales (\$millions)**

	Optimistic Scenario						Total
	2007	2008	2009	2010	2011	2012	
Alabama	321.4	343.5	332.8	440.0	502.2	561.0	2,500.9
Alaska	2.8	3.0	2.9	3.9	4.4	5.0	22.1
Arizona	693.0	740.8	717.6	948.8	1,083.0	1,209.9	5,393.2
Arkansas	213.1	227.8	220.6	291.7	333.0	372.0	1,658.1
California	3,687.1	3,941.6	3,818.0	5,047.9	5,762.0	6,437.1	28,693.7
Colorado	328.1	350.7	339.7	449.2	512.7	572.8	2,553.3
Connecticut	120.7	129.0	125.0	165.3	188.6	210.7	939.4
District of Columbia	67.5	72.1	69.9	92.4	105.4	117.8	525.0
Florida	1,544.8	1,651.4	1,599.6	2,114.9	2,414.1	2,696.9	12,021.6
Georgia	782.6	836.6	810.4	1,071.4	1,223.0	1,366.3	6,090.3
Hawaii	111.4	119.0	115.3	152.4	174.0	194.4	866.6
Idaho	87.6	93.7	90.8	120.0	137.0	153.0	682.0
Illinois	977.5	1,045.0	1,012.2	1,338.3	1,527.6	1,706.6	7,607.2
Indiana	373.0	398.7	386.2	510.6	582.9	651.2	2,902.6
Iowa	166.6	178.1	172.5	228.1	260.4	290.9	1,296.7
Kansas	289.1	309.1	299.4	395.8	451.8	504.8	2,250.1
Kentucky	221.6	236.9	229.5	303.4	346.3	386.9	1,724.7
Louisiana	737.3	788.2	763.5	1,009.4	1,152.2	1,287.2	5,737.9
Maine	60.2	64.3	62.3	82.4	94.1	105.1	468.4
Maryland	350.2	374.4	362.6	479.4	547.2	611.4	2,725.2
Massachusetts	248.2	265.4	257.0	339.9	387.9	433.4	1,931.8
Michigan	270.0	288.7	279.6	369.7	422.0	471.4	2,101.4
Minnesota	440.5	470.9	456.1	603.1	688.4	769.0	3,428.0
Mississippi	252.7	270.1	261.6	345.9	394.8	441.1	1,966.2
Missouri	400.9	428.6	415.2	548.9	626.5	699.9	3,120.1
Nebraska	114.9	122.8	119.0	157.3	179.5	200.6	894.0
Nevada	323.9	346.3	335.4	443.4	506.2	565.5	2,520.7
New Jersey	384.7	411.2	398.3	526.6	601.1	671.6	2,993.6
New Mexico	227.3	243.0	235.4	311.3	355.3	396.9	1,769.2
New York	1,783.8	1,907.0	1,847.2	2,442.2	2,787.7	3,114.3	13,882.2
North Carolina	409.8	438.0	424.3	561.0	640.3	715.4	3,188.8
North Dakota	30.2	32.3	31.3	41.3	47.2	52.7	234.9
Ohio	587.2	627.7	608.0	803.9	917.6	1,025.1	4,569.3
Oklahoma	265.1	283.4	274.5	362.9	414.3	462.8	2,063.0
Pennsylvania	651.2	696.2	674.4	891.6	1,017.7	1,137.0	5,068.0
Rhode Island	53.5	57.2	55.4	73.2	83.6	93.4	416.3
South Carolina	235.7	252.0	244.1	322.8	368.4	411.6	1,834.6
South Dakota	53.3	57.0	55.2	72.9	83.3	93.0	414.6
Tennessee	786.4	840.7	814.3	1,076.6	1,228.9	1,372.9	6,119.9
Texas	1,676.8	1,792.5	1,736.3	2,295.7	2,620.4	2,927.4	13,049.2
Utah	168.5	180.2	174.5	230.7	263.4	294.2	1,311.6
Vermont	44.7	47.8	46.3	61.2	69.9	78.1	347.9
Virginia	396.5	423.8	410.5	542.8	619.6	692.2	3,085.4
Washington	574.0	613.6	594.3	785.8	897.0	1,002.0	4,466.6
West Virginia	93.8	100.3	97.1	128.4	146.6	163.7	729.8
Wisconsin	269.7	288.3	279.3	369.3	421.5	470.9	2,099.0
Wyoming	52.3	55.9	54.2	71.6	81.8	91.4	407.3
TOTAL	21,931.2	23,444.9	22,709.6	30,025.4	34,273.1	38,288.3	170,672.5

Appendix A Table 3: Total State and Local Sales and Use Tax Revenue Losses from E-Commerce Sales (\$millions)

	Optimistic Scenario						
	2007	2008	2009	2010	2011	2012	Total
Alabama	108.3	115.8	112.2	148.3	169.3	189.2	843.1
Alaska	1.0	1.0	1.0	1.3	1.5	1.7	7.4
Arizona	235.2	251.4	243.5	322.0	367.6	410.6	1,830.3
Arkansas	72.4	77.4	75.0	99.1	113.2	126.4	563.5
California	1,211.2	1,294.8	1,254.2	1,658.3	1,892.9	2,114.6	9,426.0
Colorado	109.9	117.4	113.8	150.4	171.7	191.8	854.9
Connecticut	40.6	43.4	42.0	55.5	63.4	70.8	315.6
District of Columbia	22.6	24.2	23.4	31.0	35.3	39.5	175.9
Florida	511.2	546.5	529.3	699.9	798.9	892.5	3,978.3
Georgia	260.9	278.9	270.2	357.2	407.8	455.5	2,030.5
Hawaii	38.2	40.8	39.5	52.2	59.6	66.6	297.0
Idaho	29.5	31.5	30.5	40.4	46.1	51.5	229.4
Illinois	322.3	344.6	333.8	441.3	503.7	562.8	2,508.5
Indiana	124.2	132.8	128.6	170.1	194.1	216.9	966.7
Iowa	56.4	60.3	58.4	77.2	88.1	98.4	438.8
Kansas	90.9	97.2	94.1	124.4	142.0	158.7	707.3
Kentucky	69.9	74.8	72.4	95.7	109.3	122.1	544.2
Louisiana	251.8	269.2	260.7	344.7	393.5	439.6	1,959.4
Maine	20.4	21.8	21.1	27.9	31.9	35.6	158.7
Maryland	117.1	125.2	121.3	160.3	183.0	204.4	911.3
Massachusetts	83.5	89.2	86.4	114.3	130.5	145.7	649.7
Michigan	90.0	96.2	93.2	123.2	140.6	157.1	700.3
Minnesota	149.6	160.0	154.9	204.9	233.8	261.2	1,164.4
Mississippi	85.8	91.7	88.8	117.4	134.1	149.8	667.6
Missouri	134.0	143.2	138.8	183.5	209.4	233.9	1,042.8
Nebraska	39.0	41.7	40.4	53.4	61.0	68.1	303.6
Nevada	107.4	114.8	111.2	147.1	167.9	187.6	836.0
New Jersey	128.8	137.7	133.3	176.3	201.2	224.8	1,002.1
New Mexico	76.6	81.9	79.3	104.9	119.7	133.7	596.2
New York	550.4	588.4	570.0	753.6	860.2	960.9	4,283.4
North Carolina	136.0	145.3	140.8	186.1	212.5	237.4	1,058.0
North Dakota	9.8	10.4	10.1	13.4	15.2	17.0	75.9
Ohio	195.8	209.4	202.8	268.1	306.1	341.9	1,524.1
Oklahoma	89.5	95.7	92.7	122.6	139.9	156.3	696.8
Pennsylvania	220.0	235.2	227.8	301.2	343.8	384.0	1,711.9
Rhode Island	18.5	19.7	19.1	25.3	28.9	32.2	143.7
South Carolina	79.2	84.7	82.0	108.4	123.8	138.3	616.4
South Dakota	18.9	20.2	19.6	25.9	29.6	33.1	147.4
Tennessee	261.3	279.3	270.5	357.7	408.3	456.1	2,033.3
Texas	553.6	591.8	573.2	757.9	865.1	966.4	4,307.9
Utah	56.3	60.1	58.3	77.0	87.9	98.2	437.8
Vermont	16.0	17.1	16.5	21.9	25.0	27.9	124.3
Virginia	131.6	140.7	136.3	180.2	205.7	229.8	1,024.4
Washington	179.3	191.7	185.7	245.5	280.2	313.1	1,395.5
West Virginia	32.2	34.4	33.3	44.1	50.3	56.2	250.6
Wisconsin	90.4	96.6	93.6	123.8	141.3	157.8	703.5
Wyoming	18.2	19.4	18.8	24.9	28.4	31.8	141.6
TOTAL	7,245.6	7,745.7	7,502.7	9,919.7	11,323.1	12,649.6	56,386.3

**Appendix A Table 4: Total State and Local Sales and Use Tax Revenue
Losses from E-Commerce Sales as a Percentage of 2007 Sales and Use Tax
Collections**

	Optimistic Scenario					
	2007	2008	2009	2010	2011	2012
Alabama	2.67	2.85	2.76	3.65	4.17	4.65
Alaska	0.56	0.59	0.58	0.76	0.87	0.97
Arizona	3.00	3.21	3.10	4.10	4.69	5.23
Arkansas	1.92	2.05	1.99	2.63	3.00	3.35
California	2.96	3.16	3.06	4.05	4.62	5.17
Colorado	2.25	2.40	2.33	3.07	3.51	3.92
Connecticut	1.34	1.43	1.39	1.83	2.09	2.34
District of Columbia	2.77	2.96	2.87	3.79	4.32	4.83
Florida	2.22	2.38	2.30	3.04	3.47	3.88
Georgia	2.50	2.67	2.59	3.42	3.91	4.36
Hawaii	1.56	1.67	1.62	2.14	2.44	2.72
Idaho	2.31	2.47	2.39	3.16	3.61	4.03
Illinois	3.53	3.77	3.66	4.83	5.52	6.16
Indiana	2.29	2.45	2.37	3.14	3.58	4.00
Iowa	2.44	2.61	2.52	3.34	3.81	4.26
Kansas	3.05	3.26	3.16	4.17	4.76	5.32
Kentucky	2.16	2.31	2.23	2.95	3.37	3.77
Louisiana	3.76	4.02	3.89	5.14	5.87	6.56
Maine	1.93	2.07	2.00	2.65	3.02	3.38
Maryland	2.30	2.46	2.38	3.15	3.59	4.01
Massachusetts	1.97	2.11	2.04	2.70	3.08	3.44
Michigan	1.13	1.20	1.17	1.54	1.76	1.97
Minnesota	2.95	3.15	3.05	4.03	4.60	5.14
Mississippi	2.71	2.90	2.81	3.71	4.24	4.73
Missouri	2.57	2.75	2.66	3.52	4.02	4.49
Nebraska	2.25	2.40	2.33	3.08	3.51	3.92
Nevada	3.19	3.41	3.30	4.36	4.98	5.56
New Jersey	1.54	1.65	1.60	2.11	2.41	2.69
New Mexico	2.73	2.92	2.83	3.74	4.27	4.77
New York	2.79	2.98	2.89	3.82	4.36	4.87
North Carolina	1.83	1.95	1.89	2.50	2.85	3.19
North Dakota	1.45	1.55	1.50	1.98	2.26	2.53
Ohio	2.12	2.26	2.19	2.90	3.31	3.69
Oklahoma	2.59	2.76	2.68	3.54	4.04	4.51
Pennsylvania	2.48	2.65	2.57	3.40	3.88	4.33
Rhode Island	2.11	2.25	2.18	2.89	3.30	3.68
South Carolina	2.37	2.54	2.46	3.25	3.71	4.14
South Dakota	1.84	1.96	1.90	2.51	2.87	3.21
Tennessee	3.04	3.25	3.15	4.16	4.75	5.30
Texas	1.89	2.02	1.96	2.59	2.95	3.30
Utah	2.29	2.44	2.37	3.13	3.57	3.99
Vermont	2.56	2.73	2.65	3.50	4.00	4.46
Virginia	2.38	2.54	2.46	3.26	3.72	4.16
Washington	1.92	2.05	1.99	2.63	3.00	3.35
West Virginia	2.47	2.64	2.56	3.38	3.86	4.31
Wisconsin	2.04	2.18	2.11	2.80	3.19	3.56
Wyoming	2.03	2.17	2.10	2.77	3.17	3.54
TOTAL	2.43	2.60	2.52	3.33	3.80	4.25

Note: 2007 Collections are actually the adjusted 2007 state base multiplied by the sum of the state and local sales and use tax rates. The lone exception is Alaska, for which actual 2007 collections are used.

APPENDIX B: TAXABLE SALES SURVEY

Due Date: February 4, 2009

Send to: dbruce@utk.edu

State: _____
Contact Name: _____
Best means for contact: _____

Survey Instructions

There are two options for completing this survey. **Choose one option.** Instructions for each option follow. Under Option 1, you should report the percent of sales on which taxes are due. Under Option 2, you should report the percent of sales on which taxes have been collected. We ask which option you used at the end of these instructions.

Option 1: Report the percentage of sales on which sales and use taxes are due

Please estimate the percentage of total gross receipts that are made by firms in each NAICS code that *would be taxable* if purchased in your state. Sales may not be taxable for several reasons, including (1) the sale of the type of good and service is specifically exempted, (2) your state tax base does not include the transaction, or (3) the purchaser is exempt (e.g., tax exempt organization).

You should assume perfect sales **and** use tax compliance rates. Do **not** reduce the taxability ratio because the sale is out of state because we care about the taxable sales in your state.

Examples:

Note: You do not have to include the detail of exemptions. This is included in the examples for illustrative purposes. We only need the total taxable percentage.

NAICS 441: Your state exempts the following sales of Motor vehicles and Parts:

Sales to residents of Indian reservations	About 1% of sales
Sales of autos to residents of military bases	About 3% of sales
Sales to business when used in manufacturing process	About 2% of sales
Sales to ICC permit holders	About 5% of sales
Total percentage of exempt sales	About 11%

Total Taxable Percentage for NAICS 441 = 89%

Note: Out of state sales are also exempt. However, these sales are included in the taxable percentage because we want to include the taxability of goods and services sold to the residents and businesses of your state that are accounted for through the use tax.

NAICS 334: Your state exempts the following sales made by Computer and Electronic products manufacturers:

Wholesale sales or sale for resale	About 70% of Sales
Products used as component parts in manufacturing	About 3% of Sales
Total Percentage of exempt sales	About 73%

Total Taxable Percentage for NAICS 334 = 27%

Option 2: Report the percentage of sales on which sales and use taxes has been collected

Ignore all instructions for Option 1. If you are not comfortable estimating taxability, please estimate the percent of sales on which you think taxes have been collected. You may choose to prepare the estimates using judgment or actual data. If you use data, you may divide total receipts for each NAICS code by a measure of gross sales, which are available in various Census reports. If you use another measure of gross sales, please describe it briefly below. Professors Fox, Bruce and Luna will make the necessary adjustments to convert taxes collected to taxes due. (A description of their methodology is available on request.)

Please check one of the following boxes:

I have reported percent of sales using

- Option 1 (based on taxes due)
 Option 2 (based on taxes collected)

If you checked Option 1, skip the following questions.

If you checked Option 2, please answer the following questions.

Which of the following did you use to calculate the ratios?

- Professional judgment
 Data

If you checked data above, please briefly describe your data source(s).

Three tables follow. Table 1 is for sales by retailers, which are mostly but not exclusively sales to individuals. Similarly, Table 3 is for sales by wholesalers and manufacturers, which are mostly but not exclusively sales to other businesses. Table 2 is for sales by service firms, which are separated into those to consumers and those to businesses.

Please contact the research team at dbruce@utk.edu if you have any questions.

Thank you for your participation.

Table 1: Approximate percent of taxable sales of goods sold by retailers to households and business (consider only the types of goods sold remotely to residents and businesses of your state)

NAICS	Category	Taxable Percent
441	Motor vehicles and parts dealers	
442	Furniture and home furnishings stores	
443	Electronics and appliance stores	
444	Building materials and garden equipment and supplies stores	
445	Food and beverage stores	
446	Health and personal care stores	
447	Gasoline Stations	
448	Clothing and clothing accessories stores	
451	Sporting goods, hobby, book and music stores	
452	General merchandise stores	
453	Miscellaneous store retailers	

Please indicate the approximate percentage of gross receipts for each category of services sold to other businesses (B2B) and to individuals (B2C).

Table 2: Approximate percent of taxable sales by service providers (consider only the types of services sold remotely to residents and businesses of your state)

NAICS	Category	Taxable B2B	Taxable B2C
51	Information		
511	Publishing industries		
517	Telecommunications		
51811	Internet service providers and web search portals		
5231	Securities and commodity contracts intermediation and brokerage		
532	Rental and Leasing Services		
5415	Computer systems design and related services		

56	Administrative and Support and Waste Management and Remediation Services		
5615	Travel arrangement and reservation services		
62	Health Care and Social Assistance Services		
71	Arts, Entertainment, and Recreation Services		
72	Accommodation and Food Services		
811	Repair and maintenance		
813	Religious, grant-making, civic, professional, and similar organizations		

In Table 3, please indicate the approximate taxable percentage of total sales for each category of goods. Codes starting with 31-33 are manufacturing firms; 42 are wholesale trade; 48-49 are transportation and warehousing.

**Table 3: Approximate percent of taxable sales by manufacturers and wholesalers
(Consider only the types of goods sold remotely to residents and businesses of your state)**

NAICS	Vendors	Taxable Percent
311, 4244, 4245	Food products	
313, 314	Textile products	
315, 4243	Apparel	
316	Leather and allied products	
322, 4241	Paper and paper products	
323	Printing and related support activities	
325, 4246	Chemicals	
326	Plastics and rubber products	
327	Nonmetallic mineral products	
331, 4235	Primary metals	
332	Fabricated metal products	
333, 4238	Machinery	
334	Computer and electronic products	
335, 4236	Electrical equipment, appliances, and components	
4231, 336	Motor vehicles and automotive equipment	
4232, 321, 337	Furniture and home furnishings	
4233	Lumber and other construction material	
4234	Professional and commercial equipment and supplies	
42343	Computer equipment and supplies	
4237	Hardware, plumbing and heating equipment	
4242	Drugs, drug proprietaries and druggists' sundries	
324, 4247	Petroleum and petroleum products	
4248, 312	Beer, wine, and distilled beverages and tobacco	
484	Truck transportation	

492	Courier and messengers	
493	Warehousing and storage	

Further Comments: