Appendix #10

D. Bruce and W. Fox, "State and Local Tax Revenue Losses for E-Commerce: Updated Estimates," Center for Business and Economic Research, University of Tennessee, July 2004

State and Local Sales Tax Revenue Losses from E-Commerce: Estimates as of July 2004

by

Dr. Donald Bruce, Research Assistant Professor
dbruce@utk.edu

and

Dr. William F. Fox, Professor and Director
billfox@utk.edu

Center for Business and Economic Research
College of Business Administration
The University of Tennessee
1000 Volunteer Boulevard
100 Glocker Building
Knoxville, TN 37996-4170
(865) 974-5441
(865) 974-3100 – fax
http://cber.bus.utk.edu

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THE UNIVERSITY of TENNESSEE
Center for Business and Economic Research

Introduction

Rapid growth in electronic commerce has magnified states' problems in effectively collecting sales and use taxes on many remote transactions. Difficulties in collecting the tax may arise because remote firms do not have nexus and therefore do not have sales tax collection responsibility. In these cases, states must rely on voluntary compliance by purchasers,[1] which results in much greater noncompliance. Collection experience may also be hampered if the sales tax is more difficult to audit and enforce for remote vendors with nexus than for local vendors.

Inability to collect the tax potentially has a number of important implications. Firms have an incentive to locate production and sales activity to avoid tax collection responsibility, thereby imposing economic efficiency losses on the overall economy. The sales tax becomes more regressive as those who are least able to purchase online are more likely to pay sales taxes than those who purchase online more frequently. Further, state and local government tax revenues are reduced. This paper provides an update of our two earlier studies[2] that were focused on the latter issue, the effects of e-commerce on the revenues collected by state and local governments.

Revenue erosion continues to represent a significant loss to state and local government.

The experience of the last several years indicates that e-commerce has been a less robust channel for transacting goods and services than was anticipated when we prepared the earlier estimates. The findings provided here are based on lower estimates of e-commerce, and the result is a smaller revenue loss than we previously indicated. Our loss estimates are also lower because many more vendors have begun to collect sales and use taxes on their remote

[1] Some vendors have chosen to voluntarily comply, which should result in compliance levels that are generally consistent with those found for in-state vendors.
[2] Donald Bruce and William Fox, "E-Commerce in the Context of Declining State Sales Tax Bases," *National Tax Journal*, Vol. 53 No. 4, 2000; Donald Bruce and William Fox, "State and Local Sales Tax Revenue Losses from E-Commerce: Updated Estimates," *State Tax Notes*, Vol. 23, No. 3, October 15, 2001.

sales.[3] Still, the Census Bureau reports a combined $1.16 trillion in 2002 in e-commerce transactions by manufacturers, wholesalers, service providers, and retailers, and Forrester Research, Inc.'s expectations continue to be for strong growth in e-commerce in coming years.[4] Thus, the revenue erosion continues to represent a significant loss to state and local government.

Methodology

Two steps were used in preparing the numbers reported here: estimates were made of the aggregate national revenue losses and the national estimates were allocated to individual states.[5] The national estimates were calculated using detailed forecasts of e-commerce transactions from 2003 to 2008, professional judgments about the taxability of each type of transaction and about the degree of voluntary use tax compliance, and a weighted average sales tax rate. The state losses are prepared by allocating the national loss in sales tax base to each state based on the breadth and size of each state's tax base and the state's tax rate.

Forecasts were necessary for both business-to-consumer (B2C) and business-to-business (B2B) e-commerce. Forecasts for B2C e-commerce transactions were obtained from a study prepared by Forrester Research, Inc. for the National Governors Association and the National Conference of State Legislatures.[6] Detailed forecasts were not available directly for B2B e-commerce so separate analyses are prepared based on two different assumptions about B2B growth. Both approaches begin with the 2002 B2B transactions forecast by Forrester Research, Inc. for our estimates that were prepared in 2001, and assume that the relative pattern of growth

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[3] For example, a number of firms have merged their online and offline channels after initially seeking to separate the activities. See *The Growth of Multichannel Retailing*, prepared by Carrie Johnson, Forrester Research, Inc. for the National Governors Association and the National Conference of State Legislatures.

[4] Census numbers are available at <http://www.census.gov/eos/www/2002tables.html>. The most recent e-commerce forecast was obtained in *The Growth of Multichannel Retailing*, prepared by Carrie Johnson, Forrester Research, Inc. for the National Governors Association and the National Conference of State Legislatures.

[5] The methodology employed here was developed in our earlier studies, and interested readers should review those reports for more details.

[6] See note 4 above.

by type of B2B transactions is the same as in our earlier analysis. We believe this remains a good starting point since the 2001 and 2002 B2B sales in our previous study are generally consistent with the levels of manufacturing and wholesale transactions[7] that are reported by the US Census Bureau.[8] Our low-growth forecast assumes that aggregate B2B sales rise at the same rate as the Congressional Budget Office (CBO) forecasts for nominal GDP.[9] The high-growth forecast uses the same starting point but assumes that B2B sales represent the same percentage of total e-commerce transactions in each year as in the Forrester Research, Inc. forecast that was used in our 2001 study. Estimates of B2C transactions are the same in both forecasts. Our assumptions about sales and use tax compliance for online transactions were revised, consistent with the increased propensity for vendors to collect the tax. Our assumptions yield compliance rates of about 72 to 73 percent for online B2B transactions and about 40 percent for online B2C transactions.

Estimated Revenue Losses

Tables 1 and 2 present our 2003 to 2008 estimates of state and local government revenue losses using the high- and low-growth forecasts. We provide estimates for the *total* revenues that are lost as a result of inability to collect taxes due on e-commerce. The estimates are illustrated in Figure 1. We also provide estimates of the part of the total loss that we believe represents a *new* loss caused by the advent of e-commerce (i.e., we subtract the part of the total loss that would have been a revenue loss anyway, as many e-commerce sales would have otherwise been transacted via some other form of essentially untaxed remote sales).

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[7] No direct correspondence exists between the Census categories and B2B sales, and the Census data are used only to provide general support for the 2002 estimate provided by Forrester Research, Inc.
[8] See note 4 above.
[9] *The Budget and Economic Outlook: Fiscal Years 2005 to 2014*, Congressional Budget Office, January 2004 (Table E-1). Available at <http://www.cbo.gov/showdoc.cfm?index=4985&sequence=10#tableE-1>.

The total revenue loss equals total taxes due on sales over the Internet less taxes collected. In 2003, sales taxes were due on $752 billion of the $1.28 trillion in Internet sales that were estimated using the low-growth methodology. Tax was not collected on $236.3 billion, resulting in an estimated $15.5 billion in total lost state and local sales tax revenue given the current weighted average 6.5 percent state and local sales tax rate. The loss is expected to reach $21.5 billion by 2008 as states are unable to collect sales tax on $329.2 billion in taxable transactions. The high-growth methodology results in estimated total losses of $16.1 billion in 2003 that rise to $33.7 billion by 2008. We estimate the 2008 revenue loss for state and local governments to range between $21.5 billion and $33.7 billion.[10] Thus, the 2008 losses represent between 3.9 and 6.1 percent of actual 2003 state tax revenues.

We estimate the 2003 revenue loss for state and local governments to range between $21.5 billion and $33.7 billion.

Table 1: Estimated Total State and Local Sales Tax Revenue Losses from E-Commerce - Low-Growth Scenario

(Millions)	2003	2004	2005	2006	2007	2008
Total Business-to-Business*	1,192,567	1,262,928	1,329,863	1,392,367	1,455,023	1,523,409
Total Business-to-Consumer*	91,851	117,212	142,363	168,654	195,153	219,812
Total E-Commerce	**1,284,418**	**1,380,140**	**1,472,226**	**1,561,021**	**1,650,176**	**1,743,222**
Less Exempt B2B	-513,239	-554,238	-596,161	-637,362	-679,944	-727,133
Less B2B on which sales/use tax collected	-485,824	-507,473	-525,978	-541,731	-556,604	-572,379
Less Exempt B2C	-19,032	-23,980	-28,906	-34,156	-39,626	-44,651
Less B2C on which sales/use tax collected	-30,038	-37,786	-45,593	-53,765	-62,014	-69,857
Total Adjustments	-1,048,133	-1,123,476	-1,196,638	-1,267,014	-1,338,187	-1,414,020
E-Commerce Resulting in Revenue Loss	236,285	256,664	275,588	294,007	311,989	329,201
Average State and Local Tax Rate	0.065	0.065	0.065	0.065	0.065	0.065
Estimated *Total* Sales Tax Revenue Loss	**15,456**	**16,787**	**18,026**	**19,232**	**20,409**	**21,536**
Less Substitution for Other Remote Sales	-7,308	-7,850	-8,348	-8,824	-9,286	-9,734
Estimated *New* Sales Tax Revenue Loss	**8,148**	**8,937**	**9,678**	**10,408**	**11,123**	**11,802**

Source: Authors' calculations based on E-Commerce forecast provided by Forrester Research, Inc.
Note: Apparent mathematical inconsistencies are the result of rounding.
*Sales-taxing states only.

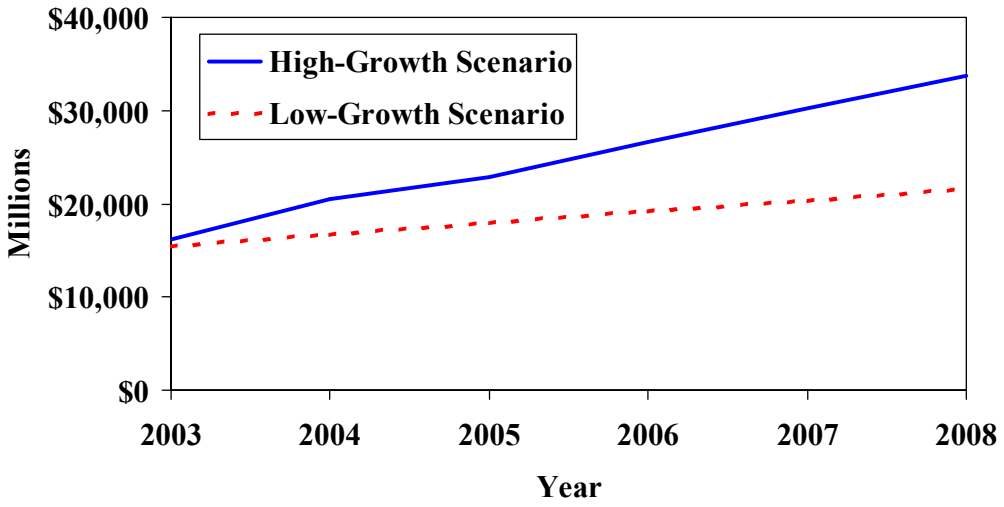
[10] Improved compliance has reduced the 2008 revenue loss by $6.3 billion with the low-growth forecast and $9.3 billion with the high-growth forecast.

Table 2: Estimated Total State and Local Sales Tax Revenue Losses from E-Commerce - High-Growth Scenario

(Millions)	2003	2004	2005	2006	2007	2008
Total Business-to-Business*	1,282,088	1,771,270	2,027,460	2,565,371	3,146,613	3,724,628
Total Business-to-Consumer*	91,851	117,212	142,363	168,654	195,153	219,812
Total E-Commerce	**1,373,939**	**1,888,482**	**2,169,823**	**2,734,026**	**3,341,766**	**3,944,440**
Less Exempt B2B	-561,371	-847,878	-1,012,523	-1,379,492	-1,791,399	-2,208,688
Less B2B on which sales/use tax collected	-517,271	-666,364	-734,087	-860,459	-986,070	-1,106,436
Less Exempt B2C	-19,032	-23,980	-28,906	-34,156	-39,626	-44,651
Less B2C on which sales/use tax collected	-30,038	-37,786	-45,593	-53,765	-62,014	-69,857
Total Adjustments	-1,127,712	-1,576,008	-1,821,109	-2,327,872	-2,879,109	-3,429,632
E-Commerce Resulting in Revenue Loss	246,227	312,474	348,713	406,153	462,657	514,809
Average State and Local Tax Rate	0.065	0.065	0.065	0.065	0.065	0.065
Estimated *Total* Sales Tax Revenue Loss	**16,106**	**20,437**	**22,809**	**26,568**	**30,265**	**33,678**
Less Substitution for Other Remote Sales	-7,633	-9,675	-10,739	-12,493	-14,216	-15,805
Estimated *New* Sales Tax Revenue Loss	**8,473**	**10,762**	**12,070**	**14,075**	**16,049**	**17,873**

Source: Authors' calculations based on E-Commerce forecast provided by Forrester Research, Inc.
Note: Apparent mathematical inconsistencies are the result of rounding.
*Sales-taxing states only.

Figure 1: Estimated Total State and Local Sales Tax Revenue Loss



The greatest losses occur in states relying most heavily on the sales tax as a revenue source.

Losses for individual states are given in Table 3 for 2003 and in Table 4 for 2008. The largest losses are in states with the greatest population including California, Texas, New York, and Florida. The total losses are separated into state and local governments in Table 5. State governments will lose $27.8 billion in revenues and local governments $5.8 billion under the high-growth scenario in 2008. The expected losses differ between states based on a number of state-specific factors including the sales tax base breadth, the sales tax rate, and the level and growth of the sales tax base. Table 6 shows the 2008 revenue losses as a percentage of 2003 total state tax collections. The top 10 states in terms of this percentage are illustrated in Figure 2. A general conclusion is that the greatest losses occur in states relying most heavily on the sales tax as a revenue source.

Table 3: Combined State and Local Revenue Losses from E-Commerce - 2003

	Low-Growth Scenario		High Growth Scenario	
(Millions)	**Total**	**New**	**Total**	**New**
AL	205.9	108.5	214.5	112.9
AR	165.8	87.4	172.8	90.9
AZ	377.3	198.9	393.2	206.9
CA	2,129.3	1,122.6	2,218.9	1,167.4
CO	248.2	130.8	258.6	136.1
CT	226.9	119.6	236.4	124.4
DC	43.9	23.2	45.8	24.1
FL	1,072.7	565.5	1,117.8	588.1
GA	511.4	269.6	532.9	280.4
HI	112.6	59.4	117.3	61.7
IA	125.4	66.1	130.7	68.8
ID	57.6	30.4	60.1	31.6
IL	501.3	264.3	522.4	274.8
IN	279.3	147.3	291.1	153.1
KS	156.8	82.6	163.4	85.9
KY	187.4	98.8	195.2	102.7
LA	366.5	193.2	381.9	200.9
MA	245.7	129.5	256.1	134.7
MD	232.8	122.7	242.6	127.6
ME	58.9	31.1	61.4	32.3
MI	500.6	263.9	521.7	274.5
MN	331.2	174.6	345.1	181.6
MO	272.8	143.8	284.3	149.6
MS	167.7	88.4	174.8	92.0
NC	341.8	180.2	356.2	187.4
ND	31.9	16.8	33.2	17.5
NE	109.4	57.7	114.0	60.0
NJ	404.6	213.3	421.7	221.8
NM	124.0	65.4	129.2	68.0
NV	159.1	83.9	165.8	87.2
NY	1,098.3	579.0	1,144.5	602.1
OH	525.7	277.1	547.8	288.2
OK	167.9	88.5	175.0	92.1
PA	509.1	268.4	530.5	279.1
RI	51.5	27.1	53.6	28.2
SC	179.4	94.6	186.9	98.3
SD	42.0	22.2	43.8	23.0
TN	436.3	230.0	454.7	239.2
TX	1,419.4	748.3	1,479.1	778.2
UT	129.1	68.1	134.6	70.8
VA	256.0	135.0	266.8	140.4
VT	25.4	13.4	26.4	13.9
WA	488.2	257.4	508.7	267.6
WI	264.3	139.3	275.4	144.9
WV	77.5	40.9	80.8	42.5
WY	36.8	19.4	38.4	20.2
US	15,455.7	8,148.2	16,106.1	8,473.6

Source: Authors' calculations.

Table 4: Combined State and Local Revenue Losses from E-Commerce - 2008

	Low-Growth Scenario		High Growth Scenario	
(Millions)	**Total**	**New**	**Total**	**New**
AL	287.6	157.6	449.7	238.7
AR	229.7	125.9	359.2	190.6
AZ	525.0	287.7	821.1	435.7
CA	2,954.6	1,619.1	4,620.4	2,452.0
CO	346.8	190.1	542.4	287.8
CT	320.5	175.6	501.2	266.0
DC	58.7	32.2	91.9	48.8
FL	1,504.1	824.2	2,352.1	1,248.2
GA	722.9	396.2	1,130.5	600.0
HI	157.0	86.0	245.5	130.3
IA	170.3	93.3	266.4	141.4
ID	79.9	43.8	125.0	66.3
IL	701.5	384.4	1,097.0	582.2
IN	389.9	213.7	609.7	323.6
KS	215.4	118.0	336.9	178.8
KY	258.6	141.7	404.3	214.6
LA	493.8	270.6	772.2	409.8
MA	345.1	189.1	539.6	286.4
MD	320.4	175.6	501.1	265.9
ME	81.0	44.4	126.6	67.2
MI	707.6	387.8	1,106.6	587.3
MN	459.3	251.7	718.3	381.2
MO	378.2	207.3	591.5	313.9
MS	231.2	126.7	361.6	191.9
NC	489.1	268.0	764.9	405.9
ND	41.3	22.6	64.6	34.3
NE	148.6	81.5	232.4	123.4
NJ	566.2	310.3	885.5	469.9
NM	169.2	92.7	264.6	140.4
NV	224.8	123.2	351.5	186.6
NY	1,552.4	850.7	2,427.7	1,288.4
OH	733.3	401.9	1,146.8	608.6
OK	223.4	122.4	349.3	185.4
PA	705.6	386.7	1,103.4	585.6
RI	70.5	38.7	110.3	58.5
SC	252.3	138.3	394.5	209.4
SD	56.7	31.1	88.6	47.0
TN	612.5	335.7	957.9	508.3
TX	1,969.5	1,079.3	3,079.9	1,634.5
UT	181.6	99.5	284.0	150.7
VA	355.2	194.6	555.4	294.8
VT	35.1	19.2	54.8	29.1
WA	692.3	379.4	1,082.7	574.6
WI	365.6	200.4	571.7	303.4
WV	104.4	57.2	163.2	86.6
WY	46.9	25.7	73.3	38.9
US	21,535.6	11,801.8	33,677.8	17,872.9

Source: Authors' calculations.

Table 5: State-Local Split of Estimated Total Revenue Losses from E-Commerce - 2008

	Low-Growth Scenario		High Growth Scenario	
(Millions)	State	Local	State	Local
AL	179.0	108.6	279.9	169.8
AR	179.5	50.2	280.8	78.5
AZ	408.4	116.7	638.6	182.5
CA	2,317.4	637.1	3,624.0	996.4
CO	176.0	170.8	275.2	267.2
CT	320.5	0.0	501.2	0.0
DC	58.7	0.0	91.9	0.0
FL	1,455.1	49.0	2,275.5	76.6
GA	451.4	271.5	705.9	424.6
HI	157.0	0.0	245.5	0.0
IA	155.5	14.8	243.2	23.2
ID	79.9	0.0	125.0	0.0
IL	621.7	79.8	972.2	124.8
IN	389.9	0.0	609.7	0.0
KS	173.8	41.6	271.7	65.1
KY	258.5	0.0	404.3	0.0
LA	255.6	238.2	399.7	372.4
MA	345.1	0.0	539.6	0.0
MD	320.4	0.0	501.1	0.0
ME	81.0	0.0	126.6	0.0
MI	707.6	0.0	1,106.6	0.0
MN	456.2	3.2	713.4	4.9
MO	259.4	118.8	405.7	185.8
MS	231.2	0.0	361.6	0.0
NC	378.3	110.8	591.7	173.3
ND	36.7	4.6	57.3	7.2
NE	127.8	20.8	199.9	32.6
NJ	566.2	0.0	885.5	0.0
NM	140.1	29.1	219.1	45.6
NV	212.5	12.3	332.3	19.3
NY	805.8	746.6	1,260.2	1,167.5
OH	620.5	112.8	970.4	176.4
OK	138.6	84.8	216.7	132.6
PA	690.0	15.6	1,079.1	24.3
RI	70.5	0.0	110.3	0.0
SC	243.0	9.3	380.0	14.5
SD	43.4	13.3	67.9	20.8
TN	493.0	119.5	771.0	186.9
TX	1,663.4	306.1	2,601.2	478.7
UT	142.2	39.4	222.4	61.6
VA	283.8	71.3	443.9	111.5
VT	35.1	0.0	54.8	0.0
WA	580.3	112.0	907.6	175.1
WI	347.8	17.8	544.0	27.8
WV	104.4	0.0	163.2	0.0
WY	37.9	8.9	59.3	13.9
US	17,800.1	3,735.3	27,836.7	5,841.4

Table 6: 2008 State Revenue Losses from E-Commerce
As a Percentage of 2003 State Total Tax Collections

	Low-Growth Scenario	High Growth Scenario
AL	2.8%	4.4%
AR	3.5%	5.5%
AZ	4.7%	7.3%
CA	2.9%	4.6%
CO	2.7%	4.1%
CT	3.4%	5.3%
FL	5.4%	8.5%
GA	3.4%	5.3%
HI	4.4%	6.9%
IA	3.1%	4.8%
ID	3.4%	5.3%
IL	2.8%	4.4%
IN	3.5%	5.4%
KS	3.5%	5.4%
KY	3.1%	4.9%
LA	3.4%	5.4%
MA	2.2%	3.5%
MD	2.9%	4.6%
ME	3.0%	4.7%
MI	3.1%	4.9%
MN	3.4%	5.3%
MO	3.0%	4.7%
MS	4.7%	7.3%
NC	2.4%	3.7%
ND	3.1%	4.9%
NE	3.8%	6.0%
NJ	2.8%	4.4%
NM	3.9%	6.1%
NV	5.1%	8.0%
NY	2.0%	3.1%
OH	3.0%	4.7%
OK	2.3%	3.7%
PA	3.0%	4.7%
RI	3.1%	4.9%
SC	3.8%	6.0%
SD	4.3%	6.7%
TN	5.6%	8.7%
TX	5.7%	8.9%
UT	3.6%	5.6%
VA	2.2%	3.4%
VT	2.3%	3.5%
WA	4.5%	7.0%
WI	2.9%	4.5%
WV	2.9%	4.5%
WY	3.1%	4.9%

Source: Authors' calculations.

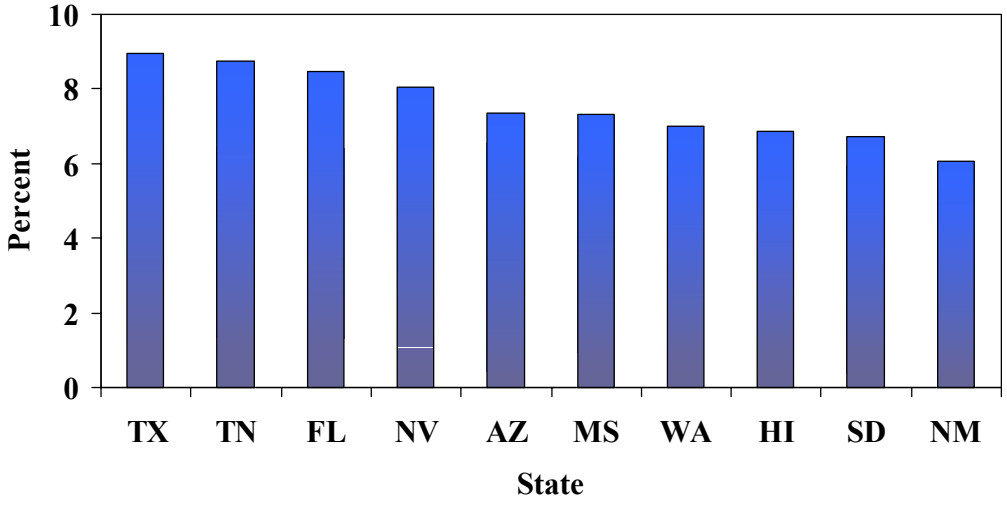



Figure 2:
State Revenue Losses from E-Commerce in 2008 as a Percentage of Total Tax Revenues in 2003, Low-Growth Scenario