



## Does More Broadband Mean Less Local Sales Tax Collections?

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Broadband Internet access is becoming more common across the country. This is generally seen as a positive development, since broadband can provide opportunities for commerce, education, and entertainment. However, the implications for the local retail sector are unclear. Local retail stores often compete with online vendors that can provide many of the same goods. Since most online sales do not face an effective sales tax, some community developers worry that local sales tax revenues will decline as more and more people use the Internet. This loss of tax revenue could negatively impact the provision of many public services, such as law enforcement or health infrastructure. In fact, rural hospitals across the nation are often dependent on city or county-level sales taxes passed specifically to help them stay open.

This document will use Oklahoma data to explain recent findings on the relationship between broadband adoption and local retail sales tax collections. Both an intuitive mapping technique and more sophisticated statistical models are used to determine whether more broadband does, in fact, lead to lower tax collections from local retail sales.

### E-commerce and Taxes: Background Information

As a previous OSU Cooperative Extension fact sheet (AGEC-1022) notes, only some online sales are subject to sales tax. In particular, unless a store has a presence (or "nexus") in a particular state, it is not required to gather and remit sales tax in that state. Thus, many e-commerce sales do not result in sales taxes being paid. It is common for some people to use the Internet in order to avoid paying sales tax. Goolsbee (2000) found that people who live in areas with high taxes are much more likely to buy things online.

However, e-commerce is only a small part of traditional retail sales. The U.S. Census Bureau collects data on e-commerce transactions. While the amount of e-commerce sales have steadily increased since 2000, e-commerce makes up only a small percentage (3.6 percent) of total retail sales in 2008 (Table 1).

### What Effect Does E-commerce Have on Retailers and Communities?

Given the small percentages documented in Table 1, several researchers have estimated the loss of sales tax collections to be small (Goolsbee 2001; Bruce, Fox, and Luna 2009). However, significant concern still exists about the impact of e-commerce on local retailers and the local community – so much that legislation known as the Main Street Fairness Act was introduced to the U.S. House of Representatives in 2010 focusing on both the potential tax revenue lost and the issue of equality between online and bricks-and-mortar stores (McCullagh 2010). While most of the focus has dealt with why broadband access might hurt local retailers, there is some evidence to suggest that broadband could actually help local stores. Each case is examined below:

### Why Broadband Might Hurt Local Retailers

In addition to the price advantage of not having to pay sales tax noted above, there are a number of other reasons why consumers might prefer online retailing to shopping at more traditional physical locations. These include the ability to shop for lower prices among many competitors, convenience, access to previously unavailable goods, time savings, or simply avoiding the hassle associated with crowds and travel. Recent statistics back this up, with 93 percent of

**Table 1. E-commerce as a percentage of total retail sales in the U.S., 2000 – 2008.**

U.S. Retail Sales	2000	2001	2002	2003	2004	2005	2006	2007	2008
Total (\$B)	2,989	3,068	3,134	3,268	3,480	3,698	3,882	4,005	3,959
E-commerce (\$B)	28	34	45	58	74	92	114	137	142
Percent of total (%)	0.9	1.1	1.4	1.8	2.1	2.5	2.9	3.4	3.6

Source: U.S. Shipments, Sales, Revenues, and E-commerce, U.S. Census e-stats - Table 7 (2010).

Internet users indicating that they had performed some type of activity related to e-commerce (Horrigan 2008). Further, Kolko (2010) finds that higher levels of broadband adoption have led to higher likelihoods of purchasing online.

### Why Broadband Might Help Local Retailers

Some surveys have suggested that local retail stores might actually benefit from higher levels of broadband adoption. Many consumers use the Internet to help them shop locally, an activity known as "research online, buy offline" (ROBO). Surveys conducted by BIGresearch, Forrester, and comScore have all found high levels of this type of activity. Consumers may perform this type of activity for any number of reasons, including wanting to see or touch an item before purchasing, immediate gratification, or support of local establishments.

### How Do You Figure Out What Role Broadband Plays?

In order to determine whether increasing levels of broadband have impacted sales tax collections, data from two distinct periods are introduced. In 1998, broadband access was a rarity – in fact, less than 5 percent of households had access when the first surveys on the topic were conducted in 2000 (Pew Internet, 2010). Therefore, the assumption is made that broadband use was negligible in 1998. A decade later, however, broadband access had become widespread, with over 50 percent of households adopting by 2008. Moreover, data on county-level broadband adoption became available for 2008. The data comes from the Federal Communications Commission and is broken into five categories that represent the number of fixed broadband connections per 1,000 households:

- Category 1:  $0 < x < 200$  (0 – 20%)
- Category 2:  $200 < x < 400$  (20 – 40%)
- Category 3:  $400 < x < 600$  (40 – 60%)
- Category 4:  $600 < x < 800$  (60 – 80%)
- Category 5:  $800 < x$  (80 – 100%)

Figure 1 shows the level of broadband adoption in Oklahoma in 2008. Some areas, notably those around Oklahoma City, show very high levels of adoption, while others (particularly in the southeastern part of the state) have very low levels.

Since broadband access was virtually nonexistent in 1998, Figure 1 indicates that certain parts of the state adopted

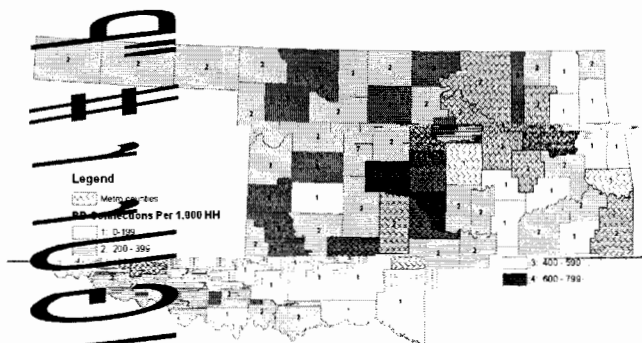
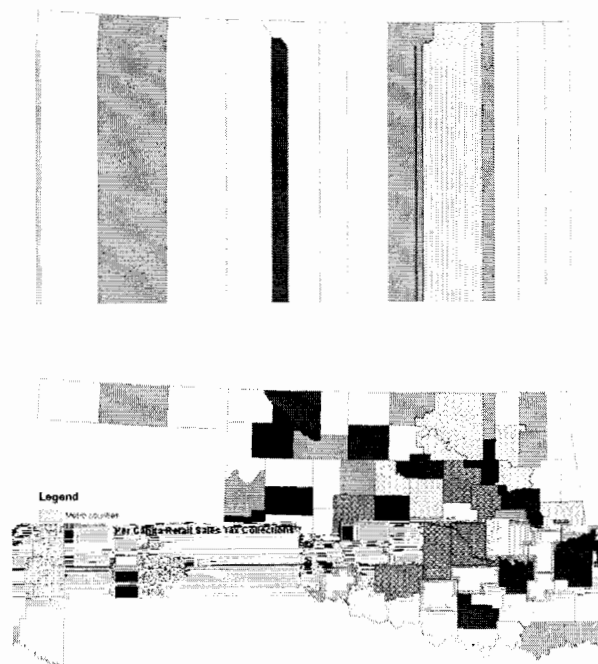


Figure 1. Residential Broadband Adoption in Oklahoma, 2008



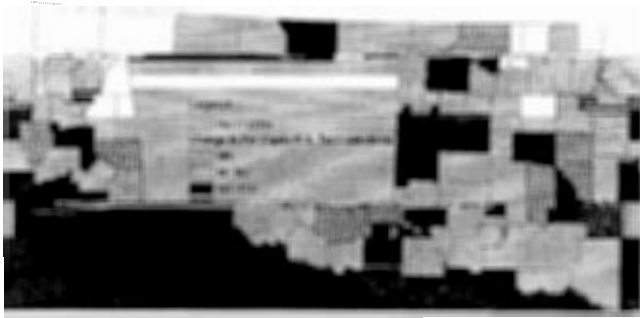
broadband at higher rates than others. If broadband access did have some type of relationship with the amount of retail sales tax collections, it should become apparent by observing the changes in retail sales tax collections over this period.

Figure 2 shows per-capita retail sales tax collections in Oklahoma's 77 counties in these two time periods: 1998 and 2008 (the 1998 values have been adjusted for inflation to 2008 levels). Even after adjusting for inflation, the state average increased significantly over this time (from \$186 per capita to \$226 per capita). However, most counties with high sales tax collections in 1998 still had high levels in 2008. Similarly, counties with low collections in 1998 typically repeated that pattern in 2008.

Figure 3 takes this analysis a step further and shows the change in per capita retail sales tax collections between 1998 and 2008. Some counties declined in the amount of per capita collections, although most increased and several had significant levels of growth. Ultimately, comparing the changes in Figure 3 to those in Figure 1 will help answer whether or not changing rates of broadband access are associated with any changes in retail sales tax collections.

Figures 1 and 3 provide little evidence that there is any significant relationship between broadband adoption rates and changes in retail sales tax collections. Some counties with high broadband rates experienced growth in tax collections, while others saw declines. Similarly, counties with low rates of broadband adoption showed both improvements and drops in tax collections, without any apparent pattern.

To statistically test whether or not increasing broadband rates had any impact on retail sales tax collections, data on a number of variables that could potentially influence sales tax collections were collected for all 77 counties in Oklahoma in



**Figure 3. Change in Per-capita Retail Sales Tax Collections, 1998 – 2008 (constant 2008 dollars)**

both 1998 and 2008. This included items such as the tax rate in a particular county, household income levels, age levels, and whether or not a community had a Wal-Mart. These are summarized in Table 2. Note that all variables with dollar values have been converted to 2008 dollars using inflation indices from the Bureau of Labor Statistics.

While the per capita retail sales tax collected increased dramatically over this time period, several other measures also showed increases: the tax rate of the counties collecting tax, the number of retail employees, the number of Wal-Mart stores per county, the poverty rate, and the level of broadband access.

To determine which of these various increases actually impacted the amount of retail sales tax collections, a technique called “difference-in-difference” regression was used. This technique models the *change* in a particular variable (in this case, per capita retail sales tax collected) based on *changes* in other variables that might have impacted it over that time. Only some variables will be statistically linked to the rise in per capita retail sales tax collections. The remaining, insignificant variables can be said to have no effective impact on the retail sales tax collections (for more detail on the study and methodology, see Whitacre (2011)).

**Table 2. Mean Values of Variables in the Analysis, 1998 and 2008.**

	1998	2008
retail sales tax collected (2008\$)	14,110,049	17,027,549
retail sales tax per capita (2008\$)	186	226
retail establishments	187	172
retail establishments per capita	0.0044	0.0038
tax rate	8.17	8.82
retail employees	2,154	2,309
household income (2008\$)	39,524	39,340
population density (people per sq. mile)	60	66
poverty rate	16.56	17.28
unemployment rate	5.31	3.61
age 18-64	0.59	0.60
age 65+	0.16	0.16
wal-mart	0.22	0.90
broadband	0.00	2.49
# observations	77	77

So, which variables were determined to be “statistically significant?” Only two:

- Tax Rate
- Poverty Rate

Interestingly, only these two variables (higher rates of taxes and higher poverty levels) had any impacts on the changes in retail sales taxes collected over this period. The higher rates of taxes contributed to higher tax collections, while the higher poverty levels in 2008 decreased the levels of tax collections. Notably, the higher levels of broadband adoption played absolutely no role in the changes that were seen in retail sales tax collections. This pattern held when a separate analysis was done on only non-metropolitan counties in the state.

## Summary

Many politicians and main street / chamber organizations have been leery of increased Internet usage in their areas, fearing that local customers will begin shopping online and ultimately diminish the local tax base. The results shown here suggest that this has *not* been a concern: tax collections have not varied in any way based on broadband adoption trends. Thus, communities should feel free to offer educational programs to residents about the benefits of broadband. This would include encouraging participants to shop on the Internet as they feel comfortable – with some buying online, and others using the Internet as an auxiliary source of information to buy a product locally. However, as Table 1 clearly shows, e-commerce's percentage of total retail sales has been trending upward for an entire decade, and a continuation of that trend over the next decade could change the findings here.

## References / Additional Reading

- Bruce D., Fox W., and Luna L. (2009). State and local sales tax revenue losses from e-commerce. University of Tennessee. <http://cber.utk.edu/ecomm/ecom0409.pdf>
- Goolsbee, A. (2000). In a world without borders: The impact of taxes on Internet commerce. *Quarterly Journal of Economics* 115: 561-576.
- Goolsbee, A. (2001). The implication of electronic commerce for fiscal policy (and vice versa). *Journal of Economic Perspectives* 15: 13-24.
- Horrigan J. (2008). Online shopping: Internet users like the convenience but worry about the security of their financial information. [www.pewinternet.org/Reports/2008/Online-Shopping.aspx](http://www.pewinternet.org/Reports/2008/Online-Shopping.aspx)
- Kolko J. (2010). How broadband changes online and offline behaviors. *Information Economics and Policy* 22: 144-152.
- McCullagh D. (2010). Democrats push for new Internet sales tax. *Cnet News*, 2 July 2.
- Pew Internet and American Life Project. (2010). Online activities, 2000-2009. [www.pewinternet.org/Static-Pages/Trend-Data/Online-Activities-20002009.aspx](http://www.pewinternet.org/Static-Pages/Trend-Data/Online-Activities-20002009.aspx)
- Whitacre, B., Ferrell, S., and Hobbs, J.C. (2010). E-commerce and sales taxes: What you collect depends on where you ship. Fact Sheet AGEC-1022. Stillwater, OK: Oklahoma Cooperative Extension Service.
- Whitacre, B. (2011) “Do higher broadband adoption rates mean lower tax collections from retail sales? Implications of e-commerce in rural areas of the U.S.” *Regional Science Policy and Practice* 3(2): 71-85.

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