

## **BIG BOXES AND FISCAL PAYOFFS**

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### **ABSTRACT**

Municipalities and their consultants commonly believe that “big box” retail stores—large-format discounters and wholesale clubs such as Wal-Mart, Target, and Costco—have a strong positive influence on net sales tax receipts. Based on this belief, such developments are widely coveted, pursued, and sometimes subsidized. Some researchers have pointed out that large retail stores, and general merchandise discounters in particular, likely cannibalize sales of existing retail stores within the city limits, depending on the particular size and geography of the municipality. There has been little empirical investigation of this question. Using cross-sectional data from the California Board of Equalization and population data from the state Department of Finance for 116 cities in the San Francisco Bay Area metropolitan region, I used an empirical model to account for the separate roles of big box retailers, population growth, local household income, and other factors that may play a role in the amount of local retail sales in a community. The analysis confirms that very small cities can get a big payoff from a big box. However, for 98 percent of cities in the Bay Area, the presence of such stores is not significantly correlated with high tax receipts when controlling for other factors. I discuss possible reasons for this result. Such stores may follow rather than create retail demand; the big box format itself may be only one of many planning decisions motivated by sales tax revenue; and initial disparities in sales tax generation may have been reduced over time as retail development in the Bay Area has matured.

## **Introduction**

Cities often pursue large format general retailers, or what municipal planners call “big boxes,” in order to boost tax revenue and improve their fiscal condition. Taxable sales of these stores—such as the conventional Wal-Mart, Target, and Kmart discount format stores—are typically in the range of \$50 million per year.

When such a store is opened up, does it actually increase city sales tax revenue? What share of its sales is due to new spending by residents of other cities and capture of “leakage” (former spending by residents outside the city limits), and what percentage is attributable to shifts of within-city shopping (both by residents and non-residents)? If these stores give a boost to sales tax revenue, does it persist?

Studying cities within a metropolitan region is particularly relevant since local municipalities within regions compete with each other for these uses in an explicitly spatial sense. The study area here, consisting of the San Francisco Bay Area and two outlying counties, includes 116 cities, 40 percent of which have at least one “big box” as defined below.

## **Data**

An ideal means of investigating the impact of big boxes on municipal sales tax revenue would be to use time-lag regression methods with longitudinal data. In the absence of longitudinal data on when big box stores were first developed, a second-best alternative is to employ a cross-sectional inferential approach. That is what is done here. The limitations of the approach are discussed in the Conclusions section.

For 116 cities in the 12-county area I collected data on per capita and household income from the 2000 U.S. Census, taxable sales from the California Board of Equalization for 2001 (the most recent year available), and population from the California Department of Finance

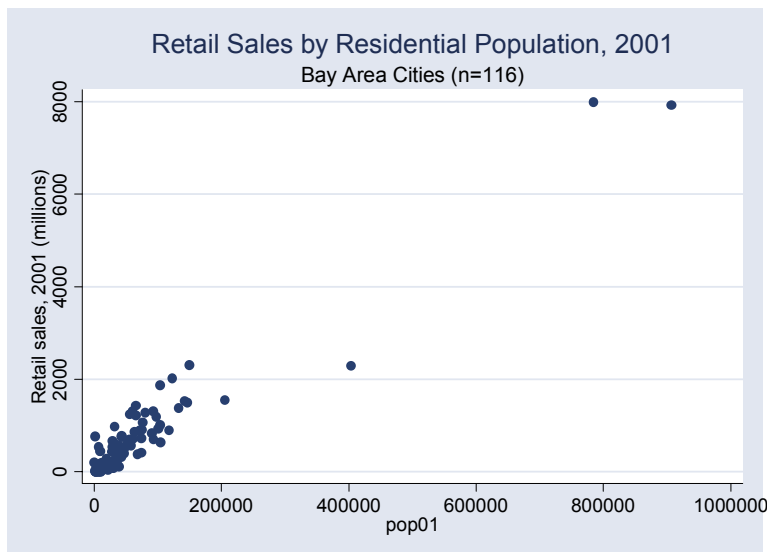
(projections based on building permits, the 2000 Census and other information). Taxable retail sales among study area cities in 2001 ranged between \$667,000 (Hillsborough) up to \$8 billion (both San Jose and San Francisco) (Figure 1).

**Figure 1: Retail Sales, 2001**



This relationship is highly correlated with the residential population of the city (Figure 2, Figure 3).

**Figure 2: Retail Sales by Population**

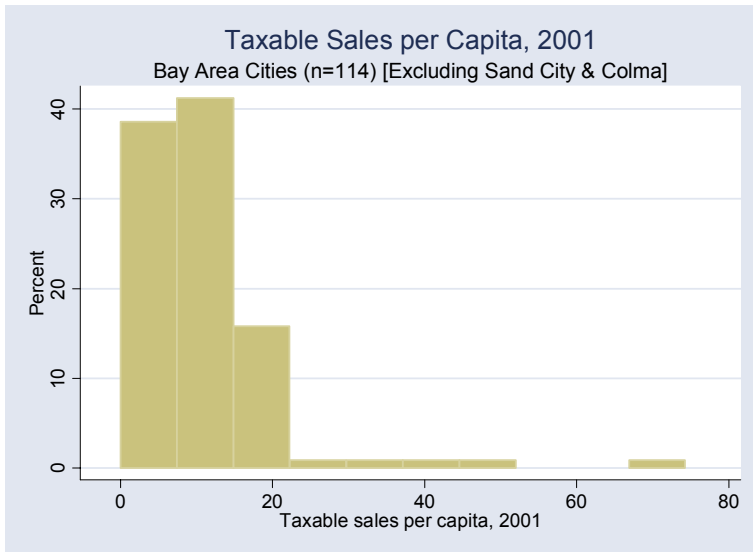


**Figure 3: Retail Sales per Population, Excluding San Jose and San Francisco**



The distribution of per capita taxable sales has less variance, once two outliers are excluded (Figure 4).

**Figure 4: Distribution of Cities by Taxable Sales Per Capita, 2001**

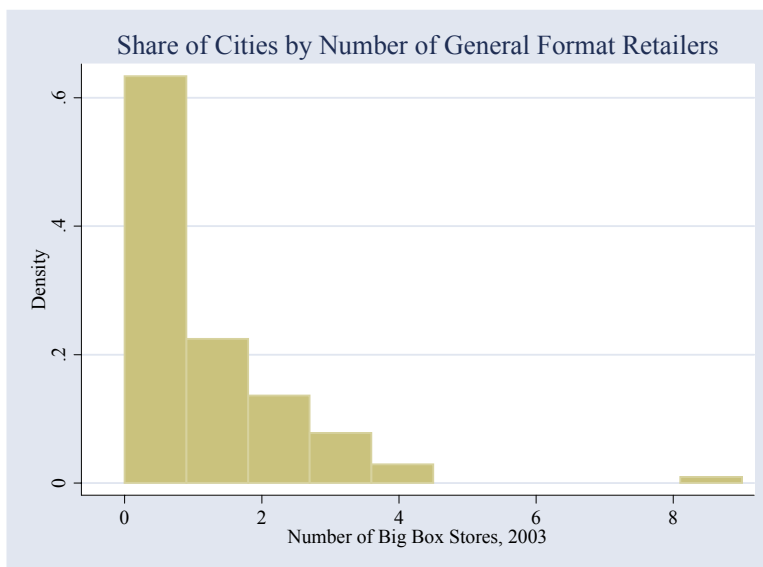


Costco, Kmart, Sam's Club, Target, and Wal-Mart stores are similar in that they sell a wide range of retail goods, have building footprints of 100,000 square feet or more, and have

revenues typically in excess of \$50 million per year.<sup>1</sup> In contrast to Wal-Mart, Target and Kmart stores in the study area, Costco and Sam's Club devote a substantial percentage of their floor area to grocery and drugstore items, such as food and toiletries; tend to sell items in bulk; and require a yearly membership fee.<sup>2</sup>

Data on the location of big boxes was collected in 2003 from company directories and telephone directories. Of the 116 cities in the dataset, 51 (or 44 percent of the total) had one or more of these large format general retailers in 2003, and 26 (23 percent) had two or more (Figure 5). As with retail sales tax revenue, one would expect a correlation of the number of large-format general retailers with the population of the city. Figure 6 shows that this is the case.

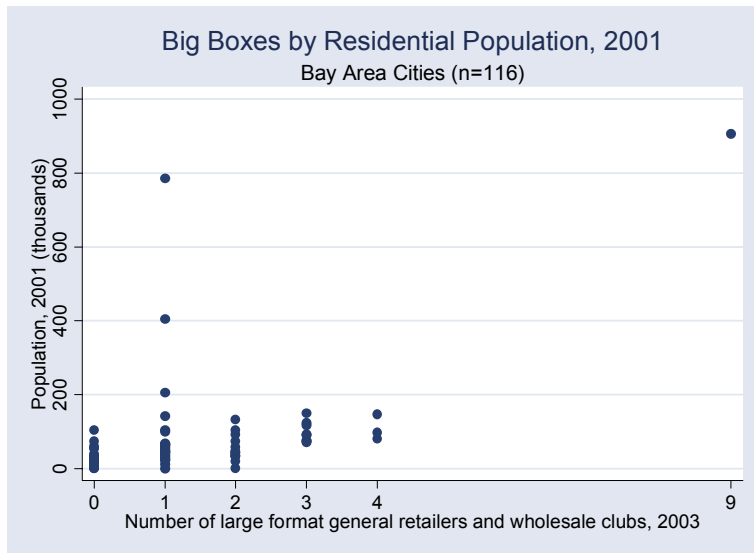
**Figure 5: Share of Cities by Number of Big Boxes**



<sup>1</sup> With associated parking and landscaping the development footprint for a standalone general format retailer can be expected to exceed five acres. More recently developed stores are generally larger.

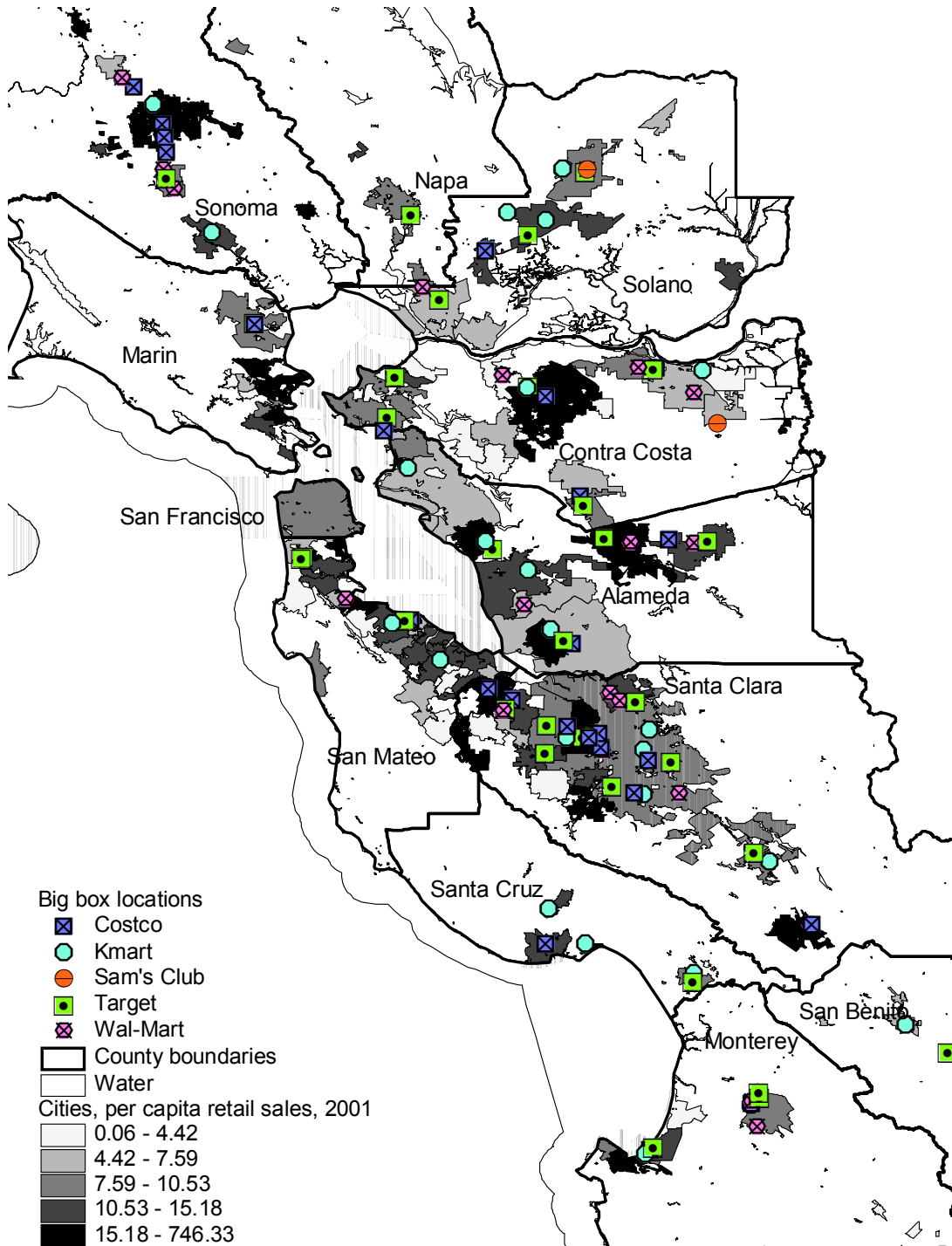
<sup>2</sup> In the study region, there is only one “supercenter,” a store which includes a full scale grocery and drugstore component and exceeds 200,000 square feet. Supercenters are the most common recently developed store type for Wal-Mart stores and (to a lesser extent) Target elsewhere in the United States. (A Wal-Mart supercenter recently received City Council approval in Gilroy, a city in south Santa Clara County.)

**Figure 6: Big Boxes by Residential Population**



I merged the taxable sales data with data about the location of discount retail and wholesale club stores. Figure 7 shows the spatial distribution of per capita taxable sales along with the locations of stores in the five chains.

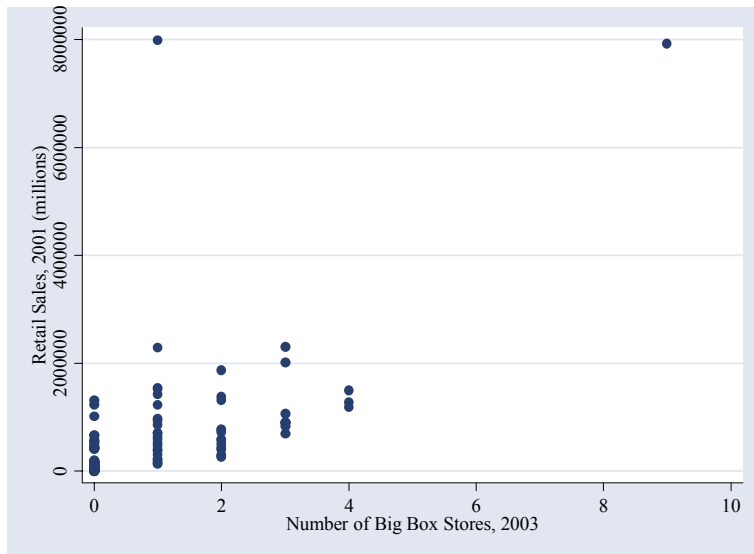
Figure 7: Study Region, Location of Big Boxes and Cities by Taxable Sales Revenue



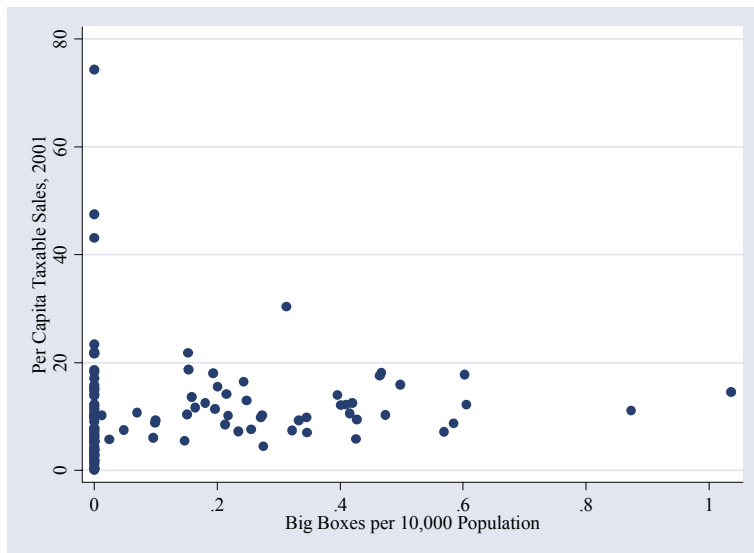
## Analysis

Because both the number of big box stores and retail sales tax revenue for cities are positively associated with population, we expect an association between the number of stores and retail sales (Figure 8). However, the presence of these large retail uses isn't associated in any obvious way with higher *per capita* revenues (Figure 9).

**Figure 8: Retail Sales by the Number of Big Box Stores**



**Figure 9: Taxable Sales by Number of Big Boxes, Per Capita**



I initially regressed per capita retail sales on the number of big box stores per capita. Big box stores per capita was highly statistically significant. This initial regression indicated that for each additional general discount store per 10,000 population, a city would be expected to have an additional \$22 per capita in retail sales (Table 1).

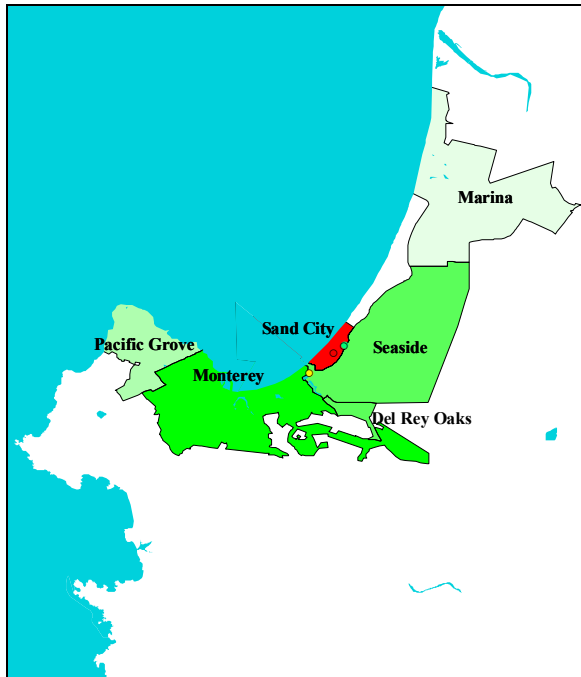
**Table 1: Taxable Sales per Capita Regressed on Big Boxes per 10,000 Residents**

Source	SS	df	MS			
Model	845445.892	1	845445.892	Number of obs =	116	
Residual	88503.9953	114	776.350836	F( 1, 114) =	1089.00	
				Prob > F =	0.0000	
				R-squared =	0.9052	
				Adj R-squared =	0.9044	
				Root MSE =	27.863	
Total	933949.887	115	8121.30336			
Ret. sales per cap.	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
Big boxes per cap.	22.64036	.6860717	33.00	0.000	21.28126	23.99947
Constant	8.993031	2.619525	3.43	0.001	3.803773	14.18229

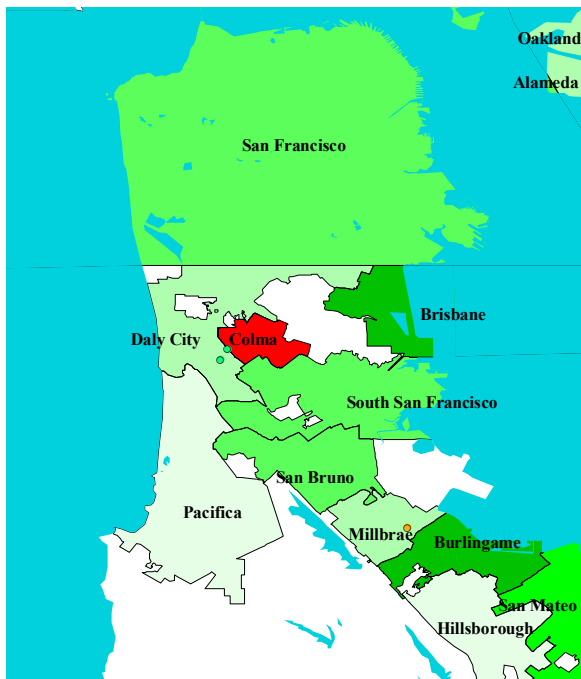
Since more than 90 percent of cities in the Bay Area have less than \$22 per capita in retail sales, but many of those have one or more of the general discount retail stores in our dataset, I suspected that the highly skewed distribution of stores was influencing the analysis.<sup>3</sup> Indeed, further analysis shows that two small cities with very high per capita retail sales—Sand City in Monterey County with \$746 per capita, and Colma in San Mateo County with \$642 per capita—are driving this result. These cities have very small populations (less than 300 residents in Sand City, less than 1,200 in Colma) along with taxable sales in the moderate range (\$200 million per year in Sand City and \$765 million in Colma). Colma has a Kmart and a Target, while Sand City has a Costco.

<sup>3</sup> Conventional regression analysis (that is, ordinary least squares) assumes that the underlying distribution of the independent variable is normal. This is clearly not the case with taxable sales per resident.

**Figure 10: Sand City, \$764 Taxable Sales per Capita**



**Figure 11: Colma, \$642 Taxable Sales per Capita**



Conventional regression analysis relies on a normal distribution of the independent variable. One method to restore normality is to remove outliers from the analysis. I removed Sand City and Colma from the dataset and ran the regression again, and found that the number of

big box retailers per 10,000 capita was no longer strongly correlated with taxable sales per capita, with an additional \$4 or so per capita associated with each additional big box store per 10,000 residents, but not a statistically significant relationship (Table 2).

**Table 2: Taxable Sales per Capita Regressed on Big Boxes per 10,000 Residents, Extreme Outliers Excluded**

REGRESSION 2						
Source	SS	df	MS			
Model	83.341732	1	83.341732	Number of obs =	114	
Residual	10307.261	112	92.0291159	F( 1, 112) =	0.91	
Total	10390.6027	113	91.9522364	Prob > F =	0.3433	
				R-squared =	0.0080	
				Adj R-squared =	-0.0008	
				Root MSE =	9.5932	
Ret. sales per cap.	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
Big boxes per cap.	4.184351	4.39703	0.95	0.343	-4.5278	12.8965
Constant	10.22217	1.075444	9.51	0.000	8.091319	12.35303

This result was robust to city size. The same was true when the analysis was restricted to cities of less than 100,000 (100 cities), cities of less than 50,000 population (79 cities), and cities of less than 25,000 population (49 cities).

The residual importance of big box development declines further once per capita income is taken into account (Table 3). We can expect that per capita taxable sales will be higher in areas with higher income and lower in other areas, particularly if a substantial share of spending comes from those living within city boundaries and if average income within cities is spatially correlated, as seems to be the case in the Bay Area.

That said, there may be some mutual causality at work. Middle-income cities are most likely to have big box stores, and poor and rich cities the least likely. In the case of poor cities, developers may be less likely to choose such locations to avoid low patronage. In the case of rich cities, the taste of local residents may run away from discount stores and the planning agencies

may be more likely not to permit such uses because fiscal concerns are not the issue so much as aesthetic concerns.

**Table 3: Per Capita Taxable Sales Regressed on Income, Population and Big Boxes per Capita (Extreme Outliers Excluded)**

Source	SS	df	MS			
Model	1091.91586	4	272.978966	Number of obs =	114	
Residual	9298.68685	109	85.3090537	F( 4, 109) =	3.20	
Total	10390.6027	113	91.9522364	Prob > F =	0.0158	
				R-squared =	0.1051	
				Adj R-squared =	0.0722	
				Root MSE =	9.2363	

Ret. sales per cap.	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
Per cap. income	.3936408	.1564154	2.52	0.013	.0836305	.703651
Income squared	-.0041231	.0013534	-3.05	0.003	-.0068054	-.0014407
Population	-4.01e-06	7.46e-06	-0.54	0.592	-.0000188	.0000108
Big boxes per cap.	2.393854	4.388856	0.55	0.587	-6.304716	11.09242
Constant	3.76593	3.68771	1.02	0.309	-3.542991	11.07485

## Conclusions

What conclusions can be derived from this exercise? It tends to confirm, or at least does not directly contradict, two rather unexceptionable premises. First, very small cities can get a big payoff from a big box. Second, for cities of moderate size and/or geographic extent, general merchandisers do not by themselves ensure high tax receipts.

Clearly, small cities get a big boost from a big box, and it makes rational sense for such cities to subsidize those uses. In the long run, larger cities probably cannot benefit much. This inference supports the oft-cited hypothesis that greater municipal fragmentation (i.e., smaller cities) result in inefficiencies at the regional level as more cities have an incentive to subsidize the uses only to shift spending from one locality to another.

The fact that I did not find a correlation between per capita retail sales and the presence of one of the five kinds of big box store in this dataset, except for two extreme cases, does not by

itself mean that big box retail stores have no effect on retail sales. There are other more likely hypotheses to explain this result.

One hypothesis is that the taxable retail sales revenues of cities are largely a function of market factors, and cities can do little to significantly change this.

A second, potentially contradictory hypothesis is that many retail uses (including other big box specialty formats such as Home Depot, Toys-R-Us, and Staples) contribute to the overall taxable sales profile of a city, and general merchandisers are just one part of that profile. The second hypothesis may contradict the first insofar as municipalities do likely attempt to attract myriad sales tax generating uses. We cannot address these alternative hypotheses in detail here.

One can conclude, however, that in the Bay Area the location of large format general retailers and wholesale clubs does not by itself lead to a taxable sales payoff for municipalities. Clearly other factors are important.