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Vandegrift, Donald; Loyer, John and Kababik, David
The College of New Jersey

16. May 2011

The Effect of Walmart on the Tax Base: Evidence from New Jersey

Donald Vandegrift[a]

John Loyer

David Kababik

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Abstract: *This paper measures the impact of 30 Walmart openings on the municipal tax base using panel data for New Jersey municipalities from 1998-2007. We consider the impact of the new Walmart on the home municipality as well as the nearest adjacent municipality in the year the outlet opens as well as the two subsequent years. Because Walmart may exert differing effects on residential and non-residential values, we undertake separate analyses of the impact of Walmart on the residential and non-residential tax bases. We find that a new Walmart has a significant positive impact on the growth in the tax base in host municipalities the second year that it is open, but not in years one and three. In addition, the impact of the Walmart on the growth in the tax base depends on the size of the municipality. In the average-sized municipality, the real equalized tax base growth rate rises only about 0.35 percentage points in the second year. This effect is primarily the result of Walmart's impact on residential values in the host municipality. By contrast, a new Walmart causes a modest but consistently negative effect on growth of the tax base in the adjacent municipality across all three years that we are able to measure. In the average sized municipality for our sample, the real equalized tax base growth rate falls rate falls 0.065, 0.081, and 0.096 percentage points, respectively. This effect occurs primarily through the Walmart's impact on growth of non-residential values. The cumulative effect of this reduction in growth in the adjacent municipality is roughly two thirds of the increase in growth experienced by the home municipality.*

JEL Codes: L81, R11, R58
Keywords: Tax Base, Walmart, Retailing, Big Box

[a] Corresponding author: Donald Vandegrift, Professor of Economics, School of Business, The College of New Jersey, 2000 Pennington Rd., Ewing, NJ 08628-0718. e-mail: vandedon@tcnj.edu; phone: (609) 771-2294; fax: (609) 637-5129.

I. Introduction

Proposals to open a new Walmart have been the subject of controversy in countless communities across the nation. On one side, Walmart proponents typically argue that the new store will increase employment, attract additional commercial development, foster lower prices on consumer goods, and generate higher levels of tax revenue by increasing the tax base. In contrast, opponents contend that Walmart drives out smaller, locally owned businesses, leaving vacant tracts of property and reducing property values. Worse yet, the bankruptcies cause a decrease in wages and an increase in unemployment.

But because ultimate authority for new development typically rests with the municipal government and local planning board, the fiscal impact of the new Walmart on the municipal tax base and budget is often the focus of the debate. The tax base of a municipality, which is the total value of all taxable real estate, is the primary source of revenue to fund local services such as police, fire, school systems, sewer, garbage collection, and road maintenance. Because tax base expansion results in more revenue to fund municipal services and may even allow officials to cut the tax rate, municipal officials are often motivated by a desire to expand the tax base.

It seems obvious that the municipal tax base will rise with the construction of a Walmart because the value of the new store is added to the tax base. Indeed, the positive impact of a new Walmart on the tax base may extend beyond the direct effect of adding the value of the Walmart store to the tax base. Walmart's presence may attract other commercial and retail stores, increasing both the number of properties on the tax rolls but also the value of commercial property in the area. Because homeowners typically value convenient access to consumer goods, this retail expansion may in turn raise values of nearby residential properties. Adding to the desirability of retail expansion is the perception that Walmart and other "big-box" retailers require little in terms of public services such as sewer and garbage collection relative to their

contribution to the tax base. Thus, Walmart and other "big-box" retailers, according to Boarnet and Crane (1999) are, "often characterized as no-brainers, fiscally speaking."

Of course, opponents of Walmart are usually skeptical of such claims. Because the tax base is not only dependent on the number of properties on the tax roll but also the value of those properties, it is possible that new development can actually diminish the tax base by decreasing other property values in town (Gscottshneider 1998). Such externalities from new development may stem from developing incompatible uses in adjoining lots or from simple spillover effects that are unavoidable. For instance, a new industrial park bordering a residential neighborhood, may cause a reduction in residential values sufficient to lower the total tax base. In addition, property values may fall simply because of the noise, traffic and trash from a new retail development.

These externalities do not respect municipal borders and as a consequence the net benefits of a new Walmart may not be distributed evenly across municipalities. The nearest adjacent municipality to the new Walmart does not receive the direct benefit of adding the market value of the Walmart outlet to the tax base but may face many of its negative externalities. A Walmart in one municipality may decrease the value of other shopping centers nearby. The impact on residential property values is less obvious. However, it is possible that they may fall because negative externalities such as increased traffic, noise, and trash more than offset the benefits of access to the Walmart.

Given this, adjacent municipalities may receive little benefit from the new Walmart yet face many of the costs. Thus, Walmart's potential impact on adjacent municipalities' tax base is also a topic of controversy. Even assuming that Walmarts require few municipal services, it is not clear that Walmarts are a "no-brainer." To date, the economic literature has gathered little

evidence on this question, and as a result, decision makers have little evidence on which to base their judgments.

We choose to examine the impact of Walmart because it is the largest retailer in the U.S. and a leading practitioner of the "big box" retailing format. In fact, Walmart is the largest private employer in the U.S. with over 1.4 million employees and over 4,200 stores.[1] Our data includes 30 Walmart openings in the State of New Jersey for the period 1998-2007. As of April 2011, there were 65 Walmart stores including 43 discount stores, 10 Sam's Clubs and 12 Supercenters in the State of New Jersey.[2] The stores employed 17,361 associates and collected more than $141 million in sales tax and paid more than $45.8 million in state and local taxes in 2011.

While researchers have analyzed the impact of a Walmart on retail prices, employment levels, wages, poverty, and social capital, there is little economic literature on the effect of Walmart on the tax base. This paper seeks to augment the existing Walmart literature by assessing the impact of a new Walmart on the tax base in its home municipality and the closest adjacent municipality in the year the outlet opens as well as the two subsequent years. To better understand the mechanics of Walmart's impact on the tax base, we also examine the separate effects of Walmart on residential and non-residential values. This paper begins with a review of the currently available literature on the effect of Walmart store openings. In the subsequent section, we report the results of our panel data analysis.

We find that a new Walmart has a significant positive impact on the growth in the tax base in host municipalities the second year that it is open, but not in years one and three. In addition, the impact of the Walmart on the growth of the tax base depends on the size of the municipality. In the average sized municipality for our sample, the real equalized tax base growth rate rises only about 0.35 percentage points. This impact is primarily the result of

[1] http://walmartstores.com/pressroom/FactSheets/
[2] http://walmartstores.com/pressroom/StateByState/State.aspx?st=NJ

Walmart's impact on residential values in the host municipality. By contrast, a new Walmart causes a modest but consistently negative effect on growth of the tax base in the adjacent municipality across all three years that we are able to measure. In the average sized municipality for our sample, the real equalized tax base growth rate falls rate falls 0.065, 0.081, and 0.096 percentage points respectively. This effect occurs primarily through the Walmart's impact on growth of non-residential values. The cumulative effect of this reduction in growth in the adjacent municipality is roughly two thirds of the increase in growth experienced by the home municipality.

II. Literature Review

Several recent studies have examined Walmart's effect on the tax base, tax revenues, and residential property values (Muller and Humstone 1996; Hicks 2007; Johnson et al. 2009). However, none of these studies employ statistical designs that allow reliable inferences on the causal effect of Walmart on the tax base nor do they attempt to disaggregate this effect by analyzing the impact of Walmart on the residential and non-residential tax bases. Muller and Humstone (1996) conducted a series of case studies on three Iowa communities and nine counties in Iowa were Walmarts opened. The case studies found that Walmart initially added around $2 million to the local tax-base. However, many downtown businesses began to close following Walmart's entrance, and nearby commercial property values declined as a result.

Similarly, Johnson et al. (2009) examined the effect of 13 big box stores (5 Walmarts, 3 Kmarts, 3 Targets and 3 Best Buys) in El Paso county Colorado between 1994 and 2005. They found a $7,000 penalty for properties within 2 miles of a Walmart but a premium of $29,107 to $39,222 for properties within 2 miles of a K-mart, Target or Best Buy. The authors do not claim that Walmart in fact causes the reduction in property values. Instead, they point out that it is

possible that Walmart chooses locations in lower value neighborhoods. Thus, Walmart opponents may have it exactly backwards – low property values cause Walmarts and not the reverse.

Hicks (2007) includes better statistical controls and finds a more favorable impact from Walmart on local commercial and industrial property tax revenues. The paper analyzes Walmart's effect on county level commercial and industrial property tax revenues using a panel of Ohio's 88 counties from the years 1985 to 2003 and finds that a Walmart increases county-level property tax collections between $350,000 and $1.3 million annually. However, he points out that these estimates should be viewed with caution because he is not able to completely control for the intra-county variability in rates.

While the literature that assesses Walmart's impact on the tax base is limited, an extensive literature explores Walmart's effects on retail prices (Basker, 2005a; Hausman and Liebtag, 2007), retail sales (Stone 1997; Artz and McConnon 2001; Artz and Stone 2006; Cotton and Cachon 2007), the number of retail establishments (Hicks and Wilburn 2001; Hicks 2009; Haltiwanger et al. 2009; Paruchuri et al. 2009), employment and wages (Hicks and Wilburn 2001; Basker 2005b, Neumark et al. 2008; Hicks 2008), and poverty (Goetz and Swaminathan 2006; Hicks 2005, 2007). It is no secret that Walmart thrives by providing consumers with goods at lower prices than competitors. This strategy tends to lower prices in the markets it enters, as well as increase consumer surplus, especially for low income households (Basker, 2005a; Hausman and Liebtag, 2007).

Basker (2005a) analyzed the effect of Walmart's price-slashing strategy on retail prices in the markets it enters. Comparing the prices of 10 products in markets Walmart had entered to those where it did not, he found that Walmart's entrance into a market reduces average prices by 1.5 percent to 3 percent in the short run and up to four times that in a the long run. Hausman and

Liebtag (2007) analyzed the price reduction effect from Walmart's supercenter expansion (grocery retail) on consumer welfare and found that Walmart's Supercenters have a total compensating variation of 25 percent of food expenditures. This implies that consumers save about 25 percent of their food expenditures by shopping at Walmart than if they were to buy the same goods from other retailers. Moreover, even consumers that do not shop at Walmart receive benefits as other retailers respond to the new Walmart by cutting prices.

While several studies have shown that Walmart increases the levels of sales in a given area, these sales come at the expense of sales in adjacent areas. Stone (1997) compared the retail performance of 34 towns in Iowa that had a Walmart for 10 years or more to 15 demographically similar towns that did not have a Walmart over a ten-year period. He found that the total level of sales in Iowa towns that receive a Walmart increases every year over the ten-year period, while those nearby rural towns lose sales year after year.

In a similar vein, Artz and McConnon (2001) analyzed the average change in sales in towns with a Walmart versus those in towns without a Walmart. They found that general merchandise sales in Walmart towns nearly doubled after 5 years of receiving a Walmart compared to non-Walmart towns which only had only an 11 percent increase. This study also found that host towns trade areas increased nearly 50 percent while non-Walmart towns suffered a 6.1 percent decline in the size of their trade area.

Naturally, many people, retailers especially, are concerned that a new Walmart will decrease sales at other local retail outlets. Muller and Humstone (1996) found that 84 percent of sales at a new Walmart came at the expense of businesses in the same county. Despite increased total sales in towns with Walmarts, Stone (1997) found that many retailers lose sales to` Walmart. Sectors that are likely to benefit from the arrival of a Walmart are home furnishings, restaurants, and general merchandise. The increases in sales in a Walmart community from

general merchandise are likely to be large enough that they offset the sales losses in food, specialty stores, and other sectors (Stone 1997).

Similarly, Artz and Stone (2006) analyzed changes in retail grocery sales after a Walmart Supercenter opened in Mississippi using a difference-in-difference estimation strategy that compared host counties before and after the entrance of a Walmart Supercenter to those counties without a Walmart Supercenter. They found that a new Walmart Supercenter captured 4 percent of retail grocery sales in metropolitan areas and 17 percent in nonmetropolitan areas. Artz and McConnon (2001) also found evidence that Walmart has a negative impact on "other" stores as sales in this sector in host towns declined for three years while non-Walmart towns' sales had increased. Interestingly, Cotton and Cachon (2007) employed survey data to examine the sales of local retail businesses in towns where Walmart recently opened and found that though two-thirds had sales that declined. However, one-third actually had a growth in sales of over 21 percent. The authors attribute this growth to differentiation and niche marketing (Cotton and Cachon, 2007).

As prices and sales fall for other local businesses, we would expect a decrease in the total number of retail establishments; however, research shows mixed results. Muller and Humstone (1996) found that five years after the opening of the Walmart there was a net loss in the number of retail stores downtown, with the majority of closings in the category of general merchandise. Basker (2005b) finds that after a five-year period the average Walmart displaces 4 small (i.e., 20 or fewer employees) retailers. Medium-sized (i.e., 20-99 employees) retailers fare a bit better. After 5 years, Walmart causes a reduction of only 0.7 medium-sized retailers. By contrast, Hicks and Wilburn (2001) find the opposite result. They examined the effect of Walmart's entrance on the retail trade sector in West Virginia counties over an eight-year period. They discovered that Walmart actually causes a modest increase in the number of retail firms in the same county.

Similarly, Hicks (2009) found weak evidence that Walmart can increase the number of small firms in a county while decreasing the number in adjacent counties.

Proximity to a big-box store may also effect entry and exit rates of smaller stores. Analyzing the metropolitan Washington, D.C. region, Haltiwanger et al. (2009) contend that there is a strong negative effect on retail establishments located near (1 to 5 miles) a big-box store. Smaller stores located further away (5 to 10 miles) from big-box stores are not as negatively impacted. The size of the negative effect depends on whether or not a smaller store competes in the same retail category as the larger chains. For example, a restaurant thrives when it is located in close proximity to a Walmart or another big-box store. This is most likely due to the increase in traffic associated with the big box store.

Paruchuri et al. (2009) studied Walmart's effect on the exit and entry rates of independent retailers by zip code over a 25-year period. They conclude that in the same zip code, Walmart does not increase exit rates but rather decreases entry rates. In other words, Walmart does not drive existing businesses out of town, but rather reduces the number of new businesses. On the other hand, in zip codes adjacent to those that have a Walmart the exit rate is greater than the rate of entry.

Because Walmart has had such a large impact on the economic organization of retailing, researchers have also examined whether Walmart impacts employment in retailing. The results, however, are mixed. Hicks and Wilburn (2001) find weak statistical evidence that Walmart causes an increase in county-level retail employment. Basker (2005b) finds that in the first year after a Walmart opens, retail employment increases by 100 at the county level, however only half of these jobs remain after five years. In addition, wholesale employment decreases by 20 jobs. By contrast, Neumark et al. (2008) find that a new Walmart cuts retail employment at the county level by about 180 employees. On retail earnings, the results are also mixed. Neumark et

al. find that Walmart reduces retail earnings at the county level by about 2.8 percent but Hicks and Wilburn (2001) and Hicks (2008) find that Walmart causes a significant increase in the wages of retail employees.

As Walmart is often criticized for its low wages, meager benefits, and heavy reliance on part-time employees, it is not surprising that researchers have examined Walmart's impact on poverty. To determine the impact, Goetz and Swaminathan (2006) studied county-level family-poverty rates over an eleven-year period and found that poverty rates increased more (or decreased less) in those counties where Walmart opened a store or added more stores. They argue that poverty rates rise because Walmart creates an externality. In addition to this, Hicks (2005, 2007) finds that Walmart also increases the number of EITC claims in addition to Medicaid expenditures in a county. These findings suggest there are other costs to social programs that are associated with the presence of a Walmart.

Even if a new Walmart attracts low-wage workers, decreases the number of retail establishments, and increases the number of Medicaid claims in a county, the tax base may still rise. These studies suggest that Walmart's tax-revenue argument may not be as straightforward as formerly thought, but rather can have a range of components.

III. Data and Methods

The purpose of this paper is to analyze Walmart's effect on the growth of the real equalized tax base and on the growth of real equalized residential and non-residential property values. These growth rates were calculated using a year-over-year calculation for the entire time period (i.e., Tax Base Growth$_{it}$ = (Real Equalized Tax Base$_{it}$ – Real Equalized Tax Base$_{it-1}$)/ Real Equalized Tax Base$_{it-1}$). We analyze the growth in the tax base rather than the level of the tax base for four reasons. First, using growth rates allows us to address endogeneity concerns

between the tax base and the tax rate (Vandegrift and Lahr 2011). By lagging the growth of the tax rate, we can ensure that that the tax base is not causing changes in the tax rate as it is highly unlikely that growth in the tax base in period t could cause growth in the tax rate in period *t*-2. Endogeneity between the tax rate level and the tax base level occurs because a higher tax base allows municipalities to raise the same revenue from a lower tax rate. At the same time, higher tax rates make development less desirable and therefore depress the tax base.

Second, use of growth rates allows us to determine the effect of the Walmart entry on the tax base over time. That is, we can determine whether the Walmart provides a one-time bump (or dip) to the tax base or initiates a long-term process of growth (or decline). Third, using growth rates allows us to draw clear causal inferences about the effect of a Walmart on the tax base. We can test to ensure that Walmart is not entering slow or fast growing municipalities. That is, we can examine growth rates of the tax base prior to the date the new Walmart is built to rule out the possibility that growth or decline of the municipality causes the Walmart. We adopt a similar strategy in our analysis of the effect of a new Walmart on the residential and non-residential property values. Finally, use of growth rates allows us to correct for differences in municipality size.

To conduct the analysis, we merge data sources and construct a panel data set at the municipal level in New Jersey over a ten-year period from 1998 to 2007. The first data source includes 30 Walmart store openings that occurred in New Jersey from 1998 to 2007. The New Jersey Walmart openings were drawn from a master sheet for all Walmart openings in the United States from 1962 to January 2006 compiled by Thomas J. Holmes and posted on his internet homepage under the title, "Diffusion of Walmart and Economies of Density."[3] To identify the Walmart stores that opened in New Jersey between February 2006 to December 2007, we

[3] Retrieved from http://www.econ.umn.edu/~holmes/data/WalMart/index.html

reviewed Walmart's Annual Reports and found five additional openings in this period.[4] We then reviewed Walmart press releases for openings in New Jersey to determine where and when these openings occurred. [5] Some of the stores were opened in unincorporated areas under the jurisdiction of larger municipalities. Consequently, we contacted the relevant municipal governments to ensure that our store opening data matched the municipal tax base data. Because we calculate growth rates of the key variables and then lag some of the growth rates two years, we lose three years of observations (1998-2000).

The second data set includes data on New Jersey property tax rates, the total tax base, tax base data by development type (e.g., residential), and the equalization ratio for all 566 municipalities in New Jersey from 1998-2007. These data were obtained from the New Jersey Department of Community Affairs - Division of Local Government Services.[6] The tax rate, tax base, and residential values were all equalized using the equalization ratio. We also correct for inflation in the tax base variables using the GDP deflator (2005 dollars).

To determine the impact of a new Walmart on the tax base in its home municipality and the closest adjacent municipality, we created two dummy variables that were then transformed to take into consideration the size of the municipality. The first dummy variable, $OpnYr_{it}$, takes the value 1 in the year *t* a Walmart store opens in municipality *i* and 0 otherwise. Over the entire study period, 30 Walmarts opened and the openings are relatively evenly distributed across the time period (1998: 2, 1999: 2, 2000: 3, 2001: 3, 2002: 2, 2003: 3, 2004: 6, 2005: 4, 2006: 5, 2007: 0). The second dummy variable, $Adj\ OpnYr_{it}$, takes the value 1 for the next closest municipality in the year a Walmart opens in municipality *j*. To locate the nearest adjacent municipality to a particular Walmart, we used GoogleMaps to first locate each of the 30 Walmart

[4] Retrieved from http://walmartstores.com/media/investors/2007_annual_report.pdf; and http://walmartstores.com/sites/AnnualReport/2008/docs/wal_mart_annual_report_2008.pdf
[5] Retrieved from http://walmartstores.com/pressroom/news/
[6] Retrieved from http://www.state.nj.us/dca/lgs/taxes/taxmenu.shtml

stores previously identified. We then found the bordering municipality closest to the Walmart location. Since municipality borders are not shown in GoogleMaps, we cross-referenced with a municipality map obtained from the Office of State Planning for New Jersey.[7]

Because the impact of a Walmart on the tax base growth will vary with the size of the municipality, we transform our dummy variables to account for the size of the municipality. We expect that the impact of a Walmart will diminish in the absolute size of the tax base as well as the geographic area of the municipality. The effect of a new Walmart on growth of the tax base will be smaller in a municipality with a tax base of $50 billion than a municipality with a tax base of $50 million. Likewise, the effect of a new Walmart on growth of the tax base will be smaller in a municipality with an area of 30,000 acres than in a municipality with an area of 3,000 acres. Any impact from Walmart on property values, and therefore the tax base, likely diminishes in the distance from the Walmart. In larger municipalities, the average property will be further from the Walmart. Consequently, we divide our Walmart dummies ($OpnYr_{it}$, $Adj\ OpnYr_{it}$) by the area of municipality i to create ($OpnYr/Acres_{it}$ and $Adj\ OpnYr/Acres_{it}$). Because we wish to capture the impact of a Walmart on the growth of the tax base in years following the opening year, we also created a one- and two-year lag of $OpnYr/Acres_{it}$ and $Adj\ OpnYr/Acres_{it}$.

Using the tax rate data described above, we create two variables: the growth rate of the equalized tax rate and the level of the equalized tax rate. Each variable is lagged two years to address the endogeneity concerns discussed above. We expect a negative relation between lagged tax rate growth and the growth of the tax base variables. Growth in property tax rates should make property ownership less desirable and therefore reduce property prices. This should in turn reduce the growth of the tax base variables. The lagged tax rate level is a proxy for the

[7] http://www.nj.gov/dca/divisions/osg/docs/municipalitiesmap.pdf

quality of services offered by the municipality. Thus, we expect a positive relation between the lagged equalized tax rate and the growth of the tax base variables.

We also use high school standardized test scores to create two additional control variables: *Lang Scores* and *Lang Scores Growth*. Because the standardized test the State administers to every 11th grader in a New Jersey high school was reconfigured during the study period, we must normalize the data by year to ensure that the data are comparable across years.[8] Calculating the year-over-year growth in the normalized scores implies that we are essentially calculating growth in rank. The state reports the student pass rate by high school (not by municipality) for every high school in the state.

Because some municipalities have multiple high schools while other municipalities share a high school, the data had to be resorted. For municipalities with multiple high schools, we weight the pass rate (i.e., the percentage of students deemed "proficient") by the total student population of the respective high schools. Finally, the tests assess both math and language arts skills and, for a given high school, the pass rates on these sections are highly correlated. Consequently, we use only the language arts pass rate to construct in our regressions. The lagged test scores should show a positive effect on the growth of the tax base. The positive effect occurs because the amenity is capitalized into higher property values. In addition, the variable may serve as a proxy for the quality of municipal services more generally. Finally, we include a series of year dummies in our regressions to capture the effect of changes in macroeconomic conditions on the tax base. Thus, we estimate the following equation:

$$(1)\quad \textit{Tax Base Growth}_{it} = \gamma_1\, \textit{OpnYr}_{it,t-1,t-2} + \gamma_2\, \textit{Adj OpnYr}_{it,t-1,t-2} + \gamma_3\, \textit{Tax Rate Growth}_{it-2} + X_{it}\Gamma + \delta_t\tau + \alpha_i + u_{it} \quad \text{where } i = 1,\ldots,N \text{ (municipalities); } t = 2001,\ldots,2007 \text{ (years).}$$

[8] Until 2001, the State of New Jersey administered the High School Proficiency Test (HSPT). After 2001, the State switched to the High School Proficiency Assessment (HSPA).

X_{it} is a vector of control variables that includes the equalized tax base per acre, the equalized tax rate lagged two years, normalized standardized language test scores lagged two years, and growth in normalized standardized language test scores lagged two years. τ is a vector of time dummies; α_i accounts for municipality fixed effects; and u_{it} is the transitory error term that varies across municipalities and time-periods. We estimate similar equations for the growth in residential and non-residential tax bases. For these estimates, we simply substitute either growth in residential and non-residential tax base for the dependent variable and substitute either equalized residential values per acre or equalized non-residential values per acre for the equalized tax base per acre.

IV. Results

Table 1 shows means and standard deviations for growth in the tax base, growth in residential values, and growth in non-residential values. From column 2 we see that over the nine year period from 1999-2007 there is an average growth of about 8 percent a year in the real equalized tax base across all municipalities. The tax base growth rate rises during the early years in the study (1999-2003), levels off (2003-2006), and then falls in the final year of the study (2007). From column 3, we see that variation in the growth rates across municipalities is especially high in 2002 and 2003. From column 4, we see that growth in residential values follows the same pattern as the overall tax base growth and the variation in the growth rates is also essentially the same. This is not surprising, as residential values are about 75 percent of the total tax base. For non-residential values growth, the increase and then the decrease from the peak is more pronounced compared to the tax base growth. In addition, the variation in the growth rates is greater for non-residential values.

Table 2 displays the means and standard deviations for the independent variables. The average New Jersey municipality is about 8,400 acres but the standard deviation is large. The mean real equalized tax base per acre is roughly $570,000 but once again, there is quite a bit of variation across municipalities. Variation in the equalized property tax rate is substantially lower. Because of growth in the tax base over the period, the equalized property tax rate generally declines over the period.

Effect of Walmart on the Growth Rate of the Tax Base

To estimate the effect of Walmart openings on the growth of the tax base, controlling for the growth in the tax rate and other municipal characteristics, we run regressions based on equation (1) above. We employ a fixed-effects regression procedure (rather than random effects) based on the results of a Hausman test ($\chi^2 = 112.3$, $p < 0.001$). Column 2 of Table 3 reports the results of a fixed-effects regression with robust standard errors. However, a Wooldridge test suggests that serial autocorrelation is present ($F = 21.7$, $p < 0.001$). Based on this result and the likelihood that spatial autocorrelation is also present, we estimate the same relation as column 2 with Driscoll-Kraay standard errors.[9] The results of this estimation appear in column 3. Column 4 adds controls based on standardized test scores (*Lang Scores t-2* and *Lang Scores Growth t-2*). However, a Wooldridge test, once again, indicates the presence of serial autocorrelation ($F = 22.5$, $p < 0.001$). Consequently, we re-estimate the equation in column 4 with Driscoll-Kraay standard errors. The results appear in column 5.

From column 5 of Table 3, we see that a new Walmart in municipality *i* has no statistically significant effect on the growth in the real equalized tax base in municipality *i* the first year it is open (*OpnYr/Acres t*). However, the second year the Walmart is open the growth

[9] Driscoll and Kraay (1998) devise a covariance matrix estimation technique for panel data that produces standard error estimates that are robust to general forms of spatial and temporal dependence.

in the real equalized tax base in municipality *i* increases significantly (*OpnYr/Acres t-1*). If we evaluate the estimate at mean acreage for the data set (8,431 acres), we see that the real equalized tax base growth rate rises 0.35 percentage points (30.14/8,431). Given that average annual growth in the tax base is about 8 percent over the period, the new Walmart raises the tax base growth only an additional 4 percent (0.35/8.2).

Of course, the impact of a new Walmart is larger in smaller municipalities. For instance, if we evaluate the impact of a new Walmart in a municipality in the 10^{th} percentile (509 acres) of the size distribution, we see that the real equalized tax base growth rate rises 5.9 percentage points (30.14/509). In this case, the new Walmart increases the tax base by an additional 72 percent (5.9/8.2). On the other hand, the effect of a new Walmart on the real equalized tax base growth rate essentially disappears if we evaluate the impact of a new Walmart in a municipality in the 90^{th} percentile of the size distribution (24,183 acres). In this case, the new Walmart increases the real equalized tax base growth rate by only 0.12 percentage points (30.14/24,183). While the estimated impact of the Walmart is positive in the third year (*OpnYr/Acres t-2*), the standard error is large and the estimate cannot be statistically bounded from zero.

By contrast, the new Walmart reduces the real equalized tax base growth in the closest adjacent municipality. The effect of the Walmart on the real equalized tax base growth rate in any one year is modest. However, the effect is statistically significant across all three years. Summing the impact across all three years, eliminates about two thirds of the gains realized by the municipality where the new Walmart is built. From column 5 of Table 3, we see that a new Walmart in municipality *i* has a negative and statistically significant effect on the growth in the real equalized tax base in the next closest municipality (*Adj OpnYr/Acres*). If we evaluate the estimates for each of the three years at mean acreage for the data set (8,431 acres), we see that the real equalized tax base growth rate falls 0.065, 0.081, and 0.096 percentage points

respectively. Given that average annual growth in the tax base is about 8 percent over the period, the new Walmart reduces the tax base growth by only about 3 percent after 3 years (0.242/8.2).

If we evaluate the impact of a new Walmart on the adjacent municipality when the adjacent municipality is in the 10^{th} percentile (509 acres) of the size distribution, we see that the real equalized tax base growth rate decreases by a larger amount (4.0 percentage points) after 3 years. Thus, the new Walmart decreases the tax base growth by about 49 percent after 3 years. The effect of a new Walmart on the real equalized tax base growth rate essentially disappears if we evaluate the impact of a new Walmart for a municipality in the 90^{th} percentile (24,183 acres).

Given that the impact of a new Walmart on the adjacent municipality is significant across all three years, we test for the impact in the fourth year. While the estimate is negative, it is not statistically significant. Keeping in mind that we reduce the number of Walmarts in our sample with each lag, the result may simply reflect the limitations of the data set. Finally, we test whether Walmart chooses fast growing municipalities as locations for its outlets. We test for this effect by adding a dummy for a Walmart location in municipality *i* and then leading the variable (rather than lagging) by one year. The results (not reported) show that municipalities where Walmarts will be built do not have significantly faster (or slower) rates of growth of their real equalized tax base than municipalities where Walmarts are not built ($\beta = 0.0076$, $p = 0.17$).

Finally, we note that controls for tax rate, tax rate growth, language scores, growth in language scores, and the year dummies are statistically significant (except the dummy for 2007). Ten percent growth in the tax rate in year *t*-2 reduces growth in the tax base after two years by 0.68 percentage points. By contrast, a tax rate level that is higher by one dollar in year *t*-2 is associated with a tax base growth rate that is 6.8 percentage points higher. This likely captures the higher levels of municipal services are associated with higher growth. Likewise, higher language scores in year *t*-2 are associated with more growth in the tax base. An increase of one

standard deviation in language scores increases growth rate the tax base 1.1 percent percentage points. Finally, growth in language scores causes a reduction in tax base growth. This result is somewhat surprising but is likely the result of the fact that we normalized the test scores across years. Thus, the variable reflects changes in rank over time. Because low ranked schools are more able to improve their rank and these low ranked areas have less tax base growth, we find a negative effect.

Effect of Walmart on the Growth Rate of Residential and Non-Residential Values

To better understand the mechanism through which a new Walmart increases the tax base in its home municipality and reduces the tax base in the nearest adjacent municipality, we disaggregate the tax base into residential and non-residential components. The results on the regressions on the growth of residential values by municipality are reported in Table 4. The non-residential estimates are shown in Table 5. For consistency, Tables 4 and 5 repeat the same basic specifications as Table 3. In the case of Table 4, we substitute the real equalized growth rate of residential values (dependent variable) for the real equalized growth rate of the tax base. We also substitute the real equalized residential value per acre for the real equalized tax base per acre on the right-hand side of the equation. In the case of Table 5, we substitute the real equalized growth rate of non-residential values (dependent variable) for the real equalized growth rate of the tax base and we substitute the real equalized non-residential value per acre for the real equalized tax base per acre on the right-hand side of the equation.

The fixed effects estimates reported in columns 2 and 4 of Table 4 show evidence of serial correlation ($F = 11.33$, $p = 0.001$; $F = 11.61$, $p = 0.001$) but the fixed effects estimates reported in columns 2 and 4 of Table 5 do not ($F = 0.943$, $p = 0.33$; $F = 0.968$, $p = 0.33$). Even though the estimates in Table 5 show no evidence of autocorrelation, we follow the pattern

established in Table 3 and report both fixed effects estimates with both robust standard errors and Driscoll-Kraay standard errors. We prefer the Driscoll-Kraay standard errors even for the Table 5 estimates because spatial autocorrelation may bias the robust standard errors even if there is no serial correlation.

From column 5 of Table 4 we see that we see that a new Walmart in municipality *i* has no statistically significant effect on the growth in the real equalized residential values in municipality *i* in either the first year it is open (*OpnYr/Acres t*) or in the third year (*OpnYr/Acres t-2*). However, the second year the Walmart is open the growth in the real equalized residential values in municipality *i* increase significantly (*OpnYr/Acres t-1*). If we evaluate the estimate at mean acreage for the data set (8,431 acres), we see that the real equalized residential values growth rate rises 0.45 percentage points (38.01/8,431). Given that average annual growth in the tax base is about 8.6 percent over the period, the new Walmart raises the tax base growth only an additional 5.2 percent (0.45/8.6).

From column 5 of Table 5 we see that a new Walmart in municipality *i* has a statistically significant effect on the growth in the real equalized non-residential values in municipality *i* only in the first year it is open (*OpnYr/Acres t*). This is no doubt the direct impact of adding the value of Walmart property to the tax base (as opposed to changes in property values in proximity to the Walmart). If we evaluate the estimate at mean acreage for the data set (8,431 acres), we see that the real equalized residential values growth rate rises 0.32 percentage points (28.68/8,431). Despite this, we find no subsequent impact from the Walmart on the non-residential equalized tax base growth (*OpnYr/Acres t-1* and *OpnYr/Acres t-2*).

Taken together with the results for the *OpnYr/Acres* estimates in Tables 3 and 4, this result suggests that the impact of the Walmart on the tax base is primarily from the Walmart's impact on residential values. Recall that: 1) only *OpnYr/Acres t-1* was significant in the tax base

estimates and the residential value estimates; 2) the magnitude of the *OpnYr/Acres t-1* estimate is slightly higher in the residential values estimates; and 3) residential values are about 75 percent of the total tax base on average. While the *OpnYr/Acres t* is significant in the non-residential equation, the effect is essentially buried in the total tax base likely because the non-residential base is only about 25 percent of the total tax base.

A somewhat different picture emerges for the impact of a new Walmart on the closest adjacent municipality. From column 5 of Table 4 we see that a new Walmart in municipality *i* has no statistically significant effect on the growth in the real equalized residential values in the adjacent municipality in the first year it is open (*OpnYr/Acres t*). In the second and third years the effect is statistically significant but the parameter estimates have different signs. As a consequence the net effect of the Walmart on residential values in the adjacent municipality is close to zero. If we evaluate the estimate for the second year (*OpnYr/Acres t-1*) at the mean acreage for the data set (8,431 acres), we see that the real equalized residential values growth rate rises 0.21 percentage points (17.76/8,431). If we evaluate the estimate for the third year (*OpnYr/Acres t-2*) at mean acreage for the data set, we see that the real equalized residential values growth rate falls 0.13 percentage points (11.18/8,431). One possible interpretation of this result is that proximity to the Walmart initially raises residential values but the subsequent loss of local businesses from the Walmart lowers the values.

Thus, the negative and significant effects of a new Walmart on the overall tax base of the closest adjacent municipality in years one and two are primarily the result of the impact of the Walmart on the growth rate of the equalized non-residential tax base. From column 5 of Table 5 we see that a new Walmart in municipality *i* has a statistically significant and negative effect on the growth in the real equalized non-residential values in the adjacent municipality in the first year it is open (*Adj OpnYr/Acres t*) and in the second year (*Adj OpnYr/Acres t-1*). If we evaluate

the estimate for the first and second years at the mean acreage for the data set, we see that the real equalized non-residential values growth rate rises 0.06 and 0.1 percentage points, respectively (5.25/8,431 and 8.62/8.431). Given the estimates in Table 3 and that the non-residential base is on average only about a quarter of the total tax base, we would expect these estimates to be a bit higher.

Looking across Tables 4 and 5 we can see that the controls are more often significant in the non-residential estimates. First, the non-residential base is more sensitive to changes in the tax rate. A ten percent increase in the tax rate in year *t*-2 reduces the growth in non-residential values after two years by 0.11 percentage points. For the residential values, growth in the tax rate is not significant. The tax rate level also produces a stronger effect in the non-residential estimates. A tax rate level that is higher by one dollar in year *t*-2 is associated with growth in the non-residential values that is 9.1 percentage points higher but that same one dollar increase causes an increase of only 5.5 percentage points in the case of the residential values. While the level of residential values has no effect on the growth of residential values, the level of non-residential values has a significant positive impact on the growth of non-residential values. This suggests non-residential development clusters but residential development does not. However, the effect of the level of non-residential values on the growth of non-residential values is modest: a $100,000 increase the non-residential values per acre raises the growth rate by only 0.027 percentage points.

Finally, the level of language test scores and the growth in language test scores exert a stronger effect on non-residential growth. An increase of one standard deviation in language scores increases the growth of non-residential values by 2.0 percentage points but has no impact on the growth of the residential values. Growth in language scores causes a statistically significant reduction in growth across both residential and non-residential values; however, the

effect in each case is very small. Ten percent growth in language scores reduces residential value growth by 0.0064 percent and non-residential values growth by 0.0075 percent.

V. Conclusion

Municipal governments often wrestle with the fiscal implications of a new Walmart. Proponents argue that the new Walmart will expand the tax base both directly and indirectly. Direct effects follow from adding the market value of the Walmart outlet to the tax base and indirect effects follow from the convenient access to low prices on a wide range of consumer goods. Because indirect effects are typically capitalized into house prices, they also add to the tax base. By contrast, opponents contend that the indirect effects of Walmart are generally negative. In their view, residential property values will fall because the Walmart will cause congestion, noise, and trash. Worse yet, competition from Walmart will drive other local also retailers into bankruptcy.

Following the contours of this debate, this paper measures the impact of 30 Walmart openings on the growth of the municipal tax base across a three-year period using panel data for New Jersey municipalities from 1998-2007. Because the nearest adjacent municipality to the new Walmart does not receive the direct benefit of adding the market value of the Walmart outlet to the tax base, we assess the impact of the Walmart in its home municipality and the closest adjacent municipality. To better understand the mechanics of Walmart's impact on the tax base, we also decompose the tax base into residential and non-residential values.

We find that a Walmart has a significant positive impact on the growth in the tax base in host municipalities the second year that it is open, but not in years one and three. In addition, the impact of the Walmart on the growth of the tax base depends on the size of the municipality. In the average sized municipality for our sample, the real equalized tax base growth rate rises only

about 0.35 percentage points. If we evaluate the impact of a new Walmart in a municipality in the 10th percentile (509 acres) of the size distribution, we see that the real equalized tax base growth rate rises 5.9 percentage points.

However, much of the increase in growth in the home municipality is offset by decreases in growth in the closest adjacent municipality. We find that the new Walmart causes a modest but consistently negative effect on growth of the tax base in the adjacent municipality across all three years that we are able to measure. In the average sized municipality for our sample, the real equalized tax base growth rate falls rate falls 0.065, 0.081, and 0.096 percentage points respectively. Thus, the cumulative effect of the reduction in growth is roughly two thirds of the increase in growth experienced by the home municipality.

If we decompose the tax base into residential and non-residential values, we can identify the source of the impact on the tax base growth from a new Walmart. We find that the source of the impact varies depending on whether we are considering the impact on the home municipality or the closest adjacent municipality. As noted above, we find a positive effect on tax base growth for the home municipality in the second year the Walmart is open. This impact is primarily the result of Walmart's impact on residential values. We are able to identify a direct effect from the Walmart on the growth of non-residential values the first year the Walmart is open in the home municipality. However, this direct effect is not manifest in the growth of the overall tax base the first year the Walmart is open.

By contrast, the tax base impact of a new Walmart on the closest adjacent municipality occurs primarily through the Walmart's impact on growth of non-residential values. The negative and significant effects of a new Walmart on the overall tax base of the closest adjacent municipality in years one and two are primarily the result of the impact of the Walmart on the growth rate of the non-residential values. This suggests that the impact of the Walmart on the

closest adjacent municipality is not primarily from trash, noise and congestion but rather its impact on local businesses.

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Table 1. Descriptive Statistics for Real Equalized Tax Base Growth, Real Equalized Residential Value Growth, and Real Equalized Non-Residential Value Growth

	Tax Base Growth[a]		Residential Values Growth[b]		Non-Residential Values Growth[c]	
Year	*Mean*	*Std. Dev.*	*Mean*	*Std. Dev.*	*Mean*	*Std. Dev.*
1999	0.0256	0.0384	0.0276	0.0595	0.0131	0.0611
2000	0.0444	0.0521	0.0499	0.0537	0.0275	0.0682
2001	0.0718	0.0585	0.0747	0.0621	0.0619	0.0707
2002	0.0961	0.1329	0.1008	0.1365	0.0781	0.1312
2003	0.1173	0.1464	0.1210	0.1441	0.1018	0.1676
2004	0.1076	0.0619	0.1109	0.0675	0.0955	0.1361
2005	0.1186	0.1032	0.1244	0.1032	0.0966	0.1377
2006	0.1084	0.0641	0.1191	0.0705	0.0890	0.1160
2007	0.0443	0.0494	0.0520	0.0552	0.0253	0.0792
1999-2007	0.0816	0.0930	0.0867	0.0937	0.0654	0.1181
n	5076		5057		5066	

[a] Tax Base Growth = (Real Equalized Tax Base$_{it}$ – Real Equalized Tax Base$_{it-1}$)/ Real Equalized Tax Base$_{it-1}$ for municipality *i* in period *t* (GDP deflator, 2005 dollars).

[b] Residential Values Growth = (Real Equalized Residential Values$_{it}$ – Real Equalized Residential Values$_{it-1}$) / Real Equalized Residential Values$_{it-1}$ for municipality *i* in period *t* (GDP deflator, 2005 dollars).

[c] Non-Residential Values Growth = (Real Equalized Non-Residential Values$_{it}$ – Real Equalized Non-Residential Values$_{it-1}$)/ Real Equalized Non-Residential Values$_{it-1}$ for municipality *i* in period *t* (GDP deflator, 2005 dollars).

Table 2. Means and Standard Deviations for Independent Variables

Variable	n	Mean	Standard Deviation
Acres[a]	563	8,431.8	11,724.6
Tax Base per Acre[b]	5630	570.32	774.84
Res Val per Acre[c]	5629	429.48	615.38
Non-res Val per Acre[d]	5629	140.93	246.14
Tax Rate[e]	5630	2.248	0.8416
Tax Rate Growth[f]	5067	-0.0347	0.0815
Lang Scores[g]	5630	-0.0000899	0.9994
Lang Scores Growth[h]	5067	-0.1282	9.74

[a] $Acres_i$ = total area in municipality *i* (measured in acres).
[b] Tax Base per $Acre_{it}$ = total real equalized tax base in municipality *i* in year *t* divided by total acres in municipality *i* (in thousands of 2005 dollars, GDP deflator).
[c] Residential Value per $Acre_{it}$ = total real equalized residential property value in municipality *i* in year *t* divided by total acres in municipality *i* (in thousands of 2005 dollars, GDP deflator).
[d] Non-res Value per $Acre_{it}$ = total real equalized non-residential property value in municipality *i* in year *t* divided by total acres in municipality *i* (in thousands of 2005 dollars, GDP deflator).
[e] Tax $Rate_{it}$ = total equalized property tax rate per $100 of assessed value for municipality *i* in year *t*.
[f] Tax Rate Growth = (Tax $Rate_{it}$ – Tax $Rate_{it-1}$)/ Tax $Rate_{it-1}$ for municipality *i* in period *t*.
[g] Lang Scores = normalized language score on the 11th grade New Jersey High School Proficiency Assessment (HSPA) test for municipality *i* in period *t.*
[h] Lang Scores Growth = (Normalized Language $Score_{it}$ – Normalized Language $Score_{it-1}$)/ Normalized Language $Score_{it-1}$ for municipality *i* in period *t* (GDP deflator, 2005 dollars).

Table 3. Regressions for Growth of the Tax Base

	Tax Base Growth	Tax Base Growth	Tax Base Growth	Tax Base Growth
Constant	-0.119***	-0.119*	-0.120***	-0.120*
	(0.0301)	(0.0690)	(0.0302)	(0.0690)
Tax Rate Growth t-2	-0.0688**	-0.0688*	-0.0676**	-0.0676*
	(0.0305)	(0.0394)	(0.0304)	(0.0385)
Tax Rate t-2	0.0679***	0.0679***	0.0683***	0.0683***
	(0.0104)	(0.0206)	(0.0104)	(0.0210)
Tax Base per Acre	0.000041***	0.000041	0.000041***	0.000041
	(0.000013)	(0.000043)	(0.000013)	(0.000043)
OpnYr/Acres t [a]	9.14	9.14	8.11	8.11
	(16.69)	(10.65)	(15.72)	(10.61)
OpenYr/Acres t-1	38.03	38.03***	30.14	30.14*
	(28.18)	(14.59)	(25.31)	(16.01)
OpenYr/Acres t-2	17.83	17.83	15.13	15.13
	(39.92)	(23.17)	(38.42)	(23.43)
Adj OpenYr/Acres t [b]	-4.89***	-4.89**	-5.46***	-5.45***
	(1.99)	(2.08)	(2.08)	(1.89)
Adj OpenYr/Acres t-1	-4.82	-4.82	-6.89**	-6.89**
	(3.24)	(3.45)	(3.54)	(2.97)
Adj OpenYr/Acres t-2	-6.97***	-6.97*	-8.06***	-8.06**
	(2.01)	(3.93)	(2.04)	(3.94)
Lang Scores t-2			0.011**	0.011*
			(0.0056)	(0.0061)
Lang Scores Growth t-2			-0.00065	-0.00065***
			(0.00058)	(0.00023)
2002 dummy [c]	0.0231***	0.0231***	0.0227***	0.0227***
	(0.0054)	(0.0020)	(0.0054)	(0.0021)
2003 dummy	0.0456***	0.0456***	0.0441***	0.0441***
	(0.0062)	(0.0041)	(0.0061)	(0.0045)
2004 dummy	0.0378***	0.0378***	0.0375***	0.0375***
	(0.0038)	(0.0057)	(0.0038)	(0.0058)
2005 dummy	0.0516***	0.0516***	0.0514***	0.0514***
	(0.0054)	(0.0081)	(0.0051)	(0.0082)
2006 dummy	0.0456***	0.0456***	0.0461***	0.0461***
	(0.0061)	(0.0103)	(0.0061)	(0.0101)
2007 dummy	-0.010	-0.010	-0.010	-0.010
	(0.0067)	(0.0102)	(0.0068)	(0.0102)
R^2 (within)	0.10	0.10	0.10	0.10
n	3941	3941	3941	3941

*Significant at 0.1 level **Significant at 0.05 level ***Significant at 0.01 level
Robust standard errors for regressions in columns 2 and 4. Driscoll-Kraay standard errors for regressions in column 3 and 5.

[a] OpnYr/Acres t = dummy variable indicating whether a Walmart opened in municipality i in year t divided by the area of municipality i measured in acres.
[b] Adj OpnYr/Acres t = dummy variable indicating the closest municipality i to the home municipality in which a Walmart opened in year t divided by the area of municipality i measured in acres.
[c] 2002-2007 dummy = dummy variable indicating year.

Table 4. Regressions for the Growth of Residential Values

	Res Value Growth	Res Value Growth	Res Value Growth	Res Value Growth
Constant	-0.0758***	-0.0758	-0.077***	-0.077
	(0.0295)	(0.0566)	(0.0295)	(0.0569)
Tax Rate Growth t-2	-0.0510**	-0.0510	-0.0498**	-0.0499
	(0.0251)	(0.0334)	(0.0248)	(0.0331)
Tax Rate t-2	0.055***	0.055***	0.0554***	0.0554***
	(0.0105)	(0.0169)	(0.0105)	(0.0170)
Res Val per Acre	0.000033**	0.000033	0.000033**	0.000033
	(0.000015)	(0.000052)	(0.000015)	(0.000052)
OpnYr/Acres t	1.02	1.02	0.182	0.182
	(20.02)	(13.06)	(19.34)	(12.71)
OpenYr/Acres t-1	44.71*	44.71***	38.01	38.01**
	(25.87)	(14.46)	(23.80)	(16.15)
OpenYr/Acres t-2	22.53	22.53	20.75	20.75
	(36.02)	(14.77)	(35.59)	(15.78)
Adj OpenYr/Acres t	2.59	2.59	2.3	2.30
	(9.18)	(3.65)	(9.50)	(3.51)
Adj OpenYr/Acres t-1	18.93**	18.93**	17.76**	17.76***
	(8.81)	(5.94)	(8.96)	(5.89)
Adj OpenYr/Acres t-2	-8.84	-8.84**	-11.18	-11.18**
	(11.40)	(4.94)	(11.63)	(4.87)
Lang Scores t-2			0.0078	0.0078
			(0.0057)	(0.0071)
Lang Scores Growth t-2			-0.00064	-0.00064***
			(0.00060)	(0.00022)
2002 dummy	0.0256***	0.0256***	0.0253***	0.0253***
	(0.0056)	(0.0019)	(0.0057)	(0.0020)
2003 dummy	0.0472***	0.0473***	0.0458***	0.0458***
	(0.0061)	(0.0040)	(0.0060)	(0.0044)
2004 dummy	0.0393***	0.0393***	0.0391***	0.0391***
	(0.0039)	(0.0059)	(0.0040)	(0.0060)
2005 dummy	0.0556***	0.0556***	0.0555***	0.0555***
	(0.0047)	(0.0085)	(0.0048)	(0.0086)
2006 dummy	0.0544***	0.0544***	0.0548***	0.0548***
	(0.0063)	(0.0109)	(0.0064)	(0.0110)
2007 dummy	-0.0056	-0.0056	-0.0056	-0.0056
	(0.0071)	(0.0114)	(0.0072)	(0.0114)
R^2 (within)	0.09	0.09	0.10	0.10
N	3934	3934	3934	3934

*Significant at 0.1 level **Significant at 0.05 level ***Significant at 0.01 level
Robust standard errors for regressions in columns 2 and 4. Driscoll-Kraay standard errors for regressions in column 3 and 5.

Table 5. Regressions for Growth of Non-residential Values

	Non-Res Growth	Non-Res Growth	Non-Res Growth	Non-Res Growth
Constant	-0.201***	-0.201***	-0.200***	-0.200***
	(0.0321)	(0.0436)	(0.0316)	(0.0447)
Tax Rate Growth t-2	-0.111***	-0.111***	-0.109***	-0.109***
	(0.0397)	(0.0416)	(0.0397)	(0.0399)
Tax Rate t-2	0.0909***	0.0909***	0.0908***	0.0908***
	(0.0111)	(0.0150)	(0.0109)	(0.0154)
Non-Res Val per Acre	0.000273***	0.000273***	0.000270***	0.000270***
	(0.000056)	(0.000091)	(0.000055)	(0.000092)
OpnYr/Acres t	30.38	30.38**	28.68	28.68*
	(23.46)	(14.44)	(21.82)	(16.22)
OpenYr/Acres t-1	22.54	22.54	10.73	10.73
	(37.33)	(16.11)	(32.13)	(16.38)
OpenYr/Acres t-2	43.67	43.67	38.39	38.39
	(80.49)	(57.39)	(76.65)	(55.56)
Adj OpenYr/Acres t	-4.33	-4.33*	-5.25*	-5.25***
	(2.95)	(2.31)	(3.09)	(2.02)
Adj OpenYr/Acres t-1	-5.71	-5.71	-8.62**	-8.62**
	(3.68)	(4.05)	(4.03)	(3.56)
Adj OpenYr/Acres t-2	-19.34*	-19.34	-23.69**	-23.69
	(11.62)	(17.08)	(11.53)	(16.99)
Lang Scores t-2			0.0201***	0.0201***
			(0.0081)	(0.0081)
Lang Scores Growth t-2			-0.00075	-0.00075***
			(0.00063)	(0.00025)
2002 dummy	0.0143***	0.0143***	0.0140***	0.0140***
	(0.0058)	(0.0010)	(0.0059)	(0.0011)
2003 dummy	0.0391***	0.0391***	0.0376***	0.0376***
	(0.0076)	(0.0025)	(0.0074)	(0.0029)
2004 dummy	0.0353***	0.0353***	0.0352***	0.0352***
	(0.0064)	(0.0034)	(0.0065)	(0.0035)
2005 dummy	0.0400***	0.0400***	0.0400***	0.0400***
	(0.0060)	(0.0052)	(0.0060)	(0.0053)
2006 dummy	0.0379***	0.0379***	0.0387***	0.0387***
	(0.0072)	(0.0071)	(0.0072)	(0.0070)
2007 dummy	-0.0142**	-0.0142*	-0.0140**	-0.0140*
	(0.0072)	(0.0082)	(0.0072)	(0.0082)
R^2 (within)	0.07	0.07	0.08	0.08
n	3934	3941	3941	3941

*Significant at 0.1 level **Significant at 0.05 level ***Significant at 0.01 level.
Robust standard errors for regressions in columns 2 and 4. Driscoll-Kraay standard errors for regressions in column 3 and 5.