The Effect of Wal-Mart on Residential and Commercial Property Values: Evidence from New Jersey

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Abstract: *Wal-Mart openings are a frequent source of controversy. Homeowners worry that traffic and noise from the Wal-Mart will decrease property values and local businesses fear that Wal-Mart will drive them into bankruptcy. While there is significant economic literature on the effect of Wal-Mart, there is no analysis of the effect of the retail giant on the tax base. This paper expands on the currently available literature by examining the effect of Wal-Mart stores on the tax base. Using panel data analysis, we measure the impact of 30 Wal-Mart openings on the municipal tax base in New Jersey over a ten-year period from 1998-2007. We gauge the impact of Wal-Mart on the municipalities they locate in as well as adjoining municipalities. Because Wal-Mart may exert differing effects on residential and commercial sectors, we undertake separate analyses of the impact of Wal-Mart on the residential and commercial tax bases. Finally, we correct for endogeneity between the tax rate, our control variable, and the tax base by using high school test scores. Our results indicate that Wal-Mart store openings do not have an effect on the growth in the tax base in host or adjacent municipalities in either the first year or subsequent years. We also find no evidence that Wal-Mart has an effect on residential or commercial property values.*

I. Introduction

The planned development of a Wal-Mart has been the subject of controversy in countless communities across the nation. On one side, proponents of Wal-Mart argue that it will bring an increase in jobs, attract other commercial development, bring lower prices and generate higher levels of tax revenue. On the other hand, opponents believe that Wal-Mart drives out smaller, locally owned businesses leaving vacant tracts of property while adversely affecting property values, in addition to decreasing wages and diverting money from the local economy.

These are concerns not only of a town's populace, but also must be considered seriously by local officials who must act in the best interest of their citizens. The choice to pursue the development of a Wal-Mart in a town, or any development for that matter, is influenced by the social and fiscal impact it will likely have on the town. It would seem that a town's tax revenues will almost certainly increase with the addition of a Wal-Mart. The property itself would add to the tax base. In addition, access to convenient shopping may raise values of nearby residential properties. To date, the economic literature has gathered little evidence on this question, and as a result, decision makers have little on which to base their judgment.

The tax base of a municipality, which is the total value of all real estate, is the primary source of revenue to fund local services such as police, fire, school systems, sewer, garbage collection, and road maintenance. Pressures to not only maintain these services but improve upon them are constant and increasing the tax base is a primary route to achieving this target. The addition of a 100,000+ square foot commercial retail building to the tax rolls is a clear way to increase the tax base. Moreover, it is a generally believed that Wal-Mart and other "big-box" retailers require little in terms of public services such as sewer and garbage collection while contributing heavily to the tax base. Thus, Wal-Mart and other "big-box" retailers, according to

Boarnet and Crane (1999) are, "often characterized as no-brainers, fiscally speaking." Even assuming that Wal-Mart did cost very little in terms of municipal services, it is a misconception that Wal-Marts are a "no-brainer" even when only viewed in a fiscal light.

What is often overlooked or perhaps forgotten in this assertion is that the tax base is not only dependent on the number of properties on the tax roll but also the value of those properties. Often times, new real estate development will expand the tax base. However, Gscottshneider (1998) points out that in some instances new development can actually diminish the tax base by decreasing other property values in town. For instance, a new shopping center may decrease the property value of other nearby shopping centers. In addition, a new development placed near an incompatible use, such as an industrial park bordering a residential neighborhood, may cause a reduction in residential values sufficient to lower the total tax base. Property values may fall simply because of the noise, traffic and trash from a Wal-Mart. Lastly, a municipality may focus too much on new development and neglect existing properties, to such a degree that total property values fall. No matter the case, the possibility that the tax base can contract with new development is often not realized and the repercussions could be costly.

Of course, as many local officials, economic development professionals, and Wal-Mart proponents would contend, is that there is also the (greater) possibility that development can have a larger positive impact on the tax base than anticipated. Wal-Mart's presence may attract other commercial and retail stores, increasing both the number of properties on the tax roll but also the value of commercial property in the area. Furthermore, some might consider the low-price and convenience of a nearby Wal-Mart as an asset that augments residential property values as well.

Furthermore, a Wal-Mart's effects may spillover into adjacent municipalities. A Wal-Mart in one municipality may decrease the value of other shopping centers nearby. On the other hand, commercial property values in adjacent towns might grow because Wal-Mart attracts more economic activity to the region and they stand to benefit. The impact on residential property values is less obvious. However, it is possible that they may rise because those nearby can enjoy Wal-Mart's convenience and savings, yet are not subjected to its potential negative externalities such as increased traffic, noise, and trash. Likewise, because of Wal-Mart's potential impact on adjacent municipalities' tax base, this should be considered as well.

Researchers have analyzed the impact of a Wal-Mart on retail prices, employment levels, wages, poverty, and social capital. Despite this, the effect of Wal-Mart on the tax base, and more specifically, on residential and commercial property values has not been adequately researched. Moreover, many developers and local officials believe that a Wal-Mart will expand the tax base and increase tax revenues though there is little empirical evidence to suggest that this is the case. This paper seeks to augment the existing Wal-Mart literature by assessing the impact of a new Wal-Mart on the tax base in its home municipality and the closest adjacent municipality. To better understand the mechanics of Wal-Mart's impact on the tax base, we also examine the separate effects of Wal-Mart on the residential and commercial tax bases.

II. Literature Review

The earliest studies assessed Wal-Mart's effect on sales and the number of firms in regions surrounding Wal-Mart. Subsequent literature analyzed Wal-Mart's effect on prices, employment levels, wages, poverty, and social capital. More recently, studies have included Wal-Mart's effect on the tax base, property tax assessments, and one even analyzed its effect on

residential property values. However, none of these studies adequately analyze the effect on a municipality's tax base nor do they attempt to disaggregate this effect by analyzing the impact of Wal-Mart on the commercial and residential tax bases.

Several previous studies analyzed Wal-Mart's impact on local revenues and property values. Muller and Humstone (1996) conducted a series of case studies on three Iowa communities and nine counties in Iowa were Wal-Marts recently opened. The case studies found that Wal-Mart initially added around $2 million to the local tax-base. However, many downtown businesses began to close following Wal-Mart's entrance, and nearby commercial property values declined as a result. Likewise, a case study by Johnson, Lybecker, Gurley, and Stiller-Shulman (2009) examined the effect of a Wal-Mart's entrance on residential property values in five Colorado communities and found that proximity to a Wal-Mart decreases residential property value. However, they also find evidence of the possibility that the convenience of being in close proximity to the store may outweigh the negative effect on property values in some instances. The authors make no case for causality but they do suggest that it is plausible that Wal-Mart chooses locations in lower value neighborhoods suggesting that opponent's blame on declining values is perhaps backwards. While these results suggest that Wal-Mart likely has an effect on the tax base and property values, the small scale of the study and lack of rigorous statistical controls renders the conclusions suspect.

Hicks (2007) includes better statistical controls and finds a more favorable impact from Wal-Mart on local commercial and industrial property tax revenues. The paper analyzes Wal-Mart's effect on county level commercial and industrial property tax assessments using a panel of Ohio's 88 counties from the years 1985 to 2003 and finds that a Wal-Mart 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.

Most recently, Kababik (2010) assessed Wal-Mart's effect on the tax-base of host and adjoining Wal-Mart municipalities in New Jersey. The study found that the tax base of host towns increases 1.5 percent after the first year and 1.2 percent after the second year. For adjoining municipalities, there is no initial effect, yet in the second year there is a 1.8 percent growth in the tax-base. However, there is a question to the strength of the findings as he acknowledges concern over a lack of instrumentation for the tax rate which is endogenous with the tax base. Furthermore, there are concerns about his data as he fails to include Wal-Mart openings at the beginning and end of his dataset.

While the literature that assesses Wal-Mart's impact on the tax base is limited, an extensive literature explores Wal-Mart's effects on retail prices, employment levels, wages, poverty, and social capital. It is no secret that Wal-Mart 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 Wal-Mart's price-slashing strategy on retail prices in the markets it enters. Comparing the prices of 10 products in markets Wal-Mart had entered to those where it did not, he found that Wal-Mart'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 due to Wal-Mart's Supercenter expansion (grocery retail) on consumer welfare and found that Wal-Mart's Supercenters have a total compensating variation of 25% of food expenditures, mainly providing benefits to lower-income households. This means that consumers save about 25

percent of their food expenditures by shopping at Wal-Mart than if they were to buy the same goods from other retailers. These findings may concern businesses and residents alike, as local businesses can struggle to compete with lower prices and residents can be apprehensive about lower-income residents coming to their towns.

Businesses fear they will lose sales to Wal-Mart and studies show that these fears are not unfounded. While many studies have shown that Wal-Mart increases the levels of sales in a given area, these sales come at the expense of adjacent areas. Stone (1997) compared the retail performance of 34 towns in Iowa that had a Wal-Mart for 10 years or more to 15 demographically similar towns that did not have a Wal-Mart over a ten-year period. His study found that the total level of sales in Iowa towns that receive a Wal-Mart increases every year over the ten-year period, while those nearby rural towns lose sales year after year. Another study analyzed the average change in sales in towns with Wal-Mart versus those in towns without Wal-Mart and found that general merchandise sales in Wal-Mart towns nearly doubled after 5 years of receiving a Wal-Mart in comparison to non-Wal-Mart towns which only had an 11% increase (Artz & McConnon, 2001). This study also found that host towns trade areas increased nearly 50% while non-Wal-Mart towns suffered a 6.1% decline in their trade area size.

Naturally, many people, retailers especially, are concerned that a new Wal-Mart will decrease sales at their other retailers. Muller and Humstone (1996) found that 84 percent of sales at a new Wal-Mart came at the expense of businesses in the same county. Despite increased total sales in towns with Wal-Marts, Stone (1997) found that many retailers lose out on sales in other sectors. Sectors that are likely to benefit from the arrival of a Wal-Mart are home furnishings, restaurants, and of course general merchandise (Stone 1997). The increases in sales in a Wal-

Mart 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 the opening of Wal-Mart Supercenters in markets in Mississippi using a difference-in-differences estimation strategy that compared host counties before and after the entrance of a Wal-Mart Supercenter to those counties without a Wal-Mart Supercenter. They found that the entrance of Wal-Mart Supercenters on retail grocery sales in metropolitan and nonmetropolitan areas captures 4% and 17% of existing food sales, respectively. Artz and McConnon (2001) also found evidence that Wal-Mart has a negative impact on "other" stores as sales in this sector in host towns declined for three years while non-Wal-Mart towns' sales had increased. Interestingly, Cotton and Cachon (2007) employed survey data to examine the sales of local retail businesses in towns where Wal-Mart recently opened and found that though two-thirds had sales that declined. However, one-third actually had a growth in sales of over 21%. 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 Wal-Mart there was a net loss in the number of retail stores downtown, with the majority of closings in the category of general merchandise. Hicks and Wilburn (2001) examined the effect of Wal-Mart's entrance on the retail trade sector in West Virginia counties over an eight-year period. Surprisingly, they discovered that Wal-Mart actually causes a modest increase in the number of retail firms in the same county. Similarly, Hicks (2009) found weak evidence that Wal-Mart can increase the number of small firms in a county while decreasing the number in adjacent counties. Paruchuri, Baum, and Potere

(2009) studied Wal-Mart'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, Wal-Mart does not increase exit rates but rather decreases entry rates. In other words, it does not drive businesses out of town, but rather restricts the opening of new ones. On the other hand, in zip codes adjacent to those that have a Wal-Mart the exit rate is greater than the rate of entry.

In addition to changes in the number of businesses, Wal-Mart's price-cutting techniques have led many to question its impact on employment and wages. Despite the extensive literature, the results are mixed. Basker (2005b) finds that in the first year after a Wal-Mart opens, retail employment increases by 100 on the county level, however only half of these jobs remain after five years. In addition, wholesale employment decreases by 20 jobs. Hicks and Wilburn (2001) find weak statistical evidence that Wal-Mart causes an increase in county-level retail employment. Other studies have found that Wal-Mart reduces retail employment on the county level (Neumark et al., 2008; Hicks 2008). While Neumark et al. (2008) find that Wal-Mart reduces retail earnings in a county, two studies find a significant increase in the wages of retail employees (Hicks and Wilburn, 2001; Hicks, 2008).

As Wal-Mart is often criticized for its low wages, meager benefits, and heavy reliance on part-time employees, it is not surprising that researchers have examined Wal-Mart'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 had greater increases (or smaller decreases) in those counties where Wal-Mart opened a store or added more stores. They argue that poverty rates rise because Wal-Mart creates an externality. In addition to this, Hicks (2005, 2007) finds that Wal-Mart 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 Wal-Mart.

Even if a new Wal-Mart 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 Wal-Mart's tax-revenue argument may not be as straightforward as formerly thought, but rather can have a range of components. Hence, the purpose of this paper is to analyze Wal-Mart's effect on the tax base and on residential and commercial property values. It will do so by instrumenting for the tax rate due to its simultaneity with the tax base. It will also not only assess the aggregate effect of a new Wal-Mart on the tax-base but also analyze its components to measure changes in residential and commercial property values as a result of the entrance of a Wal-Mart.

III. Formulation of Model and Data

This proposed analysis merges three data sources to conduct a panel data study at the municipal level in New Jersey over a ten-year period from 1998 to 2007. The first set includes 30 Wal-Mart store openings that occurred in New Jersey from 1998 to 2007. The New Jersey Wal-Mart openings were drawn from a master sheet for all Wal-Mart 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 Wal-Mart and Economies of Density."[1] To identify the Wal-Mart stores that opened in New Jersey between February 2006 to December 2007, we reviewed Wal-Mart's Annual Reports and found five additional openings in this period. [2,3] We then browsed the Wal-Mart press releases for openings in New Jersey to determine where and

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[1] Retrieved from http://www.econ.umn.edu/~holmes/data/WalMart/index.html
[2] http://walmartstores.com/media/investors/2007_annual_report.pdf;
[3] http://walmartstores.com/sites/AnnualReport/2008/docs/wal_mart_annual_report_2008.pdf

when these openings occurred. [4] 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.

The second data set includes New Jersey property tax tables and property value classifications for all 566 municipalities in New Jersey obtained from the New Jersey Department of Community Affairs' Division of Local Government Services. These data, dating back to 1998, are available on the Department's website. [5] From these tables we retrieved for each municipality the "Net Valuation Taxable," or the total tax base, as well as the State Equalization Table Average Ratio (SETAR) and the total equalized tax rate. In addition to this, we also used the Residential Value and Commercial Value columns that represent the total value of each in a municipality. The tax rate, tax base, residential values and commercial values are all equalized using the SETAR.

To adjust for the municipality size and to facilitate comparisons across municipalities, we calculated the growth rates for the tax base variables and the tax rate over the entire time period for all New Jersey municipalities. These variables were calculated using a year-over-year calculation for the entire time period. To determine the impact of Wal-Mart store entries, we created two dummy variables. The first dummy variable, *openyear*, is a measure of the impact of a Wal-Mart in a host town and takes the value 1 only in the year a Wal-Mart store opens in a municipality and 0 otherwise. The second dummy variable, *openyear_adj*, takes the value 1 in the year a Wal-Mart opened in the adjacent municipality to measure the affect a Wal-Mart has on adjacent towns. To locate the nearest adjacent municipality to a particular Wal-Mart, we used GoogleMaps to first locate each of the 30 Wal-Mart stores previously identified. Since

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[4] http://walmartstores.com/pressroom/news/
[5] http://www.state.nj.us/dca/lgs/taxes/taxmenu.shtml

municipality borders are not shown in GoogleMaps, we cross-referenced with a municipality map obtained from the Office of State Planning for New Jersey.[6]

Finally, there is a simultaneous relationship that exists between the tax base and the property tax rate for which we must instrument (Vandegrift and Lahr 2011). Municipalities with a larger tax base can raise a given amount of revenue with a lower property tax rate. At the same time, however, higher property tax rates can discourage development and suppress property values, effectively reducing the size of the tax base. Thus, there is likely endogeneity between changes in the property tax rates and changes in the tax base. We instrument for changes in the tax rate using standardized high school test scores administered in New Jersey because increases in test scores diminish the pressure to take costly remedial action in local schools. Because education spending is a large portion of local spending, this exerts downward pressure on the tax rate.

The standardized test scores were obtained for the years 1998 through 2008 from the New Jersey Department of Education's website.[7] All vocational, charter and magnet schools were removed from the dataset. Because some municipalities have multiple high schools, test scores were weighted by the enrollment in the various high schools to calculate a weighted average for these municipalities. During the 2001–2002 school year, the state changed the standardized test from the High School Proficiency Test (HSPT) to the High School Proficiency Assessment (HSPA). This switch caused two minor issues. For one, the HSPT tested in Writing, Math, and Reading and measured passing rates, whereas the HSPA assessed only Language and Math and measured proficiency (partially proficient, proficient, and advanced proficient). From the HSPT tests we used the passing percentages only from the reading assessment while in the

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

HSPA we summed the proficient and advanced proficient levels for language. Second, the HSPT was administered in the fall of the school year whereas the HSPA was administered in the spring, and they are labeled by the state for the year in which they were administered. As a result, there is a "gap" for the year 2001 when they switched exams. To adjust for this, we moved all the HSPA data forward a year (so 2002 became 2001, 2003 became 2002, and so on); though ideally we would have liked to lag the HSPT, data for 1997 was unavailable. Next, we normalized the passing/proficiency rates for language for each municipality, creating the variable *norm_readlang*. Lastly, we calculated the growth rate of *norm_readlang* (*GR _norm_readlang*) and lagged it one year. We then checked the validity of these instruments running a fixed effect regression of *GR _norm_readlang_lag on GR_tx_rate*.

To better control for the effects in the overall level of economic activity and other unobserved characteristics, we ran the following fixed-effects regressions:

$$(1)\ GR\_tx\_Base_{it} = \alpha_i + \beta^*openyear_{it} + \gamma^*year_t + \delta^*GR\_tx\_rate_{it} + \varepsilon_{it}$$
$$(2)\ GRResValue_{it} = \alpha_i + \beta^*openyear_{it} + \gamma^*year_t + \delta^*GR\_tx\_rate_{it} + \varepsilon_{it}$$
$$(3)\ GRCommValue_{it} = \alpha_i + \beta^*openyear_{it} + \gamma^*year_t + \delta^*GR\_tx\_rate_{it} + \varepsilon_{it}$$

where *i* denotes the indexed municipality and *t* is the year. Our dependent variables, *Gr_tx_Base*, is the growth rate of the tax base, *GRResValue*, is the growth of residential values, *GRCommValue*, is the growth of commercial values, *openyear* is the dummy variable indicating when a store opened in a municipality; *year* measures the average growth of the tax base each year; and *GR_tx_rate* is the growth rate of the tax rate. Three fixed-effects regressions were then run for each of the six models, the second and third using a one- and two-year lag of the Wal-Mart entry *openyear* variable to capture effects on the tax base and property values that often take some time to emerge.

IV. Results

Table 1 shows means and standard deviations for growth in the tax base, growth in residential values, growth in commercial values and growth in the tax rate. In column (I) we see that over the nine year period from 1999-2007 there is an average growth of about 11 percent a year in the tax base across all municipalities. Furthermore, there is a steady increase in the tax base year after year until 2007 when the average growth of the tax base in New Jersey is cut roughly in half, almost a certain result of the collapse of the real estate market. Column (3) and (4) show that growth in residential and commercial values almost mirror those of the entire tax base, with residential values growing an average of 11.3 percent a year and commercial values growing 10.2 percent a year. Conversely, column (2) shows that in same nine year period (1999-2007) the tax rate decreased an average of 3.5 percentage points a year.

We instrument for the growth in the tax rate using a one year lag of the growth in reading scores. We expect that growth in reading scores will explain the tax rate because reading scores are a measure of the quality of the school system, which is the main expenditure of municipalities. As the quality of education increases, there is a reduced demand for expenditures on education and a reduction in the growth of the tax rate reflects this decreased demand. To test the validity of the instrument, we regress *Gr_tx_Base* on *GR_tx_rate, year, openyear*, and *GR_norm_readlang_lag*. The results indicate that the impact of *GR_norm_readlang_lag* on *Gr_tx_Base* occurs only through *GR_tx_rate*. Thus, *GR _norm_readlang_lag* has no independent effect on *Gr_tx_Base*.

Consequently, we regress *GR_tx_rate* on *year* and *openyear*, *and GR_norm_readlang_lag*. The results are reported in Table 2. The results show that after controlling for *year* and *openyear*, *GR _norm_readlang_lag* is a significant predictor of

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GR_tx_rate. This implies that the lagged growth of the normalized reading and language scores is a valid instrument for the growth of the tax rate. The results suggest that these two variables are inversely related, that is as the growth of reading scores increase, the growth of the tax rate declines. This addresses the key concern with simultaneity between the tax rate and the tax base that Kababik (2010) failed to control for.

To estimate the effect of Wal-Mart openings on the growth of the tax base, controlling for the growth in the tax rate, we ran a series of regressions based on equations (1) to (3) above. Table 3 shows the first set of results with column (1) testing the effect of the *openyear* variable, columns (2) and (3) a one- and two-year lag of this variable, and (4) testing for the growth of the tax base one year prior to the Wal-Mart's entry using the variable *openyear_plusone*. The estimate for growth in the tax rate is significant and negative. This suggests that after correcting for endogeneity a one percentage point increase in taxes causes a .79% reduction in the tax base.

The coefficient on *openyear* and *openyear_lag* are positive, however they are not significant. This might suggest that Wal-Mart increases the tax base the first two years they enter a municipality, however this increase is statistically indistinguishable from zero. On the other hand, the coefficients on the variables *openyear_lag2* and *openyear_plusone* are negative, though insignificant as well. Likewise, the coefficient on the second year lagged variable might suggest that a Wal-Mart might decrease the growth of the tax base in towns it locates in, though this claim is not statistically supported. Lastly, the lack of significance on the *openyear_plusone* variable alleviates concerns about the endogeneity between local economic factors and Wal-Mart's entrance into these municipalities. In fact, insignificant coefficient on the *openyear_plusone* variable suggests that Wal-Mart is not entering towns with a rising tax base.

This is consistent with Hicks (2008) and Kababik (2010) and supports the suggestion offered by Johnson et al. (2009) that Wal-Mart locates near places with declining property values.

We also ran the same regression to estimate the effect of Wal-Mart openings on the growth of the tax base in adjacent municipalities, using the variable *openyear_adj*. *Openyear_adj* is a dummy variable indicating a store opened in an adjacent municipality that year. The results are printed in Table 4, with column (1) testing the effect using the *openyear_adj* variable and columns (2) and (3) using a one- and two-year lag of this variable. The coefficient on the variable *openyear_adj* is small and positive, while the coefficients on both the lag variables are relatively small and negative. However, like in host municipalities, none of the *openyar_adj* variables are significant. This suggests that that the entrance of a Wal-Mart does not have a net effect on the tax base of adjacent municipalities.

Because Wal-Mart opening variables showed no significant effect on the tax base, we sought to determine whether there were perhaps offsetting effects on residential and commercial values. However, this did not prove to be the case. Based on equations (2) and (3), we ran a series of regressions identical to the ones above with *GRResValue* and *GRCommValue* as the dependent variables. These results on appear in Tables 5 and 6 with columns (1) and (2) testing the effect on host municipalities using the *openyear* variable and the one-year lag of this variable and columns (3) and (4) testing the effect on adjacent municipalities using the *openyear_adj* variable and the one-year lag of this variable. Regressions were also run on the two-year lags of these variables, however, they were not reported. Coefficients on Wal-Mart's effect on residential values in their opening and second year are positive though insignificant. In adjacent municipalities, in the initial year the coefficient is positive though changes to negative the subsequent year, though similarly these variables are insignificant. These findings suggest that

Wal-Mart does not have an effect on the residential property values either in those municipalities in which they locate or those adjacent to them.

The results on Wal-Mart's effect on commercial property values are reported in Table 6. Interestingly, the results show that the commercial tax base is far less sensitive to growth in the tax rate than the residential tax base. In municipalities where a Wal-Mart opened the coefficient on *openyear* in the initial year was very small and negative, however, interestingly, in the year after its opening it became large and positive, though still insignificant. This might suggest that Wal-Mart has little effect in the first year on commercial property values yet its impact is noticed in the subsequent years, though again there is no statistical evidence to support this. Lastly, in municipalities adjacent to those where a Wal-Mart opened up, the effect on the commercial values appears to be negative, though again these results were insignificant.

V. Conclusion

Overall, our results do not find any clear effect of Wal-Mart on the tax base of a municipality in which they open or those adjacent to it. Unlike Kababik (2010) we find no evidence that Wal-Mart increases the tax base in municipalities it locates in nor does it have an effect on adjacent municipalities' tax bases. In analyzing if this net effect is null perhaps due to offsetting effects in commercial and residential property values, our results again indicate that this is not the case. In fact, Wal-Mart has no effect on either residential or commercial values in host or adjacent towns.

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Table 1. **Descriptive Statistics for Equalized: Tax Base Growth, Tax Rate Growth, Residential Value Growth, and Commercial Value Growth**

Year	Tax Base Growth (1)		Tax Rate Growth (2)		Residential Values Growth (3)		Commercial Values Growth (4)	
	Mean	*Std. Dev.*	*Mean*	*Std. Dev.*	*Mean*	*Std. Dev.*	*Mean*	*Std. Dev.*
1999	.0407025	.039006	-.0019718	.0511205	.0428144	.0604233	.0487988	.1055598
2000	.0670158	.0532516	-.0082346	.0797889	.0726889	.0549208	.0704231	.1076248
2001	.0960433	.059846	-.0334846	.0543741	.0990013	.0635037	.1006792	.1021377
2002	.1137702	.1350015	-.021791	.1142758	.1185564	.1386602	.1061561	.1579916
2003	.1414044	.1495698	-.0417952	.1134213	.1451332	.1472003	.1426141	.2236059
2004	.1390248	.0636654	-.061571	.0809186	.1424144	.069442	.126572	.0909303
2005	.1559423	.1066455	-.0689851	.068281	.1620025	.0813013	.1366741	.1483834
2006	.144583	.0662459	-.0617668	.0552574	.155649	.0727725	.132363	.2294641
2007	.0750666	.0509035	-.0132709	.0528701	.0829903	.0568556	.0574936	.1018883
1999-2007	.1081726	.0966187	-.0347635	.0815896	.1134803	.0973239	.1024193	.1532338

Table 2.   **Regression on the Growth of the Tax Rate**

Dependent Variable:	Growth of Tax Rate
Constant	7.874833***
	(1.100056)
GR_norm_readlang_lag	-.0004319***
	(.0001337)
year	-.00395***
	(.0005491)
openyear	-.0025133
	(.0176862)
R^2	0.0018
N	4504

*Significant at 0.1 level **Significant at 0.05 level ***Significant at 0.01 level

Table 3.   **Regression on the Growth of the Tax Base in Host Municipalities**

Dependent Variable:	GR_tx_Base (1)	GR_tx_Base (2)	GR_tx_Base (3)	GR_tx_Base (4)
GR_tx_rate	-.7913086***	-.7905134***	-.7905251***	-.911839***
	(.2204803)	(.2205558)	(.2205818)	(.1817058)
openyear	.0116835			
	(.0126067)			
openyear_lag		.0112944		
		(.0121641)		
openyear_lag2			-.0021617	
			(.0128552)	
openyear_plusone				-.0033511
				(.0144348)
year	.0018542*	.0018483*	.0018584*	.0054662**
	(.0009695)	(.0009703)	(.0009701)	(.0018225)
R^2	0.6242	0.6240	0.6240	0.6014
N	4504	4504	4504	3933

*Significant at 0.1 level **Significant at 0.05 level ***Significant at 0.01 level

Table 4.   Regression on the Growth of the Tax Base in Adjacent Municipalities

Dependent Variable:	GR_tx_Base (1)	GR_tx_Base (2)	GR_tx_Base (3)
GR_tx_rate	-.7910338*** (.2206174)	-.7922101*** (.2204486)	-.7905413*** (.2206621)
openyearadj	.0036148 (.0126036)		
openyearadj_lag		.0107051 (.0123813)	
openyearadj_lag2			-.0001607 (.0128602)
year	.0018548* (.00097)	.0018435* (.000969)	.0018569* (.0009704)
R^2	0.5834	0.5834	0.5834
N	4504	4504	4504

*Significant at 0.1 level **Significant at 0.05 level ***Significant at 0.01 level

Table 5.   Regression on the Growth of the Residential Values in Host and Adjacent Municipalities

Dependent Variable:	GRResValue (1)	GRResValue (2)	GRResValue (3)	GRResValue (4)
GR_tx_rate	-.8162459*** (.2311362)	-.8156105*** (.2311676)	-.8157285*** (.231248)	-.8172391*** (.231141)
openyear	.0091085 (.0130556)			
openyear_lag		.0128229 (.0125945)		
openyearadj			.0020236 (.013335)	
openyearadj_lag				.0093567 (.0130611)
year	.0025093** (.0010064)	.0025017** (.0010071)	.0025111** (.001007)	.0025002** (.0010063)
R^2	0.5846	0.5846	0.5388	0.5387
N	4495	4495	4495	4495

*Significant at 0.1 level **Significant at 0.05 level ***Significant at 0.01 level

Table 6. **Regression on the Growth of the Commercial Values in Host and Adjacent Municipalities**

Dependent Variable:	GRCommValue (1)	GRCommValue (2)	GRCommValue (3)	GRCommValue (4)
GR_tx_rate	-.6652222 (.5234098)	-.665167 (.5233474)	-.6652717 (.5236081)	-.6714295 (.5231069)
openyear	-.0005384 (.0296388)			
openyear_lag		.0420603 (.0285859)		
openyearadj			.0003097 (.0302697)	
openyearadj_lag				.0361152 (.0296325)
year	-.0009833 (.0023088)	-.0010152 (.0023097)	-.0009835 (.0023098)	-.0010268 (.002307)
R^2	0.2109	0.2113	0.1938	0.1914
N	4480	4480	4480	4480

*Significant at 0.1 level **Significant at 0.05 level ***Significant at 0.01 level