

The Impact of Wal-Mart on Local Fiscal Health: Evidence from a Panel of Ohio Counties

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Abstract: This research analyzes selected fiscal impacts of Wal-Mart in Ohio from 1985 through 2003. Using a panel of counties, and accounting for spatial autocorrelation in an instrumental variable model I estimate impact of Wal-Mart and Super-Centers on selected revenues and transfer payments. On revenues I find that the presence of a Wal-Mart increases local commercial property tax assessments, resulting in collection increases of between \$350,000 to roughly \$1.3 million. Wal-Mart also is associated with higher levels of local labor force participation. On expenditures I also find that the presence of a Wal-Mart dramatically increases the per capita EITC claims in a county (between 18 and 43 percent), while the dollar value of these claims experiences mixed impacts between Wal-Mart and a Supercenter. Similarly, the impact of Wal-Mart on Foodstamps expenditures is mixed, but small in any case. There are no in-county impacts of Wal-Mart on expenditures on Temporary Assistance to Needy Families and its predecessor Aid to Families with Dependent Children. However, Medicaid expenditures experience growth which may amount to roughly 16 additional cases per county attributable to a single Wal-Mart. The per worker costs of Medicaid estimated in this study is consistent with reported levels in a number of states, and study estimates by Dube and Jacobs [2004], Carlson [2005] and Hicks [2005a]. The magnitude and statistical certainty of these findings, accompanied by a review of previous research suggests that local fiscal intervention, either through incentives or the much touted “Wal-Mart Tax” is unwarranted.

Disclosure: The author of this study owns no stock in Wal-Mart or any related firm (other than that held by the mutual fund companies Vanguard and TIAA-CREF). I have performed no paid consulting services from any retail firm, its developers, local governments or related entities since 2002 (though I continue to field frequent questions on my earlier research). I have received no honoraria related to Wal-Mart research (other than travel costs paid by the Federal Reserve Bank of Richmond in 2001). In short, except for roughly \$1,500 purchases of diapers annual since 1999 I have no financial relationship with Wal-Mart or any affiliate that I am aware of.

The views expressed in this paper are those of the author and do not reflect the official policy or position of the United States Air Force, Department of Defense or the U.S. Government

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Introduction

Few issues receive as much debate in local communities as the expected opening of a Wal-Mart. Over the past twenty years communities across the United States (and increasingly worldwide) have seen both benefits and costs associated with the entrance of the retailing giant Wal-Mart, a Wal-Mart Supercenter or related stores.

Proponents of Wal-Mart expansion see the opportunities for new flexible employment, the addition of an anchor store and specialty shops with accompanying economic growth and, of course, convenient shopping with low priced goods and services. The potential for greater local tax revenues also apparently interests some local officials. Residents who favor market economies often see Wal-Mart as evidence that efficiencies are rewarded by markets, and are pleased at its growth.

Opponents of Wal-Mart stores foretell the loss of competing retail stores, a change in current land use patterns (or sprawl) and worry that workers will be compelled to accept jobs at lower wages, with fewer benefits. There is also concern that Wal-Mart will provide less support to local activities (charities, little league, etc.) than do incumbent retailers. Finally, sympathetic local leaders argue that public expenditures, both in infrastructure and services will exceed any potential tax revenue gains from a new Wal-Mart store.

There is also national voice to this debate. Reason Public Policy Institute and the National Center for Policy Analysis have both weighed into the debate voicing free market support for Wal-Mart citing several studies. Two prominent economists at the University of Chicago (Becker and Posner) have covered many of the workforce issues in their economics blog, effectively challenging the intellectual rigor of the anti-Wal-Mart campaign. In contrast, many national unions, notably the AFL-CIO and AFCW, struggling to reverse the trend of declining membership, oppose Wal-Mart, where unionization has been almost wholly unsuccessful. Wal-Mart has been singled out for its extensive use of local and state tax incentives and local infrastructure financing, and for having employees who receive public assistance (primarily Medicaid and the Earned Income Tax Credit). Finally, the purported role Wal-Mart plays in engendering global commerce attracts opposition from a host of anti-globalization forces who are applying their credo of thinking globally and acting locally.

Whatever arguments one favors, there can be no doubt that these issues are compelling local policy considerations that deserve serious analysis. And, while one seemingly violation of

the law of scarcity is that there is never a shortage of ill informed cranks, even a casual observer would conclude that these debates have been increasingly informed by research.

The early case studies and static comparisons of Wal-Mart impacts gave way to more advanced econometric studies of commercial impacts. The scholarly research has also examined the role of firm level productivity, while advocacy research has focused on the fiscal impacts – primarily expenditures by state and local governments.

This paper presents analysis designed to better inform the debate by estimating some of the fiscal impacts associated with the presence of a Wal-Mart. I begin with a review of the existing literature, which is followed by a description of the region under analysis. I then construct an empirical model and explain the data which populates it. Finally, I offer estimation considerations and results, and finish with a summary and policy discussion.

Studies of Wal-Mart

Serious empirical evaluation of the role of Wal-Mart on local economies began with Ken Stone's [1988] study of the impact of Wal-Mart on small towns and communities in Iowa. This study and other subsequent analysis by Stone and co-authors present mixed evidence regarding the impact of Wal-Mart. The studies find that counties with Wal-Marts, and host towns generally experience a sharp, but short term growth in retail. This phenomenon is attributed to Wal-Mart, but the effect is heavily offset by lost sales by existing retailers. In contrast these studies generally find that Wal-Mart stores locating outside small towns reduced retail employment and businesses within the small towns, even if the overall impact was positive. Stone found in these (and later studies) mixed impacts on associated retail.¹

These studies are among the most often cited analysis of Wal-Mart, and while particularly important early analysis they suffer from the common problems of case studies. Specifically, they cannot control for retail changes attributable to other factors (notably population changes in rural Iowa), and like all case studies they suffer from concerns regarding selection bias. Despite these shortcomings these studies provide important findings. Among the contributions of is the recognition that many of the potential impacts of Wal-Mart may occur within counties, thus county level estimates may not capture a much larger sub-county impact on

¹ See Stone (1989, 1995, 1997) these papers restate many of the same findings, but with further analysis of the cause and the interim changes to the state of the literature. Also see Stone, Artz and Myles, 2002. These studies also offer both policy guidance and recommendations for retailers coexisting with Wal-Mart.

the retail industry. Also, these studies detail impacts on sub-sectors of retail trade linked to the degree to which firms compete with goods or services offered by Wal-Mart. These studies are also very much in the extension spirit and so offer assistance to rural and small town retailers. Perhaps most importantly the policy guide offered by Stone [1997] is entirely free of the later polemics against Wal-Mart and recognizes the potential for unintended consequences for community policies both opposing and supporting Wal-Mart.

Later studies (Keon, Robb and Franz, 1989; Ozment and Martin, 1990) examined different geographical regions, and both found some modest positive impacts on wages, employment and number of businesses within counties with Wal-Mart stores. However, as noted by Ozment and Martin [1990] the possibility that Wal-Mart chose faster growing counties as potential new store sites distorts the results. This endogeneity concern continues to plague analysis of Wal-Mart entrance.

Analysis continued to mature by the late 1990's with Barnes and Connell [1996] and Ketchum and Hughes [1997] employing quasi-experimental control techniques to evaluate the impacts of Wal-Mart entrance on wages, employment and retail industry structure. Both studies examined retail sales and employment growth, but found no evidence of increases in the number of retail firms. Barnes and McConnell found a modest decline in the number of specialty retail stores at the county level. A 1994 Congressional Research Study (Hornbeck, 1994) performed a literature review on the existing studies and estimated that small towns would observe a decline in retail employment and establishments. McGee and Gresham [1995] examined towns in the upper mid-west following Wal-Mart entrance finding growth in retail trade in the Wal-Mart towns and very large declines in surrounding towns. Artz [1999] and Artz and McConnon [2001] examined the impact of Wal-Mart in several retail sectors in towns in Maine. They found Wal-Mart towns experienced large growth in general merchandise retail sales, but that surrounding towns lost sales, and that differences in existing conditions within the local economies accounted for part of this difference. Stone, Artz and Myles [2002] found a similar pattern in Mississippi Counties for food and general merchandise, and furniture stores. Mehta, Baimann and Persky [2004] estimates the economic impact of Wal-Mart in Chicago employing an input-output model, employing the assumptions of a reduced workforce, and lower net retail expenditures, with predictable results on the net impact.

The preceding studies suffer some common weaknesses. Absence of control for underlying conditions, potential concern over selection bias and failure to make statistical comparisons of impacts (even when quasi-experimental comparisons have been employed) weaken many of the conclusions of these studies. Also, in several of these studies simple means comparisons were not presented, so for example the statistical certainty of employment, establishment and wage differences in regions with and without Wal-Mart are unavailable. The use of more advanced modeling in recent years clarified some, but certainly not all of these conclusions.

The first of the econometric studies (Hicks and Wilburn, 2001) analyzed a panel of county level data in West Virginia from 1988 through 2000, testing the impact of Wal-Mart's presence on retail industry structure, wages and employment. The model included corrections for spatial autocorrelation and entrance of Wal-Mart in adjoining counties, which accounts for the pull factor considerations noted by Stone [1995]. This study found that the entrance of a Wal-Mart store led to a modest increase in the number of retail establishments, a permanent retail employment increase of roughly 54 workers and no impact on retail wages.

Hicks and Wilburn [2001] evaluated endogeneity of the Wal-Mart entrance decision by testing entrance on contemporaneous and lagged growth variables. This is similar to the technique employed by Franklin [2001] who examined the Wal-Mart Supercenter impacts on the structure of grocery stores in metropolitan areas. Both studies concluded empirically that Wal-Mart entrance decisions are independent of regional growth conditions. Also, these researchers offered anecdotal evidence that Wal-Mart is largely unconcerned with local economic conditions when making decisions to open new locations. However, this approach has been criticized for failing to include an endogeneity test within the estimation framework (Curs, State and Visser, 2004). Also, criticism of the generalizability of the findings has been raised since the study region, West Virginia, is poorer and more rural than average states.²

A later study (Basker, 2005) performed a similar analysis of a much larger sample of U.S. counties. This analysis used an instrumental variable method to control for endogeneity with the planned entrance date as an instrument. This study reports that following an initial increase in retail employment, within roughly three years this dissipates to a 55 worker increase, with a

² See www.preservationist.net/sprawl for a remarkably balanced review by an advocacy group of this and other studies.

modest reduction in the number of small retail firms. Basker also found very modest impacts of Wal-Mart entrance on adjoining counties. The striking similarity of these findings to those of Hicks and Wilburn [2001] were noted by Villareal (2005).

Basker's fine study has been criticized (perhaps unjustly) for its choice of instruments (Curs, Stater and Visser, 2004). More robust criticism notes the censoring of the sample (counties with employment levels above 1,500 in 1964, with positive employment growth and without a Wal-Mart prior to 1977). This censoring of the data eliminates from consideration virtually all of the counties with urgent and compelling policy concerns (Goetz and Swaminathan, 2004). This latter criticism also raises the specter of selection bias problems in the study as earlier research (Graff, 1998) which identified a specific expansion pattern for Wal-Mart Supercenters in mid-sized towns (which may well have been censored by Basker). Further, failure to control for interstate fiscal differences may offer a different endogeneity concern as states with high levels of local financing may actively seek Wal-Mart stores (Wassmer, 2002). Of greater concern than these issues is the absence of a correction for spatial autocorrelation in the model providing concern of bias in the estimation results.

Despite the criticisms of both Hicks and Wilburn [2001] and Basker [2005] the remarkable concurrence of findings in the most rigorous studies to date, it is clear that claims of the critics regarding Wal-Mart's employment and wage impacts at the county level would fail to enjoy much significant empirical support.

The impact of Wal-Mart on economic well being, measured differently than through retail wages was performed by Goetz and Swaminatham [2004], in an evaluation of county wide poverty impacts of Wal-Mart's presence. This study is important in addressing a major criticism of Wal-Mart in general, and changing retail structural conditions perhaps evidenced by the increase in the number of Wal-Mart stores around the nation.

The authors estimated poverty rates in two time periods, thus permitting a much richer choice of explanatory variables than are typically employed in more dynamic time series models.³ Employing a two stage estimation technique, which should account for some endogeneity concerns, the authors found that a new Wal-Mart, entering a county between 1987

³ The choice of the two time period model permitted the use of more detailed (but less frequently collected) Census and USDA data on poverty and regional population characteristics.

and 1998 had a marginal impact of 0.2 percent on the county poverty rate, and that stores that existed prior to 1987 increased the poverty rate by just under half that amount.

The authors attribute this effect to three possible causes. First, the loss of “mom and pop” retail employment may cause workers to settle for less well paying jobs (though they acknowledge the rather severe criticism leveled at this argument). Second, philanthropy by Wal-Mart may be less than the incumbent firms. Third, which they argue is the most important; Wal-Mart would weaken local entrepreneurship resulting in greater poverty through a chain of leadership and social capital. This is part of a more extensive research stream on rural poverty by Goetz and others, and so enjoys much earlier development in technique and findings.

There two major concerns with this study. First, the magnitude of the poverty impact of Wal-Mart estimated by these authors is small at 0.099 percent for existing Wal-Marts and 0.204 percent for new Wal-Marts respectively, and was not adequately discussed. This is in contrast to a strong discussion of the potential causes. Perhaps the greatest flaw in this study is the incomplete development of the assertion that the poverty result implies an externality of exchange at Wal-Mart. While this is a convenient method of explaining possible policy interventions, it is more likely that Wal-Marts behavior is better explained as a result of public choices rather than a market failure.⁴ Importantly, neither weakness impugns the results, only the potential policy interventions which may be inferred from their findings. Notwithstanding this criticism, Goetz and Swaminathan [2004] offer an important study in that while acknowledging that earlier research has found little of the criticism of Wal-Mart to enjoy empirical support, it has examined a more extensive set of regional issues.

One criticism of the preceding studies is the emphasis on empirics over theory. The earliest of the studies reviewed above employed descriptive models of the chain of events surrounding Wal-Mart entrance. Both Hicks and Wilburn [2001] and Basker [2005] attribute firm level productivity differentials to explain their results. And, the former authors conclude that protection of local incumbent rents is the source of much of the local disfavor targeting Wal-Mart. Konishi [1999] provides a spatial equilibrium model where retail concentration results from very tractable assumptions regarding consumer behavior. The first venture into formal

⁴As I have earlier said, I believe the claims of benefit based externalities are on very shaky theoretical ground. Even the most compelling of these arguments (Waddoups, 2004) asserts market failure for employer based health insurance in the construction industry based upon an argument of scale economies in the provision of private sector health insurance (both in financial access and firm production costs).

theory is offered by Curs, Stater and Visser [2004, 2005] who offer a location model which provides testable hypotheses for land rents for big-box retailers which includes relative location of existing commerce and transportation costs. Hopefully this research will yield compelling empirics in the coming months.

Despite almost two decades of research, the hyperbole regarding Wal-Mart and its putative economic and fiscal impacts far outweighs the level of scholarly scrutiny applied to it. A number of advocacy group reports focus on Wal-Mart's fiscal impacts. Among these are the Shils Report [1997], an extensive criticism of Wal-Mart described corporate social welfare through a number of anecdotal experiences in local funding issues mostly related to property and sales taxes. Mattera and Purinton [2004] compiled a very long list of examples of Wal-Mart employing local tax incentives (tax increment financing, infrastructure grants, property tax abatement, etc.) to support growth. This issue was also evaluated specifically for Ohio by Schiller [2002] with discussion of Wal-Mart. LeFaivre and Hicks [2005] offer a broader theoretical and empirical critique of the role of incentives and economic growth in Michigan, with empirics regarding incentives to wholesale distribution centers (among others) as part of Michigan's MEGA Incentive Program.

Dube and Jacobs [2004] describe the potential for Wal-Mart's workers to rely on government assistance by simulating individual worker use of such programs. This simulation model provides much needed evidence of a public finance problem, but does not provide unassailable evidence that Wal-Mart practices differ systematically from other similar firms. These authors use data from a court case in which Wal-Mart was compelled to release wage data. From these data the authors apply California take-up rates for a variety of public assistance programs to estimate the difference between Wal-Mart and other retail firms in the state.

Carlson [2005] offers a similar analysis of the government subsidization of Wal-Mart through a variety of transfer instruments in Oregon. This extensive analysis provides estimates of total subsidization of Wal-Mart using representative firm models on 2001 data. As with any study of its type it fails to provide controls. However, this study is as in-depth an analysis of the state level fiscal considerations surrounding the Wal-Mart debate as is available. This is even more remarkable when compared to a 2004 report to Congress (Miller, 2004) which repeats, in some concise detail, all the arguments against Wal-Mart while bravely ignoring either theory or

evidence to the contrary.⁵ At the heart of these papers is the question of whether or not Wal-Mart workers use poverty related transfer payments at rates that differ from the retail industry in general. The AFL-CIO compiled a list of States in which Wal-Mart has been named as having employees receiving Medicaid (or similar state programs). This list did not include calculated percentages, but provided the basic data to find that in the 10 states where actual numbers of take rates are known, Wal-Mart employees use Medicaid at rates from 2.3 percent in Washington State to 24.9 percent in Tennessee's beleaguered TennCare program. The only industry wide average I have found for the Trade sector (both retail and wholesale) is 11.8 percent in Nevada (Waddoups, 2004). Hicks [2005a] estimated a spatial model of the lower 48 states finding the average state experiences and increase in Medicaid expenditures of roughly \$900 per Wal-Mart worker. The author notes the similarity of this finding to other estimates of costs per low wage worker in the United States. The aforementioned studies provide wide ranges of estimates, making their interpretation difficult in the context of a single firm in a low wage industry however, I will discuss my findings in comparison to these in the empirical results section.

Finally, a more complex set of fiscal considerations driving the location of big-box retailers was examined by Wassmer [2002] who suggests greater reliance on local taxes increases the tendency of land use patterns to result in big-box retail. This study is potentially important in that it argues for careful selection of geographic areas of analysis, especially with regard to fiscal differentiation, which might lead to endogeneity in the Wal-Mart entrance decision. Gross [2004] describes the impact of land use patterns on local taxes in a study that failed to control for other variables, finding that development in commercial and industrial facilities offered a greater local return (tax to expenditure ratio) in Ohio than did residential development. This result was noted by Coyne [2003] in his analysis of the fiscal impact of sprawl though did not offer empirical support.

The literature described above has provided fairly conclusive analysis of the commercial impacts of Wal-Mart. When controlling for other factors, there is strong counter evidence to the argument that Wal-Mart causes net employment decline, mixed evidence of a reduction in the

⁵ This is all the more remarkable given that Carlson's work is an undergraduate honors thesis, authored, one might well hope, by a young woman currently engaged in graduate economic education. Sadly, there would be much to recommend in Miller (as this paper will suggest) were it even to enjoy the pretense of balance.

number of firms, and no evidence that Wal-Mart reduces retail wages.⁶ However, scholarly research into Wal-Mart's impact is much needed in a number of areas that bear important insights on land use patterns and the optimal structure of public expenditures for poverty amelioration.⁷

The expansion of the literature, though uneven does suggest that analysis of the local fiscal impacts, both revenue and expenditure be more fully evaluated. In addition to the research discussed above policy concerns over Wal-Mart's fiscal impact are emerging. Calls for a "Wal-Mart Tax" to be levied on firms based upon their share of workers receiving Medicaid have been sufficiently robust that 18 states are at least making efforts to collect data on Medicaid participation by employees.⁸ Before proceeding to evaluate fiscal impacts of Wal-Mart it is useful to briefly review both some of the economic geography of Ohio, its fiscal structure and the entrance patterns of Wal-Mart.

Wal-Mart in Ohio

The state of Ohio offers a ripe region for studying Wal-Mart for a variety of reasons. First, the state enjoys both highly urban and highly rural areas providing a natural experiment for potential policy variations. Wal-Mart has been studied specifically in Ohio (Schiller, 2002; Gross, 2004), which provides considerable background. Also, Wal-Mart came to Ohio later than to many states (1988) and Ohio has an unusually decentralized fiscal structure.

Ohio's 88 counties are highly heterogeneous and range from distressed Appalachian counties to major centers of commerce in Columbus, Cleveland and Cincinnati. The largest county has a population of over 1.3 million, while the smallest a mere 13,000. Per capita income ranged from a county average high of over \$41 thousand to a low of \$17 thousand.

⁶ Even the harsh critics of Wal-Mart (Dube and Jacobs, 2004) compare estimates of Wal-Mart wages against regional averages and unionized retail firms (not comparable discount firms).

⁷ Indeed, it might well be argued that analysis of labor markets would provide more fruitful policy than simply targeting a firm that has been successful in changing retail markets (see Reich, 2005).

⁸ See www.goodjobsfirst.org for a frequently updated list of these states. In May 2005, Maryland's Governor Ehrlich vetoed SB 790/HB 1284, the Fair Share Health Care Fund Act, which required selected firms to pay at least 8% of total employee expenses in health care related activities. This legislation was clearly targeting Wal-Mart stores in Maryland. (though it certainly could effect others). A detailed examination of state policies effecting Supercenter development was also produced for the California Governors Office of Planning and Research (Clanton, and Duffy, 2004).

Local governments in Ohio depend heavily upon locally generated revenues with local taxes comprising almost fifty percent of all tax revenues in the state over the past two decades, though the local share of taxes declined by roughly 5 percent over the 1990's. As with most states, local taxes are dominated by property taxes, with residential and agricultural taxes accounting for 38 percent of the total local share (or roughly 17.5 percent of the total non-federal taxes collected in 2000). Commercial and industrial property taxes accounted for another 14 percent of the total local taxes and municipal income taxes accounted for 20 percent of local tax revenues in the state. However, in Ohio, municipal income taxes may only be levied by cities, not counties (with residents of townships within cities exempted). Tangible personal property and sales and transit sales taxes account for a further 10 and 8 percent respectively. Only public utility personal property taxes and the local estate taxes accounted for more than 1 percent of local revenues in 2000.⁹

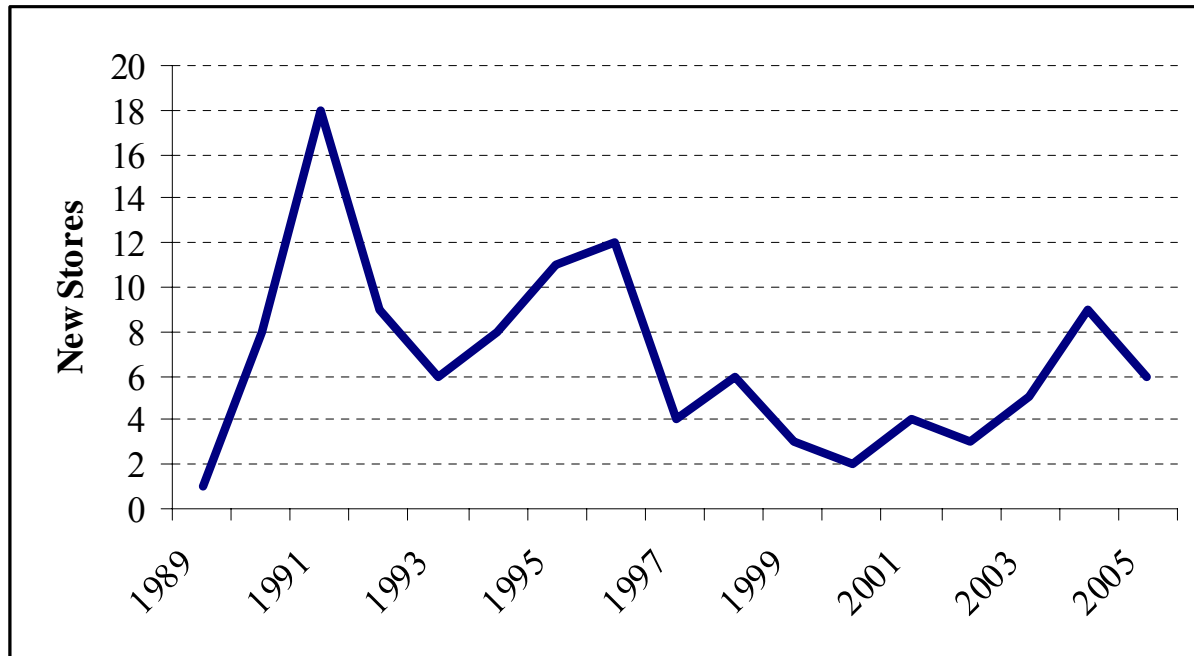
These local revenues generate expenditures on local infrastructure (less roadways) and operations, to include K-12 schooling.¹⁰ A recent evaluation of land-use patterns on revenue collections suggests that both commercial and industrial uses provides relatively much higher return to local governments than does residential growth.¹¹ Thus, for Ohio communities, a Wal-Mart may provide a ready source of local revenues that exceed expenditures, a proclivity noted by Wassmer [2002]. Wal-Mart's local economic impact analysis reports over \$37.1 million in direct state and local taxes paid in Ohio in 2004.

Wal-Mart opened its first Ohio store in 1988, and new entrance has continued at a furious pace in the ensuing years. This tendency for Wal-Mart to initially open a number of stores within a state following an acquisition or opening of a regional distribution network has been noted nationwide (Graff, 1998; Hicks, 2005a). Figure 1 illustrates annual combined entrance of Wal-Mart and Wal-Mart Supercenters in Ohio.

⁹ See Sheridan, Ellis and Marountas, 2003 for review of Ohio's fiscal structure.

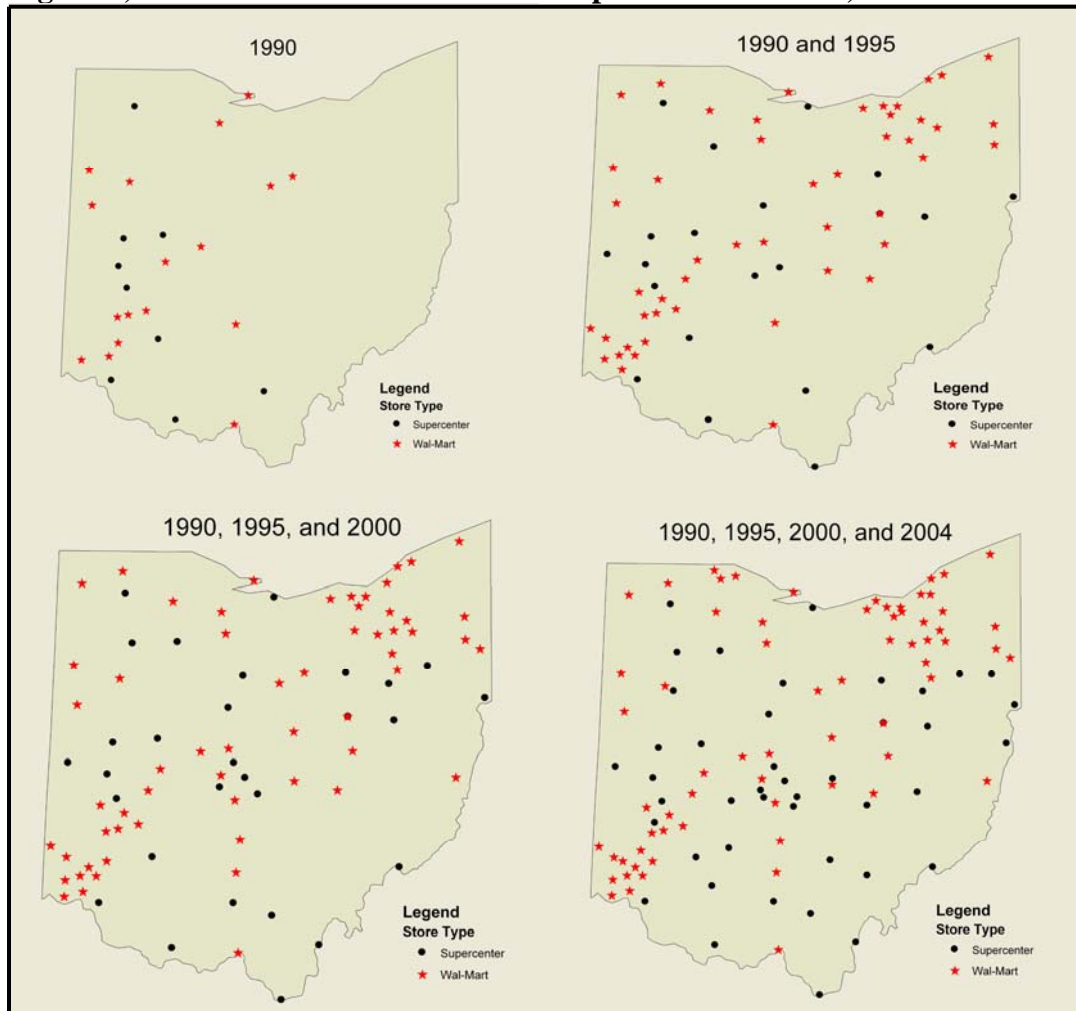
¹⁰ A recent case sought to generate reforms that would alter the local funding mechanism, and while it ultimately prevailed in litigation, saw no important structural adjustments to the state tax policy. See *DeRolph et. al. v. The State of Ohio, 2001*.

¹¹ Gross [2002] found that residential development generates \$1.05 in local fiscal expenditures to each dollar in revenues raised, while either commercial or industrial development costs only \$0.38 per dollar revenue collected.

Figure 1, New Wal-Mart and Wal-Mart Supercenters in Ohio

By July, 2005 Wal-Mart reports over 47 thousand employees in Ohio, earning on average \$9.46 per hour. In addition, Wal-Mart claims over 2,291 suppliers in Ohio who sold over \$11 billion in goods and services to Wal-Mart. In all, as of 2005, 36 of Ohio's 88 counties had at least one Wal-Mart store, while 42 had at least one Wal-Mart Supercenter. Only 17 of Ohio's 88 counties had neither a Wal-Mart nor a Supercenter, while no county had more than 7 of both types of stores. Progressive maps of total stores are displayed in Figure 3.

Figure 2, The Growth of Wal-Mart and Supercenters in Ohio, 1990-2004



In terms of regional heterogeneity, the relative import of local taxation and the compressed entrance of Wal-Mart, Ohio serve as a useful region of analysis to evaluate the role of Wal-Mart in state and local fiscal conditions.

Modeling Fiscal Effects of Wal-Mart in Ohio

State and local tax revenues and expenditures in Ohio may be influenced by the presence of Wal-Mart stores through several transmission mechanisms. In this analysis I focus on the first order influence of Wal-Mart on both revenues and expenditures. To accomplish this I first evaluate the revenue side by testing the presence of Wal-Mart on adjusted sales tax collections. Ohio has a patchwork of local taxes for property and income within counties. Sales tax rates vary by county, but there is not intra-county variability which permitted adjustments by county

according to rates (Wisemuller, 2004).¹² Further, I evaluate the impact of Wal-Mart on county level commercial and industrial property tax assessments, but cannot effectively estimate collections due to intra-county variability in rates. Happily, the aggregate measures of assessed property and income serve as good proxies for the Wal-Mart impact from which ranges of local revenue collections can be deduced.

Evaluation of the expenditure side is motivated by the critiques of Wal-Mart which suggest the company's employment policies increase poverty (Goetz and Swaminatham; 2004), and increase reliance by poor workers on Medicaid (Dube and Jacobs, 2004; Miller, 2004; Carlson, 2005). To examine these assertions I test the impact of Wal-Mart on expenditures to alleviate poverty (AFDC/TANF, Foodstamps, EITC and Medicaid).

The economic data on retail trade, employment, population are obtained from the Bureau of Economic Analysis, Regional Economic Information Systems (REIS). Foodstamp expenditures, Unemployment Compensation payments and Medicaid expenditures are likewise county level, annual data drawn from the REIS. All of the REIS data are available from 1969 through 2003.

Commercial property tax data are obtained from the State of Ohio's Department of Taxation, and are available only from 1980 through 2004. Data on county level sales tax rates was available only from 1991. Data on the Earned Income Tax Credit (EITC) are available from the Brookings Institution.¹³ The EITC data are available only from 1994 through 2002. I have constructed binary variables for years in which there was at least one quarter in recession using the NBER recession series. Similarly, due to the noted association between Medicaid, EITC and changes to the welfare laws (the 1996 Welfare Reform Act, or Personal Responsibility and Work Opportunity Reconciliation Act creating the Temporary Assistance for Needy Families program) I have created a dummy variable for these years.

Data on Wal-Mart were provided by a Wal-Mart employee and included listings of each store number, physical location, county, state, opening data and type of store (Wal-Mart or Superstore). These are exact data from Wal-Mart and hence do not suffer from the potential measurement errors noted by Basker (2005). Selected summary statistics appear in Table 1.

¹² This author resides in an Ohio township and is subject to different county, city and township taxes (but exempt from city income taxes, though the township is located within the city).

¹³ The Brookings Institution Metropolitan Policy Program offers downloadable data on EITC payments, filers and total returns at a number of geographic levels in the United States.

Table 1, Selected Summary Statistics (2003)

	Mean	Median	Std Dev	Min	Max
Population	129,644	57,081	215,454	13,138	1,373,997
Employment	76,060	29,036	153,344	3,650	929,589
Foodstamp Expenditures (\$1,000's)	8,542	2,912	18,834	465	137,281
EITC Cases	8,653	3,546	15,688	707	104,805
Labor Force Participation Rate	50.60%	50.41%	10.88%	27.78%	78.26%
Commercial Property Tax Assessments (\$1,000's)	398,931	90,044	1,000,260	5,374	6,204,874
Medicaid Expenditures (\$1,000's)	113,669	47,083	213,743	9,965	1,509,745
Wal-Mart Presence	0.20	0.00	0.89	0.00	7.00
Wal-Mart Super Store Presence	0.49	0.00	0.69	0.00	4.00

The Model and Econometric Considerations

The basic ordinary least squares model for the first test takes the form:

$$Y_{i,t} = \alpha_1 + \alpha_i + \beta_1 WM_{i,t} + \beta_2 WMSUP_{i,t} + \beta_3 WM_{j,t} + \beta_4 WMSUP_{j,t} +$$

$$\delta_i \bar{W} Y_{i,t} + \beta_5 PCI_{i,t} + \beta_6 POP_{i,t} + \beta_7 REC_t + \beta_8 \theta_{i,t} + \mu_{i,t}; \quad \mu_{i,t} \square i.i.d.N(0, \sigma^2)$$

Equation 1

Where the dependent variable Y , changes with the test to be performed, and α_1 is an intercept and α_i county dummies. The variables WM and $WMSUP$ are presence count variables for Wal-Mart and Wal-Mart Superstores respectively. The subscripts i , are for each county and j , the sum of these variables in adjacent counties in time t . In this specification, I separate the impact of Wal-Mart and Wal-Mart Supercenters. A comparison of these impacts and the result of aggregating the two stores presence will be discussed in the section dealing with estimation results. The spatial autocorrelation scalar δ is estimated on the $n \times n$ first order contiguity matrix W for county j .

$$\bar{W} = \begin{bmatrix} c_{1,j} & 0 & 0 \\ 0 & \ddots & 0 \\ 0 & 0 & c_{n,j} \end{bmatrix}$$

Equation 2

Where $c_{i,j}$ to $c_{n,j}$ are the adjoining counties. Thus, the $WY_{i,j}$ is the weighted value of Y in county j in period t , or the correction for contemporaneous spatial autocorrelation (see Hicks and Wilburn, 2001). The value $WY_{i,j}$ captures the degree to which Y in county i is affected by Y in j adjoining counties. Real per capita income and population are the remaining regionally measured variables in the model. The θ is the first order autoregressive element. The Recession dummy variable completes the model, with the exception of a PRWORA dummy variable for the Medicaid and Welfare tests, which was discussed earlier. The model is executed on data from 1985 through 2003, with the exception of the EITC models, which are confined to data from 1994 through 2002, the commercial property tax data which extend only through 2002 and the adjusted county sales tax data which was executed only from 1991 through 2002.

None of these series appear to contain a unit root, so estimation was performed on the levels in each case.¹⁴ Also, all dollar values are in real terms of 2003 dollars using the Consumer Price Index, All Urban Consumers series.

Endogeneity in Wal-Mart's choice of entrance location and time are the prime concern in this estimation. Earlier research (Franklin, 2001; Hicks and Wilburn, 2001) provide separate tests for endogeneity by attempting to model actual entrance of Supercenters and Wal-Marts as a function of demographic and economic variables. Both studies found that location and timing were unaffected by local economic conditions. A series of casual estimates of the Wal-Mart entrance timing and location suggest that for regular Wal-Mart stores, none of the variables employed in the model above yield significant influence. For Wal-Mart Supercenters, population and real per capita income are weakly correlated with entrance, but the magnitudes of the estimates are far too small to be meaningful. Recessions were negatively correlated with Supercenter entrance, but the coefficients were again, too small to be meaningful. Potential concerns with panel estimates on binary dependent variables suggest that these results are far from definitive, however repeated findings that endogeneity are not a problem should mollify concerns about this issue. Further, there is considerable anecdotal evidence that Wal-Mart has been making location decisions independent of local economic conditions.¹⁵

¹⁴ Unit root tests are available from the author.

¹⁵ In 2001 and 2002 the author has had extensive discussions with several local developers who are retained by Wal-Mart to develop potential properties. In each case, the developers clearly stated that the choice of county and location within county are wholly independent of economic growth (and while it seems unfathomable, these

Despite this evidence, Curs, Stater and Visser [2004] rightly note that a preferable method is to include instrumental variable estimation to correct for endogeneity. I follow Basker [2005] in choosing an instrument to capture an announcement of the opening of Wal-Mart. In this IV approach the one year lead of the Wal-Mart entrance variable (for both Wal-Mart and Supercenters) are used. Basker assigned a time to the store number to proxy for the announced entrance, which is hypothesized to influence the local economy (or to account for preexisting economic conditions). I attempt to include a similar instrument employing the lead of the actual entrance year (which should coincide with the economic conditions that led to entrance). Lagged predetermined variables complete the instrument list, which meets the usual order conditions, with the rank condition assumed to be met as is the usual case. The use of the lagged predetermined variables as instruments argues against inclusion of a recursive spatial autocorrelation component in this specification.¹⁶

The instrumental variable representation, in compact form is thus:

$$Y_{i,t} = \Phi\bar{\Gamma} + X_{t-1}\Gamma + e_{i,t}$$

$$\bar{Y}_{i,t} = X_t\mathbf{B} + u_{i,t}$$

Equation 3

Where Γ represents the coefficient scalars on the lead entrance matrix Φ and lagged predetermined matrix X with standard error term, e . The resulting second stage estimate is performed on the predicted value of Y , for the basic two stage least squares estimator.

Estimation Results

The suite of revenue impacts includes the basic concern regarding Wal-Mart's impact on the local economy. Though earlier studies (Hicks and Wilburn, 2001; Basker, 2005) have generally found a modest positive impact, this study provides the first comparison of Wal-Mart and Wal-Mart Supercenter impacts on local fiscal conditions. Again, the within county heterogeneity in tax rates and instruments requires that economic impacts (property valuations)

developers are largely ignorant of population and regional economic dynamics). These findings are also supported by Franklin [2001] Graff [1998] and Goetz and Swaminatham [2004].

¹⁶ Including the recursive spatial autocorrelation value (as in Hicks and Wilburn, 2001) did not substantially change the results, while introducing concerns about the instrument validity and so is not reported.

provide the basis for commercial and industrial property tax revenue changes attributable to Wal-Mart. The expenditure considerations for Wal-Mart include not only the transfer payments estimated in this paper (TANF/AFDC, Medicaid, Foodstamps and EITC) but also infrastructure and other services. Also, I note that the state share of Medicaid expenditures varies by State. The first examination is of the results of income and property valuation, see Table 2.

Table 2, County Retail Incomes and Commercial Property Tax Assessments

(t-statistics in parentheses)

	<u>Adjusted Sales Tax</u>	<u>Commercial Property Tax Assessment</u>
C	56577771.0 (2.76)	265,000,000.0 (0.40)
Wal-Mart	9,424,503.0 (1.52)	169,000,000.0 (2.27)
Supercenter	-94,839.8 (-0.03)	64,189,646.0 (0.97)
Adjacent Wal-Marts	-42,514,286.0 (-4.61)	-35,015,777.0 (-0.23)
Adjacent Supercenters	4,294,834.0 (0.81)	177,000,000.0 (0.55)
Spatial Autocorrelation	1.26 (3.66)	-0.1 (-0.20)
Real Per Capita Income	-311,808.6 (-0.60)	-11,969,771.0 (-0.29)
Population	-651.6 (-2.57)	2,218.7 (0.76)
Recession	-796,553.0 (-0.34)	216,000,000.0 (0.88)
Autoregressive	0.04 (0.98)	0.36 (4.09)
R-Squared	0.88	0.97

These results present the first of the critical empirical findings of this paper – the impact of Wal-Mart differs from that of a Wal-Mart Supercenter. In this test of sales tax income I find a basic Wal-Mart generates marginal impact of roughly \$9 million, while a Supercenter has no effect.¹⁷ The weak statistical significance of this result should be considered in evaluating this impact. Adjacent Wal-Marts exert a large negative impact (far larger than the mean county sales tax collections). The magnitude of the impacts may reflect the wide variability in Ohio’s retail sector across counties. A\This data accounts for the possibility that the entrance of a Wal-Mart store may have motivated counties to change tax rates, thus shifting collection burdens.

¹⁷ Estimates of this kind aggregating Wal-Mart and Supercenters yield roughly similar results on impacts. Importantly, the Supercenters account for the bulk of new entrance nationwide in the most recent years.

Understanding the differential impact is not a trivial process. Wal-Marts in traditional strip mall centers were often accompanied by several small specialty stores and eating and drinking establishments. Wal-Mart Supercenters are bigger, include a grocery store and are often paired with a Sam's Club and less frequently with the suite of specialty stores and eating and drinking establishments. Also, Supercenters appear to employ more skilled workers (more pharmacists, optometrists and skilled grocery staff, etc.) which would likely cause their impacts to differ from the traditional Wal-Mart. Further, the Supercenters require larger tracts of land, perhaps placing them farther from residential and commercial activities. Also, the Wal-Mart and Supercenter may enter in locations with different competitive structures in retail and grocery causing their impacts to differ. Also, the relative late opening of the Super-Centers may have occurred in more saturated retail markets. This is similar to an argument presented by Hicks and Wilburn [2001] regarding retail saturation and Pull-Factors. Finally, idiosyncratic distribution of population and commercial economic activity within counties may account for the differences. It is likely a fuller understanding of these results will require analysis of land use patterns associated with both types of stores.

Commercial property taxes are affected by the opening of a Wal-Mart (but surprisingly not by a Supercenter). However, the magnitude of this coefficient should be viewed with some caution given its sensitivity to the choice of county dummy variables. The statewide average county commercial and industrial property tax rate is 80.18 mills which translates into county property tax collection increases of between \$352,000 and \$1,350,000 annually. In total, the state and local tax revenues are clearly positively influenced by the opening of Wal-Mart and Wal-Mart Supercenters.

The influence of Wal-Mart on State and local expenditures has enjoyed much recent debate, as have the impact on poverty. The fiscal instruments most clearly associated with this debate are the transfer payments consisting of Welfare expenditures, Foodstamps, Medicaid and Earned Income Tax Credit rate in counties (though clearly these are not paid by local revenue sources). These variables were estimated as the revenue impacts above. See Table 3.

Table 3, Selected Transfer Payments

	<u>Welfare</u>	<u>Foodstamps</u>	<u>Medicaid</u>	<u>\$/ETC Case</u>	<u>ETC Cases/POP</u>
C	41150.6 (0.99)	-71,354.7 (-2.15)	-324,491 (-1.00)	221.271 (0.20)	0.21346 (3.57)
Wal-Mart	-14,552.5 (-1.25)	-22,151.5 (-2.49)	228,860.1 (5.49)	119.6571 (1.50)	0.029734 (1.44)
Supercenter	3,265.7 (0.97)	-4,610.0 (-1.93)	65,114.6 (2.18)	-42.3459 (-2.08)	-0.00336 (-0.41)
Adjacent Wal-Marts	-43,744.4 (-3.55)	-7,154.7 (-0.94)	187,867.8 (2.18)	-316.782 (-1.68)	-0.02667 (-0.39)
Adjacent Supercenters	-2,413.9 (-0.55)	17,788.6 (1.99)	219,884.7 (2.17)	-65.089 (-1.13)	-0.01201 (-0.48)
Spatial Autocorrelation	0.069 (0.062)	-0.09904 (-0.27)	-19,644 (-1.98)	0.935814 (2.53)	1.91E-06 (0.83)
Real PCI	-1,584.4 (-1.01)	3,277.6 (1.40)	-33,484 (-0.72)	0.261982 (-0.01)	-0.00648 (-3.77)
Population	0.04 (0.15)	0.141909 (0.95)	22,148.6 (1.26)	14.21331 (1.39)	-1.01E-08 (-0.45)
Recession	3,957.6 (1.64)	-2,137.85 (-0.25)	-0.53786 (-0.57)	-0.00025 (-0.29)	0.008112 (1.16)
PROWRA	1,969.7 (1.60)	-21,651 (-2.31)	-93,901.7 (-2.57)
Autoregressive	0.38 (8.79)	0.429076 (4.90)	0.561516 (9.11)
R-squared	0.84	0.91	0.99	0.99	0.93

The Wal-Mart impact on these transfer payments suggest results that while mixed are explainable within the program context and were described by Hicks's [2005a] discussion of Foodstamps, AFDC/TANF and Medicaid. Neither Wal-Marts nor Supercenters influence Welfare expenditures within the county in which it is located, but Supercenters in adjacent counties do reduce Welfare costs within a county but the impact is quite small at only \$43,000. The presence of a Wal-Mart or Supercenter reduces county wide expenditures on Foodstamps, but the impacts are again small, representing the movement of between 5 and 7 families off of Foodstamps (or a concomitant decrease in eligibility by a larger number of families). An adjacent Wal-Mart increases Foodstamps expenditures, offsetting roughly two thirds of the impact of a single Wal-Mart within a county. By comparison, the 1996 welfare reform (PRWORA) changes to eligibility (which affected most Foodstamp recipients) had an almost equal effect.

In contrast, Medicaid expenditures rose in counties both with Wal-Mart and Supercenters and for adjacent county entrance. However, these impacts are quite small relative to county wide expenditures, accounting for between one half and three quarters of a percent of annual expenditures in the most recent years. With Medicaid expenditures averaging at \$13,660 per recipient in 2004 (SSA, 2005), new Wal-Mart associated Medicaid expenditures in a county would account for roughly 16 additional individual recipients per county. This translates into a Medicaid costs of roughly \$651 per Wal-Mart worker. This point estimate is higher, but not inconsistent with estimates of per worker cost of \$586 in Connecticut, \$246 in Massachusetts, \$174 in Wisconsin. Nor does it differ dramatically from Carlson's [2005] estimate of \$311 in Oregon.¹⁸ It is somewhat lower than the national average estimated by Hicks [2005a] at roughly \$900 per worker.

The final transfer payment I have analyzed is the Earned Income Tax Credit (EITC). This payment is especially helpful in that since participation levels are scaled to income it may better account for marginal changes in family economic wellbeing. A criticism of the EITC data is that participation rates are small relative to those that are eligible. However, these data may provide a better measure of incremental changes to poverty levels than do regional poverty rates or participation in other transfer payment programs.

The impact of a single Wal-Mart on EITC payments and cases are again mixed. A Wal-Mart was associated with an increase of family receipts of \$119 or roughly 7 percent of the state average payments (Honauer, 2004). Further, the number of cases rose between 16 and 43 percent depending upon specification of the model (either fixed or random effects). However, in both cases the statistical significance was not at the commonly reported levels, so definitive conclusions regarding Wal-Mart's impact on EITC are elusive. Explaining the opposing effects on EITC and Foodstamps and Medicaid is an ongoing area of research which suggests changes in eligibility caused by increased in EITC will reduce Foodstamp and Medicaid expenditures. However, the dominant research in this area only suggests, but does not fully conclude this is occurring (see Mikelson and Lerman, 2004; CBO, 2005).

Again, the impact of Wal-Mart and its Supercenters differed, with Supercenters reducing the increase of EITC payments per family. These are sensitive to the data definition, and combining Wal-Mart with Supercenters eliminated any impacts on EITC.

¹⁸ See Hicks, 2005b for Medicaid review in the context of Wal-Mart.

Additional tests performed included evaluation of the impact of Wal-Mart and Supercenters on unemployment compensation payments and on labor force participation rates. No impact on unemployment compensation payments was found, while the Labor Force Participation Rate was increased by roughly one percent for each new Wal-Mart in a county. This finding is difficult to interpret, but is not inconsistent with more flexible labor markets or an increase in part time labor in a county. Unfortunately, this finding may serve to both bolster approbation and criticism of Wal-Mart, depending upon ones views about labor market flexibility or family living wages.

Importantly, neither the revenue or expenditure estimates presented here are exhaustive. In particular, income taxes for individuals and corporations as well as a myriad of much smaller instruments may be affected by Wal-Mart. These two should be viewed however as representative of the local impacts. Federal, state and local governments also engage in expenditures related to poverty amelioration not discussed here. These include WIC, Rental Vouchers, low income energy assistance and service support in city and county governments. However, the impacts on Welfare (AFDC/TANF), Foodstamps, Medicaid and EITC should be viewed as a representative impact on local poverty amelioration efforts (Dube and Jacobs, 2004 estimate Medicaid and Foodstamps alone account for more than 70 percent of public assistance).

Wal-Mart also affects both infrastructure related collections (increased gasoline taxes, etc.) and infrastructure expenditures (new traffic lights, water and sewer). See Hicks [2005] for a discussion of these impacts as they relate to urban sprawl in Colorado. Also, changes in local consumer prices may be uneven (see Basker, 2005b) masking the true utility enhancing impacts of Wal-Mart. Thus, while these findings are illustrative of both the expenditures and revenues associated with a Wal-Mart, this is far from a comprehensive benefit cost analysis.

Summary and Policy Discussion

A notable evolution of the policy debate regarding Wal-Mart has evolved from the progressive improvement of economic research regarding its impact. The static case studies of the late 1980's and 1990's have given way to more robust analysis of its impact, which have effectively concluded that Wal-Mart generates no local commercial economic ills at the county level. This, of course, should not satisfy earnest researchers (and certainly will not satisfy Wal-Mart's critics).

Much remains in our understanding of Wal-Mart and its impact on regional economies. In particular, more extensive regional analysis is warranted. Neither this study, nor any of the reviewed studies provides robust geographic coverage. Also, detailing the impact of Wal-Mart on regions with different fiscal structures would be a welcomed addition to our understanding of Wal-Mart. A more comprehensive examination of individual fiscal issues as well as aggregation of these across more instruments may be warranted. In addition to the regional and fiscal questions, more analysis of local retail structure and labor markets, and perhaps examination of the role of competition and labor market flexibility surrounding Wal-Mart's entrance would be welcomed. Finally, estimating the impact of Wal-Mart while controlling for other similar stores (K-Mart, Target, etc.), would be a natural extension of analysis of a single firm.¹⁹

This research has attempted to address some of the local fiscal influences of Wal-Mart. I find that in Ohio, the presence of a Wal-Mart significantly increases local commercial property tax assessments, increases sales tax collections and leads to higher levels of local labor force participation. Local governments would typically view these as happy outcomes, though whether they are utility enhancing is another question. In contrast, I also find that the presence of a Wal-Mart dramatically increases the per capita EITC claims in a county, while the dollar value of these claims experiences mixed impacts between Wal-Mart and a Supercenter. Similarly, the impact of Wal-Mart on Foodstamps expenditures is mixed, but small in any case. Medicaid expenditures experience growth which may amount to roughly 16 additional cases per county, which translates into payments equaling \$651 per worker at Wal-Mart.

From these and other findings policy considerations regarding Wal-Mart do emerge. First, at the local level the evidence presented here would certainly fall far short of supporting a so called "Wal-Mart Tax" to subsidize state or local communities for the costs of Wal-Mart.²⁰ Indeed, in Ohio the analysis is fairly unanimous that a Wal-Mart would actually generate more revenue than expenditures (see Schiller, 2002). This study supports that conclusion. Also, without empirical (as opposed to simulation) research, we do not know how Wal-Mart's impact on transfer payments differs from other firms. The best of the existing studies (e.g. Carlson,

¹⁹ There are a number of other considerations regarding the change in retail structure in general, and Wal-Mart specifically which researchers have sought fit to explore, but on which I pleasingly remain silent. These range from the sociology of central place to local architectural aesthetics. Even my most ardent admirers would concede I am breathtakingly unqualified to express an opinion on this research (though I should note its existence).

²⁰ See the AFL-CIO memorandum dated March 31, 2005 for a discussion of the Wal-Mart Tax.

2005) do not clarify this issue. Similarly, the benefits of a Wal-Mart to local governments do not appear to warrant fiscal incentives (see Gabe and Wraybill, 1996; Gross, 2002; LeFavre and Hicks, 2005). This research implicitly concurs with that assessment.

The estimates presented in this paper suggest that there are clear fiscal impacts, both to revenues and expenditures associated with Wal-Mart in a county. There are also a number of far less clear impacts. The only incontrovertible result is that Wal-Mart, like all of us and our institutions is neither all good nor all bad.

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