Wal-Mart and County-Wide Poverty*

Stephan J. Goetz, *The Pennsylvania State University*

Hema Swaminathan, *International Center for Research on Women*

Objectives. This study seeks to identify the independent effect of Wal-Mart stores on changes in U.S. family-poverty rates at the county level. We draw on the contributions of a number of disciplines to enhance our understanding of the broader forces that influence poverty. *Methods.* A key innovation is that we estimate a two-stage regression model, in which an instrument is created for new Wal-Mart stores from a location equation; this reduces any potential endogeneity bias in the poverty-change equation. In addition, we use spatial econometric methods to correct for spatial dependence bias. *Results.* After controlling for other factors determining changes in the poverty rate over time, we find that counties with more initial (1987) Wal-Mart stores and counties with more additions of stores between 1987 and 1998 experienced greater increases (or smaller decreases) in family-poverty rates during the 1990s economic boom period. *Conclusions.* Wal-Mart creates both benefits and costs to communities in which the chain locates. These benefits and costs need to be weighed carefully by community decisionmakers in deciding whether to provide public subsidies to the chain.

Local leaders and academic researchers are increasingly interested in the community-level effects of "big box" retailers and discount department stores. Wal-Mart, in particular, has received considerable and mostly negative public media and congressional attention, in addition to spawning a number of hostile websites.[1] The interest in Wal-Mart is not surprising as it

[1] A prominent example is ⟨www.walmartwatch.com⟩; bumper stickers include "SprawlMart sucks the life out of downtown businesses." Other negative coverage includes a recent report that the chain was fined $3.1 million by the EPA for violating for the second time the Clean Water Act by failing to control runoff from its construction sites (*Salt Lake Tribune* online, May 13, 2004). Anecdotal evidence suggests that Wal-Mart stores increase crime rates or at least the cost of dealing with crime (see "Crime Linked to Wal-Mart Overwhelms Small-Town Police," *Daily News, Huntingdon, PA*, May 25, 2004, p. 7), and a recent report by the advocacy group Good Jobs First suggests that the chain benefits from substantial public subsidies (Mattera and Purinton, 2004). See Miller (2004) for the congressional report.

has no equal among big box retailers. With total revenues of $256 billion in 2003, Wal-Mart Stores Inc. is the largest corporation in the world. The chain employs 1.3 million workers worldwide and operates 4,750 stores (3,600 in the United States). Because of its size, purchasing power, and technological sophistication, the chain is revolutionizing not only the industrial organization of local retail trade, but also the entire wholesale, transportation, and logistics sector. *BusinessWeek* recently described the "Wal-Mart effect" in a cover story,[2] referring to the corporation's cost efficiency that has contributed to economy-wide productivity gains and reduced the annual rate of inflation by about one percentage point. On the other hand, Wal-Mart has been blamed for the loss of U.S. manufacturing jobs and the demise of mom-and-pop-type retailers.

This study examines the impact of Wal-Mart stores on county-level family-poverty rates in the United States. The analysis is relevant to local policymakers as they debate the pros and cons of having Wal-Mart and other "big box" retailers locate in their communities. The attraction of such retailers has been viewed as a strategy for stimulating local economic growth (e.g., Ketchum and Hughes, 1997). However, retail stores have a much smaller net economic impact on local economies than do manufacturing firms, for example. In particular, retail stores are usually part of what economists call the nonbasic sector, which exists solely to serve the so-called *basic* sector. The basic sector commonly includes agriculture, mining, and manufacturing, and it is responsible for exporting goods and services that bring "new money" into a community. As this new money is spent and respent in the community, economic growth occurs. Although important (because it supports the basic sector), the nonbasic sector does not play this role of bringing in new money and it therefore makes a much smaller contribution to local economic growth over time than does the basic sector.

Wal-Mart and Poverty

There are a number of possible reasons why the presence of a Wal-Mart store may exert an independent effect on poverty rates in a community, that is, exert a residual effect after other determinants of poverty have been taken into account. The first and perhaps most direct effect is the demise of existing mom-and-pop-type operations that is caused by the arrival of Wal-Mart in a community. We hypothesize that this in turn may have a number of consequences.

Poverty rates will rise if retail workers displaced from existing mom-and-pop-type operations work for Wal-Mart at lower wages because they have no alternatives (this assertion has been contested in the literature), all else equal. Although Wal-Mart is estimated to employ no more than 2 percent of the

---

[2]See the October 6, 2003 issue.

average county's workforce, there is at least anecdotal evidence that the arrival of the chain also forces other local retailers to reduce wages in order to remain competitive. Also, the share of Wal-Mart's employment in total county retail jobs is substantially greater than only 2 percent. In addition, the Wal-Mart jobs may be part time as opposed to full time, leading to lower family incomes, all else equal.

A perhaps more profound effect, and one that has not been discussed in the literature, is that the demise of mom-and-pop stores leads to the closing of local businesses that previously supplied those stores: wholesalers, transporters, logistics providers, accountants, lawyers, and others. Many of these are higher-paying jobs. Wal-Mart handles all or most of these service functions through its headquarters in Bentonville, Arkansas, providing tremendous labor-saving scale economies. This consolidation and rationalization of the local retail supply chain potentially devastates local labor markets in smaller communities. As a reviewer pointed out, it is unlikely that the incomes of lawyers, bankers, and accountants who provided services to the local stores fall below the poverty line after the chain store's arrival. However, it is likely that these more highly-educated individuals depart from the rural community in pursuit of better opportunities elsewhere, contributing to the rural-to-urban exodus over the last decade, leaving behind those with fewer opportunities and raising the poverty rate by reducing the number of nonpoor households in the denominator.

It may not be desirable or even possible to stop these trends, but it is important to be aware of and understand them. In the future, with the introduction of radio frequency identification (RFID) tags, Wal-Mart is poised to become even more efficient in deploying workers in the stores themselves.[3] A reduced demand for workers in specific communities translates into lower wages (with minimum wages serving as a floor) if the supply of workers remains constant.

Even though Wal-Mart presents itself as a "good local citizen" and engaged in local philanthropy through the Sam Walton Foundation in the amount of $106.9 million in 2003 alone,[4] this type of philanthropy may not be as extensive or effective as that which the displaced mom-and-pop-type stores would have provided. A perhaps more subtle effect may be that by destroying the local class of entrepreneurs, the Wal-Mart chain also destroys local leadership capacity. Rural sociologists and others have pointed to this as one outcome of the increasing concentration of nonlocal bank ownership and the resulting branch plant economy that is believed to have destroyed the pool of local leadership talent.

---

[3]For example, with this technology a single worker can potentially keep track of 10 check-out lines because a cart containing purchases can be scanned in a matter of seconds without items even being removed from the shopping cart.

[4]See ⟨http://www.wffhome.com/Grant%20Awards.htm⟩, accessed May 8, 2004. This amount represents about one-tenth of 1 percent of the estimated wealth of the Wal-Mart heirs.

The destruction of small, locally owned businesses may also reduce social capital levels, as argued, for example, by Cornell University's T. Lyson (Personal Communication, 2002). Social capital, or civic capacity, is an essential ingredient for economic growth to occur, according to Harvard University's Robert Putnam and, more recently, Skinner and Staiger (2005), who show that this variable is even more important than certain economic factors in explaining why some regions lag behind others. This elimination of local leaders as a key group of entrepreneurs may be the single-most important and far-reaching impact of Wal-Mart Corp.

In summary, detractors have consistently argued that because Wal-Mart jobs are low paying, and the hours worked are often less than 40 per week, these jobs do not help families transition out of poverty. *BusinessWeek* reports that the average wage for an "associate" in 2001 was $8.23 per hour, for an annual income of $13,861, which was below the federal poverty line for a family of three at that time. Although individual workers have the option of working or not working for Wal-Mart, a public policy issue arises if the chain creates externalities that raise poverty levels in the community. In that case, both the demand for and eligibility to participate in welfare programs increase, leading not only to new claims on tax dollars but also a dis-utility for those who are concerned about poor people living in their community. The Wal-Mart phenomenon is such that the chain seeks to minimize its workers' pay, while the rents captured by the Walton heirs place them among the 10 wealthiest Americans.[5]

Two important issues arise here. First, even if Wal-Mart raises poverty rates, it also lowers prices to consumers (at least in the short run), thereby in effect lowering the real poverty threshold. It should be noted, however, that the poverty rate is inflation adjusted, so this beneficial effect of the chain is already reflected in the poverty rate measured at any point in time. If the winners can compensate the losers, then the presence of a Wal-Mart store is still Pareto optimal. We are not able to address this question in the present study. Second, the increased cost to taxpayers resulting from the increased eligibility for welfare payments (caused by Wal-Mart) need to be added to any other subsidies that the chain may receive in exchange for opening a store, such as infrastructure improvements. These subsidies are dollar-for-dollar transfers to the corporation's bottom line.

---

[5]As reported in *Forbes* magazine (2003 Special Issue on the 400 Richest People in America), widow Helen R. Walton and heirs S. Robson, John T., Jim C., and Alice L. Walton each had a wealth of $20.5 billion in 2003. Alternatively, at a combined total of $102.5 billion, the Walton wealth is twice that controlled by Microsoft Chairman William H. Gates. Only three individuals had greater wealth in 2003: William H. Gates with $46 billion, Warren Buffett with $36 billion, and Paul Allen (also of Microsoft), $22 billion. As a comparison to the annual earnings of an associate worker of approximately $14,000, assuming a conservative annual rate of return on the Wal-Mart wealth of 1 percent in 2003, each of the five heirs would have earned an income of $205 million in 2003.

The Impact of Wal-Mart: Previous Literature

Popular press articles on Wal-Mart focus on the company's nonunionization policy and the provision of part-time jobs with low wages and few benefits, along with impacts on the environment, congestion, and crime rate (see footnote 1). In the academic literature, considerable attention has also been paid to retail restructuring caused by the chain (e.g., Artz and McConnon, 2001; Stone, 1997; Franklin, 2001; Huang et al., 2002), usually focusing on loss of retail employment, decreases in the number of establishments, and decline of downtown shopping areas. However, with some exceptions (e.g., Vias, in press), these articles are based on case studies for specific states or on anecdotal evidence. There are no academic studies that examine the impact of Wal-Mart on county-wide family-poverty rates, or contemporaneous changes in those rates over time. Likewise, we were unable to locate any econometric study of Wal-Mart's location strategy at the level of all U.S. counties (Graff, 1998 describes Wal-Mart Supercenter locations relative to locations of distribution centers and county populations).

Basker's path-breaking study examines the effect of Wal-Mart expansions on retail employment in 1,749 counties over a 23-year period and concludes (2002:19) "that Wal-Mart entry has a small positive effect on retail employment at the county level while reducing the number of small retail establishments in the county." Basker also finds small reductions in wholesale employment and no effect in those sectors in which the chain does not sell goods or services (specifically, restaurants and motor vehicle sales and services). On balance, she concludes that a decade after a Wal-Mart store's entry into a community (2002:17), "the estimated effect on total [county] employment . . . is statistically zero." Basker's work has two potential shortcomings, however: the use of a limited set of counties (truncated at employment levels above 1,500 in 1964, which may have eliminated some of the most interesting counties), and the choice only of employment as an impact measure (albeit an important one). Given the data with which she was working, Basker also was unable to distinguish between full- and part-time employment.

Hicks and Wilburn (2001) evaluate the effect of Wal-Mart stores on the retail trade sector in both the county in which the store is located and in adjacent counties in southern West Virginia using spatial analysis. They control for potential reverse causation (endogeneity) between population growth and entrance of Wal-Mart, but this raises the question of whether population growth is even a factor in Wal-Mart's location strategy (see also Franklin, 2001). Hicks and Wilburn cite the work of Vance and Scott (1992), who argued that the costs of a Wal-Mart were not as high as the benefits. Hicks and Wilburn conclude (2001:312) that there "is clearly a net benefit to employment and wages in having a Wal-Mart locate in a county." Furthermore, they note (2001:313) that "the criticisms leveled against Wal-Mart are a familiar refrain . . . [and that] local monopolies may have a great deal to lose from entrance by firms that enjoy, and exploit, economies of

scale.'' As already noted, these conclusions are based on results from a specific region in a single state.

Ketchum and Hughes (1997) studied Wal-Mart's effects on employment and wages in Maine and failed to find support for the claim made by Wal-Mart's opponents that the entry of the firm harms local economic growth because of a negative effect on wages, employment levels, or the number of retail establishments. In their subsequent study of 19 communities in Maine that received a Wal-Mart between 1992 and 1995, Artz and McConnon (2001:24) find that the introduction of a Wal-Mart store leads to "significant changes in retail market structure" both in the town hosting the store and in adjacent communities. In his study of rural Iowa counties, Stone (1997) concludes that no single recent phenomenon has had a larger adverse impact on rural Iowa communities than mass discount merchandisers (i.e., Wal-Mart). As noted, all these studies are limited in that they focus on data from only a few counties or individual states. None focuses on county-wide poverty rates.

Estimation Strategy, Hypotheses, and Data

Our estimation strategy is simple and yet provides a relatively powerful test of the independent effect of Wal-Mart on changes in poverty rates in a community. The strategy is also innovative in that we correct for likely simultaneity (reverse causation) in the phenomenon of which we are trying to measure the impact—that is, the new Wal-Mart stores—using a common two-stage procedure that is based on instrumental variables (IV) estimation. In other words, it could be that Wal-Mart locates in communities that are poor because poverty is a widely claimed characteristic of their shoppers, or the communities are poor because Wal-Mart is located in them.

As described in more detail below, we get around the statistical problem by following the standard procedure of first modeling Wal-Mart store locations econometrically and then using predicted values of these locations in the second-stage (primary) regression. In the second-stage regression, we add the following two treatment effects to an equation adapted from Levernier, Patridge, and Rickman (2000) that explains spatial variation in poverty rates: the initial number of Wal-Mart stores, at the beginning of the period over which the change in the poverty rate is measured, and the instrumented variable reflecting the change in Wal-Mart stores over the decade of interest, which is by construction purged of any simultaneity bias.

This sets a fairly high standard of statistical evidence for establishing any effect of Wal-Mart on poverty: we control for initial poverty rates as well as other known determinants of poverty, and examine the ceteris paribus or independent treatment effect of adding Wal-Mart stores on the *change* in the poverty rate over the subsequent period. Of equal importance, using the change in, rather than the level of, the poverty rate reduces the effect of spatial cost-of-living differences on the change in actual or real poverty

experienced over the period of analysis (so long as one can assume that the relative differences in costs among places did not vary materially over time).

Furthermore, we control for the presence of Wal-Mart stores at the beginning of the period over which change in poverty is calculated, allowing us to examine the effect both of *initial* stores and of *additions* of Wal-Mart stores on the change in poverty. Our study also represents a more comprehensive test of the chain's effect in that we do not merely compare employment and wages in specific retail sectors before and after Wal-Mart enters a community, but rather the community-wide effect of such an entry (if any). Our choice of the period 1989–1999 (conditioned by data availability) to measure poverty coincides with the booming "New Economy" decade of the 1990s, during which average county-level family-poverty rates nationwide fell from 13.1 to 10.7 percent (U.S. Census Bureau).

U.S. counties are the unit of analysis and the data are obtained from a variety of secondary sources. The use of county-level data is an increasingly common approach to understanding spatial social and economic processes; for a recent example, see Hooks et al. (2004). The present research also draws heavily on the work of Rupasingha and Goetz (2003) and Jensen, Goetz, and Swaminathan (in press), who analyze the structural determinants of poverty in the United States, including local social capital and political influence.

As noted above, since the location of Wal-Mart stores is likely to be nonrandom or systematic, that is, Wal-Mart location decisions are based on identifiable county characteristics, we account for potential reverse causation or simultaneity in the location decision using instrumental variables estimation. To do this, we first have to specify a model that "explains" how Wal-Mart chooses sites for its stores, and we draw on the establishment location literature to specify this equation. Kilkenny and Thisse (1999) contains a survey of location decisions in the retail sector, while earlier work on retailers includes Craig, Ghosh, and McLafferty (1984) and Vandell and Carter (1993). More recently, Shields and Kures (in press) develop a profit-maximizing spatially-referenced model of retail store locations.

We also use spatial econometric methods to test for the effects of spatial clustering. This allows us to examine spatial spillovers across county borders that are not already captured in the pull factor, which measures per-capita retail spending in a county relative to the national average. Counties with higher pull factors, also known as retail hubs, tend to attract shoppers from surrounding counties, while counties with lower pull factors lose such shoppers. The spatial econometric methods remove any remaining statistical noise or bias in the results that could arise from the fact that a Wal-Mart store can have an effect on neighboring counties beyond the pull factor. This is accomplished by means of a so-called spatial-weights matrix, which explicitly captures the contiguity relationship among or distance between every single county. Conceptually, with U.S. county-level data, this is a matrix consisting of over 3,000 rows by more than 3,000 columns.

The following model is estimated recursively. We start with the Wal-Mart store location equation that is used to obtain the instrumental variable estimate.

$$\Delta WM_{0+t} = f_1(\Omega_0, POV_0, WM_0) \qquad (1)$$

We then include this instrumental variable estimate in the second-stage equation, which represents the change in the poverty rate over the decade.

$$\Delta POV_{0+t} = f_2(\Psi_0, POV_0, WM_0, \Delta WM_{0+t}) \qquad (2)$$

Here, WM_0 is the number of Wal-Mart stores in 1987, ΔWM_{0+t} the net change in stores between 1987 and 1998,[6] ΔWM_{0+t} is the change predicted (instrumented) from Equation (1), Ω_0 contains variables influencing the Wal-Mart location decision, POV_0 is the beginning of period (1989) poverty rate, ΔPOV_{0+t} the change in the poverty rate over the decade, and Ψ_0 incorporates variables affecting the change in the poverty rate over the decade.

In terms of the variables included in Ω_0 in the store location Equation (1), we hypothesize that Wal-Mart locates its stores in counties with a high retail pull factor, interstate highway access, more female-headed households and female labor force participation (to have a larger pool of workers), longer commuting times to work (which increase the opportunity cost of time spent shopping), more purchasing power as reflected in earnings and educational attainment, and that it avoids communities with existing Wal-Mart stores. By including the initial poverty rate, we also are able to test empirically whether Wal-Mart is drawn into communities with higher poverty rates.

In addition, we hypothesize that communities with higher levels of social capital, greater political competition, and more self-employed workers are better able to organize to prevent Wal-Mart stores from locating in their communities. Wal-Mart avoids counties with higher population density (at least until recently) in part because of higher land costs in these counties, and while the chain has traditionally located in rural communities, it also avoids sparsely populated, more remote places. We include state fixed effects to, among other factors, capture differences in state policy and population growth rates that may affect Wal-Mart's location strategy. Finally, this equation is formulated as a Tobit model because the dependent variable is for practical purposes censored at zero.[7] Ignoring this fact would create a downward bias in the coefficient estimates, and their effects would be understated (this is also known as attenuation of the slope).

For the specification of regressors in the change-in-poverty equation (Ψ_0), we draw on Levernier, Patridge, and Rickman (2000) and on Rupasingha and Goetz (2003), who model poverty as a function of individual-level characteristics, economic factors, social capital variables, and political factors. We use six variables that have not been used previously in analyses of poverty

[6]The beginning year was chosen to coincide with the U.S. Economic Census of 1987 and to precede the year 1989 for the poverty measure, while 1998 was chosen to be as close as possible to and yet precede the 1999 poverty measure.

[7]About 1 percent of counties (31) had a smaller number of stores in 1998 than in 1987.

rates. The first is political competition, which is measured as the degree to which the county voted for one presidential candidate over another in 1992, relative to the nation (Levitt and Poterba, 1999). The argument here is that the more closely the county voting behavior follows the nation's, the greater the competition among local political parties and the stronger is the pressure on elected leaders to reduce poverty.[8]

The second variable is a county-level social capital index created by Rupasingha, Goetz, and Freshwater (in press). This variable captures the density of local associations that are conducive to forming social capital (such as civic and social organizations), voter participation rates, participation in the national (1990) Census, and the density of nonprofit organizations in the county. Counties with higher stocks of social capital are expected to be in stronger positions to reduce poverty rates over time. A third new variable is the county's self-employment rate, measured as the share of self-employed workers in total employment. We hypothesize that in counties in which workers show greater initiative—by working for themselves—the capacity to reduce poverty rates over time is greater than in counties where workers tend to work primarily for others through wage-and-salary employment.

The fourth variable is the (gross) loss of jobs due to the North American Free Trade Agreement (NAFTA), as certified by the U.S. Department of Labor starting in 1994. Although there are problems with the certification process for Trade Adjustment Assistance (TAA), including this variable allows us to gauge at least in a preliminary manner the local impacts of the federal policy underlying this important international trade agreement. We measure these job losses as a percent of total existing employment in the county, and hypothesize that greater relative job losses weakened the ability of counties to reduce poverty rates over the decade. The fifth variable is an ethnic diversity index based on Alesina, Baqir, and Easterly (1999). This variable captures the odds that two individuals drawn randomly from a county's population are from different ethnic groups. A higher value implies greater ethnic fractionalization and less agreement on public policies (Alesina and Rodrick, 1996) that could lead to poverty alleviation.

Finally, we examine the ratio of so-called maintenance to total expenditures in each county's budget. Rauch (1995) separates public spending into longer-term investments, such as education, roads, and bridges, and shorter-term expenditures on projects that represent consumption rather than investment, such as greater relative expenditures on motor vehicle pools or public parks and flower gardens. He argues that a higher ratio of this variable means that elected local leaders who are making the county spending decisions are more interested in short-term political gains (patronage) than in longer-term economic growth that would reduce poverty.

---

[8]A reviewer pointed out that this is a resurrection of the old argument by political scientist V. O. Key. The concept of political competition is now being used by both sociologists and economists as a potential factor influencing economic growth and poverty.

We add to this poverty-change equation the beginning period number of Wal-Mart stores (WM_0) as well as the change in the number of stores (ΔWM_{0+t}) over time, instrumented using Equation (1). We also control for state fixed effects in this equation. Because poverty tends to occur in clusters at the county level, we also test for spatial dependence bias.

Wal-Mart store location information for 1987 and 1998 is obtained from the *Directory of Chain Stores* and from the Wal-Mart edition of the *Rand McNally Atlas*. The dependent variable is extracted from the 2000 U.S. Census Summary File 3 data sets. The county-level variables describing structural forces, political involvement, and measures of social capital are compiled from a variety of secondary data sources and described in more detail in Rupasingha, Goetz, and Freshwater (in press) or Rupasingha and Goetz (2003).

Results: Discussion

Summary statistics for the regressors are reported in the Appendix. Table 1 provides regression coefficients for determinants of net new Wal-Mart store locations between 1987 and 1998. The retail pull factor, existing Wal-Mart stores (WM_0), adults with a college degree, social capital stocks, self-employment, interstate highway access, commuting time, and earnings power each have the expected signs and are statistically significant at below the 1 percent level. The effect of population density is negative, all else equal and as expected.

In terms of state fixed effects, the following states had more new Wal-Mart stores (relative to Wyoming): Arizona, California, Florida, Indiana, Iowa, Maine, Massachusetts, Michigan, Minnesota, New Hampshire, North Carolina, Ohio, Oregon, Pennsylvania, Utah, West Virginia, and Wisconsin. Especially noteworthy is the absence of Nevada from this list, despite the fact that no state experienced more rapid population growth in relative terms over the period studied. In contrast, Pennsylvania is one of the slowest-growing states in the nation, and yet it attracted a number of stores. From this we conclude that rapid population growth may not be a prerequisite for the Wal-Mart Corporation to locate new stores.

We next turn to our equation of primary interest, the change in the poverty rate.[9] Holding constant the initial (1989) poverty rate, the results show that counties with more Wal-Mart stores (in 1987) had a higher poverty rate in 1999 (or a smaller reduction in the rate) than did counties with fewer or no Wal-Mart stores in 1987. Equally important, counties in

---

[9]The mean of the dependent variable is negative (average poverty rates dropped nationwide during the 1990s); therefore, a positive coefficient estimate in Table 1 indicates that a higher value of the exogenous variable (regressor) caused a *smaller* reduction than average in the poverty rate (the variable essentially contributed to a higher ending period poverty rate), while a negative coefficient estimate implies that the independent variable contributed to greater reductions in poverty.

TABLE 1

Wal-Mart Tobit Store Location and SEM Poverty Equations

Variable	Coeff.	t Statistic	Coeff.	t Statistic
Constant	− 1.094	− 3.90***	13.536	14.0***
Family-poverty rate, 1989	− 0.009	− 2.19**	− 0.518	− 34.2***
Initial stores, 1987	− 0.036	− 3.46***	0.099	2.14**
New stores (predicted)			0.204	2.36**
Interstate highway	0.055	2.60***		
Retail market area pull factor	0.288	7.24***		
Earnings/job	0.027	3.21***		
Property tax per capita	− 0.006	− 1.08		
Population density × 1,000 (per square mile)	− 0.020	− 3.05***		
Average commuting time to work (minutes)	0.016	4.49***		
Households with more than 3 vehicles	− 0.019	− 5.18***		
Female-headed households	0.006	1.48		
Female labor force participation rate	0.005	2.03**	− 0.067	− 6.22***
High school plus, no college	0.006	2.17**	− 0.097	− 10.2***
College graduate	0.010	4.33***	− 0.027	− 2.00**
Self-employment rates	− 0.015	− 4.94***	− 0.044	− 4.85***
Employment growth			− 0.074	− 0.11
Employment rate			− 0.088	− 4.46***
Industrial churning			0.032	2.35**
Agriculture-sector employment			0.016	1.64
Goods employment			−0.014	− 1.76*
Transportation employment			− 0.019	− 0.99
Wholesale/retail employment			− 0.014	− 0.98
Finance, insurance, real estate employment			− 0.047	− 1.51
Service-sector employment			0.018	1.53
Job losses to NAFTA			0.082	3.18***
Population 0–17 years of age			0.130	6.49***
Population 18–24 years of age			− 0.013	− 0.74
Population 65 years of age and above			− 0.025	− 1.20
Nonblack minority			0.022	2.99***
Stayers (predicted nonmigrants)			3.920	3.04***
Foreign-born population			− 0.011	− 0.65
Ethnic index			3.306	8.45***
Income inequality			1.496	4.19***
Federal grants/capita			0.0002	2.28**
Rauch measure			− 0.0004	− 0.07
Political competition	− 0.0001	− 0.03	0.019	3.03***
Social capital index	− 0.032	− 2.40**	− 0.187	− 4.13***
NONMET4	− 0.170	− 4.20***	0.426	2.32**
NONMET5	− 0.099	− 2.15**	0.701	3.33***
NONMET6	− 0.177	− 5.62***	0.135	1.01
NONMET7	− 0.156	− 4.30***	0.514	3.43***
NONMET8	− 0.537	− 7.13***	0.170	0.96
NONMET9	− 0.513	− 8.41***	0.580	3.15***
Lambda (spatial parameter)			0.404	55.3***

*Significant at the 10% level.

**Significant at the 5% level.

***Significant at the 1% or lower level.

NOTE: SEM refers to the spatial error model.

which new Wal-Mart stores were built between 1987 and 1998 also experienced higher poverty rates, ceteris paribus. The marginal effect of another Wal-Mart store on the average poverty rate was 0.204, while that of each existing store was 0.099 percentage points.

These results have potentially profound implications for public policy related to big box operations. In particular, the chain is not the engine of local economic growth that the company's spokespersons and public relations materials suggest. It is of no small consequence that, after controlling for other determinants of changes in poverty rates, residual variation remains in the dependent variable that can be accounted for by the presence of Wal-Mart stores, and this at a statistically significant level.

To test the robustness of this finding, we estimated a supplementary equation with changes in food stamp payments per capita (utilization) over the corresponding decade as the dependent variable, and initial food stamp usage in 1989 as an additional regressor.[10] Our results for the reestimated equation are as follows. First, the predicted change or growth in Wal-Mart stores over the decade has a statistically significant, positive effect on changes in food stamp payments per capita over the decade; at 4.14, the t statistic is higher than that in the current equation. Second, the effect of initial (1987) Wal-Mart stores on changes in food stamps per capita is not statistically different from zero. We suspect that this is due to the inclusion in the equation not only of initial Wal-Mart stores and the initial poverty rate (1989) but also the initial level of food stamp payments per capita in 1989. More specifically, multicollinearity may make it impossible for the initial Wal-Mart stores to exert an effect that is independent from that of initial food stamp payments per capita. Thus, our results provide clear evidence that the spread of Wal-Mart stores during the 1990s was associated with higher usage of food stamps per capita, or with smaller reductions in this variable, holding other factors constant, including whether a Wal-Mart store was present at the beginning of the decade.

The public costs that the chain imposes by raising the poverty rate suggest that public infrastructure subsidies may not be warranted or, as a minimum, that these two types of costs need to be added together to assess the overall cost of the chain to a community. The question remains for future research of how these effects on poverty operate through one or all of the six factors identified above. Our analysis does not allow us to determine the relative importance of these factors in explaining the results. Even so, we believe that both in terms of substance and policy relevance, a focus in future work on the effect of big boxes on local social capital and civic capacity has the potential to generate the largest payoffs.

The other coefficients in Equation (2) generally had the signs expected based on earlier studies. In terms of the measures that have not been used previously in poverty studies, more job losses due to NAFTA, greater ethnic

---

[10]We thank a reviewer for suggesting this additional test.

diversity, less political competition, smaller self-employment rates, and lower levels of social capital each were associated with smaller reductions in poverty rates over the decade, as hypothesized (the coefficient estimate for the Rauch measure did not differ statistically from zero).

Finally, we discuss shortcomings of our work as suggestions for areas of improvement in future endeavors. As noted by a reviewer, our study involves only two points in time (although our data represent events and processes that occurred over an entire decade); we do not measure the size of the Wal-Mart store (e.g., there are differences between Supercenters and regular stores); and we are forced to concentrate on only a single chain—Wal-Mart—rather than examining the effects of all big boxes. To the extent that Wal-Mart is the industry pacesetter, however, this appears to be reasonable. As noted above, and this is one innovation of our work, we do control for the effect of stores on neighboring counties using spatial econometric methods.

Summary and Conclusion

After carefully and comprehensively accounting for other local determinants of changes in poverty, we find that the presence of Wal-Mart was unequivocally associated with smaller reductions in family-poverty rates in U.S. counties during the 1990s relative to places that had no stores. This was true not only in terms of existing stores in a county in 1987, but also an independent outcome of new stores built between 1987 and 1998. The question of whether the cost of relatively higher poverty in a county is offset by the benefits of lower prices and wider choices available to consumers associated with a Wal-Mart store cannot be answered here.

However, if Wal-Mart does contribute to a higher poverty rate, then it is not bearing the full economic and social costs of its business practices. Instead, Wal-Mart transfers income from the working poor and from taxpayers, though welfare programs directed at the poor, to stockholders and the heirs of the Wal-Mart fortune, as well as to consumers. These transfers are in addition to the public infrastructure subsidies often provided by local communities. Regardless of the distributional effects, the empirical evidence shows that the Wal-Mart business model extracts cumulative rents that exceed those earned by owners of other corporations, including Microsoft and Home Depot.

In conclusion, the costs to communities in terms of labor displacement and higher poverty need to be weighed against the benefits of lower prices and greater shopping convenience. Similarly, once local businesses have been driven out, the possibility of monopolies or oligopolies emerging in retailing (both on the input and the output side) needs to be considered carefully by public policymakers.[11]

---

[11]One dimension of this is the vast amount of information held by Wal-Mart on consumer purchasing decisions. According to some estimates, the amount of information stored on Wal-Mart computers is twice that available on the entire World Wide Web.

REFERENCES

Alesina, A., R. Baqir, and W. Easterly. 1999. "Public Goods and Ethnic Divisions." *Quarterly Journal of Economics* 114:1243–84.

Alesina, A., and D. Rodrick. 1996. "Distributive Politics and Economic Growth." *Quarterly Journal of Economics* 109:465–90.

Artz, G. M., and J. C. McConnon, Jr. 2001. "The Impact of Wal-Mart on Host Towns and Surrounding Communities in Maine." Paper presented at the NAREA Meeting. Bar Harbor, ME.

Basker, E. 2002. "Job Creation or Destruction? Labor Market Effects of Wal-Mart Expansion." Ch. 1 in *Essays on Local Labor Markets* (Ph.D. Dissertation). Cambridge, MA: Massachusetts Institute of Technology, Department of Economics.

Craig, C. S., A. Ghosh, and S. McLafferty. 1984. "Models of the Retail Location Process: A Review." *Journal of Retailing* 60(1):5–36.

Franklin, A. W. 2001. "The Impact of Wal-Mart Supercenters on Supermarket Concentration in U.S. Metropolitan Areas." *Agribusiness* 17(1):105–14.

Graff, T. O. 1998. "The Locations of Wal-Mart and Kmart Supercenters: Contrasting Corporate Strategies." *Professional Geographer* 50(1):46–57.

Hicks, M. J., and K. L. Wilburn. 2001. "The Regional Impact of Wal-Mart Entrance: A Panel Study of the Retail Trade Sector in West Virginia." *Review of Regional Studies* 31(3):305–13.

Hooks, G., C. Mosher, T. Rotolo, and L. Lobao. 2004. "The Prison Industry: Carceral Expansion and Employment in U.S. Counties, 1969–1994." *Social Science Quarterly* 85(1):37–57.

Huang, C. L., J. E. Epperson, B. J. Cude, and B. J. Woo. 2002. "Walmart Supercenter: The New Low-Price Food Retailer in Town." *Choices* 6(9):40–41.

Jensen, Leif, Stephan J. Goetz, and Hema Swaminathan. In press. "Changing Fortunes: Poverty in Rural America." Ch. 6 in David Brown and William Kandel, eds., *The Population of Rural America: Demographic Research for a New Century*. Dordrecht, Netherlands: Kluwer Academic Publishers.

Ketchum, B. A., and J. W. Hughes. 1997. "Walmart and Maine: The Effect on Employment and Wages." *Maine Business Indicators* 42(2):6. Available at ⟨http://www.usm.maine.edu/cber/mbi/summer97/hughes.htm⟩.

Kilkenny, M., and J. F. Thisse. 1999. "Economics of Location: A Selective Survey." *Computers and Operations Research* 26:1369–94.

Levernier, W., M. D. Partridge, and D. S. Rickman. 2000. "The Causes of Regional Variations in U.S. Poverty: A Cross-County Analysis." *Journal of Regional Science* 40:473–97.

Levitt, S. D., and J. M. Poterba. 1999. "Congressional Distributive Politics and State Economic Performance." *Public Choice* 99:185–216.

Mattera, Philip, and Anna Purinton. 2004. *Shopping for Subsidies: How Wal-Mart Uses Taxpayer Money to Finance Its Never-Ending Growth*. Washington, DC: Good Jobs First.

Miller, George. 2004. *Everyday Low Wages: The Hidden Price We All Pay for Wal-Mart*. Report by the Democratic Staff of the Committee on Education and the Workforce, U.S. House of Representatives. Available at ⟨http://edworkforce.house.gov/democrats/WALMARTREPORT.pdf⟩.

Rauch, J. E. 1995. "Bureaucracy, Infrastructure, and Economic Growth: Evidence from U.S. Cities During the Progressive Era." *American Economic Review* 85:968–79.

Rupasingha, A., and S. Goetz. 2003. *The Causes of Enduring Poverty: An Expanded Spatial Analysis of the Structural Determinants of Poverty in the US*. RDP No. 22, 2003. University Park, PA: Northeast Regional Center for Rural Development, University Park, PA. Available at ⟨http://www.cas.nercrd.psu.edu/Publications/RDPAPERS.rdp22.pdf⟩.

Rupasingha, A., S. Goetz, and D. Freshwater. In press. "The Production of Social Capital in US Counties." *Journal of Socioeconomics*.

Shields, Martin, and Matt Kures. In press. "Lights Out for the Blue Light Special: An Analysis of K-Mart Store Closing Decisions." *Journal of Retailing and Consumer Services*.

Skinner, J., and D. Staiger. 2005. *Technology Adoption from Hybrid Corn to Beta Blockers*. National Bureau of Economic Research, Working Paper No. 11251. Available at ⟨http://www.nber.org/papers/W11251⟩.

Stone, K. E. 1997. "Impact of the Wal-Mart Phenomenon on Rural Communities." Pp. 189–200 in *Increasing Understanding of Public Problems and Policies*, Oak Brook, IL: Farm Foundation.

Vandell, K. D., and C. C. Carter. 1993. "Retail Store Location and Market Analysis: A Review of the Research." *Journal of Real Estate Literature* 1:13–45.

Vias, A. C. In press. "Bigger Stores, More Stores, or No Stores: Paths of Retail Restructuring in Rural America." *Journal of Rural Studies*. Available at ⟨http://www.sciencedirect.com/science/journal/07430167⟩.

APPENDIX

Variable Definitions and Summary Statistics

Variable	Definition	Mean	SD
CHG8798	Change in Wal-Mart store numbers, 1987–1998	0.5539	1.2711
FAMPOV89	Family-poverty rate, 1989	13.07	6.92
INEQ89	Income inequality, 1989	1.458	0.135
PULLFAC	Retail market area pull factor, 1990	0.877	0.303
WAL87	Wal-Mart stores, 1987	0.40	0.89
FLF90	Female labor force participation rate, 1990	51.88	7.10
HISSOM90	High school plus graduates (no college), 1990 (%)	56.18	7.49
COLL90	College graduates, 1990 (%)	13.37	6.38
POLCOM92	Political competition, 1992 (see text)	8.86	6.69
SKI90PCM	Social capital index, 1990 (see text)	0.01	1.35
SELEMP90	Self-employment rate, 1990 (%)	17.32	5.24
HWYDUM	Highway interstate access ramp	0.427	0.495
PCEARN87	Earnings per job, 1987	10.921	1.613
PCPTAX87	Property taxes per capita, 1987	4.183	3.190
POPDEN87	Population density, 1987	0.266	1.982
CHGEMP90	Growth in private wage and salary jobs, 1988–1990	0.035	0.054
EMP90	Employment rate, 1990 (workers/population)	93.325	3.028
ISC8890	Industrial churning index, 1988–1990**	0.341	2.610
AG90	Agriculture, fisheries, & forestry employment, 1990 (%)	10.3	9.2
GOODS90	Manufacturing employment (%)	27.3	10.2
TRANS90	Transportation, public utilities employment (%)	6.5	2.1
WHRET90	Wholesale/retail employment (%)	19.7	3.4
FIRE90	Finance, insurance, real estate employment (%)	4.4	1.8
SERVIC90	Service-sector employment (%)	28.8	5.7
JBLOSS	Job losses due to NAFTA, 1994–1999 (%) (see text)	0.347	1.321
A017A90	Population 0–17 years of age, 1990 (%)	26.9	3.4
A1824A90	Population 18–24 years	9.3	3.4
A65OV90	Population 65 years and older (%)	15.0	4.3
NONBLK90	Nonblack minority share, 1990	3.8	7.3
PRDSTY90*	Nonmoving households (share), 1985–1990	0.749	0.050
FBPOP90	Foreign-born population (%)	2.16	3.41
ETHNIC90	Ethnic diversity (fractionalization) index (see text)	0.174	0.167
FEDGNT90	Federal grants per capita, 1990 ($)	472.4	504.3
RAUCH90	Consumption spending (Rauch, 1995) (see text)	88.5	7.0
NONMET4	Beale code county = 4***	0.043	0.203
NONMET5	etc.	0.035	0.185
NONMET6		0.200	0.400
NONMET7		0.213	0.410
NONMET8		0.081	0.273
NONMET9		0.164	0.371

*Denotes a predicted value from an auxiliary equation.

**This is an industrial employment dissimilarity index that measures the extent of transitioning of workers between industries (see Levernier, Partridge, and Rickman, 2000).

***The degree of rurality and remoteness of a county increases with the Beale code number.

NOTE: Data measured in 1990 except where indicated. $N = 3{,}004$ U.S. counties.