Has Wal-Mart Buried Mom and Pop?: The Impact of Wal-Mart on Self Employment and Small Establishments in the United States[*]

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Abstract

Saving traditional small 'mom and pop' businesses has been a justification for political and court decisions preventing Wal-Mart from opening new stores virtually everywhere across the United States. We present the first rigorous econometric investigation of how Wal-Mart actually impacts the small business sector. We examine the rate of self-employment and the number of small-employer establishments using both time-series and cross-sectional data. Contrary to popular belief, our results suggest that the process of creative destruction unleashed by Wal-Mart has had no statistically significant long-run impact on the overall size and profitability of the small business sector in the United States.

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"Wal-Mart has indeed set prices low enough to drive mom & pop stores out of business all over the country and kept the prices that low forever."[1]

"During the last 20 years, Wal-Mart has moved into communities and destroyed them, wiping out stores, slashing the tax base, and turning downtown areas into ghost-towns."[2]

I. Introduction

The argument that Wal-Mart inflicts significant harm on the small 'mom and pop' business sector of the U.S. economy is so widely accepted that one of the paper's opening quotes is actually from a *pro*-Wal-Mart article, which goes on to discuss the merits and efficiency enhancements that result, claiming that "[i]n a free market, large suppliers of nearly everything will drive most small suppliers out of business." Wal-MartWatch, one of the largest Anti-Wal-Mart organizations, features an academic article claiming that in Iowa, Wal-Mart's expansion has been responsible for widespread closings of 'mom and pop' stores, including 555 grocery stores, 298 hardware stores, 293 building suppliers, 161 variety shops, 158 women's stores, and 116 pharmacies.[3]

Perhaps because of its size and success, unlike most other firms, Wal-Mart's ability to open new stores is generally decided within the political process. State and local economic development authorities, and state courts, in most cases make the final decisions on whether to allow the entry of a specific new Wal-Mart store. These decisions are often significantly influenced by arguments about the harm done to small businesses. For example, in her comments to a local reporter surrounding the city commission's vote on allowing a new Wal-Mart store, Aberdeen, South Dakota city commissioner Pat Klabo stated "If this were a moral decision, we would have voted right away [in favor of the 'mom and pop' stores]."[4] Even President Clinton's former

Secretary of Labor, Robert B. Reich, writes in the *New York Times* that Wal-Mart will turn "main streets into ghost towns by sucking business away from small retailers."[5]

However, these previous estimates of the negative impact of Wal-Mart on other businesses, such as the numbers cited above, are misleading. These estimates come from a series of applied policy studies that simply compare averages for counties with Wal-Mart stores to those without.[6] While these studies have garnered significant media publicity and widespread acceptance, they are problematic for several reasons. First, no econometric methods are employed, making it hard to know if the differences are statistically significant or caused by the many other economic and demographic factors that differ between counties with Wal-Mart stores and those without.

In addition, perhaps the biggest problem with these previous studies is that they analyze data only for directly competing retail business sectors within that specific county. This is even true for the one published study that does use econometric techniques to examine the data, Basker (2005a). The idea of creative destruction, first eloquently stated by Schumpeter (1934) explains how entrepreneurs, like Sam Walton, are a disruptive force in an economy.[7] Schumpeter emphasizes the beneficial aspects of this process of creative destruction, one in which the introduction of new products results in the obsolescence or failure of others. Schumpeter points out that while these inventions do result in job losses in certain areas, they result in overall net gains because of the positive impacts on economic activity in other areas.[8] These impacts are, however, widespread and often hard to identify.[9] Similarly, Wal-Mart's openings, while resulting in the failure of some small businesses, create opportunities for new businesses, both large and small, not only in that local area but in other more distant places as well.

Because of their reliance on county level data that considers only directly competing retail firms, this process of creative destruction is not accounted for in previous research. If a new Wal-Mart store opens, for example, and it causes a local hardware store to fail, and subsequently a new art gallery opens in its place, only the failure of the hardware store is counted by previous studies. The opening of the art gallery is not reflected in the data because it is not a retail store. In reality, one business was substituted for another, but this effect would not be reflected in the data because expansions in sectors that don't directly compete with Wal-Mart are, by definition, excluded from their analysis. In addition, because previous studies use county-level data, virtually all of the general equilibrium impacts that occur at the macroeconomic level—in other counties, for example—are ignored. And it is likely that these macroeconomic effects, in the case of Wal-Mart, are enormous.

Finally, previous research is problematic because it generally uses data for *all* competing retail businesses, including other large retailers like Kmart, Target, and Home Depot, who are all clearly negatively impacted by Wal-Mart. Thus, it is unclear to what extent these previous negative estimates can be used to infer about the impact Wal-Mart has on the 'mom and pop' sector of the economy alone, as Kmart's store closings would be counted in the data used in these previous studies.

From an economic standpoint, the real question of interest is how Wal-Mart impacts the overall size of the small business sector for the *entire* U.S. economy. To overcome the problems in previous studies, we use both state and national level data, restrict our analysis to small firms only, and include all small firms regardless of whether they are in a directly competing business sector or not.

To be clear, there is no question that certain specific small businesses fail because of the entry of a new Wal-Mart store, and that Wal-Mart has negative impacts on other major retailers like Kmart. These are the effects other studies have estimated. The question that remains unanswered, however, is how Wal-Mart has affected the *overall* level of small business activity in the U.S. after all long-run readjustments have occurred, and this is what we estimate.

We proceed by first discussing what economic theory would predict with regard to Wal-Mart's impact on small business activity, focusing on Schumpeter's theory of creative destruction. We then perform statistical analysis of both aggregate time series data and state-level cross sectional data using spatial econometric methods to arrive at an estimate of the impact Wal-Mart has on the small businesses sector in the United States.

II. The Process of Creative Destruction Unleashed by Wal-Mart

Virtually every U.S. citizen has witnessed, first hand, the closing of small downtown merchants after the arrival of a new Wal-Mart store. Particularly hard hit are small businesses that used to sell building supplies, toiletries, groceries, clothing, and electronics. Downtowns with empty storefronts, however, soon see new small businesses opening in these vacant locations. In Morgantown, West Virginia, for example, a shop that was once a women's clothing store has now turned into a high-end restaurant. A former record and Compact Disc store has been converted into an ice cream parlor. Other vacated stores have been filled by a coffee shop, an indoor rock climbing facility, an art gallery, a candle shop, a collectible comic book store, a dinner theatre, an antique mall, and a new law firm.[10]

This 'recycling' of productive resources into new areas is precisely the mechanism by which the process of creative destruction increases economic efficiency. Prior to the opening of Wal-Mart stores, downtown retail space was very competitive, and was generally allocated to those stores providing the type of general merchandise now sold at Wal-Mart. Only when these valuable store locations were freed up by the entry of Wal-Mart did they become economically viable locations for many other types of small businesses. This provided opportunities for new entrepreneurs, opportunities formerly unviable before these resources were freed from the production of general merchandise. In the case of the antique mall, what used to be a single retail establishment is now replaced by approximately 20 to 30 small sole proprietors under this one roof. Wal-Mart has also eased the traffic flow in highly congested downtown areas. Businesses whose shoppers need to run in and out quickly are thus more viable in the downtown area, as their customers no longer have to compete for parking with people doing their weekly shopping.

Perhaps most importantly, the money consumers save on their general merchandise purchases because of Wal-Mart's lower prices is extra money that can be spent on other goods and services, such as those sold by these new specialty shops. Basker (2005b) finds that the opening of a new Wal-Mart store results in city-wide price reductions of approximately two or three percent in the short run and about ten percent in the long run, giving consumers a significant amount of additional disposable income to spend on new goods and services. Some of this money will be spent on goods and services produced by local small businesses, while some will be spent on goods and

services produced by small businesses outside the local area expanding small business activity in other counties and regions.

Thus, while in terms of local business failures the costs of a Wal-Mart store opening are easy to identify, the benefits are widespread and difficult to identify without examining more aggregate data.[11] In theory, there could be one additional recreation company (like a whitewater rafting company, for example) in existence solely because of the time and money Wal-Mart has saved consumers. These new businesses, however, are not necessarily in the specific county in which Wal-Mart opens, nor in directly competing business sectors. Other small businesses, like this hypothetical additional whitewater rafting company, clearly occur in other counties, and in other industries (as with our examples of new downtown non-retail businesses), and have been completely excluded from previous studies. This has resulted in a very incomplete picture of how Wal-Mart actually impacts the overall size of the U.S. small business sector.

Additionally, because Wal-Mart store managers are given some degree of flexibility in their decisions to carry lines of local merchandise, new markets have opened for other businesses who now sell products in their local Wal-Mart stores.[12] The building of a Wal-Mart store itself results in significant contracting with small local suppliers. By increasing the volume of exchange in an area, and through the reallocation of productive resources, Wal-Mart has a significant, positive impact on the small business sector.

Thus, while it is clear that Wal-Mart does result in some small business failures, many of which are highly visible, economic theory predicts that there are other impacts of Wal-Mart that can exert positive and offsetting impacts within the small business sector. The question is whether, in total, these positive impacts outweigh the small

business failures Wal-Mart causes for its direct competitors. In particular, the opening of a Wal-Mart store causes businesses of various sizes to fail, while at the same time creating opportunities for new businesses of various sizes. At issue, then, is how the average size of the businesses that fail compares to the average size of those that open.

As this section has illustrated, based purely on theory alone, it is difficult to predict whether Wal-Mart exerts a positive or negative impact on the overall size of the small business sector. There are many effects, working in opposite directions. In the end, it is an empirical question. We now turn to performing this analysis in the next several sections of this paper. We begin by exploring the impacts detectable in aggregate U.S. time series data, and then proceed to a cross-sectional analysis at the state level.

III. The Aggregate U.S. Effects of Wal-Mart in Time Series Small Business Data

Wal-Mart is big enough to have significant macroeconomic effects. Hausman and Leibtag (2004), for example, find that the Consumer Price Index (CPI) is biased because of the failure to specifically account for Wal-Mart. These authors find that the CPI-U 'food at home' inflation rate is overstated by about 0.32 to 0.42 percentage points, which they conclude leads to a substantial 15% upward bias in the U.S. inflation rate each year.[13] Thus, because of its sheer size, if Wal-Mart has a negative effect on small business activity, this effect should be discernable in aggregate U.S. data.

In Iowa, for example, there are roughly 5,000 establishments with one to four employees, out of a total of 14,000 establishments. Recall that previous estimates (discussed earlier), so heavily popularized by anti-Wal-Mart groups and the media, cites Wal-Mart's expansion as responsible for the failure of 555 grocery stores, 298 hardware

stores, 293 building suppliers, 161 variety shops, 158 women's stores, and 116

pharmacies, for a total of 1,581 business failures. Taken at face value, this would amount

to a failure of 11.3 percent of all business firms in the state of Iowa, or 31.6 percent of all

establishments with one to four employees. Impacts of this magnitude, occurring in all

50 states, would certainly be discernable in aggregate U.S. data. In fact, because Iowa is

a fairly representative state in the sample, an extrapolation would suggest that based on

the estimates from these policy studies, the overall size of the small business sector in the

United States should have fallen by about one-third relative to days prior to Wal-Mart's

expansion across America. Has this one-third reduction in U.S. small business activity

really happened? If so it should be clearly visible in the raw data on U.S. small business

activity, and this is the first evidence we will examine.

For our analysis we collect data (for the 48 continental U.S. states) on the rate of

self-employment, the number of small establishments, and the number of Wal-Mart

stores (including both Wal-Mart Discount Stores and Wal-Mart Supercenters).[14] The rate

of self employment for each state is calculated by taking nonfarm proprietor employment

(i.e., the number of self employed persons) as a percentage of total nonfarm employment

using data from the U.S. Department of Commerce's Bureau of Economic Analysis.[15] As

another measure of the number of small, 'mom and pop', businesses we collect data on

the number of retail establishments with one to four employees per 100,000 of state

population from the U.S. Census Bureau. For a check of robustness, we also examine the

number of retail establishments with five to nine employees, also normalized per 100,000

of state population. We arrive at our aggregate measures for the entire U.S. by summing

up these state-level data points. Brief data descriptions, with sources and descriptive

statistics for each variable we use, are presented in Appendix 1.

[Figure 1 about here.]

Figure 1 presents data on the expansion and growth of Wal-Mart stores in the

United States alongside data on the rate of self employment. During the period in which

the number of Wal-Mart stores grew from a handful to over 2,500 we see a continuing

and uninterrupted increase in the rate of self employment in the United States. The

overall upward trend in self employment appears just as strong during the 1980s, when

Wal-Mart was expanding the most rapidly, as it did in the 1970s. If Wal-Mart were

having a significant negative impact on self employment in the United States, as is now

generally accepted, we should have seen this measure fall significantly, rather than grow

from 11 percent to 16 percent (almost a 50 percent increase) during the same period when

Wal-Mart grew from a single store in Arkansas into the nation's largest retailer.

[Figures 2a and 2b about here.]

Figure 2 shows similar comparisons for the number of establishments with 1 to 4

employees (Figure 2a) and 5 to 9 employees (Figure 2b). One problem with this

establishment data series is that in 1998 the U.S. Census Bureau redefined the way they

measure it, causing a discontinuity in the data. The drop in this series in that year is due

to this redefinition, so we present these data as two separate lines in the figures. In both,

we see the same pattern, although different from the pattern seen in Figure 1. While self

employment has been steadily growing in the United States, the number of small

establishments has remained virtually unchanged since the beginning of our data series in

1985. The overall trend is completely flat for both size businesses, both using the old

data series, and the new data series. There are just as many small establishments in the United States today as there were twenty years ago, before the invasion of Wal-Mart.

The aggregate time series data examined in this section would seem to be at significant odds with the magnitude of the estimates from previous research on this issue. We see no evidence, in the raw aggregate data on small business activity, that Wal-Mart's expansion into the U.S. economy has drastically reduced the rates of self-employment or the number of small employer establishments. In fact, the raw data seem to pretty clearly reject the popular hypothesis extrapolated from previous work that Wal-Mart has reduced the small business sector in the United States by almost one-third. In the raw data this reduction simply isn't there. This doesn't mean that Wal-Mart might not have slowed the growth of these sectors, or have had a small and/or hard to identify impacts, however, and that is why in the next section we turn to a more rigorous cross-sectional analysis to see if this remains true at a less aggregated level.

IV. Cross-Sectional Estimates of the Effect of Wal-Mart on Small Businesses

For our cross-sectional analysis we use data for 2000, maximizing the number of control variables we can obtain from the 2000 U.S. Census. In addition to examining the *level* of small business activity, we also examine the rate of annual growth centered around the year 2000.[16] Thus, our analysis in this section includes both an estimate of how the level of Wal-Mart stores impacts the level of small business activity, and also how the growth rate of Wal-Mart impacts the growth rate of small business activity at the U.S. state level.

Prior to beginning our formal empirical analysis, it is worthwhile to examine the raw data to see whether any relationship can be seen before it is adjusted for other

factors. Table 1a presents data on our small business measures for the five states with the most Wal-Mart stores per capita (per 100,000 population), and the five states with the fewest Wal-Mart stores per capita. Arkansas, the home state of Wal-Mart, is not surprisingly the state with the largest number of Wal-Mart stores by this measure. In Arkansas there are just slightly more than three stores for every 100,000 people. Nevada, Mississippi, Missouri, and Alabama round out the list of the top five Wal-Mart states. The states with the fewest Wal-Mart stores per capita are New York, New Jersey, California, Washington, and Connecticut. The five states with the most Wal-Mart stores per capita have an average of 2.3 Wal-Mart stores per 100,000 population, while the five states with the least number of Wal-Mart stores per capita have an average of 0.3 stores per 100,000 population. Thus, on average, the five states at the top have more than seven times as many Wal-Mart stores per capita as the five states at the bottom.

[Tables 1a and 1b about here.]

With this large of a difference, if the presence of Wal-Mart stores has a negative impact on small business activity, then we should see that the states with the most Wal-Mart stores per capita also have a lower level of small business activity. The final three columns of data in Table 1a show the values for our small business measures for these states. While the states with the larger number of Wal-Marts do have a very slightly lower rate of self employment (15.9 versus 15.0), they actually have more small firm establishments per capita (194 versus 189 for one to four employees, and 115 versus 90 for five to nine employees).

Table 1b shows this same analysis repeated using the growth rates of these variables. The five states with the fastest growth of Wal-Mart stores saw an annual

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increase of 13.6 percent, while the slowest growth states experienced an annual increase of 0.2 percent in the number of Wal-Mart stores. Do the states with the faster expansion of Wal-Mart stores have different rates of growth in small business activity? The data show that exactly the opposite is true for both self employment and one to four employee firms. Self employment grew at an annualized rate of almost 16 percent in the states with rapid Wal-Mart expansion, while it grew at an annualized rate of less than one percent in the states with the lowest Wal-Mart store growth. The growth rate of small-employer establishments is negative for both categories, but is less negative for the one to four employee firms in fast Wal-Mart growth states. This pattern is exactly opposite for the growth rate of five to nine employee establishments, with the faster growth Wal-Mart states having larger reductions.

[Figures 3, 4a, and 4b about here.]

Tables 1a and 1b rely on comparisons of only the top and bottom five states for each category. Do these data patterns hold up more generally across all states? Figures 3 and 4 present data for all states on the number of Wal-Mart stores per capita and measures of small business activity. In Figure 3, the best-fit regression line has a slope that is positive, but not significantly different from zero, suggesting no negative impact of Wal-Marts on the rate of self employment. Figure 4 again rejects the hypothesis that Wal-Mart stores reduce the number of small employer retail establishments (Figure 4a for 1-4 employee establishments, and Figure 4b for 5-9 employee establishments). The slope of the best-fit regression line is positive in both cases, and in the case of 5-9 employee establishments, it is actually significantly different from zero, suggesting states with more Wal-Marts have significantly *higher* levels of 5-9 employee establishments.

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Taken as a whole, Tables 1 and 2, and Figures 3 and 4, show that there is clearly no striking negative impact, at least not one large enough to be seen in the raw data, of Wal-Mart prevalence, nor of Wal-Mart store growth on state small business activity. Even for the state of Iowa, cited as having massive reductions in small business activity caused by Wal-Mart, we find little evidence of this being true in Iowa's state-level data. Iowa (not detailed in the tables), falls about in the middle of the pack on all variables, has a respectable 1.62 percent growth rate of self employment over this period, and has one of the lower rates of reduction in one to four employee establishments (-0.28 percent) among the states in the sample. Thus, even for Iowa, a state held as an example of Wal-Mart's disastrous impact on small business, we see little evidence in the raw data to support this claim on a state economy-wide basis. Again, however, while we can reject the conventional wisdom that Wal-Mart has lowered the small business sector by 30 percent or more, even with the raw data, it is worthwhile to explore whether any smaller impacts can be found with a more rigorous statistical analysis.

We now turn to regression analysis to control for other factors that might impact this relationship to see if this conclusion still holds. In addition to the number of Wal-Mart stores per 100,000 people, we include control variables to help explain the per capita levels and growth rates of these small businesses measures. These control variables include median age, percent metropolitan population, percent of population in poverty, median family income (in thousands), percent of population nonwhite, percent of population with a college degree, percent of population male, and state land area (in thousands of square miles). These variables are traditionally used in studies of self employment to capture the impacts of economic conditions, population density, and

demographic variations that help to explain the likelihood of individuals becoming entrepreneurs and the likelihood of new small business survival.[17]

We first estimate our models using OLS. However, the OLS estimator can be shown to be either biased and inconsistent or inefficient when spatial dependence exists in the data, which is potentially present for both small business activity, and Wal-Mart location prevalence.[18] To the extent that there are unobservable geographic correlations among either our dependent variable, or the regression error term, spatial econometric methods must be used to control for these geographic patterns in the data. If the level of small business activity in a state is impacted by the level of small business activity in neighboring states, spatial methods must be used to obtain unbiased and efficient coefficient estimates in the presence of this dependence. Spatial econometric methods are, in fact, ideally suited to examine this data as they specifically control for regional trends, spillovers, and geographic correlations that are generally present in retail data.

For readers unfamiliar with spatial econometrics, LeSage and Pace (2004) provides a nice overview of the advantages of these techniques, however one may simply think of spatial models as analogous to ARMA time series models, but with the lags occurring over geographic distances, rather than through time. Thus, for a given state, one spatial lag refers to all neighboring states, while two spatial lags would refer to the states who are two states away (or neighbors to its neighbors). We run both a spatial autoregressive model (SAR) of the form in equation (1), and a generalized spatial model (SAC) that incorporates both a spatial autoregressive term and a spatially correlated error structure (analogous to the MA, moving average component, in time series), of the form in equation (2).

$$Y = \rho \cdot W \cdot Y + X \cdot \beta + \upsilon \tag{1}$$

$$Y = \rho \cdot W \cdot Y + X \cdot \beta + \varphi; \text{ where } \varphi = (I - \lambda \cdot W)^{-1} \cdot \upsilon \tag{2}$$

where Y is the N x 1 dependent variable, X is the N x K matrix of exogenous variables, W is the N x N spatial weighting matrix based on first degree contiguity (geographic neighbors), ρ is the spatial autoregressive coefficient, λ is the spatial error coefficient and υ is the N x 1 vector of IID random errors. We run these specifications in MATLAB.[19] For each model we compute the LM-test statistic, generally used to discern whether the SAR model is sufficient to remove this spatial dependence, or whether there remains additional spatial dependence in the residuals of the SAR model that would necessitate the use of the SAC model. A significant LM-test statistic for an individual SAR model would imply the need to use the SAC model instead.

In the results that follow, we present both the OLS results and the results from our spatial estimations that control for any potential geographic dependence in the data.

[Table 2 about here.]

The results of our estimations are presented in Table 2. The first three columns show the results using the self-employment rate as the dependent variable, while the final six columns show the results using the measures of small establishments. None of the coefficient estimates for Wal-Mart prevalence (highlighted near the top of the table) are statistically significant. A large number of Wal-Mart stores has no significant relation to small business activity in a state as measured by either self-employment, nor the number of 1 to 4 and 5 to 9 employee firms. This holds true when looking at the OLS results, as well as the spatial autoregressive (SAR) and general spatial model (SAC) estimates.

[Table 3 about here.]

Table 3 shows results similar to those in Table 2, except in these regressions the annual growth rates are substituted for the levels for both our measures of small business activity, and the number of Wal-Mart stores. Rather than examining whether the levels of the variables are correlated, these regressions search for correlations among the growth rates of these variables. However, even when examining the growth rates, none of the coefficient estimates for Wal-Mart prevalence (highlighted near the top of the table) are statistically significant, with one exception. This lone significant result, however, is in the opposite direction of what might be expected, as it illustrates a positive and significant relationship between Wal-Mart store growth and the growth rate of the number of 1-4 employee establishments. This significant result, however, only appears in the SAR specification, so it is not robust enough to be persuasive. In summary, the results presented in Table 3 suggest no statistically significant impact of Wal-Mart store growth on the growth rate of small business activity. Thus, taken as a whole, the evidence in Tables 2 and 3 strongly rejects the hypothesis that Wal-Mart has a negative impact on the 'mom and pop' sector of the U.S. economy (either in levels or growth).

V. Robustness Checks

In this section we re-estimate our models to check for potential problems with endogeneity in Wal-Mart store location. Presumably, Wal-Mart could be expanding the most in areas where unobservable variables are also leading to more rapid growth in small business activity. Controlling for endogeneity with regard to Wal-Mart store location is likely to make little difference in the results, however, as prior studies have rejected endogeneity both through empirical testing and anecdotal evidence directly from

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Wal-Mart (Hicks and Wilburn 2001, Franklin 2001, Graff 1998, Hicks 2006), although Basker (2005a) did find some small differences after controlling for it.

We do this in two ways. First, we re-estimate all of the models above using the five year lagged value of the Wal-Mart store (or growth rate) variable. Not only does this help to uncover clues suggesting the existence of problems with endogeneity and simultaneity, but it also addresses any concerns that the true negative impact of Wal-Mart on small business activity takes time to become visible. Secondly, we employ instrumental variable methodology to first predict the number of Wal-Mart stores in each state, and in a second stage, use this predicted value in our regressions. To obtain this prediction we use the fitted values from a general spatial model (SAC) with Wal-Mart stores (per capita) as the dependent variable and the explanatory variables used by previous studies to instrument the number of Wal-Mart stores.[20] The results of these two new estimations are presented in Tables 4 and 5.

[Tables 4 and 5 about here.]

Consistent with the findings of previous literature, both of our attempts to control for endogeneity make little difference. In all 18 specifications, the results are virtually identical to those presented earlier. In no specification is the number of Wal-Mart stores per capita significantly related to the level of small business activity.

Thus, the use of spatial methods, growth rates, lagged values, and instrumental variables does not change our main econometric result: We find no statistically significant negative impact of Wal-Mart on the *overall* level and growth of small, 'mom and pop' business activity in the U.S. states. Thus, while Wal-Mart might hurt some directly competing small retail business in the county in which they open, once the

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general equilibrium reallocation impacts in other counties and other industries are taken into account as we do, the size of the small business sector has been unaffected in total.

VI. Are the New Small Businesses 'Worse' than the Old Ones?

The evidence clearly suggests that the overall size of the small business sector is unaffected by Wal-Mart. Some firms fail when a Wal-Mart opens (both large and small) and new firms arise (both large and small) in their place, taking advantage of the newly available productive resources. Given we find no significant impact on the overall size of the small business sector implies that these displaced resources are equally likely to go back into the small business sector.

One potential criticism, however, is that the new small businesses opening are in some respects 'inferior' to the ones that are closing. For example, a profitable and long-standing local toy store might go out of business and be replaced by a marginal small business with very low net income. In this respect, the concern is that while the number of small businesses is unchanging, the mix is changing unfavorably. Conveniently, this criticism has a direct empirical prediction, that through time the average sales and/or net income of small businesses in the U.S. should be falling as Wal-Mart has expanded.

[Figures 5a and 5b about here.]

In Figures 5a and 5b we present evidence on this claim. Figure 5a shows a time series of the average real net income of sole proprietors in the United States, alongside the number of Wal-Mart stores. In Figure 5a it is clear that the average real income of sole proprietors has grown, almost uniformly throughout the period. Small businesses today are more profitable then ever before, in real terms. Figure 5b shows similar data

for the average real sales revenue of sole proprietors. As with net income, there is no

evidence that average revenue has gone down. In fact, like with net income, real sales

revenue among sole proprietors has grown substantially throughout the period as well.

Thus, no only do we find that the total number of small businesses is unaffected,

due to new firms replacing old ones, we can also find no evidence to support the possible

criticism that 'good' small businesses are being replaced by 'worse' small businesses that

generate less income for their owners. Today, small businesses have larger average sales

revenue and larger average net income (both in real terms), than in the past.

VII. Summary and Conclusion

This paper tests the widely-held belief that Wal-Mart has a large negative impact on the

size of the small business ('mom and pop') sector of the U.S. economy. A series of

heavily-popularized applied studies suggests that this negative impact is sizeable, in the

case of Iowa amounting to almost a third of all existing small businesses closing as a

result of Wal-Mart's entry in the state. If accurate, given the size and growth of Wal-

Mart across the entire United States, this would imply a massive overall impact for the

U.S. economy, and should be reflected in significant overall declines in the level of small

business activity for the economy as a whole.

After examining a battery of different measures of small business activity and

growth, employing different geographic levels of data, examining both time series and

cross section data, and using different econometric techniques, our conclusion is firmly

that there is no evidence for the claim that Wal-Mart has shrunk the size of the small

business sector in the U.S. economy. One reason our results differ from the previous

applied literature because we expand our data to include more than simply the directly competing retail businesses within the specific county in which Wal-Mart opens.

While the entry of a specific Wal-Mart store might cause some individual small, 'mom and pop' businesses to fail, our results suggest that these failures are completely offset by the entry of other new small businesses somewhere else in the economy. This is consistent with Schumpeter's theory of creative destruction, explaining how business failures, by freeing up resources for alternative uses, result in economic progress. The readjustments caused by Wal-Mart are no different. Anecdotal evidence suggests that this reallocation allows an opportunity for new entrepreneurial ventures, such as coffee shops, art galleries, and high-end restaurants, to emerge. Prior to Wal-Mart these types of firms were at a significant disadvantage in competing for the high-valued downtown retail space occupied by general merchandisers who fail when Wal-Mart comes to town.

While the total number of small businesses is unaffected, due to new firms replacing old ones, a possible criticism is that 'good' small businesses are replaced by 'worse' small businesses that generate less income for their owners. However, we can find no evidence consistent with this claim either. Average real revenue and net income for small businesses continued to grow substantially throughout the entire period in which new small businesses replaced the old ones who failed.

The widespread belief that Wal-Mart hurts the small business sector has been used repeatedly by politicians and courts as a justification for not allowing the opening of new Wal-Mart stores. However, the results of our study suggest that claims about harm to the small business sector are statistically unfounded, and should be given no weight in future political and court decisions regarding openings of new Wal-Mart stores.

Endnotes

[1] See DeCoster (2003).

[2] See Freeman (2003).

[3] See Wal-Mart Watch (2005).

[4] See Fennell (2005).

[5] See Reich (2005).

[6] See Stone (1995), Stone (1997), and Stone, Artz, and Myles (2002). In one of these articles, Stone (1997) concludes that existing retailers in small towns lose up to 47 percent of their sales after 10 years of having a Wal-Mart store nearby.

[7] See Darby and Zucker (2003) for a discussion of the process of creative destruction and how incorporating this scientific entrepreneurial process is critical to reformulating endogenous growth models.

[8] See Cox and Alm (1992) for a good discussion of the process of creative destruction along with specific examples and data from U.S. history.

[9] Failing to account for these 'unseen' general-equilibrium effects is, and has long been, a common source of error in many economic arguments, as was noted by 19th century political economist Frederic Bastiat and, more recently, by Henry Hazlitt. The distinction between what is seen and what is unseen was the main argument employed by Bastiat with respect to debunking the popular 'broken window fallacy,' [see Bastiat (1995, [ca. 1844])]. This is also a central idea expressed by Henry Hazlitt in his popular book *Economics in One Lesson* (1979, [1946]). For evidence that free-market institutions do promote investment and growth through these general equilibrium impacts, see Dawson (1998).

[10] We are indebted to Donald Boudreaux for his observation that many of these new businesses appear to be what people would consider more 'culturally enriched' types of businesses than the ones they replace, like coffee shops where academics meet to discuss ideas, art galleries that increase public awareness of the arts, and ice cream parlors where families share quality family time.

[11] Within the political realm, however, allowing the entry of a new Wal-Mart store creates difficult to identify, widespread benefits for consumers and other businesses, while imposing concentrated costs on competing business firms and labor unions. In the public choice / political economy literature this combination is a recipe that favors the organized groups at the expense of the widespread beneficiaries. For a good introduction to the special interest effect created when one side is concentrated and the other widespread, see Chapter 6 in Gwartney, Stroup, Sobel, and Macpherson (2006). For a more rigorous work in a particular case of this phenomenon, see Weingast, Shepsle, and Johnsen (1981). For an interesting analysis of how sometimes opposing groups can form a common interest, see Yandle (1983).

[12] Wal-Mart purchases goods and services from more than 61,000 U.S. suppliers, see Wal-Mart, 23 Apr 2005 <http://www.Wal-Martfacts.com/community/nationwide-impact.aspx>.

[13] This effect is due to an outlet substitution bias, which in effect 'links out' Wal-Mart's lower prices.

[14] Alaska and Hawaii are excluded from our analysis primarily because it is impossible to include them in our spatial econometric models as they have no contiguous neighboring states.

[15] For an analysis of the determinants of what makes young individuals more likely to become entrepreneurs (and why success rates may differ) see Schiller and Crewson (1997).

[16] Because of changes in the method of data collection and reporting by these agencies, these periods differ slightly for our variables, being the annualized growth rate for 1997 to 2003 for self-employment growth, 1998 to 2002 for small establishment growth, and 1995 to 2005 for the growth of Wal-Mart stores.

[17] For example and discussion see Kreft and Sobel (2005).

[18] See Anselin (1988), Dubin (1988), Case (1991), Baltagi (2001), and Lacombe (2004) for more on specification and estimation of models with spatial dependence.

[19] The spatial econometric toolbox for MATLAB is a public domain set of functions maintained by James LeSage. The toolbox can be downloaded for free at <www.spatial-econometrics.com>.

[20] Following the previous literature, the independent variables we include are: distance from Bentonville, Arkansas, (and distance squared), percent metropolitan population, percent of population with a college degree, percent of population in poverty, median family income, state land area, and the top corporate tax rate in the state.

Table 1a – Small Business Indicators for States with the Highest and Lowest Number of Wal-Mart Stores Per Capita

	State	Wal-Mart Stores per 100,000 Population	Self Employment Rate	Number of Establishments with 1 to 4 Employees	Number of Establishments with 5 to 9 Employees
	Arkansas	3.067	16.175	220.805	123.999
	Nevada	2.602	15.292	140.222	89.828
Top 5 States	Mississippi	2.109	14.217	210.922	125.041
	Missouri	2.020	14.900	190.556	114.687
	Alabama	1.844	14.500	207.843	122.934
Average		*2.328*	*15.017*	*194.070*	*115.298*
	Connecticut	0.470	15.936	192.626	102.626
	Washington	0.424	16.513	171.154	97.640
Bottom 5 States	California	0.340	19.464	145.629	78.372
	New Jersey	0.261	13.635	215.988	86.899
	New York	0.084	14.107	220.299	83.319
Average		*0.316*	*15.931*	*189.139*	*89.771*

Notes: Data is for 2000. Variable descriptions can be found in Appendix 1.

Table 1b – Small Business Indicators for States with the Highest and Lowest Growth Rates of Wal-Mart Stores

	State	Average Annual Wal-Mart Store Growth	Average Annual Self Employment Growth	Average Annual Growth in Number of Establishments with 1 to 4 Employees	Average Annual Growth in Number of Establishments with 5 to 9 Employees
	Connecticut	18.222	2.116	-1.429	-1.439
	Vermont	14.870	1.249	-1.097	-0.845
Top 5 States	Delaware	13.346	1.719	0.685	-1.349
	Washington	11.026	0.684	-0.400	0.338
	New Jersey	10.501	1.491	0.991	-1.387
Average		*13.593*	*1.452*	*-0.250*	*-0.937*
	Missouri	0.717	1.671	-0.999	-0.114
	Oklahoma	0.501	0.343	-1.937	-0.089
Bottom 5 States	Arkansas	0.000	0.831	-1.943	0.420
	North Dakota	0.000	0.901	-0.388	-1.283
	Wyoming	0.000	-0.005	-1.566	-1.117
Average		*0.244*	*0.748*	*-1.367*	*-0.437*

Notes: Growth rates are average annualized growth rates for the following periods: Wal-Mart stores (1995-2005), Self Employment (1997-2003), and Establishment Data (1998-2002). Variable descriptions can be found in Appendix 1.

Table 2. Wal-Mart Stores Per Capita as Explanatory Variable

	Dependent Variable								
	Self Employment Rate			Establishments with 1-4 Employees (per 100,000 population)			Establishments with 5-9 Employees (per 100,000 population)		
Independent Variable	OLS	SAR	SAC	OLS	SAR	SAC	OLS	SAR	SAC
Constant	-66.933** (2.233)	-51.274* (1.751)	-49.688* (1.756)	90.075 (0.191)	-182.669 (0.440)	-236.980 (0.547)	180.046 (0.901)	76.651 (0.373)	104.764 (0.528)
Wal-Mart Stores (per 100,000 population)	**-0.109 (0.229)**	**-0.001 (0.002)**	**-0.152 (0.385)**	**2.203 (0.297)**	**0.954 (0.167)**	**-1.955 (0.291)**	**3.933 (1.247)**	**1.712 (0.583)**	**3.539 (1.113)**
Percent Metropolitan Population (%)	-0.036* (1.750)	-0.032* (1.959)	-0.031* (1.898)	-1.273*** (3.974)	-0.899*** (3.676)	-0.983*** (4.507)	-0.849*** (6.243)	-0.683*** (5.575)	-0.658*** (5.358)
Median Age (years)	0.222 (1.650)	0.221* (1.868)	0.225* (1.942)	6.925*** (3.284)	6.926*** (3.962)	6.730*** (4.143)	1.768* (1.974)	1.952** (2.231)	1.819** (2.127)
Percent in Poverty (%)	0.207 (1.094)	0.139 (0.825)	0.142 (0.887)	0.541 (.182)	-0.510 (0.207)	-0.500 (0.208)	-2.564** (2.031)	-3.047** (2.459)	-3.008** (2.470)
Median Family Income (1,000 dollars)	-0.115 (1.054)	-0.122 (1.333)	-0.111 (1.287)	-0.862 (0.504)	-1.502 (1.112)	-1.113 (0.823)	-1.419* (1.954)	-1.883*** (2.782)	-1.931*** (2.914)
Percent Non-white (%)	-0.037 (1.189)	-0.027 (0.964)	-0.021 (0.744)	0.193 (0.397)	0.419 (1.018)	0.060 (0.141)	0.171 (0.829)	0.255 (1.227)	0.216 (1.015)
Land area (1,000 sq. miles)	0.013 (1.644)	0.012* (1.784)	0.010 (1.598)	-0.036 (0.303)	-0.086 (0.893)	-0.003 (0.032)	-0.045 (0.973)	-0.091* (1.815)	-0.084* (1.659)
Percent with College Education (%)	0.408*** (4.018)	0.378*** (4.372)	0.345*** (3.600)	4.401*** (2.762)	3.126*** (2.579)	2.347 (1.496)	1.832** (2.708)	1.591*** (2.626)	1.811*** (2.635)
Percent Male (%)	1.448** (2.692)	1.095** (2.050)	1.029* (1.898)	-2.619 (0.310)	2.181 (0.302)	5.137 (0.621)	-0.378 (0.106)	1.707 (0.478)	1.095 (0.313)
Rho	--	0.188 (1.260)	0.301 (1.364)	--	0.442*** (3.435)	0.076 (0.318)	--	0.182 (1.450)	0.181 (1.106)
Lambda	--	--	-0.220 (0.660)	--	--	0.660*** (3.829)	--	--	0.043 (0.163)
LM-test	--	0.530	--	--	30.121[†]	--	--	1.144	--
Observations	48	48	48	48	48	48	48	48	48
R-squared	0.652	0.730	0.744	0.615	0.678	0.773	0.814	0.820	0.827
Log-likelihood	-109.448	-61.444	-33.607	-239.156	-191.891	-162.983	-215.524	-157.502	-129.555

Notes: t-statistics in parentheses; asterisks indicate significance as follows: ***=1%, **=5%, *=10%; LM-test cross indicates no spatial dependence in the errors.

Table 3. Wal-Mart Store Growth as Explanatory Variable

Independent Variable	Dependent Variable								
	Self Employment Annual Growth Rate			Establishments with 1-4 employees (annual growth rate)			Establishments with 5-9 employees (annual growth rate)		
	OLS	SAR	SAC	OLS	SAR	SAC	OLS	SAR	SAC
Constant	22.063 (2.031)	10.808 (1.199)	11.045 (1.155)	-31.983* (1.814)	-26.825* (1.705)	-34.979** (2.029)	-27.824 (1.543)	-42.076** (2.550)	-35.501* (1.806)
Wal-Mart Stores Annual Growth Rate (%)	**-0.020 (0.846)**	**-0.013 (1.494)**	**-0.023 (1.286)**	**0.279 (0.741)**	**0.051*** (3.293)**	**0.030 (0.879)**	**-0.019 (0.486)**	**-0.001 (0.069)**	**0.007 (0.235)**
Percent Metropolitan Population (%)	0.005 (0.785)	0.005 (0.880)	0.004 (0.707)	0.015 (1.399)	0.018** (1.987)	0.019* (1.816)	0.013 (1.186)	0.015 (1.580)	0.013 (1.224)
Median Age (years)	-0.092* (1.972)	-0.097*** (2.615)	-0.103*** (2.829)	-0.248*** (3.274)	-0.270*** (4.340)	-0.257*** (3.889)	-0.091 (1.171)	-0.099 (1.481)	-0.097 (1.420)
Percent in Poverty (%)	0.013 (0.200)	0.064 (1.170)	0.045 (0.871)	-0.085 (0.779)	-0.183** (1.997)	-0.088 (0.902)	0.094 (0.838)	0.119 (1.220)	0.111 (1.226)
Median Family Income (1,000 dollars)	0.042 (1.059)	0.060* (1.889)	0.048 (1.578)	-0.003 (0.050)	-0.071 (1.294)	-0.018 (0.304)	-0.030 (0.456)	-0.032 (0.565)	-0.024 (0.423)
Percent Non-white (%)	-0.001 (0.019)	-0.011 (1.297)	-0.006 (0.760)	0.028 (1.645)	0.050*** (3.342)	0.028* (1.814)	-0.012 (0.683)	-0.009 (0.556)	-0.009 (0.613)
Land area (1,000 sq. miles)	-0.003 (1.232)	-0.002 (0.739)	-0.002 (1.077)	-0.005 (1.042)	-0.006 (1.630)	-0.005 (1.185)	-0.001 (0.123)	-0.001 (0.256)	-0.002 (0.500)
Percent with College Education (%)	-0.045 (1.408)	-0.030 (1.209)	-0.029 (1.189)	-0.026 (0.509)	-0.024 (0.590)	-0.022 (0.461)	0.019 (0.368)	0.027 (0.608)	0.019 (0.472)
Percent Male (%)	-0.381* (1.978)	-0.193 (1.210)	-0.181 (1.064)	0.835** (2.671)	0.813*** (2.865)	0.911*** (2.808)	0.603* (1.886)	0.888*** (3.014)	0.757** (2.014)
Rho	--	0.449*** (3.251)	0.571** (2.478)	--	-0.189 (1.259)	-0.134 (0.547)	--	-0.377** (1.981)	-0.046 (0.098)
Lambda	--	--	-0.269 (0.674)	--	--	0.149 (0.507)	--	--	-0.467 (0.916)
LM-test	--	128.011†	--	--	0.163	--	--	27.782†	--
Observations	48	48	48	48	48	48	48	48	48
R-squared	0.393	0.533	0.637	0.574	0.706	0.662	0.208	0.341	0.456
Log-likelihood	-45.304	-6.676	20.097	-77.065	-30.422	-7.197	-63.290	-34.333	-5.999

Notes: t-statistics in parentheses; asterisks indicate significance as follows: ***=1%, **=5%, *=10%; LM-test cross indicates no spatial dependence in the errors.

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Table 4. Wal-Mart Stores Per Capita (Lagged) as Explanatory Variable

	Dependent Variable								
	Self Employment Rate			Establishments with 1-4 employees (per 100,000 population)			Establishments with 5-9 employees (per 100,000 population)		
Independent Variable	OLS	SAR	SAC	OLS	SAR	SAC	OLS	SAR	SAC
Constant	-68.967** (2.177)	-51.274* (1.751)	-50.110 (1.564)	-8.591 (0.017)	-182.669 (0.440)	-274.594 (0.643)	130.183 (0.609)	76.651 (0.373)	68.145 (0.331)
Wal-Mart Stores (5 yr. lag per 100,000 population)	**0.082 (0.186)**	**-0.001 (0.003)**	**-0.045 (0.122)**	**4.347 (0.633)**	**0.954 (0.167)**	**3.624 (0.537)**	**2.341 (0.791)**	**1.712 (0.583)**	**1.937 (0.633)**
Percent Metropolitan Population (%)	-0.033 (1.651)	-0.032* (1.959)	-0.030* (1.813)	-1.249*** (3.942)	-0.899*** (3.676)	-0.932*** (4.389)	-0.869*** (6.358)	-0.683*** (5.575)	-0.681*** (5.555)
Median Age (years)	0.224 (1.648)	0.221* (1.868)	0.223* (1.876)	7.177*** (3.377)	6.926*** (3.962)	6.425*** (4.187)	1.945** (2.121)	1.952** (2.231)	1.972** (2.268)
Percent in Poverty (%)	0.219 (1.142)	0.139 (0.825)	0.152 (0.917)	0.821 (0.274)	-0.510 (0.207)	-0.335 (0.141)	-2.538* (1.959)	-3.047** (2.459)	-3.038** (2.437)
Median Family Income (1,000 dollars)	-0.112 (1.009)	-0.122 (1.333)	-0.110 (1.236)	-0.668 (0.386)	-1.502 (1.112)	-1.274 (0.974)	-1.307* (1.752)	-1.884*** (2.782)	-1.849*** (2.726)
Percent Non-white (%)	-0.039 (1.278)	-0.027 (0.964)	-0.023 (0.805)	0.171 (0.356)	0.419 (1.018)	0.018 (0.043)	0.196 (0.949)	0.255 (1.227)	0.234 (1.093)
Land area (1,000 sq. miles)	0.012 (1.633)	0.012* (1.784)	0.011 (1.603)	-0.044 (0.368)	-0.088 (0.893)	0.007 (0.078)	-0.055 (1.075)	-0.091* (1.815)	-0.087* (1.714)
Percent with College Education (%)	0.423*** (4.534)	0.379*** (4.372)	0.355*** (3.923)	4.410*** (3.027)	3.126*** (2.579)	2.879** (2.078)	1.569** (2.497)	1.591*** (2.626)	1.575** (2.497)
Percent Male (%)	1.467*** (0.555)	1.095** (2.049)	1.025* (1.748)	-1.113 (0.128)	2.181 (0.167)	6.010 (0.732)	0.582 (0.155)	1.707 (0.478)	1.888 (0.525)
Rho	--	0.188 (1.260)	0.307 (1.392)	--	0.442*** (3.435)	0.021 (0.090)	--	0.182 (1.450)	0.160 (0.946)
Lambda	--	--	-0.258 (0.771)	--	--	0.706*** (4.670)	--	--	0.061 (0.230)
LM-test	--	0.534	--	--	30.227†	--	--	1.150	--
Observations	48	48	48	48	48	48	48	48	48
R-squared	0.653	0.730	0.745	0.618	0.687	0.779	0.810	0.820	0.823
Log-likelihood	-78.969	-61.444	-33.668	-210.950	-191.891	-162.907	-170.594	-157.502	-130.018

Notes: t-statistics in parentheses; asterisks indicate significance as follows: ***=1%, **=5%, *=10%; LM-test cross indicates no spatial dependence in the errors.

# Table 5. Wal-Mart Stores Per Capita (IV) as Explanatory Variable

Independent Variable	Self Employment Rate			Establishments with 1-4 employees (per 100,000 population)			Establishments with 5-9 employees (per 100,000 population)		
	OLS	SAR	SAC	OLS	SAR	SAC	OLS	SAR	SAC
Constant	-68.372** (2.221)	-51.119* (1.818)	-51.373* (1.706)	-22.216 (0.047)	-203.947 (0.521)	-77.504 (0.192)	160.269 (0.768)	112.330 (0.611)	120.685 (0.652)
Estimated Wal-Mart Stores per 100,000 population)	**0.177 (0.187)**	**0.040 (0.048)**	**-0.030 (0.039)**	**15.574 (1.058)**	**6.700 (0.559)**	**6.015 (0.387)**	**3.318 (0.515)**	**1.790 (0.314)**	**1.511 (0.280)**
Percent Metropolitan Population (%)	-0.032 (1.435)	-0.034* (1.740)	-0.032 (1.643)	-1.118*** (3.202)	-1.021*** (3.637)	-1.096*** (4.034)	-0.857*** (5.616)	-0.827*** (6.153)	-0.838*** (6.165)
Median Age (years)	0.224 (1.648)	0.224* (1.900)	0.227* (1.908)	7.321*** (3.477)	7.054*** (4.199)	6.813*** (4.500)	1.905** (2.068)	1.912** (2.383)	1.877** (2.318)
Percent in Poverty (%)	0.223 (1.132)	0.165 (0.958)	0.177 (1.028)	1.400 (0.459)	0.701 (0.288)	-0.024 (0.010)	-2.539* (1.901)	-2.463** (2.114)	-2.373** (2.069)
Median Family Income (1,000 dollars)	-0.117 (1.070)	-0.101 (1.048)	-0.092 (0.971)	-1.045 (0.615)	-0.719 (0.531)	-0.793 (0.566)	-1.448* (1.950)	-1.318** (2.028)	-1.309** (2.031)
Percent Non-white (%)	-0.040 (1.260)	-0.029 (1.033)	-0.274 (0.955)	0.062 (0.126)	0.341 (0.850)	0.089 (0.208)	0.190 (0.882)	0.239 (1.241)	0.270 (1.438)
Land area (1,000 sq. miles)	0.0125 (1.647)	0.012* (1.877)	0.012* (1.755)	-0.042 (0.354)	-0.059 (0.622)	0.009 (0.107)	-0.053 (1.024)	-0.065 (1.405)	-0.068 (1.470)
Percent with College Education (%)	0.438*** (3.126)	0.371*** (2.856)	0.350*** (2.670)	5.942*** (2.736)	3.513** (1.952)	3.141 (1.315)	1.823* (1.918)	1.461* (1.714)	1.482* (1.849)
Percent Male (%)	1.450** (2.690)	1.060** (2.069)	1.034* (1.837)	-1.851 (0.222)	1.368 (0.200)	0.707 (0.091)	-0.027 (0.007)	0.613 (0.192)	0.359 (0.114)
Rho	--	0.209 (1.421)	0.291 (1.296)	--	0.422*** (3.352)	0.135 (0.606)	--	0.147 (1.289)	0.181 (1.305)
Lambda	--	--	-0.184 (0.548)	--	--	0.573*** (2.888)	--	--	-0.142 (0.549)
Observations	48	48	48	48	48	48	48	48	48
R-squared	0.719	0.727	0.740	0.697	0.702	0.786	0.845	0.851	0.853

Notes: t-statistics in parentheses; asterisks indicate significance as follows: ***=1%, **=5%, *=10%;

Figure 1 – Wal-Mart Stores and Self Employment, U.S. Totals, 1969-2001
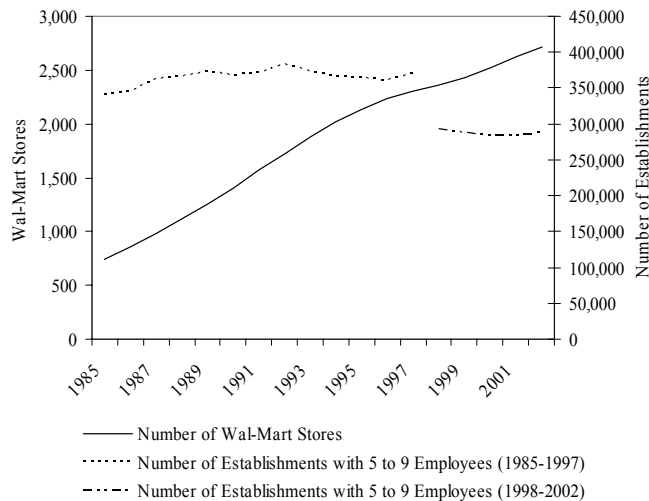
Figure 2a – Wal-Mart Stores and Retail Establishments with 1 to 4 Employees, U.S. Totals, 1985-2002
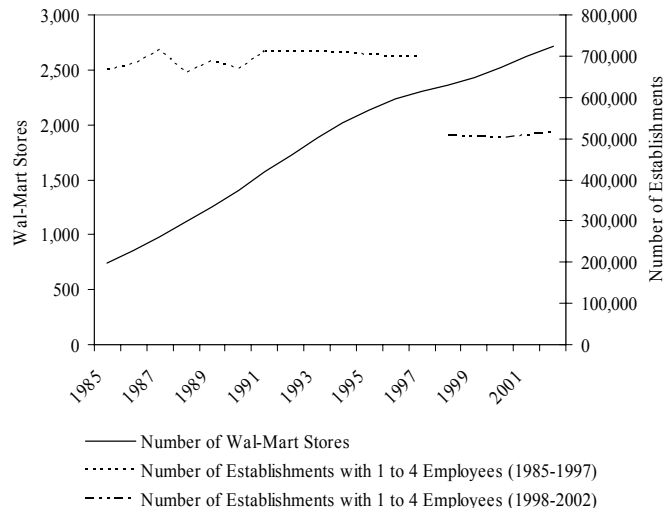

Notes: In 1998 the U.S. Census Bureau redefined the way they measure the establishment data series, causing a discontinuity in the data from 1997 to 1998. The drop in the level of this series in that year is due to this redefinition, so we present these data as two separate lines in the figure.

Figure 2b – Wal-Mart Stores and Retail Establishments with 5 to 9 Employees, U.S. Totals, 1985-2002

Notes: In 1998 the U.S. Census Bureau redefined the way they measure the establishment data series, causing a discontinuity in the data from 1997 to 1998. The drop in the level of this series in that year is due to this redefinition, so we present these data as two separate lines in the figure.

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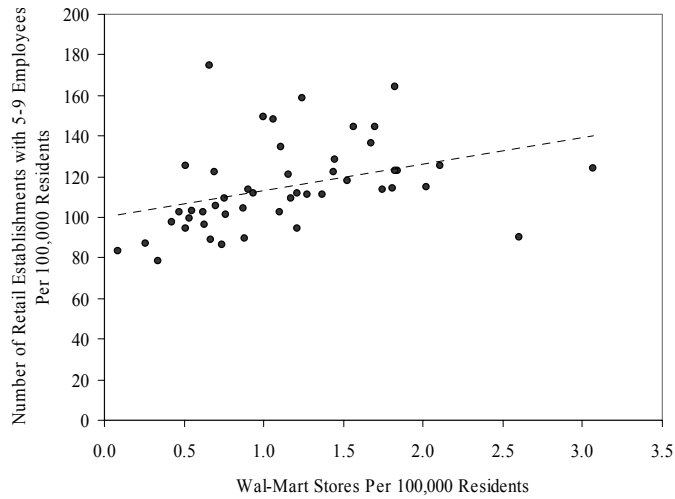**Figure 3 – Wal-Mart Stores versus Self Employment Rates, 2000**
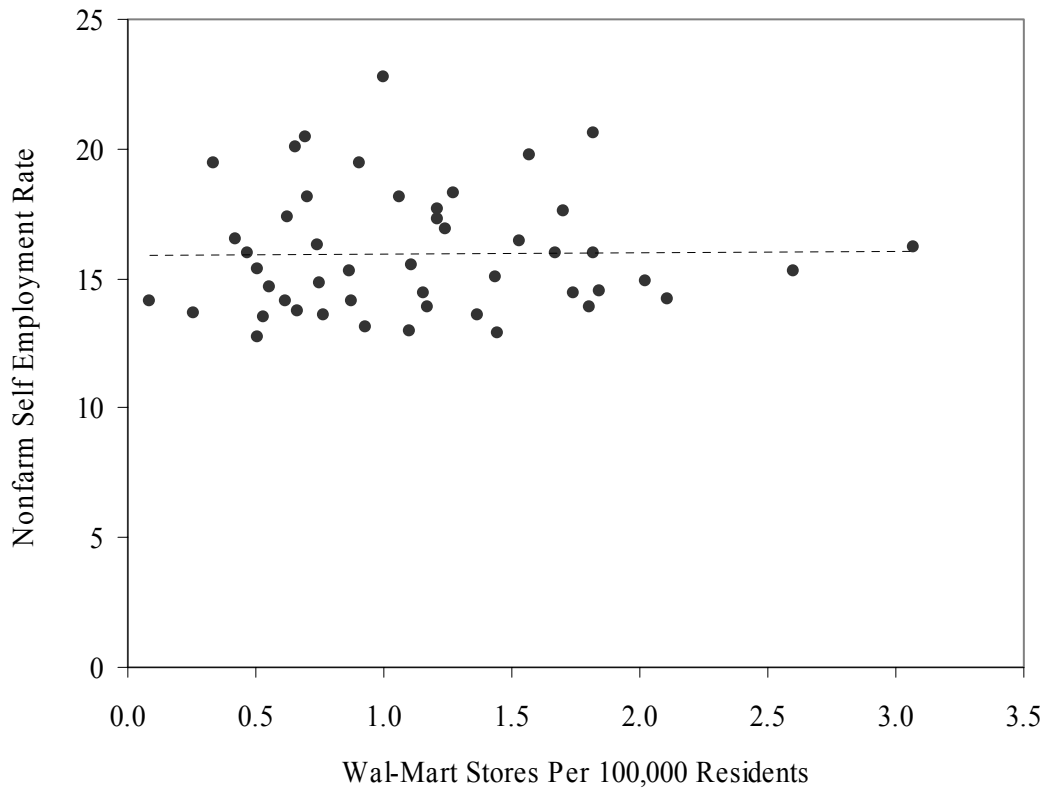
Notes: See Appendix 1 for variable definitions and sources. Data represent the 48 continental states. Slope of the regression line shown is 0.035 and the t-statistic is 0.062 (which is not statistically significant).

**Figure 4a – Wal-Mart Stores versus Number of Establishments with 1-4 Employees, 2000**
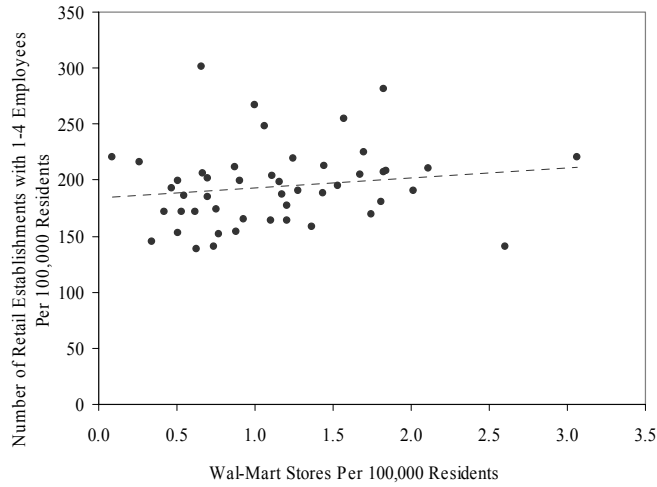
Notes: See Appendix 1 for variable definitions and sources. Data represent the 48 continental states. The slope of the regression line shown is 8.805 and the t-statistic is 1.052 (which is not statistically significant).

**Figure 4b – Wal-Mart Stores versus Number of Establishments with 5-9 Employees, 2000**

Notes: See Appendix 1 for variable definitions and sources. Data represent the 48 continental states. The slope of the regression line shown is 13.027 and the t-statistic is 2.710 (which is statistically significant at the 1% level).

Figure 5a – Wal-Mart Stores versus Average Sole Proprietor Real Net Income
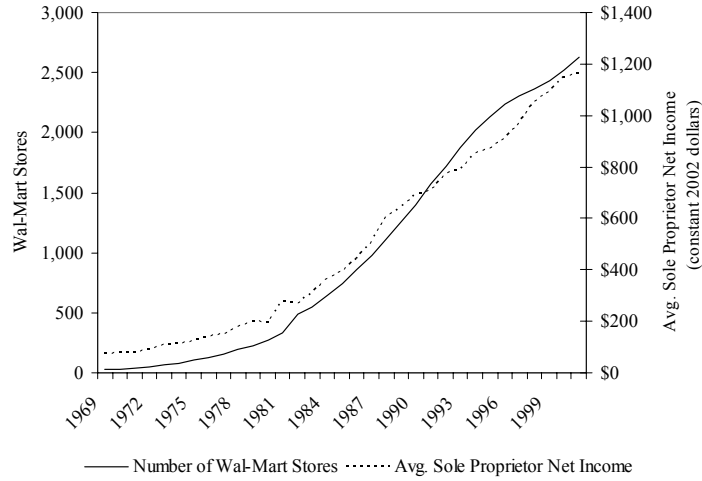
Notes: Average sole proprietor net income is converted to real dollars using the CPI. Sole proprietorship data obtained from U.S. Internal Revenue Service, *Statistics of Income*, various years.

Figure 5b – Wal-Mart Stores versus Average Sole Proprietor Real Revenue
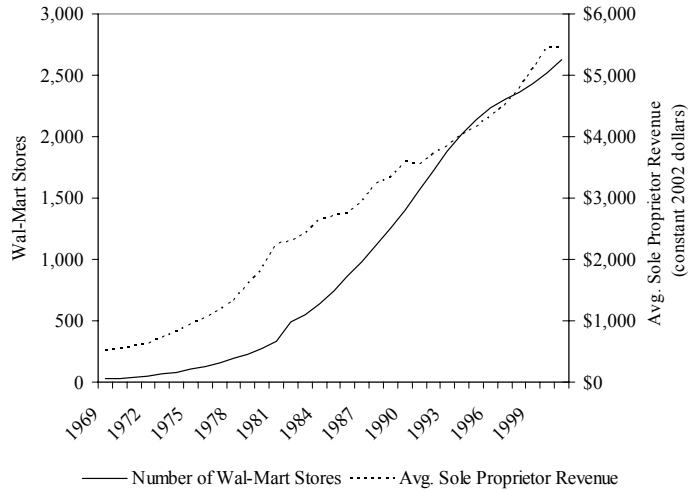
Notes: Average sole proprietor sales receipts (revenue) is converted to real dollars using the CPI. Sole proprietorship data obtained from U.S. Internal Revenue Service, *Statistics of Income*, various years.

Appendix 1: Data Description and Sources

Variable Name (source)	Description	Mean (Std. Dev.)
Dependent Variables:		
Self Employment Rate (1)	Annual nonfarm proprietor employment as a percentage of total nonfarm employment (%)	15.95 (2.39)
Self Employment Growth Rate (1)	Average annual growth rate of nonfarm proprietors from 1997 to 2003 (%)	1.27 (0.63)
Establishments with 1-4 Employees (2)	Retail establishments with one to four employees per 100,000 of state population	194.25 (35.66)
Establishments with 5-9 Employees (2)	Retail establishments with five to nine employees per 100,000 of state population	114.90 (21.79)
Establishments with 1-4 Employees (annual growth rate) (2)	Average annual growth rate of retail establishments with one to four employees from 1998 to 2002 (%)	-0.15 (4.90)
Establishments with 5-9 Employees (annual growth rate) (2)	Average annual growth rate of retail establishments with five to nine employees from 1998 to 2002 (%)	-1.82 (3.51)
Independent Variables:		
Wal-Mart Stores (3)	Number of discount stores and supercenters per 100,000 population	1.14 (0.62)
Wal-Mart Store Annual Growth Rate (3)	Average annual growth rate from 1995 to 2005, (%)	4.69 (4.01)
Median Age (4)	Median age of population (years)	35.59 (1.89)
Percent Metropolitan Population (4)	As a percent of state (2000) (%)	68.36 (20.64)
Percent in Poverty (4)	Percent of population for whom poverty status is determined (%)	12.02 (3.16)
Median Family Income (4)	Median income per 1000 dollars	48.88 (7.02)
Percent Non-white (4)	Percent of total population (%)	22.93 (13.00)
Percent with College Education (4)	Percent of population with a Bachelor's degree or higher (%)	23.71 (4.35)
Percent Male (4)	Percent of population that is male (%)	49.11 (0.67)
Land Area (5)	Land area per 1000 square miles	61.65 (46.81)

1. U.S. Department of Commerce, Bureau of Economic Analysis, *State and Local Area Data*, Washington, D.C.
2. U.S. Department of Commerce, Census Bureau, *2000 County Business Patterns*, Washington, D.C.
3. Wal-Mart, *Wal-Mart Annual Report*, various years.
4. U.S. Department of Commerce, Census Bureau, *Census 2000*, Washington, D.C.
5. U.S. Department of Commerce, Census Bureau, *Statistical Abstract of the United States*, Washington, D.C.

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