Wal-Mart and Rural Poverty

Stephan J. Goetz and Hema Swaminathan

Department of Agricultural Economics and Rural Sociology 7E Armsby Building The Pennsylvania State University University Park, PA 16802-5602 Phone: 814/863-4656 FAX 814/863-0586

Contact: sgoetz@psu.edu

Selected Paper prepared for presentation at the American Agricultural Economics Association Annual Meeting, Denver, Colorado, August 1-3, 2004

Copyright 2004 by Stephan J. Goetz and Hema Swaminthan. Readers may make verbatim copies of this document for non-commercial purposes by any means, provided that this copyright notice appears on all such copies.

Wal-Mart® and Rural Poverty¹

Abstract

Wal-Mart® has created tremendous economic benefits for consumers by providing more choices at lower prices. The benefits are felt especially in communities that had only local retail monopolies prior to the arrival of the store. Yet no retailer evokes stronger negative emotions than this chain. Recent media attention has focused on questionable labor practices and low wages combined with lack of benefits paid by the corporation, while academic studies have examined effects of the stores on retail wages, employment levels and numbers of establishments. Missing from the literature is an analysis of whether the "Wal-Mart effect" is large enough to measurably influence *community*-wide family poverty rates over time. This is the first study to carefully and comprehensively examine whether a relationship exists between existing and new locations of Wal-Mart stores and county-wide family poverty rates.

.

¹ The research underlying this paper was supported in part by NRI Competitive Grants Program 03-35401-12936. Goetz is Professor of Agricultural and Regional Economics and Swaminathan is a Post-Doctoral scholar. Opinions expressed are strictly those of the authors.

Introduction

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 recent media attention, in addition to spawning a number of hostile web-sites.² The interest in Wal-Mart is not surprising as it has no equal among big box retailers. With total revenues of \$256 billon in 2003, Wal-Mart Stores Inc. is the largest corporation in the world. Wal-Mart employs 1.3 million workers worldwide and operates 4,750 stores (3,600 in the US). 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 wholesale and transportation logistics industries. *BusinessWeek* recently described the "Wal-Mart effect" in a cover story,³ referring to the corporation's cost efficiency that has contributed to economy-wide productivity gains and kept recent inflation rates at about one percent. On the other hand, Wal-Mart has been blamed for the loss of US 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 US. The analysis is relevant to local policy-makers 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 traditionally been viewed as a viable strategy for stimulating local

² Two prominent examples are <u>www.walmartwatch.com</u> and <u>www.walmartsucks.com</u>; 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 run-off from its construction sites (*Salt Lake Tribune* on-line, May 13, 2004).

³ See the October 6, 2003 issue.

economic growth. However, detractors have argued that because these jobs are low-paying they will 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. While individual workers have the option of working or not working for Wal-Mart, externalities are created if the chain raises poverty levels in the community. In that case public tax dollars are spent on welfare programs and a disutility is created for those who are concerned with poor people living in their community. The Wal-Mart phenomenon is such that (unlike CostcoTM) the chain keeps its workers' pay at a minimum, while the rents captured by the Walton heirs position them among the ten wealthiest Americans.⁴

Literature

Popular press articles on Wal-Mart focus on the company's non-unionization policy and the provision of part-time jobs with lower wages and fewer benefits. Considerable attention has also been paid to retail restructuring, usually due to loss of retail employment, decreases in the number of establishments, and decline of downtown shopping areas. However, with some exceptions (e.g., Vias 2003), these articles are mostly based on case studies for specific states or on anecdotal evidence. There are no academic studies that examine the impact of Wal-Mart on

⁴ 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 Bill Gates. Only three individuals had greater wealth in 2003: William H. Gates with \$46 billion, Warren Buffett with \$36 million, and Paul Allen (also of Microsoft), \$22 billion.

county-wide poverty rates. Likewise, we were unable to locate any large-scale econometric study of Wal-Mart's location strategy at the level of all US counties.

Basker (2003) examines the effect of Wal-Mart expansions on retail employment in 1,749 counties and concludes (p. 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 none in the sectors in which the chain does not sell goods or services. Two problems with her analysis are the use of a limited set of counties (truncated at employment levels above 1,500) as well as the choice only of employment as an impact measure.

Hicks and Wilburn (2001) use a recursive time-space model to 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 West Virginia using spatial analysis. They control for potential 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 (p. 312) that there "is clearly a net benefit to employment and wages in having a Wal-Mart locate in a county." Furthermore, they note (p. 313) "...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 single state.

Ketchum and Hughes (1997) studied Wal-Mart's effects on employment and wages in Maine while Stone (1995, 1997) explored the chain's impacts on small towns in Iowa. These studies do not conclusively support the claim made by Wal-Mart's opponents, that the entry of the firm is harmful to local economic growth because of a negative effect on wages, employment levels or the number of retail establishments. All of these studies are limited in that they focus on only a few counties or individual states.

Estimation Strategy, Hypotheses, and Data

Our estimation strategy is simple and yet provides a fairly powerful test of the effect of Wal-Mart on a community. We add to an equation that predicts change in poverty rates during the 1990s a variable measuring the change in Wal-Mart stores, appropriately instrumented to avoid endogeneity problems. 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* treatment effect of adding a Wal-Mart store on the *change* in the poverty rate over the subsequent period. This procedure also reduces the effect of spatial cost of living differences on the change in actual or real poverty experienced over the period of analysis (if one can assume that the relative differences in costs among places did not vary).

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. This is also a more comprehensive test of the chain's effect in that it does 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. Our choice of the period 1989-1999 (conditioned by data availability) to measure poverty coincides with the booming decade of the 1990s, during which poverty rates nation-wide fell from 13.1 to 12.4 percent (US Census Bureau). Of course, one key factor that our study does not capture is that Wal-Mart likely lowers prices paid by consumers in the community in the short- to medium-run.

US counties are the unit of analysis and the data are obtained from a variety of secondary sources. The research builds on Rupasingha and Goetz (2003), who analyze the structural determinants of poverty in the US, including local social capital and political influence. Since the location of Wal-Mart stores is likely to be non-random, i.e., Wal-Mart location decisions are based on identifiable county characteristics, we account for potential endogeneity using instrumental variables. Following Rupasingha and Goetz (2003), 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.

Thus, we estimate the following model recursively:

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

(2)
$$\Delta POV_{0+t} = f_2(\Psi_0, POV_0, WM_0, \Delta \underline{WM}_{0+t})$$

where WM₀ is the number of WalMart stores in 1987, Δ WM_{0+t} the net change in stores between 1987 and 1998, $^5\Delta$ WM_{0+t} is the change predicted (instrumented) from equation 1, Ω_0 contains regressors affecting the Wal-Mart location decision, POV₀ is the beginning-ofperiod (1989) poverty rate, Δ POV_{0+t} the change in the poverty rate over the decade, and Ψ_0 incorporates regressors affecting the change in poverty over the decade. Maps 1 and 2 show Wal-Mart locations in 1987 as well as the spread of new stores through 1998.

In terms of regressors to include in Ω_0 , we hypothesize that Wal-Mart locates in counties with a high pull factor, interstate highway access, more female labor force participation (to have a larger pool of workers), more purchasing power as reflected in earnings and educational attainment, and that it avoids communities with higher poverty rates and existing Wal-Mart stores. Thus, we are able to test empirically the question of whether or not 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 less populated, more remote places. We also include state fixed

⁵ The beginning year was chosen to coincide with the Economic Census of 1987 and 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.

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.⁶

For the specification of regressors in the change in poverty equation (Ψ_0), we draw on Rupasingha and Goetz (2003), who model poverty as a function of individual-level characteristics, economic factors, social capital variables and political factors. We add to this 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. Because poverty tends to occur in clusters at the county-level, we 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 US 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 (forthcoming) or Rupasingha and Goetz (2003).

⁶ About 1 percent of counties (31) had a smaller number of stores in 1998 than in 1987.

Results

Summary statistics for the regressors are reported in the Appendix Table. Table 1 provides partial derivatives of regression coefficients, evaluated at the conditional means for all observations, for net new Wal-Mart store locations between 1987 and 1998. The pull factor, existing Wal-Mart stores (WM₀), adults with a college degree, social capital stocks, self-employment, interstate highway access 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 (although not distinguishable statistically from zero), while the non-metro counties each have fewer new stores than metro counties, all else equal.

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 sharp 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 new Wal-Mart store locations.

We next turn to our equation of primary interest, change in the poverty rate. 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 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 0.25, while that of existing stores was 0.08 percentage points. The other coefficients had effects that were similar to those already reported in Rupasingha and Goetz (2003), and we do not discuss them further here.

This raises the question of why Wal-Mart affects county poverty rates. First is the obvious fact that 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. Second, even though Wal-Mart Corp. presents itself as a "good local citizen" and engaged in local philanthropy through the Sam Walton Foundation in the amount of \$106.9 million 2003 alone, 7 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 third and perhaps more subtle effect may be that, by destroying the local class of entrepreneurs, the Wal-Mart chain also destroys local leadership capacity. This has been pointed to by rural sociologists and others as one outcome of the increasing concentration of non-local bank ownership and the resulting branch plant economy that is believed to have destroyed the pool of local leadership talent. The destruction of small, locally-owned businesses may also reduce social capital levels, as has been suggested, for example, by T. Lyson (*pers. comm.*).

⁷ Source: http://www.wffhome.com/Grant%20Awards.htm; accessed May 8, 2004. This amount represents about one-tenth of one percent of the estimated wealth of the Wal-Mart heirs.

2002). Thus, the elimination of a substantial number of local leaders from among a key group of entrepreneurs may be the single-most important and far-reaching impact of Wal-Mart Corp.

Conclusion

After carefully and comprehensively accounting for other local determinants of poverty, we find that Wal-Mart unequivocally raised family poverty rates in US counties during the 1990s. This was true not only as a consequence of existing stores, but it was also an independent outcome of the contemporaneous construction of new stores between 1987 and 1998. This happened even as average poverty rates declined nation-wide. The question whether the cost of higher poverty is offset by the benefits of lower prices and wider choices available to consumers in counties with Wal-Mart stores cannot be answered here.

However, if Wal-Mart does indeed "cause" poverty to rise, then it is not bearing the full economic and social costs of its business practices. Instead, Wal-Mart transfers income from tax-payers though welfare-programs directed at the poor to stockholders and the heirs of the Wal-Mart fortune as well as to consumers. Regardless of the distributional effects, the Wal-Mart business model allows substantial rents to be extracted from the economy.

References

Artz, G.M. and McConnon, J.C. Jr. "The Impact of Wal-Mart on Host Towns and Surrounding Communities in Maine," paper presented at The NAREA Meeting, Bar Harbor, ME, June 10-12, 2001, 26pp.

Basker, E. "Essays on Local Labor Markets," Ph.D. Dissertation, Cambridge, MA: Massachusetts Institute of Technology, Department of Economics, 2002.

Basker, E. "Job Creation or Destruction? Labor Market Effects of Wal-Mart Expansion," Columbia, MO: University of Missouri, working paper, 2003.

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

Franklin, A.W. "The Impact of Wal-Mart Supercenters on Supermarket Concentration in U.S. Metropolitan Areas," *Agribusiness*, 17, 1 (2001): 105-114.

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

Hicks, M.J. and Wilburn, K.L. "The Regional Impact of Wal-Mart Entrance: A Panel Study of the Retail Trade Sector in West Virginia," *The Review of Regional Studies*, 31, 3 (2001): 305-313.

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

Ketchum, B.A. and Hughes, J.W. "Walmart and Maine: The Effect on Employment and Wages," Maine Business Indicators, 42(2): 6pp. Online. Available HTTP: http://www.usm.maine.edu/cber/mbi/summer97/hughes.htm (accessed on 10 May 2004).

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

Rupasingha, A. and S. Goetz, *The Causes of Enduring Poverty: An Expanded Spatial Analysis of the Structural Determinants of Poverty in the US*, The Northeast Regional Center for Rural Development, University Park, PA, RDP No. 22, 2003; available at (accessed May 15, 2004): http://www.cas.nercrd.psu.edu/Publications/RDPAPERS/rdp22.pdf

Rupasingha, A., S. Goetz and D. Freshwater "The Production of Social Capital in US Counties," *Journal of Socio-Economics* (forthcoming).

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

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

Online. Available HTTP: http://www.sciencedirect.com/science/journal/07430167 (accessed 07 May 2004).

Table 1: Wal-Mart® TOBIT Store Location and SEM Poverty Equations

Table 1: Wal-Mart® TOBIT Store Location Variable	Coeff	t-stat	quatic	Coeff	t-stat	
Constant	-1.234	-4.32	***	7.446	2.75	***
Constant	-1.234	-4.32		7.440	2.75	
Family poverty rate, 1989	-0.0010	-0.30		-0.522	33.59	***
Initial stores, 1987	-0.032	-2.91	***	0.081	1.73	*
New stores (predicted)				0.252	2.50	**
Interstate highway	0.060	2.71	***			
Pull Factor	0.313	7.75	***			
Earnings/job [capita]	0.041	4.75	***			
Prop. Tax per capita	-0.0055	-0.96				
Population density	-0.0056	-1.26				
Female LFPR	0.0030	1.17		-0.064	-6.32	***
HISSOM90	0.0060	2.20	**	-0.082	-8.08	***
COLL90	0.013	5.52	***	-0.039	-2.81	***
SELEMP90	-0.016	-6.09	***	-0.042	-4.41	***
Employment growth				0.276	0.39	
Employment rate				-0.093	-4.34	***
Industrial churning				0.045	3.31	***
Ag sector employment				0.019	2.18	**
Goods employment				-0.0018	-0.23	
Transportation employment				-0.022	-1.18	
Wholesale/retail empl.				0.0077	0.54	
Finance, Ins., Real Estate empl.				-0.022	-0.73	
Service sector employment				0.046	3.69	***
Jobs losses to NAFTA				0.079	3.12	***
Pop. 0-17 years of age				0.196	8.73	***
Pop. 18-24 years of age				0.018	1.06	
Pop. 65 years of age and above				-0.0062	-0.31	
Non-black minority				0.018	2.26	**
Stayers (predicted)				6.751	4.16	***
Foreign born popl (%)				0.0060	0.37	
Ethnic index				3.057	7.28	***
Income inequality				1.635	4.54	***
Federal grants/capita				0.00016	2.20	**
Rauch measure				-0.0027	-0.56	
Political competition	-0.0012	-0.69		0.024	3.85	***
Social capital index	-0.052	-3.88	***	-0.093	-1.87	*
NONMET4	-0.206	-4.82	***	0.498	2.68	***
NONMET5	-0.151	-3.14	***	0.551	2.66	***
NONMET6	-0.226	-6.82	***	0.249	1.83	*
NONMET7	-0.241	-6.60	***	0.607	4.08	***
NONMET8	-0.589	-7.54	***	0.325	1.82	*
NONMET9	-0.639	-10.4	***	0.745	4.10	***
Sigma	0.294		***			
lambda				0.229	25.94	***

Significance levels: *=10%, **=5% and ***=1% or lower.

Note: SEM refers to the spatial error model.

Appendix Table: Summary Statistics for Variables Used in the Regressions

Appendix Table. Summary Statistics for Variables Used in the Regressions									
Variable	Definition	Mean	Std.Dev.	Minimum	Maximum				
CHG8798	Chg in poverty rate, 1987-98	0.5539	1.2711	0	21				
FAMPOV89	Family poverty rate, 1989	13.07	6.92	1.35	56.90				
INEQ89	Income Inequality, 1989	1.458	0.135	1.115	3.738				
PULLFAC	Pull factor, 1990	0.877	0.303	0.031	3.950				
WAL87	Wal-Mart® stores, 1987	0.40	0.89	0	16				
FLF90	Female labor force part., 1990	51.88	7.10	25.76	84.08				
HISSOM90	High school plus grads, 1990 (%)	56.18	7.49	24.84	74.95				
COLL90	College grads, 1990 (%)	13.37	6.38	3.69	53.42				
POLCOM92	Political competition, 1992	8.86	6.69	0.00	39.79				
SKI90PCM	Social capital index, 1990	0.01	1.35	-4.26	9.91				
SELEMP90	Self-employment rate, 1990	17.32	5.24	1.42	43.88				
HWYDUM	Highway interstate access ramp	0.427	0.495	0	1				
PCEARN87	Earnings per job, 1987	10.921	1.613	2.794	21.184				
PCPTAX87	Property taxes per capita, 1987	4.183	3.190	0.0000005	29.537				
POPDEN87	Population denisty, 1987	0.266	1.982	0.0004774	81.573				
	•								
YINEQ	Growth in Wal-Mart® stores*	0.581	0.809	0.00002	5.575				
CHGEMP90	Growth in private jobs, 1988-1990	0.035	0.054	-0.493	0.447				
EMP90	Employment rate, 1990	93.325	3.028	69.466	100.000				
ISC8890	Industrial churn, 1988-1990	0.341	2.610	0.005	82.154				
AG90	Ag F For employment, 1990 (%)	10.3	9.2	0.3	70.6				
GOODS90	Manufacturing employ (%)	27.3	10.2	3.9	59.9				
TRANS90	Trans, public utilities employ (%)	6.5	2.1	1.9	28.5				
WHRET90	Wholesale/retail employment (%)	19.7	3.4	5.8	35.5				
FIRE90	Fin, ins, real estate empl (%)	4.4	1.8	0.0	17.1				
SERVIC90	Service sector empl (%)	28.8	5.7	13.2	72.7				
JBLOSS	Job losses to NAFTA	0.347	1.321	0.000	32.288				
A017A90	Pop 0-17 years, percent, 1990	26.9	3.4	15.1	45.1				
A1824A90	Pop 18-24 years, percent	9.3	3.4	3.5	34.5				
A65OV90	Pop 65 yrs and older, percent	15.0	4.3	1.4	34.1				
NONBLK90	Non-black minority share, 1990	3.8	7.3	0.0	94.9				
PRDSTY90	Non-moving hh shares, 1985-90*	0.749	0.050	0.436	0.931				
FBPOP90	Foreign-born population, percent	2.16	3.41	0.00	36.36				
ETHNIC90	Ethnic inequality index	0.174	0.167	0.001	0.659				
FEDGNT90	Federal grants per capita (\$), 1990	472.4	504.3	-1188.1	9652.4				
RAUCH90	Consumption spending (Rauch)	88.5	7.0	17.0	99.8				
NONMET4	Beale code county = 4	0.043	0.203	0	1				
NONMET5	etc.	0.035	0.185	0	1				
NONMET6		0.200	0.400	0	1				
NONMET7		0.213	0.410	0	1				
NONMET8		0.081	0.273	0	1				
NONMET9		0.164	0.371	0	1				
		5.101	0.01		<u> </u>				

Number of cases=3,004 US counties

^{*}denotes a predicted value from an auxiliary equation



