ROLLING BACK PRICES AND RAISING CRIME RATES?

The Walmart Effect on Crime in the United States

Scott E. Wolfe and David C. Pyrooz*

Wal-Mart is not an ordinary retail store—communities are impacted in significant ways by its entrance. Using various data sources and propensity-weighted multilevel modelling, this paper explores the 'Wal-Mart effect' on crime. Concentrating on the 1990s, results reveal that Wal-Mart is located in United States counties with higher crime rates, net of robust macro-level correlates of crime. Wal-Mart selected into counties primed for the 1990s crime decline, but, after accounting for endogeneity, growth of the company stunted crime declines when compared to matched counties. A Wal-Mart–crime relationship exists. If Wal-Mart did not build in a county, property crime rates fell by an additional 17 units per capita from the 1990s to the 2000s. A marginally statistically significant, yet stable, effect for violent crime was also observed, falling by two units per capita. These findings provide important theoretical implications regarding the influence of specific economic forces on aggregate crime trends and offer important implications for local governments faced with the prospect of Wal-Mart entering their communities.

Keywords: Wal-Mart, economic correlates of crime, crime rates

Introduction

Big box retail companies—large international retail chain stores—have been identified as influential forces on a number of economic, political and social outcomes. Wal-Mart, as the biggest retailer in the world, has garnered considerable research attention. To be sure, Wal-Mart is not an ordinary retail store. The company is the largest private employer in the United States, with approximately 1.3 million employees, stores located within 15 miles of 88 per cent of the population and product sales to 84 per cent of Americans in 2005 (Pew Research Center 2005; Basker 2007a;). Wal-Mart is a masterful money maker, with revenues exceeding those of Target, Costco, Kroger, Home Depot and Sears *combined*, which are the next five largest retailers in the United States (Goetz and Swaminathan 2006; Basker 2007a;). Wal-Mart's influence reaches far beyond United States borders: nearly 40 per cent of Wal-Mart's employees are located outside of the United States and work in stores located in Africa, Canada, Mexico, various South American countries, China, India, Japan and the United Kingdom (http://corporate.walmart.com/our-story/locations). International locations of the retail giant are often not called 'Wal-Mart' but are, nonetheless, part of the corporation. For example, the United Kingdom chain ASDA was acquired by Wal-Mart in 1999 and has become Britain's second largest supermarket, with nearly 600 retail locations. Wal-Mart's size

* Scott Wolfe, Department of Criminology and Criminal Justice, University of South Carolina, Currell College Room 209, Columbia, SC 29208; e-mail: swolfe@mailbox.sc.edu; David C. Pyrooz, Department of Criminal Justice and Criminology, Sam Houston State University, Huntsville, TX.

alone demands attention from the research community, especially considering its expansion in markets outside the United States (Basker 2007a).

Collectively, the literature has established what has become referred to as the 'Wal-Mart effect'[1] because of the company's overwhelming influence across a variety of outcomes (see Fishman 2006). Studies have shown that the company has deleterious consequences for local economies, such as the reduction of job opportunities (Basker 2005a; Neumark *et al.* 2008), closure of local businesses (Basker 2005a; Fishman 2006; Hicks 2006), decreased social capital (Goetz and Rupasingha 2006) and increased poverty rates (Goetz and Swaminathan 2006). At the same time, however, some research suggests that the retailer has a beneficial impact on communities. The company has been shown to significantly increase the number of retail jobs, reduce product prices and have a positive effect on social capital in certain areas it occupies (Basker 2007a; Carden *et al.* 2009). Put simply, the verdict is still out regarding whether there is a harmful or beneficial Wal-Mart effect on local economic and social landscapes.

One topic of inquiry remains unexplored: whether Wal-Mart's entrance or expansion is related to crime rates. The extant Wal-Mart-effect literature provides mixed evidence regarding whether a positive and negative relationship should be expected between the retailer and crime rates. Some of the findings are consistent with theoretical perspectives that would anticipate a positive relationship between the growth of the retailer and crime, such as social disorganization, dual labour market and routine activity theories. However, the opposite may be true. If Wal-Mart provides a community with more job opportunities, greater ability to save money on products and increased social capital, it may be linked with community economic and social improvement and lower crime rates. Therefore, whether Wal-Mart is positively or negatively associated with crime rates remains an empirical question—one with important implications for the economic policies of communities where the corporation may build.

The present study extends the Wal-Mart effect literature to the study of crime. Using a variety of data sources, we examine the impact of Wal-Mart growth within United States counties during the 1990s on property and violent crime rate trends over a 19-year period. We concentrate on the 1990s because of Wal-Mart's dynamic growth throughout the United States during this period. Complicating this strategy, however, is the fact that the United States experienced dramatic crime-rate reductions throughout the 1990s (Zimring 2007) and Wal-Mart's decision to build a store is not a random process. Therefore, we use propensity score matching and multilevel growth curve modelling to account for the endogeneity of Wal-Mart's decision to locate in communities and assess the contribution of Wal-Mart to variability in crime trends throughout the study period.

Wal-Mart in American Communities

The Wal-Mart-effect literature focuses almost entirely on the retailer's influence on American communities because the corporation is most heavily concentrated in the United States. Overall, the findings point to a simple conclusion: communities change when Wal-Mart enters. Whether these changes improve or weaken local social and

---

[1] A Web of Knowledge query resulted in around 150 articles with 'Wal-Mart' in the title between 2000 and 2013. Interest in the study of Wal-Mart has increased over time and outside of the domain of economic outlets.

economic conditions has been the subject of intense empirical scrutiny. Popular discourse and the media often demonize Wal-Mart as a job killer, and there is empirical evidence to support this claim. Basker (2005a) showed that Wal-Mart sends a shock through local economies that often results in fewer employment opportunities over the long run. The introduction of a store increases retail employment opportunities so quickly (i.e. an average of 300 new jobs) that it pulls employees away from other retail businesses. Basker's research reveals that, within five years of Wal-Mart opening in a community, the company can only be credited with an overall net gain of 50 retail-sector jobs and decreases in the number of wholesale-sector jobs by 20. This suggests that Wal-Mart's initial positive effect on retail employment may wane over time. Neumark, Zhang and Ciccarella (2008) also explored this issue and found that a new Wal-Mart reduces county-level retail employment by about 150 workers. Accordingly, each job 'created' by Wal-Mart replaces 1.4 other retail jobs. Moreover, Neumark and colleagues reported that a store opening leads to a 1.5 per cent net decline in county-level earnings, partially due to reductions in employment. It is important to note that Neumark and colleagues' analyses were restricted to Wal-Mart's effect on the retail sector and they conclude that the store may cause little net gain or loss in overall employment.

Economists believe these effects occur because Wal-Mart's market advantage creates an unmanageable strain on local competitors and suppliers (particularly family-owned or 'mom-and-pop' stores). Such businesses are often forced to close because their market share and profit margins are drastically reduced (Basker 2005a; Goetz and Swaminathan 2006). This Wal-Mart effect has been shown to be quite complex and localized. Recent research suggests that big-box retailers such as Wal-Mart displace local businesses only when they are both located in the same area and involved in the same industry (Haltiwanger *et al.* 2010). Nonetheless, because Wal-Mart chooses to deal with its own suppliers that are typically outside of the community, wholesale-sector employment reductions may also ensue due to reduced demand for local suppliers (Basker 2005a; Fishman 2006; Hicks 2007). With several thousand stores in the United States alone, Wal-Mart has had a significant impact on the country's economic environment over the past several decades. This trend has important implications for countries outside the United States where the retailer is expanding—including, but not limited to, the United Kingdom.

A prime example of Wal-Mart's harmful effects on the structural characteristics of communities is presented by Goetz and Swaminathan (2006). They used data from all counties in the 48 contiguous United States states and examined whether growth of Wal-Mart during the 1990s corresponded with changes in poverty during the decade. They found that the addition of Wal-Marts in United States counties was associated with increased poverty rates (or less of a decline, as poverty rates reduced across the United States). The authors argued that the downfall of existing 'mom-and-pop-type' retailers and local wholesalers and replacement of these occupations with low-wage and part-time jobs that require workers to seek supplemental compensation led to increases in poverty.

Wal-Mart and Crime

Crime is a considerable social problem that has been the focus of social science research for decades. Prominent within this line of study is the theoretical explanation

of aggregate criminal activity in delimited geographic areas, such as neighbourhoods, cities, counties, states and countries. Macro-level theories seek to explain variations in crime rates across these units using structural characteristics from demographic, social, economic, housing, cultural and public policy domains (Land *et al.* 1990; Kposowa *et al.* 1995; Sampson *et al.* 1997). Pratt and Cullen's (2005) meta-analysis of over 200 macro-level empirical studies revealed that structural characteristics including poverty, unemployment and residential mobility have moderate to strong effects on crime rates. Missing from social science research on crime is the examination of specific economic forces that may be related to aggregate crime rates (Bushway and Reuter 2008). The dramatic Wal-Mart effect, for instance, may extend into the domain of crime rates, but no known research has explored the issue (Goetz *et al.* 2012).[2]

   Expansion of Wal-Mart into local communities can be theoretically linked to aggregate crime patterns in several ways. First, consistently with the social disorganization tradition, structural disadvantages inhibit communities' ability to realize common goals and engage in self-regulation (Sampson and Groves 1989; Bursik and Grasmick 1993; Parker and McCall 1999; Stucky and Ottensmann 2009; Pyrooz 2012). Recent research documents that the economic dynamics of the Wal-Mart effect may operate causally prior to structural conditions related to crime. Based on the research described above, Wal-Mart may increase poverty in communities by reducing the overall number of employment opportunities (Goetz and Swaminathan 2006). Residential turnover may also ensue if Wal-Mart pushes residents to search for employment elsewhere after forcing local business closures. Furthermore, it has been argued that Wal-Mart may partially depress communal social capital by reducing the number of community leaders that worked in thriving local businesses prior to the retailer's entrance (Goetz and Rupasingha 2006; Rupasingha *et al.* 2006). Given that poverty, residential instability and diminished social capital are some of the most robust structural correlates of crime (Pratt and Cullen 2005), Wal-Mart is likely associated with crime rates by way of any detrimental effect it has on such community structural conditions.

   A second theoretical linkage centres on the empirical research guided by Wilson's (1987; 1996) dual labour market thesis. This research relies on the notion that macroeconomic changes in labour market structure give way to community structural disadvantages which weaken the norms and values that typically inhibit the use of violence and perpetration of crime for pecuniary gain (Crutchfield 1989; Sampson and Wilson 1995; Bellair *et al.* 2003). According to Wilson, the exodus of manufacturing jobs outside of metropolitan areas left only unstable, low-skill, low-wage service-sector jobs for residents whereas professional, high-wage occupations moved to the suburbs. The bifurcated labour market, as Wilson points out, sends disadvantaged communities with residents too poor to follow better jobs into further decay. Evidence suggests that Wal-Mart's introduction into particular communities may support a dual labour market structure by over-saturating the area with low-wage occupations and minimizing access to middle-class jobs (i.e. through the reduction of manufacturing and wholesale-sector employment). This is important because research reveals the presence of locally oriented retail and small manufacturing establishments is associated with

---

[2] It is important to note that we focus on Wal-Mart because its footprint in the retail world dwarfs that of other big-box retailers and is, therefore, the centrepiece of a burgeoning research literature. Missing from this line of work is evidence indicating similar effects of other big-box stores on social and economic outcomes.

higher average income levels, lower poverty and unemployment, and greater social capital (Tolbert *et al.* 1998; Tolbert 2005; Lee 2008). Wal-Mart may be associated with unfavourable changes in crime rates given the dire structural conditions brought on by the displacement of such local businesses and the creation of a weak labour market structure.

A third theoretical connection considers the influence of macro-level routine activity changes on aggregate crime patterns (Cohen and Felson 1979). Routine activity theory maintains that increases in crime rates transpire when a greater supply of motivated offenders is brought into closer proximity to suitable targets that are insufficiently protected from victimization (Sampson and Wooldredge 1987; Pratt and Cullen 2005; Higgins *et al.* 2008). From this perspective, Wal-Mart may function as a crime attractor (or a crime generator by simply providing more opportunities) by drawing motivated offenders to a single location that provides potential for various criminal activities (Brantingham and Brantingham 1993; 1999). Prior to the entrance of Wal-Mart, resident shopping routines may be fragmented between various locations throughout communities. Wal-Mart provides a multitude of consumer products, thereby concentrating greater numbers of people in a single location than would be observed at locally oriented, specialty businesses around town. Higher concentrations of people allow both suitable targets and motivated offenders to intersect at a greater frequency. By transforming communities' shopping-related routine activities, Wal-Mart may generate more opportunities for property (e.g. theft from the store, customers or vehicles in the parking lots) and violent (e.g. robbery of the store or customers) crimes compared to areas without the retailers' presence.

Wal-Mart and Less Crime?

The above theoretical connections only predict a positive relationship between Wal-Mart and crime if the retailer has a harmful influence on community structural characteristics. Consistently with some of the Wal-Mart-effect literature, however, the company may not have such damaging consequences on communities that result in higher crime rates. Wal-Mart may actually fill a void in communities with existing high unemployment or poverty rates by creating low-wage job opportunities (Basker 2005a; 2007a; Hicks 2006). Under certain conditions, such retail growth may also open the door for employment opportunities in other sectors as different businesses (e.g. restaurants) develop in the area. Adding more employment prospects for citizens is likely to lead to better economic conditions for the community at large, particularly for areas in economic despair. Indeed, better economic conditions can also work in the opposite direction of theories emphasizing social control and opportunity (Arvanites and Defina 2006).

Wal-Mart also reduces retail prices throughout the community, leading to less economic strain by allowing consumers to spend less on everyday products. Fishman (2006) quoted Warren Buffett in identifying that Wal-Mart saves United States consumers $10 billion a year in their low-cost pricing strategy. Empirical research also supports this argument. Basker and Noel (2009), for example, revealed that Wal-Mart's entrance into a community leads to grocery price reductions in both small- and large-scale competitors (see also Hausman and Leibtag 2007). More specifically, Courtemanche and

Carden (2011) estimate that Wal-Mart supercentres (i.e. supermarkets) save the average American household $177 per year. Wal-Mart's use of technological innovations and being in constant connection with its suppliers have had such a substantial economic effect that the 'retail sector as a whole has become more efficient at providing consumers with the goods they want at better prices and with increased convenience' (Basker 2007a: 195). In fact, Wal-Mart's entry into a county reduces prices of specific product lines by up to 12 per cent across the entire retail sector (Basker 2005b). Therefore, it is entirely possible that the retailer may help communities out of social disadvantages and foster environments for better informal social-control efforts that translate into lower crime rates.

Evidence reported by Carden and colleagues (2009) reveals that Wal-Mart does not negatively influence social capital within communities. Rather, building a store can provide a new and larger economic community and increase the local stock of social capital. If this reasoning is correct, Wal-Mart may have an inverse relationship with crime rates by increasing a community's ability to engage in self-regulatory behaviour (Rosenfeld *et al.* 2001).

In the event that Wal-Mart is related to decreases in crime rates, the same theoretical frameworks discussed above can be used to understand such a relationship, albeit in the opposite direction than previously proposed. A convincing test of Wal-Mart's influence will control for known structural covariates of criminal activity to determine whether the retailer has a positive or negative influence on crime. Unfortunately, the Wal-Mart-effect literature is inconclusive and does not provide enough evidence to favour one hypothesis over the other. In short, the Wal-Mart–crime connection remains an open empirical question.

The Present Study

This study examines the influence of a specific, tangible economic force—Wal-Mart—on United States county-level crime rates. As the 'industry pacesetter' (Goetz and Swaminathan 2006: 223), Wal-Mart may have important implications for the macro-level study of crime. It is important to emphasize that our aims are not to sully Wal-Mart; indeed, this is not an exercise in the 'criminology of the unpopular' (Wilcox and Eck 2011). Rather, as we have outlined above, Wal-Mart and its attendant effects on communities finds itself entwined within the framework of several macro-level theories of crime. Exploring the Wal-Mart effect on crime, therefore, has important theoretical and policy implications. While our analyses focus on the United States, the results may be relevant to other countries that are experiencing or will experience growth of the company (see, e.g. Arnold 1999; Arnold and Fernie 2000; Hallsworth and Evers 2002).

We focus our attention on the 1990s—a period when Wal-Mart was undergoing dynamic expansion and the economy as a whole in the United States was growing remarkably (Oliner and Sichel 2000). The 1990s also marked an era of astonishing crime-rate declines throughout the United States that fall nothing short of a criminological miracle (Zimring 2007). From an analytic standpoint, the crime decline makes it difficult to disentangle the overall trend from social and economic factors that influence crime rates. For example, it may appear that Wal-Mart has a significant

relationship with crime when, in reality, the effect is masked or distorted by the crime decline. We adopt a propensity-weighted multilevel analytic strategy because it allows us to estimate the Wal-Mart effect on crime rates over and above the crime-rate decline trend and the endogeneity of Wal-Mart's building decisions. The results shed light on whether counties that experienced growth in Wal-Mart had equal, greater or lesser crime rate reductions than similarly situated counties without such Wal-Mart growth.

Methods

Data

United States counties are the unit of analysis in this study. Counties are geographic subdivisions with varying levels of local government authority and service. The study of Wal-Mart is particularly appropriate at the county level. Neumark *et al.* (2008: 409) established that county-level analyses are suitable for estimating Wal-Mart's influence because it is a unit of analysis 'not so small that many of the effects may occur outside of the geographic unit, and not so large that the effects may be undetectable'. For this reason, a number of Wal-Mart-effects studies have used counties as the unit of analysis (Basker 2005a; 2005b; Goetz and Rupasingha 2006; Goetz and Swaminathan 2006; Carden *et al.* 2009). A similar structural context extends to the study of Wal-Mart's association with crime rates. While Wal-Mart effects could be operating in smaller areal units, which is not uncommon in macro-level criminological research (e.g. Hipp 2007), our theoretical rationale is consistent with county-level observation.

Data from 3,109 United States counties are drawn from four sources: (1) annual crime data from the FBI's Uniform Crime Reports (UCR) between 1990 and 2009, (2) Wal-Mart store data from a publicly available database, (3) county structural indicators drawn from the 1990 US Census and (4) employment-sector data obtained from the 1990 Bureau of Economic Analysis. ArcGIS 9.3 was used to merge all data into a United States county shape file based on unique five-digit state-county FIPS codes (Federal Information Processing Standard) and incorporated into a single database for analysis.

Dependent variables

County-level crime rates are the outcome of this study. We use UCR county-level data to decompose the number of crimes per 10,000 persons into measures of *violent crime rates* (i.e. murder and non-negligent manslaughter, rape, robbery and aggravated assault) and *property crime rates* (i.e. burglary, larceny and motor vehicle theft). In doing so, it protects the study of county-level crime rates from being overly dominated by less serious and more frequent property crimes, as opposed to more serious and less frequent violent crimes. Property and violent crime-rate trends were examined (1) on an annual basis from 1991 to 2009 and (2) on a decade-by-decade basis in the 1990s and 2000s in order to adequately capture periods of dynamic change in Wal-Mart's growth and crime volatility in the United States.

205

Independent variable

The growth of a new Wal-Mart within a county in the 1990s is the key explanatory variable in this study. United States counties where Wal-Mart entered or expanded between 1 January 1990 and 31 December 1999 were coded '1', while counties where Wal-Mart did not build were coded '0'. The ten-year period and associated binary coding scheme was chosen because Wal-Mart's growth in the 1990s was both expansive *and* selective. The economic boom of the 1990s corresponded with the largest growth of Wal-Mart (Basker 2007a). Indeed, in the 28 years of Wal-Mart's existence prior to 1990, there were 1,328 Wal-Mart stores concentrated in 32 per cent of United States counties in this study. The following ten years revealed an 86 per cent growth rate, increasing the number of Wal-Marts to 2,470. Focusing on this period permits an assessment of the consequences of growth and expansion of the retailer, which occurred simultaneously to one of the largest crime declines observed in United States history.

But Walmart did not simply expand into any county. Wal-Mart's expansion of stores in the 1990s corresponded with an equally large expansion into unchartered markets; nearly nine out of every ten stores built in the 1990s were located in counties previously without a Wal-Mart. By the turn of the century, Wal-Mart was present in the majority of United States counties (54 per cent). In the counties where Wal-Mart expanded during this period, the vast majority (94 per cent) witnessed the construction of only one store, which makes the binary coding scheme for the independent variable particularly suitable for the present study. We illustrate the growth patterns of the 1990s in Figure 1. This twofold strategy of expansive and selective growth allows us to establish temporal ordering of independent and dependent variables given that we track violent and property crime rates simultaneous (1991–99) and subsequent (2000–09) to the period of
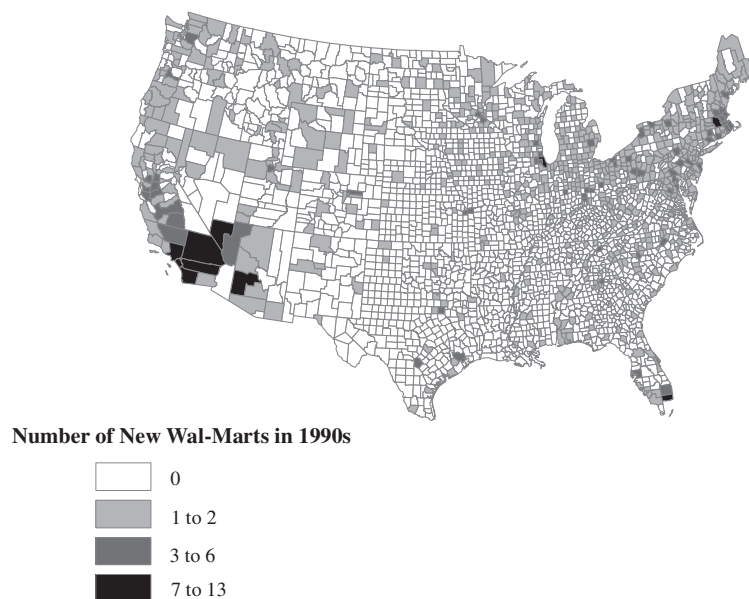

Number of New Wal-Marts in 1990s

- 0
- 1 to 2
- 3 to 6
- 7 to 13

Fɪɢ. 1 Wal-Mart stores built during the 1990s in United States counties

expansion. This is consistent with the Wal-Mart effects literature and allows us to assess the extent to which Wal-Mart growth was related to these changes.

Endogeneity correction

Wal-Mart's decision to build a new store is not the product of stochastic selectivity. Indeed, random processes would not have resulted in Wal-Mart ranking among the most successful commercial enterprises in United States history (Fishman 2006). Failure to account for the factors that influence the selection process could lead us to misidentify the Wal-Mart effect on crime. Correcting for Wal-Mart's location choice is the source of considerable debate, and there is no agreed-upon method in the economics literature—arguably the literature most embroiled with issues concerning Wal-Mart (Goetz and Swaminathan 2006; Basker 2007a; 2007b; Neumark *et al.* 2008). Fortunately, the product of the Wal-Mart selection debate has included the identification of key variables related to Wal-Mart's building strategy, and we adjust for these influences (as well as notable structural covariates of aggregate crime rates) in our analytic design prior to the measurement of our independent variable.

The growth of Wal-Mart occurred within spatial proximity to Benton County, Arkansas, the first store, which opened in 1962. New stores were built in geographic clusters across the United States (Walton 1992). The spatial–temporal visualization of this trend has been documented excellently (http://projects.flowingdata.com/walmart/) and used to instrument the endogeneity of Wal-Mart (Basker 2005b; Neumark *et al.* 2008; Courtemanche and Carden 2011). *Distance from Benton County* was used as an endogeneity correction and was created in ArcGIS 9.3 using centroid distance in miles from Benton County, AK. Because Wal-Mart is unlikely to build where a store is already located, we adjust for a binary indicator, *existing Wal-Mart* (0 = no, 1 = yes), and rate indicator, *Wal-Mart per capita* (100,000 persons) of the company's presence. The latter helps tap market saturation in larger counties. Also, we account for the average *commute time* to work (Goetz and Swaminathan 2006).

Numerous other county-level variables are used to protect against omitted variable bias. Labour market, population, demographic, social, economic and geographic factors are not only key components of structural theories of crime (Crutchfield and Pitchford 1997; Osgood and Chambers 2000; Pratt and Cullen 2005; Rosenfeld and Fornango 2007; Sampson 2012), but have also been shown to be important covariates in the Wal-Mart effect literature (Goetz and Rupasingha 2006; Goetz and Swaminathan 2006; Hicks 2007; Carden *et al.* 2009; Goetz *et al.* 2012). Derived from the Bureau of Economic Analysis and the US Census bureau, labour market measures include controls for the percentage of residents in *retail*, *wholesale*, *manufacturing* and *service* sectors, as well as rates of *unemployment* in the civilian workforce over age 16. These measures were computed by dividing the people in a county working in a given sector or unemployed by the total number of people employed in all sectors. We also include a measure of *females in the labour force*, given that a majority of Wal-Mart's employees are female.

Other economic indicators include a county's *median household income* and the *per capita payroll* in a county. Additional covariates closely related to Wal-Mart's selection strategy and county-level crime rates include the percentage of a county's population in *poverty, female-headed households with children* and *high school degree* completion. Population

and demographic variables include the total persons residing in a county, *population*, the rate of persons per square mile, *population density* and the percentage of the population that is *black*, *Hispanic* and *foreign born*. Residential mobility is tracked by accounting for the percentage of the population living in the *same residence for 5 years* and *owner-occupied houses*. In addition to our geographic indicators to account for Wal-Mart's growth patterns, we include a dummy variable for *South* (0 = no, 1 = yes) that indicates whether a county is within a southern state according to census definitions (Baller *et al.* 2001). Finally, we include measures of crime, *violent crime rate* and *property crime rate*, in 1990 to ensure that counties are statistically equivalent at the baseline of the study.

Analytic Strategy

A selection-on-observables strategy—propensity score matching—is used to account for the endogeneity of Wal-Mart. As an increasingly common method in criminological research (Apel and Sweeten 2010), propensity score matching is a quasi-experimental technique to estimate the effect of behaviours or interventions that arise non-randomly by statistically parsing out selection biases. A propensity score is built, $e(X) = P(NewWalMart = 1|X)$, where treatment is the growth of Wal-Mart in the 1990s and X is the vector of covariates described above that relate to the key variables on the left and/or right side of the equation (i.e. Walmart growth and/or crime). A standard cumulative logistic function was used to obtain the propensity scores. Counties are matched according to their conditional probability of treatment assignment based on the vector of covariates (Rosenbaum and Rubin 1983: 41; Apel and Sweeten 2010). The conditional independence assumption holds that treatment is assumed random conditional on the vector of covariates used to model treatment. The rich information used to correct for Wal-Mart's selection strategy is particularly beneficial for achieving balance among the covariates in order to meet this assumption, as we detail below.

The Epanechnikov kernel estimator was the matching algorithm used to generate the weights to balance treated and untreated counties. As the default kernel estimator in the *psmatch2* program in Stata (Leuven and Sianesi 2003), the propensity scores of counties where Wal-Mart did not grow (i.e. untreated counties) falling within a specified bandwidth of a county where Wal-Mart did grow (i.e. treated counties) are weighted proportional to the probability density function of a Gaussian distribution. The trade-off between bias and variance surrounding the 'neighbourhood' of the propensity score must be considered (Smith and Todd 2005; Caliendo and Kopeinig 2008; Guo and Fraser 2010). An inclusive neighbourhood results in increased bias because more distant propensity scores influence the estimates. Therefore, we employ a relatively exclusive bandwidth (0.02). No cases fell off support, which means that all counties were used in the analyses. Combined, the estimator and the bandwidth resulted in the greatest reduction of bias relative to alternative configurations of estimators/ bandwidths.

Based on the matching scheme, standardized differences—equivalent to Cohen's *d*— were assessed to determine whether the conditional independence assumption was met (unadjusted and adjusted means and standardized differences are available upon request). Table 1 reports the global fit statistics for the first two stages of propensity score matching. The logistic regression results confirm that we are identifying

208

TABLE 1   *Global fit statistics for selection-on-observables adjustment*

Logistic regression (y = Wal-Mart growth)	
Pseudo R^2	49.1%
Sensitivity	87.5%
Specificity	85.0%
Correctly classified	85.6%
Absolute standardized differences	
Before matching	
Mean (SD)	47.1 (31.7)
After matching	
Mean (SD)	7.4 (5.0)
Percent bias reduction	84%

Wal-Mart's selection strategy effectively, accounting for half of the variance in the outcome and correctly classifying 86 per cent of counties. This, in turn, corresponds with a strong reduction in the standardized differences. Prior to matching, 23 of the 32 covariates were imbalanced at the |20| threshold for standardized differences; after matching, not one of the covariates exceeded |20| (Rosenbaum and Rubin 1985). Therefore, treatment is assumed to be exogenous conditional on the covariates used to model Wal-Mart's expansion in counties. As a result, counties are statistically equivalent as of 1990 and prior to the treatment (i.e. growth of Wal-Mart) and we can compare rates of violent and property crime thereafter. We use the weighting scheme generated from the kernel estimator in the proceeding analysis to obtain the average treatment effect on the treated (ATT) counties, where $w_t = 1$ and $w_u = P/(1 - P)$. The results represent the expected differences in county-level crime rates for counties where Wal-Mart built in the 1990s.

In the primary portion of the analysis, we turn to a multilevel modelling strategy that is better equipped to address the longitudinal questions posed in this study. Here, we estimate two sets of multilevel models for violent and property crime rates over the study period, fitting two-level models where time in years is nested within counties. The model takes the following form:

$$y_{it} = \beta_{0i} + \beta_{1i}\left(Time_{it}\right) + \beta_{2i}\left(Time_{it}^2\right) + \varepsilon_{it} \tag{1}$$

$$\beta_{0i} = \gamma_{00} + \gamma_{01}\left(NewWalMart_i\right) + \mu_{0i} \tag{2}$$

$$\beta_{1i} = \gamma_{10} + \gamma_{11}\left(NewWalMart_i\right) + \mu_{1i} \tag{3}$$

$$\beta_{2i} = \gamma_{20} \tag{4}$$

where the dependent variable (y_{it}) represents violent and property crime rates, respectively, for county i at time t, the linear and quadratic terms, β_1 and β_2, pick up trends in crime rates and represent time in years and time in years squared from 1991. We find a random intercept and linear slope coefficient are sufficient for modelling this relationship, allowing crime trends to vary across counties. The primary coefficient of interest, (γ_{11}), answers whether Wal-Mart's growth in a county corresponded with differential patterning in crime trends after parsing out the endogeneity of Wal-Mart through the application of level-2 propensity score weights.

To circumvent the overlap in Wal-Mart's growth in the 1990s with the modelling of our outcome, we estimate an additional equation with a decade-by-decade comparison:

$$y_{it} = \beta_{0i} + \beta_{1i}\left(NewWalMart_i\right) + \beta_{2i}\left(2000s_{it}\right) + \beta_{3i}\left(2000s_{it} \times NewWalMart_i\right) \qquad (5)$$

where $2000s_{it}$ is a binary indicator of the decade, β_{1i} is the average difference between Wal-Mart-treated and -untreated counties in the 1990s and β_{2i} and β_{3i} are the average decade-by-decade changes in crime rates for no-Wal-Mart growth and Wal-Mart growth counties, respectively. This ensures that we are observing changes in crime rates subsequent to Wal-Mart's growth. All analyses are weighted and based on $NT = 29{,}146$ observations ((767 treated + 767 weighted untreated counties) × 19 years). We present the results without and with propensity score weights for the untreated counties, where the former are derived from an intercept-only logistic regression model and the latter represent ATT propensity score weights. All of the multilevel analyses were carried out using *xtmixed* in Stata 12.0 and report standard errors using Huber–White sandwich estimators.

Results

Naïve differences

It has been well documented that crime rates fell across the United States during the 1990s before levelling off in the early 2000s. Few studies have reported on these patterns at the county level, and the descriptive statistics presented in Table 2 are consistent with crime trends in the United States (Zimring 2007; Xie 2012). On average, violent and property crime rates fell between the decades by 2 and 25 units, respectively, with a great deal of variation across counties. We observe uneven crime declines when we partial counties where Wal-Mart built in the 1990s from counties Wal-Mart avoided. Growth counties witnessed a crime decline that was four times greater than non-growth counties. Of course, it is premature to conclude that these naive—albeit statistically significant—differences in county-level changes in crime rates cannot be ruled out by alternative explanations, especially once we consider the covariates used to adjust for endogeneity.

Wal-Mart growth counties are statistically and substantively different from the remaining 75 per cent of United States counties. Throughout the period of observation, growth counties had higher violent and property crime rates than non-growth counties. Also, growth counties had a lower rate of Wal-Marts per capita, a lower prevalence of Wal-Mart's presence, were located disproportionately outside of the southern United States, and were about 270 miles further away from Benton County. The socio-economic status of growth counties in 1990 was better than non-growth counties; the former had higher median incomes, a better educated populace, lower unemployment and poverty rates, a higher per capita payroll and a greater reliance on retail, wholesale, manufacturing and service-sector employment. Another indicator of Wal-Mart's non-random selection strategy is that the counties where they built had on average six times the population and nearly twice the population density. Further, fewer of the residents in growth counties owned their homes or had changed residences within the last five years. Across many of the structural factors, such differences make sense, as it would be

TABLE 2   *Descriptive statistics by Wal-Mart growth in the 1990s*

	Full sample		No Wal-Mart growth		Wal-Mart growth	
	Mean	(SD)	Mean	(SD)	Mean	(SD)
Dependent variables						
Violent crime pooled	25.39	−24.41	23.56	−23.65	30.99*	−25.8
Property crime pooled	219.42	−149.96	193.83	−141.65	297.58*	−147.66
Violent crime decade change[a]	−1.96	−16.77	−1.13	−17.47	−4.48*	−14.18
Property crime decade change[a]	−24.89	−95.4	−14.63	−95.98	−56.21*	−86.42
Treatment variable						
Wal-Mart growth (0–1)	0.25		0		1	
Selection controls[b]						
Violent crime rate (1990)	26.74	−33.45	24.22	−32.87	34.46*	−34.05
Property crime rate (1990)	257.82	−199.52	222.48	−188.37	365.73*	−193.91
Wal-Marts per capita	1.14	−2.15	1.46	−2.37	0.16*	−0.64
Wal-Mart (0–1)	0.32		0.38		0.13*	
Median income ($)	23,855	−6,459	22,347	−5,445	28,457*	−7,103
High school degree (%)	69.54	−10.34	67.62	−10.28	75.40*	−8.09
Unemployment (%)	6.65	−3.07	6.74	−3.27	6.35*	−2.32
Population density (sq. mile)	221.3	−1,438	178.27	−1602.6	352.68*	−721.27
Population	79,461	−264,726	35,827	−97,272	212,697*	−481,490
Black (%)	8.65	−14.38	9.16	−15.24	7.08*	−11.25
Hispanic (%)	4.48	−11.1	4.6	−11.75	4.13	−8.83
Foreign born (%)	2.22	−3.59	1.84	−3.22	3.36*	−4.35
Owner-occupied houses (%)	72.63	−7.71	73.6	−7.56	69.68*	−7.42
Same residence, 5 years (%)	54.47	−8	55.6	−7.72	51.02*	−7.84
Poverty (%)	16.23	−7.76	17.55	−7.93	12.22*	−5.57
Female-headed HH w/kids (%)	7.44	−3.21	7.25	−3.4	8.05*	−2.85
Per capita payroll ($)	44,348	−32,313	37,599	−29,548	64,955*	−31,681
Retail (%)	15.4	−4.05	14.68	−4.12	17.61*	−2.85
Wholesale (%)	3.25	−1.95	3.07	−1.98	3.77*	−1.75
Manufacturing (%)	14.6	−10.62	14.2	−11.1	15.81*	−8.92
Service (%)	20.32	−6.88	19.02	−6.65	24.26*	−6.01
Females in the labour force (%)	93.24	−3.19	93.07	−3.42	93.76*	−2.28
South (0–1)	0.45		0.52		0.25*	
Commute time (in minutes)	19.53	−4.95	19.44	−5.21	19.81#	−4.04
Distance Bentonville (miles)	650.93	−336.29	583.66	−304.92	856.31*	−344.46
N =	3,109		2,342		767	

* $p < 0.05$; # $p = 0.10$.

[a] Values represent raw change by pooled decade.

[b] All variables were collected at the baseline period (i.e. ~1990).

ill advised to select into counties with economic weakness, limited spending power or a populace with strong allegiances to local businesses.

What is difficult to reconcile, however, is that, while the overall standing of growth counties appears superior to non-growth counties, crime remained high at the baseline period. While this study is focused on crime-rate changes across the decade, in supplemental analyses (not reported in table format), we also examined the between-county association of Wal-Mart with crime pooled throughout the study period. Wal-Mart maintained a sturdy between-county relationship with crime rates. Among the 54 per cent of counties that had a Wal-Mart as of 31 December 1999, both violent crime (b = 2.53, se = 0.88, p < 0.01) and property crime (b = 21.98, se = 4.89, p < 0.01) rates were higher than the remaining counties pooled across the study period. This finding operated

net of macro-level correlates of crime, including disadvantage, socio-economic standing, immigration, residential stability, labour market, population density and southern region—all of which are established macro-level correlates of crime (Pratt and Cullen 2005). Of course, these findings are limited to an association between Wal-Mart and crime, and ignorant of the 1990s crime decline.

There is something unique about the counties that Wal-Mart selects. As one of the most successful businesses in United States history, Wal-Mart makes calculated and skilled decisions when locating new stores. Could Wal-Mart have selected into counties that were primed for crime declines? This could be an appealing feature to a corporation and their arrival in the 1990s may have spurred additional growth and macro-level criminal desistance mechanisms. Or is endogeneity distorting the underlying relationship? That is, it could be that spurious or positive effects emerge once Wal-Mart is exogenous and isolated from the covariates detailed above. The extent to which Wal-Mart is tied to county-level changes in crime rates awaits analyses that better account for threats to the validity of these observations.

The effects of Wal-Mart on county-level crime rates

Table 3 presents four models that examine the effects of Wal-Mart's growth in a county on violent and property crime rates. Models 1 and 2 report unweighted results, where the linear and quadratic trends reflect the decelerating crime decline in the United States. Counties where Wal-Mart entered in the 1990s had higher violent (b = 9.86, p < 0.05) and property (b = 138.08, p < 0.05) crime rates in 1991. The linear terms indicate that crime declined over the remainder of the study period in United States counties where Wal-Mart did not build; however, the results indicate that, on a year-by-year basis, the crime decline was 30 per cent (violent crime) and 50 per cent (property crime) greater in counties where Wal-Mart grew (e.g. 31% = 1 − [(−0.87 − 0.27)/−0.87]). Indeed, the violent and property crime rates fell by over 1 and 11 units annually in Wal-Mart

TABLE 3   *Propensity-weighted multilevel models of the impact of Wal-Mart growth on annual changes in violent and property crime rates from 1991 to 2009*

	Violent crime rate b (se) z			Property crime rate b (se) z		
Models 1 and 2: Unweighted						
Wal-Mart growth trend	−0.27	(0.06)	4.53*	−3.84	(0.35)	10.95*
Wal-Mart growth intercept	9.86	(1.42)	6.92*	138.08	(8.10)	17.06*
Linear trend	−0.87	(0.08)	11.60*	−7.07	(0.45)	15.80*
Quadratic trend	0.04	(0.00)	11.96*	0.31	(0.02)	13.70*
Intercept	26.80	(0.72)	37.20*	221.91	(3.96)	56.09*
Models 3 and 4: Weighted						
Wal-Mart growth trend	0.20	(0.11)	1.78#	1.50	(0.70)	2.15*
Wal-Mart growth intercept	−4.57	(3.40)	1.34	−20.14	(20.22)	1.00
Linear trend	−1.67	(0.27)	6.17*	−14.10	(1.37)	10.27*
Quadratic trend	0.06	(0.01)	5.20*	0.40	(0.07)	5.68*
Intercept	42.16	(3.27)	12.91*	384.89	(18.19)	21.49*

* p < 0.05; # p = 0.076, two-tailed tests. N = 1,534 (767 + 767), NT = 29,146 (1,534 × 19). Huber–White standard errors are reported.

growth counties, compared to fewer than 1 and 7 units in non-Wal-Mart growth counties. At first glance, these results support the 'more Wal-Mart, less crime' thesis.

The above results are naive to endogeneity. To account for this, propensity-weighted multilevel regression models are used to match Wal-Mart growth counties with comparably situated non-growth counties. The key findings for the present study are found in Models 3 and 4. As expected, Wal-Mart's presence in United States counties exhibited no statistical relationship with violent or property crime at the intercept. The linear trends again confirm the crime decline from the 1990s to the 2000s for non-growth counties, but the magnitudes of the effects were about twice the size from the unweighted models. In other words, the covariates used to build the propensity scores were characteristic of counties primed for the crime decline. Turning to the central finding, the Wal-Mart growth trend, we find that the impact of Wal-Mart is positive once growth counties are statistically matched to non-growth counties. While the result for the Wal-Mart effect on violent crime is marginally statistically significant (p = 0.076), the property crime finding meets standards of statistical significance (p = 0.032). Put simply, United States counties where Wal-Mart built in the 1990s did not experience the same crime decline as counties without Wal-Mart growth.

Table 4 reports the results of our decade-by-decade analyses. Here we compare pooled crime rates in the 1990s to the 2000s across propensity-weighted growth and non-growth counties. These models ensure temporal order by separating Wal-Mart's 1990s growth from crime rates over the study period by assessing pooled decade changes (i.e. crime in the 1990s versus crime in the 2000s). In terms of statistical significance, the findings are identical to the annual trend. Substantively, given the pooling of the data points, the results reveal large changes in crime rates associated with Wal-Mart's growth in counties. The key findings presented in Models 3 and 4 reveal that, on average, the violent (p = 0.081) and property (p = 0.013) crime rate fell by 2.1 and 17.0 additional units per 10,000 citizens if Wal-Mart *did not* build in a county in the 1990s.

The analyses were supplemented by a partial assessment of the change mechanisms linked to Wal-Mart's growth in a county. We estimated a series of propensity-weighted regression models to examine changes in the covariates used to build the propensity scores from 1990 to 2000. Of the covariates outlined in Table 2, we only observed

TABLE 4   *Propensity-weighted multilevel models of the impact of Wal-Mart growth on changes in violent and property crime rates from the 1990s to the 2000s*

	Violent crime rate b (se) z			Property crime rate b (se) z		
Models 1 and 2: Unweighted						
Wal-Mart decade trend	−3.15	(0.61)	5.19*	−38.11	(3.64)	10.47*
Wal-Mart decade intercept	9.06	(1.26)	7.21*	123.57	(7.17)	17.23*
Decade trend	−1.10	(0.35)	3.10*	−11.94	(1.97)	6.07*
Intercept	24.14	(0.61)	40.54*	199.15	(3.41)	58.38*
Models 3 and 4: Weighted						
Wal-Mart decade trend	2.11	(1.21)	1.74#	16.96	(6.13)	2.47*
Wal-Mart decade intercept	−3.86	(3.19)	1.21	−15.54	(18.10)	0.86
Decade trend	−6.35	(1.10)	5.75*	−67.01	(5.81)	11.13*
Intercept	37.07	(3.00)	12.37*	338.26	(16.97)	19.94*

* p < 0.05; # p = 0.081, two-tailed tests. N = 1,534 (767 + 767), NT = 29,146 (1,534 × 19). Huber–White standard errors are reported.

213

statistically significant changes in labour market outcomes—retail (b = 0.75, se = 0.18, p < 0.05) and wholesale (b = 0.28, se = 0.09, p < 0.05) employment. The importance of these findings is that much of the mechanisms underlying the Wal-Mart effect remain unobserved—a topic we return to shortly.

Together, the results provide support for the following conclusions regarding the Wal-Mart–crime relationship: (1) the crime rates in United States counties where Wal-Mart is located are higher than counties without Wal-Mart, regardless of time period and even after controlling for the strongest and most consistent macro-level covariates of crime; (2) Wal-Mart selected into United States counties that had higher crime rates in 1990 and those that were primed for the crime decline of the 1990s; (3) after accounting for the non-random selection strategy of Wal-Mart, the crime decline was statistically more modest in counties where Wal-Mart built compared to their matched counterparts; and (4) our most conservative interpretation of the findings lead us to conclude that the effect of Wal-Mart is more salient for property crime rates than violent crime rates.

Discussion

Communities are the product of the larger, macro-economic climate they are situated within. Structural conditions that characterize society are a function of the economic standing, types of industries and job access in a particular area. Any brief review of United States history demonstrates the impact—both good and bad—of a capitalistic society on the structural conditions of communities. The past 100 years have observed the introduction and evolution of the automobile industry, the internet and advances in civil rights that have fundamentally changed the social structure, routine activities and culture of people in the United States and abroad. Mass-merchandizing stores comprise a part of this story, impacting the production, distribution and consumption of goods. As a product of the capitalist economic landscape, Wal-Mart is the 'biggest' big-box retailer and an economic force. This study assessed whether Wal-Mart's effects extend into the domain of crime rates. Herein, we situate our key findings in the larger literatures surrounding 'the Wal-Mart effect' and the social scientific study of criminal activity.

Wal-Mart is located in counties with more crime

Our analyses revealed that counties with Wal-Mart had, on average, higher violent and property crime rates compared to similarly situated counties without the retailer's presence. These findings are particularly important in light of the fact that the Wal-Mart association is observed after controlling for robust predictors of crime rates such as disadvantage and residential stability (Baller *et al.* 2001; Pratt and Cullen 2005). Accordingly, our data suggest that there may be something unique about Wal-Mart that produces a relationship with crime.

One explanation for this result can be gleaned from research demonstrating that social capital, in the form of community organization and grassroots movements, plays an important role in helping communities to voice opposition to Wal-Mart's entrance (Goetz and Rupasingha 2006; Carden *et al.* 2009). Ingram and colleagues (2010), for

instance, detailed how Wal-Mart used a 'test for protest' model as part of the company's strategy to build stores. Greater opposition from communities when proposals are 'floated' is indicative of a greater fight (i.e. cost) Wal-Mart would endure if it attempted to build in the area. Perhaps low levels of social capital in certain counties help to partially explain Wal-Mart's decision to build. Research centred on civic community theory reveals that areas with higher concentrations of locally owned business tend to have greater social capital and, as a result, better structural conditions including lower crime rates (Tolbert *et al.* 1998; Tolbert 2005; Lee 2008). Wal-Mart may tend to locate in areas with less social capital and higher crime but further research is needed to disentangle this relationship.

Wal-Mart corresponds with lower crime declines

Recall that extant empirical evidence suggests that Wal-Mart could either have a positive or negative effect on crime-rate changes. Our data deliver evidence suggesting that the relationship is more complex than either hypothesis. The study period—the 1990s—was an important time in United States history whereby drastic crime-rate declines swept the nation. During this same period, Wal-Mart experienced dynamic growth. Our multilevel models that accounted for the endogeneity of Wal-Mart's location decision isolated the Wal-Mart effect on crime rates from the overall crime-decline trend. The findings illustrate that counties where Wal-Mart expanded experienced lower crime declines throughout the 1990s and 2000s relative to matched, untreated counties. Analyses revealed that the decade-by-decade change in violent and property crime rates was about 2 and 17 crimes per 10,000 people, respectively, greater in counties where Wal-Mart grew.

  The evidence suggests Wal-Mart growth stunted what could have otherwise been greater drops in crime, particularly property crime. The theoretical arguments outlined earlier propose possible indirect relationships between Wal-Mart and crime via the retailer's influence on community structural conditions. Our supplemental analyses, however, reveal no statistically significant Wal-Mart effect on changes in county-level covariates that are typically associated with crime rates (e.g. poverty, disadvantage, unemployment). Why Wal-Mart obstructs crime declines appears to be a more complex question than data typically available to macro-level researchers can answer (i.e. US Census). Empirical research indicates that Wal-Mart not only locates in communities with lower levels of social capital, but, under certain conditions, it *decreases* social capital in these areas (Goetz and Rupasingha 2006; Carden *et al.* 2009). Thus, one avenue for future research is to explore the connection between Wal-Mart and social capital or related concepts such as collective efficacy (Sampson *et al.* 1997; Sutherland *et al.* 2013). The retailer may be associated with less favourable crime rates because it reduces mutual trust and social cohesion among community residents resulting in less ability to intervene in the common good. If so, it will also be necessary to determine whether the closure of locally owned businesses or other factors initiate this process. Another consideration for future research is the unit of analysis under exploration. Research has found that structural conditions have different effects on crime rates, depending on the level of aggregation used in the analysis (Hipp 2007; Kaylen and Pridemore 2013). It would be useful for future research to examine whether Wal-Mart exerts a more

localized effect (e.g. block- or tract-level) that is hidden within county-level analyses typically explored in the Wal-Mart literature.[3]

Along similar lines, the connection between Wal-Mart and crime rates may also be informed by routine activity theory. As discussed earlier, the retailer's entrance may have important implications on the shopping activities of local communities. The store offers such a diversity of products that consumers can often complete all shopping needs in a single location versus travelling to various locally oriented businesses. As such, more motivated offenders and suitable targets will have the ability to converge in time and location compared to a fragmented retail space. In such instances, both higher property and violent crime rates can be expected. At the same time, Wal-Mart may serve as a more localized crime attractor rather than influence crime across an entire county. The presence of a store increases opportunities for crimes such as theft and burglary. Therefore, crimes that are directed at Wal-Mart (e.g. shoplifting) or occur on the store's property (e.g. auto break-in) may be largely responsible for increases in overall property crime rates, especially in light of Wal-Mart's asset protect department with resources to detect and report theft and other crimes. Further research is required to determine the role Wal-Mart plays in shaping macro-level shopping patterns and subsequent effects on crime rates. Additionally, research grounded in routine activity theory examining possible place-based Wal-Mart effects would not be misguided. Such avenues of research should help paint a clearer picture of the Wal-Mart–crime relationship.

Policy implications

Wal-Mart's entrance into communities has important implications for community stakeholders. Indeed, individuals in charge of guiding community priorities, such as elected officials and appointees to economic development committees, have reason to consider the longer-term costs of mass merchandiser entrance. Halebsky (2009) detailed what appears to be a win–win situation that Wal-Mart presents to local officials, as entrance shows they are 'doing something' about jobs while expanding the local tax base. At first glance, this may appear to benefit communities through an influx of opportunities for income; however, it must be taken into consideration that Wal-Mart tends to introduce low-wage and part-time employment with little or no benefit packages (Basker 2005a). Some have even reported that the low-wage jobs Wal-Mart introduces ultimately cost taxpayers because employees are forced to rely on government subsidies to supplement their income (Dube and Jacobs 2004). The nature of Wal-Mart job creation is consistent with dual labour-market theory more generally (Crutchfield 1989) but it is important to note that small, locally owned establishments (i.e. 'mom and pops') are often less likely to offer insurance coverage or retirement packages than larger corporations (Abraham *et al.* 2009). Thus, the threat of Wal-Mart replacing locally oriented businesses may be eased by the fact that such companies offer similar wages and lack of benefits to community residents. What is more, some research suggests that Wal-Mart can improve the economic standing of particular communities yearning for job opportunities.

Finally, it is important to remember that the Wal-Mart effect observed in this study and others like it may represent a larger mass-merchandiser effect. Future research is

---

[3] We thank an anonymous reviewer for this recommendation.

needed to determine whether this is indeed the case—is the Wal-Mart effect unique or do other big-box retailers have similar effects on local communities? After all, communities where Wal-Mart builds are likely similar to areas where other big-box retailers locate (e.g. Target and Costco), which raises the question: is this an independent or additive (or multiplicative) relationship? An interesting avenue for future inquiry would be to explore whether the clustering of large retail establishments has an influence on community crime rates. The take-away message is that policy makers should carefully consider the company's potential consequences on local communities given the specific needs and conditions of the particular area. Such a recommendation is particularly important in locations outside United States borders where Wal-Mart is currently expanding. For example, ASDA, a subsidiary of Wal-Mart, has been a forerunner in the development of 'deep discount' and 'variety' superstores in the United Kingdom's retail sector over the past decade (see, e.g. Milimuka, 2012). Corresponding with such growth has been a decline in locally owned businesses such as butchers and specialty retail stores. Worthy of consideration by British policy makers is whether growth of big-box retailers corresponds with reductions in local businesses and whether such growth is in the best interest of the local economy (see, e.g. Bernburg 2002).

Conclusion

The results of the present study demonstrate that a specific economic force has a significant relationship with crime rates. On the whole, the results suggest that it is wise to look outside of the variables specified in our traditional theories of crime and explore the role of economic factors that often occur causally prior to structural conditions emphasized in such frameworks. Crime-related studies of this type may be criticized as exercises in the 'criminology of the unpopular' (Wilcox and Eck 2011). That is, scholars often explore the connection between unsavoury economic factors (e.g. payday lenders or Wal-Mart) and crime because such controversial topics receive attention and get published. This research does not fall into this category. Wal-Mart is an economic force that has far-reaching social, political and economic consequences. With that said, scholars often look suspiciously on research that does not conform to the relationship they want to observe. We must be careful of this bias and listen to what the data demonstrate. This study revealed a Wal-Mart effect on macro-level crime-rate changes. While Wal-Mart does not necessarily *increase* crime as some may have expected (or wanted to observe), the retailer does not reduce crime either. Rather, Wal-Mart's presence made it more difficult for United States counties to experience crime-rate declines throughout the 1990s. Only time and continued empirical inquiry will reveal whether a similar Wal-Mart effect is observed in countries outside of the United States where the company eyes expansion.

References

ABRAHAM, J. M., DELEIRE, T. and ROYALTY, A. B. (2009), 'Access to Health Insurance at Small Establishments: What Can We Learn from Analyzing Other Fringe Benefits?', *Inquiry*, 46: 253–73.

APEL, R. J. and SWEETEN, G. (2010), 'Propensity Score Matching in Criminology and Criminal Justice', in D. Weisburd and A. R. Piquero, eds, *Handbook of Quantitative Criminology*, 543–562. Springer.

ARNOLD, S. J. (1999), 'Research Note: Wal-Mart in Europe', *International Journal of Retail & Distribution Management*, 27: 48–51.

ARNOLD, S. J. and FERNIE, J. (2000), 'Wal-Mart in Europe: Prospects for the UK', *International Marketing Review*, 17: 416–32.

ARVANITES, T. M. and DEFINA, R. H. (2006), 'Business Cycles and Street Crime', *Criminology*, 44: 139–64.

BALLER, R. D., ANSELIN, L., MESSNER, S. F., DEANE, G. and HAWKINS, D. F. (2001), 'Structural Covariates of US County Homicide Rates: Incorporating Spatial Effects', *Criminology*, 39: 561–90.

BASKER, E. (2005a), 'Job Creation or Destruction? Labor Market Effects of Wal-Mart Expansion', *Review of Economics and Statistics*, 87: 174–83.

——(2005b), 'Selling a Cheaper Mousetrap: Wal-Mart's Effect on Retail Prices', *Journal of Urban Economics*, 58: 203–29.

——(2007a), 'The Causes and Consequences of Wal-Mart's Growth', *Journal of Economic Perspectives*, 21: 177–98.

——(2007b), 'When Good Instruments Go Bad: A Reply to Neumark, Zhang, and Ciccarella', unpublished manuscript, University of Missouri-Columbia, available online at http://ssrn.com/abstract=980988.

BASKER, E. and NOEL, M. (2009), 'The Evolving Food Chain: Competitive Effects of Wal-Mart's Entry into the Supermarket Industry', *Journal of Economics and Management Strategy*, 18: 977–1009.

BELLAIR, P. E., ROSCIGNO, V. J. and MCNULTY, T. L. (2003), 'Linking Labor Market Opportunity to Violent Adolescent Delinquency', *Journal of Research in Crime and Delinquency*, 40: 6–33.

BERNBURG, J. G. (2002), 'Anomie, Social Change and Crime: A Theoretical Examination of Institutional–Anomie Theory', *British Journal of Criminology*, 42: 729–42.

BRANTINGHAM, P. J. and BRANTINGHAM, P. L. (1993), 'Environment, Routine and Situation: Toward a Pattern Theory of Crime', *Advances in Criminological Theory*, 5: 259–94.

——(1999), 'A Theoretical Model of Crime Hot Spot Generation', *Studies on Crime & Crime Prevention*,

BURSIK, R. J. and GRASMICK, H. G. (1993), *Neighborhoods and Crime: The Dimensions of Effective Community Control*. Macmillan.

Bushway, S. and Reuter, P. (2008), 'Economists' Contribution to the Study of Crime and the Criminal Justice System', *Crime and Justice*, 37: 389–451.

Caliendo, M. and Kopeinig, S. (2008), 'Some Practical Guidance for the Implementation of Propensity Score Matching', *Journal of Economic Surveys*, 22: 31–72.

Carden, A., Courtemanche, C. and Meiners, J. (2009), 'Does Wal-Mart Reduce Social Capital?', *Public Choice*, 138: 109–36.

Cohen, L. E. and Felson, M. (1979), 'Social Change and Crime Rate Trends: A Routine Activity Approach', *American Sociological Review*, 44: 588–608.

Courtemanche, C. and Carden, A. (2011), 'Supersizing Supercenters? The Impact of Wal-Mart Supercenters on Body Mass Index and Obesity', *Journal of Urban Economics*, 69: 165–81.

Crutchfield, R. D. (1989), 'Labor Stratification and Violent Crime', *Social Forces*, 68: 489–512.

Crutchfield, R. D. and Pitchford, S. R. (1997), 'Work and Crime: The Effects of Labor Market Stratification', *Social Forces*, 76: 93–118.

Dube, A. and Jacobs, K. (2004), *Hidden Costs of Wal-Mart Jobs: Use of Safety Net Programs by Wal-Mart Workers in California*, Briefing Paper Series, UC Berkley Labor Center.

Fishman, C. (2006), *The Wal-Mart Effect: How the World's Most Powerful Company Really Works— and How It's Transforming the American Economy*. Penguin Press.

Goetz, S. J. and Rupasingha, A. (2006), 'Wal-Mart and Social Capital', *American Journal of Agricultural Economics*, 88: 1304–10.

Goetz, S. J. and Swaminathan, H. (2006), 'Wal-Mart and County-Wide Poverty', *Social Science Quarterly*, 87: 211–26.

Goetz, S. J., Rupasingha, A. and Loveridge, S. (2012), 'Social Capital, Religion, Wal-Mart, and Hate Groups in America', *Social Science Quarterly*, 93: 379–93.

Guo, S. and Fraser, M. W. (2010), *Propensity Score Analysis: Statistical Methods and Applications*. Sage.

Halebsky, S. (2009), *Small Towns and Big Business: Challenging Wal-Mart Superstores*. Lexington Books.

Hallsworth, A. and Evers, D. (2002), 'The Steady Advance of Wal-Mart across Europe and Changing Government Attitudes towards Planning and Competition', *Environment and Planning C: Government and Policy*, 20: 297–310.

Haltiwanger, J. C., Jarmin, R. S. and Krizan, C. J. (2010), 'Mom-and-Pop Meet Big-Box: Complements or Substitutes?', *Journal of Urban Economics*, 67: 116–34.

Hausman, J. and Leibtag, E. (2007), 'Consumer Benefits from Increased Competition in Shopping Outlets: Measuring the Effect of Wal-Mart', *Journal of Applied Econometrics*, 22: 1157–77.

Hicks, M. J. (2006). What is the local Wal-Mart effect? *Econ Devel J*, 5: 23–31.

Hicks, M. J. (2007), *The Local Economic Impact of Walmart*. Cambria.

Higgins, G. E., Hughes, T., Ricketts, M. L. and Wolfe, S. E. (2008), 'Identity Theft Complaints: Exploring the State-Level Correlates', *Journal of Financial Crime*, 15: 295–307.

Hipp, J. R. (2007), 'Block, Tract, and Levels of Aggregation: Neighborhood Structure and Crime and Disorder as a Case in Point', *American Sociological Review*, 72: 659–80.

Ingram, P., Qingyuan Yue, L. and Rao, H. (2010), 'Trouble in Store: Probes, Protests, and Store Openings by Wal-Mart, 1998–2007', *American Journal of Sociology*, 116: 53–92.

Kaylen, M. T. and Pridemore, W. A. (2013), 'Social Disorganization and Crime in Rural Communities: The First Direct Test of the Systemic Model', *British Journal of Criminology*, 53: 905–923.

Kposowa, A. J., Breault, K. D. and Harrison, B. M. (1995), 'Reassessing the Structural Covariates of Violent and Property Crimes in the USA: A County-Level Analysis', *British Journal of Sociology*, 46: 79–105.

Land, K. C., McCall, P. L., and Cohen, L. E. (1990). Structural covariates of homicide rates: Are there any invariances across time and social space? *Am J of Soc*, 95: 922–63.

Lee, M. R. (2008), 'Civic Community in the Hinterland: Toward a Theory of Rural Social Structure and Violence', *Criminology*, 46: 447–78.

Leuven, E. and Sianesi, B. (2003), 'Psmatch2: Stata Module to Perform Full Mahalanobis and Propensity Score Matching, Common Support Graphing, and Covariate Imbalance Testing', available online at http://ideas.repec.org/c/boc/bocode/s432001.html.

Milimuka, E. (2012), *Convenience Goods Retail Study Update 2012*. London Borough of Hillingdon, available online at http://www.hillingdon.gov.uk/media.jsp?mediaid=24831&filetype=pdf.

Neumark, D., Zhang, J. and Ciccarella, S. (2008), 'The Effects of Wal-Mart on Local Labor Markets', *Journal of Urban Economics*, 63: 405–30.

Oliner, S. D. and Sichel, D. E. (2000), 'The Resurgence of Growth in the Late 1990s: Is Information Technology the Story?', *Journal of Economic Perspectives*, 14: 3–22.

Osgood, D. W. and Chambers, J. M. (2000), 'Social Disorganization Outside the Metropolis: An Analysis of Rural Youth Violence', *Criminology*, 38: 81–116.

Parker, K. F. and McCall, P. L. (1999), 'Structural Conditions and Racial Homicide Patterns: A Look at the Multiple Disadvantages in Urban Areas', *Criminology*, 37: 447–77.

Pew Research Center (2005), 'Wal-Mart: A Good Place to Shop but Some Critics Too', available online at http://people-press.org/report/265/wal-mart-a-good-place-to-shop-but-some-critics-too.

Pratt, T. C. and Cullen, F. T. (2005), 'Assessing Macro-Level Predictors and Theories of Crime: A Meta-Analysis', *Crime and Justice*, 32: 373–450.

Pyrooz, D. C. (2012), 'Structural Covariates of Gang Homicide in Large US Cities', *Journal of Research in Crime and Delinquency*, 49: 489–518.

Rosenbaum, P. R. and Rubin, D. B. (1983), 'The Central Role of the Propensity Score in Observational Studies for Causal Effects', *Biometrika*, 70: 41–55.

——(1985), 'Constructing a Control Group Using Multivariate Matched Sampling Methods that Incorporate the Propensity Score', *American Statistician*, 39: 33–83.

Rosenfeld, R. and Fornango, R. (2007), 'The Impact of Economic Conditions on Robbery and Property Crime: The Role of Consumer Sentiment', *Criminology*, 45: 735–69.

Rosenfeld, R., Messner, S. F. and Baumer, E. P. (2001), 'Social Capital and Homicide', *Social Forces*, 80: 283–309.

Rupasingha, A., Goetz, S. J. and Freshwater, D. (2006), 'The Production of Social Capital in US Counties', *Journal of Socio-Economics*, 35: 83–101.

Sampson, R. J. (2012), *The Great American City: Chicago and the Enduring Neighborhood Effect*. University of Chicago Press.

Sampson, R. J. and Groves, W. B. (1989), 'Community Structure and Crime: Testing Social Disorganization Theory', *American Journal of Sociology*, 94: 744–802.

Sampson, R. J. and Wilson, W. J. (1995), 'Toward a Theory of Race, Crime, and Inequality', in J. Hagan and R. D. Peterson, eds, *Crime and Inequality*, 177–89. Stanford University Press.

Sampson, R. J. and Wooldredge, J. D. (1987), 'Linking the Micro- and Macro-Level Dimensions of Lifestyle-Routine Activity and Opportunity Models of Predatory Victimization', *Journal of Quantitative Criminology*, 3: 371–93.

Sampson, R. J., Raudenbush, S. W. and Earls, F. (1997), 'Neighborhoods and Violent Crime: A Multilevel Study of Collective Efficacy', *Science*, 277: 918–24.

Smith, J. A. and Todd, P. E. (2005), 'Does Matching Overcome LaLonde's Critique of Nonexperimental Estimators?', *Journal of Econometrics*, 125: 305–53.

Stucky, T. D. and Ottensmann, J. R. (2009), 'Land Use and Violent Crime', *Criminology*, 47: 1223–64.

Sutherland, A., Brunton-Smith, I. and Jackson, J. (2013), 'Collective Efficacy, Deprivation and Violence in London', *British Journal of Criminology*, 53: 1050–74.

Tolbert, C. M. (2005), 'Minding Our Own Business: Local Retail Establishments and the Future of Southern Civic Community', *Social Forces*, 83: 1309–28.

Tolbert, C. M., Lyson, T. A. and Irwin, M. D. (1998), 'Local Capitalism, Civic Engagement, and Socioeconomic Well-Being', *Social Forces*, 77: 401–27.

Walton, S. (1992), *Made In America: My Story*. Doubleday.

Wilcox, P. and Eck, J. E. (2011), 'Criminology of the Unpopular: Implications for Policy Aimed at Payday Lending Facilities', *Criminology and Public Policy*, 10: 473–82.

Wilson, W. J. (1987), *The Truly Disadvantaged: The Inner City, the Underclass, and Public Policy*. University of Chicago Press.

——(1996), *When Work Disappears: The World of the New Urban Poor*. New York: Random House.

Xie, M. (2012), 'Area Differences and Time Trends in Crime Reporting: Comparing New York with Other Metropolitan Areas', *Justice Quarterly*, doi: 10.1080/07418825.2012.742126.

Zimring, F. E. (2007), *The Great American Crime Decline*. Oxford University Press.