

**Does Fringe Banking Exacerbate Neighborhood Crime Rates?  
Social Disorganization and the Ecology of Payday Lending<sup>\*</sup>**

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## **Does Fringe Banking Exacerbate Neighborhood Crime Rates? Social Disorganization and the Ecology of Payday Lending**

### **Abstract:**

Payday lenders have become the banker of choice for many residents of poor and working class neighborhoods in recent years. The substantial costs that customers of these fringe bankers incur have long been documented. Yet there is reason to believe there are broader community costs that *all* residents pay in those neighborhoods where payday lenders are concentrated. One such cost may be an increase in crime. In a case study of Seattle, Washington, a city that has seen a typical increase in the number of payday lenders, we find that a concentration of payday lending leads to higher violent crime rates, controlling on a range of factors traditionally associated with neighborhood crime. Social disorganization theory provides a theoretical framework that accounts for this relationship. The findings suggest important policy recommendations and directions for future research that could ameliorate these costs.

Payday lenders have become the banker of choice for many residents of distressed urban communities in the United States. By offering cash advances on post-dated checks, a growing number of financially-strapped families are obtaining the money they need to get by at least in the short-run. As just one piece of a growing fringe banking industry (consisting of check-cashers, pawn shops, rent-to-own stores, and other high-cost financial services) payday lenders provide services but at a heavy cost to some of the most financially vulnerable families. Much attention has been given to the costs the customers of such services are incurring. Yet there may well be additional broader community costs that have been ignored in recent debates and in the scholarly literature. One of those, and the focus of this research, is a possible link between payday lending and neighborhood crime rates.

While pawn shops, loan sharks, and other predatory financial service providers have long histories, the number and range of such fringe banking institutions have mushroomed in the latter part of the twentieth and early years of the twenty-first centuries, amidst great controversy. In financial services, the rise of subprime and predatory lending has led to record foreclosure rates. A broader economic recession is now reaching overseas. These developments have been followed by unprecedented bailout and rescue plans. While these events have received most of the attention in financial industry circles, the rise in payday lending and other high-priced services has hardly gone unnoticed. Critics accuse payday lenders with charging exorbitant, exploitative interest rates and fees and several states have taken legal action to restrict their activities or virtually put them out of business altogether. Providers maintain they are offering valuable services to markets that are ignored by conventional financial services (e.g. banks, thrifts, credit unions) and that their costs simply reflect the risks they encounter as well as other legitimate business costs.

The debates over payday lending so far have focused almost exclusively on the implications for the immediate customers. Yet given the location of these services and the socio-economic status of their customer base – what we refer to as the ecology of payday lending – there may be other costs incurred by the communities in which they are located, costs that are paid by community members who do not use their services along with those paid by the clients. One potential cost for all residents appears to be higher crime rates in communities where payday lenders are located. There are theoretically plausible reasons for such a link, starting with the simple fact that where there are payday lenders there is a concentration of cash among store customers often late into the evening and during weekends in neighborhoods where many residents are experiencing financial hardships. Social disorganization theory offers a more detailed explanation for such a link. And in the following pages we provide some empirical evidence that, in fact, such a connection exists.

Below we report on a case study of a fairly typical U.S. city where payday lending has grown in recent years, Seattle, Washington. In our discussion leading up to the analysis, we note the growth of payday lending and fringe banking generally in the U.S. in recent years and the controversy that has resulted. Next we elaborate on why the hypothesized relationship between payday lending and neighborhood crime rates might exist. Finally, we provide empirical evidence for that relationship in Seattle neighborhoods. Crime is just one community cost that may well be associated with payday lending and in the conclusion, we briefly note other potential costs. We conclude with a discussion of policy implications of our findings and recommendations for future research.

## **The Growth of Fringe Banking and Payday Lending**

A two-tiered system in financial services has emerged in the U.S. in recent years, one featuring conventional products distributed by banks and savings institutions and the other featuring alternative, higher-cost services offered by payday lenders, check cashers, and pawnshops—often referred to as “fringe bankers.” Minority and low-income families are more likely than other families to use fringe banking services (Caskey 1994; Hudson 1996; Karger 2005). Alternative financial services are disproportionately (though not exclusively) located in low-income, minority neighborhoods and disproportionately serve minority customers (Fellowes 2006; Graves 2003; Li et al. 2009; Logan and Weller 2009; Temkin and Sawyer 2004). Users of these services pay greatly for the privilege.

Fringe banking has been the subject of much policy debate among financial service providers, regulators, elected officials, and consumer groups. This reflects, in part, substantial growth of fringe banking, its concentration in distressed communities, and adverse economic consequences for those who rely on these institutions for financial services. To illustrate, payday lending outlets were virtually non-existent in 1990 but by 2006 there were more than 15,000 outlets which extended \$25 billion in credit (Lawrence and Elliehausen 2008:299). By 2008, more than 22,000 locations originated over \$27 billion in loan volume annually (Parrish and King 2009:11).<sup>1</sup> The growth of payday lending has been impressive, growing faster than Starbucks during the mid-1990s (Graves and Peterson 2008: 668). Today there are more payday lenders than McDonald’s restaurants (Karger 2005:73).

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<sup>1</sup> Payday loans are cash advances on a post-dated personal check generally for two weeks or less when the borrower will receive the next paycheck. Amounts are typically in the range of \$300-\$500. In order to qualify, a borrower must have a checking account, source of income, and identification. Typically the borrower writes the check for an amount exceeding the cash loan (to cover the finance charge, generally \$15-\$30 per \$100 or approximately a 390-780 percent annual percentage rate for a two week loan). At the next payday, the borrower can repay the full loan amount, the check could be deposited for payment, or the borrower can pay the finance charge and renew the loan for another term (Consumer Federation of America 2007:3,4).

Several case studies concretely demonstrate that these services are concentrated in low-income and minority-neighborhoods, though they are starting to grow in many working and middle-class neighborhoods. In North Carolina there are three times as many payday lenders per capita in African American neighborhoods as there are in white neighborhoods (King et. al 2005). In the state of Washington, the site of the current study, they are twice as likely to be located in African-American as white areas and they are also concentrated in poverty zip codes (Oron 2006). In California they are eight times as concentrated in African-American and Latino neighborhoods as in white neighborhoods. Even controlling on income, poverty rate, population, education, and other socio-economic factors the racial disparity persists at 2.4 (Li et al. 2009:2). In Denver neighborhoods where the median income is below \$30,000 there is one check-casher for every 3,196 residents compared to one for every 27,416 residents in neighborhoods where the median income is between \$90,000 and \$120,000 (Fellowes 2006:26-28).<sup>2</sup>

These services are expensive and it is struggling working families who are paying the highest costs. The Center for Responsible Lending reported that payday lending costs U.S. families \$4.2 billion in excessive fees, that is fees which exceed the risk posed by borrowers and the costs of similar services provided by conventional financial institutions (King et al. 2006:2,7). Ironically, over 75 percent of these fees cover the costs of loans taken out by borrowers to repay debts incurred from previous payday loans, which they were unable to pay when the debt originally came due (Parrish and King 2009:11). Payday lenders claim their fees reflect the costs of doing business and note they are providing services in communities not being served by banks, thrifts, or credit unions. Given the history of redlining and discrimination in U.S. financial service industries, it is the case that payday lenders are operating in communities

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<sup>2</sup> Check cashers are businesses that charge a fee for cashing checks (Karger 2005:215).

that have been traditionally underserved though that has begun to change in recent years (Immergluck 2004).

Payday lenders also assert their borrowers are primarily middle income though recent research indicates it is low- and moderate-income borrowers who constitute a disproportionate share of customers. A study of Colorado borrowers found that those earning less than \$30,000 a year make up two-thirds of payday lender customers. A Texas study found that the median income of borrowers was \$18,540 (Fox 2007:6,7). A 2001 nationwide survey found that 23 percent earned less than \$25,000 and 51.5 percent earned between \$25,000 and \$50,000 (Lawrence and Elliehausen 2008:305). In its 2007 Survey of Consumer Finances, the Federal Reserve, for the first time, asked if respondents had taken out a payday loan in the previous year. Those who did so had a median income of \$30,892 compared to \$48,397 for those who had not taken out such loans. And payday loan borrowers had a median net worth of zero compared to \$80,510 for non-borrowers (Logan and Weller 2009:8).

The industry also claims its customers are generally people who use their services only on rare occasions to meet sudden emergencies. According to the 2001 survey, however, over 22 percent had 14 or more payday loans that year, another 26 percent had more than six, and just 15 percent had only one or two (Lawrence and Elliehausen 2008:311). The Center for Responsible Lending found that less than 2 percent of all payday loans went to borrowers who just took out one loan. Repeat borrowing was much more common with over 60 percent of loans going to those who took out 12 or more loans per year and 24 percent going to those with 21 or more per year (King and Parrish 2007:2,3). Half of these loans were taken out within one day of repaying a previous loan, further indicating that borrowers often take out such loans in order to retire the

debt of previous payday loans (Parrish and King 2009:8). Given the high fees and frequent use, payday loans have been referred to as “debt traps” by many consumer groups (Fox 2007:7,8).

Policymakers have begun to listen to consumer complaints. In 2006 Congress prohibited payday lending to military members and capped at 36 percent the interest rate that could be charged to them on any loan in connection with any other product (Powers 2006). Fifteen states and the District of Columbia have small loan usury laws or rate caps that effectively prohibit payday lending at triple-interest rates (Consumer Federation of America 2008; Li et al. 2009:25). Several more states and Congress are considering legislation and regulations restricting such lending (American Banker 2007).

All this attention is generated primarily by the growth of the industry, the fees that are being charged, and the customers and neighborhoods which are being targeted. Borrowers are clearly paying high costs, as we’ve already noted.<sup>3</sup> Lost in this discussion, however, are the broader costs that many communities may be incurring, including heightened levels of crime and violence. Payday lenders are concentrated in precisely those neighborhoods where crime rates are highest and where ex-offenders are most likely to return once they have served their sentence (Lynch and Sabol 2001:3, Rose and Clear 1998, Visser et al. 2004). No research, however, has examined the direct impact of fringe banking services on neighborhood crime rates. There is reason to believe that such a connection exists and that it is quite costly. Social disorganization theory offers some explanation for why this may be the case.

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<sup>3</sup> There is evidence that payday lending also increases the odds of bankruptcy, difficulty making mortgage and rent payments, having to move out of one’s home, and delaying medical and dental care as well as purchasing prescription drugs (Melzer 2007).



## **Social Disorganization Theory and Neighborhood Crime Rates**

Social disorganization theory has emerged as the critical framework for understanding the relationship between neighborhood characteristics and crime in urban areas. According to the theory, certain neighborhood characteristics can lead to social disorganization, defined as the inability of a community to realize the common values of its residents and maintain effective social controls (Kornhauser 1978:120). Social disorganization, in turn, can cause crime.

The most commonly studied aspects of neighborhoods include levels of economic deprivation, residential instability, and population heterogeneity. An impressive literature conducted over decades has found that these and related characteristics are positively associated with community crime rates, both directly and indirectly through their effect on neighborhood processes such as informal social control and collective efficacy (for a review of this literature, see Kubrin and Weitzer 2003).

Along with these community characteristics, local institutions are also theorized to play a key role in shaping crime rates according to this perspective. This occurs in large part because such institutions structure the daily interaction patterns of residents, affect the ability of communities to exercise social control, and influence available routes to valued goals such as economic or community development. Disadvantaged neighborhoods, in particular, have difficulty attracting and maintaining the types of local institutions that impede crime by providing community stability, social control, and alternatives to occupy residents' time (Peterson et al. 2000:32).

Neighborhood studies of crime have focused on a variety of local institutions such as bars, public housing, and recreational facilities. It is argued that recreation centers and libraries “provide places and activities where people can gather, thereby structuring time and observing

each other in public. To the degree that these institutions offer organized activities, they place local residents in settings that promote and facilitate the sharing of common values and goals. As this occurs, community networks are more likely to form and fulfill control functions” (Peterson et al. 2000:34). Likewise, banks and other economic institutions are important in terms of their potential function to connect local areas with larger political and economic institutions such as business associations and government agencies, enhancing the ability of neighborhoods to gain services and protection that help reduce crime.

Other types of local institutions, however, such as bars, may serve to encourage criminal behavior in neighborhoods. Researchers have argued their presence can cause crime directly, by inducing violence within these establishments themselves (because of intoxication and impaired judgment) and indirectly, by undermining informal social control in communities where bars are densely located (Parker 1995; Roncek and Maier 1991).

In a study on the role of local institutions and their effect on violent crime rates in Columbus, Ohio neighborhoods, Peterson et al. (2000) find some support for these arguments. They document that a greater prevalence of recreation centers reduces violent crime, at least in the most economically disadvantaged areas of Columbus. They also document that a greater prevalence of bars in Columbus tracts is related to higher levels of violent crime. Beyond their study and previous research, however, they claim “...scholars have not explored the empirical linkages between the presence of various types of institutions and neighborhood crime” (pg. 36) and caution that “additional research is needed to specify more fully what types of institutions...will have the most payoff” for reducing community crime rates (pg. 57).

We would like to add payday lenders to the list of local institutions that may affect community crime rates. We argue here that, like bars, they encourage crime and violence in

communities. At a minimum, the availability of cash in distressed neighborhoods at readily identifiable businesses, often open during evening and weekend hours, suggests a probable link between crime, particularly violent crime, and payday lending. Residents who use payday lenders leave these establishments often with great sums of cash in their wallets, a fact likely not overlooked by potential criminals. Moreover, a concentration of payday lenders may constitute a visible sign of neighborhood decline and signal to potential troublemakers that informal social control is weak at best.

It is also reasonable to believe that some of the increase in crime could be attributable to the manner in which payday lenders may lubricate the cash-only drug trade. In places where cash is available on a moment's notice to anyone with a job or government check, those wanting to fuel an addiction, or lifestyle, need not wait until payday with ample payday loan opportunities. And persons who find themselves in an ever descending debt spiral, perhaps pressured by the threats of debt collectors, would also seem more likely to suffer from stress, anxiety, fear and other emotional difficulties that manifest themselves in violence, particularly against family, co-workers, friends, and neighbors. It is also easy to imagine that hopelessly indebted persons might turn to other forms of crime to compensate for the debt incurred to payday lenders. In short, there are several reasons why the presence of payday lenders in neighborhoods may be associated with violent and property crime rates in those neighborhoods.

Previous research has investigated the relationship between crime and residential instability, poverty, unemployment and other factors. Previous research has also documented the effect of local institutions including bars and recreational facilities on community crime rates. To date, however, no research has systematically examined the relationship between payday lending and crime. In fact, there is very little overlap in the payday lending and crime literatures, despite

the plausibility of such a relationship. As such, this is the first empirical examination of the fringe banking-neighborhood crime nexus. In this study, we examine the direct effects of payday lending on crime, controlling for a range of variables identified by social disorganization theory as predicting neighborhood crime rates.

## **The Research Context**

The city of Seattle, Washington was selected because it is a representative major U.S. city (with a population of over 550,000, of which nonwhites account for 30 percent) and is located in a state where payday lending has grown substantially over the last several years. Payday lending was legalized in the State of Washington in 1995. It grew slowly at first, but then gained momentum in 2003 when the state legislature increased the maximum loan amount from \$200 to \$700. In Seattle, the number of payday lenders has grown from 37 in 2003 to 52 in 2007, an increase of nearly 30 percent. Equally important, as in most metropolitan areas, the location of payday lenders in Seattle is concentrated in low- and moderate-income and minority communities, where crime rates are the highest. We also selected Seattle as our study site because it is rather typical in terms of the number and density of payday lenders. Payday lenders in Seattle do not exhibit any unusual spatial pattern as one might find in heavily ghettoized cities or cities with a significant military presence. Finally, we chose Seattle because it has been the focus of numerous studies of community crime rates over the last two decades (Crutchfield 1989; Kubrin 2000; Matsueda, Drakulich, and Kubrin 2006; Miethe and McDowall 1993; Warner and Rountree 1997). The current study builds on this literature.

The primary question we explore is whether those neighborhoods that have a relatively greater share of payday lenders also exhibit higher neighborhood crime rates after taking into consideration a range of factors known to be associated with crime (e.g. poverty, unemployment,

population turnover, and related socio-economic factors) as well as other potential explanatory factors associated with spatial autocorrelation and endogeneity. These findings will inform current policy debates and suggest specific directions for future research on the impact of payday lending as well as theoretical understandings of neighborhood crime and community development generally.

## **Data and Methodology**

To examine the relationship between payday lending and neighborhood crime rates, we perform a series of regression analyses using data on the location of payday lenders in conjunction with census and crime data for census tracts in Seattle. Census tracts approximate neighborhoods and are the smallest geographic level for which all three datasets are available.<sup>4</sup>

### *Independent Variables*

Our key independent variable is the number of licensed payday lenders in Seattle census tracts in 2005 (see Peterson et al. 2000:39 for identical measures of other local institutions). Data on payday lenders were collected by Steven Graves as part of a larger study focused on payday lenders and the military (Graves and Peterson 2005). The street address for each lender was assigned a census tract number using ArcView GIS. In the 116 Seattle tracts for which crime data were available, there were 44 lenders in operation in 2005. The minimum number of payday lenders in a tract was zero while the maximum was 4. The mean number of lenders across all tracts was .38. These statistics are comparable with other major U.S. cities including Milwaukee (41), Fort Worth (62), San Francisco (45) and Salt Lake City (53).

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<sup>4</sup> Seattle has 123 census tracts but only 116 were included in the analyses. Recently several tracts have been reconfigured into other tracts or eliminated altogether. Tract 23 is now subsumed in tract 40, tract 55 is now subsumed in tract 57, and tract 37 no longer exists. The remaining tracts were excluded because they encompass

Ten variables were constructed from the 2000 Census to reflect critical neighborhood differences according to social disorganization theory: *percent secondary sector low-wage jobs* (percent of total employed civilian population age 16 and over employed in the six occupations with the lowest mean incomes<sup>5</sup>), *jobless rate*, (percent of civilian labor force age 16-64 who are unemployed or not in the labor force), *percent professionals and managers* (percent of employed civilian population age 16 and over in management, professional, and related occupations), *percent high school graduates* (percent of adults age 25 and over who are at least high school graduates), *poverty rate* (percent of the population for whom poverty status is determined whose income in 1999 was below the poverty level), *percent black* (percent of the total population that is non-Hispanic black), *percent young males* (percent of the total population who are males between the ages of 15 and 24), *residential instability index* (index comprised of percent renters, or percent of occupied housing units that are renter occupied, and percent movers, or percent of population ages 5 and over who lived in a different house in 1995<sup>6</sup>), *percent female-headed households* (percent of households that are female-headed with no husband), and *population* (tract population).<sup>7</sup> The social disorganization literature has demonstrated that these characteristics are related to community crime rates in a variety of cities throughout the U.S. (Krivo and Peterson 1996; Kubrin 2000; Morenoff et al. 2001; Warner and Rountree 1997).

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unique areas without corresponding census data. Tract 53 is excluded because it encompasses the University of Washington campus and tracts 83 and 85 are excluded because they encompass the University's medical complex.

<sup>5</sup> The occupations include health care support, food preparation and serving related occupations, building and grounds cleaning and maintenance, personal care and service, farming, fishing, and forestry, and material moving. The mean wages were derived from 2000 census data available in the Integrated Public Use Microdata Series (<http://www.ipums.org>).

<sup>6</sup> The index represents the average of the standardized scores of these two variables.

<sup>7</sup> All Census and some crime data (see below) used in the study were compiled by Ruth D. Peterson and Lauren J. Krivo (2006) as part of the National Neighborhood Crime Study (NNCS). The NNCS contains information on the Federal Bureau of Investigation's (FBI) Index crimes, and socio-demographic characteristics for census tracts in a representative sample of large U.S. cities for 2000.

An important variable that classifies tracts as within or not within the Seattle Central Business District (CBD) is included in the analyses because few and atypical residents live in CBD tracts. In Seattle today, CBD residents tend to be urban professionals with high incomes or people who are poor and homeless. Controlling for whether tracts are inside or outside the CBD minimizes the likelihood that the unique characteristics of this area will distort the results (Crutchfield 1989).

Previous community-level studies have had to address problems of multicollinearity among the independent variables. To diagnose potential collinearity, we examined variance inflation factor (VIF) scores, which confirmed the high collinearity between many of the disadvantage-related variables. Using these diagnostics and previous research as a guide (e.g., Sampson and Raudenbush 1999:621), we performed principal components factor analysis with varimax rotation. Not surprisingly, the results suggest the disadvantage-related variables all load on a single index, which we label *Neighborhood Disadvantage*. The following variables encompass our neighborhood disadvantage index (factor loadings in parenthesis): percent secondary sector low-wage jobs (.94), jobless rate (.87), percent professionals and managers (-.86), percent high school graduates (-.93), poverty rate (.80), and percent black (.71). The factor has an eigenvalue of 4.39 and explains 73 percent of the variance in the construct. In the analyses, the disadvantage index is used along with the instability index, young male rate, rate of female-headed households, total population, central business district, and our payday lending measure to predict Seattle neighborhood crime rates.<sup>8</sup>

### *Dependent Variables*

Data to compute violent and property crime rates at the census tract level come from Seattle Police Department annual reports. Following common practice, multiple year (2006-07) average crime rates (per 1,000 population) were calculated to minimize the impact of annual fluctuations.<sup>9</sup> The violent crime rate sums murder, rape, robbery, and assault rates whereas the property crime rate is calculated as a sum of the burglary, larceny, and auto-theft rates.<sup>10</sup>

### *Analytic Issues and Strategy*

One critical issue in neighborhood research is that of spatial dependence. Crime is not randomly distributed but spatially concentrated in certain areas in the metropolis. Formally, the presence or absence of this pattern is indicated by the concept of spatial autocorrelation, or the co-incidence of similarity in value with similarity in location (Anselin et al 2000:14). When high values in a location are associated with high values at nearby locations, or low values with low values for neighbors, positive spatial autocorrelation or spatial clustering occurs. In analyses using spatial data, such as in the current study, one must attend to potential autocorrelation because ignoring spatial dependence in the model may lead to false indications of significance, biased parameter estimates, and misleading suggestions of fit (Messner et al. 2001:427).

In the current study, we address potential spatial dependence by mapping the residuals from our regression analysis and running a series of diagnostic tests to check for problematic levels of spatial autocorrelation. We used several variants of the Moran's I test and several software packages, including GeoDA, SPSS, ArcMap 9.3 and s3 (Mathematica). In those models

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<sup>8</sup> Careful examination of collinearity diagnostics revealed no multicollinearity problems in the parameter estimates presented below.

<sup>9</sup> Crime data by census tract for 2008 through the present have not yet been publically released.

<sup>10</sup> Histograms and descriptive statistics indicate that several of the variables were skewed and needed to be logged in the analyses including the young male rate, the count of payday lenders, and the violent and property crime rates.



where spatial autocorrelation was indicated, we performed a series of spatially weighted regression analyses using both GeoDA and s3 to boost statistical rigor and to ensure the completeness of our analysis. The results for these analyses are reported below.

A second critical issue is the causal ordering of the payday lending-crime relationship. We argue the presence of payday lenders in an area affects its crime rate. However, a case could be made for reverse causal effects—that is, crime could affect where payday lenders set up shop. In other words, the relationship between payday lending and crime could be bidirectional. Although in the present study we are fundamentally interested in how the presence of payday lending affects neighborhood crime rates (rather than the reverse), as one way to address potential endogeneity, we follow similar neighborhood-level studies (e.g., Sampson and Raudenbush 1999:625; Sampson, Raudenbush, and Earls 1997) and re-estimate our main model controlling for *prior* violent and property crime rates using three-year average rates in 1999, 2000, and 2001. It is important to adjust for prior crime rates in the model not only because high crime communities might be associated with less (or more) fringe banking investment due to the perception that such areas are riskier, more volatile neighborhoods, but also because high crime neighborhoods at time one are likely to be high crime neighborhoods at time two. Indeed, the average 1999-01 log violent crime rate is correlated at .93 with the average log violent rate in 2006-07. Likewise, the average 1999-01 log property crime rate is correlated at .94 with the average log property rate in 2006-07. Incorporating prior crime rates into the models provides some purchase on controlling for prior sources of crime not captured in our measured variables (see Sampson and Raudenbush 1999:621).

Given the issues just raised and our focus on investigating the independent relationship between payday lending and neighborhood crime rates, after providing some descriptive

statistics on the payday lending-crime relationship, we estimate a series of ordinary least squares (OLS) regression analyses. In the first model, we assess whether payday lending and crime are associated using a baseline model where only payday lending is included. In the second model, we introduce into the analysis the standard social disorganization neighborhood crime correlates (e.g., neighborhood disadvantage, residential instability, etc.) to determine if any payday lending effect withstands these controls. In the third model, we control for prior crime rates as one method to deal with endogeneity and to assess its (potential) effect on any payday lending-crime relationship. For each model where it is appropriate, we test for spatial autocorrelation and account for potential spatial effects in order to address spatial biases that may undermine our ability to accurately determine the direct relationship between payday lending and crime. For all sets of analyses, we examine both violent and property crime rates in Seattle neighborhoods.

## **Findings**

### *Descriptive Statistics*

A preliminary view of descriptive statistics suggests a positive association between payday lending and crime. Means, standard deviations, and correlations for all variables are presented in Table 1. The average number of payday lenders across Seattle neighborhoods is .38. Consistent with crime patterns throughout the United States, property offenses comprised the majority of reported crimes in Seattle in 2006-07. The average rates for property and violent crime, respectively, were roughly 74 and 8 per 1,000 population. Note these values are lower than violent and property crime rates in 1999-2001 (nearly 86 and 9 per 1,000 population, respectively). As expected, the explanatory variables, and particularly neighborhood disadvantage, have positive relationships with violent and property crime rates. More importantly, payday lending is significantly positively associated with both violent ( $r = .45$ ) and

property crime ( $r = .43$ ). As the number of payday lenders increases in Seattle neighborhoods, violent and property crime rates increase. These correlations suggest initial support for a payday lending-crime relationship.

#### TABLE 1 ABOUT HERE

The bivariate relationship between payday lending and crime can be visually illustrated. Figure 1 plots the distribution of payday lenders and violent crime rates in Seattle neighborhoods. The map in Figure 1 clearly displays the strong bivariate relationship between payday lending and violent crime. In the downtown and inner-city areas where payday lenders are more numerous (as indicated by x's on the map), the violent crime rate is also highest (as indicated by the darkest shading on the map). The safest neighborhoods in Seattle have no payday lenders in them. The map also shows moderate violent crime rates in areas with lower densities of payday lending. Clearly, payday lenders have become a barometer of violent crime in Seattle. Where you see payday lenders, you are also more likely to witness violent crime. Results for the distribution of payday lenders and property crime rates, although not presented, mirror closely those for violent crime rates. At issue, however, is whether the significant positive relationship between payday lending and crime will remain after controlling for other community characteristics known to be associated with crime. To determine this, we turn to the regression results.

#### FIGURE 1 ABOUT HERE

## *Regression Results*

Findings from the regression analyses are generally consistent with what the descriptive statistics indicated. Tables 2 and 3 present the regression results for violent and property crime rates, respectively. These tables contain results from a series of three regression models. For both tables, the first column reports a baseline regression model in which violent or property crime rates are predicted only by the payday lending variable. In each subsequent model, we progressively expand on that initial model by adding measures reflecting social disorganization theory, concerns about endogeneity, and tests for spatial autocorrelation. Consistent with our objectives, this model-building strategy allows us to gauge the extent to which the observed relationship between payday lending and violent and property crime remains after controlling for other community characteristics known to be associated with both crime types.

TABLES 2 and 3 ABOUT HERE

### Baseline Model

In the first model of Table 2 we find evidence, not surprisingly, of a statistically significant positive relationship between payday lending and violent crime. Also not surprisingly, we find evidence of a statistically significant positive relationship between payday lending and property crime, as indicated in the first model of Table 3. In essence, as the presence of payday lenders in Seattle neighborhoods increases, so do the violent and property crime rates.

### Social Disorganization Model

In the second model, we introduce several measures representing social disorganization theory. Recall this theory suggests that community characteristics such as disadvantage, residential instability, female-headed households, and the presence of young males in the area

are positively associated with violent and property crime rates in neighborhoods. In line with the theory, regression results show that neighborhood disadvantage, residential instability and female-headed households are all significantly positively associated with violent crime rates. Likewise, disadvantage and residential instability are significantly positively associated with property crime rates. The young male rate, however, is not significant in either model. Moreover, whether the census tract is located in the Central Business District also matters for violent and property crime rates. Our CBD variable is significant and positive in both models. Most important, however, is that the inclusion of the social disorganization variables does not eliminate the effect of payday lending on crime rates. Although for violent and property crime the standardized coefficients for payday lending are reduced (from .450 in model 1 to .217 in model 2 and from .433 in model 1 to .227 in model 2, respectively) payday lending remains a significant predictor in both models.

Using several variants of the Moran's I test and several software packages, we measured the potential effects of spatial autocorrelation within the social disorganization model. We found that the effect of spatial autocorrelation was minimal in both analyses of violent and property crime, falling well below the threshold that might raise concern (see, e.g., Parker and Asencio 2009:208).

Table 4 reports the results of these tests, using a minimum threshold distance of 2,400 meters in a contiguity model. As shown in the table, the Moran's I scores, which are similar to a Pearson's r score, are very low and in some instances slightly negative. The lack of spatially autocorrelated data, though typically a danger in most cities, appears to be minimal in Seattle thanks, in part, to its unusual physical geography. Unlike many cities, Seattle has numerous natural barriers (e.g., bodies of water, hills, etc.) and manmade barriers (e.g., bridges, freeways,

etc.) which appear to inhibit interaction. The map in Figure 1 helps make this clear. This finding is consistent with other studies that have examined spatial autocorrelation and neighborhood crime rates in Seattle (e.g., Kubrin 2000) and accounts for why previous researchers have not had to directly address autocorrelation in their analyses of Seattle neighborhoods (e.g., Crutchfield et al. 2006; Rountree et al. 1994; Warner and Rountree 1997).

### Endogeneity Model

The third model in our investigation introduces a measure of prior violent or property crime rates from 1999-2001 as one way to control for the possible effects of endogeneity. Recall that although we are primarily interested in the effect of payday lending on crime, this relationship could be bidirectional and thus it is important to control for potential reciprocal effects when estimating the payday lending-crime relationship. Turning first to the results for violent crime, one can see that prior violent crime rates are significantly positively associated with violent crime rates in 2005-06 in Seattle. One can also see that adding prior violent crime rates to the model drastically reduces the effects of many of the social disorganization variables, rendering some (e.g., residential instability and female-headed households) non-significant. Neighborhood disadvantage, however, remains a significant predictor in the model despite the introduction of prior violent crime rates. More importantly, although reduced in magnitude yet again, the payday lending coefficient remains significant even after including prior violent crime in the model. Thus, despite controlling for social disorganization measures and potential reciprocal effects, payday lending remains significantly and positively associated with violent crime rates in Seattle neighborhoods.

The same is not true for property crime rates, however. As shown in Model 3 of Table 3, adding prior property crime rates into the equation pushes the payday lending variable just

beyond significance ( $p < .10$ ). Thus, payday lending and property crime are not significantly associated once endogeneity is accounted for in the model. It is also important to note that adding prior property crime rates reduces the effects of all explanatory variables (excluding population size) and renders them non-significant.

To guard against potential spatial biases in the endogeneity models, we once again measured the level of spatial autocorrelation using a variety of Moran's I tests. We found no troubling spatial biases in our analysis of violent crime rates. However, there was a significant level of spatial autocorrelation in the endogeneity model when we examined property crime rates. Collinearity was problematic when we tested for it using both the GeoDa and s3 software packages. One measure of the condition value reported by both software packages was 44.85, exceeding the common rule-of-thumb limit of 30 (see, e.g., Parker and Asencio 2009:223). Because the condition index was around 16.7 in the Social Disorganization Model, where prior crime rates are excluded, we can assume that the prior crime rate variable is substantially adding to the endogeneity model's instability when current property crime rates are examined. Table 4 reports the results of these tests.

#### TABLE 4 ABOUT HERE

To account for the spatial biases in the property crime rate component of our endogeneity model, we applied spatial weights to our assumptions using both GeoDa and s3 to complete a series of spatially weighted regression analyses. Diagnostics for spatial dependence showed that the spatial weights were not sufficient to overcome the problems with the endogeneity model when property crime rates were under consideration. Table 5 shows the results of spatially weighted regression tests done in GeoDa using queens contiguity rules. In both the spatial error

and spatial lag models, the effect of payday lending on property crime rates, though still positive, slips below the significance level.

#### TABLE 5 ABOUT HERE

We applied another spatially weighted regression model advocated by Parker and Asencio (2009) to the data using a statistical program known as s3. Our analysis in s3 revealed very similar results to those we found using GeoDA. Using s3 we found, again, that even after applying additional spatial weights to the model, payday lenders exerted a positive effect on property crime, but the t-score failed to reach a compelling level of significance. Table 6 below displays the results of the Spatial Autoregressive Model run in s3.

#### TABLE 6 ABOUT HERE.

In sum, the results of our analyses reveal that payday lending and crime, particularly violent crime, are significantly associated. This relationship holds even after controlling for a host of factors typically associated with neighborhood crime rates. The payday lending-violent crime relationship also holds after accounting for prior crime rates and after appropriate tests for spatial autocorrelation.

Violent crime is just one community cost that, we now can be reasonably certain, is associated with payday lending. In the conclusion below, we briefly note other potential costs. We end with a discussion of policy implications of our findings and recommendations for future research.



## Conclusion

Payday lenders in Seattle are concentrated in the very same communities where crime rates are highest. More important, the association between payday lending and violent crime remains statistically significant even after controlling on a range of factors traditionally associated with crime. And spatial autocorrelation and the potential impact of crime on payday lending also failed to explain away the effect of payday lending on violent crime. The substantial costs that customers pay for utilizing payday lenders have long been documented. Our findings indicate there are broader community costs that *all* residents pay, whether they are customers or not, if they reside in neighborhoods with a concentration of payday lenders. These costs suggest a number of policy implications as well as directions for future research.

### *Policy Implications*

A critical public policy challenge is to preserve access to small consumer loans on an equitable basis, and to do so in a way that does not enhance the danger to those in the community where these services are being provided. This is a challenge not just for financial service providers and regulators, law enforcement authorities, or community development officials. Coordinated efforts should be launched to successfully meet these objectives. One approach would be to cap the interest rate that payday lenders are allowed to charge at 36 percent as several states have done and as Congress did for loans to members of the military and their families. (Credit cards, though not ideal for all consumers, currently offer cash advances for far less than 36% APR). While this would eliminate many of the abusive practices often associated with payday lending, it would effectively put many payday lenders out of business. This raises the question of whether other financial institutions could step in and provide small consumer

loans. One credit union has found a way to do so profitably, and with a high-risk pool of borrowers.

In 2001 the North Carolina State Employee's Credit Union (SECU) created the Salary Advance Loan (SALO) product that helps employees make it from paycheck to paycheck while still building savings. Members who have their paycheck automatically deposited can request salary advances up to \$500. The advance is automatically repaid the next payday. The annual percentage rate is 12 percent. Typical SALO borrowers have an annual income of less than \$25,000 with account balances of under \$150. Two-thirds take out advances every month. SECU has earned a net income of \$1.5 million on a loan volume of \$400 million with loan charge-offs of 0.27 percent. As Michael A. Stegman concluded, this experience "shows that large institutions can market more affordable payday loan products to high-risk customers at interest rates that are a small fraction of prevailing payday loan rates" (Stegman 2007:183). Credit Unions around the country offer similar loans, generally with the proviso that the borrower also build a "rainy-day" fund with the credit provider.

Federal banking regulators could encourage larger financial institutions to offer similar services by giving credit to those lenders in their Community Reinvestment Act (CRA) examinations and evaluations. Under the CRA, federally regulated depository institutions are required to affirmatively ascertain and be responsive to the credit needs of their entire service areas, including low- and moderate-income communities. Regulators take lenders' CRA records into account when considering applications for mergers, acquisitions, and other changes in bank lending practices (Immergluck 2004). Providing CRA credit for offering small consumer loans on equitable terms would encourage more large institutions to do so.

State and local governments could enact zoning laws that limit the number of new payday lenders. Today 81 cities, 5 counties, and 19 states have enacted local ordinances limiting the location and density of alternative financial institutions like payday lenders, check cashers, and pawn shops. For example, in 2008 St. Louis passed an ordinance prohibiting check cashers and short-term loan operators from opening within a mile of an existing store and within 500 feet of a residence, elementary school, or secondary school (Standaert 2009:432). Similar rules could be targeted explicitly to payday lenders. Such zoning laws could reduce the extent to which neighborhoods become stigmatized due to the concentration of fringe banking institutions and lessen the extent of social disorganization in those areas.

A more direct approach would be to establish a suitability standard prohibiting payday lenders from providing multiple loans to borrowers or offering any other terms and conditions of such loans that are designed to entrap borrowers in a cycle of debt. Guidelines by the Federal Deposit Insurance Company that prohibit regulated banks working with third parties, like payday lenders, from giving loans to borrowers with recent outstanding payday loan debts, could be extended to all payday lenders.

An immediate concern is the safety of those in neighborhoods where payday lenders are concentrated. Local law enforcement authorities should carefully assess levels of criminal activity in those areas and consider providing additional service at appropriate times. Not only would employees and customers of payday lenders benefit, but residents of the surrounding neighborhoods would enjoy safer streets as well. In turn, this might attract other businesses and more residents to the area, stimulating broader economic and community development of many currently distressed areas. In essence, by reducing the social disorganization of such

neighborhoods, a virtuous cycle could be launched that would bring lower crime rates and many associated benefits.

### *Research Implications*

There is a growing body of research on the business operations of payday lenders, their customer base, and the linkages to other financial services. Not so widely researched are potential neighborhood costs. As shown from this study, a spike in neighborhood violent crime rates is one such cost. But there may be others. Most potentially problematic might be the impact on local property values. If a concentration of payday lenders reduced property values (and we think it is difficult to imagine it would increase values) this would mean that the value of neighborhood homes and other properties along with the equity and wealth of property owners would be depressed. In turn, property tax revenues would decline requiring either a reduction in critical public services (e.g. schools, police, fire protection) or higher taxes for local residents and businesses. It would be informative to know if payday lenders have such an impact and, if so, to quantify that impact.

It also stands to reason that in communities with significant concentrations of payday lenders, capital loss in the form of the so-called multiplier leakage occurs. In this scenario, capital crucial to local economic development efforts, or for simple circulation within the local economy, is siphoned off by payday lenders, the vast majority of which are owned by interests far distant from branch operations. Compounding this, of course, is the fact that payday lenders are most common in neighborhoods that already suffer from various types of disinvestment. Estimating the flight of capital from such communities due to the activity of payday lenders would provide valuable information for planners and regulators as well as the research community.

An obvious extension of this research would be case studies of additional cities. We suspect our findings are not unique to Seattle. But there may be variations associated with the size, demography, regional location, industrial structure, and other city characteristics that affect the linkage between payday lending and crime. Unfortunately, uneven crime data and even poorer data on payday lenders constitute a key challenge.

How the payday lending-neighborhood crime link varies over time is also unknown. Payday lenders suddenly appeared on the map of virtually all major cities within the past 20 years. Depending on the trajectory of various political initiatives, their numbers could continue to grow or decline with equal speed. In the current study, we offer a snapshot. Longitudinal work would better flesh out this connection.

### *A Final Word*

Access to a wide range of financial services on fair and equitable terms has become a major public policy issue and the topic of much social science research in recent years. Payday lenders constitute part of the growing web of fringe bankers that have been concentrated in low-income and disproportionately minority communities though they have begun to expand into working and middle class communities as well. The costs to many individual borrowers and families has long been evident, often quantified with some precision. While not understood with the same level of specificity, the broader neighborhood costs are becoming recognized as facts of life in the nation's metropolitan regions. The link between payday lending and neighborhood crime should, in fact, come as no surprise. How we choose to respond to that connection, if we choose to respond at all, remains to be determined.

## References

- American Banker*. 2007. "Making a Case to the Pentagon: Five Trade Groups Prep Military Lending Input," (January 8.).
- Anselin, Luc, Jacqueline Cohen, David Cook, Wilpen Gorr, and George Tita. 2000. "Spatial Analyses of Crime." Pp. 213-62 in *Criminal Justice 2000, vol. 4, Measurement and Analysis of Crime and Justice*, edited by D. Duffee. Washington, D.C.: National Institute of Justice.
- Caskey, John. 1994. *Fringe Banking: Check-Cashing Outlets, Pawnshops, and the Poor*. New York: Russell Sage Foundation.
- Consumer Federation of America. 2008. PayDay Loan Consumer Information: Legal Status (December 10) <http://usmilitary.about.com/od/millegislation/a/paydayloans.htm?p=1>
- \_\_\_\_\_. Comments To the Federal Trade Commission Regarding the Fair Debt Collection Practices Act, "Collecting Consumer Debts: The Challenges of Change," Washington, D.C. (June 20).
- Crutchfield, Robert D. 1989. "Labor Stratification and Violent Crime." *Social Forces* 68:489-512.
- Crutchfield, Robert D., Ross L. Matsueda, and Kevin Drakulich. 2006. "Race, Labor Markets, and Neighborhood Violence." Pp. 199-220 in *The Many Colors of Crime*, edited by Ruth D. Peterson, Lauren J. Krivo, and John Hagan. New York: New York University Press.
- Fellowes, Matt. 2006. "From Poverty, Opportunity: Putting the Market to Work for Lower Income Families," Washington, D.C.: The Brookings Institution, Metropolitan Policy Program.
- Fox, Jean Ann. 2007. Testimony of Jean Ann Fox on Behalf of Consumer Federation, Consumers Union, National consumer Law Center (on behalf of its low income clients)

- Before the Subcommittee on domestic Policy of the House Committee on Oversight and Domestic Reform, Hearing on Foreclosure, Predatory Lending and Payday Lending in America's Cities (March 21).
- Graves, Steven M. 2003. "Landscapes of Predation, Landscapes of Neglect: A Location Analysis of Payday Lenders and Banks." *Professional Geographer* 55(3): 303-317.
- Graves, Steven M. and Christopher Peterson. 2005. "Predatory Lending and the Military: The Law and Geography of 'Payday' Loans in Military Towns." *The Ohio State Law Journal*. 66(4): 653-832.
- Graves, Steven M. and Christopher Peterson. 2008. "Usury Law and the Christian Right: Faith-Based Political Power and the Geography of American Payday Loan Regulation." *Catholic University Law Review* 57(3):637-700.
- Hudson, Michael. 1996. *Merchants of Misery: How Corporate America Profits from Poverty*. Monroe, Maine: Common Courage Press.
- Immergluck, Dan. 2004. *Credit to the Community: Community Reinvestment and Fair Lending Policy in the United States*. Armonk, NY: M.E. Sharpe.
- Karger, Howard. 2005. *Shortchanges: Life and debt in the fringe economy*. San Francisco: Berrett-Koehler Publishers, Inc.
- King, Uriah, Wei Li, Delvin Davis, and Keith Ernst. 2005. "Race Matters: The Concentration of Payday Lenders in African-American Neighborhoods in North Carolina," Durham, N.C.: Center for Responsible Lending.
- King, Uriah and Leslie Parrish. 2007. "Springing the Debt Trap: Rate caps are only proven payday lending reform," Durham, N.C.: Center for Responsible Lending.

- Kornhauser, Ruth D. 1978. *Social Sources of Delinquency: An Appraisal of Analytic Models*. Chicago: University of Chicago Press.
- Kubrin, Charis E. 2000. "Racial Heterogeneity and Crime: Measuring Static and Dynamic Effects." *Research in Community Sociology* 10:189-218.
- Kubrin, Charis E. and Ronald Weitzer. 2003. "New Directions in Social Disorganization Theory." *Journal of Research in Crime and Delinquency* 40:139-170.
- Lawrence, Edward C. and Gregory Elliehausen. 2008. "A Comparative Analysis of Payday Loan Customers," *Contemporary Economic Policy* 26 (2): 299-316.
- Li, Wei, Leslie Parrish, Keith Ernst, and Delvin Davis. 2009. "Predatory Profiling: The Role of Race and Ethnicity in the Location of Payday Lenders in California," Durham, N.C.: Center for Responsible Lending.
- Logan, Amanda and Christian E. Weller. 2009. "Who Borrows From Payday Lenders?" Washington, D.C.: Center for American Progress.
- Lynch, James P. and William J. Sabol. 2001. "Prisoner Reentry in Perspective." *Crime Policy Report Vol. 3*. Washington, D.C.: Urban Institute Justice Policy Center.
- Matsueda, Ross L, Kevin Drakulich and Charis E. Kubrin. 2006. "Race and Neighborhood Codes of the Street." Pp. 199-220 in *The Many Colors of Crime: Inequalities of Race, Ethnicity, and Crime in America*, edited by Ruth D. Peterson, Lauren J. Krivo, and John Hagan. New York University Press.
- Melzer, Brian T. 2007. "The Real costs of Credit Access: Evidence from the Payday Lending Market." Unpublished paper.
- Messner, Steven F., Luc Anselin, Robert D. Baller, Darnell F. Hawkins, Glenn Deane, and Stewart E. Tolnay. 2001. "The Spatial Patterning of County Homicide Rates: An



- Application of Exploratory Spatial Data Analysis.” *Journal of Quantitative Criminology* 15:423-450.
- Miethe, Terance D. and David McDowall. 1993. “Contextual Effects in Models of Criminal Victimization.” *Social Forces* 71:741-759.
- Oron, Assaf. 2006. “Easy Prey: Evidence for Race and Military Related Targeting in the Distribution of Pay-Day Loan Branches in Washington State,” Consulting Report for the *Seattle Post-Intelligencer*, March 2006. cited in Fox 2007: 6.
- Parker, Robert N. 1995. “Bringing ‘Booze’ Back In: The Relationship between Alcohol and Homicide.” *Journal of Research in Crime and Delinquency* 32:3-38.
- Parker, Robert N. and Emily K. Asencio. 2009. *GIS and Spatial Analysis for the Social Sciences: Coding, Mapping, and Modeling*. New York: Routledge.
- Parrish, Leslie and Uriah King. 2009. “Phantom Demand,” Durham, N.C.: Center for Responsible Lending.
- Peterson, Ruth D. and Lauren J. Krivo. 2006. “The National Neighborhood Crime Study.” Prepared with funds from the National Science Foundation (SES-0080091). Columbus, OH: Ohio State University, Criminal Justice Research Center.
- Peterson, Ruth D., Lauren J. Krivo, and Mark A. Harris. 2000. “Disadvantage and Neighborhood Violent Crime: Do Local Institutions Matter?” *Journal of Research in Crime and Delinquency* 37:31-63.
- Powers, Rod. 2006. “Payday Loans,” About.com US Military (October 28)  
<http://usmilitary.about.com/od/millegislation/a/paydayloans.htm?p=1>
- Roncek, Dennis W. and Pamela A. Maier. 1991. “Bars, Blocks, and Crimes Revisited: Linking the Theory of Routine Activities to the Empiricism of ‘Hot Spots.’” *Criminology* 29:725-753.

- Rose, Dina R. and Todd Clear. 1998. "Incarceration, Social Capital, and Crime: Implications for Social Disorganization Theory." *Criminology* 36: 441-479.
- Rountree, Pamela Wilcox, Kenneth C. Land, and Terance D. Miethe. 1994. "Macro-Micro Integration in the Study of Victimization: A Hierarchical Logistic Model Analysis across Seattle Neighborhoods." *Criminology* 32:387-414.
- Standaert, Diane. 2009. "The Impact of Fringe Financial Services on Communities and Consumers," in Roger A. Clay, Jr. and Susan R. Jones (eds.) *Building Healthy Communities: A Guide to Community Economic Development for Advocates, Lawyers, and Policymakers*. Chicago: American Bar Association.
- Stegman, Michael A. 2007. "Payday Lending," *Journal of Economic Perspectives* 21 (1): 169-190.
- Temkin, Kenneth and Noah Sawyer. *Analysis of Alternative Financial Service Providers*. Washington, D.C.: Urban Institute.
- Visher, Christy A., Vera Kachnowski, Nancy LaVigne, and Jeremy Travis. 2004. "Baltimore Prisoners' Experiences Returning Home." Washington, D.C.: Urban Institute.
- Warner, Barbara D. and Pamela Wilcox Rountree. 1997. "Local Social Ties in a Community and Crime Model: Questioning the Systemic Nature of Informal Social Control." *Social Problems* 44:520-536.

**Table 1. Descriptive Statistics and Correlations**

	1	2	3	4	5	6	7	8	9	10	11
1. 06-07 Violent Crime Rate (ln)	1.00	.80**	-.03	.74**	.45**	.63**	.25**	.45**	.93**	.79**	.45**
2. 06-07 Property Crime Rate (ln)		1.00	-.23*	.44**	.38**	.75**	-.15	.58**	.78**	.94**	.43**
3. Total Population (ln)			1.00	.08	.12	-.04	.22*	-.16	-.05	-.19*	.15
4. Disadvantage Index				1.00	.39**	.32**	.56**	.19*	.75**	.46**	.22*
5. Young Male Rate (ln)					1.00	.51**	.13	.05	.45**	.40**	.30**
6. Residential Mobility Index						1.00	-.28**	.46**	.65**	.76**	.35**
7. % Female Headed Households							1.00	-.29**	.25**	-.12	.00
8. Central Business District								1.00	.48**	.62**	.11
9. 99-01 Violent Crime Rate (ln)									1.00	.83**	.40**
10. 99-01 Property Crime Rate (ln)										1.00	.43**
11. Count of Payday Lenders											1.00
$\bar{X}$	7.69	73.74	4709	.00	6.30	.14	8.29	.08	8.45	85.97	.38
SD	11.60	78.00	1875	1.00	3.52	.86	5.27	.27	14.09	101.56	.72

N = 116 census tracts

NOTE: ln = measured in natural logarithms; means and standard deviations for all variables are expressed in non-logged values for ease of interpretation

\* p &lt; .05

\*\* p &lt; .01

**Table 2. OLS Regression Results for Violent Crime**

	<u>1</u>	<u>2</u>	<u>3</u>
Predictors	Baseline Model	Social Disorganization Model	Endogeneity Model
Payday Lenders (Ln)	.450*** .236 (.044)	.217*** .114 .025	.116** .061 (.020)
Neighborhood Disadvantage		.455*** .521 (.079)	.167** .191 (.071)
Young Male Rate (Ln)		.017 .045 (.148)	.018 .047 (.114)
Residential Instability Index		.339*** .453 (.091)	.063 .084 (.082)
Female Headed Households		.167* .036 (.015)	.018 .004 (.012)
Central Business District		.214*** .913 (.228)	.055 .236 (.191)
Population Size		-.091 .000 (.000)	-.018 .000 (.000)
Prior Violent Crime Rate			.677*** .708 (.081)
Constant	2.128 (.171)	1.478 (.318)	.429 (.272)
<u>Model Summary Information</u>			
Adjusted R <sup>2</sup>	.196	.782	.871

Total Number Tracts (N)	116	116	116
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Note: Entries are standardized coefficients and unstandardized coefficients followed by standard errors in parenthesis.

\*  $p < .05$       \*\*  $p < .01$       \*\*\*  $p < .001$

**Table 3. OLS Regression Results for Property Crime**

	<u>1</u>	<u>2</u>	<u>3</u>
Predictors	Baseline Model	Social Disorganization Model	Endogeneity Model
Payday Lenders (Ln)	.433*** .132 (.026)	.227*** .069 .016	.065^ .020 (.012)
Neighborhood Disadvantage		.224** .149 (.051)	.082 .055 (.035)
Young Male Rate (Ln)		.006 .009 (.096)	-.019 -.030 (.064)
Residential Instability Index		.452*** .350 (.059)	.082 .063 (.046)
Female Headed Households		-.025 -.003 (.010)	-.055 -.007 (.006)
Central Business District		.266*** .658 (.147)	.004 .010 (.112)
Population Size		-.218*** .00007 (.000)	-.078* .00005 (.000)
Prior Property Crime Rate			.793*** .764 (.065)
Constant	4.448 (.132)	4.519 (.206)	1.146 (.318)
<u>Model Summary Information</u>			
Adjusted R <sup>2</sup>	.180	.729	.880

Total Number Tracts (N)	116	116	116
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Note: Entries are standardized coefficients and unstandardized coefficients followed by standard errors in parenthesis.

\*  $p < .05$       \*\*  $p < .01$       \*\*\*  $p < .001$     ^  $p < .10$

**Table 4: Moran's I Test for Spatial Autocorrelation**

<b>MODEL</b>	<b>Dependent Var.</b>	<b>Technique</b>	<b>MORAN'S I</b>	<b>Z SCORE</b>	<b>P Value</b>	<b>Pattern</b>
Social Disorganization Model	Violent Crime Rate	Contiguity	0.05	0.97	0.33	Random
		Inverse Distance	-0.02	-0.32	0.75	Random
Social Disorganization Model	Property Crime Rate	Contiguity	0.05	1.06	0.29	Random
		Inverse Distance	0.04	1.10	0.27	Random
Endogeneity Model	Violent Crime Rate	Contiguity	0.00	0.22	0.82	Random
		Inverse Distance	-0.05	-0.90	0.37	Random
Endogeneity Model	Property Crime Rate	Contiguity	0.23	4.18	0.00	Clustered
		Inverse Distance	0.17	4.08	0.00	Clustered



**Table 5: Spatially Weighted Regression Applied to Endogeneity Model (GeoDA)**

Spatial Regression Models – GeoDA – Queen Spatial Contiguity Model

<b>Model</b>	<b>Dependent Variable.</b>	<b>Technique</b>	<b>R-Squared</b>	<b>Payday Lenders</b>	<b>Z SCORE</b>	<b>P Value</b>
Endogeneity	Violent Crime Rate	Sp. Error	0.88	0.06	3.11	0.001
		Sp. Lag	0.88	0.06	3.2	0.001
Endogeneity	Property Crime Rate	Sp. Error	0.91	0.01	1.03	0.304
		Sp. Lag	0.88	0.018	1.59	0.112

**Table 6: Spatially Weighted Regression applied to the Endogeneity Model (s3)**  
**Spatial Regression Models - s3 - GLS**

Model	Variable	Pseudo R-Squared	Payday Lender -b	t- SCORE
Endogeneity Model	Violent Crime Rate	0.882	0.0614	3.05
Endogeneity Model	Property Crime Rate	0.9108	0.015	1.406

# Payday Lenders and Violent Crime Rate Seattle, Washington

