Violent Crime, Entrepreneurship, and Cities

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Abstract

This paper estimates the impact of violent crime on the location of business activity and entrepreneurship in five U.S. cities. Central to our analysis is the idea that different sectors of the economy will sort into high- and low-crime areas depending on their relative sensitivity to crime. We illustrate this by comparing retail industries to their wholesale counterparts, and high-end restaurants to low-end eateries. Because retail industries are dependent on pedestrian shoppers, they are expected to be especially sensitive to violent crime. Because high-end restaurants are dependent on evening business, they are expected to be especially sensitive to violent crime over the prime dinner hours.

Findings indicate that retail, wholesale, high- and low-end restaurants are all more active in areas with higher local rates of violent crime, even after conditioning on an extensive set of model controls. This could arise because violent crime is attracted to our target industries. This also likely reflects that other sectors of the economy outbid our target industries for safer locations (e.g. residential). Further analysis confirms such sorting behavior. Retailers are more likely to locate in safer locations as compared to wholesalers in the same industry. Among restaurants, an increase in violent crime during the prime dinner hours equivalent to the sample max/min range would decrease the high-end share of local restaurants by roughly 40 percentage points. These findings indicate that entrepreneurs take violent crime into account when bidding for locations within a city. These finding also indicate that efforts to make distressed portions of cities more vibrant must give consideration to the need to ensure that such areas are safe.

Key words: Crime, Entrepreneurship, Cities
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I. Introduction

Since Becker (1968), a prominent literature has examined the economic causes of crime and the efficacy of various policies designed to deter criminal activity (see Levitt (2004) for a review). Findings include that property crime is typically financially motivated whereas violent crime often is not (Levitt (2004), Kelly (2000)); that property crime is more sensitive to the expected penalties of engaging in criminal activity (Kelly (2000)) as compared to violent crime; that greater police presence and stiffer sentencing deters crime (Ehrlich (1975), Levitt (1997), Di Tella and Schargrodsky (2004)), and that deterrent policies applied differently across jurisdictions have the potential to cause criminal activity to shift between "competing" locations (Iyengar (2008)).[1] All of this literature is relevant to the health and vitality of cities given compelling arguments that we should expect crime rates to be higher in densely developed areas (e.g. Glaesar and Sacerdote (1999)).[2] It is also noteworthy that while we have learned much about the *causes* of crime, much less attention has been devoted to the *consequences* of crime for cities and patterns of urban development. This paper will seek to fill part of that gap.

Our primary goal is to estimate the impact of violent crime on the location of business activity and entrepreneurship within individual cities. Central to our analysis is the idea that different sectors of the economy will sort into high- and low-crime areas depending on their relative sensitivity to crime. We illustrate this by considering the location patterns of retail establishments and high-end restaurants, two industries that are often associated with vibrant neighborhoods and nightlife. From an empirical perspective, our primary challenge is that retail

[1]Other studies include Glaesar and DiPasquale (1997), who examined the causes of riots and found that ethnic diversity was a significant determinant of rioting. Gould, Weinburg and Mustard (2002) find that lower wages and higher unemployment rates increase crime. Donohue and Levitt (2001) offer evidence that Roe v. Wade accounts for a large portion of the decrease in crime in the 1990s. Using an instrumental variables approach, Levitt (1997) finds that a greater police presence reduces crime. Ehrlich (1975) argues that the death penalty deters crime.
[2]Glaeser and Sacerdote (1999) argue that crime rates tend to be higher in cities because of the presence of higher valued "targets," lower probabilities of arrest, and the composition of residents.

and high-end restaurants not only react to crime, but also contribute to local crime by presenting attractive targets, even allowing for an enhanced police presence in retail and high-end restaurant districts. As a consequence, inadequately specified regressions of retail and high-end restaurant activity could easily understate the tendency of retail and high-end restaurants to avoid high crime areas.

Possibly, one could consider zooming out to a higher level of geographic aggregation in order to address the local nature of the identification problem. But eventually, that would preclude analysis of the relationship between violent crime and the vitality of local neighborhoods. Moreover, at sufficiently high levels of geographic aggregation, crime likely has little impact on the overall scale of retail and restaurant activity. Figure 1 illustrates this point by plotting MSA-level retail employment against population.[3] The figure makes clear that MSA retail employment is nearly perfectly (and positively) correlated with population size: a regression of MSA retail employment on MSA population yields an R-squared of over 90 percent (based on data from the 2000 decennial census). It seems likely that an analogous result would hold for high-end restaurants. Thus, violent crime is unlikely to have much effect on the overall level of retail and high-end restaurant activity at the metropolitan level. On the other hand, violent crime likely would affect the propensity of these industries to locate in different neighborhoods within a city, even though identification of such effects is challenging.

We respond to the identification challenge in several ways. Perhaps most important, we develop a rich data base by drawing upon detailed crime data for five large U.S. cities in conjunction with Dunn & Bradstreet data on business activity. Using these data, initially, we regress the level of retail and high-end restaurant activity in census tracts on local rates of violent

[3] The retail employment and population data were both obtained from http://www.census.gov/csd/susb/susb05.htm. A similar pattern was obtained when smaller micropolitan statistical areas were added to the MSA sample.

crime and property crime. We also run regressions for wholesale and low-end eateries as these industries provide a useful comparison in a manner that will become clear. These and all later regressions also control for the census tract density of employment and population, the composition of the local population, and city and industry fixed effects. To the extent that our target industries elevate the local rate of criminal activity, these regressions likely understate the degree to which crime discourages their presence, but they nevertheless are illuminating.

Next, for thirteen 4-digit industries, we difference the neighborhood-level presence of retail to wholesale activity within each industry. With competitive land markets, locations are occupied by the high bidder, and our focus shifts to the equilibrium composition of local economic activity as would arise from a sorting model. Because retail and wholesale merchandise is the same within a given industry (approximately), differencing between sectors helps to control for unobserved factors that may be correlated with crime. Moreover, whereas retail outlets rely on shoppers walking to their doors, wholesale distributors typically ship their product by truck to the retail outlets. That difference is substantive and suggests that retailer bids for land are likely more sensitive to the threat of violent crime as compared to their wholesale counterparts since pedestrian shoppers will avoid unsafe areas.

To further isolate the effect of violent crime on the vitality of local communities, we compare the locations of high-end restaurants to lower-tier eateries. Restaurants have two traits that allow us to sharpen our identification. First, restaurants offer much less in the way of valuable merchandise for a potential thief as compared to the typical retail/wholesale establishment. This suggests that our analysis of the impact of violent crime on local restaurant activity is less subject to possible confounding effects from imperfectly measured risk of property crime as compared to retail/wholesale establishments.

Second, there are systematic differences in the time of day during which high-end versus lower-tier restaurants operate. Comparing high- to low-end restaurant activity across different times of the day introduces a second level of differencing enabling us to further isolate the causal effects of violent crime. Although many high-end restaurants operate over the lunch hour, many others only operate during the dinner hours. In addition, it is common for high-end restaurants to price discriminate by charging higher prices at dinner than at lunch. These features suggest that demand for high-end restaurants is more inelastic in the evening, and it is during this period that high-end restaurants do a disproportionate amount of their business. Late at night, high-end restaurants close except in rare instances. In contrast, lower-tier restaurants typically charge the same price throughout the day, and typically operate over a wider range of hours as compared to high-end establishments, including late at night. These differences suggest a systematic pattern of testable outcomes: (i) during day-time business hours violent crime should have relatively little effect on the composition of high- and lower-tier restaurants; (ii) over the prime dinner hours violent crime should reduce the comparative presence of high-end establishments, and (iii) late at night violent crime should increase the comparative presence of high-end establishments since high-end restaurants are closed but many lower-tier establishments remain open.

Testing the above conditions is revealing, but for completeness, consider the possibility that high-end restaurant patrons are more attractive targets for muggers than patrons of lower tier eateries. That would cause our estimate of the impact of violent crime during the evening hours to be upward biased, towards a more positive number. In fact, we find clear evidence that violent crime over the dinner hour is negatively associated with the local high-end share of restaurants. This suggests that if anything, our estimates understate the impact of violent crime on local high-end restaurant activity and nightlife.

Although the literature to date has focused predominantly on the causes of crime, several studies have considered the impact of crime on cities and there are lessons from this literature that influence the specification of our empirical models. Cullen and Levitt (1999) examine the degree to which high crime rates in cities influence flight to the suburbs. Their results suggest that highly educated individuals and families with children are especially sensitive to high crime rates. Gould Ellen and O'Regan (2008) extend this analysis to the 1990s, a decade of large and unforeseen decreases in crime. If high crime rates caused residents to move out of cities in the 1980s, do low crime rates in the 1990s cause them to return? Their paper provides evidence that residents did not move back into the city after crime rates decreased but that cities were better able to retain residents in areas after the decline. Both of these papers are examples of instances in which individuals sort into different locations as a response to the presence of crime. Our paper is analogous in that we consider the influence of crime on business location.[4]

Other research has demonstrated that an increase in the perceived risk of crime adversely affects property values, presumably because of lesser demand for the location. Linden and Rockoff (2008) and Pope (2008) both examine the impact on property values when a registered sex offender moves into a neighborhood. Both studies find that property values are significantly reduced within one tenth of a mile of the sex offender's residence, with sharply attenuated effects beyond that distance. Pope (2008) also shows that house prices rebound almost immediately when the sex offender moves out of the area. Gautier, Siegmann, and Vuuren (2009) examined the impact of the highly publicized murder of Theo van Gogh in Amsterdam. van Gogh was murdered by an Islamic fundamentalist in a racially charged context and this adversely affected intergroup relations between Muslims and non-Muslims in the city. Results show that after the

[4]Sethi and O'Flaherty (2009) also develop a conceptual model that helps to explain why various forms of vice (prostitution and drug sales) tend to be disproportionately concentrated in central city minority neighborhoods.

murder home prices in minority neighborhoods decreased. These papers make clear that crime has the potential to affect bids for land, resulting in a new sorting equilibrium, and land values.[5]

Abadie and Dermisi (2008) is one of the few studies that we are aware of that explicitly considers the impact of fear of crime on equilibrium patterns of business locations. They examine how a change in the risk of terrorism affects agglomeration economies in central business districts. Using data on commercial vacancy rates in Chicago, they found that after the 9-11 attacks on the Trade Towers, vacancy rates in landmark buildings in Chicago (the Sears Tower, Hancock Center, and Aon Building) and the surrounding areas increased. This result and several robustness checks provide evidence that the terrorist attacks and corresponding concerns about safety reduced demand for space in the tallest buildings. These findings are broadly consistent with Bollinger and Ihanfeldt (2003) who find that high local crime rates in Atlanta reduce a neighborhood's share of total employment in the city, and also survey based evidence in which business owners report that they take crime into account when deciding how to operate their companies (e.g. Shury et al (2005), Burrows et al (2001), Fisher (1991), and Mirrlees-Black and Ross (1995)).[6]

Results from our analysis complement these prior studies and are consistent with our priors. Regressions of the local level of retail, wholesale, and both high- and low-end restaurant activity indicate a positive and highly significant relationship with violent crime in each case. This likely reflects at least in part the endogenous sorting of these industries into unsafe areas given competition from other sectors of the economy that place greater value on safety (e.g.

[5]See also, Pope and Pope (2008) who examine the effect of the drop in crime during the 1990s on property values.
[6]Greenbaum and Tita (2004) also examine the impact of local increases in homicide rates on the growth of local retail and personal services. They use propensity score methods at the zipcode level before and after local increases in homicide rates in five cities. Results suggest that higher local rates of violent crime discourage growth. As with many studies in the crime literature, these findings are also sensitive to unobserved factors that may drive both crime and local business activity (e.g. local unemployment shocks).

residential developers). It is also possible, however, that our target industries disproportionately attract violent crime relative to other sectors.

When examining the retail share of an industry's activity (relative to retail plus wholesale), a clearer picture begins to emerge. Pooling data across the thirteen industries, the relationship between the retail share of activity and violent crime is negative and significant. When estimating separately for individual retail/wholesale industries, the relationship between violent crime and retail share is small, positive, and insignificant for four industries. For nine industries the violent crime effect is negative, including five for which the estimated effect is sizeable and significant. These latter industries include furniture, hardware, toys, computers, and sporting goods. Of these, the largest magnitude is for toys, for which the 90/10 percentile sample difference in violent crime is associated with a 20 percent lower retail share, and the max/min sample difference in violent crime is associated with an 80 percent lower retail share.

For restaurants, the magnitudes of the estimated effects are also important. For violent crimes between 5 and 9 pm, the 90/10 percentile sample difference in violent crime results in roughly a 9.5 percent lower high-end share of local restaurants, while the sample max/min difference in violent crime lowers the high-end share of local restaurants by roughly 40 percent. These effects are noteworthy, and confirm that entrepreneurs take violent crime into account when choosing where to locate their businesses. From a policy perspective, our estimates also indicate that efforts to make distressed portions of cities more vibrant must address the need to ensure that such areas are safe. This is especially true during prime dinner hours if a community is to have an active night life.

The rest of the paper is organized as follows. Section 2 describes the conceptual framework that motivates the empirical work. Section 3 discusses the data and empirical models. Section 4 presents results, and Section 5 concludes.

II. Model

2.1 Overview

This section describes the conceptual model that motivates our empirical analysis to follow. Our modeling approach is based on the idea that land is occupied by the highest bidder, bids decline monotonically with violent crime, and the bid-rent functions of two given industries cross only once. This single-crossing assumption is standard in many sorting models (e.g. Epple and Romano (1998), Epple, Romer, and Sieg (2001)) and implies, among other things, that the sorting of two industries into low- and high-crime locations is independent of the presence of other industries. This simplifies our empirical work by allowing us to compare the relative locations of two industries without directly modeling the possible presence of alternative industries. We begin by considering retail activity relative to wholesale. This is followed by a discussion of high- versus lower-tier restaurants.

2.2 Retail versus wholesale

Three defining assumptions govern our portrayal of how crime affects retailers. First, we assume that violent crime is a demand shifter, but does not affect costs directly.[7] Second, violent crime affects the scale of local retail activity, and this has an indirect effect on cost because of economies of scale in the provision of local retail opportunities. Third, we assume that the threat

[7]Demand for retail opportunities also varies across locations with proximity to potential customers, including the residential population, local employment, and the attributes of these groups (e.g. income, education, etc.). These factors are taken into account in the empirical work to follow.

of property crime increases retailer costs by an amount proportionate to the non-land cost of providing retail goods and services.

Given these assumptions, retailer profit (π_s) at location s is written as,

$$\pi_s^{retail} = p(C_{vs}, x_s)x_s - g(x_s)(1+C_{bs}) - r_s \quad , \tag{2.1}$$

In (2.1), p is the price of retail goods and depends on the threat of violent crime (C_{vs}) as well as the scale of local retail activity (x_s). Non-land production costs are given by $g(x_s)\cdot(1+C_{bs})$, where costs increase with production ($\partial g/\partial x_s > 0$) but at a declining rate ($\partial^2 g/\partial^2 x_s < 0$) given local scale economies as emphasized above. Property crime (e.g. burglary) increases retailer costs by an amount given by $g(x_s)\cdot C_{bs}$, where C_{bs} denotes the intensity of property crime. Finally, retailers inelastically occupy one unit of land, the cost of which is r_s.[8]

Setting π_s to zero (with competitive markets) and rearranging gives the retailer's bid-rent for land at location s,

$$r_s^{retail} = p(C_{vs}, x_s)x_s - g(x_s)(1+C_{bs}) \quad . \tag{2.2}$$

This varies spatially with both violent crime and property crime. To demonstrate that retailer bid-rent declines with violent crime, note first that entrepreneurs are assumed to adjust the scale of local retail activity to maximize profits. Differentiating the profit function, x is chosen to satisfy,

$$\frac{\partial \pi_s^{retail}}{\partial x_s} = \frac{\partial p(C_{vs}, x_s)}{\partial x_s}x_s + p(C_{vs}, x_s) - \frac{\partial g(x_s)}{\partial x_s}(1+C_{bs}) = 0 \quad . \tag{2.3}$$

Differentiating the bid-rent function with respect to C_{vs} and substituting from (2.3) yields,

$$\frac{\partial r_s^{retail}}{\partial C_{vs}} = \frac{\partial p(C_{vs}, x_s)}{\partial C_{vs}}x_s < 0 \quad . \tag{2.4}$$

[8]This abstracts from questions about the impact of crime on the density of development.

Assuming that violent crime reduces demand for local retail services ($\partial p/\partial C_{vs} < 0$) and that x is chosen optimally, retailer bids for land decline unambiguously with violent crime.

Consider next the wholesaler's problem. Because wholesalers do not have customers walking to their doors, we assume that local rates of violent crime do not affect demand for a wholesaler's services. Moreover, wholesalers ship their products by truck to retailers throughout the metropolitan area regardless of where the wholesaler is located. We assume that these shipping costs are dominated by loading and unloading fees and are relatively insensitive to distance shipped. This reduces the sensitivity of wholesaler costs to proximity to retailers. As an approximation, we assume that wholesaler revenue (qX) does not vary with the wholesaler's location in the city, where q is the price of goods sold to retailers and X denotes sales to retailers throughout the metropolitan area. Wholesaler non-land production costs are analogous to those of retailers and are given by $z(X)(1+ C_{bs})$. In the absence of property crime, these costs equal $z(X)$ and do not vary with wholesaler location. However, wholesalers are also subject to property crime which adds $z(X)C_{bs}$ to production costs, and which do vary with wholesaler location. Collecting terms, the wholesaler's profit function is given by,

$$\pi_s^{wholesale} = q(X)X - z(X)(1+C_{bs}) - r_s \quad . \tag{2.5}$$

Setting profits to zero and rearranging as above, the bid-rent function is,

$$r_s^{wholesale} = q(X)X - z(X)(1+C_{bs}) \quad . \tag{2.6}$$

As formulated, it is important to note that wholesaler bid-rent does not depend on violent crime.

Consider now the difference between the retail and wholesale bid-rent functions,

$$r_s^{retail} - r_s^{wholesale} = \{p(C_{vs}, x_s)x_s - q(X)X\} - \{g(x_s) - z(X)\}(1+C_{bs}) \quad , \tag{2.7}$$

where the terms are grouped by revenue and costs to facilitate comparison. As portrayed in (2.7), we cannot rule out the possibility that property crime could contribute to differences in retail versus wholesale bid-rents. This might arise because of differences in the local scale of retail versus wholesale activity (x_s versus X), or because of differences in the technology associated with non-land costs of production (g versus z). For that reason, in the empirical work to follow we run all of our models with and without controls for burglary, where burglary serves to proxy for the local presence of property crime. Our primary focus, of course, is on the influence of violent crime on the location of retailers relative to wholesalers. Because violent crime enters into (2.7) only through the retailer's bid-rent, $\frac{\partial(r_s^{retail} - r_s^{wholesale})}{\partial C_{vs}} = \frac{\partial r_s^{retail}}{\partial C_{vs}} < 0$. Given the single-crossing of the bid-rents, this ensures that retailers will occupy areas with low rates of violent crime while wholesalers will occupy more hazardous locations, ceteris paribus. This prediction is testable and forms the basis for much of the empirical work to follow.

2.3 High-end restaurants versus other restaurants

The analysis above can also be applied to restaurants, with high-end restaurants taking on the role of retailers, while other restaurants take on the role of wholesalers. As noted in the Introduction, our ability to identify the causal effect of violent crime on the relative location of high- and low-end restaurants is likely sharper than for retail/wholesale establishments. In part, this is because restaurants offer relatively little in the way of valuable merchandise to potential thieves, and also to the degree that many restaurants rely on credit card transactions. As discussed earlier, this reduces the possible confounding effects of property crime that might otherwise obscure our assessment of the impact of violent crime. Nevertheless, as with the

retail/wholesale analysis, we run all of our restaurant regressions twice, with and without controls for burglary to explore the possible role of property crime.

As also emphasized in the Introduction, there are systematic differences in the time of day during which high- and lower-tier restaurants tend to operate, with high-end restaurants doing a disproportionate share of their business during the dinner hours. The risk of violent crime for restaurant patrons also varies over the day, and is likely greater at night when it is dark and fewer people are present. For these reasons, the sensitivity to the risk of violent crime likely differs between low- and high-end restaurants and in a manner that varies with the time of day.

Bearing these points in mind, the bid-rents for high- and low-end restaurants are obtained in a manner analogous to those for retailers and wholesalers, and are given by,

$$r_s^{high} = p(\sum_{t=1}^{24} \theta_t^{high} C_{vst}, x_{st}^{high}) x_{st}^{high} - m(\sum_{t=1}^{24} x_{st}^{high}) \quad (2.8a)$$

$$r_s^{low} = p(\sum_{t=1}^{24} \theta_t^{low} C_{vst}, x_{st}^{low}) x_{st}^{low} - m(\sum_{t=1}^{24} x_{st}^{low}) \quad . \quad (2.8b)$$

In (2.8a) and (2.8b), *s* denotes location as before while *t* denotes the time of day. At a given time of day, high-end restaurants secure high-quality labor and other inputs (e.g. food) to produce high-quality meals (x_{st}^{high}), while low-end restaurants produce lower quality meals (x_{st}^{low}). Production costs are given by *m*, with $m(x_{st}^{high}) > m(x_{st}^{low})$, indicating that per meal costs are higher at higher end restaurants.[9] We allow for differences in the sensitivity of high- and low-end restaurants to violent crime by interacting C_{vst} with θ_t^{high} and θ_t^{low}, respectively, the values for which are between 0 and 1. During prime dinner hours, high-end restaurants are likely more adversely affected by violent crime relative to low-end eateries, with $\theta_t^{high} > \theta_t^{low}$. Late at night

[9]Both types of restaurants are also sensitive to proximity to population and employment which are important demand shifters. These factors are taken into account in the empirical work.

the reverse is true with $\theta_t^{high} < \theta_t^{low}$. Applying the same mechanics as in (2.4), this suggests that over the dinner hour, high-end restaurant bid-rents are more steeply sloped in response to violent crime as compared to those of low-end eateries. It follows that high-end restaurants sort into areas that are relatively safe during the prime dinner hour, all else equal. Late at night, however, the reverse is likely true as many high-end restaurants will have closed while many lower-tier restaurants remain open. These predictions will be tested.[10]

2.4 Endogenous measures of crime

In the empirical work later in the paper, we take explicit account of both property and violent crime, consistent with the model above. An important issue, however, is the degree to which property and violent crime are endogenous. Here, we characterize briefly several principles that guide our interpretation of the upcoming empirical models

First, it is important to recognize that property and violent crime are quite different, and should not be treated alike. Second, there are two sources of endogenous matching of different types of local economic activity with crime: (i) economic activity may *cause* crime by presenting attractive targets, and (ii) in equilibrium some industries may sort into high-crime locations even if crime adversely affects their production and operating costs. Third, these effects likely differ with the idiosyncratic features of different industries. Fourth, our goal is not to assess the impact of crime on a company's cost function. Instead, our focus is to assess the impact of crime on the equilibrium mix of different types of industries in a given neighborhood.

If the composition of local economic activity causes the incidence of crime to increase, then OLS estimates of the relationship between economic activity and crime would understate

[10]If safety is a normal good, then higher-income patrons of high-end restaurants would respond more strongly to the risk of violent crime, and that would reinforce the tendency of high-end restaurants to avoid unsafe areas.

the impact of crime on local industries. OLS estimates could also yield biased estimates of the impact of crime on the mix of local industries to the extent that different industries foster different degrees of crime. It is worth reiterating, however, that there is no need to control for the endogenous selection of different industries into high- and low-crime areas, with resulting effects on the estimated coefficients on crime. Instead, the equilibrium sorting of industries into high- and low-crime locations is precisely the pattern we seek to document and is the primary focus of this study.

III. Data

3.1 Crime data

The analysis is based on two primary data sources. The first is a unique data set on reported crime as obtained from the website of local police agencies in Atlanta, Chicago, Houston, Indianapolis, and Seattle.[11] For Atlanta, Chicago, and Seattle, the police agency provides data on reported crime in the city proper. For Houston and Indianapolis, the police agency covers the city proper and some additional suburbs.[12]

All of the cities provide information on the number of reported murders, rapes, robberies, assaults, burglaries, and motor vehicle thefts. For that reason, the analysis is based on these crimes as this ensures that a consistent definition of crime is used across cities.[13] To measure violent crime, we sum together incidents of murder, rape, robbery, and assault. In our preferred

[11] Crime data for Atlanta, Chicago, Houston, Indianapolis, and Seattle were obtained from the following URLs, respectively: http://www.atlantapd.org/ ; www.chicagopolice.org ; http://www.houstontx.gov/police/index.html ; www.indy.gov/eGov/IMPD/ ; www.cityofseattle.net/Police/ .

[12] As with prior studies on crime (e.g. Levitt (1998) and Conaway and Lohr (1994)), we note that crime data obtained from police agencies includes information only on reported crimes and, for that reason, likley understates the level of criminal activity. However, it seems unlikely that this would bias our key results related to the sorting of different types of industries into high- and low-crime neighborhoods.

[13] Most of these cities also provided information on other crimes, including in some instances motor vehicle burglary, larceny, and arson. However, only the six crimes highlighted above are reported in each of the five cities.

specifications, we also include motor vehicle thefts as this also affects perceptions of safety (although results are robust to omitting auto theft). Property crime is measured by burglary.

An important feature of the crime data is that the information obtained for the five different cities covers different, overlapping time periods. For Atlanta, the crime data covers January 2004 to July 2008; for Chicago, July 2007 to January 2008; for Houston, January 2005 to April 2008; for Indianapolis, January 2006 to April 2008, and for Seattle, January 2003 to December 2007. We address these differences by collapsing the crime data to a single cross-section rather than making any attempt to take explicit account of temporal patterns. We do this by computing the average number of crimes per month for each individual census tract over the entire period in which the crime data are reported for the given tract. The average number of crimes per month varies across locations. This variable is used to assess the impact of crime on the wholesale/retail composition of local economic activity drawing on data from all five cities.[14]

When assessing the impact of crime on the composition of high-end versus lower-end restaurants, we are limited to just Atlanta, Chicago, Houston, and Indianapolis. That is because these cities report the time of day of an offense whereas Seattle does not. As discussed earlier, high-end restaurants operate predominantly during prime dinner hours, whereas lower-end restaurants operate throughout the day. Accordingly, for restaurants, we control for the time of day the crime occurs: midnight to 8 am, 8 am to 5 pm, 5 pm to 9 pm, and 9 pm to midnight.

Summary measures of the crime data are provided in Table 1. Panel A reports the distribution of crime across census tracts for the five cities combined, separately for different types of crime. Also reported is the total number of crimes over all tracts and time periods available for the five cities combined. Panel B reports time-of-day measures of criminal activity

[14]We also ran the core retail/wholesale and restaurant models separately for each of the five cities. Results were robust although noisier as would be expected given the smaller sample sizes for the individual cities.

for Atlanta, Chicago, Houston, and Indianapolis. For both panels, it is noteworthy that there is considerable variation in criminal activity. In Panel A, the number of violent crimes in the 25th and 75th percentile census tracts is 1.57 and 9.63 per month, respectively; for the 10th and 90th percentiles the difference is 0.26 versus 17.25. Analogous variation is observed in Panel B. We will comment further on this variation in criminal activity later in the paper when characterizing the magnitude of our estimated effects of crime on the composition of local economic activity.

3.2 Business activity data

The second data set used is the Dunn and Bradstreet (D&B) Marketplace files for the third quarter of 2007. This data is collected by Dunn and Bradstreet, a for-profit firm, and was obtained aggregated to the zip code level. The data were then converted to year-2000 census tract geography using GIS software and assuming that business activity in a given zip code is uniformly distributed across space.[15] This was done for two reasons. First, for some of the cities (e.g. Seattle), the crime data are reported at the census tract level. Second, in the regression work to follow, we control for local socioeconomic attributes of the residential population using tract-level information from the 2000 decennial census. Converting the business activity data to census tract geography allows us to map all of the data to common geographic units.

The D&B data contains a wealth of information on businesses. This includes detailed information on the industry to which each establishment belongs (based on the establishment's Standard Industrial Code), and also the number of workers on site. For the wholesale/retail analysis, we then matched wholesalers and retailers in the same industry at the 4-digit SIC level. For example, electronics retailers, SIC5731, are matched to electronics wholesalers, SIC5064. Table 2 Panels A, B, C, and D provide a complete list of the thirteen industries used in the

[15]We used MapInfo and MapBasic to create the correspondence file and map zip code to census tract geography.

wholesale/retail analysis, including the SIC codes used to match wholesalers and retailers in each industry. Also provided in Table 2 are summary statistics on the distribution of the number of wholesale and retail establishments and related employment per census tract.

For restaurants, we concentrate primarily on single-site establishments for which total sales are observed.[16] Restaurants were classified as high- and lower-end based on the distribution of sales within individual restaurant employment size categories. High-, middle-, and low-end establishments were flagged based on natural breaks in the sales distribution for each size category of restaurants. Further details on this procedure are provided in Appendix A.

As a robustness check we also experimented with including chain restaurants in with "lower-end" stores in the denominator of our dependent variable. For these purposes, we assumed that single site establishments did not belong to chains, whereas establishments identified in the Dunn and Bradstreet data as either branches or headquarters were part of a chain. Table 3 contains the summary statistics on establishment counts and employment per census tract for the different types of restaurants.

As noted above, the industry and crime data were merged with year-2000 socio-demographic attributes of the census tracts. Table 4 provides summary statistics on the distribution of the socio-demographic controls, including population and employment density.

IV. Results

4.1 Wholesale/Retail

We begin by presenting estimates from Tobit models of the level of retail and wholesale activity. These models allow for left-censoring since activity is bounded below by zero. For this

[16] Sales at establishments belonging to multi-site firms are always coded to the headquarters of the firm making it difficult to discern the dollar volume of sales at a given restaurant.

portion of the work, we report results for activity measured based on the level of employment and establishments in a census tract. Results are qualitatively similar for both measures of activity. We focus on the estimates using employment as the dependent variable in the discussion below.

In all of the regression models to follow, robust standard errors are used throughout. All of the models also include controls for census tract employment and population density, an array of tract socio-demographic attributes, city fixed effects and, where applicable, industry fixed effects. Despite these controls, for reasons outlined earlier, one must interpret the levels regressions with care. That is because retail and wholesale activity likely attract crime given the presence of valuable merchandise, and also endogenously sort into different types of neighborhoods, including high- and low-crime areas. Both mechanisms influence the coefficients on crime in the levels models, even though our primary focus is on sorting.

Tobit estimates of the level of retail and wholesale business activity in a given census tract are presented in Table 5. For both sectors, violent crime is measured by summing together the monthly average incidents of murder, rape, robbery, and assault, and then adding motor vehicle theft. Although auto theft is not a violent crime per se, it contributes to a shopper's sense of security when visiting a local store.[17]

Consider first the relationship between retail and wholesale activity with regard to density of development. Regardless of specification, it is clear that, in equilibrium, activity is positively associated with employment density and negatively associated with residential density: as a descriptive point, retail and wholesale districts are concentrated in the business areas, and less so in residential zones. Activity is also significantly less in census tracts with high concentrations

[17]We also ran all of the models excluding motor vehicle theft from the violent crime measure. Results were similar and are not reported to conserve space.

of African Americans, as well as tracts with high concentrations of high school graduates in comparison to locations populated by the college educated.

There is little evidence of a systematic equilibrium relationship between retail activity and burglary, while for the wholesale sector the association between property crime and activity is negative and significant. These patterns are in sharp contrast to the coefficients on violent crime plus auto theft. For both the retail and wholesale sectors, the equilibrium association between employment and violent crime is positive and significant, with a somewhat larger magnitude for wholesale. The positive relationships here could indicate that retail and wholesale activity endogenously attract violent crime, even after controlling for the other model controls (including the city fixed effects, local density of employment and population, etc.). An alternative explanation is that other sectors of the economy such as residential developers outbid retail and wholesale establishments for space in safer locations. In equilibrium, one would then observe retail and wholesale outlets in locations with higher rates of violent crime.[18] This is speculation, of course, and relies on a comparison of the *relative* location of alternative sectors. Accordingly, we consider next the location of retail activity relative to wholesale for which a sharper interpretation of the estimated relationships is feasible.[19]

For the next set of regressions, the dependent variable is given by,

$$RetailShare_{ij} = \frac{Retail_{ij}}{Retail_{ij} + Wholesale_{ij}} \quad . \tag{4.1}$$

where *RetailShare* is the local retail share of activity in a given industry, normalized by retail plus wholesale activity, *i* denotes the industry in question and *j* denotes the census tract. Note that this expression is bounded below by 0 when wholesale is present but retail is not, and above

[18]Bates and Robb (2008) make an analogous argument when examining individual companies represented in the Characteristics of Business Owners Survey.

[19]It is worth recalling that if the single crossing condition in Section 2 holds we can ignore other industries when comparing the relative location of retail and wholesale activity.

by 1 when retail is present but wholesale is not. To allow for both forms of censoring, we estimate all of our models using a double Tobit specification that allows for left and right censoring at 0 and at 1, respectively. In addition, in all cases we omit observations in which both retail and wholesale activity are absent from a given industry and census tract.

Table 6 presents estimates from four specifications, two each for models that exclude and include controls for burglary, and for each pair, models that measure activity based on employment versus establishment counts. Results are qualitatively alike for the two measures of activity and are very similar in magnitude as well. This suggests that factors driving the sorting of wholesale and retail activity into different locations do not differentially affect large versus small companies. To streamline the discussion, we focus on the third column which includes burglary as a control and uses employment to measure business activity. We consider first the coefficients on the non-crime controls.

Relative to wholesalers, retail establishments should be especially sensitive to proximity to potential customers. Consistent with that view, observe that the coefficient on population density is positive and highly significant, and equal to 0.00143. This indicates that an increase in population density of 10,000 individuals per square mile – roughly comparable to the sample inter-quartile range (see Table 4) – would increase the retail share of employment in an industry by 1.43 percentage points. Interestingly, the effect of employment density on the retail share of employment is negative and much smaller in magnitude: an increase in employment density of 3,000 workers per square mile – also comparable to the inter-quartile range (Table 4) – would reduce the retail share of employment by 0.15 percentage point. Possibly this indicates that wholesalers benefit from proximity to other businesses (e.g. business service establishments).

The effect of the demographic attributes of a census tract's residential population are harder to interpret, in part because of the overlapping influence of various indicators of socio-economic status, and also the tendency of these variables to proxy for other factors (e.g. wealth, tastes, etc.). A 10 percentage point increase in the African American share of a census tract's population would increase the retail share of employment by 1.3 percentage points. A similar size increase in the male share of a tract's population would reduce the retail share of employment by 1.9 percentage points. Tracts populated with individuals with high school degrees or some college have higher retail shares as compared to locations dominated by the college educated. Higher tract median income also significantly increases a tract's retail share of employment, although income level at the 25^{th} and 75^{th} percentiles appears not to affect the retail/wholesale mix of activity. Percent Hispanic and age of the population are not significant.

For the purposes of this paper, the primary role of these demographic controls, along with controls for density and the city and industry fixed effects, is to strip away factors that might confound our analysis of the impact of crime. Accordingly, we now consider the coefficients on property and violent crime, focusing on the third column in Table 6 as above.

Observe first that the coefficient on burglary is positive 0.00473 and highly significant. This indicates that in equilibrium, there is a positive association between the retail share of employment in an industry and property crime. This could possibly arise because retail disproportionately attracts property crime relative to wholesale, although we have no reason for believing that is the case. An alternative explanation is that retailer costs are *less* sensitive to property crime than costs incurred by wholesalers, possibly because wholesalers are less able to protect themselves against theft. Although we cannot identify which of these two mechanisms

may be at work (or both), including burglary in the model helps to further control for factors that might otherwise bias our estimate of the causal impact of violent crime.

Turning to violent crime, the coefficient on violent crime plus motor vehicle theft equals – 0.00222 and is highly significant. This indicates that an increase of 10 such crimes per month – roughly equivalent to the inter-quartile range (see Table 1, Panel A) – causes the retail share of activity to fall by 2.2 percentage points. An increase of 100 such crimes per month – equivalent to a shift from the sample min to max– would reduce the retail share of employment by 22 percent. These results are consistent with our priors and indicate that higher local rates of violent crime have a substantive, negative impact on the retail share of activity in a local industry.[20]

Table 7 revisits this analysis but stratifies the regression models by industry for each of the thirteen industries in the sample. To conserve space, only the estimates based on employment are included in Table 7 while the results for establishment counts can be found in Appendix B. As before, the qualitative patterns for the two measures of business activity are identical. The magnitudes of the reported coefficients are also very similar, although some differences do occur.

The patterns in Table 7 are largely consistent with those for the pooled regressions in Table 6, allowing for variation across industries. Property crime, as proxied by burglary, has a negative and significant coefficient for Jewelry and Prescription Drugs (which is marginally significant), and a positive and significant coefficient for Furniture, Computers, and Sporting Goods. For the other eight industries the coefficient on property crime is not significant. The interpretation of these property crime patterns are as before.

[20]To explore these patterns further, we also stratified the models in Table 6 into four subsamples based on the first through fourth quartiles with respect to the level of violent crime plus auto theft. The corresponding coefficients were small and insignificant for the two lower quartile samples, but negative and highly significant for the upper two quartiles, with coefficients of increasing magnitude. This indicates that the marginal impact of violent crime and motor vehicle theft increases with the level of crime in the local community.

For violent crime plus motor vehicle theft (MVT) the estimates are more illuminating. In no industry is the coefficient on violent crime plus MVT positive and significant. Moreover, of the four industries with positive coefficients (Electronics, Jewelry, Books, and Clothing and Footwear), the estimated coefficients are close to zero. Of the remaining nine industries, the coefficients on violent crime plus MVT are all negative, with sizable and significant estimates in five of the industries (Furniture, Hardware, Toys, Computers, and Sporting Goods). Of this latter group, the largest magnitude is for Toys, for which the 90/10 percentile sample difference in violent crime plus MVT is associated with a 20 percent lower retail share, and the max/min sample difference in violent crime is associated with an 80 percent lower retail share.

In part, differences in the estimated patterns across industries likely reflect the reduced power of the industry-specific regressions, for which the number of establishments by industry is more limited which serves to amplify the censoring problem. This is evident when comparing the number censored observations by industry in Table 7 to that of the pooled regressions in Table 6. In addition, however, variation in patterns across industries likely reflects differences in the demographic mix of individuals that patronize retail establishments. Toy stores, for example, are frequented by parents with children in tow, and it is plausible that safe locations are necessary for such stores to thrive. In contrast, we see little association between violent crime and Liquor, an industry frequented primarily by adults. More generally, those industries most dependent on customers sensitive to consumer safety will likely locate away from unsafe areas.

4.2 Restaurants

We turn now to our analysis of restaurant activity. Analogous to our discussion of retail/wholesale activity, we begin by presenting Tobit regressions of the level of employment

and establishment counts in high- and low-end restaurants. As noted earlier, the manner in which high- and low-tier restaurants are defined is given in Appendix A.

Estimates in Table 8 are similar for both establishment counts and employment, and as before, we focus on the later. Observe that both high- and low-end restaurants are significantly less present in tracts with high population density, and more prevalent in tracts with high employment density. As with retail and wholesale, restaurants are more common in business districts and less common in residential areas.[21]

Burglary is negatively associated with the presence of restaurants, but the estimated relationship is sometimes imprecise and differs somewhat depending on whether we focus on employment versus establishment counts. On the other hand, the coefficients on violent crime plus MVT are always positive and highly significant. Although we cannot rule out the possibility that restaurants may attract criminal activity, it seems likely that the positive and significant coefficients on violent crime plus MVT arise at least in part from an endogenous sorting of restaurants into unsafe areas.

We consider now share regressions that compare directly the relative presence of high- and lower-tier restaurants, and which also take time-of-day of violent crime and motor vehicle theft into account. For reasons outlined earlier, we believe that these regressions go furthest to identifying causal impacts of violent crime on the mix of local economic activity.

In this instance, the dependent variable is given by

[21]Observe also that an increase in a tract's minority population (both Hispanic and African American) has a large, and highly significant negative effect on the presence of high-end restaurants. For low-tier restaurants, the African American effect persists while the Hispanic effect disappears. High-end restaurants are also significantly more prevalent when the 75th percentile of the income distribution is of higher income, and also when there are fewer high school educated households as compared to college educated. There is some evidence of a positive high-income effect on the presence of lower-tier restaurants, but the t-ratios are quite low. In addition, we do not see compelling evidence that education of the local community affects low-tier eateries.

$$HighEndShare_{ij} = \frac{High\text{-}End\ Restaurants_{ij}}{High\text{-}End + Alternative\ Restaurants_{ij}} \quad . \tag{4.2}$$

As defined in Appendix A, we specify three different measures of alternate restaurants based on low-end plus middle-tier plus Chain restaurants, low-end plus middle-tier, and just low-end. These alternative specifications provide an increasingly sharp comparison, as high- and low-end restaurants are most clearly distinct both in the data and in the nature of their markets. Table 9 presents results based on employment shares, while results based on establishment counts can be found in Appendix B. Estimates are similar between the two tables. To streamline the discussion, we discuss only the two far right columns of Table 9 (without and with burglary as a control) which compare high-end to low-end restaurants.

Before discussing the crime coefficients, it is useful to briefly comment on the other control variables. As before, employment density has a positive and significant impact on the high-end share of local restaurants. However, different from the retail/wholesale comparison, population density is not particularly related to the mix of restaurant activity. Minority presence (both African American and Hispanic) significantly reduces the high-end share of restaurants, as does an increase in the local population share of high school educated as compared to college educated. The other demographic controls are largely insignificant, at least individually.

The most distinctive feature of Table 9 is that violent crime is measured separately for four different periods of the day for reasons described earlier. Specifically, we separately control for crimes occurring between midnight to 8 am, 8 am to 5 pm, 5 pm to 9 pm, and 9 pm to midnight. We do not decompose burglary by time of day as nearly all burglaries occur at night.

Observe first that the coefficient on burglary in the far right column is – 0.00309 with a t-ratio of 1.61. This suggests that 5 more burglaries per month – equal to the sample inter-quartile range (see Table 1, Panel A) – would reduce the high-end share of restaurants by roughly 1.4

percentage points. We note that this coefficient is somewhat imprecisely estimated and of modest size compared to the violent crime coefficients. Moreover, in the last two columns in the table, it is clear that including burglary does not affect the coefficients on violent crime.

Based on the estimates in the far right column, it is evident that the effect of violent crime plus MVT is clearly time-of-day dependent. For crimes committed during the prime dinner hour (5 to 9 pm), the coefficient is -0.01566 with a t-ratio of 2.40. As the evening progresses, however, this effect reverses: the coefficient is 0.00922 (with a t-ratio of 1.16) for crimes committed between 9 pm and midnight, and 0.00882 (with a t-ratio of 1.70) for crimes committed between midnight and 8 am. During the daytime hours (8 am to 5 pm), the coefficient is essentially zero, 0.00074 (with a t-ratio of 0.26).

These patterns are consistent with our priors and the discussion earlier in the paper. High-end restaurants operate disproportionately during prime dinner hours, and violent crime plus MVT during that time of the day deters high-end restaurants relative to lower-tier eateries. As the evening wears on, high-end restaurants begin to close while lower-tier restaurants are more likely to remain open. As a result, violent crimes and MVT committed late at night have a greater impact on profits at lower-tier eateries. The shifting effects influence which category of restaurant is the high bidder for the different locations. Come morning, daylight arrives, which in itself may help to mitigate fears of violent crime. Moreover, as the day progresses, high-end restaurants begin to open, and the relative impact of violent crimes committed during this part of the day becomes more similar for high- and low-end restaurants.

The magnitude of the impact of safety on the mix of restaurants is also of economic importance. From Table 1, Panel B, note that the sample inter-quartile range for violent crime plus MVT during the 5 pm to 9 pm period is roughly 2.5 crimes per month, while the sample min

to max difference is roughly 22. Given the coefficient of – 0.01752 for dinner-hour effects in the far right column of the table, this suggests that an increase in violent crime plus MVT equivalent to the sample inter-quartile range would reduce the high-end share of local restaurants by 4.4 percentage points; for the sample min/max spread the corresponding effect would be 38 percentage points. Whereas the impact associated with the sample inter-quartile range could seem modest to some, it is important to note that the distribution of violent crime plus MVT is highly skewed, as is evident from Table 1. Happily, most census tracts are relatively safe. However, the findings here clearly indicate that among those tracts that do suffer from violence and motor vehicle theft, high-end restaurants and retail activity will be substantially less present.

V. Conclusions

Much has been written about the determinants of crime and the efficacy of different crime prevention strategies. Much less attention, however, has been given to the economic impacts of crime, and especially with regard to patterns of urban development. This paper fills part of that gap by estimating the impact of violent crime on the location of business activity and entrepreneurship in five U.S. cities. Central to our analysis is the idea that different sectors of the economy will sort into high- and low-crime areas depending on their relative sensitivity to crime. We illustrate this by comparing retail industries to their wholesale counterparts, and high-end restaurants to low-end eateries.

Our first important result is that all of our target industries tend to be disproportionately located in census tracts with higher rates of violent crime and motor vehicle theft. This likely arises at least in part because these industries tend to be outbid for space in safer locations by other sectors of the economy (e.g. residential). That interpretation, however, is not certain

because our target industries may also disproportionately attract violent crime relative to other sectors.

Further analysis based on matched pairs of retail and wholesale sectors for thirteen industries is more revealing and yields our second set of important results. Findings indicate that an increase in violent crime plus motor vehicle theft equivalent to the sample inter-quartile range would cause the retail share of activity (relative to retail plus wholesale) to fall by 2.2 percentage points. An increase of 100 such crimes per month – equivalent to a shift from the sample min to max– would reduce the retail share of employment by 22 percent. This effect also differs across industries, presumably at least in part because of differences in the retail clientele. Toy stores, for example, include children among their retail patrons and are particularly sensitive to the need for safe locales; liquor stores, in contrast, cater to adults and are not.

Lastly, we compare high-end restaurants to lower-tier eateries. Findings indicate that an increase in violent crime during the prime dinner hours equivalent to the sample inter-quartile range would reduce the high-end share of local restaurants by 4.4 percentage points, while an increase in crime equivalent to the sample max/min difference would increase the high-end share of local restaurants by 38 percentage points. For crimes committed late at night – after high-end restaurants have closed – the sign of these effects is reversed, presumably because lower-tier eateries that remain open sort into safer locations.

Together, these findings indicate that entrepreneurs take violent crime into account when bidding for locations within a city. These finding also indicate that policy efforts to make distressed portions of cities more vibrant must ensure that such locations are safe.

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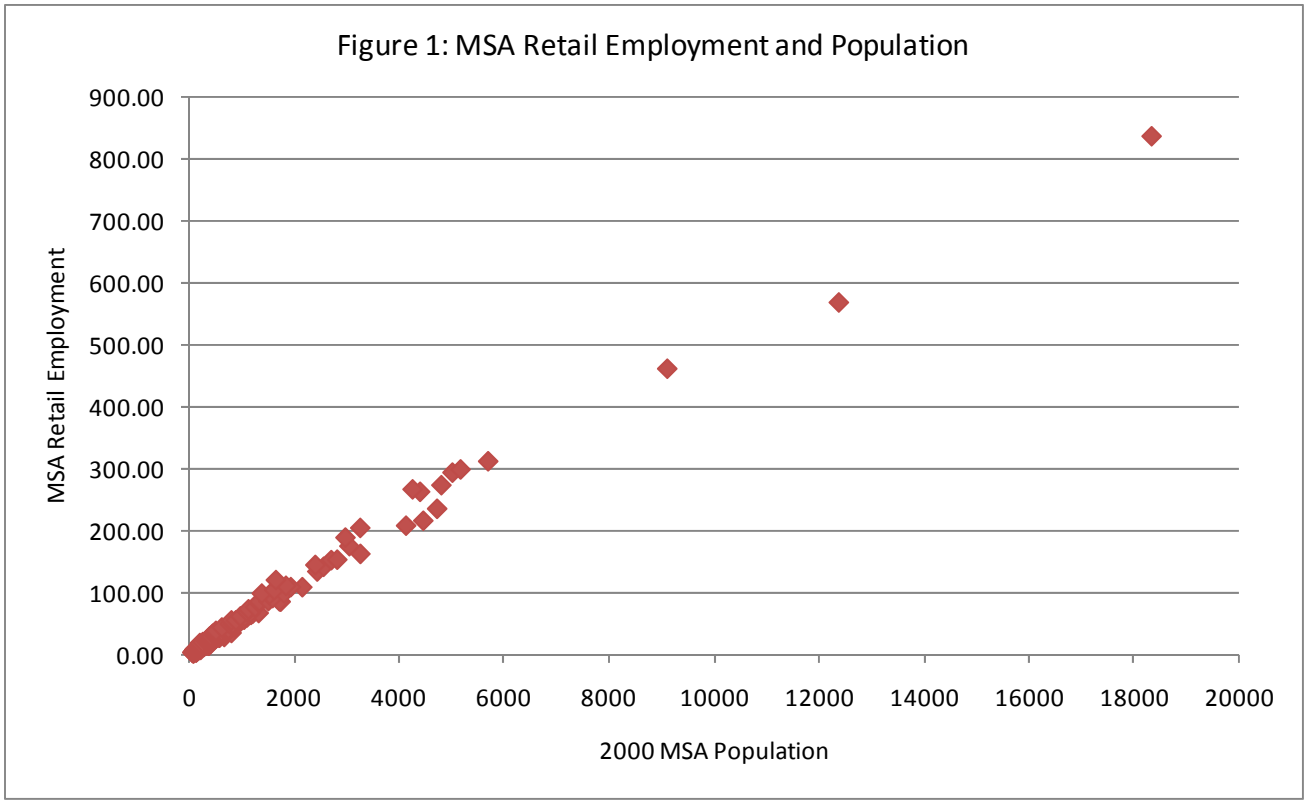

[a]Data obtained from the 2000 decennial census (http://www.census.gov/csd/susb/susb05.htm).

Table 1: Crime Summary Statistics

Panel A: Distribution of the average monthly number of crimes across census tracts[ab]

	10th Percentile	25th Percentile	50th Percentile	75th Percentile	90th Percentile	Minimum	Maximum	Mean	Total Number of Crimes[c]
Murder	0.00	0.00	0.00	0.13	0.28	0.00	1.14	0.80	2,443
Rape	0.00	0.00	0.13	0.29	0.57	0.00	3.43	0.23	5,860
Robbery	0.10	0.50	1.50	3.43	6.30	0.00	36.57	2.70	80,546
Assault	0.13	0.75	2.45	5.86	10.86	0.00	45.89	4.30	124,790
Motor Vehicle Theft	0.30	1.12	2.71	4.86	8.14	0.00	31.14	3.70	131,830
Burglary	0.37	1.43	3.57	6.40	10.29	0.00	48.71	4.80	166,257
Violent Crime[d]	0.26	1.57	4.43	9.63	17.25	0.00	79.86	7.31	213,639
Violent Crime + Motor Vehicle Theft	0.75	2.86	7.38	14.43	24.57	0.00	98.57	11.01	345,469

Panel B: Distribution of the average monthly number of crimes across census tracts by time of day[ab]

	10th Percentile	25th Percentile	50th Percentile	75th Percentile	90th Percentile	Minimum	Maximum	Mean	Total Number of Crimes[c]
Violent Crime[d]	0.43	1.93	4.71	10.10	17.71	0.00	79.86	7.70	211,488
Violent Crimes 12:01 am – 8:00 am	0.05	0.32	0.93	1.93	3.39	0.00	18.00	1.45	47,639
Violent Crimes 8:01 am – 5:00 pm	0.14	0.73	2.00	4.57	9.29	0.00	41.57	3.74	84,174
Violent Crimes 5:01 pm – 9:00 pm	0.07	0.38	1.00	2.25	4.14	0.00	18.43	1.73	45,894
Violent Crimes 9:01 pm – 12:00 am	0.00	0.14	0.46	1.10	1.96	0.00	7.43	0.78	33,781
Violent Crime + Motor Vehicle Theft (MVT)	0.83	3.43	7.79	14.86	25.71	0.00	98.57	11.51	338,823
Violent + MVT 12:01 am – 8:00 am	0.14	0.57	1.53	2.89	5.00	0.00	22.43	2.19	73,263
Violent + MVT 8:01 am – 5:00 pm	0.29	1.33	3.29	7.00	12.86	0.00	55.29	5.51	132,281
Violent + MVT 5:01 pm – 9:00 pm	0.15	0.71	1.71	3.35	5.71	0.00	21.86	2.55	74,490
Violent + MVT 9:01 pm – 12:00 am	0.03	0.29	0.86	1.78	3.00	0.00	9.90	1.26	58,789

[a]For Panel A, data are obtained at the police precinct level for Atlanta, Chicago, Houston, Indianapolis, and Seattle. For Panel B, time-of-day measures of crime are available only for Atlanta, Chicago, Houston, and Indianapolis. For Atlanta, Chicago, and Seattle this includes just the incorporated city. For Houston and Indianapolis, data reported cover both the incorporated city as well as some of the adjacent suburbs outside of the city proper.

[b]Summary measures were formed by first calculating the average number of crimes per month in a given census tract over the period for which the crime data was available (January 2004 to July 2008 for Atlanta; July 2007 – January 2008 for Chicago; January 2005 to April 2008 for Houston; January 2006 to April 2008 for Indianapolis; and January 2003 – December 2007 for Seattle).

[c]Total number of crimes over all time periods and census tracts.

[d]Violent crime includes murder, rape, robbery, and assault.

Table 2: Business Activity Summary Statistics

Panel A: Number of wholesale establishments per census tract in 2007:Q3

	SIC4 Codes Included	25th Percentile	50th Percentile	75th Percentile	Minimum	Maximum	Mean	Total
Electronics	5064	0.00	0.00	0.05	0.00	2.55	0.05	98
Jewelry	5094	0.00	0.04	0.16	0.00	33.91	0.28	514
Books	5192	0.00	0.00	0.07	0.00	2.32	0.06	111
Liquor	5182	0.00	0.00	0.05	0.00	5.46	0.05	96
Furniture	5021, 5023	0.04	0.12	0.25	0.00	20.85	0.28	509
Hardware	5072	0.00	0.01	0.10	0.00	3.73	0.09	157
Toys	5092	0.00	0.00	0.06	0.00	1.59	0.05	99
Cameras	5043	0.00	0.00	0.00	0.00	1.20	0.02	28
Computers	5045	0.00	0.03	0.18	0.00	6.24	0.19	339
Sporting Goods	5091	0.00	0.00	0.04	0.00	6.22	0.05	94
Prescription Drugs	5122	0.00	0.04	0.13	0.00	2.56	0.11	208
Clothing and Footwear	5136, 5137, 5139	0.00	0.05	0.14	0.00	3.50	0.12	213
Construction Materials	5031, 5032, 5033, 5039, 5072	0.03	0.08	0.18	0.00	5.57	0.16	296

Panel B: Number of retail establishments per census tract in 2007:Q3

	SIC4 Codes Included	25th Percentile	50th Percentile	75th Percentile	Minimum	Maximum	Mean	Total
Electronics	5731	0.03	0.13	0.33	0.00	2.74	0.24	444
Jewelry	5944	0.09	0.26	0.63	0.00	37.85	0.65	1187
Books	5942	0.05	0.16	0.39	0.00	4.97	0.32	576
Liquor	5921	0.18	0.35	0.65	0.00	4.26	0.48	875
Furniture	5712, 5713, 5714, 5719	0.09	0.22	0.51	0.00	8.35	0.42	758
Hardware	5251	0.04	0.13	0.24	0.00	2.65	0.18	323
Toys	5945	0.01	0.07	0.24	0.00	3.98	0.21	384
Cameras	5946	0.00	0.00	0.00	0.00	1.68	0.04	70
Computers	5734	0.04	0.14	0.37	0.00	7.41	0.35	628
Sporting Goods	5941	0.04	0.15	0.37	0.00	23.33	0.32	573
Prescription Drugs	5912	0.19	0.37	0.68	0.00	8.76	0.54	981
Clothing and Footwear	5611, 5621, 5632, 5641, 5651, 5661	0.09	0.21	0.47	0.00	33.52	0.47	849
Construction Materials	5211, 5231, 5251	0.07	0.14	0.29	0.00	5.17	0.24	437

Panel C: Wholesale employment per census tract in 2007:Q3

	SIC4 Codes Included	25th Percentile	50th Percentile	75th Percentile	Minimum	Maximum	Mean	Total
Electronics	5064	0.00	0.00	0.24	0.00	25.53	0.39	704
Jewelry	5094	0.00	0.07	0.50	0.00	162.75	1.23	2236
Books	5192	0.00	0.01	0.18	0.00	48.37	0.68	1230
Liquor	5182	0.00	0.00	0.19	0.00	527.34	1.84	3349
Furniture	5021, 5023	0.11	0.48	1.58	0.00	385.51	2.43	4412
Hardware	5072	0.00	0.05	0.57	0.00	106.76	4.48	1834
Toys	5092	0.00	0.00	0.24	0.00	40.55	0.29	533
Cameras	5043	0.00	0.00	0.00	0.00	37.32	0.29	519
Computers	5045	0.00	0.10	0.89	0.00	217.70	2.47	4488
Sporting Goods	5091	0.00	0.01	0.29	0.00	62.63	0.71	1291
Prescription Drugs	5122	0.00	0.09	0.45	0.00	243.58	1.50	2722
Clothing and Footwear	5136, 5137, 5139	0.01	0.20	0.46	0.00	94.34	1.10	1999
Construction Materials	5031, 5032, 5033, 5039, 5072	0.13	0.50	1.55	0.00	115.64	2.00	3630

Panel D: Retail employment per census tract in 2007:Q3

	SIC4 Codes Included	25th Percentile	50th Percentile	75th Percentile	Minimum	Maximum	Mean	Total
Electronics	5731	0.09	0.54	1.59	0.00	179.09	2.26	4114
Jewelry	5944	0.19	0.60	1.55	0.00	165.44	2.45	4451
Books	5942	0.09	0.51	2.21	0.00	122.00	2.22	4033
Liquor	5921	0.60	1.27	2.58	0.00	24.64	2.09	3794
Furniture	5712, 5713, 5714, 5719	0.24	0.75	2.18	0.00	108.46	2.42	4401
Hardware	5251	0.14	0.45	1.25	0.00	35.41	1.09	1976
Toys	5945	0.02	0.14	0.74	0.00	93.33	1.26	2288
Cameras	5946	0.00	0.00	0.01	0.00	27.44	0.36	661
Computers	5734	0.10	0.49	1.69	0.00	102.23	1.88	3412
Sporting Goods	5941	0.12	0.43	1.63	0.00	95.24	1.89	3340
Prescription Drugs	5912	1.98	4.38	9.25	0.00	125.57	7.08	12868
Clothing and Footwear	5611, 5621, 5632, 5641, 5651, 5661	0.24	0.70	1.90	0.00	291.60	3.17	5756
Construction Materials	5211, 5231, 5251	0.22	0.58	1.94	0.00	243.96	3.58	6509

Table 3: Restaurant Summary Statistics

Panel A: Number of restaurant establishments per census tract in 2007:Q3

	25th Percentile	50th Percentile	75th Percentile	Minimum	Maximum	Mean	Total
High-End Restaurant[a]	0.00	0.04	0.18	0.00	4.36	0.17	294
Middle-Tier Restaurants[b]	0.28	0.70	1.45	0.00	27.09	1.28	2247
Low-End Restaurants[c]	0.75	1.47	2.77	0.00	39.16	2.18	3833
Chain Restaurants	0.11	0.33	1.05	0.00	20.69	0.86	1520

[a]High-end restaurants are classified based on sales for a given employment level. Restaurants are high end if they have 1-24 employees and sales are greater than $0.5 million, 25-49 employees and sales are greater than $1.0 million, or 50-99 employees and sales are greater than $2.5 million. All restaurants classified as high-end are single site establishments.
[b]"Middle-tier" restaurants are defined as those that generate $0.2 to $0.4 million in sales and have 1-24 employees, generate $0.5 to $0.9 million in sales and have 24-49 employees, or generate $1.0 to $2.4 million in sales and have 50-99 employees.
[c]Low-end restaurants are also classified based on sales. Restaurants are low end if they have 1-24 employees and sales are less than $0.2 million, 25-49 employees and sales are less than $0.5 million, or 50-99 employees and sales are less than $1.0 million. These restaurants are all also single site establishments.

Panel B: Number of restaurant employment per census tract in 2007:Q3

	25th Percentile	50th Percentile	75th Percentile	Minimum	Maximum	Mean	Total
High-End Restaurants[a]	0.00	0.58	3.78	0.00	120.19	3.87	6814
Middle-Tier Restaurants[b]	4.46	13.04	29.31	0.00	610.47	27.90	49097
Low-End Restaurants[c]	3.09	6.00	12.00	0.00	195.30	9.41	16559
Chain Restaurants	2.38	6.83	24.83	0.00	1310.75	25.08	44144

[a]High-end restaurants are classified based on sales for a given employment level. Restaurants are high end if they have 1-24 employees and sales are greater than $0.5 million, 25-49 employees and sales are greater than $1.0 million, or 50-99 employees and sales are greater than $2.5 million. All restaurants classified as high-end are single site establishments.
[b]"Middle-tier" restaurants are defined as those that generate $0.2 to $0.4 million in sales and have 1-24 employees, generate $0.5 to $0.9 million in sales and have 24-49 employees, or generate $1.0 to $2.4 million in sales and have 50-99 employees.
[c]Low-end restaurants are also classified based on sales. Restaurants are low end if they have 1-24 employees and sales are less than $0.2 million, 25-49 employees and sales are less than $0.5 million, or 50-99 employees and sales are less than $1.0 million. These restaurants are all also single site establishments.

Table 4: Socio-Demographic[a] and employment density control variables[b]

	25th Percentile	50th Percentile	75th Percentile	Minimum	Maximum	Mean
Employment Density (1,000/sq. mile)	1.05	2.14	4.06	0.00	1327.33	5.39
Population Density (1,000/sq. mile)	3.39	6.74	15.80	0.00	93.10	11.00
Percent Hispanic	0.02	0.08	0.34	0.00	1.00	0.22
Percent African American	0.03	0.13	0.83	0.00	1.00	0.36
Average Age	30.35	33.57	36.95	15.75	80.00	33.84
Percent Male	0.46	0.49	0.51	0.00	1.00	0.49
25th Income Percentile (1,000s)	17.50	22.50	37.50	5.00	175.00	27.96
50th Income Percentile (1,000s)	27.50	42.50	55.00	5.00	200.00	48.33
75th Income Percentile (1,000s)	47.50	67.50	87.50	5.00	200.00	75.29
Percent Adults < High School	0.15	0.29	0.44	0.00	1.00	0.30
Percent Adults with High School	0.18	0.26	0.32	0.00	1.00	0.25
Percent Adults with Some College	0.14	0.19	0.25	0.00	1.00	0.20

[a]Socio-Demographic controls are from the 2000 census
[b]Employment density is computed using employment counts from the Dunn and Bradstreet Marketplace file, 2007:Q3.

Table 5: Tobit Regressions of Retail and Wholesale Business Activity
(Absolute values of t-ratios in parentheses are based on robust standard errors)[a]

	Retail		Wholesale	
	Employment	Establishments	Employment	Establishments
Violent Crime + Motor Vehicle Theft [b]	0.06530	0.01060	0.10172	0.00793
	(7.83)	(9.02)	(4.64)	(4.63)
Burglary	-0.00741	-0.00542	-0.11928	-0.00771
	(0.44)	(2.42)	(2.80)	(2.67)
Employment density (1,000/sq. mile)	0.01798	0.00296	0.03139	0.00284
	(3.60)	(3.02)	(3.63)	(2.91)
Population density (1,000/sq. mile)	-0.03365	-0.00500	-0.06665	-0.00473
	(6.31)	(7.07)	(6.60)	(4.17)
Percent Hispanic	0.09392	-0.04209	0.42693	-0.08759
	(0.33)	(1.10)	(0.79)	(1.64)
Percent Af.American	-1.99304	-0.2424	-2.93347	-0.32048
	(9.46)	(9.42)	(7.57)	(5.97)
Average Age of Pop.	0.00607	0.00100	-0.01555	-0.00192
	(0.45)	(0.75)	(0.97)	(1.03)
Percent Pop. Male	-0.06991	0.15796	7.41272	0.48424
	(0.06)	(1.47)	(1.77)	(3.17)
25th Percentile Family Income (1,000s)	-0.00485	-0.00085	-0.00850	-0.00283
	(0.58)	(0.79)	(0.53)	(1.46)
50th Percentile Family Income (1,000s)	0.01216	0.00138	0.00430	0.00122
	(1.48)	(1.50)	(0.35)	(0.93)
75th Percentile Family Income (1,000s)	0.01407	0.0016	0.00842	0.00086
	(2.34)	(2.42)	(1.64)	(1.67)
Percent Adults < High School	-0.72062	-0.03414	-1.93301	-0.08783
	(1.26)	(0.55)	(2.12)	(1.10)
Percent Adults with High School	-4.56331	-0.43032	-3.93496	-0.60248
	(6.22)	(5.31)	(3.94)	(4.76)
Percent Adults Some College	1.41547	0.19052	-1.40019	-0.00554
	(1.46)	(1.52)	(0.81)	(0.03)
Industry Fixed Effects[c]	13	13	13	13
City Fixed Effects[d]	5	5	5	5
Pseudo-R Sq	0.02	0.07	0.01	0.05
Total Obs	21816	21816	21816	21816
Left-Censored Obs	526	526	6706	6706
Log-Likelihood	-73199.64	-23293.23	-59143.86	-21506.46

[a]Dependent variable equals the number of retail (or wholesale) employees.
[b]Violent crime includes murder, rape, robbery, and assault.
[c]Industries include electronics, jewelry, books, liquor, furniture, hardware, toys, cameras, computers, sporting goods, prescription drugs, clothing and footwear, and construction materials.
[d]Cities include Chicago, Atlanta, Indianapolis, Houston, and Seattle.

Table 6: Tobit Regressions of the Retail Share of Business Activity
(Absolute values of t-ratios in parentheses are based on robust standard errors)[a]

	Excluding Burglary		Including Burglary	
	Employment	Establishments	Employment	Establishments
Violent Crime + Motor Vehicle Theft [b]	-0.00055	-0.00046	-0.00222	-0.00181
	(1.84)	(1.84)	(4.23)	(4.09)
Burglary	-	-	0.00473	0.00380
	-	-	(3.90)	(3.79)
Employment density (1,000/sq. mile)	-0.00051	-0.00038	-0.00049	-0.00036
	(5.10)	(5.13)	(4.96)	(4.97)
Population density (1,000/sq. mile)	0.00146	0.00092	0.00143	0.00091
	(4.45)	(3.52)	(4.40)	(3.47)
Percent Hispanic	0.00892	0.05119	-0.00009	0.04392
	(0.38)	(2.70)	(0.00)	(2.31)
Percent Af.American	0.13444	0.11573	0.13373	0.11515
	(9.06)	(9.38)	(9.01)	(9.33)
Average Age of Pop.	-0.00050	-0.00038	-0.00051	-0.00038
	(0.72)	(0.66)	(0.72)	(0.66)
Percent Pop. Male	-0.19693	-0.14284	-0.18864	-0.13623
	(3.58)	(3.19)	(3.44)	(3.05)
25th Percentile Family Income (1,000s)	0.00010	0.00025	0.00013	0.00027
	(0.24)	(0.78)	(0.33)	(0.87)
50th Percentile Family Income (1,000s)	0.00076	0.00067	0.00076	0.00066
	(2.37)	(2.57)	(2.37)	(2.56)
75th Percentile Family Income (1,000s)	-0.00008	-0.00017	-0.00009	-0.00019
	(0.40)	(1.10)	(0.50)	(1.20)
Percent Adults < High School	0.02499	0.05823	0.04282	0.07254
	(0.69)	(1.97)	(1.17)	(2.43)
Percent Adults with High School	0.09834	0.17056	0.08870	0.16282
	(2.63)	(5.60)	(2.37)	(5.34)
Percent Adults Some College	0.17518	0.16566	0.18156	0.17076
	(3.53)	(4.04)	(3.65)	(4.16)
Industry Fixed Effects[c]	13	13	13	13
City Fixed Effects[d]	5	5	5	5
Pseudo-R Sq	0.09	0.13	0.09	0.13
Total Obs	21816	21816	21816	21816
Left-Censored Obs	526	526	526	526
Right-Censored Obs	6708	6708	6708	6708
Log-Likelihood	-13138.60	-10370.44	-13130.51	-10362.63

[a]Dependent variable equals (number of retail employees)/(number of retail employees + number of wholesale employees).
[b]Violent crime includes murder, rape, robbery, and assault.
[c]Industries include electronics, jewelry, books, liquor, furniture, hardware, toys, cameras, computers, sporting goods, prescription drugs, clothing and footwear, and construction materials.
[d]Cities include Chicago, Atlanta, Indianapolis, Houston, and Seattle.

Table 7: Tobit Regressions of Retail Share of Employment by Industry[a]
(Numbers in parentheses are the absolute values of t-ratios based on robust standard errors.)

	Excluding Burglary	Including Burglary			Excluding Burglary	Including Burglary	
	Violent + MVT[b]	Violent + MVT[b]	Burglary		Violent + MVT[b]	Violent + MVT[b]	Burglary
Electronics	-0.00135	0.00008	-0.00408	Cameras	-0.00695	-0.01002	0.00903
t-ratio	(1.01)	(0.03)	(0.81)	t-ratio	(1.28)	(1.24)	(0.46)
Total Obs	1661	1661	1661	Total Obs	648	648	648
Left-Censored Obs	42	42	42	Left-Censored Obs	120	120	120
Right-Censored Obs	704	704	704	Right-Censored Obs	329	329	329
Jewelry	-0.00244	0.00055	-0.00824	Computers	0.00278	-0.00664	0.02652
t-ratio	(2.32)	(0.33)	(2.16)	t-ratio	(2.32)	(2.95)	(5.43)
Total Obs	1767	1767	1767	Total Obs	1750	1750	1750
Left-Censored Obs	34	34	34	Left-Censored Obs	57	57	57
Right-Censored Obs	500	500	500	Right-Censored Obs	451	451	451
Books	0.00106	0.00010	0.00269	Sporting Goods	0.00238	-0.00752	0.03029
t-ratio	(1.01)	(0.06)	(0.67)	t-ratio	(1.70)	(3.07)	(5.65)
Total Obs	1769	1769	1769	Total Obs	1765	1765	1765
Left-Censored Obs	33	33	33	Left-Censored Obs	26	26	26
Right-Censored Obs	713	713	713	Right-Censored Obs	687	687	687
Liquor	-0.00068	-0.00104	0.00107	Prescription Drugs	-0.00128	-0.00036	-0.00255
t-ratio	(0.54)	(0.43)	(0.18)	t-ratio	(3.04)	(0.45)	(1.46)
Total Obs	1793	1793	1793	Total Obs	1812	1812	1812
Left-Censored Obs	10	10	10	Left-Censored Obs	10	10	10
Right-Censored Obs	1039	1039	1039	Right-Censored Obs	368	368	368
Furniture	0.00002	-0.00320	0.00902	Clothing and Footwear	0.00070	0.00117	-0.00133
t-ratio	(0.03)	(2.51)	(3.14)	t-ratio	(1.24)	(1.11)	(0.53)
Total Obs	1795	1795	1795	Total Obs	1818	1818	1818
Left-Censored Obs	3	3	3	Left-Censored Obs	4	4	4
Right-Censored Obs	135	135	135	Right-Censored Obs	309	309	309
Hardware	-0.00210	-0.00408	0.00556	Constrution Materials	0.00098	-0.00078	0.00496
t-ratio	(1.92)	(2.17)	(1.21)	t-ratio	(1.22)	(0.54)	(1.36)
Total Obs	1742	1742	1742	Total Obs	1812	1812	1812
Left-Censored Obs	78	78	78	Left-Censored Obs	11	11	11
Right-Censored Obs	569	569	569	Right-Censored Obs	183	183	183
Toys	-0.00598	-0.00803	0.00582				
t-ratio	(3.26)	(2.48)	(0.80)				
Total Obs	1651	1651	1651				
Left-Censored Obs	98	98	98				
Right-Censored Obs	725	725	725				

[a]All models include the full set of control variables as reported in Table 6a. The dependent variable is defined the same way as in Table 6a as well.
[b]Violent crime includes murder, rape, robbery, and assault.

Table 8: Tobit Regressions of High-end and Low-end Restaurant Activity
(Absolute values of t-ratios in parentheses are based on robust standard errors)[a]

	High-End		Low-End	
	Employment	Establishments	Employment	Establishments
Violent Crime + Motor Vehicle Theft [b]	0.20032	0.00600	0.25395	0.05429
	(3.16)	(3.10)	(3.85)	(4.30)
Burglary	-0.29654	-0.00642	-0.11605	-0.01499
	(2.40)	(1.60)	(0.88)	(0.58)
Employment density (1,000/sq. mile)	0.09062	0.00300	0.10678	0.01884
	(3.17)	(4.93)	(2.57)	(3.23)
Population density (1,000/sq. mile)	-0.08579	-0.00320	-0.17634	-0.0359
	(2.33)	(3.00)	(6.02)	(6.21)
Percent Hispanic	-4.23686	-0.07649	0.05410	0.2873
	(1.88)	(0.95)	(0.02)	(0.52)
Percent Af.American	-8.86422	-0.29980	-7.07330	-1.60438
	(5.95)	(7.16)	(5.34)	(5.87)
Average Age of Pop.	0.05909	0.00480	0.23150	0.05208
	(0.67)	(1.29)	(1.77)	(1.99)
Percent Pop. Male	-2.70099	0.01521	1.86004	0.81722
	(0.37)	(0.05)	(0.14)	(0.30)
25th Percentile Family Income (1,000s)	-0.00743	-0.00232	-0.04500	-0.01609
	(0.14)	(1.34)	(0.86)	(1.65)
50th Percentile Family Income (1,000s)	-0.00066	0.00096	-0.01595	-0.00440
	(0.01)	(0.60)	(0.31)	(0.43)
75th Percentile Family Income (1,000s)	0.05149	0.00244	0.06867	0.01631
	(1.80)	(1.79)	(1.28)	(1.53)
Percent Adults < High School	-0.15126	-0.09510	-7.81889	-1.75022
	(0.04)	(0.56)	(1.26)	(1.42)
Percent Adults with High School	-14.57930	-0.38159	-0.49151	-0.02609
	(2.85)	(2.02)	(0.07)	(0.02)
Percent Adults Some College	-5.13894	-0.31554	-14.24410	-3.02343
	(0.77)	(1.16)	(1.55)	(1.68)
Industry Fixed Effects[c]	13	13	13	13
City Fixed Effects[d]	5	5	5	5
Pseudo-R Sq	0.06	0.32	0.04	0.07
Total Obs	1738	1738	1738	1738
Left-Censored Obs	429	429	0	0
Log-Likelihood	-5056.66	-725.29	-6522.62	-3813.82

[a]Dependent variable equals number of high-end (or low-end) employment.
[b]Violent crime includes murder, rape, robbery, and assault.
[c]Industries include electronics, jewelry, books, liquor, furniture, hardware, toys, cameras, computers, sporting goods, prescription drugs, clothing and footwear, and construction materials.
[d]Cities include Chicago, Atlanta, Indianapolis, Houston, and Seattle.

Table 9: Tobit Regressions of the Impact of Violent Crime[a] and Motor Vehicle Theft on the High-End Share of Restaurant Employment
(Absolute values of t-ratios in parentheses are based on robust standard errors)[b]

	High-End Relative to Low-End + Middle-Tier + Chains		High-End Relative to Low-End + Middle-Tier		High-End Relative to Low-End	
Crimes Reported 12:01 am – 8:00 am	-0.00096	-0.00087	0.00012	0.00042	0.00801	0.00882
	(0.60)	(0.53)	(0.05)	(0.18)	(1.56)	(1.70)
Crimes Reported 8:01 am – 5:00 pm	0.00027	0.00038	0.00027	0.00061	-0.00014	0.00074
	(0.27)	(0.37)	(0.20)	(0.46)	(0.05)	(0.26)
Crimes Reported 5:01 pm – 9:00 pm	-0.00356	-0.00336	-0.00632	-0.00568	-0.01727	-0.01566
	(1.52)	(1.45)	(2.03)	(1.84)	(2.64)	(2.40)
Crimes Reported 9:01 pm – 12:00 am	0.00429	0.00453	0.00593	0.0067	0.00729	0.00922
	(1.86)	(1.92)	(1.67)	(1.85)	(0.93)	(1.16)
Burglary	-	-0.00038	-	-0.00121	-	-0.00309
	-	(0.58)	-	(1.33)	-	(1.61)
Employment density (1,000/sq. mile)	0.00010	0.00010	0.00014	0.00014	0.00047	0.00046
	(1.68)	(1.67)	(1.69)	(1.68)	(2.48)	(2.50)
Population density (1,000/sq. mile)	-0.00015	-0.00015	-0.00008	-0.00007	0.00019	0.00020
	(0.90)	(0.89)	(0.32)	(0.30)	(0.31)	(0.33)
Percent Hispanic	-0.03935	-0.03861	-0.05612	-0.05376	-0.16081	-0.15477
	(3.22)	(3.16)	(3.24)	(3.11)	(3.89)	(3.76)
Percent Af.American	-0.05424	-0.05412	-0.07344	-0.07304	-0.21172	-0.21070
	(6.72)	(6.71)	(6.32)	(6.30)	(8.15)	(8.13)
Average Age of Pop.	0.00011	0.00011	0.00032	0.00032	0.00068	0.00068
	(0.32)	(0.32)	(0.60)	(0.61)	(0.50)	(0.51)
Percent Pop. Male	0.05072	0.05008	0.04109	0.03904	0.08932	0.08405
	(1.70)	(1.68)	(0.98)	(0.94)	(0.83)	(0.79)
25th Percentile Family Income (1,000s)	-0.00016	-0.00016	-0.00032	-0.00033	-0.00093	-0.00094
	(0.77)	(0.78)	(1.05)	(1.08)	(1.12)	(1.14)
50th Percentile Family Income (1,000s)	-0.00001	-0.00001	0.00011	0.00012	0.00083	0.00083
	(0.04)	(0.03)	(0.47)	(0.48)	(1.26)	(1.27)
75th Percentile Family Income (1,000s)	0.00010	0.00010	0.00010	0.00010	0.00034	0.00035
	(0.98)	(0.99)	(0.66)	(0.70)	(0.88)	(0.91)
Percent Adults < High School	0.01759	0.01621	0.02355	0.01916	0.04473	0.03358
	(0.86)	(0.78)	(0.82)	(0.66)	(0.65)	(0.48)
Percent Adults with High School	-0.05916	-0.05851	-0.07815	-0.0761	-0.29389	-0.28865
	(2.68)	(2.66)	(2.52)	(2.46)	(3.94)	(3.89)
Percent Adults Some College	0.00315	0.00275	0.02628	0.02498	0.02915	0.02581
	(0.12)	(0.10)	(0.69)	(0.66)	(0.28)	(0.25)
City Fixed Effects[c]	4	4	4	4	4	4
Psuedo R-Squared	-0.14	-0.14	-0.16	-0.16	0.73	0.73
Total Obs	1738	1738	1738	1738	1738	1738
Left-Censored Obs	429	429	429	429	429	429
Right-Censored Obs	0	0	0	0	0	0
Log-Likelihood	1434.61	1434.92	1019.90	1020.64	-94.90	-93.87

[a]Violent crime includes murder, rape, robbery, and assault.
[b]Dependent variable equals (number of employees at high-end non-chain restaurants)/(number of employees at alternate restaurants + number of employees at high-end non-chain restaurants). High-end, Middle-Tier, and Low-End restaurants are defined as described in the Appendix.
[c]Cities include Chicago, Atlanta, Indianapolis, and Houston.

Appendix A: Defining High-End Restaurants

This appendix clarifies how we grouped single-site restaurants into high- and low-end establishments. As indicated earlier, we first split single-site restaurants into different size categories, and reviewed the distribution of sales within each size category. Table A-1 presents those data. We examined the patterns in Table A-1 and defined high-end stores based on what appeared to be natural breaks in the distribution.

A single-site restaurant is considered to be high-end if it has 1-24 employees and sales are greater than $0.5 million, 25-49 employees and sales are greater than $1.0 million, or 50-99 employees and sales are greater than $2.5 million.

A restaurant is middle-tier if it is a single-site establishment and has 1-24 employees and sales are between $0.2 and $0.5 million, 25-49 employees and sales are between $0.5 million and $1.0 million, or 50-99 employees and sales are between $1.0 million and $2.5 million.

A single-site restaurant is low-end if it has 1-24 employees and sales are less than $0.2 million, 25-49 employees and sales are less than $0.5 million, or 50-99 employees and sales are less than $1.0 million.

Table A-1: Number of Restaurants in 2007:Q3 By Sales and Number of Workers

	Annual Sales in Millions of $						
	Under $0.2	$0.2 to $0.4	$0.5 to $0.9	$1.0 to $2.4	$2.5 to $4.9	$5.0 to $9.9	$10.0 to $24.9
1 to 9 employees	3791	245	33	10	0	1	0
10 to 24 employees	16	1345	117	42	1	0	0
25 to 49 employees	4	17	438	68	7	0	0
50 to 99 employees	0	2	14	222	13	2	1

[a]Data for this table are based on 1745 census tracts in the cities of Atlanta, Chicago, Houston, and Indianapolis and were obtained from the Dunn and Bradstreet Marketplace file for 2007:Q3.

Appendix B: Supplemental Tables

Table B-1: Tobit Regressions of Retail Share of Establishments by Industry[a]
(Numbers in parentheses are the absolute values of t-ratios based on robust standard errors.)

	Excluding Burglary	Including Burglary	
	Violent + MVT[a]	Violent + MVT[a]	Burglary
Electronics	-0.00204	-0.00045	-0.00454
t-ratio	(1.63)	(0.21)	(0.96)
Total Obs	1661	1661	1661
Left-Censored Obs	37	37	37
Right-Censored Obs	687	687	687
Jewelry	-0.00227	-0.00050	-0.00488
t-ratio	(2.44)	(0.35)	(1.43)
Total Obs	1767	1767	1767
Left-Censored Obs	34	34	34
Right-Censored Obs	499	499	499
Books	0.00139	0.00067	0.00199
t-ratio	(1.64)	(0.51)	(0.63)
Total Obs	1769	1769	1769
Left-Censored Obs	31	31	31
Right-Censored Obs	690	690	690
Liquor	-0.00012	-0.00104	0.00269
t-ratio	(0.17)	(0.75)	(0.73)
Total Obs	1793	1793	1793
Left-Censored Obs	10	10	10
Right-Censored Obs	1026	1026	1026
Furniture	-0.00085	-0.00168	0.00234
t-ratio	(1.72)	(1.91)	(1.14)
Total Obs	1814	1814	1814
Left-Censored Obs	3	3	3
Right-Censored Obs	131	131	131
Hardware	-0.00006	-0.00126	0.00334
t-ratio	(0.07)	(0.80)	(0.87)
Total Obs	1742	1742	1742
Left-Censored Obs	78	78	78
Right-Censored Obs	538	538	538
Toys	-0.00530	-0.00800	0.007667
t-ratio	(3.03)	(2.60)	(1.12)
Total Obs	1665	1665	1665
Left-Censored Obs	98	98	98
Right-Censored Obs	725	725	725
Cameras	-0.00875	-0.00747	-0.00375
t-ratio	(1.67)	(0.94)	(0.20)
Total Obs	648	648	648
Left-Censored Obs	120	120	120
Right-Censored Obs	320	320	320
Computers	0.00155	-0.00604	0.02131
t-ratio	(1.50)	(3.70)	(5.09)
Total Obs	1750	1750	1750
Left-Censored Obs	57	57	57
Right-Censored Obs	451	451	451
Sporting Goods	0.00243	-0.00687	0.02870
t-ratio	(1.92)	(3.11)	(6.05)
Total Obs	1765	1765	1765
Left-Censored Obs	26	26	26
Right-Censored Obs	688	688	688
Prescription Drugs	-0.00038	0.00063	-0.00280
t-ratio	(1.26)	(1.11)	(2.19)
Total Obs	1812	1812	1812
Left-Censored Obs	5	5	5
Right-Censored Obs	357	357	357
Clothing and Footwear	-0.00046	-0.00055	0.00027
t-ratio	(0.84)	(0.60)	(0.13)
Total Obs	1818	1818	1818
Left-Censored Obs	0	0	0
Right-Censored Obs	305	305	305
Constrution Materials	0.00148	-0.00012	0.00448
t-ratio	(2.87)	(0.13)	(2.00)
Total Obs	1812	1812	1812
Left-Censored Obs	9	9	9
Right-Censored Obs	127	127	127

[a]All models include the full set of control variables as reported in Table 6. Violent crime includes murder, rape, robbery, and assault.

Table B-2: Tobit Regressions of the Impact of Violent Crime[a] and MVT on the High-End Share of Restaurant Establishments
(Absolute values of t-ratios in parentheses are based on robust standard errors)[b]

	High-End Relative to Low-End + Middle-Tier + Chains		High-End Relative to Low-End + Middle-Tier		High-End Relative to Low-End	
Crimes Reported 12:01 am – 8:00 am	0.00099	0.00101	0.00136	0.00141	0.00319	0.00333
	(1.10)	(1.11)	(1.25)	(1.29)	(1.89)	(1.95)
Crimes Reported 8:01 am – 5:00 pm	0.00011	0.00013	0.00024	0.00030	0.00044	0.00059
	(0.22)	(0.26)	(0.41)	(0.50)	(0.51)	(0.66)
Crimes Reported 5:01 pm – 9:00 pm	-0.00236	-0.00232	-0.00321	-0.00309	-0.00560	-0.00533
	(2.00)	(1.99)	(2.30)	(2.24)	(2.68)	(2.57)
Crimes Reported 9:01 pm – 12:00 am	0.00086	0.00091	0.00073	0.00087	-0.00034	-0.00001
	(0.71)	(0.73)	(0.48)	(0.57)	(0.14)	(0.00)
Burglary	-	-0.00007	-	-0.00023	-	-0.00052
	-	(0.20)	-	(0.53)	-	(0.81)
Employment density (1,000/sq. mile)	0.00005	0.00005	0.00008	0.00008	0.00016	0.00016
	(2.14)	(2.14)	(2.15)	(2.15)	(2.50)	(2.51)
Population density (1,000/sq. mile)	0.00002	0.00002	0.00007	0.00007	0.00022	0.00022
	(0.21)	(0.21)	(0.58)	(0.59)	(1.02)	(1.03)
Percent Hispanic	-0.01814	-0.01799	-0.02278	-0.02234	-0.04254	-0.04153
	(2.70)	(2.67)	(2.83)	(2.77)	(3.27)	(3.20)
Percent Af.American	-0.0318	-0.03178	-0.03731	-0.03724	-0.06246	-0.0623
	(7.17)	(7.16)	(6.98)	(6.97)	(7.49)	(7.48)
Average Age of Pop.	0.00011	0.00011	0.00010	0.00010	0.00012	0.00012
	(0.53)	(0.53)	(0.38)	(0.38)	(0.27)	(0.27)
Percent Pop. Male	0.0248	0.02467	0.02176	0.02138	0.0254	0.02451
	(1.37)	(1.36)	(1.02)	(1.00)	(0.73)	(0.70)
25th Percentile Family Income (1,000s)	-0.00028	-0.00028	-0.00032	-0.00032	-0.00042	-0.00043
	(2.14)	(2.15)	(2.01)	(2.02)	(1.52)	(1.53)
50th Percentile Family Income (1,000s)	0.00013	0.00013	0.00020	0.00020	0.00038	0.00039
	(1.35)	(1.35)	(1.63)	(1.63)	(1.76)	(1.76)
75th Percentile Family Income (1,000s)	0.00009	0.00009	0.00008	0.00009	0.00012	0.00012
	(1.48)	(1.48)	(1.10)	(1.12)	(0.92)	(0.94)
Percent Adults < High School	-0.00255	-0.00281	-0.00508	-0.00591	-0.00461	-0.00647
	(0.22)	(0.25)	(0.37)	(0.43)	(0.21)	(0.29)
Percent Adults with High School	-0.03686	-0.03673	-0.0468	-0.04641	-0.10170	-0.10083
	(3.19)	(3.18)	(3.32)	(3.31)	(4.23)	(4.20)
Percent Adults Some College	-0.00511	-0.00519	-0.00212	-0.00236	-0.00552	-0.00607
	(0.31)	(0.31)	(0.11)	(0.12)	(0.16)	(0.17)
City Fixed Effects[c]	4	4	4	4	4	4
Psuedo R-Squared	-0.12	-0.12	-0.13	-0.13	-0.25	-0.25
Total Obs	1738	1738	1738	1738	1738	1738
Left-Censored Obs	429	429	429	429	429	429
Right-Censored Obs	0	0	0	0	0	0
Log-Likelihood	2213.96	2214.02	2000.91	2000.97	1395.27	1395.49

[a]Violent crime includes murder, rape, robbery, and assault.
[b]Dependent variable equals (number of high-end, non-chain restaurants establishments)/(number alternate restaurants establishments+ number of high-end restaurant establishments). High-end, Middle-Tier, and Low-End restaurants are defined as described in the Appendix.
[c]Cities include Chicago, Atlanta, Indianapolis, and Houston.