Violent Crime, Entrepreneurship, and Vibrant Cities

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Abstract

Although numerous studies have examined the causes of urban crime, relatively few have considered the impact of crime on patterns of urban development. This paper adds to that small literature by assessing the degree to which violent crime discourages retail and high-end restaurants, establishments central to a vibrant urban area and nightlife. Our research design compares local retail to wholesale activity within individual industries, and also high-end to lower-tier restaurants. Differencing in this manner helps to strip away common threats from property crime along with the influence of other unobserved factors. Our models also control directly for city fixed effects and a host of census tract socio-demographic attributes, as well as local employment and population density.

Results indicate that higher local violent crime rates depress retail employment relative to wholesale, and that the magnitude of the effect is noteworthy. For the thirteen industries examined, an increase in crime from the 10^{th} to the 90^{th} percentile would reduce retail employment relative to wholesale by roughly 35 percent. Analogous estimates based on a comparison of high- to low-end restaurants are nearly twice as large. These findings indicate that efforts to make distressed portions of cities more vibrant must give consideration to the need to ensure that such areas are safe.

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 than violent crime to the expected penalties of engaging in criminal activity (Kelly (2000)); 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)).[2] 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)).[3] 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 focus is on the impact of violent crime on the presence of retail establishments and high-end restaurants, two industries that are often associated with vibrant neighborhoods and cities. We concentrate primarily on the effect of violent crime on the intra-city location of these industries *relative* to that of other industries. We do this for two reasons. First, as shown in Figure 1, MSA-level retail employment is driven almost entirely by population size. A

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[2]There are many other studies as well, of course. For example, Glaesar and DiPasquale (1997), 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, a question that remains controversial today.

[3] Glaeser and Sacerdote (1999) argue that three mechanisms contribute to higher crime rates in cities relative to suburban areas: the presence of higher valued "targets," lower probabilities of arrest, and the composition of residents including a higher concentration of female-headed households.

regression of MSA retail employment on MSA population yields an R-squared of over 90 percent (based on data from the 2000 decennial census). Thus, violent crime is unlikely to have much effect on a metropolitan area's overall level of retail activity, but may well affect the location of retail activity within a city.[4]

The second reason we focus on the relative location of retail and high-end restaurants is to control for unobserved factors that might otherwise obscure the effect of violent crime. To be precise, we compare the location of retail to wholesale activity in the same industry, and also high-end restaurants to lower-tier establishments. With competitive land markets, locations are occupied by the high bidder, and the comparisons between the different market segments allow us to difference away the influence of unobserved factors, at least as an approximation. Before clarifying, some further background is in order.

Although the literature on the economics of crime has focused predominantly on the causes of crime, several studies have considered the impact of crime on cities and there are lessons to be learned from this literature. 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

[4] 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 non-MSA micropolitan statistical areas were added to the MSA sample.

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.

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 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.

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)).[5]

Building on this literature, we argue that violent crime has a particularly depressive effect on the retail and nightlife sectors of a community's local economy, and that this has a direct and adverse impact on the vitality of city life. Our analysis draws upon detailed crime data for five large U.S. cities in conjunction with Dunn & Bradstreet data on business activity. For thirteen industries, we code data to the census tract level and compare the impact of violent crime (including auto crime in some models) on the location of retail activity relative to wholesale in the same industry. We also consider the location of high-end restaurants to that of other restaurants. In both cases, we argue that the influence of property crime within individual industries differences away approximately allowing us to isolate the impact of violent crime. All of our models further control for census tract socioeconomic attributes and city fixed effects.

Results are consistent with our priors. Violent and auto crime reduce the local presence of retail employment relative to wholesale. Pooling data across thirteen industries, the estimated elasticity of the ratio of wholesale to retail employment with respect to violent crime is roughly 7 percent. This implies an impact of roughly 20 percent when comparing crime rates in the 25th versus the 75th percentile census tract, and roughly 35 percent when comparing the 10th to 90th percentile census tracts. The estimated elasticity is fairly robust across individual industries. Electronics, jewelry, furniture, toys, cameras, computers, prescription drugs, clothing and footwear, and construction materials all have elasticities between 5 and 10 percent. Hardware

[5]Greenbaum and Tita (2004) also consider the impact of murders on the growth of personal service and retail establishments but their data and empirical approach is likely subject to concerns that their key control measures are endogenous.

and liquor have the largest elasticities, both of which are over 10 percent, while books and sporting goods have the smallest elasticities, with estimates below 3 percent.

Analogous results are obtained for high- versus low-end restaurants, a key component to a city's nightlife. In this case, we further control for the time of day during which violent crimes occur. Results indicate that violent crime depresses the relative presence of high-end restaurants, and especially so for crimes committed during the prime dinner hours. Moreover, the magnitude of the effects is roughly twice as large relative to the wholesale/retail comparisons.

Our results confirm that higher violent crime rates discourage retail and high-end restaurant activity relative to other segments of a community's local economy, and that the magnitude of the effect is large enough to be noteworthy. From a policy perspective, these findings 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 local 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.

A primary challenge in the empirical work is to control for the influence of property crime which is both correlated with violent crime and also almost certainly endogenous to the level of activity given that merchandise presents an attractive target. To address this issue we adopt a differencing strategy in which we compare the location patterns of retail to wholesale activity within individual industries, and also high-end to lower-end restaurants. Although this strategy precludes assessment of the overall impact of violent crime on the level of local economic activity, it nonetheless allows us to assess the impact of violent crime on the relative composition of local economic activity. We begin by considering retail activity relative to wholesale.

2.2 Retail versus wholesale

For the retail sector, a defining assumption is that costs increase with property crime (C_p) in a manner proportional to the value of the inventory. Allowing for the quantity of inventory (X), as well as the cost of labor (w), land (r), and the price per unit of inventory (q), we write the indirect cost function as follows,

$$Cost_s = r_s + g(w, q(X)) + C_{p,s} \cdot qX \qquad (2.1)$$

where $g'_w > 0$, $g'_q > 0$, and $q'_x < 0$.

In (2.1), we implicitly assume that retailers inelastically occupy one unit of land and thereby abstract from questions about the impact of crime on the density of development. The first two indicated derivatives, g'_w and g'_q, say that total costs increase with the prices of labor and inventory. The last derivative, q'_x, is important as it says that there are local economies of scale in the provision of retail opportunities.[6] Those economies of scale allow retailers to acquire and market inventory at lower cost when operating at a larger scale, a point we will return to shortly. Notice also that the threat of property crime is assumed to vary spatially across sites (*s*) and increases retailer costs by an additive component in proportion to the cost of the inventory. This will cause bids for land to vary spatially in a manner to be clarified, but is assumed to have no direct impact on the price of labor or the price of inventory.[7]

A second defining assumption of the model concerns the impact of violent crime and auto theft (C_v) on the revenue side of a retailer's problem. We assume that local demand for retail outlets is inversely related to C_v but is unaffected by property crime. Demand for retail outlets also varies across locations with proximity to potential customers, including the residential population (pop_s), local employment (emp_s), and the attributes of these groups (e.g. income, education, etc.). Total revenue is then given by

$$Revenue_s = p(X) \cdot X(C_{v,s}, pop_s, emp_s | p), \qquad (2.2)$$

where p is the price of retail goods, $p'_x < 0$, and $X'_{Cv} < 0$. In this expression, note that the price charged by a retailer is assumed to decline with the scale of activity, $p'_x < 0$. This is consistent with the assumption above that there are local economies of scale in the provision of retail

[6]For the purposes of our discussion below, it is not necessary for us to distinguish between internal versus external economies of scale in retail activity.

[7]Implicitly, this presumes that property crime does not directly threaten workers at the retail outlet and also does not impact the cost of shipping inventory from wholesale establishments to the retail outlets (which would affect *q*).

opportunities, and that with competitive markets, these cost savings are passed on to consumers in the form of lower product prices.

Differencing the revenue and cost functions, profit associated with retail activity at location s is given by,

$$\pi_s = p(X)X(C_{v,s}, pop_s, emp_s | p) - r_s - g(w, q(X)) - C_{p,s} \cdot qX \,. \qquad (2.3)$$

Setting π_s to zero (with competitive markets) and solving implicitly for a retailer's bid for land at location s yields,

$$r_{s,retail} = p(X)X(C_{v,s}, pop_s, emp_s | p) - g(w, q(X)) - C_{p,s} \cdot qX. \qquad (2.4)$$

This expression makes clear that a retail shop owner's bid-rent for land varies spatially with both violent crime and property crime. Property crime enters through the cost function. Violent crime has a direct impact on local demand for retail opportunities, and that in turn has an indirect effect on cost because of economies of scale in retail activity.

It is useful to also note that the impact of violent crime on a retailer's bid-rent is almost certainly negative, although in principle, the sign of the relationship is potentially ambiguous. Differentiating $r_{s,retail}$ with respect to $C_{v,s}$ yields,

$$\partial\, r_{s,retail} / \partial C_{v,s} = \{p'_x \cdot X'_{Cv} + p_x(X) \cdot X'_{Cv}\} - \{g'_q \cdot q'_x\} - \{C_{p,s} \cdot (q\, X'_{Cv} + q'_x\, X'_{Cv} \cdot X)\}. \qquad (2.5)$$

The first bracketed term reflects the impact of violent crime on total revenue. In a strict sense, the sign of this term is ambiguous: violent crime reduces the size of the local retail sector reducing revenue for a given price, but that same decline in activity dampens local scale economies causing the price of retail goods to increase. The second bracketed term reflects the impact of violent crime on retailer costs apart from property crime. The sign on this term is negative given the assumption that violent crime reduces the scale of local retail activity, causing the price of acquiring and marketing inventory to increase. The third bracketed term reflects the impact of violent crime on the value of inventory lost to property crime. The sign of this term is also ambiguous: to the extent that violent crime depresses the size of the retail sector, the quantity of inventory lost to property crime will decrease (thieves cannot steal what is not there), but the price of inventory will increase owing to the reduced scale economies.

Summarizing, the signs of the first and third bracketed terms in (2.5) are ambiguous while the sign of the second term is negative. In principle, this suggests that the qualitative impact of violent crime on retail activity is uncertain. In practice, however, unless scale economies and property crime are especially sensitive to even small shifts in the level of retail activity, it seems nearly certain that the overall derivative in (2.5) is negative. This would say that an increase in the local rate of violent crime would reduce a retailer's bid for land. We provide evidence of this relationship later in the paper.

It would be appealing to estimate (2.4) directly as this would provide measures of the impact of violent and property crime on the willingness of retailers to bid for a given location. In practice, however, direct estimation of (2.4) is difficult because one would need to observe a given establishment's bid for space at multiple locations. In addition, and particularly relevant to this study, property crime ($C_{p,s}$) is certainly endogenous given that valuable inventories create targets for criminal activity. In principle, one could address this concern by instrumenting for $C_{p,s}$. However, it is difficult to come up with valid instruments since most drivers of property crime at the local level likely also have a direct impact on the retailer's bid-rent function (e.g. attributes of the local population). Instead, and to address both challenges just noted, we apply a differencing strategy that compares the location of retail establishments to that of wholesalers in the same industry. To clarify, consider now the wholesaler's problem.

Wholesalers are assumed to ship their products to retail outlets by truck throughout the metropolitan area. We assume that shipping costs are comprised of fixed loading and unloading fees, along with line-haul costs that increase with distance. Loading and unloading fees are assumed to dominate the overall cost of shipping between wholesalers and retail outlets. Accordingly, we further assume that wholesalers do not take proximity to retail units or proximity to residential population into account when choosing their location within a given city. On the other hand, we do assume that wholesaler costs are sensitive to proximity to other employment as this may affect opportunities to secure intermediate services (e.g. legal, accounting, and other business services).

Two additional assumptions are central to our differencing approach. First, because wholesaler inventories are comprised of the same items as are stored at retail outlets, we assume that the local risk of property crime has the same impact on the corresponding bid-rent functions for wholesalers and retail outlets, at least approximately. Second, 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, and as a consequence, do not affect the wholesaler's bid-rent function.[8]

Given these assumptions, wholesaler revenue does not vary with the wholesaler's location in the city, but the wholesaler's costs do vary spatially with property crime. The wholesaler's bid-rent function is given by,

$$r_{s,wholesale} = qX_{wholesaler} - h(emp_s, w) - C_{p,s} \cdot qX_{wholesaler}. \qquad (2.6)$$

Subtracting the wholesaler bid-rent from that of the retailer and rearranging yields,

[8]A weaker assumption that would yield similar results is that wholesaler profits are less sensitive to local rates of violent crime as compared to retail outlets.

$$r_{s,retail} - r_{s,wholesale} = p(X)X(C_{v,s}, pop_s, emp_s | p) - g(w, q(X)) - C_{p,s} \cdot qX \qquad (2.7)$$

$$- (qX_{wholesaler} - h(emp_s, w) - C_{p,s} \cdot qX_{wholesaler}]$$

$$= p(X)X(C_{v,s}, pop_s, emp_s | p) - g(w, q(X)) - qX_{wholesaler} + h(emp_s, w).$$

An important assumption implicit in (2.7) is that the influence of property crime differences away when comparing the bid-rents of retailers and wholesalers in the same industry. Moreover, given the assumption that violent crime reduces retailer bid-rent, and assuming that wholesaler bid-rent is not affected by violent crime, it follows that $r_{s,retail} - r_{s,wholesale}$ declines with violent crime. With a single crossing of the bid-rents, retailers will occupy areas with low rates of violent crime while wholesalers will occupy more hazardous locations. The qualitative nature of this prediction is testable and forms the basis for the empirical work to follow.

2.3 High-end restaurants versus other restaurants

The analysis above can also be applied to restaurants. In this instance we assume that restaurants are not targets of property crime as they offer relatively little in the way of valuable merchandise, and also to the degree that many restaurants rely on credit card transactions. High-end restaurants take on the role of retailers, while other restaurants take on the role of wholesalers. We also note that high-end restaurants operate predominantly during the prime dinner hours, while lower-end restaurants derive a greater share of their revenues during regular daytime business hours. The risk of violent crime, however, varies over the day, and is likely greater at night when it is dark and fewer people are present. For these reasons, $C_{v,s}$ likely differs between low- and high-end restaurants and in a manner that varies with the time of day, denoted below by the *time* subscript on $C_{v,s}$.

Bearing these points in mind, the bid-rents for high- and low-end restaurants are given by,

$$r_{s,high} = p_{high}(X_{high})X(C_{v,s,time}, pop_s, emp_s | p_{high}) - g(w_{high}, q_{high}) \quad (2.8a)$$

$$r_{s,low} = p_{low}(X_{low})X(C_{v,s,time}, pop_s, emp_s | p_{low}) - g(w_{low}, q_{low}). \quad (2.8b)$$

We assume that high-end restaurants secure high-quality labor and other inputs (e.g. food) at prices w_{high} and q_{high}, respectively, that exceed their counterparts at low-end restaurants. This translates naturally into higher priced meals at high-end restaurants ($p_{high} > p_{low}$). Both types of restaurants are sensitive to proximity to population and employment which are demand shifters. We also anticipate that high-end restaurants are relatively more discouraged by violent crime during the prime dinner hours given that is their primary period of operation. This prediction will be tested.[9]

III. Data and empirical specification

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,[10] Chicago,[11] Houston,[12] Indianapolis,[13] and Seattle.[14] 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.

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

[9] 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 further contribute to a tendency of high-end restaurants to avoid unsafe areas relative to lower-end restaurants.
[10] http://www.atlantapd.org/
[11] www.chicagopolice.org
[12] http://www.houstontx.gov/police/index.html
[13] www.indy.gov/eGov/IMPD/
[14] www.cityofseattle.net/Police/

crimes as this ensures that a consistent definition of crime is used across cities.[15] When measuring violent crime, we sum together incidents of murder, rape, robbery, and assault. In some applications, we further add in motor vehicle thefts as this also affects perceptions of safety. 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. In the empirical work to follow 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.

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. To allow for such differences, for this portion of the analysis, we control for crime based on the time of day the incident occurs: midnight to 8am, 8 am to 5pm, 5pm to 9 pm, and 9 pm to midnight.

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[15]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.

Summary measures of the crime data are provided in Table 1, Panels A and B. 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 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 25^{th} and 75^{th} percentile census tracts is 1.57 and 9.71 per month, respectively, a doubling of roughly 2.5 times; for the 10^{th} and 90^{th} percentiles the difference is 0.27 versus 17.86, a doubling of approximately 5 times. Analogous variation is observed in Panel B as well. 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.[16] 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.

[16]We used MapInfo and MapBasic to create the correspondence file that allows us to map zip code geography to 2000 census tract geography.

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 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.[17] In classifying restaurants as high- and lower-end, we examined the distribution of sales within individual restaurant employment size categories. High-, middle-, and low-end establishments were then flagged based on natural breaks in the sales distribution for each size category of restaurants. Further details on this procedure are provided in the Appendix.

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.

[17] 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.

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.

3.3 Empirical specification

Our strategy as described earlier is to estimate the impact of violent crime and other controls on the concentration of activity in one industry segment relative to a comparison segment. In each of our regressions, the dependent variable is designed to take explicit account of this differencing strategy. For the wholesale/retail analysis, we begin by forming the ratio of the level of wholesale activity to retail activity. Depending on the model in question, activity is measured using either counts of establishments or employment at the establishments in question. In addition, we add 1 to the denominator to avoid dropping census tracts in which retail activity is not present in a given industry. The ratio is then formed as follows:

$$RatioWhole_{ij} = \frac{TotalWhole_{ij}}{TotalRetail_{ij} + 1}. \qquad (3.1)$$

where *i* denotes the industry in question and *j* denotes the census tract. To facilitate interpretation of the results, all of our models are estimated in double log form so that the coefficients are elasticities. However, this also complicates measurement for those tracts for which no wholesale activity is present. Accordingly, we add 1 to the ratio before taking logs and our dependent variable for the wholesale/retail analysis becomes:

$$\log\left(RatioWhole_{ij}\right) = \log\left(\frac{TotalWhole_{ij}}{TotalRetail_{ij} + 1} + 1\right). \qquad (3.2)$$

To allow for the censoring, we estimate our models using Tobit specifications that account for zeros in the log ratio.

An analogous measure is constructed for our analysis of high-end relative to other restaurant activity. Specifically, the dependent variable in those regressions is given by

$$\log\left(RatioHighEnd_{ij}\right) = \log\left(\frac{TotalHighEnd_{ij}}{Alternate_{ij}+1} + 1\right). \quad (3.3)$$

As will become apparent, 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.

In all of the regression models to follow, certain features are common and are highlighted here to facilitate the discussion. To allow for censoring, as noted above, all of the models are estimated using Tobit specifications that account for the presence of zeros in the dependent variables. Robust standard errors are used throughout. In addition, all of the models include an extensive array of census tract socio-demographic attributes. To conserve space, the coefficients on those variables are presented only for the core tables and are not provided for all of the regressions. All of the models also control for city fixed effects and, where applicable, industry fixed effects as well.

Two additional features of the model specifications bear special notice. Our differencing strategy described above is designed to sweep out the influence of property crime and other unobserved local attributes in order to ensure that our estimate of the influence of violent crime on spatial patterns of development is not biased. Nevertheless, the possibility remains that unobserved local factors that drive the composition of economic activity could be correlated with our measures of violent crime causing the violent crime variable to be endogenous. As a robustness check, for each of our regression models, we also report results from an IV approach in which we instrument for violent crime with the number of burglaries in the census tract. In this regard, it is worth highlighting that whereas robbery implies the attempt to take something of value using intimidation and/or violence, burglary refers to theft of property in the absence of threat of violence. For these regressions, note also that we use the Newey (1987) two-step IV-Tobit procedure.

Our IV approach is based on the assumption that burglary is strongly correlated with our measure of violent crime, and also that burglary is exogenous to the local ratio of wholesale to retail activity, or high-end to low-end restaurants, depending on the model in question. As will become apparent, one can test for instrument strength, and perhaps not surprisingly, we find that burglary is a very strong instrument. This eliminates any concerns about weak instrument bias (e.g. Stock and Yogo (2005)). On the other hand, our models are exactly identified and this precludes any attempt to formerly test for instrument exogeneity, even allowing for concerns about the robustness of such tests in overidentified systems (e.g. Sargan or Hansen-J tests). We note, however, that the great majority of burglaries occur at residential sites and not at retail or restaurant establishments.[18] This is suggestive that burglary does not affect the relative bid-rent functions and locations of retail to wholesale, or high-end to low-end restaurants, since such establishments are not likely to be directly affected by burglaries. Accordingly, at least as an approximation, we treat burglary as exogenous. As will become apparent, in most applications there is little difference between the non-IV and IV results.

A final feature of the models that should be noted concerns the measure of economic activity. We utilize two approaches and present results from both. In the first case, economic activity is measured based on counts of establishments. This is the case both for the wholesale/retail analysis, and also for the analysis of restaurant activity. We also report results from a second set of regressions in which economic activity is measured based on the number of workers in a given industry rather than the number of establishments. This allows for the

[18] For Chicago and Houston, our data includes information on the premises as which each crime took place. In Chicago, 81.9 percent of all burglaries were residential and only 2.1 percent were retail. In Houston, about 62.1 percent of all burglaries are residential and only 3.6 percent were retail.

possibility that unusually large establishments may be disproportionately affected by violent crime. Focusing on employment counts also is closer in spirit to the discussion in Section 2 where we assumed that local scale economies in the retail sector reduce the average cost of providing retail goods and lower local prices for retail products and services.

IV. Results

4.1 Wholesale/Retail

Tables 5a and 5b present Tobit estimates of the impact of violent crime on the log ratio of wholesale to retail activity in a given census tract. In Table 5a, business activity is measured based on counts of establishments, while in Table 5b activity is measured based on employment in each sector. Reviewing both tables, it is apparent that on a qualitative basis, the results are identical between the two tables. However, the estimated elasticities are typically two to three times larger for the various control variables when measuring activity based on employment counts, including the impact of violent crime on the composition of local business activity. Taken as a whole, this indicates that the overall composition of employment (wholesale versus retail) is much more responsive to drivers of local wholesale and retail activity as compared to the actual number of establishments. That in turn implies that factors driving the sorting of wholesale and retail activity into different locations disproportionately affect larger companies. To maintain focus on the core issues in this paper, we choose not to pursue this issue here. Instead, in the discussion below, we tend to emphasize results based on employment rather than establishment counts. Bearing that in mind, we focus now on Table 5b.

Table 5b presents results from four models that differ in their definition of violent crime and also whether the models are estimated using an instrumental variables approach. However, the coefficients on the variables apart from violent crime differ little across the four models, and we focus on those coefficients first. In viewing the models, recall that with all variables in logs the estimated coefficients are elasticities. In addition, all of the coefficients have been scaled by 100. Thus, a reported coefficient of 10 would indicate a 10 percent elasticity.

Retail establishments are likely especially sensitive to proximity to potential customers. Not surprisingly, therefore, in all of the models in Table 5b, observe that population density has a strong negative effect, with an elasticity of roughly 8.5 percent. This indicates that census tracts with a higher population density – and proximity to potential retail customers – have a lower ratio of wholesale to retail employment, or equivalently, a relatively higher concentration of retail activity. Interestingly, the opposite result is obtained for employment density, for which the elasticity is approximately positive 10. Possibly this indicates that wholesalers benefit from proximity to other businesses (e.g. business service establishments), and also that local workers may shop closer to home rather than in the census tract in which they are employed.

The elasticities on the demographic attributes of a census tract's residential population are somewhat harder to interpret, in part because of the overlapping influence of various indicators of socio-economic status. The presence of African Americans and an older population both sharply reduce the wholesale to retail share of local employment, with elasticities of roughly – 30 percent and – 20 percent, respectively. These results are suggestive that such communities value having retail outlets nearby, though other explanations could also possibly be offered. The coefficients on the 25th and 50th percentile income in a census tract are positive, but small and insignificant, indicating that the bottom half of the income distribution in a census tract appears to have little influence on the composition of local business activity. In contrast, the elasticity on the 75th percentile of a tract's income distribution is roughly 7.5 percent and significant. This indicates that there is some tendency for retail activity to be relatively less present in higher income communities, but the effect is not large. Notice also the coefficients on the distribution of education. For this group of variables, the omitted category is the percentage of the census tract residential population with a college degree. Bearing that in mind, the positive and significant elasticities on the percent of population with less than high school, high school degree, or some college (with elasticities of roughly 10 percent, 23 percent, and 13 percent, respectively), are suggestive that local economic activity is relatively more skewed towards retail as opposed to wholesale activity in more highly educated communities. While some of these demographic results are difficult to interpret in a precise manner, they help to explain variation in the local composition of economic activity. Along with the industry and city fixed effects that are also included in the models, and the controls for density, these measures help to strip away factors that might otherwise confound our analysis of the impact of violent crime on the wholesale/retail composition of local economic activity. Accordingly, we now focus on the impact of crime.

In Table 5b, observe that the elasticity of the wholesale/retail composition with respect to violent crime is 6.49 percent in column 1 and 6.59 percent in column 2 when automobile theft is included in the crime measure. Instrumenting for violent crime using burglary increases these elasticities slightly (in columns 3 and 4, respectively), moving the elasticities up to 8.02 and 7.03, respectively. On balance, these results are consistent with our priors and indicate that a doubling of violent crime would increase the local ratio of wholesale to retail employment by roughly 6.5 to 8 percent depending on the preferred model specification. These estimates are also highly significant.

Tables 6a and 6b revisit this analysis but stratify the regression models by industry for each of the thirteen industries in the sample. Results based on establishment counts are in Tabled 6a while estimates based on employment are in Table 6b. As before, the qualitative patterns are identical but the elasticities are larger when measuring business activity using employment. Also as before, we focus on the latter set of results.

In Table 6b, crime elasticities for each industry are presented down the rows while each column pertains to a different model specification as in Tables 5a and 5b. Recall that all of the previous model controls are included in each of the industry-specific regressions, but are not reported to conserve space.

As before, the estimates are largely similar across the different model specifications, but there are some important exceptions. For electronics, the non-IV estimates are 3.64 and 4.20 for the two different measures of violent crime, respectively, while the IV estimates are larger, roughly 8 percent and 7 percent, respectively. The IV estimates are also noticeably larger for liquor but smaller for cameras. For the other industries, the non-IV and IV estimates are quite similar. As before, in all instances, burglary is very strongly correlated with the measure of violent crime. Provided that burglary is exogenous, the magnitudes of the IV estimates are more reliable. Accordingly, we focus on the IV estimates in the discussion below.

Concentrating on the two far right columns, it is evident that violent crime increases the local wholesale/retail mix of employment for a wide range of industries, but the magnitude of the effect differs. The largest effect is obtained for the liquor industry, for which the elasticity is 22 to 25 percent depending on the measure of violent crime. For this industry, there appears to be a particularly strong tendency for shoppers to avoid visiting retail outlets in unsafe areas.

Hardware and cameras both have elasticities in the neighborhood of 10, indicating that these industries also are quite responsive to safety. With two exceptions, the remaining industries all have elasticities between 5 and 10, including electronics, jewelry, furniture, toys, computers, prescription drugs, clothing and footwear, and construction materials. The two industries with the smallest elasticities are books (roughly 3 percent) and especially sporting goods, for which the elasticity in the IV models is below 2 percent. It is difficult to say precisely how the variation in response across industries should be interpreted. Very generally, the socio-economic mix of individuals that patronize retail establishments likely differs across industries, and those industries most dependent on customers sensitive to consumer safety will likely locate away from unsafe areas.

4.2 Restaurants

Tables 7a and 7b report results for the analysis of restaurant activity, with business activity measured by establishment counts in Table 7a, and by employment counts in Table 7b. As discussed earlier, the dependent variable is set equal to the log ratio of high-end restaurants to lower-end restaurants. The first set of models in the table compares high-end restaurants to all other restaurants, including lower-end, middle-tier, and chain restaurants. The second set of models compares high-end restaurants to lower-end plus middle-tier establishments. The third and final set of models compares high-end restaurants to just lower-end facilities. The progression across these three sets of models is designed to create an increasingly sharp comparison between two segments of the restaurant industry that likely draw on very different clientele and also operate at different times of the day (with high-end operating predominantly during prime dinner hours).[19]

The most distinctive feature with respect to the structure of Table 7 is that violent crime is measured separately for four different periods of the day for reasons also described earlier. Specifically, crime is entered separately for crimes occurring between midnight to 8 am, 8 am to 5 pm, 5 pm to 9 pm, and 9 pm to midnight. The remaining control measures in the models are identical to those used for the wholesale/retail analysis.

Finally, for the restaurant analysis we only report results from non-IV models. We do this for two reasons. The first is that with time-of-day measures of violent crime, we increase the number of needed instruments. Although burglary could be measured by time of day, in practice, this does not seem a viable strategy. The second reason is that the evidence from Tables 5 and 6 suggest that estimates for the non-IV and IV models were quite similar, and it seems likely that this would carry over to the restaurant analysis.

Comparing estimates across Tables 7a and 7b, as with the prior analysis of wholesale/retail activity, the qualitative nature of the results are largely the same regardless of whether we measure economic activity based on the number of establishments or employment. With regard to magnitudes, also as before, the estimated elasticities are larger when we use employment to measure the response of high- and lower-end restaurant activity to violent crime. We focus on these latter estimates, which are presented in Table 7b.

In Table 7b, several general patterns are apparent. First, notice that for any given pair of columns for which the dependent variable is the same, the estimated elasticities are quite similar

[19]The manner in which restaurants are characterized as low-, middle-, and high-end is as described earlier and is discussed in detail in the Appendix. Briefly, recall that we identify non-chain high-end facilities by selecting out restaurants with unusually high sales volumes for each of several different size classes of restaurants, where size is measured by the number of employees.

regardless of whether motor vehicle theft is included with violent crime as our measure of crime. Second, observe that as one reads across the columns from left to right, with relatively few exceptions, the elasticities in the two far right columns are largest. Recall that those two models provide the sharpest comparison of the three sets of regressions in that we include only low-end restaurants in the denominator with high-end in the numerator. It is not surprising, therefore, that the elasticities are larger for that model.

Before discussing the crime coefficients, we first briefly comment on the other control variables. As before, employment and population density have opposite and highly significant effects. Focusing on the far right columns, the elasticities with respect to employment and population density are roughly 7.9 and – 3.3. This pattern seemingly indicates that high-end restaurants tend to be attracted to business centers and less to residential neighborhoods, presumably to cater to business dinners, although this is speculative. Larger concentrations of minority families (as measured by percent Hispanic and percent African American) have large, negative, and highly significant impacts on the relative presence of high-end restaurants (with elasticities of roughly – 24 and – 38 percent, respectively). Very likely, minority status is a proxy for low wealth communities which would reduce demand for high-end restaurants. Higher income at the upper end of a census tract's income distribution (the 75th percentile) increases the relative presence of high-end restaurants, but the effect is modest (an elasticity of roughly 5.75) and only marginally significant. Somewhat larger and negative elasticities are obtained for the share of the local population with no more than a high school degree (elasticities of roughly 30 percent) indicating that high-end restaurants are less prevalent in less educated communities.

The effect of crime is clearly time-of-day dependent. In the far right column, observe that the elasticity associated with violent crime (plus MVT) is roughly – 13.6 for crimes committed during the prime dinner hour (5 to 9 pm). As the evening progresses, however, this effect disappears: the elasticity is only 2.6 and not significant for crimes committed between 9 pm and midnight. Between midnight and 8 am, the corresponding elasticity rises to 8.13 (with a t-ratio of 2.78), and then falls back to 2.05 for crimes committed during “regular” business hours of 8 am to 5 pm (with a t-ratio of just 0.85).

How should these time-of-day patterns be interpreted? We offer the following scenario that strikes us as a likely explanation and which fits the data. High-end restaurants operate primarily during prime dinner hours. For reasons argued earlier, we believe this is why violent crime committed during these hours deters the presence of high-end facilities. However, as the evening wears on, high-end restaurants begin to close. By midnight, most high-end restaurants will have closed down, but not so for many lower-end facilities. Because low-end restaurants are more likely to be operating between midnight and 8 am as compared to high-end establishments, it is the low-end facilities that are most affected by crimes committed during those hours. This would result in corresponding shifts of the respective bid-rent functions, with high-end restaurants outbidding low-end establishments for space in locations subject to violent crime between midnight and the early morning hours, all else equal. 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, some of which do a lunch business, and the relative impact of violent crimes committed during this part of the day becomes more similar for high- and low-end restaurants.

4.3 Magnitudes

From the discussion above, we see that violent crime in the local community discourages retail and high-end restaurant activity, at least as compared to wholesale and lower-end restaurant activity, respectively. It is important to also note the magnitude of these effects. Recall from Table 1 (Panels A and B), that the difference in violent crime associated with the 25^{th} versus the 75^{th} percentile tract in our sample entails a doubling of the number of crimes roughly 2.5 times. A shift from the 10^{th} to the 90^{th} percentiles entails a doubling of the roughly 5 times. Using an elasticity of 7 for the crime effect on the wholesale/retail employment ratio in Table 5b, the $25^{th}/75^{th}$ tract difference in crime would cause a shift in the wholesale/retail ratio of employment equal to roughly 20 percent; for the $10^{th}/90^{th}$ tract difference the corresponding effect would be a roughly 35 percent change. When considering high-end to low-end restaurant employment, as in the far right columns of Table 7b, the elasticity associated with violent crime during prime dinner hours is roughly 12 percent and the corresponding differences for the $25^{th}/75^{th}$ spread and the $10^{th}/90^{th}$ spread for crime during this part of the day are roughly 30 percent and 60 percent, respectively. These magnitudes make clear that violent crime has an economically important impact on the complexion of a local community.

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 examining the impact of violent crime on the relative concentration of retail and high-end restaurant establishments, industries often associated with a vibrant community, and night life.

Our conceptual model makes clear that the impact of violent crime on the location of retail and high-end restaurant activity within a city is potentially ambiguous. However, under reasonable assumptions about scale economies both in the provision of retail services and the threat of property crime, we anticipate that high local rates of violent crime discourage local retail and high-end restaurant activity. Our estimates confirm that prior.

For thirteen industries examined, an increase in violent crime from the 10^{th} to the 90^{th} percentile across census tracts in our sample would reduce retail employment relative to wholesale by roughly 35 percent. For high-end restaurants relative to low-end restaurants the effect is nearly twice as large, and especially for violent crime occurring during the prime dinner hours. These findings underscore that policy efforts to make distressed portions of cities more vibrant must ensure that such locations are safe.

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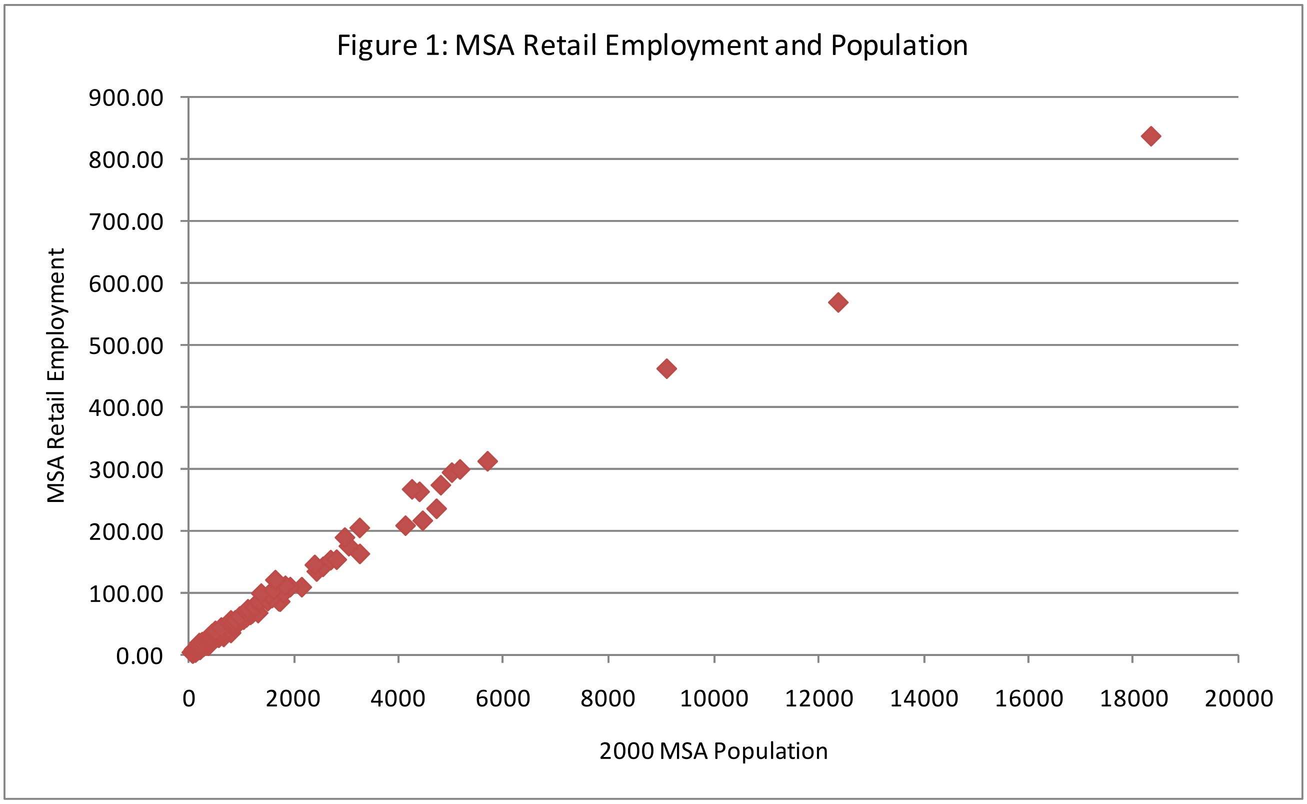

[a]Data obtained from the 2000 decennial census (http://www.census.gov/csd/susb/susb05.htm).

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	0	0	0.13	0.29	0	1.14	0.8	2,443
Rape	0	0	0.13	0.29	0.57	0	3.43	0.24	5,860
Robbery	0.10	0.53	1.54	3.42	6.30	0	36.57	2.73	80,546
Assault	0.13	0.78	2.50	5.86	11.00	0	45.29	4.36	124,790
Motor Vehicle Theft	0.30	1.14	2.71	4.86	8.14	0	31.14	3.70	131,830
Burglary	0.38	1.43	3.57	6.42	10.29	0	48.71	4.84	166,257
Violent Crime[d]	0.27	1.57	4.53	9.71	17.86	0	79.86	7.40	?
Violent Crime + Motor Vehicle Theft	0.75	2.93	7.48	14.57	24.71	0	98.57	11.11	?

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	10.13	17.71	0	79.86	7.70	213,560
Violent Crimes 12:01 am – 8:00 am	0.05	0.32	0.93	1.93	3.41	0	18.00	1.45	48,110
Violent Crimes 8:01 am – 5:00 pm	0.14	0.73	2.00	4.57	9.29	0	41.57	3.73	84,768
Violent Crimes 5:01 pm – 9:00 pm	0.07	0.38	1.00	2.29	4.14	0	18.43	1.73	46,365
Violent Crimes 9:01 pm – 12:00 am	0.00	0.14	0.47	1.10	1.97	0	7.43	0.79	34,317
Violent Crime + Motor Vehicle Theft (MVT)	0.82	3.43	7.77	14.88	25.39	0	98.57	11.52	342,400
Violent + MVT 12:01 am – 8:00 am	0.14	0.57	1.51	2.89	5.00	0	22.43	2.20	73,947
Violent + MVT 8:01 am – 5:00 pm	0.29	1.33	3.29	7.00	12.79	0	55.29	5.50	133,327
Violent + MVT 5:01 pm – 9:00 pm	0.15	0.71	1.71	3.37	5.71	0	21.86	2.55	75,341
Violent + MVT 9:01 pm – 12:00 am	0.03	0.29	0.86	1.78	3.00	0	9.90	1.27	59,785

[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	25^{th} Percentile	50^{th} Percentile	75^{th} 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	25^{th} Percentile	50^{th} Percentile	75^{th} 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

	25^{th} Percentile	50^{th} Percentile	75^{th} 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

	25^{th} Percentile	50^{th} Percentile	75^{th} 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	1039.55	2139.64	4016.87	.000048	1327325.00	5376.34
Population Density	3381.71	6740.13	15766.48	0.00	93100.00	10986.69
Percent Hispanic	0.02	0.09	0.35	0.00	1.00	0.22
Percent African American	0.03	0.14	0.82	0.00	1.00	0.36
Average Age	30.33	33.55	36.93	15.75	80.00	33.82
Percent Male	0.46	0.49	0.51	0.00	1.00	0.49
25th Income Percentile	17.50	22.50	37.50	5.00	175.00	27.96
50th Income Percentile	27.50	42.50	55.00	5.00	200.00	48.32
75th Income Percentile	47.50	67.50	87.50	5.00	200.00	75.26
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 5a: Tobit Regressions of the Ratio of Wholesale to Retail Establishments
(Dependent and independent variables are in logs; Coefficients are scaled by 100; absolute values of t-ratios in parentheses are based on robust standard errors)[a]

	Tobit Models		IV-Tobit Models[c]	
Violent Crime (count)[b]	2.33	-	2.58	-
	(17.98)	-	(16.84)	-
Violent Crime + Motor Vehicle Theft [b]	-	2.23	-	2.25
	-	(18.95)	-	(16.80)
Employment density	3.43	3.39	3.43	3.39
	(31.34)	(31.07)	(43.45)	(43.03)
Population density	-2.86	-2.84	-2.92	-2.85
	(19.66)	(19.82)	(27.14)	(26.81)
Percent Hispanic	-0.50	-1.26	-0.75	-1.30
	(0.54)	(1.36)	(0.81)	(1.39)
Percent Af.American	-10.64	-10.61	-11.01	-10.65
	(16.20)	(16.33)	(17.06)	(16.69)
Average Age of Pop.	-5.72	-5.99	-5.80	-6.00
	(7.14)	(7.46)	(8.07)	(8.35)
Percent Pop. Male	-4.08	-4.94	-4.30	-5.00
	(1.29)	(1.56)	(1.76)	(2.04)
25th Percentile Family Income	0.35	0.36	0.37	0.37
	(1.06)	(1.09)	(1.13)	(1.12)
50th Percentile Family Income	-0.29	-0.25	-0.31	-0.25
	(0.46)	(0.39)	(0.58)	(0.47)
75th Percentile Family Income	2.79	2.80	2.81	2.80
	(4.93)	(4.94)	(5.92)	(5.90)
Percent Adults < High School	-2.65	-1.77	-2.69	-1.76
	(1.80)	(1.20)	(1.95)	(1.28)
Percent Adults with High School	-0.95	-0.83	-1.16	-0.85
	(0.65)	(0.57)	(0.87)	(0.64)
Percent Adults Some College	7.09	7.55	6.89	7.53
	(3.44)	(3.68)	(4.07)	(4.46)
Industry Fixed Effects[d]	13	13	13	13
City Fixed Effects[e]	5	5	5	5
First Stage Coefficient on log of Burglary	-	-	84.95	96.78
First Stage t-ratio on log of Burglary	-	-	221.42	249.54
Pseudo-R Sq	-2.25	-2.26	-	-
Censored Obs	8289	8289	8289	8289
Total Obs	23426	23426	23426	23426
Log-Likelihood	6428.02	6446.99	-	-

[a]Dependent variable equals log(number of wholesale establishments/(number of retail establishments + 1) + 1).
[b]Violent crime includes murder, rape, robbery, and assault.
[c]IV-Tobit models were estimated using Newey (1987) two-step procedure using Stata.
[d]Industries include electronics, jewelry, books, liquor, furniture, hardware, toys, cameras, computers, sporting goods, prescription drugs, clothing and footwear, and construction materials.
[e]Cities include Chicago, Atlanta, Indianapolis, Houston, and Seattle.

Table 5b: Tobit Regressions of the Ratio of Wholesale to Retail Employment
(Dependent and independent variables are in logs; Coefficients are scaled by 100; absolute values of t-ratios in parentheses are based on robust standard errors)[a]

	Tobit Models		IV-Tobit Models[c]	
Violent Crime (count)[b]	6.49	-	8.02	-
	(12.62)	-	(12.77)	-
Violent Crime + Motor Vehicle Theft [b]	-	6.59	-	7.03
	-	(14.11)	-	(12.76)
Employment density	10.03	9.91	10.01	9.90
	(28.53)	(28.23)	(31.12)	(30.77)
Population density	-8.47	-8.50	-8.84	-8.61
	(16.42)	(16.63)	(19.92)	(19.67)
Percent Hispanic	0.34	-2.29	-1.22	-2.92
	(0.09)	(0.61)	(0.32)	(0.76)
Percent Af.American	-32.44	-32.94	-34.74	-33.64
	(12.38)	(12.66)	(13.09)	(12.83)
Average Age of Pop.	-20.53	-21.42	-21.01	-21.62
	(6.78)	(7.07)	(7.11)	(7.31)
Percent Pop. Male	0.75	-2.14	-0.63	-2.70
	(0.07)	(0.19)	(0.06)	(0.27)
25^{th} Percentile Family Income	0.61	0.68	0.72	0.71
	(0.45)	(0.50)	(0.54)	(0.53)
50^{th} Percentile Family Income	1.04	1.11	0.90	1.08
	(0.49)	(0.52)	(0.41)	(0.50)
75^{th} Percentile Family Income	7.46	7.54	7.62	7.58
	(3.86)	(3.89)	(3.89)	(3.88)
Percent Adults < High School	10.26	12.78	10.06	12.89
	(1.81)	(2.26)	(1.77)	(2.27)
Percent Adults with High School	23.28	23.27	21.95	22.94
	(4.08)	(4.09)	(4.01)	(4.20)
Percent Adults Some College	13.06	14.01	11.73	13.69
	(1.79)	(1.93)	(1.68)	(1.97)
Industry Fixed Effects[d]	13	13	13	13
City Fixed Effects[e]	5	5	5	5
First Stage Coefficient on log of Burglary	-	-	84.95	96.78
First Stage t-ratio on log of Burglary	-	-	221.42	249.54
Pseudo-R Sq	0.15	0.15	-	-
Censored Obs	8426	8426	8426	8426
Total Obs	23426	23426	23426	23426
Log-Likelihood	-14930.73	-14910.94	-	-

[a]Dependent variable equals log(number of wholesale employees/(number of retail employees + 1) + 1).
[b]Violent crime includes murder, rape, robbery, and assault.
[c]IV-Tobit models were estimated using Newey (1987) two-step procedure using Stata.
[d]Industries include electronics, jewelry, books, liquor, furniture, hardware, toys, cameras, computers, sporting goods, prescription drugs, clothing and footwear, and construction materials.
[e]Cities include Chicago, Atlanta, Indianapolis, Houston, and Seattle.

Table 6a: Ratio of Wholesale to Retail Establishments by Type of Industry[a]
(Dependent and independent variables in logs; Coefficients are scaled by 100, and numbers in parentheses are the absolute values of t-ratios based on robust standard errors.)

	Tobit Models		IV-Tobit Models[b]	
	Violent Crime[c]	Violent + MVT[c]	Violent Crime[c]	Violent + MVT[c]
Electronics	2.11	2.12	3.62	3.18
t-ratio	(5.69)	(6.30)	(8.20)	(8.23)
Censored Obs[d]	836	836	836	836
Jewelry	2.85	2.49	2.46	2.13
t-ratio	(5.76)	(5.78)	(4.40)	(4.33)
Censored Obs	545	545	545	545
Books	1.23	1.21	1.25	1.11
t-ratio	(3.67)	(3.83)	(3.33)	(3.35)
Censored Obs	725	725	725	725
Liquor	2.43	2.40	3.26	2.87
t-ratio	(5.03)	(5.40)	(5.86)	(5.87)
Censored Obs	1039	1039	1039	1039
Furniture	4.25	4.00	4.45	3.90
t-ratio	(8.10)	(8.57)	(7.32)	(7.32)
Censored Obs	138	138	138	138
Hardware	2.27	2.21	2.92	2.56
t-ratio	(4.84)	(5.08)	(4.98)	(4.98)
Censored Obs	610	610	610	610
Toys	2.62	2.31	2.77	2.41
t-ratio	(6.20)	(6.10)	(5.58)	(5.52)
Censored Obs	863	863	863	863
Cameras	2.63	2.83	3.30	2.91
t-ratio	(3.61)	(4.39)	(3.67)	(3.69)
Censored Obs	1478	1478	1478	1478
Computers	2.84	2.70	2.11	1.83
t-ratio	(4.89)	(5.10)	(3.40)	(3.36)
Censored Obs	518	518	518	518
Sporting Goods	0.77	0.92	0.29	0.23
t-ratio	(1.80)	(2.32)	(0.53)	(0.47)
Censored Obs	742	742	742	742
Prescription Drugs	1.60	1.54	2.02	1.78
t-ratio	(5.75)	(5.88)	(5.32)	(5.34)
Censored Obs	353	353	353	353
Clothing and Footwear	2.38	2.24	2.54	2.23
t-ratio	(7.32)	(7.50)	(6.26)	(6.26)
Censored Obs	307	307	307	307
Construction Materials	2.23	2.15	2.78	2.43
t-ratio	(6.11)	(6.49)	(5.91)	(5.91)
Censored Obs	724	724	724	724

[a]All models include the full set of control variables as reported in Table 2. The dependent variable is defined the same way as in Table 2 as well.
[b]IV-Tobit models were estimated using Newey (1987) two-step procedure using Stata. The coefficient on burglary in the first stage always overwhelmingly passes weak instrument tests.
[c]Violent crime includes murder, rape, robbery, and assault.
[d]All models include a total of 1802 observations.

Table 6b: Ratio of Wholesale to Retail Employment by Type of Industry[a]

(Dependent and independent variables in logs; Coefficients are scaled by 100, and numbers in parentheses are the absolute values of t-ratios based on robust standard errors.)

	Tobit Models		IV-Tobit Models[b]	
	Violent Crime[c]	Violent + MVT[c]	Violent Crime[c]	Violent + MVT[c]
Electronics	3.64	4.20	8.04	7.05
t-ratio	(2.92)	(3.62)	(5.56)	(5.57)
Censored Obs[d]	855	855	855	855
Jewelry	6.21	6.04	8.22	7.19
t-ratio	(5.94)	(6.30)	(5.85)	(5.84)
Censored Obs	545	545	545	545
Books	2.92	3.34	3.10	2.75
t-ratio	(1.58)	(1.87)	(1.47)	(1.48)
Censored Obs	748	748	748	748
Liquor	15.23	16.35	25.15	22.13
t-ratio	(4.03)	(4.81)	(5.92)	(5.95)
Censored Obs	1052	1052	1052	1052
Furniture	7.48	7.49	6.24	5.46
t-ratio	(4.03)	(4.52)	(3.00)	(3.00)
Censored Obs	142	142	142	142
Hardware	10.52	10.00	13.83	12.12
t-ratio	(5.01)	(5.14)	(5.21)	(5.20)
Censored Obs	640	640	640	640
Toys	7.97	7.25	7.57	6.54
t-ratio	(6.09)	(6.18)	(4.97)	(4.89)
Censored Obs	863	863	863	863
Cameras	9.12	11.45	10.33	9.27
t-ratio	(2.26)	(3.07)	(1.96)	(2.00)
Censored Obs	1487	1487	1487	1487
Computers	10.29	9.30	6.34	5.49
t-ratio	(3.98)	(4.10)	(2.32)	(2.28)
Censored Obs	518	518	518	518
Sporting Goods	2.02	3.35	1.81	1.52
t-ratio	(1.10)	(1.97)	(0.75)	(0.72)
Censored Obs	742	742	742	742
Prescription Drugs	4.29	4.29	5.57	4.90
t-ratio	(4.74)	(5.47)	(4.95)	(4.97)
Censored Obs	364	364	364	364
Clothing and Footwear	6.34	6.34	8.97	7.88
t-ratio	(4.86)	(5.28)	(4.69)	(4.70)
Censored Obs	310	310	310	310
Construction Materials	3.80	3.10	6.75	5.93
t-ratio	(2.58)	(2.29)	(3.70)	(3.71)
Censored Obs	135	135	135	135

[a]All models include the full set of control variables as reported in Table 2. The dependent variable is defined the same way as in Table 2 as well.
[b]IV-Tobit models were estimated using Newey (1987) two-step procedure using Stata. The coefficient on burglary in the first stage always overwhelmingly passes weak instrument tests.
[c]Violent crime includes murder, rape, robbery, and assault.
[d]All models include a total of 1802 observations.

Table 7a: Tobit Regressions of the Ratio of High-End to Lower-End Restaurant Establishments
(Dependent and independent variables are in logs; Coefficients are scaled by 100; absolute values of t-ratios in parentheses are based on robust standard errors)[a]

	High-End Relative to Low-End + Middle-Tier + Chains		High-End Relative to Low-End + Middle-Tier		High-End Relative to Low-End	
	Violent[b]	Violent + MVT	Violent	Violent + MVT	Violent	Violent + MVT
Crimes Reported 12:01 am – 8:00 am	0.95	0.93	1.13	1.20	2.14	2.22
	(3.16)	(3.00)	(3.20)	(3.30)	(3.87)	(3.95)
Crimes Reported 8:01 am – 5:00 pm	0.21	0.13	0.35	0.25	0.72	0.47
	(0.73)	(0.40)	(1.04)	(0.69)	(1.48)	(0.87)
Crimes Reported 5:01 pm – 9:00 pm	-1.15	-1.07	-1.41	-1.40	-2.37	-2.27
	(3.13)	(2.73)	(3.35)	(3.10)	(3.86)	(3.39)
Crimes Reported 9:01 pm – 12:00 am	0.16	0.19	0.13	0.15	-0.26	-0.14
	(0.44)	(0.57)	(0.31)	(0.40)	(0.42)	(0.24)
Employment density	0.72	0.73	0.92	0.94	1.58	1.60
	(9.85)	(10.02)	(10.37)	(10.54)	(10.95)	(11.08)
Population density	-0.37	-0.36	-0.50	-0.48	-0.86	-0.82
	(4.46)	(4.36)	(5.01)	(4.88)	(5.60)	(5.43)
Percent Hispanic	-1.16	-1.13	-1.67	-1.63	-3.44	-3.36
	(1.75)	(1.70)	(2.16)	(2.10)	(2.97)	(2.88)
Percent Af.American	-3.69	-3.73	-4.36	-4.41	-6.89	-6.96
	(7.33)	(7.44)	(7.44)	(7.53)	(8.13)	(8.23)
Average Age of Pop.	0.08	0.09	-0.34	-0.31	-1.46	-1.40
	(0.14)	(0.16)	(0.50)	(0.46)	(1.35)	(1.30)
Percent Pop. Male	0.89	1.02	-0.45	-0.35	-2.83	-2.71
	(0.45)	(0.52)	(0.20)	(0.16)	(0.82)	(0.78)
25th Percentile Family Income	-0.25	-0.26	-0.22	-0.23	-0.21	-0.23
	(0.91)	(0.95)	(0.66)	(0.70)	(0.42)	(0.45)
50th Percentile Family Income	0.13	0.10	0.24	0.21	0.53	0.48
	(0.28)	(0.22)	(0.45)	(0.41)	(0.65)	(0.59)
75th Percentile Family Income	0.73	0.75	0.77	0.79	1.23	1.27
	(1.95)	(2.00)	(1.75)	(1.79)	(1.78)	(1.84)
Percent Adults < High School	-1.28	-1.48	-1.37	-1.58	-2.09	-2.48
	(1.18)	(1.37)	(1.08)	(1.26)	(1.12)	(1.34)
Percent Adults with High School	-2.29	-2.58	-3.11	-3.44	-6.53	-7.11
	(2.26)	(2.55)	(2.64)	(2.92)	(3.52)	(3.84)
Percent Adults Some College	0.14	0.01	0.64	0.53	0.16	-0.04
	(0.10)	(0.01)	(0.39)	(0.33)	(0.06)	(0.01)
City Fixed Effects[c]	4	4	4	4	4	4
Pseudo-R Sq	-0.16	-0.16	-0.18	-0.18	-0.30	-0.30
Censored Obs	436	436	436	436	436	436
Total Obs	1745	1745	1745	1745	1745	1745
Log-Likelihood	2610.96	2609.97	2400.63	2400.60	1877.43	1876.85

[a]Dependent variable equals log(number of high-end non-chain restaurants/(number of alternate restaurants + 1) + 1). High-end, Middle-Tier, and Low-End restaurants are defined as described in the Appendix.
[b]Violent crime includes murder, rape, robbery, and assault.
[c]Cities include Chicago, Atlanta, Indianapolis, and Houston.

Table 7b: Tobit Regressions of the Ratio of High-End to Low-End Restaurant Employment
(Dependent and independent variables are in logs; Coefficients are scaled by 100; absolute values of t-ratios in parentheses are based on robust standard errors)[a]

	High-End Relative to Low-End + Middle-Tier + Chains		High-End Relative to Low-End + Middle-Tier		High-End Relative to Low-End	
	Violent[b]	Violent + MVT	Violent	Violent + MVT	Violent	Violent + MVT
Crimes Reported 12:01 am – 8:00 am	0.39	0.56	0.17	0.75	6.97	8.13
	(0.52)	(0.72)	(0.18)	(0.73)	(2.47)	(2.78)
Crimes Reported 8:01 am – 5:00 pm	0.92	1.14	1.19	1.35	2.31	2.05
	(1.10)	(1.26)	(1.00)	(1.04)	(0.88)	(0.72)
Crimes Reported 5:01 pm – 9:00 pm	-2.50	-3.13	-3.80	-4.67	-11.52	-13.62
	(2.57)	(3.12)	(2.84)	(3.37)	(3.54)	(3.96)
Crimes Reported 9:01 pm – 12:00 am	0.47	0.90	1.78	2.13	0.26	2.62
	(0.51)	(1.11)	(1.32)	(1.84)	(0.08)	(0.85)
Employment density	1.40	1.39	2.10	2.10	7.86	7.91
	(6.17)	(6.30)	(6.28)	(6.43)	(10.32)	(10.48)
Population density	-0.33	-0.32	-0.76	-0.75	-3.32	-3.23
	(1.75)	(1.71)	(2.79)	(2.81)	(4.30)	(4.23)
Percent Hispanic	-3.98	-3.75	-5.65	-5.32	-25.13	-24.00
	(2.37)	(2.24)	(2.33)	(2.20)	(3.77)	(3.59)
Percent Af.American	-7.89	-7.93	-11.07	-11.10	-37.95	-38.17
	(5.72)	(5.85)	(5.27)	(5.36)	(7.79)	(7.87)
Average Age of Pop.	0.14	0.23	0.25	0.42	-7.87	-7.37
	(0.10)	(0.17)	(0.12)	(0.21)	(1.33)	(1.25)
Percent Pop. Male	6.72	6.72	4.18	4.18	-3.00	-2.62
	(1.48)	(1.49)	(0.65)	(0.65)	(0.17)	(0.15)
25th Percentile Family Income	0.25	0.22	-0.03	-0.09	0.47	0.31
	(0.39)	(0.34)	(0.04)	(0.10)	(0.18)	(0.12)
50th Percentile Family Income	-1.18	-1.12	-0.64	-0.56	-0.12	-0.11
	(1.05)	(1.01)	(0.43)	(0.38)	(0.03)	(0.03)
75th Percentile Family Income	1.50	1.45	1.37	1.31	5.69	5.75
	(1.60)	(1.57)	(1.06)	(1.02)	(1.56)	(1.58)
Percent Adults < High School	1.65	1.27	3.59	3.14	3.40	1.17
	(0.55)	(0.43)	(0.82)	(0.72)	(0.32)	(0.11)
Percent Adults with High School	-4.28	-4.71	-4.07	-4.70	-29.81	-32.78
	(1.60)	(1.76)	(1.04)	(1.21)	(2.83)	(3.12)
Percent Adults Some College	5.97	5.78	10.18	9.99	13.62	12.64
	(1.53)	(1.49)	(1.79)	(1.76)	(0.98)	(0.91)
City Fixed Effects[c]	4	4	4	4	4	4
Pseudo-R Sq	-0.18	-0.18	-0.26	-0.26	0.51	0.51
Censored Obs	436	436	436	436	436	436
Total Obs	1745	1745	1745	1745	1745	1745
Log-Likelihood	1376.20	1377.71	916.11	917.89	-346.98	-344.79

[a]Dependent variable equals log(number of high-end non-chain restaurants/(number of alternate restaurants + 1) + 1). High-end, Middle-Tier, and Low-End restaurants are defined as described in the Appendix.
[b]Violent crime includes murder, rape, robbery, and assault.
[c]Cities include Chicago, Atlanta, Indianapolis, and Houston.

Appendix: 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.