# "The Industrial Organization of Street Gangs"

by

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### Abstract
*Economists have long studied the determinants and organization of commercial enterprises, but few researchers have applied these theories in the context of criminal street gangs. Past research on street gangs has focused primarily on a single gang's activity or on gang activity in a single city. We examine more broadly the industrial organization of street gangs by using a survey of law enforcement on gang structure, size, and activity in 200 U.S. cities. We identify empirical factors that determine the average gang size, number of gangs in a city, number of gang-related homicides, and gang-related drive-by shootings. In addition, we look at two hypotheses drawn from within the economics literature—the role of ethnic fraction-alization on gang activity and the role gangs perform as protective associations—to better understand criminal street gangs.*

## INTRODUCTION

In the United States, there are approximately one million gang members operating within 20,000 gangs.[1]  Gang activity is growing in suburban areas, and gangs commit a growing percentage of the violence and crime in communities.  In 2008, 58 percent of state and local agencies reported criminal gangs in their jurisdictions, rising from 45 percent only four years earlier.  Some communities report that gangs commit 80 percent of the crime in their jurisdiction.  Gangs actively engage in a diverse set of criminal activities, including armed robbery, assault, auto theft, drug trafficking, extortion, fraud, home invasions, identity theft, murder, and weapons trafficking.  Street gangs represent a large and growing social problem.

Despite the significance of street gangs, we know relatively little about the economics of their organization within communities.  Compared to legitimate industries, such as the airline or car industry, we know little about what economic factors determine the number of gangs, average gang size, and their internal operations.  Case studies and ethnographic evidence (Jankowski 1991; Knox and Skaperdas 2004) show there is a substantial diversity among how street gangs organize and operate.  Some gangs have relatively flat structures with few well-defined roles and others have clearly defined hierarchies and extensively written protocols and rules (Skarbek 2010).  Street gangs can range in size from several people in a small neighborhood to "super gangs," such as the Gangster Disciples street gang, which has nearly 30,000 members in Chicago alone (Knox 2006, 756).  Some street gangs engage in illicit underground exchange, such as narcotics

distribution, and others specialize in coercion, participating in robbery, assault, and murder. Understanding how gangs differ along these dimensions is crucial for policy makers to use resources effectively, as the technology and strategy for deterrence differs depending on these characteristics (see, for example, Kleiman 2009).

This paper uses a dataset based on surveys of law enforcement personnel on the size, structure, and activity of street gangs in both urban and rural communities to examine the industrial organization of street gangs.[2] The economics literature specifically on street gangs is relatively small and lacking clear hypotheses to test, so this paper provides an exploratory analysis of some initial hypotheses.[3] In addition to better understanding factors like average gang size and gang drive-by shootings, we can use these data to examine related issues, such as the quasi-governmental role played by gangs and the effect of ethnic fractionalization on gang activity.

## LITERATURE REVIEW

The economics of crime literature has focused primarily on the determinants of crime (Levitt 2004; Glaeser, Sacerdote, and Scheinkman 1996), its social costs (Anderson 1999), optimal deterrence, (Levitt 1998) and policy implications (DiIulio 1996; Miron and Zwiebel 1995). An interesting though relatively small part of the economics of crime literature focuses specifically on organized crime. Economists have defined organized crime in various ways, choosing to focus on legal definitions, the primary activity of the group, or the competitiveness of the criminal market in which the group acts. We follow Leeson (2007: 1052) in defining organized crime broadly to include any long-term arrangement between multiple criminals that cannot rely on the government to enforce contracts and facilitate coordination. This definition includes groups as diverse as street gangs or 18th century pirates, while still including the most commonly perceived forms of organized crime, such as the iconic Italian Mafia. An important aspect to economists in defining organized crime is focusing on the analytical mechanisms, rather than the observed outcomes that result, so that there is greater predictive and explanatory power of observed variations. The goal is to explain the factors that cause gangs to be, for example, more or less organized and composed of older or younger members, instead of defining a gang by these features. The form that a group takes is an endogenous variable that results from exogenous factors, such as the absence of state enforced contracts and illicit markets. A volume collected by Fiorentini and Peltzman (1995) provides an excellent collection of the economics literature on organized crime.

Most closely related to the economics of crime literature has been research on how organized crime affects crime in general. To the extent that organized crime monopolizes criminal markets, the Mafia may reduce particular criminal activities to gain rents. Buchanan (1973), Backhaus (1979), and Chang, Lu, and Chen (2005) all present theoretical models where the presence of organized crime, under certain conditions, can actually be socially welfare improving compared to a competitive market for crime. Organized crime can increase criminal activity when it provides the governance institutions that make markets possible. The Mexican Mafia prison gang, for example, provides the institutions needed for drug dealers to do business in Los Angeles (Skarbek 2011).

Economists have modeled organized crime as profit-seeking firms that provide goods and services. For example, many street gangs sell illicit narcotics to voluntary consumers and some provide opportunities for prostitution and gambling. Reuter (1985) investigates the industrial organization of bookmaking, numbers operations, and loan sharking in New York City, and he argues that the illegality of the operations prevent taking advantage of economies of scale and outside finance, leading to relatively competitive industries, rather than a Mafia controlled monopoly. Anderson (1979) examines the structure and function of a U.S. crime family and its relationship with legitimate businesses.

In addition to providing illicit goods and services, organized crime often facilitates exchange in legal and illegal markets. Gambetta (1993) examines the Mafia in Sicily and finds that they primarily provided protection services and acted as third-party enforcers of

exchanges.  Organized crime also provides services to legitimate businesses and community groups.  Akerloff and Yellen (1994) model the incentives of community members to inform police about gang crimes, and they argue that gangs will compensate community members for their silence.  Based on several years of observation, Venkatesh (2008) finds that street gangs often assist local non-profits, housing co-ops, and local businesses; by assisting individuals in the community and obtaining their support, gangs enjoy greater safety from police and rival gangs.

There are two primary themes relating organized crime and government.  In the first, governments play a distinctly different role than organized crime.  Organized crime facilitates exchange of outlawed goods and services, such as illegal gambling, prostitution, and narcotics.  Arlacchi (1988) details the development of the Mafia in Italy, examining how the Mafia evolved to serve different functions when acting under different government and economic institutions.  Arising from the prohibition of certain goods, organized crime can sometimes corrupt members of government.  For example, Tanzi (1995) argues that weak governments often find regulation more easily implemented than taxing and spending activities, and that organized crime generates more corruption under these programs.  As a result, reducing corruption under weak-states can best be achieved by limiting the state's role in the economy.

The other theme suggests that governments and gangs perform very similar roles.  Skaperdas (2001) surveys international and historical evidence and argues that organized crime arises when the legitimate government either cannot or will not enforce contracts and protect property rights.  Baumol (1995) argues that theory and evidence suggest gangs should often be analyzed as "quasi-governments."  Grossman (1995) models the mafia as a competitor to the government for producing public services and finds that the competition can be welfare improving when the government is a kleptocracy.  Bandiera (2003) uses historical evidence to show that early Italian Mafioso protected people's land when the legitimate government would not.  Gambetta (1993) shows that the Italian Mafia primarily served the function of protecting property rights.  Similarly, Varese (2001) documents that after the collapse of communism in 1989, the Russian Mafia provided private protection services to businesses.  Milhaupt and West (2000) argue that Japanese organized crime provides services to compensate for the government's inefficient formal legal structures.  In the context of street gangs, Sobel and Osoba (2009) find evidence that gang membership rises in response to increased violence and crime in an area, suggesting that people turn to gangs for their safety when the government fails to effectively protect their rights from crime committed by youths.[4]

While there has been much written on organized crime in general, economists have done much less work specifically on street gangs and most of the research focuses on a single gang or city.  Levitt and Venkatesh's (2000) study of a Chicago drug-dealing street gang provides an interesting look at the finances and operations of criminal enterprise.  However, they note it is unclear how generalizable their results are.  Sobel and Osoba (2009) examine the relationship between street gangs in Los Angeles and measures of crime, including homicide, aggravated assault, and robbery. Grogger (2002) finds a deterrent effect on violent crime in Los Angeles from imposing civil injunctions on street gangs.  These studies inform our knowledge in particular geographic areas but provide few generalizable results.

Social scientists outside of economics have examined street gangs more generally.  Jankowski (1991) studied thirty-seven street gangs from Los Angeles, New York City, and Boston for over ten years; he provides qualitative evidence on their activity and interprets it from a rational-choice perspective.  Venkatesh (2008) followed a gang for several years to understand their internal operations and how it affected the housing projects it operated within.  Similarly, Venkatesh (2006) focuses on the underground economy of the urban poor and provides a rich depiction of how criminals influence the communities in which they live.  Though highly informative, these sources rely heavily on qualitative evidence and are specific to only one or a few cities, so quantitative analysis provides a new empirical contribution.

Criminologists have examined the empirics of street gangs, but do so without the aid of economic theory. Klein and Maxson (2006) survey many of the past street gang studies that rely on quantitative methods. Past work examines gang membership rates in different demographics, geographic regions, and institutional settings and the prevalence of gangs in cities and its relationship to migration patterns. They also investigate individual risk factors for people to join gangs. Klein and Maxson (2006) explain that the research has primarily created typologies for gangs from either a behavioral or structural form.

Economists have provided several theories to explain organized crime based on the assumptions that its members consist of rational, profit-seeking individuals. Schelling (1971) outlines a theory of organized crime-as-extortionist, and he identifies factors that facilitate third-party control, such as whether the crime is a "voluntary" one and the standardization and mobility of the crime. Dick (1995) models the integration of criminal activity based on a transaction cost theory of the firm determined by scale economies, contracting frequency, transaction specificity, and uncertainty. He tests his theory by examining eleven stylized facts about criminal organization and finds the transaction cost theory explains the data well. Gambetta (2009) uses the signaling theory developed by economists to examine the organization and operation of the criminal underworld. Leeson and Rogers (2009) argue that human and physical capital requirements determine the efficient organizational form of criminal enterprise. When entry is relatively low cost and there is competition for resources, each criminal organization faces an over extraction problem. Criminals therefore create hierarchies to mitigate this problem. They find evidence consistent with their theory in the witness statements of former Italian Mafiosi and 17th and 18th century pirates.[5]

## DATA & HYPOTHESES

In this paper, we examine the industrial organization of street gangs using Klein and Maxson's (2000) survey of law enforcement on the structure and activity of gangs in two hundred U.S. cities in 1995. This data allow us to examine factors that affect the number of gangs, the average size of gangs, the use of drive-by shootings by gangs, and gang homicides. These variables are the basis for the four dependent variables we construct to use in our empirical specifications. We provide a list of all of our variables, with their detailed descriptions, sources, and descriptive statistics in Appendix 1. The surveys were administered to experts on gang activity in local municipalities. Experts were identified by examining membership lists for gang investigator associations and recommendations for candidates from law enforcement contacts.[6] The surveyors mailed information about the project to the potential respondents and then made phone calls to them to conduct interviews. The survey uses a stratified random sample of 250 cities out of nearly 800 cities identified in a prior study related to gang migration. The interview survey asks a range of questions, including about basic demographic factors associated with the city, the emergence of gangs, number of active gangs and gang members, ethnicity of different types of gangs, gang homicides and drive-by shootings. The response rate was 80% (201 cities).

The survey data are supplemented with data from state and federal agencies on other aspects, such as crime rates and city population. Street gangs expend resources to protect themselves from prosecution and incarceration, so obtaining information about their industrial organization presents a challenge. However, law enforcement gang experts in a local community expend substantial resources -- through surveillance, interrogations, wiretaps, video recording, and informants -- and are therefore capable of speaking informatively on this topic. Past research relies heavily on information received from law enforcement experts (e.g. Knox and Robinson 2004), so this paper follows the methodology commonly used in studying street gangs.[7] We should note, too, that having been collected in the mid 1990s, the data is not recent and demographic since them might change the analysis. The reader should use appropriate caution.

While our main interest is in conducting an exploratory analysis of how a variety of legal, economic, and demographic factors correlate with these measures of gang structure

and activity, there are two specific hypothesis based on the previous literature we wish to test along the way. These hypotheses are related to the nature of government evolution and the role of ethnic fractionalization (the degree of ethnic heterogeneity). First, the literature on gangs as quasi-governments suggests that they perform similar functions; as a result, the state-formation literature may provide insights into gang formation and evolution in a community.  Nozick (1974) and Buchanan (1975) present theories of governments evolving from protective associations that emerge out of a state of nature.  According to Nozick (1974), because of assumed economies of scale in the provision of protective services, competing protective associations will eventually merge, and in the end become a single monopoly government.  This works suggests two specific empirical predictions we can test with our data.  First, is there evidence of economies of scale for gangs, and second, do we see with the passage of time a movement toward fewer, large gangs within a city.

Second, economists have identified ethnic fractionalization as an important factor in economic development and the role of governments and institutions (see, for example, Alesina and La Ferrera 2005).  Does the degree of ethnic fractionalization also impact the structure and activities of U.S. street gangs?  There are two reasons to suspect that areas with more ethnic fractionalization might witness more gang activity.  First, street gangs tend to form along ethnic (or racial) lines.  A larger number of more fractionalized groups might therefore logically result in more gang activity.  Second, ethnic fractionalization in an area may lead to different outcomes within the public sector provision of government goods and services, causing different demands for the product of gangs in the first place.  The utility received from publicly provided goods declines as diversity increases because of conflicting preferences for the content of those public goods and greater investment in strategic interactions to transfer wealth from other ethnic groups.  Law enforcement must allocate resources among many competing ends, for example, choosing to emphasize deterrence rather than apprehension or focusing on violent versus drug crimes.[8]  As preferences over these factors differ, increasing diversity may lead to less effective public sector resource use. This logic might suggest that greater ethnic fractionalization will lead to a greater street gang presence because communities spend fewer resources publically and do so less effectively. In addition to examining the impact of ethnic fractionalization more generally, we also ask whether the types of racial groups matter, and in particular, whether the proportion of black residents is correlated with gang activity holding constant the overall degree of fractionalization.

We include a measure of ethnic fractionalization using five standard categories: Asian or Pacific Islander, Black, American Indian or Eskimo, White, and Other (U.S. Census Bureau). Ethnic fractionalization (EF) is commonly computed with the following formula:

Prior to discussing our list of independent variables, it is worthwhile to examine some basic descriptive statistics from our raw data to illustrate how much diversity exists among street gangs across the country. While it is seemingly obvious that larger communities will have more gangs, what is not so obvious is why there is so much variance in the number of gangs across cities after adjusting for population (e.g., on a per capita basis). Figure I shows the frequency distribution for the number of gangs per capita (per 100,000 residents) in our data.

While just over 45 of the cities have between 10 and 15 gangs per 100,000 residents, there is a fairly uniform frequency distribution ranging up to 100 gangs per 100,000 residents. Many cities have fewer than ten gangs per capita, but there are also cities that have dozens, even more than one hundred active street gangs per capita. Clearly, city size alone does not account for the different number of gangs.

The average gang size across cities also varies substantially.  Figure II shows the frequency distribution for the average gang size (e.g., average number of members per gang) in the data. The average gang size varies from as low as five gang members to over several hundred.  The average firm size in a legitimate market will differ depending on specific factors, such as the economies of scale and regulations in an industry.  Gangs will be small on average if police can more easily identify prominent gangs, in which case smaller gangs may be less likely to draw the attention of law enforcement. If gang members face additional sentencing due to their status as gang members, then smaller gangs will be safer to join.

Figure III shows the frequency distribution for the age of gangs in the cities in the data. The data reports how many years gangs have been active in each city (years gangs have existed in the city prior to 1995).  Many cities have had active gangs for fewer than ten years, but several cities have had gangs for 50 or more years.  To test Nozick's theory of state formation we will see whether how long gangs existed has predictably reduces the number of gangs in the city.

In our subsequent regressions we include many other variables of interest.  We include variables to account for city population, from Klein and Maxon (2000), and because youth and young adults may be more likely to engage in gang crime, we include the percent of the city whose population is aged 15 to 24 years old (from the U.S. Census Bureau). We include a commonly used measure of weather in the city, 'accumulated heating degree-days,' which indicates how far below 65° F the temperature goes throughout the year. Temperature can affect gang activity by altering how much time gang members, community members, and potential victims spend outdoors.  In addition, the literature on crime finds that the weather can affect the frequency and timing of criminal activity (Cheatwood 1995; Cohn 1990; Jacob, Lefgren, and Moretti 2004).

If gangs are modeled as quasi-governments rather than as profit-seeking firms, then just as Tiebout competition is important to understanding how governments provide services to its citizens, mobility may be an important factor affecting gang organization and activity. To measure population mobility, we include data on the migration rate, which is the sum of in-migration and out-migration (U.S. Census Bureau).  A more dynamic and changing population in an area could conceivably affect both the nature of how repeated are the dealings among individuals (in the game-theoretic sense), and also how easy it is for individuals to escape the area.

We include a measure of ethnic fractionalization using five standard categories: Asian or Pacific Islander, Black, American Indian or Eskimo, White, and Other (U.S. Census Bureau). Ethnic fractionalization (EF) is commonly computed with the following formula:

where $s_i$ is the share of the group $i$ in the total population.  This measure of fractionalization indicates the probably that two randomly drawn individuals from the population belong to different ethnic groups. In addition to including the overall measure of ethnic fractionalization, we also include the percent black to control for differential impacts of different ethnic groups.

While all of the variables discussed so far are included in every specification we have other variables which we include in only some of the specifications.  The first set are those variables measuring differences across areas in the minimum ages to drop out of school and to obtain a drivers' license (and also a drivers' permit). If young people are less mobile because they cannot drive, then they will be more subject to abuse by gangs. On the other hand, the ability to drive may facilitate gang members' criminal activity.  Driving may also increase the optimal gang size by lowering transportation costs, as guarding one's turf is cheaper, and by increasing a gang's territory, driving may increase the pool of potential gang recruits.

The second set of variables we include in some specifications but not others are variables that some might argue could be endogenous that reflect crime, drug activity, and

law enforcement efforts in the area. The illicit drug use rate for individuals twelve and older is included as drug users are often the consumers demanding services from gangs, so greater consumer demand may lead to a greater number or average size of gangs within a city. Police expenditure measures the police protection percentage of total general expenditure for 1996-1997 for cities with more than 25,000 population. As police expenditure increases, the average size of gangs may decline. Violent crime per capita measures the aggravated assaults and murders by state in 1995. As Sobel and Osoba (2009) show, increased crime leads to more demand for gangs and higher gang membership. Some states also have laws providing for special enhanced penalties for gang related crime, and we include a dummy variable to indicate if the area has these enhanced sentencing provisions. The additional punishment may lead to smaller optimal gang size as small gangs can more easily avoid identification by authorities than a large gang can. Again, details for all of our variables can be found in Appendix 1.

## RESULTS

### Gangs Per Capita

Table I provides our regression results examining the number of gangs per capita. There are four specifications showing how the results change with and without including the minimum age variables, and the variables reflecting drug use, crime, and law enforcement. City population is negative and significant at the 1% level in each specification, strongly suggesting the presence of economies of scale. Larger cities do have more gangs, but the number of gangs does not grow proportionately. The percentage of the population between the ages of 15 and 24 is positive but not significant. Despite our finding suggesting economies of scale, the second part of the hypothesis linking gang activity to Nozick's (1974) government formation argument, that the number of gangs falls with the age of gangs in a city as smaller gangs merge into larger protective organizations, receives little support. The age of gangs is significant in two of the four specifications, but even in those two it is of the wrong sign. Rather than finding that the number of gangs falls with age, the coefficients are positive suggesting the number of gangs increases through time. However, once the crime, drug, and law enforcement variables are included, the age of gangs is insignificant in explaining the number of gangs per capita.

Ethnic fractionalization is positive and significant at the 1% level in the second, third, and fourth specifications. This provides some support to the prediction that more fractionalized communities face greater gang problems. The percentage of the population that is black is negative and significant at the 5% level in three specifications, suggesting that which groups are represented matters as well. More fractionalized cities tend to have more gangs per capita, but less if this fractionalization is comprised of a larger share of blacks (relative to other groups such as Hispanics, for example). The migration rate, measuring population mobility, is positive but only significant in one specification. Similarly, heating degree days is significant in only one specification (where it is positive). The variables measuring the minimum ages are also not very important in explaining the prevalence of gangs, with only one significant result for the age of drivers' license being positive.

The variable measuring illicit drug use is insignificant, as are the two variables measuring law enforcement efforts. Crime, however, is positive and significant in the two specifications in which it is included. Taken at face value these results would suggest that drugs and law enforcement efforts do not significantly alter the total number of gangs in an area, but that the underlying level of crime does. Consistent with the findings of Sobel and Osoba (2009), we find that more crime in an area leads to more people forming gangs for protective purposes. However, because of the possibility of reverse causality (gangs causing more crime) we do not place too much emphasis on this result as an overall conclusion.

**Average Gang Size**
          Table II presents the regression results using the average gang size in each city as the dependent variable.  Again we run the same four specifications for our independent variables.  The age of gangs is positive in all specifications, suggesting gangs get larger with the length of time in a city, but this result is significant in only two of the specifications. City population is positive and significant in all specifications suggesting larger cities have larger equilibrium gang sizes. Ethnic fractionalization is positive in all specifications, suggesting it leads to larger gang sizes, but it is significant in only one specification.  Two variables that were insignificant in explaining the number of gangs per capita are significant in explaining average gang size: drug use and enhanced gang penalties.  Our results suggest that both larger drug use and more severe legal punishments lead to smaller equilibrium gang sizes The remaining variables are all insignificant.

**Drive-by's Per Capita**
          Drive-by shootings often garner media attention because of their effect on innocent bystanders.  Our analysis of drive-by shootings per capita, in Table III, finds that this infamous practice increases in frequency with the age of gangs as this variable is positive and significant at the 1% level in two specifications.  In one specification the percent black is positive and significant at the 5% level.  The underlying rate of crime in the area is positively related to drive-by shootings, and interestingly the police enforcement budget is also positive and significant.  This may suggest that increased police enforcement efforts lead to more drive by shootings as a means of gang activity.  Drive-by shootings, almost by definition, are designed to flee the scene quickly and avoid leaving evidence or being apprehended.  Increased police budgets may increase the relative cost to gangs of leaving behind evidence and witnesses, so gangs engage in more drive-by shootings.
          Unlike our previous two specifications, which examine the number and size of gangs, this regression and our next examine what might be considered an output or product of gang activities.  Thus, here we also include our measures of the number of gangs per capita and average gang size to see if they impact the number of drive-by shootings per capita.  Both are highly significant in all specifications.  Drive-by shootings per capita grow with both the number of gangs per capita and with the average size of gangs.

**Homicides Per Capita**
          Our final set of regression results examines the number of gang homicides per capita, shown in Table IV.  Migration is significant (and negative) in one specification, although only marginally.  On the other hand, again our measures of the number of gangs per capita and average gang size are significant.  A larger number of gangs per capita is associated with more gang homicides and this is significant in all specifications.  In two of the four, average gang size is positive and significant. Taking the results from Tables III and IV together suggests that gang drive-bys and homicides increase both with the number and average size of a city's gangs.

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**CONCLUSION**
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          Gang crime is a large and growing social problem facing communities today. Past research on street gangs has focused on a single gang or gang activity in a single city.  As a result, few generalizable results about the factors that determine gang structure have been put forth.  Using a survey of law enforcement personnel from 200 U.S. cities, we analyzed the factors that explain average gang size, number of gangs, gang homicides, and gang drive-by shootings.  Our findings suggest that both the number of gangs per capita and their average size are positively affected by the number of years that gangs have been active in the particular city.  Larger cities do have larger gang sizes, but the number of gangs does not grow proportionately with population.  Larger cities have fewer gangs per capita, consistent with the idea that gangs experience economies of scale.  The fact that the number of gangs does not decline through time in a city as smaller ones merge into fewer large gangs is

interesting, and contrary to what would be hypothesized based on the evolution of government literature (e.g., Nozick 1974).

The rate of illicit drug use and the presence of enhanced sentencing penalties for gang members are both associated with smaller average gang size. The number of gangs in a city per capita is positively associated with the amount of violent crime suggesting that people do indeed turn to gangs for protection in areas with high pre-existing rates of underlying violence. Ethnic fractionalization in a community tends to lead both to a larger number of gangs per capita, as well as larger average gang sizes. The type of fractionalization matters, however, as the percent black (holding constant the degree of fractionalization) is negatively correlated with the number of gangs per capita. This would suggest that other racial groups, such as Hispanics, tend to result in more gang activity than do blacks.

In addition to our results examining the number and size of gangs, we also examine the number of gang homicides and drive by shootings – two of the most notorious and frightening aspects of gang activity. Both are highly correlated with the number of gangs and their average size. Cities with more gangs, or larger gangs, experience more gang related homicides and drive-by shootings. Interestingly, however, ethnic fractionalization is not significantly associated with either gang homicides or drive-by shootings.

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**Notes:**

[1] Data on gang activity and crime in this paragraph is from National Drug Intelligence Center (2009).

[2] Industrial organization traditionally studies firm behavior, the boundaries of the firm, and firm relationships with markets. This differs from the social organization literature and has a more narrow focus.

[3] Related research examines the finances of an urban street gang (Levitt and Venkatesh 2000) and issues related to employment opportunities and the IQ of gang members (Seals 2009a; 2009b).

[4] Since at least Schelling (1971), organized crime has been closely associated with extortion. While the former has received relatively more attention, research examining the welfare implications, strategic interactions, and signaling of organized criminal groups and extortionists exists (Konrad and Skaperdas 1997; Konrad and Skaperdas 1998).

[5] Recent work has overcome the challenge of analyzing covert criminal enterprises by examining historical documents about 17th and 18th century pirates. In a series of papers, Leeson (2007, 2009a, 2009b) identifies the mechanisms used to establish order onboard ships at sea and to facilitate plundering expeditions, examines the role of competition for illicit labor in reducing racial discrimination, and analyzes the collective decision institutions of pirates as a real world example of a "social contract" among criminals.

[6] Like any data source, this presents certain challenges. If is feasible, though not observed, that law enforcement activity can be influenced by political pressures, public opinion, the media, and crime reporting.

[7] Alternative information sources in studying gangs include ethnographic evidence (see Jankowski's (1991) outstanding study) and internal gang documents confiscated by law enforcement and personal accounts from former gang members (Skarbek 2010).

[8] Benson (1990) provides an excellent overview of the trade-offs faced in the enterprise of law.