Private Investment in the Public's Interest?
The Case of Business Improvement Districts and Crime in New York City

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New York City has experienced an unprecedented drop in crime that began in the early 1990s. Neighborhoods throughout New York City, however, experienced varying degrees of crime reduction. One of the reasons for this sub-municipal heterogeneity in crime reduction could be localized private investments in crime prevention. In fact, a number of New York City commercial areas formed nonprofit business improvement district (BID) organizations during the 1990s to provide local public amenities, including private security. Since then, BIDs have proliferated in cities across the globe, based largely off of their presumed effectiveness at neighborhood revitalization and public service supplementation. Many of these BIDs couch their formation in crime-prevention and in this paper we explicitly test how BIDs influence crime at the neighborhood level. We rely on a difference-in-differences design to estimate the effect of BID formation and security spending on crime and employ several counterfactuals to test the robustness of the results. Preliminary results show that BIDs are associated with increases in crime, especially non-violent ones. There is some evidence that, for BIDs with higher levels of security-related spending, crimes do go down. Future analyses will further refine strategies to tease out the BID-induced effect on crime, including models that use time-varying information on BID-level security spending and an alternative comparison group of commercial clusters that have not formed BIDs (matched with actual BID commercial clusters). In addition, we plan to incorporate information on 311 complaint calls to observe lower-level nuisance-related incidents and how their activity responded to BID formation. The findings from this research have implications for the effectiveness and value of public-private coordination in municipal-wide and neighborhood-based crime control strategies.

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New York City experienced an unprecedented drop in crime beginning in the early 1990s. Much of the credit for this crime drop has been given to the expansion of the New York City police force, the adoption of the CompStat program, and more aggressive enforcement of misdemeanor laws (Levitt, 2004; Zimring, 2011). There have been other explanations offered, including the improvement in the housing market and gentrification (Schwartz et al., 2003) and a shift in the crime-prone age population (Karmen, 2000). Private individuals and firms also play a role in determining the effectiveness of the criminal justice system, and the quality and availability of criminal opportunities (Clotfelter, 1978; Ehrlich, 1981; Cook, 1986). But the leading scholarly articles explaining the crime drop during the New York City have largely ignored the role of the private sector.

Neighborhoods throughout New York City, however, experienced varying degrees of crime reduction. One of the reasons for this sub-municipal heterogeneity in crime reduction could be localized private investments in crime prevention. In fact, a number of New York City commercial areas formed nonprofit business improvement district (BID) organizations during the 1990s to provide local public amenities, including private security. Business improvement districts (BIDs) are a particularly promising institution for harnessing private action to cost-effective crime control. A BID is a nonprofit organization created by property owners or merchants in a defined geographic area to provide supplemental public services, including public safety (Briffault, 1999). These organizations are chartered in New York City, as in most jurisdictions, through a legal process that gives them the power to tax all the owners or merchants in the district for providing additional services. Given that BIDs aim to boost street traffic and commercial activity, it is theoretically ambiguous whether they will increase or reduce crime. BIDs that focus on crime reduction may help to reduce crime but other BIDs may increase crime. Previous evaluations of BIDs in Los Angeles indicate that they reduce crime and arrest rates, at least when they focus resources on security (Brooks 2008; MacDonald et al. 2010; Cook and MacDonald, 2011), with no evidence of crime displacement.

We are unaware of any empirical investigation of their effects on crime in New York City, the U.S. locality with the most BIDs to date. In what follows we estimate how BIDs have affected different types of crime in New York City. We use several alternative identification strategies. First we undertake a precinct-level analysis over the period from 1990 to 2007 that compares crime changes within precincts after BID formation with changes in other precincts in which BIDs would form at a later date. We also test for dosage effects, by testing whether any BID effect is larger when BID coverage and/or security spending is higher. Second, we create a BID-level dataset to compare crime changes within BIDs after their formation with crime changes in areas in which BIDs would form at a later date. This formulation is similar to the precinct-level one, but using a more precise operationalization of the "treated" area. Finally, we conduct an analysis using blockface level crime data from 2004 through 2014 that examines whether, after BID formation, crime changed on blockfaces within BIDs more than on blockfaces outside the BID but still in the same neighborhood. Using the blockface-level data we also conduct a dynamic panel analysis to test for the timing and duration of effects and to control for pre-BID crime trends.

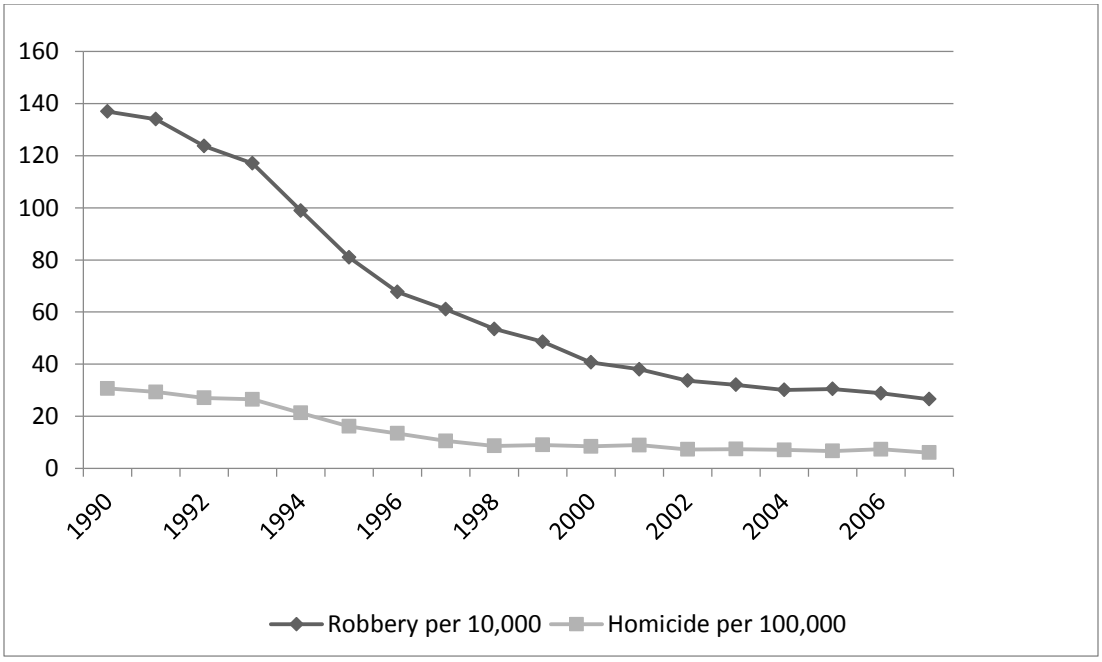
We begin with a brief discussion of the crime drop in New York City, followed by a more detailed description of how BIDs are created and managed in New York. Subsequent sections discuss the data and methods of our analysis, the results, and conclusions based on the estimated reductions in crimes.

1. The Crime Drop in New York City

The great crime decline during the last three decades represents both a happy and an unexpected story. We know the trend is real, rather than an artifact of the available data, since it is found in three independent sources – the FBI's Uniform Crime Reports, the National Crime Victimization Survey, and the homicide series in the Vital Statistics (Cook and Laub 2002). We also know that the most pronounced crime drop of any major city occurred in New York City and this has been substantiated from a comparison of official NYPD crime statistics, coroner's reports (Zimring, 2011), and a supplemental analysis of restricted NCVS data for just the city (Langan and Durose, 2004). The causes of this decline have been the subject of much speculation, and many have debated the role played by the NYPD (Karmen, 2000; Rosensfeld et al., 2005).

Figure 1 depicts robbery and homicide rates between 1990 and 2005 for New York City. Victimization rates for robbery dropped by 28% from 1990 to 1994, and then dropped another 70% from its 1994 level by 2005. Criminal homicide followed a remarkably similar pattern (r=.99). And, as others have shown (Zimring, 2011) this trend was not isolated to specific boroughs of the city.

Figure 1. Robbery and Homicide Trends in New York 1990-2014



Property crime rates also began a slide in the early 1990s, but the drop was not as steep as violent crimes. Property crime rates fell by 27% from 1990 to 1994, and then

dropped another 63% of its 1994 level by 2005. This may not be a surprise, given that national data suggest that property crime rates began their slide two decades earlier, and have declined rapidly since 1980 (Cook and MacDonald, 2011).

The extraordinary reduction in violent crime during the 1990s has been the subject of extensive exegesis by scholars (Blumstein and Wallman, 2000; Cook and Laub, 2002; Zimring, 2007; Blumstein and Wallman, 2006), and New York City has played a central role in this debate. Experts didn't predict the decline in New York City, and a number have suggested that what occurred in New York was not due to idiosyncratic policing strategies (Levitt, 2004; Rosenfeld et al. 2004). Levitt (2004), for example, notes that the decline was quite universal across the U.S., affecting all ages and races, and the most pronounced in large cities with populations over 250,000. In fact, all the 25 largest cities experienced noteworthy declines in homicide rates from their peak year (mostly in the early 1990s) to 2005, declines that ranged as high as 78.5% for New York to 67.2% for San Diego (see http://www.ucrdatatool.gov). Levitt gives partial credit for the crime drop in New York and other large cities to increasing the size of police, and others have found that hiring programs instituted by the U.S. Department of Justice's COPS program were correlated with reductions in crime in major U.S. cities (Zhao et al., 2002; Owens and Evans, 2007).

Others give innovations in policing in New York more credit for the crime drop in that city during the 1990s (Kelling and Bratton, 1998) and the sustained reductions that have occurred since 2000 (Zimring, 2011). New York also experienced a housing boom that substantially changed the demographic makeup of neighborhoods, and that reductions in crime are correlated with increases in property values (Schwartz et al., 2003). However, there is a classic simultaneity problem here, as housing values can be both a cause and consequence of crime rates. Notably, economic growth during the 1990s cannot fully explain the crime drop in New York, since the reduction in crime has been sustained long after this period of economic growth.

We cannot resolve this debate, but we do find it surprising that there has been a lack of discussion of private sector involvement in crime prevention during this period of time in New York. Private crime-prevention efforts include everything from homeowners' locking their doors and installing burglar alarms, to the employment of security guards on streets, and the declining use of cash in sales transactions. The sum total of these efforts is difficult to estimate for New York and elsewhere (Anderson 1999), but there were several marked shifts in private actions in New York City during this time period that coincided with the changes in police force size and innovation.

One notable example of the change in private actions to prevent crime is the growth of Business Improvement Districts (BIDs) in New York during this time period. Importantly, crime prevention was a central focus and justification for the establishment of a number of New York BIDs. Many of the larger BIDs in New York devoted substantial resources to hiring private security guards, which were detailed to street blocks to be an extra set of eyes and ears (Briffault, 1999). BIDs in New York and elsewhere formed in urban areas "to make places attractive – safer, cleaner, and more marketable" (Mitchell 2008; p. 3). However, to the extent that BIDs increase street traffic and commercial activity, they may also make areas more attractive to potential offenders.

While there is a lack of evidence of crime-prevention effects of private security guards in general (Eck 2006; Welsh and Farrington 2009), there is quasi-experimental evidence from studies in Los Angeles that BIDs reduced crime and arrests over and above secular trends (Brooks, 2008; MacDonald et al., 2010; Cook and MacDonald, 2011), and that BIDs that focused a larger share of their resources on private security had the largest reductions in crime (Cook and MacDonald, 2010). The role of BID formation and focus on public safety in New York City, however, has received scant academic attention in the crime drop debate. Related findings on BIDs suggest that they may have a non-trivial influence. Ellen et al. (2007), for example, find that BID formation in New York City is correlated with a significant increase in sale value of commercial property in BID locations relative to surrounding neighborhoods. Importantly, the positive returns to commercial property values stand out independent of the secular upward trend real estate values in New York during the 1990s that research has noted is associated with the crime decline (Schwartz et al., 2003).

An obvious criticism of private security efforts in BID areas is that they displace crime to other unguarded places and that affluent areas will become less willing to support public policing if they can purchase effective private protection (Bayley and Shearing, 2001). If BIDs simply redistribute crime from BID locations to other areas there will be little net public value. While displacement is a legitimate concern, whether it actually occurs remains an empirical matter. Guerette and Bowers (2009), who reviewed 102 evaluations of situational crime prevention interventions, reported that displacement was about as likely as to occur as the opposite, *diffusion* of benefits, and when displacement did occur, the magnitude of the effect was less than the effect of the intervention itself.

With regard to locations that tend to adopt BIDs in New York City and elsewhere there is also an important conceptual point about the value of crime opportunities. Lucrative crime opportunities in central business districts like Times Square in Manhattan are more likely to generate crime than would occur otherwise in the absence of effective security, as wages from street crimes will be higher in these places than in most residential neighborhoods. As Ehrlich (1974) notes the payoffs from crimes "depend, primarily, on the level of transferable assets in the community, that is, on opportunities provided by potential victims of crime (p. 87)." If, for example, the crime environment on the streets in business districts is no longer conducive to robberies of patrons or commuters, then the payoff to crime is reduced and not likely to be displaced to another location. Private security efforts that don't displace crime arguably produce net social benefits. The lack of measurable displacement of crime produced by private security efforts suggest that they are not profitable to the property owners, as they generate externalities that are positive.

2. The Creation of Business Improvement Districts in New York City

Business improvement districts (BIDs) offer an example of private action that combines situational crime prevention activities like employing private security, street sweepers that remove litter and graffiti, and streets signs to mark their boundaries, along with a with a close working relationship with the police. In New York, BIDs are

chartered as special assessment districts. This permits them to tax local land owners and merchants to provide services within a defined district in order to supplement those provided by public agencies. BIDs are managed and operated by private, nonprofit organizations, but they are chartered and regulated by the New York City government. The New York City Department of Small Business Services manages the city's BID program. Although the BIDs in New York have their origin in the Special Assessment Districts established in the mid-1970s, the first official BIDs were created in the early 1980s.[1] In 1981 and 1982 New York state and city passed enabling legislation that allowed the establishment of BIDs. In contrast to their special assessment predecessors, which were typically set up to maintain a single infrastructure or utility project, BIDs permitted property owners to define the territorial boundaries of their district and to provide self-funded services (and often very basic ones).[2] The Union Square Partnership was formed as the first official BID in Manhattan, NY in 1984. Since then, the number of BIDs has steadily increased to 72 BIDs in 2015.

The process for BID formation can be divided into planning, outreach, and legislative authorization stages. The planning starts when an individual or group who wants to form a BID contacts the New York City Department of Small Business Services (SBS). If BID formation is feasible, then the proposing group must submit a statement of need to SBS.[3] Representatives from the proposing group then form a steering committee to write a plan for the BID. The steering committee is supposed to include property owners, residents, merchants, local elected officials, and local community organizations that represent the proposed district. The committee must define tentative boundaries, identify formation resources and funding sources, and establish a project plan. Along with developing the database of constituents and conducting needs assessment surveys, the committee drafts a detailed district plan.

The second stage of outreach involves gathering support from constituents. The steering committee holds public meetings after sending out informational mailings.

[1] The precedent of NYC BIDs was initiated when the city offered then deteriorating commercial areas capital improvements in exchange for some self-funded maintenance in 1970s (NYC SBS, *A Step-by-step Guide*). Thus, by creating an agreement between property owners and the city government along with the passage of state enabling legislation, the first Special Assessment District (SAD) was formed in the Fulton Mall of Brooklyn in 1976. The 165th Street Mall and the Jamaica Center in Queens, and the Nassau Street Mall in Manhattan followed shortly afterwards as special assessment districts. These four special assessment districts became future BIDs since 1980s. The Nassau Street Mall BID, however, was merged with the Alliance for Downtown New York BID in 1997 (NYC SBS, *Best Practice*), after being dissolved by *New York New York City Administrative Code - Chapter 6 - § 25-603.1*.

[2] BIDS are supposed to deliver a range of special provisional services for their districts. According to NYC SBS homepage, the detailed services that BIDs currently deliver are as follows: maintenance (street/sidewalk cleaning, graffiti removal), public safety/hospitality (public safety officers, visitor assistance), business development (commercial vacancy reduction, business mix improvement), marketing (special events, district public relations, promotional materials, holiday decorations), capital improvements (improved streetlights, custom trash receptacles, directional street signage, custom news boxes, flower boxes), landscaping (planting trees/flowers, tree maintenance), and community service (fundraising, charitable events, homeless and youth services).

[3] SBS materials state that that the feasibility of implementing a BID depends on having a sufficient commercial property tax base, stable commercial occupancy (with a vacancy rate less than 20 percent), strong local support (including from local elected officials and community board members), and future development plans. We note, though, that these standards have changed over time, becoming increasingly more stringent.

Through these processes, the committee tracks support through two metrics – the number of supportive property owners and property assessed values of the supporters within the proposed BID boundary. One of these two categories must be more than 50%.[4] When enough support for the proposed BID has been established, documentation of this support are submitted to SBS for official authorization. SBS then submits the district plan to the City Planning Commission, which in turn submits the plan to the local community board, borough board. The local boards hold hearings and make recommendations to the City Planning Commission. After holding public hearings, the City Council must approve the report. The Mayor must then sign the enabling legislation and the State Comptroller must review and formally approve the BID formation.

Once a BID is set up, it is self-governed by a Board of Directors, which hires the managers who operate the BID (NYC SBS, *A Step-by-step Guide* for the below*)*. The board typically consists of the district representatives and public officials. The district representatives, elected by members of the district, represent the interest of commercial property owners, commercial tenants, and residents.

The BID programs and services are funded mainly by special assessments that are collected from the BID's members. Sometimes BID revenues also include special contracts, service fees, investment income, and grants.[5] Assessments are levied on owners of occupied commercial and industrial property, although the distribution of the burden of assessment to those owners varies across BIDs and is determined during the formation process. On average, the BID assessment for a commercial property owners equates to less than 5% of their typical property tax (Schwartz, Ellen and Meltzer 2006). Sometimes the burden of this tax is passed onto tenants through lease contracts. Residential and vacant commercial property owners pay reduced assessments, and all government and most non-profit organizations properties are exempted from assessments. All property owners in a BID boundary that are not exempt must pay the assessment (or be subject to liens on their properties). New York City bills and collects assessments from all the BID members and then redistributes the money back to the organization managing the BID. New York is similar to other states that rely on municipal agencies to collect and transfer assessments to a private sector organization that manages the operations of the BID. Other states rely on the nonprofit organizations managing the BIDs to collect the assessments, but they lack the legal authority to collect fees from delinquent property owners (Briffault 1999; Gross, 2005; Stokes 2006).

New York City has adopted several accountability measures to regulate BIDs. For example, the nonprofit organizations managing BIDs are required to provide the city with financial reports, and the city comptroller's office audits BID organizations to assess whether their internal controls and operating services are compliant with their district plans and to assess the internal financial controls (see Gross, 2005; Background section of each Audit Report for more detailed information). The city posts these financial reports online to create greater public transparency in expenditures and BID operations.
Many of the BIDs in New York City focus their services on sanitation and private security of common public-space areas. As of the end of 2014, there were a total of 72

[4] However, NYC SBS practically demands the ratio of supporters being at least more than 60% (Meltzer, 2008).

[5] In Fiscal Year 2009, the assessment occupied 79% of the total revenues of 64 BIDS, while the other sources did the rest 21% (The BID Annual Report).

BIDs in New York City distributed across each of the five boroughs 9 in Bronx, 23 in Brooklyn, 25 in Manhattan, 12 in Queens, and 3 in Staten Island). The borders of 43 of these BIDs fall within a single police precinct, while 29 BIDs span two or more precincts (especially in Manhattan and Brooklyn). The average start year was 1998. Appendix A displays the 72 BIDs that existed in 2014, their precinct location, and their year of formation. The bulk of BIDs formed in New York City during the crime drop that occurred between 1992 and 2007.

As for size, the average New York City BID area includes 4,130,079 square feet, covering 57 blocks and 295 retail businesses (FY15 Business Improvement District Trends Report). The average BID spent $292,174 on private security, roughly 16% of expenditures for the 69 BIDs that provide data on expenditures. A number of BIDs focus their efforts on redevelopment and enhancing commercial appeal of their shopping districts (see Business Improvement Districts 2009 Spotlight). For these BIDs we wouldn't expect to see smaller reductions in crime attributable directly to their activities, though spending on redevelopment could have some effect on crime. The distribution of security spending is highly skewed; 33 BIDs spent $0 on security, while 8 BIDs spent more than $1,000,000. We take advantage of this skewed distribution in our estimates of BID effects on the crime drop.

Of the 76 police precincts in New York City, a total of 46 include at least one BID formed between 1990 and 2014. Twenty two of these precincts include two or more BIDs (or parts of BIDs) within them. Of those 54 precincts with a BID the average geographic coverage is 5.93% of the land area.[6] Meanwhile, the distribution is much skewed. In 21 precincts, the BID area occupation is less than 1% of precinct. On the other hand, 11 precincts had BIDs that occupied more than 10% of precinct area. The highest is the 14th precinct, representing Times Square, where 56.25% of the precinct covered by the BID boundary. Among the 46 precincts that have any BID, the average security expenditure is $438,062 (in 2008 dollars), with 30% (n=14) of precincts spending more than $100,000 per year on private security, and 37% (n=17) of precincts have no security expenditures by BIDs.[7] To take into account both the amount of territory covered by BIDs in each precinct and the level of security expenditures we standardized each precinct's level of BID funded private security expenditure to the amount spent in per 10,000 square feet for the entire geographic area of the precinct. This results in 12 precincts having more than $100 per 10,000 square feet in private security expenditures in their location. We classify these as high BID security expenditure precincts.[8] Appendix B has the list of BID coverage and security expenditure for each precinct.

3. Data and Statistical Methods

In examining the effects of BIDs on crime, we examine yearly counts of seven officially recorded felony crimes that correspond to the Federal Bureau of Investigation's

[6] This is calculated by taking the sum of BID geography over/sum of precinct geography.
[7] The highest is the 14th precinct: $6,764,108.
[8] The highest is also the 14th precinct at $3,300 per 10,000 square feet of the precinct.

index offenses (homicide, rape, robbery, assault-aggravated, burglary, theft, and auto-theft) by the New York City Police Department (NYPD).

Precinct Level Analysis

In our first, precinct-level analysis, we target the years 1990 to 2007, a time span which encompasses the creation of 59% of 72 New York City BIDs that exist today. (In later drafts, we will extend the analysis beyond 2007.) New York City's 76 police precincts include an average of 110,000 residents. However, daily commuter and tourist numbers mean that the daytime population can be much higher in certain of these precincts. As a result, we don't calculate rates of crime per population because such rates can be misleadingly high in business areas of New York that have daily populations that far exceed their residential population. In addition to looking at total crime, we also examine robbery in particular because the counts are sufficiently high to detect effects and because BID services seek to limit access to street-crimes like robbery by improving the level of social control of public space through private security, increased coordination with the NYPD, and environmental design modifications to areas. Table 1 presents the descriptive statistics on these outcomes for our precinct-level analysis.

Table 1. Summary Statistics for Annual Crime Data in New York Precincts

Crime	Mean	Standard Deviation	Min	Max
Total	5634.96	3714.51	1340	31437
Violent	1367.61	985.87	194	6548
Property	4265.64	3128.54	967	25653
Robbery	723.20	574.43	94	4227

Notes: The data represent 46 NYC precincts over the period 1990–2007. Total crime includes seven crime outcomes (murder, rape, robbery, aggravated assault, burglary, larceny, auto theft). The full sample represents 828 precinct years of crime data (46 precincts*18 years).

Identifying the effect of BIDs on reported crimes is complicated by the fact that areas self-select to form BIDs. To address the potential selection bias we estimated the effect of BIDs on crimes using a longitudinal analysis of precinct-level crime data. The actual process of BID adoption is, by itself, a signal of commitment from property owners to engage in various community change activities. Even after taking into account time-invariant area differences in the average volume of crimes or other precinct-related features, it is difficult to argue that establishing a BID is independent from other factors that may presage drops in crime.[9] We focus our examination on the precincts that eventually were exposed to BIDs in our research design so that we do not have to make any assumptions about the exogeneity of BID formation in precincts. We rely on the timing of BID adoption as our identification strategy for only those 46 precincts that eventually adopted a BID. We assume that shifts in the number of crimes in a given

[9] Ellen et al. (2007), for example, find that BID formation in NYC is correlated with a significant increase in commercial property values in BID locations relative to surrounding neighborhoods.

precinct in a year, is a function of the timing of BID implementation and its private security spending and other unmeasured factors according to the following form:

$$(1)\quad ln(Crime_{pt}) = \mu + \alpha_p + \beta\, BID_{pt}*HighSecurity\$*\%P_{pt} + \gamma\, BID_{pt} + \delta_t + e_{pt}$$

In equation 1, p (=1, …,46) denotes the precinct in which the BID is situated and t the year (=1990,…,2007) of observation, α represents the fixed effect parameter for each precinct, and δ a set of dummy variables for years to control for secular trends that affect all precincts that adopt BIDs. BIDs differ in size, location, management, and priorities - including the scale of private security expenditures. We include a dummy measure (*High Security$*$_{pt}$) of private security spending to capture the effect of varying the BID "dose." This measure is extracted from the annual spending on private security (in 2008 dollars) of BIDs, and used to classify the 12 precincts that spend more than $100 per 10,000 square feet (thus, for these 12 BIDs, =1, and =0 otherwise). To account for the *geographic coverage* of high security spending BIDs in each precinct, we multiply the *HighSecurity$* variable times the geographic proportion (*%P*) of the precinct covered by BIDs. Even though we standardized security spending by 10,000 square foot of geographic coverage, it is important to take into that a greater geographic coverage of high security expenditures in a police precinct should have a clearer relationship to shifting the crime rate. Our prediction is that these BIDs that spend substantial sums on private security over a larger area of a precinct will have a greater effect on crime rates, and indeed, those that do not spend much on security may actually see increases in crime as commercial activity expands.[10] Therefore, β is the estimated BID effect (pre-post) across all precincts that adopt BIDs and spend a considerable amount of resources on private security, controlling for overall time trends. It is plausible that higher-crime neighborhoods tend to have greater crime variability. We rely on Huber/White standard errors corrections to reduce the problem of heteroscedasticity on our estimate of BID security dosage. This approach discounts the influence that high crime rate areas have on the estimate of BID private security dosage by increasing the standard errors.

The specification of the estimated BID effect on crime is extended to include controls for the four years prior to and after BID adoption. We introduce indicators (*T)* which indicate whether a precinct had or will have a BID in place for T = -4, -3,.., 3, 4 years.[11] If BIDs have only short-run effects, this specification should capture those effects directly. If the timing of BID formation is influenced by short-term movements in crime, then the pre-BID coefficients in this formulation should indicate that sort of endogeneity.

$$(2)\quad ln(Crime_{pt}) = \mu + \alpha_p + \beta\, BID_{pt}*HighSecurity\$*\%P_{pt} + \gamma\, BID_{pt} + \delta_t + \theta T_{pt} + e_{pt}$$

[10] We cannot separate out the zero security expenditure BIDs completely from the specification because they occupy the precincts that have some security spending BIDs. Therefore, we chose the high security classification. Also, of the 34 precincts with low security expenditures only precinct 10 spends more than $50 per 10,000 square feet ($89 spent by the 34th Street Partnership BID). However, this BID only occupies 1.46% of the 10th police precinct.

[11] We use this number range to have a balanced panel in our regressions.

BID Level Analysis

We replicate the above specification, narrowing the unit of analysis to the BID area. To create BID-level crime statistics we map point-level crime data into the BID boundaries and aggregate up by BID-year. Since we now rely on point-level crime data (instead of precinct-level), we must restrict the study period to 2004-2014. We run only a panel regression model, similar to that specified above:

(3) $Crime_{dt} = \mu + \alpha_d + \theta T_{dt} + \delta_t + e_{dt}$

Crime, normalized by dividing the count by the total square footage of the BID, is observed for each BID, *d*, at time, *t*. The right-hand side variables echo those in the precinct-level analysis, except we now include BID-level fixed effects, α_d (instead of precinct-level ones). We also allow for long-run effects by extending *T* to cover the duration of our sample (9 pre-BID "lead" indicators and 21 post-BID "lag" indicators). For this analysis we estimate models for total, violent and property felony crimes, as well as for all felonies and misdemeanors more broadly; this is, again, intended to capture any variation in how BIDs affect crimes related to pubic order versus more serious, and perhaps idiosyncratic, offenses.

Blockface Level Analysis

In our final identification strategy, we also use the point-specific crime data from 2004-2014. We aggregate these crimes to the level of the blockface, or both sides of the street along a street segment (Ellen, Lacoe and Sharygin, 2010). We believe this is the most sensible geographic unit, given that BIDs tend to focus activities on street segments (and not city blocks). Plus, many crimes in New York are geocoded to the middle of the street, and thus it not possible to link it to one unique block; but we can link these crimes to a given blockface.

There are 87,221 blockfaces in New York City, and 4.8 percent of them are located inside of BIDs. Table 2 shows summary statistics on crime for these blockfaces. We normalize the crime counts by dividing by the linear frontage of the blockface, which can influence the opportunity for and prevalence of crimes. We report on crimes per 100 feet of frontage. We cannot normalize by population because we do not have reliable data on population at the blockface level, whether daytime or nighttime.

Table 2. Summary Statistics for Annual Crime Data in New York Blockfaces

Crime	Mean	Standard Deviation	Min	Max
Total	1.425	4.407	0	642.6
All Felony	0.501	1.502	0	185.1
Violent Felony	0.266	0.846	0	95.1
Property Felony	0.216	0.769	0	144.4
Misdemeanor	0.586	2.233	0	452.6

Note: All felonies include violent, property, and other felonies like forgery. Total crime includes all felonies, misdemeanors, drug crimes, violations, unclassifiable, and others.

To estimate the impact of BID formation on crime counts, we estimate the following equation:

(5) $Crime_{bzt} = \beta_1 BIDEver_b + \beta_2 BIDPost_{bt} + \beta_3 BIDPost_{bt} * Security_{bt} + \delta_{zt} + e_{bzt}$

where the subscript b denotes the blockface, z the census tract, and *t* the year of observation. *BIDEver* takes on a value of one for blockfaces that are ever part of BIDs during our study period, *BIDPost* takes on a value of 1 for blockfaces that are inside a BID boundary after BID formation, *Security* includes the BID's annual spending on security measures (reported per 1,000 square feet of the BID), and δ represents a set of dummy variables for years to control for secular trends that affect all blockfaces within a given census tract.

4. Results

Precinct-Level Analysis

Figure 2 depicts the average incidence of all felony crimes per year (1990 to 2007) for the precincts that ultimately adopted BIDs and those that did not. This figure makes it clear that precincts with higher crime rates were more likely to see BIDs formed, whether these BIDs formed before or after 1994, but that BID and non-BID neighborhoods followed the same overall downward trend during the 18 years. Therefore, it is important to underscore that we control for overall yearly effects when assessing BID effects on crime at the precinct-level for only those precincts that eventually were exposed to BIDs.

Figure 2. Average Incidents of Total Crimes for BID and Non-BID Precincts

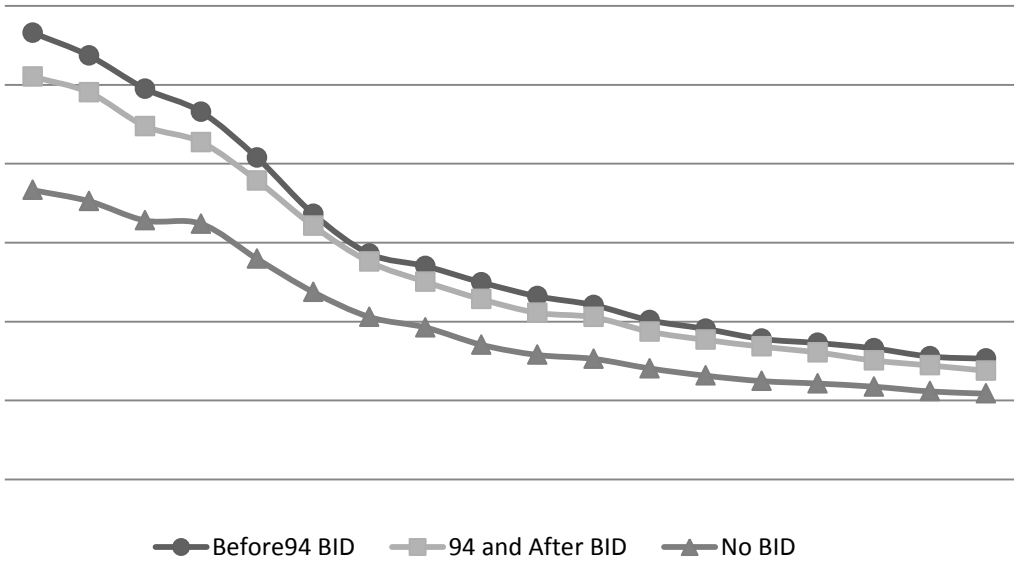


Figure 3 shows a map of the number of BIDs formed in each of the 46 precincts that adopted BIDs. We use the timing of the BID adoptions in these precincts as our identification strategy, with the implicit assumption that the starting year of a BID is an exogenous shock to the precinct trends. In what follows, we offer some partial tests of this assumption.

Figure 3. NYC 64 BIDs on 46 Precincts: Timing of Adoption (Focusing on Low Manhattan and Brooklyn)

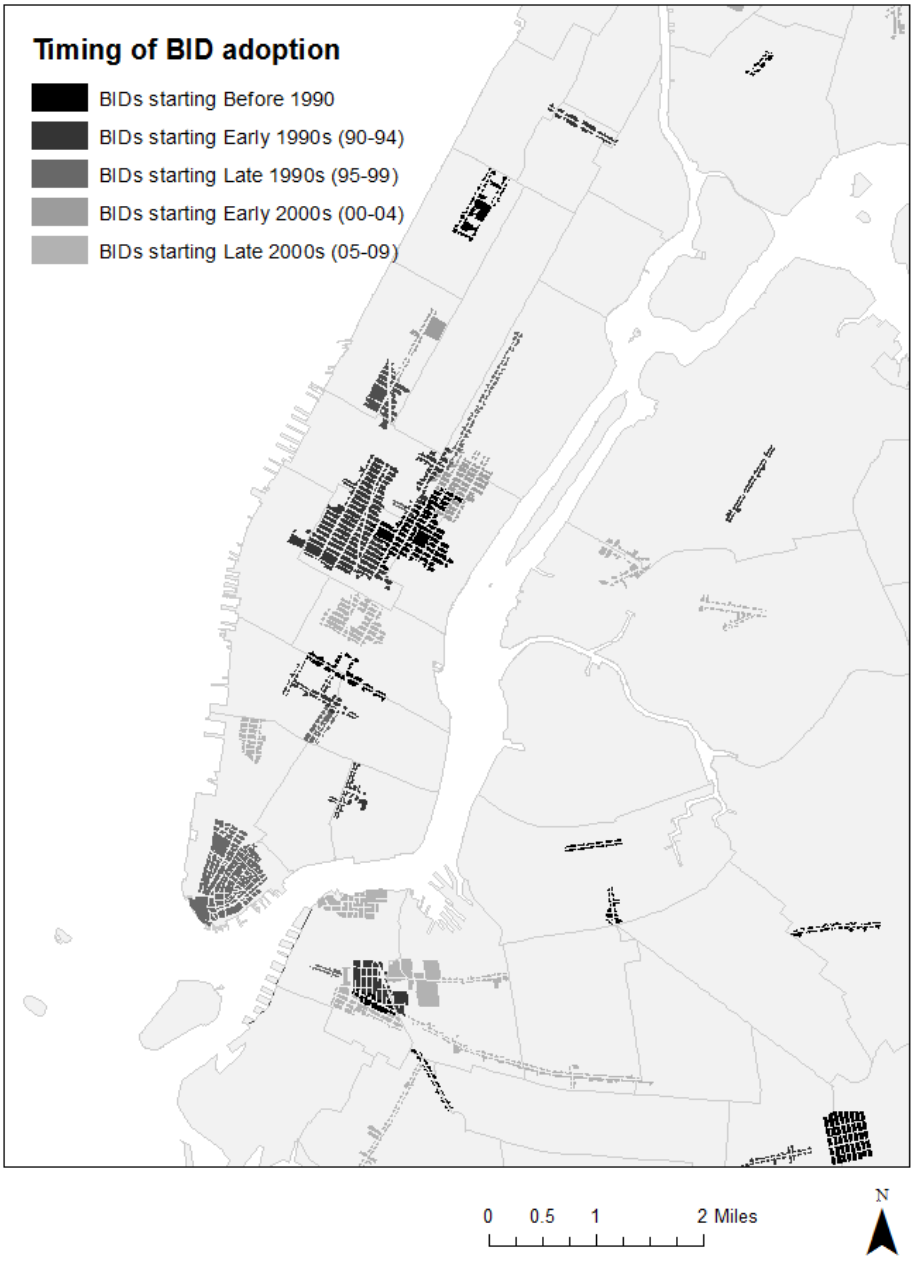


Table 3 reports our estimates of the impact of BIDs on changes in the incidence of total reported crimes, as well as separate estimates for the outcomes of all property crime, violent crime, and robberies. The top rows present the primary fixed-effects specifications (model 1) and the bottom rows present the specification that includes the pre and post-year BID adoption indicators (model 2).

Table 3 –Effect of BID Private Security Spending on Crimes

Crime	*Total*	*Violent*	*Property*	*Robbery*
Model 1				
BID High Security$%P*	-0.005*	-0.01*	-0.004*	-0.02*
	(.001)	(0.002)	(0.001)	(0.002)
BID	.02	0.09	-0.004	0.07*
	(0.01)	(0.01)	(0.02)	(0.02)
Model 2				
Years (-4 to 4) BID Adoption				
BID High Security$	-.004*	-.014*	-.004**	-0.01*
	(0.001)	(0.002)	(0.001)	(0.03)
BID	0.035	0.103*	0.005	0.06**
	(0.023)	(0.023)	(0.03)	(0.002)

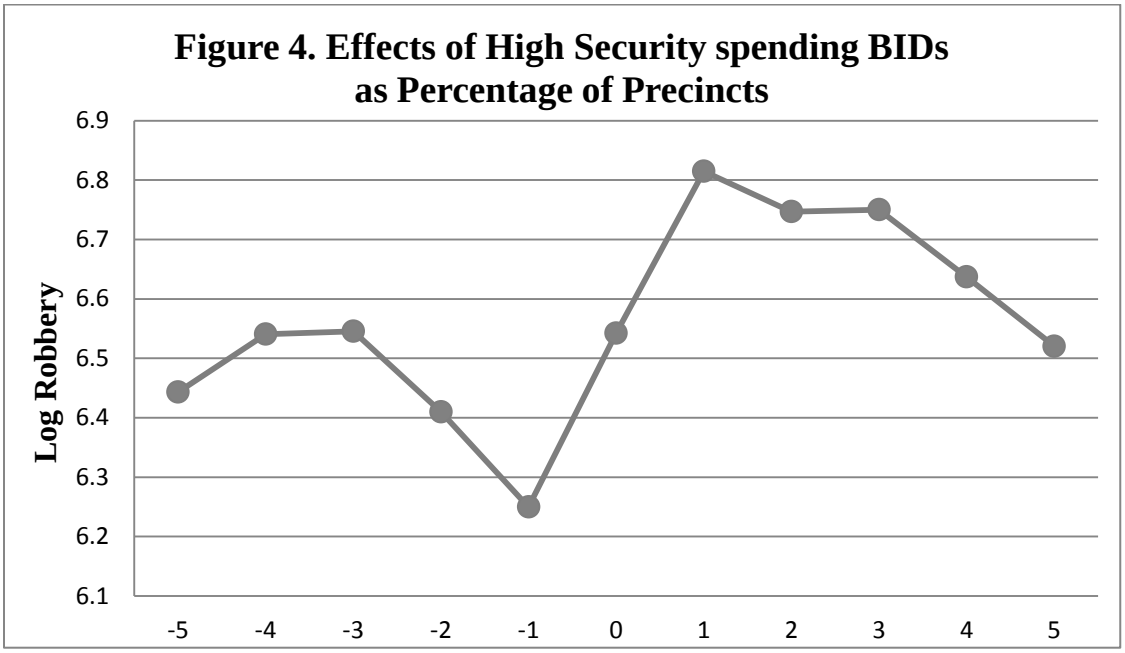
*p<.01;**p<=.05; N=828 (46 precincts*18 years).

Note: Standard errors are reported in parentheses. All regressions include precinct and year fixed effects. A Huber-White sandwich estimator was used to adjust standard errors for different variances within precincts.

The results from these regressions suggest that in themselves, the formation of BIDs appears to increase crime. This is not surprising given that BIDs are designed to increase street traffic and bolster commercial activity. Yet we also find a substantial effect of BID security expenditures in reducing crimes. Interpreting this estimate from model 1 implies that for high security spending BIDs an additional 5 percentage point increase in the geographic coverage of the BID in the precinct reduces the expected robbery count by 10%. The median geographic coverage of high security spending BID precincts is 6.4% of police precincts, suggesting that shifting the geographic coverage of high security spending BIDs up by a significant fraction would produce a meaningful effect on robberies.[12] The marginal effects are significant but less pronounced for the other crime types. BID neighborhoods averaged 567 robberies per year, implying 57 fewer robberies a year associated with a 5% increase in the coverage of high security spending BIDs in a police precinct. Additionally, we see a consistent pattern across all outcomes, but the strongest effects are for violent crimes overall that are more likely to occur in public settings. Importantly, these models control for crime yearly trends in all the police precincts. The results are identical when we remove the highest security expenditure precinct 14 (Times Square) from the regressions (the result not shown here). In contrast, we see no specific trend in BID presence on crime for those BIDs that spend little on

[12] On average high security BID spending precincts had 10.8% of their area covered by BIDs (min 0.27 to max of 52.65).

private security, and for robbery the sign is positive. The results from these implied effects for high security spending BIDs in combination with the other differences in these BIDs are plotted Figure 4, suggesting that the effects plateau a few years after BID formation but then accelerate.



Note: Solid line represent expected change in (log) robbery rates by precinct for high security spending BIDs.

The bottom of Table 3 also shows that the substantive results for high security spending BID effects are the same across all crime outcomes when we control for the four years leading up to and after BID adoption (model 2), indicating that BID adoption is not endogenous to pre-existing crime trends. [13]

If we consider the social costs of crime from the willingness-to-pay (WTP) for a reduced probability of victimization (Cohen et al., 2004) in 2008 dollars, we see that a 10% increase in the geographic coverage of high security spending BIDs (more than $100 per 10,000 square feet) in precincts produces a social-cost savings of $31.24 million for robberies (95% confidence interval $21.37-$39.46 million) in a given year.[14] If we just limit the assessment to robbery the social benefit of crime reduction is a 1.61 multiple of private expenditure of $19.4 million a year. This compares to about a 3.0 multiple shown in the literature for the costs of police relative to crime averted (Chalfin and McCrary, 2013). And, it is important to underscore that this social benefit is calculated for an entire precinct, which is a conservative test of the BIDs effect.

[13] In a separate specification we included pre-crime averages for those precincts that adopted BIDs in the regressions. The results were substantively similar, suggesting that the effects observed are not driven by mean reversion. See Table C3 in Appendix C.

[14] This is calculated by taking multiplying the marginal reduction times the unit costs. If we rely on just general crime that don't weight by severity the average costs savings is lower at $1.92 million (95% confidence interval $ 3.36-$9.6 million).

The bottom line is that the local security provided by BIDs in high security expenditure areas of New York City reduces crime by a considerable amount over and above the secular trend downward in these precincts. We do not have estimates of the effects of BID security on the profitability of the constituent businesses, but evidence does suggest that they increase commercial property values (Ellen et al., 2007). BIDs may well increase the profitability of doing business in the central city through their crime reduction benefits.

BID Level Analysis

Table 4 shows results from the BID-level analysis. By looking only at the areas of the city with actual BIDs, we can narrow in on the BID-induced effect on crime in only those areas that eventually form BIDs. First, we include only the *BIDpost* indicator to tell us the changes in crime upon BID formation, compared to changes in areas that have not yet formed a BID. We see that the formation of the BID increases the likelihood of property felony crimes and all felony crimes, compared to areas that have not yet formed a BID. As noted, the positive coefficient for felony crimes is not entirely surprising, given that BIDs can also attract more street activity, which can both increase the opportunity for crime and the likelihood of reporting the crimes. By contrast, we find that BIDs are significantly associated with a reduction in misdemeanor crimes.

Table 4 –Effect of BID Formation on Crimes

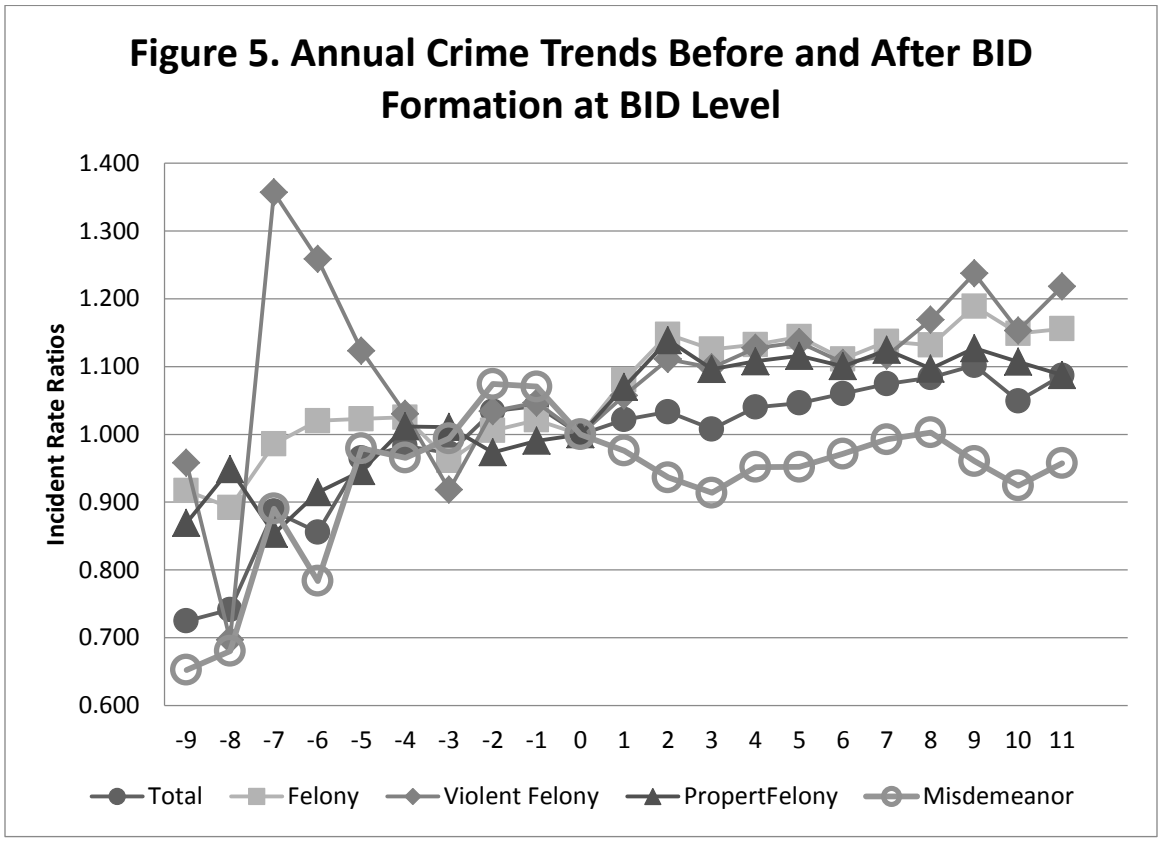
Crime	*Total*	*All Felony*	*Violent Felony*	*Property Felony*	*Mis-demeanor*
BID_Post	1.017	1.108**	1.071	1.109**	0.929**
	(0.42)	(2.24)	(1.07)	(2.43)	(-1.99)

*p<.01;**p<=.05; N=792 (72 BIDs*11 years).
Note: Incident rate ratios (IRRs) are reported from separate Poisson regressions for each outcome, and Z-scores are reported in parentheses. All regressions include BID and year fixed effects. A Huber-White sandwich estimator is used to adjust standard errors for different variances within BIDs.

To better understand the effect of the BID over time, we include instead of *BIDpost* year-specific lead and lag indictors and display the trend in Figure 5. Unlike the precinct-level results, the year-specific effects on total crime are not significant and do not show the same post-BID drop in crime. The patterns change, however, when we consider sub-classifications of crime. These trends are displayed in Figure 5 for violent and property felony crimes, and all felonies and misdemeanors more broadly.[15] Violent and property felony crimes seem to be driving the post-BID positive trend. For example, violent felony crimes climb and peak at 8 years out from BID formation. On the other hand, the likelihood of misdemeanors goes down immediately following BID formation with a

[15] We also estimate likelihoods for weapons- and drug-related crimes and violations more broadly. Trends for the weapons- and drug-related crimes more closely resemble those displayed by violent crimes and likelihoods of violations increase and then decline, at an increasing rate, over time.

decreasing rate over time. The decreasing trend of misdemeanors erodes at three years after from the BID formation.



Note: Incident rate ratios (IRRs) are reported from separate Poisson regressions for each outcome. All regressions include census tract*year fixed effects. A Huber-White sandwich estimator is used to adjust standard errors for different variances within BIDs.

Blockface Level Analysis

For the final set of results, we drill down to a smaller unit of analysis and test for the effect of BIDs on crimes on blockfaces, compared to those on blockfaces just outside of their borders and in the same neighborhood.[16] These results are displayed in Table 5. The first row (Model 1) includes only *BIDever*, which estimates the average difference in crimes across BID and non-BID blockfaces. The coefficient is positive and significant, indicating that blockfaces with BIDs have a higher rate of crime relative to those outside of BIDs in the same neighborhoods. In the second row of table 5 (Model 2) we add in *BIDpost*, which captures the change in crime due to BID formation, relative to blockfaces just outside of BIDs. Once again, this coefficient is positive and significant. Unlike in the BID-level analysis, the coefficient on misdemeanors is positive. This finding is again

[16] We replicate these models with several contrasting geographies, including the census tract, ZIP code police precinct, and borough. The displayed results include census tract*year fixed effects, and they are substantively the same as those with ZIP*year, precinct*year, and borough*year level controls.

consistent with the expectation that BIDs could attract crime. However, the effect is relatively small. Finally, we allow the BID effect to vary with the amount of private security spending, and these results are displayed in the third row (Model 3). Higher security spending is associated with relative increase in crime rates compared to blocks outside of BIDs in the same neighborhoods. This effect, however, is relatively small showing that BID security spending is not correlated with a substantial increase in crime on blockfaces relative to others in the same neighborhoods.

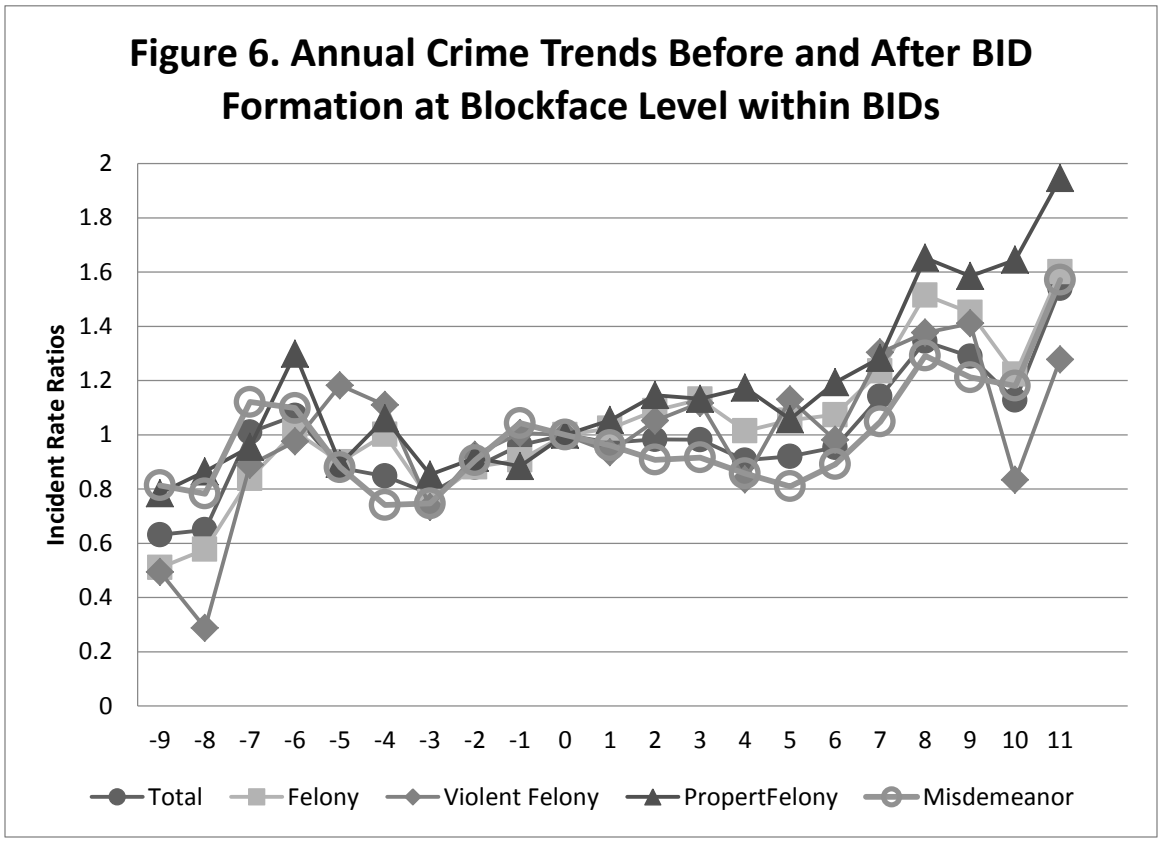
Table 5 –Effect of BID Formation on Crimes at the Blockface level

Crime	*Total*	*All Felony*	*Violent Felony*	*Property Felony*	*Mis-demeanor*
Model 1					
BID_Ever	1.822*	1.809*	1.626*	1.861*	1.950*
	(27.57)	(28.94)	(21.31)	(32.333)	(33.15)
Model 2					
BID_Ever	1.597*	1.556*	1.532*	1.502*	1.727*
	(14.50)	(15.19)	(12.51)	(10.60)	(11.83)
BID_Post	1.165	1.191*	1.071	1.285*	1.152*
	(4.06)	(5.10)	(1.71)	(5.85)	(2.86)
Model 3					
BID_Ever	1.646*	1.593*	1.566*	1.522*	1.788*
	(15.59)	(16.26)	(12.72)	(11.28)	(12.79)
BID_Post	1.009	1.056	0.985	1.155	0.978
	(0.23)	(1.52)	(-0.34)	(3.31)	(-0.43)
*BID_Post*Security Spending*	1.00009*	1.00008*	1.00007*	1.00006*	1.00009*
	(8.60)	(7.85)	(6.80)	(6.52)	(7.50)

*p<.01;**p<=.05; N= 959,431 (87,221 Blockfaces*11 years).

Note: Incident rate ratios (IRRs) are reported from separate Poisson regressions for each outcome, and Z-scores are reported in parentheses. All regressions include census tract*year fixed effects. A Huber-White sandwich estimator is used to adjust standard errors for different variances within BIDs.

Our final analysis restricts the sample to only blockfaces that are ever in a BID during the study period. This addresses some of the concern that the non-BID blockfaces are systematically different than those that end up in BIDs and that they bias our estimates of BID-induced crime changes. The results for this restricted sample are displayed in Figure 6, and they provide some more information on how the BID effect varies across time. For total crime, the incidence of crime on the rise leading up to BID formation, with a small drop just prior to BID formation, mostly driven by misdemeanor offenses. In the years immediately after BID formation, crime is largely flat or declining slightly. Yet for most of the post-BID period, the likelihood of crime is rising. This pattern is consistent, more or less, across the individual crime types.



Note: Incident rate ratios (IRRs) are reported from separate Poisson regressions for each outcome. All regressions include census tract*year fixed effects. A Huber-White sandwich estimator is used to adjust standard errors for different variances within BIDs.

Reconciliation of the results

Precinct-level analyses show some evidence of an increase in crime associated with BID formation but a reduction in crime associated with increased BID spending on security. These results are robust across several crime types. When we drill down to small geographies and more recent years of BID formation, we again find that BID formation is associated with increased crime. We have not yet been able to test the impact of security spending. It could be that the stronger positive association between BID formation and crime is explained by the fact that they reflect different secular patterns of crime in NYC. The more recent BIDs formed in a period of low crime in NYC. We recognize that public sector activities related to crime control and reporting could have shifted dramatically over time, affecting both the crime numbers and the way that BIDs manage crime in their districts. In addition, it is possible that the BIDs formed in the 1990s are systematically different than those formed post-2009: we know that the bigger BIDs, which tend to be those with larger security budgets, are also the older BIDs, and therefore the marginal effect of the newer (and smaller) BIDs on crime could be less meaningful. Finally, one of the strengths of our multi-pronged analytical approach is that it tests the same question across several alternative comparison groups. This aspect could also be driving the disparate results and requires more analysis to understand why and

how changing the unit of analysis and comparison group influences the estimated BID effect on crime.

5. Conclusion

Analysis and discussion of the New York City crime drop tends to focus on the extent to which criminal justice resources have reduced crime through deterrence, incapacitation, and the rehabilitation of criminals. This sole focus on the criminal justice policy dimension ignores the role that private action has played in New York's crime drop. Crime is not determined solely by the population of active criminals and their response to criminal justice agents. People choose whether to commit crime, and what crimes to commit, based in part on the characteristics of attractive crime opportunities. When private firms and individuals invest in crime prevention like hiring private security they reduce the supply of tangible opportunities for crime. By focusing solely on the role of the police and other criminal justice agencies in New York in explaining the drop in crime, policymakers and academics ignore the fundamental role of private action. In this preliminary study we get mixed results. We find some evidence that when BIDs allocate substantial funds to crime prevention, they are responsible for some share of the drop of crime in their respective precincts during the late 1990s and early 2000s. The results also show that the presence of BIDs in New York is associated with elevated crime rates—we have yet to disentangle how much of this is a product of their success in attracting more activity (and potentially more crime) to the area. Thus far, our results for NYC are different than the results for LA. In LA, the creation of a BID had no effect on crime but that expenditures on security reduced crime (Cook and MacDonald, 2011ab). Our NYC results suggest that the creation of the BID increases crime, and we have some preliminary results suggesting that security expenditures are effective in counteracting that effect.

Nonetheless, it is not surprising to find that BIDs remain a popular economic development approach to neighborhoods in New York, and that there appears to be continued public support from the New York City SBS to continue supporting its BIDs. The neighborhood-based approach of BIDs is appealing to municipalities, in that it exploits on-the-ground private knowledge and resources. Missing still is a robust body of evidence on how their efforts actually influence crime control on those neighborhoods and the city overall.

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Appendix A. Information of 72 NYC BIDs

BID Name	Affiliated Precinct	Borough	Year of Formation
161st Street	44	Bronx	2005
Belmont	48	Bronx	2008
Fordham Road	46, 48, 52	Bronx	2004
HUB/3rd Avenue	40	Bronx	1988
Jerome-Gun Hill	52	Bronx	1997
Kingsbridge	50	Bronx	2001
Southern Boulevard	41	Bronx	2007
Westchester Square	45,49	Bronx	2012
White Plains Road	49	Bronx	1994
86th Street Bay Ridge	68	Brooklyn	2001
Atlantic Ave.	76,84	Brooklyn	2011
Bay Ridge 5th Avenue	68	Brooklyn	2006
Bed-Stuy Gateway	79,81	Brooklyn	2009
Brighton Beach	60	Brooklyn	1987
Church Avenue	70	Brooklyn	1987
Court-Livingston-Schermerhorn	84	Brooklyn	2007
DUMBO Improvement District	84	Brooklyn	2005
East Brooklyn	73, 75	Brooklyn	1985
Flatbush Avenue	70, 71	Brooklyn	1988
Flatbush-Nostrand Junction	70	Brooklyn	2006
Fulton Area Business (FAB) Alliance	88	Brooklyn	2008
Fulton Mall Improvement Association	84	Brooklyn	1976
Graham Avenue	90	Brooklyn	1987
Grand Street	90	Brooklyn	1985
Kings Highway	61	Brooklyn	1990
MetroTech	84, 88	Brooklyn	1992
Montague Street	84	Brooklyn	1998
Myrtle Avenue Brooklyn Partnership	84, 88	Brooklyn	2005
North Flatbush	78	Brooklyn	1986
Park Slope 5th Avenue	72,78	Brooklyn	2008
Pitkin Avenue	73	Brooklyn	1993
Sunset Park	72	Brooklyn	1995
125th Street	25,26, 28	Manhattan	1994
34th Street Partnership	10, 14, 17	Manhattan	1992
47th Street	18	Manhattan	1997
Alliance for Downtown New York	1	Manhattan	1995
Bryant Park Corporation	14	Manhattan	1986
Chinatown	5,7	Manhattan	2011
Columbus Avenue	20	Manhattan	2000
Columbus/Amsterdam	24	Manhattan	1987
East Midtown Partnership	17, 18, 19	Manhattan	2002
Fashion Center	14	Manhattan	1993
Fifth Avenue	18, 19	Manhattan	1993

Flatiron/23rd Street Partnership	13	Manhattan	2006
Grand Central Partnership	14, 17, 18	Manhattan	1988
Hudson Square Connection	1	Manhattan	2009
Hudson Yards/Hell's Kitchen	10,14	Manhattan	2013
Lincoln Square	18, 20	Manhattan	1997
Lower East Side	5, 7	Manhattan	1993
Madison Avenue	18, 19	Manhattan	1996
Meatpacking	6,10	Manhattan	2015
NoHo NY	6, 9	Manhattan	1997
SoHo Broadway	1,5	Manhattan	2013
Times Square Alliance	14, 18	Manhattan	1992
Union Square Partnership	6, 9, 13	Manhattan	1984
Village Alliance	6, 9	Manhattan	1993
Washington Heights	34	Manhattan	1986
165th Street Mall	103	Queens	1978
180th Street	103	Queens	1996
82nd Street	110, 115	Queens	1990
Bayside Village	111	Queens	2007
Downtown Flushing Transit Hub	109	Queens	2003
Jamaica Center	103	Queens	1979
Long Island City	108, 114	Queens	2005
Myrtle Avenue	104	Queens	1988
Steinway Street	114	Queens	1991
Sunnyside Shines	108	Queens	2007
Sutphin Boulevard	102,103	Queens	2004
Woodhaven	102	Queens	1993
Forest Avenue	120	Staten Island	2005
South Shore	122,123	Staten Island	2015
West Shore	121	Staten Island	2014

Source: NYC SBS homepage (http://www.nyc.gov/html/sbs/html/neighborhood/bid_directory.shtml)

Appendix B. BID Coverage and Security Expenditure in Precincts

Precinct	Precinct Area (sq ft)	BID Area Total (sq ft)	BID Coverage of Precinct (%)	Security $	Security per 10,000 (sq ft)	High Security$
1	46,436,956.70	10,068,833.85	21.68%	$3,716,000	$800	1
5	18,073,859.20	3,983,509.39	22.04%	$0	$0	0
6	21,877,029.40	2,617,597.55	11.97%	$484,286	$221	1
7	18,342,912.40	1,093,775.17	5.96%	$0	$0	0
9	21,382,649.70	1,282,125.90	6.00%	$484,286	$226	1
10	26,333,281.30	5,033,473.63	19.11%	$2,004,500	$761	1
13	29,487,164.30	3,859,377.34	13.09%	$609,789	$207	1
14	20,510,163.60	10,852,457.69	52.91%	$11,118,131	$5,421	1
17	22,247,614.40	3,009,864.63	13.53%	$5,100,875	$2,293	1
18	31,437,259.40	6,532,709.86	20.78%	$9,455,207	$3,008	1

19	48,721,296.60	2,247,612.31	4.61%	$2,378,243	$488	1
20	27,603,025.10	3,433,722.60	12.44%	$368,693	$134	1
24	25,475,696.40	2,033,462.23	7.98%	$23,443	$9	0
25	44,715,259.70	24,747.30	0.06%	$224,994	$50	0
26	23,812,577.50	86,310.65	0.36%	$224,994	$94	0
28	15,289,544.20	889,417.02	5.82%	$224,994	$147	1
34	52,015,792.40	648,172.80	1.25%	$0	$0	0
40	60,230,667.50	449,457.42	0.75%	$106,633	$18	0
41	60,700,218.50	624,336.35	1.03%	$10,298	$2	0
44	55,235,071.30	1,934,742.64	3.50%	$0	$0	0
45	255,000,756.70	717,967.15	0.28%	$0	$0	0
46	38,313,694.00	401,314.04	1.05%	$12,900	$3	0
48	42,959,311.10	6,569,327.29	15.29%	$30,906	$7	0
49	105,788,277.10	372,428.56	0.35%	$0	$0	0
50	130,810,910.50	1,211,231.73	0.93%	$0	$0	0
52	78,446,710.50	1,969,292.71	2.51%	$21,106	$3	0
60	80,973,415.00	603,071.10	0.74%	$0	$0	0
61	133,240,088.40	743,859.05	0.56%	$0	$0	0
68	110,792,166.50	1,535,517.69	1.39%	$37,985	$3	0
70	82,181,409.40	2,949,223.93	3.59%	$49,086	$6	0
71	45,331,786.50	22,329.38	0.05%	$49,086	$11	0
72	103,765,039.70	2,457,448.47	2.37%	$5,400	$1	0
73	51,767,782.80	1,671,794.66	3.23%	$930	$0	0
75	177,163,875.50	2,605,523.28	1.47%	$0	$0	0
76	46,887,476.50	242,094.88	0.52%	$0	$0	0
78	64,882,733.60	2,510,956.98	3.87%	$1,383,366	$213	1
79	44,975,546.70	1,280,116.61	2.85%	$5,042	$1	0
81	34,485,431.70	96,057.80	0.28%	$5,042	$1	0
84	34,724,506.60	8,536,285.71	24.58%	$1,915,314	$552	1
88	42,280,237.30	5,989,031.27	14.17%	$1,383,366	$327	1
90	66,125,382.10	1,034,697.35	1.56%	$0	$0	0
102	133,209,839.50	1,026,458.65	0.77%	$5,924	$0	0
103	100,921,594.90	5,619,528.77	5.57%	$16,974	$2	0
104	210,257,402.80	763,185.54	0.36%	$7,063	$0	0
108	139,505,158.30	1,856,182.68	1.33%	$25,722	$2	0
109	319,573,349.50	1,703,723.40	0.53%	$0	$0	0
110	106,382,724.70	93,699.67	0.09%	$0	$0	0
111	253,604,223.20	1,021,651.99	0.40%	$0	$0	0
114	179,639,515.60	1,276,094.51	0.71%	$28,093	$2	0
115	113,170,981.90	168,127.57	0.15%	$0	$0	0
120	228,305,809.60	941,486.69	0.41%	$0	$0	0
121	408,967,540.10	9,963,903.91	2.44%	$0	$0	0
122	454,781,546.70	2,200,106.30	0.48%	$0	$0	0
123	460,789,326.10	1,060,284.08	0.23%	$0	$0	0

Appendix C. Sensitivity Test for Geographic Coverage of BIDs

Above all, precincts that had never a BID before 2008 are all removed from the dataset. Thus, 46 precincts remain. "HighSecurity$" is related to the relative size of security expenditure in these police precincts. It equals 1 when the ratio of security expenditures in 2008 per 100,000-square-feet area in a precinct is greater than or equal to $100. This provides a normalization of security expenditures.

In Table C1, column (1) represents the original reduced-form model. In this construction, when a precinct includes any BID, then the independent variable BID equals 1 for the corresponding years. Meanwhile, column (2) represents sensitivity tests of this reduced-form model. The independent variable "BID%" *indicates the portion of BIDs for a precinct which the BIDs are located in*. Thus, the coefficient of "BID%" indicates the crime rate variation (%) that is on average associated with a 1% increase in BID portion for the precinct.

The results in column (2) are somewhat mixed but overall in favor of the current arguments that BIDs reduce crime. All the coefficients, even BID%s, have a negative sign. In the precincts that spent lots of money in private security there appears to be no mean reversion. In addition, all the aggregate crime coefficients are statistically significant predictors of the trends. The violent crime coefficient has very marginal significance at 90% significant level, and the robbery coefficient is not significantly related to the trend when % of precinct is separated from high security expenditure BIDs.

Table C1. 46 precincts that have ever BID within them

		(1) BID*HighSecurity$ (Obs. 828)		(2) BID%*HighSecurity$ (Obs. 828)	
		BID (=1)	BID* HighSecurity$	BID% (=1%)	BID* HighSecurity$
Robbery	Coef	0.10	-0.22	-0.02	-0.004
	SE	0.02	0.05	0.002	0.04
	P-val.	0.00	0.00	0.00	0.93
Total	Coef	0.02	-0.14	-0.003	-0.10
	SE	0.02	0.04	0.001	0.03
	P-val.	0.19	0.00	0.053	0.00
Violence	Coef	0.11	-0.25	-0.02	-0.06
	SE	0.02	0.04	0.002	0.03
	P-val.	0.00	0.00	0.00	0.098
Property	Coef	-0.01	-0.12	-0.001	-0.11
	SE	0.02	0.05	0.002	0.03
	P-val.	0.63	0.012	0.45	0.001

Of 46 precincts with BIDs, 24 precincts have their first BIDs starting at or before 1990. Because we have crime data only from 1990 to 2007, those 24 precincts do not fit our

pre-post design. This fact may have attenuated the findings we presented. Therefore, we present models for 22 precincts that have their first BIDs starting between 1991 and 2007.

Column (3) and (4) in Table C2 reiterate the two models above with the reduced set of 22 precincts. The results in column (4) are promising. Compared to column (3) of original modeling, all the crime coefficients have a negative sign and are statistically significant.

Table C2. 22 precincts that have first BIDs starting between 1991 and 2007

		(3) BID*HighSecurity$ (Obs. 396)		(4) BID%*HighSecurity$ (Obs. 396)	
		BID(=1)	BID* HighSecurity$	BID%(=1%)	BID* HighSecurity$
Robbery	Coef	0.05	-0.25	-0.01	-0.13
	SE	0.03	0.06	0.006	0.07
	P-val.	0.11	0.00	0.11	0.06
Total	Coef	-0.01	-0.19	0.01	-0.27
	SE	0.02	0.03	0.004	0.04
	P-val.	0.59	0.00	0.03	0.00
Violence	Coef	0.06	-0.27	0.0001	-0.24
	SE	0.02	0.04	0.005	0.05
	P-val.	0.004	0.00	0.99	0.00
Property	Coef	-0.03	-0.19	0.01	-0.30
	SE	0.02	0.03	0.004	0.05
	P-val.	0.11	0.00	0.02	0.00

To inspect the possibility that pre-crime averages for those precincts that adopted high security BIDs may drive the findings estimated from model 1, we estimated another model for 22 precincts with BIDs starring between 1991 and 2007 and included their pre-crime averages for each crime outcome measure. The results presented in Table C3 are substantively similar, suggesting that the effects observed are not driven by mean reversion.

Table C3. Estimated Effects for the High Security Spending BIDs in 22 Precincts Including Pre-Crime Averages.

		(5) (Obs. 396)		
		BID(=1)	BID* HighSecurity$	Pre-Crime Rate
Robbery	Coef	-0.02	-0.02	0.0007
	SE	0.007	0.007	0.0001
	P-val.	0.013	0.013	0.00
Total	Coef	-0.01	-0.01	0.0001
	SE	0.003	0.003	0.00
	P-val.	0.00	0.00	0.00
Violence	Coef	-0.01	-0.01	0.0004
	SE	0.005	0.005	0.00005
	P-val.	0.004	0.004	0.00
Property	Coef	-0.01	-0.01	0.0002
	SE	0.003	0.003	0.00
	P-val.	0.00	0.00	0.00