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Understanding Business Improvement District formation: An analysis of neighborhoods and boundaries

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ABSTRACT

Business Improvement Districts (BIDs) provide supplemental services to urban commercial corridors using funds from member assessments. They have become a very popular urban revitalization tool, but their formation is still largely unexplained. Theory implies that BIDs will form if they add to aggregate welfare and if the marginal net benefit of membership is positive. I test this for the neighborhood overall and at the BID boundary. Using unique, micro-level and longitudinal data from New York City, I employ survival analysis methods to estimate the likelihood of a neighborhood forming a BID. I then estimate the likelihood of the marginal property's BID membership by comparing the characteristics of properties located immediately inside and outside of the BID boundaries. I find that BIDs are more likely to form when there is more commercial space over which the BID benefits can be capitalized and when there is homogeneity in service and spending preferences across properties. BIDs also tend to form in neighborhoods that possess signs of appreciation and growth. Generally, BIDs are more likely to form in neighborhoods with higher valued properties with the exception of very wealthy areas. The BID boundary, however, is comprised of relatively less valuable properties.

1. Introduction

Strapped for cash and confronted with changing populations, cities have experimented with various methods of revitalizing their downtowns. One of the most rapidly growing trends in these efforts is the Business Improvement District (BID). Part of a larger move towards so-called "private governments" (Helsley and Strange, 1998), BIDs provide supplementary and exclusive services, such as street cleaning, maintenance and security, to prescribed commercial areas. The majority of empirical work thus far focuses on the impacts of BIDs: evidence shows that BIDs increase the value of properties and reduce crime inside their borders, and by non-negligible amounts (see Brooks and Brennecke, 2008; Calanog, 2006; Ellen et al., 2007; Hoyt, 2005). These results are in contrast to a collection of studies that find little or no impact of Enterprise Zones, the largest Federal commercial revitalization effort to date, on local employment and firm creation (for example, Greenbaum and Engberg, 2000, 2004; Elvery, 2009; Neumark and Kolko, 2010).

The question of BID formation, especially at a sub-municipal level, has received relatively little attention. BIDs, and other similar associations, emerge unevenly, and many worry that they disproportionately benefit neighborhoods and properties that are already economically and politically advantaged. Moreover, in the midst of BID policies becoming so popular, no one has seriously examined whether BIDs are an appropriate tool for every neighborhood, particularly those in the midst of economic transitions. A growing body of literature on neighborhood change shows that economic upgrading is more characteristic of poorer and minority neighborhoods and those with older housing stock and growing employment opportunities (see Bond and Coulson, 1989; Ellen and O'Regan, 2008; Brueckner and Rosenthal, 2009; Kolko, 2009). No study, however, explicitly explores the role of public policies. Therefore, an important question, and one that this paper touches on, is how BIDs are situated in transitioning urban neighborhoods.

In this analysis, I test two important questions related to BID formation: in which neighborhoods do BIDs form and what properties comprise the BID boundary? To do this, I exploit the variation in BID adoption across neighborhoods and properties in New York City, the jurisdiction with the largest number of BIDs in the country. As local governments increasingly endorse BIDs as a solution for meeting diverse service demands of commercial corridors, this paper sheds light on which neighborhoods are indeed "BID-ready" and what kinds of properties comprise successfully formed BIDs.

The existing literature on BID formation is scarce. Billings and Leland (2009) look at state-level determinants of BID formation and find that the number of BIDs is positively correlated with the presence of a BID enabling legislation and, specifically, one that requires less than a majority approval. They also find that states with

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more new development have more BIDs. In two separate papers, Brooks (2006, 2007) estimates the likelihood of city-level BID adoption, using a survey of over 200 cities in California. In both papers, she finds that spatial residential heterogeneity is insignificant and the year of city incorporation is highly significant in explaining BID adoption, suggesting that BIDs do address problems endemic to older commercial areas. Brooks' model links neighborhood residential tastes to formation decisions of commercial property owners and business owners; however, heterogeneity in residential demand does not necessarily match heterogeneity in commercial demand for services since business districts surely demand distinct services and often serve consumers beyond the local residential neighborhood. In addition, even Brooks suggests that the city-level analysis may be too macro, and that a deeper understanding of BID formation requires a neighborhood-level identification strategy.

In a more recent study, Brooks and Strange (2011) drill down to the property level and look at BID votes and formation outcomes in Los Angeles. Relying on unique microdata with information on the property characteristics and voting for BID members, the authors find that there is consistently less-than-unanimous support for the BID formation. In addition, smaller properties are less likely to support BID formation, and the concentration of BID properties among large property owners is a particularly strong predictor of BID formation. This last result suggests that "anchor" participants are crucial in bearing the fixed costs of BID formation.

For the current analysis, I draw on theory developed by Helsley and Strange (1998, 2000a,b), which assumes that a BID will be more likely to form should it contribute to aggregate welfare.[1] I also rely on their reasonable assumption that the marginal property owner would prefer to be in the BID, given the option. Following from this, I condition the likelihood of BID membership on factors that influence potential BID benefits and costs. Specifically, property owners will consider the amount of commercial space over which the benefits are capitalized, the match between individual service preferences and the BID service package, and the potential for price appreciation in the immediate neighborhood. These will be weighed against the financial and coordination costs associated with BID formation in order to determine the net welfare implications. The current analysis assumes that the decision to join the BID belongs to the marginal property owner, but that it takes place within the context of other potential BID members and surrounding economic conditions. Therefore, unlike previous studies, I examine BID formation for the neighborhood *and* at the BID boundary.

I have assembled a unique micro-level and longitudinal dataset of BIDs, neighborhoods, and properties in New York City. I first employ survival analysis methods to estimate the likelihood that a neighborhood forms a BID. I then estimate the likelihood of the marginal property's BID membership by comparing the characteristics of properties located immediately inside and outside of the BID boundaries. Together, the two analyses shed light on what kinds of neighborhoods are ripe for BIDs and, at a more micro level, how the BID boundaries are determined.

Results indicate that net benefits are higher (and BID formation more likely) when there is more commercial space over which the BID benefits can be capitalized and when there are homogeneous preferences over service type and spending. This is true in aggregate for the neighborhood and for the properties at the margin. Also consistent with predictions, BIDs are more likely to form in neighborhoods that possess signs of relative appreciation and growth. The most valuable neighborhoods, however, are not the most likely to form BIDs; they presumably have properties that can organize and afford supplemental services without the aid of a BID. In addition, BIDs are more likely to form in neighborhoods with more valuable commercial properties, but at the margin properties with relatively lower assessed values are more likely to opt into the BID. This means that on the boundary more valuable properties are less likely to perceive BID membership as welfare enhancing; the higher assessment burdens outweigh potential capitalization of BID services and amenities.

The rest of this paper proceeds in the following way. Section 2 provides background on BIDs in general and BIDs in New York City; Section 3 motivates the empirical strategy and describes the data sources and analysis approach; and Section 4 presents results for the neighborhood and property analyses. Section 5 concludes and offers policy recommendations.

2. What are Business Improvement Districts?

2.1. Business Improvement Districts

According to the standard median voter demand model for public good provision, the local government will allocate its public goods evenly across neighborhoods based on a measure of median demand for services across the municipality (Bowen, 1943; Barr and Davis, 1966; Bergstrom and Goodman, 1973). However, if there exists heterogeneity in service demand, certain neighborhoods and properties will be left underserved by the public sector. BIDs, and other private governments of this kind, allow local actors, such as property owners, businesses and community groups, to decide what services should be provided in their local area, and implement binding assessments to fund them.

BIDs are somewhat of a reincarnation of special districts, as they are public in nature, providing services often thought to be the purview of the public sector and subject to public approval (Briffault, 1999). Most importantly, like special districts, they possess the power to tax in that they levy binding assessments on all the member properties, which are used to fund supplementary services, such as street cleaning, security, and marketing, to the prescribed BID area.[2] This solves the free-rider problem, i.e., the potential for recipients of the service to pay for less than the amount of the service that they consume, which is not overcome by the voluntary nature of non-profit or merchant association participation (both financially and administratively) (Hansmann, 1980).

2.2. BIDs in New York City

As of 2008, there were 60 BIDs in existence in New York City, the largest number for any single municipality in the US. There is currently at least one BID in every borough of New York City, but the majority are located in Manhattan and Brooklyn, with 20 and 18 respectively (see Table 1).

The BIDs in New York City range in size with respect to number of member properties, land area coverage, and total assessment.[3] BID composition is diverse: 12.3% of BID square footage is retail, 46.3% office, 3.9% industrial and other public space, and 37.5% is classified as residential. The largest and more corporate BIDs are located in Manhattan (on average comprising of 204 properties, covering 0.13 square miles and collecting a total assessment of $3,068,500). The smaller BIDs are concentrated in the Bronx, covering only a third of the territory covered in Manhattan and operating off of a total assessment nearly one-tenth the size of those in Manhattan (see

[1] Helsley and Strange (1998, 2000a) lay out in more detail the nuances of the welfare implications (for example, that member welfare can decline when a BID is formed), but I make a simplifying assumption here for purposes of succinctness and clarity in the empirical analysis.

[2] BID assessments are formula-based and specific to each BID. They are typically a function of the assessed value, square footage, and/or frontage of the property.

[3] BIDs can collect revenue from source other than assessments levied on the individual properties; therefore, while the total assessment is a good approximation for relative budget size, it does not include all budgeted expenditures.

Table 1
BIDs in New York City: an overview. *Source*: New York City Dept. of Small Business Services, New York City real property assessment dataset.

Borough	Number of BIDs	Avg. number of properties per BID	Avg. BID land area (sq. mi.)	Avg. total assessment (Current; 2006$)
New York City	55	164	0.073	$1,329,164
Manhattan	20	204	0.134	$3,068,500
Bronx	6	52	0.046	$270,821
Brooklyn	18	177	0.044	$403,042
Queens	10	135	0.042	$270,431
Staten Island	1	100	0.028	$150,000

Note: Statistics are based on 55 BIDs with assessments available as of 2007.

Table 1). In terms of service provision, BIDs in New York City primarily focus on keeping the streets "clean and safe." On average, BIDs spend about 33% on both sanitation and safety services; only 3.1% and 6.7%, however, are spent on marketing and capital improvement projects, respectively. BIDs' total assessments constitute just .13 of the City's total budget, but if their local spending were scaled citywide, it would amount to a substantial share of municipal spending on similar services (for example, about 45% for sanitation services).

2.3. The BID formation process

In New York City, votes for and against the BID are weighted by the assessed value of the property, and formation is conditioned on the support from either a majority of property owners or a majority of assessed value.[4] The implication of this voting structure is that BIDs can form with the support of 51% or more of the assessed property value, but a minority of property owners. This voting structure, along with property contiguity requirements, i.e. one cannot "leapfrog" over properties that do not want to be part of the BID, mean that some properties will be members involuntarily.

The process to form a BID is a multi-staged, complex process that involves gleaning support from local property owners, businesses, residents, and city officials.[5] The process takes on average 18 months to 2 years and is initiated by a steering committee comprised of property owners.[6] Establishing the BID boundaries and assessment is often an iterative process, but when potential members are approached about joining the BID, they are given a sense of the general boundaries, budget and service spending priorities. All of these items are finalized in the District Plan, which is subject to a mandatory objection period before the BID can be officially filed with the City Clerk—it is at this stage that at least 51% dissension is required to block the BID's formation.[7]

3. Data and empirical strategy

3.1. What explains BID formation?

The following analysis assumes that the BID will be more likely to form should it generate positive net benefits for the marginal property owner and contribute to aggregate welfare (Helsley and Strange, 1998, 2000a). It also assumes that the marginal property owner would prefer to be in the BID, given the option and conditioned on particular property and neighborhood characteristics (outlined below). Therefore, to be precise, participation in a BID is the outcome of (i) the steering organization asking the property to join the BID, and (ii) the property opting in or out of the BID.[8] Conditional on being asked, the property owner will weigh the benefits against the costs of BID membership, and join if the net benefit is positive.

3.1.1. Benefits

The benefits of BID formation are determined by the potential gain in welfare. For property owners, BID formation will be more probable should the property owners anticipate increases in property values from the BID-induced amenities. The potential value of these amenities will depend on three factors at the time of formation: (1) the amount of building and commercial space over which services can be capitalized, (2) the match between BID services and the owner's profit-maximizing package, and (3) the property owner's expectations about future price trends in the immediate neighborhood.

3.1.1.1. Amount of building and commercial space. BID-induced welfare gains will vary depending on the characteristics of the individual properties. Generally, the classification of the property will matter: commercial properties will anticipate more benefits than residential properties, since the services are intended to cater to businesses and commercial entities. Among commercial properties, we may observe greater potential gains for retail establishments, as compared to office or industrial enterprises, which tend to operate in street-level spaces and are more likely to benefit from improved streetscapes and pedestrian traffic. These types of establishments may also have less access to organized street clean-up services than office buildings, which are often run by larger management organizations with the resources and capacity to provide supplemental services. Larger and more valuable properties have more space and business over which local improvements can be capitalized. In addition, properties possessing more street frontage may witness higher returns from enhanced street-level exposure. Older buildings typically require more improvements and may anticipate greater benefits from BID services and investments.

3.1.1.2. Match between BID service package and property owner's profit-maximizing package. The property owner will also consider how likely the BID will satisfy his or her preferences over service types and levels. For example, if property owners see that the majority of properties in the BID share similar commercial tenants and business interests, then they will have more confidence that

[4] This is how the voting process more or less works in other municipalities, for example Philadelphia and Los Angeles; in New York City, BID officials actually like to see a super-majority of either assessed value or property owner support in order to approve BID formation.

[5] For a detailed description of the BID formation process in New York City see "Starting a Business Improvement District: A Step-by-Step Guide", available at: http://www.NewYorkCity.gov/html/sbs/downloads/pdf/bid_guide_complete.pdf.

[6] These estimates are based on conversations with officials at SBS, the agency that oversees BIDs in New York City.

[7] Objection filings are usually made by some subset of members, but there is only one case in the history of BIDs in New York City where the formation was stopped at this point. Usually, dissension is addressed earlier on in the process, and if at least a super-majority, i.e. 60%, of support is not achieved, then SBS will discourage the steering committee from moving forward. Even though the New York State BID enabling legislation only requires 51% support, in practice, SBS likes to see at least 60% support by the property owners.

[8] The "marginal" aspect is critical: for the typical property (or specifically, one that lies in between properties that have already opted into the BID), the decision to join is not theirs alone. The empirical analysis will exploit this marginal framework to test the determinants of BID participation.

the services will match their individual needs. Similarly, if the other properties are of similar sizes or values with similar assessment burdens, the likelihood of agreement on spending levels increases as well. This suggests that BID formation will be increasing in homogeneity in order to overcome these "agenda-setting" obstacles.

3.1.1.3. Expectations about future price trends in the immediate neighborhood. The property owners will also look to the conditions of the surrounding residential neighborhood. Property owners are more likely to see potential property value appreciation, and therefore support BID formation, should they perceive neighborhood stability and upgrading. Conversations with BID stakeholders in New York City suggest that BID formation is often triggered at some threshold of neighborhood development; there is a point at which the area needs an extra boost in investment and maintenance in order to retain and attract businesses and customers.[9]

3.1.2. Costs

The benefits will be weighed against the financial and organizational costs of BID membership. First, members are required to pay the binding assessment (or "tax"). Second, potential BID members will face costs associated with coordinating a diverse group of properties. BIDs are formed to overcome collective action problems in the provision of public goods, but there are costs associated with overcoming these obstacles (Olson, 1971). In some cases, these costs may be assumed by a select group of sponsors and not the typical BID member. On average, however, the costs of organization will increase in the number of entities and their overall heterogeneity. Coordination efforts will be minimized with a smaller group of potential members and if the properties have common service interests and willingness to pay.

3.2. Data

This paper focuses on BID formation in New York City. The analysis that follows is estimated for all census tracts with any commercial space (totaling 1628) and all properties lying on the border, immediately inside and outside of the BIDs (totaling 4059) in New York City for the years 1980–2008.[10]

The data on BIDs are obtained from the New York City Department of Small Business Services (SBS). This unique dataset includes information on the member properties, establishment dates, services, and assessments for all BIDs in operation or at the stage of imminent formation as of the start of 2008.

I also rely on two other important data sources. First, I use a database with information on the structural characteristics and assessed values for all properties in New York City (Real Property Assessment Dataset, or RPAD), available from the New York City Department of Finance for the years 1984 to 2007. Second, I obtain economic and social characteristics for the neighborhoods in New York City from the Geolytics Neighborhood Change Database (NCDB). This database contains Census data and normalizes the census tract boundaries to 2000 geographic definitions, so that the tracts can be analyzed as a panel across 1970, 1980, 1990 and 2000 census years. Summary statistics for the property and neighborhood variables are displayed in Tables 2 and 3.

3.3. Neighborhood analysis: empirical strategy

The neighborhood is operationalized as the census tract, and BID neighborhoods are identified as those tracts with more than 10% of the total building square footage lying within a BID.[11] In general, "BID" neighborhoods will be compared to "non-BID", commercial and mixed-use neighborhoods.

Following from the framework set up above, the likelihood of BID participation is partially a function of the amount of building and commercial space. I quantify these features using a series of physical property characteristics, including aggregate commercial property value and the type of commercial space.[12] Property values are measured using assessed values, since this amount is available for every property annually and is the basis for most BID assessment formulae (market property values are never used). In order to allow for a non-linear relationship between BID formation and assessed value, I include both linear and quadratic terms. For commercial space, I include both the percentage of square feet dedicated to office uses (versus retail uses) and the aggregate commercial building frontage.

In order to test for the presence of a match in service preferences, I include an index of heterogeneity to measure the mix in property type and value. I use property type as a proxy for the commercial tenants occupying the buildings, and assume that preferences for BID services are correlated with type of property and/or business. Ideally, I would like to measure the diversity of the commercial tenants in the potential BID, but unfortunately, this data is unavailable. In addition, since preferences for services may vary by willingness to pay (and not solely service type), I also test for the effect of mix in assessed value which constitutes the base for the BID assessments that fund the private services. For both property type and value I calculate the Hirfendahl index, H, for each census tract.[13] This index is calculated as $H = \sum_{i=1}^{n} s_i^2$, where n is the number of groups (for example, commercial property types) and s_i is the share of each group in the tract. For example, if a tract is comprised of 1/3 retail, 1/3 office and 1/3 industrial, the tract has $H = 1/3$; if all properties are retail then $H = 1$. Therefore, the index ranges from zero to one, where a heterogeneous tract with a property mix split equally among a large number of groups has an index approaching zero, and a homogeneous tract with all members in one group has an index of one.[14]

Finally, property owners will look for signs of future price appreciation and neighborhood upgrading. Therefore, I include in the model measures of population, income, and racial composition levels and changes. In addition, property owners look to the state of the local building stock, such as local rents and the average age of the building stock.[15] While rising rents and prices signal neighborhood upgrading, increasing building age is less definitive.

[9] These same conversations also reveal potential defensive motives: property owners often form BIDs to stave off future neighborhood decline (Meltzer, 2006).

[10] More detail on the property-level sample is provided in Section 3.4.

[11] The total square footage includes the "vertical" portion of the BID properties, i.e. not just the footprint. A 10% cut-off for "BID" neighborhoods represents the 40th percentile of coverage and was determined to be large enough to pick up "actual" BID presence, but not too large to miss relatively smaller BID coverage areas. The analysis was also preformed at alternate thresholds for "BID" census tracts (5% and 15%) and the results do not substantively change. Coefficients from regressions performed at thresholds of 25% and 50% square footage coverage do lose significance and change in magnitude, but the directions are largely consistent (but note that these are neighborhoods in the top 30% and 10% of the coverage distribution). The census tract is used instead of block groups since this is the finest level of geography reported in the NCDB, where Census characteristics are available over time.

[12] Again, the total commercial space includes the "vertical" portion of the BID properties.

[13] This index is often used to measure the concentration of firms within an industry. Brooks (2006, 2007, 2008) uses the same index to measure income, racial and building age heterogeneity.

[14] In order to calculate the Hirfendhal index for AV, I create quartiles based on the distribution of aggregate commercial AV for the neighborhood and use these as the index's component groups.

[15] Property owners would also likely look to the price appreciation of local commercial properties. There is not a sufficient number of sales in the sample of census tracts during the study period to include this variable in the final regression; however, regressions were conducted for a subsample of tracts and years with average and median commercial sales price as an explanatory variable and the results remain unchanged.

Table 2
Summary statistics, neighborhood variables.

Variable	1980		1990		2000	
	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.
% Office square footage	2.98	14.00	3.59	13.77	1.29	7.95
Commercial assessed value ($100 mil.)	0.986	3.069	1.700	5.102	1.397	3.483
Commercial Building Frontage (feet)	1776	1579	1923	1678	2101	1809
Property type index	0.552	0.273	0.542	0.266	0.446	0.255
Property size index	0.231	0.327	0.218	0.311	0.202	0.295
Property AV index	0.237	0.247	0.258	0.250	0.299	0.250
# Commercial properties					32	28
Population Density	0.017	0.011	0.017	0.012	0.019	0.012
Average HH Income ($)	36,143	14,235	50,680	24,863	52,671	26,762
% White	63.3	35.4	53.6	34.7	46.0	30.9
% Total housing built 40+ year ago	55.0	23.6	61.0	23.4	72.2	17.2
Average gross rent ($)	262	56	573	141	773	211
N	1635		1635		1635	

Note: All dollar amounts presented in 2000$.

Table 3
Summary statistics, property variables.

Variable	All BID & non-BID boundary properties		Interior BID properties		Boundary BID properties		Boundary non-BID properties	
	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.
Square Footage	63,075	270,226	31,398	120,890	67,446	176,172	59,260	331,179
Assessed Value ($)	3,571,346	15,139,519	1,982,005	10,268,690	4,077,106	15,091,079	3,129,768	15,171,380
Residential	0.34	0.47	0.09	0.29	0.10	0.30	0.55	0.50
Retail	0.45	0.50	0.75	0.43	0.66	0.47	0.26	0.44
Office	0.13	0.34	0.12	0.32	0.17	0.37	0.10	0.30
Property Type Match	0.46	0.50	0.77	0.42	0.68	0.47	0.26	0.44
Building Frontage (ft)	63	61	39	38	68	59	60	62
Building Age	83	19	84	15	81	18	84	20
AV Share (per $1000 AV)	8.53	31.77	2.90	7.47	9.34	26.69	7.82	35.61
N	4059		6504		1892		2167	

Note: All variables evaluated 1 year prior to BID adoption; all dollar amounts presented in 2000$.

Property owners may view aging stock as a signal of decline (or ripeness for development) and therefore a trigger for BID formation; alternatively, property owners may want to see new construction and revitalization in the housing stock before committing to BID formation.[16]

The costs of BID formation include the BID assessment and the costs associated with coordinating across properties. The BID assessment is typically calculated as a proportion of the building's value, size, or frontage, and will therefore be operationalized in three ways: (1) the aggregate commercial assessed value, (2) the proportion of square footage dedicated towards office usage in the tract (versus retail), and (3) the aggregate commercial building frontage in the tract. In order to test for the importance of coordination costs, I rely on the heterogeneity indices described above. In addition, I include two variables to explicitly test the hypothesis put forth by Brooks and Strange (forthcoming); they predict that the collective action problem can be resolved if the share of ownership is concentrated in fewer parcels, and more specifically, a smaller number of larger properties. First I use an index measuring the mix in property size to test for the effect of property size concentration on the likelihood of BID formation. Second, I include the frequency of commercial properties in each neighborhood to test whether larger collections of properties are less likely to form a BID.

Clearly, most of these variables echo those used to estimate the benefits of BID formation—therefore the coefficient for these redundant variables will capture the *net* benefit of BID formation. Should the coefficients be positive then BID formation contributes positively to aggregate welfare.

[16] Brooks (2006, 2007) finds evidence that BID formation is increasing in age, i.e. more likely for older cities.

For the current analysis, a neighborhood (or census tract) receives a BID only if a BID does not yet exist in that neighborhood. In addition, there are a number of neighborhoods that, as of the end of the study period, have not yet received a BID (these are "censored" observations). Therefore, the likelihood of BID formation will be estimated using survival analysis methods. Specifically, I use a Cox model with non-proportional hazards to estimate the likelihood of a census tract receiving a BID between t and Δt, given that it has not yet received a BID by time t (this is also known as the hazard rate, $h_n(t)$).[17] The hazard rate at time t is understood as the unobserved rate at which an event occurs, in this case, BID formation. And $1/h_n(t)$ is the expected duration of time (using the origin of the study period, 1980, as a starting point) until the event occurs. The partial likelihood of the Cox model is a flexible estimation option, for it allows for an unspecified form for the underlying survivor function as well as time-varying explanatory variables.[18] For the neighborhood-level analysis, the equation to be estimated is:

[17] A census tract is considered a "BID" tract if it possesses at least 10% BID square footage coverage. If there are multiple BIDs in a single census tract, then the BID with the earliest formation date is used. Therefore, this model is more specifically estimating the likelihood of formation for the *first* BID in a tract.

[18] I extend the Cox proportional hazards model to include time-varying covariates; other than additional computational complexity, the partial likelihood estimation is robust to this specification (see Grambschi and Therneau, 1994; Allison, 1995). The presence (and significance) of time-varying covariates by definition violates the proportionality assumption of the proportional Cox model, but is also the choice method to address variation in the hazard over time (see Allison, 1995). Time-weighted scaled Schoenfeld residuals plotted against time indicate that proportionality is upheld in most cases (see Grambschi and Therneau, 1994) and supports linear nonproportionality in the cases where time-varying covariates are used. See Allison (1984, 1995) for a detailed description of using Cox regressions models in survival analysis.

$$h_n(t) = \lambda_0(t)\exp(\boldsymbol{X}'_{n,t-1}\boldsymbol{\beta})$$

In this regression, $\lambda_0(t)$ is the baseline hazard function, i.e. the hazard function for a census tract with all covariates set to 0; and $\boldsymbol{X}_{n,t-1}$ is a vector of benefit and cost variables for neighborhood n at time $t-1$.[19] This model is also stratified by Community District (CD) in order to allow for varying hazard functions by CD,[20] where the hazard function for the nth neighborhood in the dth CD is expressed as:

$$h_{n,d}(t) = \lambda_{n,0}(t)\exp(\boldsymbol{X}'_{n,d,t-1}\boldsymbol{\beta})$$

3.4. Property analysis: empirical strategy

For this part of the analysis, the unit of observation is the property that, at any moment in time, has the choice to accept or reject BID membership.[21] For the property-level analysis, I extract a very specific subsample of BID and non-BID properties along the border of the BID. The following process is done for each city block that is entirely or partially located in a BID. First, I include BID properties that lie at the edge of a contiguous group of BID properties, such that the property is abutted by only one other BID property. Second, I include non-BID properties that abut only these border BID properties (and no other, more internal BID property).[22] The intuition behind this identification strategy relies on the fact that, at the BID boundary (and specifically the edge of a contiguous group of BID properties), membership is a voluntary property-level decision; an interior, non-boundary BID property, on the other hand, can be forced to join due to requirements of property contiguity and majority support in favor of BID formation (since it could abut two properties who have opted into the BID). While I would ideally like to have information on the voting preferences of BID members, this strategy exploits the situation of boundary properties to obtain revealed preferences for BID services in an alternative way. In addition, by comparing properties that share a BID boundary, I can control for any unobserved, local characteristics, making the properties as comparable as possible and making it easier to identify discrete changes in net benefits of BID membership.[23]

The benefit variables measure the amount of building and commercial space over which the BID benefits are capitalized and the match in service preferences. Since the estimation strategy relies on within-BID variation, I assume that any indicators of neighborhood price appreciation are constant across properties in each BID (including the boundary non-members). Therefore, this specification does not include the neighborhood-level variables. The first set of benefit variables includes commercial assessed value, building size and frontage, property type (i.e. residential or commercial), commercial establishment type (i.e. retail, office, industrial, public, etc.), and age.[24] The second set of benefit variables capture the extent of a match in service preferences across the potential BID members and the marginal property. These include: (i) the share of the property's assessed value relative to the total assessed value in the potential BID, referred to as AV-share, and (ii) an indicator for whether the property matches the predominant commercial establishment type in the proposed BID area.[25] AV-share captures the property's perceived weight in the decision-making process over BID services and priorities, since votes in the BID are weighted by AV. The "property-type-match" variable takes on the value of "1" if the property classification matches the predominant classification among the other potential BID members and "0" otherwise. Again, assuming that property type proxies for type of commercial tenant (which is correlated with particular service preferences) this variable captures the potential for a match in service package preferences.[26]

The benefits of BID membership are weighed against assessment and coordination costs. Since the BID assessment is calculated as a proportion of the building's value, size, or frontage, the assessment will be operationalized in three ways: (1) commercial assessed value, (2) building square footage, and (3) building frontage. In order to test for the importance of coordination costs (which I assume are increasing in property heterogeneity), I include the property-type-match variable described above. A positive coefficient on property type match indicates that the property is more likely to join the BID in the presence of relative property homogeneity, in part due to mitigated problems associated with collective action and service "agenda-setting". Since the model relies on within-BID variation, I cannot test for the effect of larger groups (that is, the number of properties) on the likelihood of BID formation. I do, however, weight the model by the number of properties in the BID, and compare the results to unweighted specifications.

Again, the coefficients for these particular variables will capture the *net* benefit of BID formation. Should the coefficients be positive, then, at the margin, the benefits exceed the costs of joining the BID.

In order to estimate the likelihood of BID membership, I use a conditional binomial logistic regression. The equation to be estimated is:

$$Prob(BID_{i,b} = 1 | \boldsymbol{X}_{i,b}, \boldsymbol{C}_{i,b}) = \frac{e^{\alpha_i + \boldsymbol{X}'_{i,b}\beta + \boldsymbol{C}_{i,b}\gamma}}{1 + e^{\alpha_i + \boldsymbol{X}'_{i,b}\beta + \boldsymbol{C}_{i,b}\gamma}}$$

In this regression, BID takes on the value of "1" if a property, i, on BID boundary, b, is in a BID at any point between 1980–2008 and "0" otherwise; $\boldsymbol{X}_{i,b}$ is a vector of benefit and cost variables for property i located on BID boundary b; $C_{i,b}$ are corner location dummies, included to control for properties that may be included or excluded from BIDs based on convenient corner placement; and α_i is a BID-specific constant term.[27] The regression coefficients

[19] Note that all right-hand side variables are taken at a point in time prior to BID formation at time t, as to temper any simultaneity bias. Specifically, if a BID formed any time between 1991 and 2000, the covariates for that tract at the time of formation are taken as of 1990. The same logic is applied to BIDs formed in the 1980s and post-2000. Regressions were also run using interpolated values for these covariates, and the results are substantively the same. I use the model without interpolated values to avoid making any assumptions about the functional form of the interpolation. I also work off of the assumption that the right-hand side variables change slowly over time.

[20] Community districts are political entities unique to New York City. Each CD contains approximately 100,000 residents and New York City contains 59 in total. The model was also stratified by borough and alternative neighborhoods that are smaller than CDs (defined by the New York City Department of City Planning), producing substantively identical results. CD stratification was selected, because CDs actually play a role in the BID approval process and are the level at which public services are allocated.

[21] Once a property is a member of a BID, it cannot join another BID. Properties that border more than one BID are assigned to the BID with the earliest adoption date.

[22] An example of how the boundary properties were identified using GIS is illustrated in Appendix A. The cross-hatched lots only (both shaded and white) comprise the sample. All boundary properties were identified manually for each BID by the author.

[23] See Black (1999) for a similar treatment estimating the impact of school test scores on property values for housing located on either side of school attendance boundaries.

[24] A non-linear term for assessed value was also included, but it was insignificant and did not alter the other coefficients, and therefore was excluded from the final regression specification in favor of a more parsimonious model.

[25] The total value of the "potential" BID includes all of the properties in the actual BID and the boundary non-BID properties that, in this analysis, had the opportunity to join. Both measures were also calculated using just the properties in the BID that actually formed; the results are identical between the two specifications.

[26] It may be that matches in service preferences not only convey the desire for similar types of services, which is proxied for by the property-type-match index, but also the desire to spend similar amounts on certain services. In order to test this type of preference match, I also ran similar specifications using an AV-based match variable, in order to proxy for homogeneity in the willingness to pay. This variable is never significant and does not change the other coefficients, and therefore is not included in favor of a more parsimonious specification.

[27] Results are robust to identical specifications using city block fixed effects. Due to the fact that some city blocks do not have both BID and non-BID properties, I lose observations in the block fixed-effects regression, and therefore the BID fixed-effects version is used throughout the analysis.

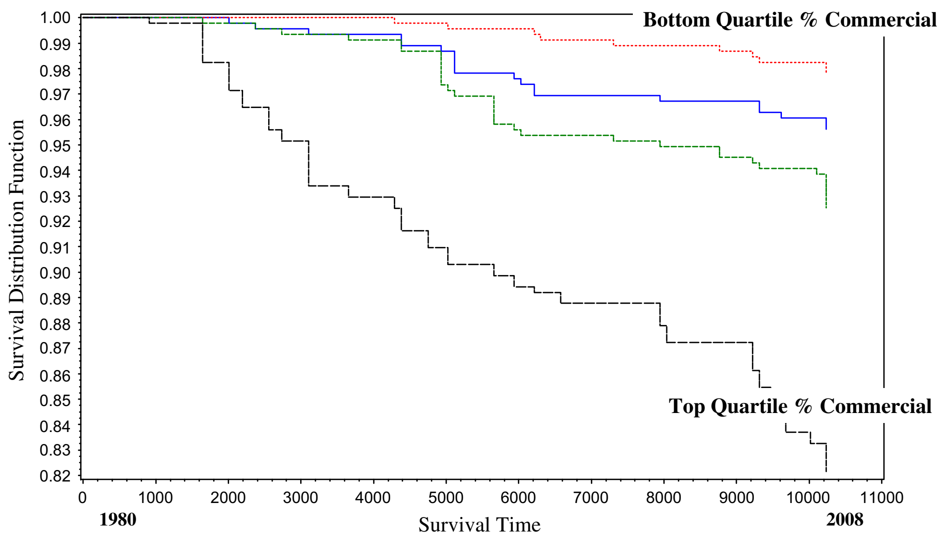

Fig. 1. Kaplan Meier survival function, stratified by % commercial.

are also weighted by the number of properties in the BID, to account for the variation in BID size and the potential for larger BIDs to disproportionately influence the estimates. All of the explanatory variables will be taken 1 year prior to the year of BID formation for property i in BID b, as to avoid bias associated with reverse causality.[28]

4. Results

4.1. Neighborhood regression results

BIDs in New York City are not evenly distributed. Fig. 1 shows survival functions for BID adoption across neighborhoods in New York City: not surprisingly, neighborhoods with the top quartile of commercial square footage are less likely to survive without a BID (or more likely to form a BID) compared to those in the lowest quartile, as shown by the more rapidly declining survival function.[29] These are also neighborhoods with more valuable commercial properties (77% of tracts with BIDs possess average commercial assessed values above the median value across the City, compared to 47% of non-BID tracts), as shown in the divergence of survival functions in Fig. 2. BIDs are also found in neighborhoods with relatively higher household incomes (see Fig. 3) and denser populations (on average, 70% of tracts with BIDs, compared to 48% of non-BID tracts, have population densities above the borough-wide median).

The hazard regression results support these patterns, as displayed in Table 4.[30] The first column displays a parsimonious specification and the following two columns display the full specification; regression (3) stratifies the sample by CD, to allow for spatial variation in the likelihood of BID formation. All three regressions consistently indicate that BID formation is explained by a combination of the characteristics of the neighborhood's commercial space, the match in service preferences, and signs of neighborhood change. Neighborhoods with more office-classified square footage (as opposed to retail-classified square footage) are no more likely to form BIDs.[31] However, holding other property characteristics constant, neighborhoods with more valuable commercial properties are more likely to form BIDs. Therefore, the total value of the properties, rather than the predominant type, seems to better predict BID formation.

The full specification, without CD-stratification (shown in the middle column of Table 4), reveals a similar, but more nuanced, story. The coefficient on linear frontage is positive and significant, indicating that net benefits increase in the amount of commercial space that is exposed to the pedestrian sidewalk.

BIDs also tend to form in neighborhoods where there is a stronger match in preferences for service type and spending. Specifically, neighborhoods with more homogeneous property types and AV mixes are more likely to form BIDs (as indicated by the positive and significant coefficients on these variables). On the other hand, the results on the costs associated with collective action are mixed: the coefficient on the property size index is not significantly different from zero, and the number of commercial properties is positive and significant. This second finding suggests that BIDs are more likely to form in neighborhoods with more commercial "players", which is contrary to the prediction that more entities would increase formation costs and deter formation (but it is consistent with the notion that BIDs are formed to overcome collective action problems, which are more endemic to larger groups).

In the final specification I stratify the sample by CD, and the patterns are largely the same (but with larger magnitudes).[32] For each additional \$10 million in aggregate value, the likelihood of BID formation increases on average by 12%. However, the benefits associated with higher valued properties appear to increase at a declining rate. Specifically, the results of the full specification more strongly indicate that the likelihood of BID formation begins to decline for those neighborhoods with aggregate property values in the top percentile; or for neighborhoods with aggregate values above \$590 million. While this trend is significant, in reality it is only true for a small portion of the neighborhoods, with either many valuable

[28] I also use variables taken at 2- and 3-year lags prior to BID formation and the results are unchanged. These results are available from the author upon request.

[29] The differences in the strata are significant at $p < .001$.

[30] For all results, parsimonious regressions omit variables that are moderately correlated with other variables. OLS and Logit regressions are displayed in Appendix B.

[31] Alternate specifications controlled for the share of commercial square footage more generally, and, as expected, neighborhoods with more commercial space are more likely to form BIDs. This suggests that BIDs are more likely in areas where the costs of the services can be spread across more interests and the benefits shared by more.

[32] Since the distribution of BIDs also differs across the boroughs, I also test for frailty at the borough level, but I cannot reject the null that the frailty parameter is significantly different from zero.

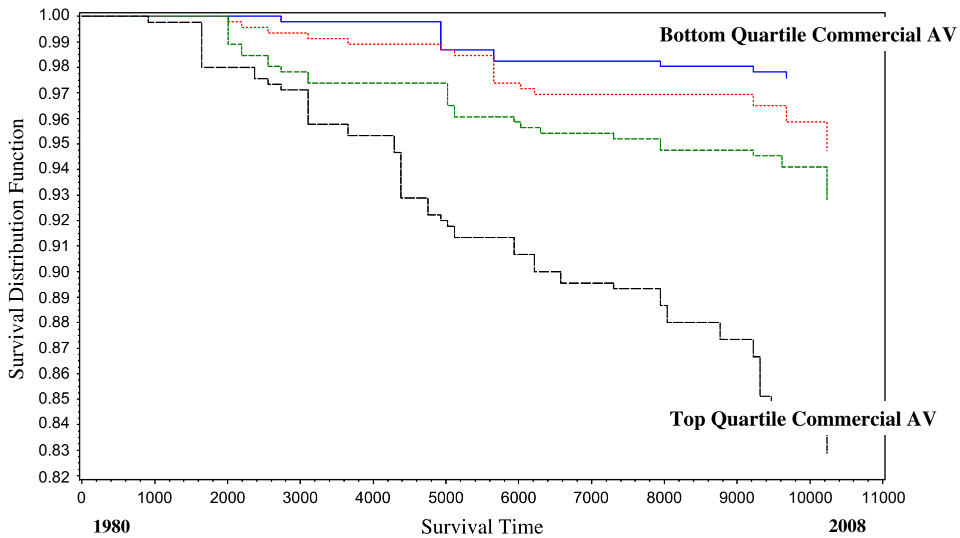

Fig. 2. Kaplan Meier survival function, stratified by commercial assessed value.

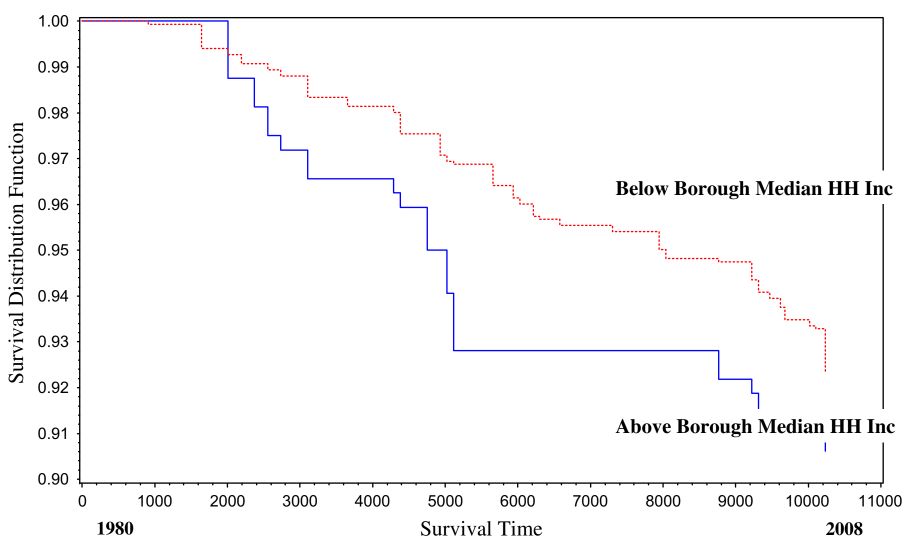

Fig. 3. Kaplan Meier survival function, stratified by household income.

properties or a cohort of exorbitantly valued properties (the mean aggregate commercial value for a neighborhood in the sample, over the entirety of the study, is about $13 million). Therefore, in general, it holds that neighborhoods with more commercial frontage and relatively higher valued properties, that are also receptive to additional improvements from the BID, are more likely to benefit from a BID. This supports the prediction that street-level businesses will disproportionately benefit from BID services that improve the streetscape and that a sizable assessment base is needed to support the provision of those services. The neighborhoods with the greatest aggregate wealth, however, are not the most likely to form a BID; perhaps they can organize and afford supplemental services without the aid of a BID.

In addition, these final results provide even stronger evidence for the importance of service match preferences: the magnitudes of the coefficients on the property type and AV indices are larger and reinforce that BIDs tend to form in neighborhoods where there is greater homogeneity in preferences over service type and spending. Of note, the coefficient on the number of commercial properties is smaller and no longer significant.

Finally, signals of neighborhood appreciation are somewhat less robust, but still important in explaining the likelihood of BID formation. Population is consistently and positively correlated with BID formation. While more parsimonious models show that neighborhoods with older housing stock are more likely to form BIDs (which is consistent with patterns of urban revitalization), this relationship goes away in the final specification. The coefficient on the change in average household income, however, increases in magnitude and becomes significant when the hazard rate is allowed to vary across CDs in the final specification. Together, these results indicate that property owners form BIDs to improve areas that have been experiencing growth and appreciation. This suggests that BIDs are more likely a solution for areas that already have some development momentum.

4.2. Property regression results

The property level analysis attempts to disentangle the individual property characteristics that explain BID membership by

Table 4
Regression results, neighborhood analysis.

Dependent variable: $h(t)$	(1)		(2)		(3)	
	Param.	Haz. Ratio	Param.	Haz. Ratio	Param.	Haz. Ratio
% Office square footage	−0.569 (0.787)	0.566	−0.049 (0.761)	0.952	0.104 (0.741)	1.109
Commercial assessed value ($100 mil.)	0.076 (0.007)***	1.079	0.078 (0.033)**	1.081	0.115 (0.037)***	1.122
Commercial assessed value^2 ($100 mil.)			−0.001 (0.001)	0.999	−0.001 (0.001)**	0.999
Log (Commercial Building Frontage)			0.658 (0.173)***	1.931	0.879 (0.199)***	2.409
Property type index	−0.178 (0.340)	0.837	0.861 (0.421)**	2.365	0.965 (0.435)**	2.624
Property size index			0.265 (0.309)	1.303	−0.094 (0.313)	0.910
Property AV index			1.107 (0.419)***	3.026	1.717 (0.493)***	5.570
# Commercial properties			0.007 (0.003)	1.007	0.004 (0.004)	1.004
Log (Population Density)	0.654 (0.153)***	1.924	0.610 (0.148)***	1.840	0.635 (0.166)***	1.887
% Change in population density (prior decade)			−0.434 (1.855)	0.648	4.434 (4.043)	84.287
Log (Average HH Income)	0.053 (0.401)	1.054	0.090 (0.473)	1.094	0.007 (0.563)	1.007
% Change in Average HH Income (prior decade)			0.251 (0.530)	1.286	0.946 (0.435)**	2.575
% White	−0.057 (0.270)	0.945	−0.184 (0.334)	0.832	−0.935 (0.634)	0.393
% Change White (prior decade)			0.087 (0.868)	1.090	1.529 (0.955)	4.612
% Total housing built 40+ year ago	2.388 (0.621)***	10.887	1.760 (0.636)***	5.814	1.034 (0.667)	2.812
Average gross rent	0.503 (0.841)	1.654	−0.438 (0.821)	0.645	−0.376 (1.020)	0.686
AIC	1740.74		1683.08		731.62	
Log-likelihood	−1724.74		−1651.08		−699.62	
CD Stratified	N		N		Y	
N	1628		1628		1628	

Notes: All variables taken at point in time prior to BID formation; Robust standard errors in parentheses.
** $p < .05$.
*** $p < .01$.

focusing on the boundary. The results (displayed in Table 5) indicate that the net benefit of membership increases in the amount of commercial space and varies by the type of commercial space. The coefficient on commercial square footage is significant and positive in both the parsimonious and full specification (displayed in columns one and two, respectively). When frontage is added to the full specification, we see that not only larger buildings, but those with smaller frontages, are more likely to join BIDs; in other words, taller buildings with more tenants perceive the net benefits of BID membership to be larger, perhaps because they can distribute the costs of the assessment across more individual payees (and therefore the cost is less observable to each individual tenant).[33] Based on the marginal effects calculations (displayed in Appendix C), holding other building characteristics constant, a 1% increase in building square footage increases the probability of BID membership by about .12 and a 1% increase in linear frontage decreases the probability of BID membership by .09.[34] In other words, if the mean square footage in the sample is 67,638, a building with 676 more square feet is 12% more likely to join a BID. Likewise, if the mean frontage in the sample is 64 ft, a building with .64 more linear front feet is 9% less likely to join a BID.

Not surprisingly, residential properties are less likely to join BIDs: a residential property is 40% less likely to join a BID than other property types in the full specification. This result is consistent with the BID's mission to serve commercial properties and businesses; therefore the benefits of membership are less evident for residential properties. BIDs can even generate costs for residential properties, such as increased noise and traffic. On the other hand, office buildings are more likely to join BIDs; specifically, in the full specification, office properties have about a .13 higher probability of joining BIDs compared to other properties. This is counter to the expectation that office buildings would have management companies to take care of supplemental services. This suggests that BIDs are either providing more comprehensive or more cost-effective services than those provided by the property owner. Interestingly, the retail variable is insignificant in the full specification and only marginally significant in the parsimonious model (albeit positive in both, as expected), suggesting that the benefits of BID membership for retail properties do not exceed the costs. The age of the building is not significant in predicting BID membership in either specification; this may be because age is a poor proxy for the level of structural disrepair, since older buildings may still be well-kept or rehabilitated.

Assessed value, on the other hand, is negatively associated with BID membership: a property valued at an additional $1 million, which is a 28% increase in value based on a sample mean assessed value of $3.57 million, is .4% less likely to join a BID. This suggests that the higher assessments associated with higher assessed values outweigh the benefits of potential property value returns, discouraging BID membership for higher valued properties at the boundary.

Property owners also consider their control over the BID's service package and the potential match in service preferences. The share of assessed value (AV share) is negative and significant in the full specification. This means that the property owners are concerned about their relative cost burden in joining the BID, and that the higher the perceived burden, the lower the likelihood of membership. Indeed, this perceived cost outweighs the benefit associated with greater voting power and control over the BID service package.[35] In addition, the coefficient on the property type match variable is positive and significant in both specifications, although it decreases in magnitude from the parsimonious to full model. In the full specification, if an individual property matches the predominant property type in the proposed BID area, the probability of BID membership increases by .18. As in the neighborhood analysis, this

[33] All the results discussed herein are robust to OLS. These are available upon request from the author.

[34] Since it is not feasible to calculate consistent marginal effects from the conditional logit model, I have estimated an identical specification including a vector of BID dummy variables instead of BID fixed effects, and derived marginal effects from this specification. While the standard errors are not corrected in the latter estimation, the parameters on the primary covariates of interest are identical. Significance levels are determined by the conditional logit adjusted standard errors. A table with the complete marginal effects estimates can be found in Appendix C.

[35] Alternative specifications were also run including assessed value and AV-share interacted separately with property type; the results do not change the overall interpretation of the variable's effect.

Table 5
Regression results, property analysis.

	(1)	(2)	(3)
Dependent variable: BID membership (=1 if property in BID; =0 if property not in BID)			
Log (Sq. Ft.)	0.492***	0.484***	0.387***
	(0.084)	(0.108)	(0.079)
Log (Building Frontage)		−0.339**	−0.246**
		(0.163)	(0.120)
Residential[a]	−1.746***	−1.742***	−1.438***
	(0.334)	(0.306)	(0.295)
Retail[a]	0.653*	0.377	0.582*
	(0.368)	(0.307)	(0.330)
Office[a]	0.777***	0.507**	0.595**
	(0.245)	(0.227)	(0.236)
Assessed Value (AV)[a] (millions $)	−0.015***	−0.016***	−0.011*
	(0.004)	(0.00609)	(0.00625)
AV Share (per $1000 AV)[a]		−0.004*	−0.002
		(0.002)	(0.002)
Property Type Match[a]	1.015***	0.708***	0.623**
	(0.223)	(0.182)	(0.258)
Log (Building Age)	−0.223	−0.153	0.021
	(0.231)	(0.220)	(0.231)
Building Age Missing	−0.611	−0.201	0.695
	(1.032)	(0.956)	(1.068)
Corner		2.090***	2.016***
		(0.268)	(0.214)
BID Fixed Effects	Y	Y	Y
BID Weights	Y	Y	N
N	4059	4059	4059
Pseudo *R*-squared	0.312	0.412	0.367

Notes: Excluded property type is "Other", which includes industrial, public, vacant, and other properties.
Property Type Match = 1 if property type matches predominant type in BID.
Robust standard errors in parentheses.
[a] These variables taken 1 year prior to BID formation.
* $p < .10$.
** $p < .05$.
*** $p < .01$.

result means that some degree of property type homogeneity is needed to overcome obstacles associated with setting the BID's service agenda.

Finally, in order to discern whether coordination costs (measured by the number of potential BID properties) influence the likelihood of BID membership I run identical models without BID-specific weights. The third column of Table 5 displays the unweighted estimates for the full specification, which are generally attenuated compared to the weighted estimates.[36] While the within-BID analysis prevents a more direct test, the difference between the two sets of results suggests that coordination costs (as proxied by the number of potential BID members) play a role in the decision to join the BID (specifically, they diminish the expected net benefits).

5. Conclusion

BIDs are an increasingly popular form of local service provision and urban revitalization, and their impacts are documented empirically and anecdotally. Their emergence, however, is uneven, and this analysis provides insight into where BIDs tend to form and, at the margin, what types of properties opt into them. BID membership is contingent on an expectation of positive net benefits. Results from both analyses indicate that net benefits are higher (and BID formation more likely) when there is more commercial space (and at the margin, office space) over which the BID benefits can be capitalized and when there is homogeneity in preferences over services and spending. Also consistent with predictions, BIDs are more likely to form in neighborhoods that possess signs of relative appreciation and growth.

The results on property values, however, are less consistent. BIDs are more likely to form in neighborhoods with more valuable commercial properties. However, the very wealthy areas, i.e. those in the top 1%, are not necessarily the most likely to form BIDs; these areas may have enough resources to independently provide their own supplemental services and find the BID costs burdensome. At the margin, properties with relatively lower assessed values are more likely to opt into the BID. These properties will most likely pay lower assessments, but receive the same level and type of services as the member property with a higher assessment burden. More valuable properties, on the other hand, do not perceive BID membership as welfare enhancing; the higher assessment burdens outweigh potential capitalization of BID services and amenities.

These findings offer policy insight. First, BIDs are more likely to successfully form in neighborhoods that are established and experiencing some appreciation. They do not appear to be a tool for staving off neighborhood decline in neighborhoods with little or no growth potential. Second, the concentration of more valuable properties in "BID" neighborhoods implies that a critical mass of valuable properties is needed to anchor the BID and push the formation process through.[37] This type of property cohort may be integral for several reasons: it may (i) have the political leverage and savvy necessary to mobilize formation,[38] (ii) provide a sizable assessment base to support basic supplemental services in the

[36] Since my estimates rely on robust standard errors and there is no variation in the degrees of freedom across the weighted and non-weighted regressions, I cannot test for a statistically significant difference in "fit" across the two specifications.

[37] This is consistent with findings from Brooks and Strange (forthcoming).

[38] This is consistent with urban "growth machine" theory, which suggests that wealthy land-owning elite will support growth-inducing policies for the very fact that they increase their property wealth and clout within the city political system (see Molotch, 1976).

area, and/or (iii) guarantee that the assessment burden will not be concentrated on a single highly-valuable or large property. However, once a cohort of valuable or large properties is formed, the evidence suggests that the boundary of the BID is comprised of less valuable properties. This finding, along with the result that property homogeneity matters, suggests that it may be strategic to initially secure a cohort of wealthy properties and/or similarly tenanted properties in order to guarantee a critical mass for successful BID formation.[39]

Third, if policymakers do believe that BIDs generate positive net benefits for property owners and neighborhoods, then perhaps the local government should be responsible for assisting commercial areas that desire supplemental services of the kind provided by BIDs, but lack the financial base or organizational capacity to achieve formation. Empirical evidence shows that BIDs increase the value of properties inside BIDs by non-negligible amounts (see Brooks and Brennecke, 2008; Ellen et al., 2007), and the current analysis demonstrates that neighborhoods are situated differently in terms of being "BID-ready." If wealthier and more stable neighborhoods form BIDs and then reap benefits from increased property values and decreased crime, any pre-existing neighborhood inequities are bound to become starker.[40]

Acknowledgments

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[39] Conversations with officials at SBS suggest that this is a typical strategy of BID formation committees.

[40] Papers by Meltzer (2011) and Brooks and Meltzer (2010) indicate that public spending and services by the local government are not, however, significantly influenced by BID presence.

Appendix A

Map of boundary properties selected for analysis, Union Square BID.

Appendix B

Neighborhood analysis, OLS and logit regressions.

Dependent variable	(1) *OLS* Param.	(2) *Logit* Param.
% Commercial square footage	0.011	0.233
	(0.051)	(0.788)
Commercial assessed value ($100 mil.)	0.030***	0.213***
	(0.005)	(0.065)
Commercial assessed value^2 ($100 mil.)	0.000***	−0.002*
	0.000	(0.001)
Log (Commercial Building Frontage)	0.000	0.518**
	−0.012	(0.237)
Property type index	0.043	0.956**
	−0.027	(0.446)
Property size index	0.005	−0.025
	−0.021	(0.346)
Property AV index	0.172***	1.656***
	−0.033	(0.430)
# Commercial properties	0.002***	0.010**
	0.000	(0.004)
Log (Population Density)	0.039***	0.602***
	−0.010	(0.156)
% Change in population density (prior decade)	−0.294	−3.953
	−0.223	(2.807)
Log (Average HH Income)	−0.027	−0.270
	−0.039	(0.622)
% Change in Average HH Income (prior decade)	0.092	1.109
	−0.058	(0.813)
% White	0.025	0.182
	−0.026	(0.450)
% Change White (prior decade)	−0.058	−0.954
	−0.045	(0.705)
% Total housing built 40+ year ago	0.060*	1.279**
	−0.032	(0.553)
Average gross rent	−0.110	−2.587
	−0.202	(3.208)
CD Stratified	N	N
N	1635	1635
R-squared	0.148	0.198

Notes: All variables taken at point in time prior to BID formation.
* $p < .10$.
** $p < .05$.
*** $p < .01$.

Appendix C

Property analysis, logit regression marginal effects.

Dependent variable: d*y*/d***X***	
Log (Sq. Ft.)	0.122***
Log (Building Frontage)	−0.085**
Residential[a]	−0.398***
Retail[a]	0.096
Office[a]	0.128**
Assessed Value (AV)[a] (millions $)	−0.004***
AV Share (per $1000 AV) [a]	−0.001*
Property Type Match[a] (=1 if property type matches majority in BID)	0.176***
Corner	−0.037***
Log (Building Age)	−0.046
Building Age Missing	0.485
BID Fixed Effects	Y
BID Weights	Y
N	4059

Notes: Excluded property type is "Other", which includes industrial, public, vacant, and other properties.
[a] These variables taken 1 year prior to BID formation.
* $p < .10$.
** $p < .05$.
*** $p < .01$.

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