# Gentrification and Small Business:
# Threat or Opportunity?

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## Abstract

Local, small businesses are very much tied to their surrounding communities. Therefore, when neighborhoods undergo meaningful economic and social changes, such as those that take place under gentrification, one would expect local businesses to feel the effects. But is gentrification a threat or a boon for existing businesses? And what are the implications for the residents that patronize these services? I test these questions here, using microdata on properties and businesses in New York City. I also drill down to three illustrative case neighborhoods, which reveal nuance beyond the average citywide effects. The results are mixed, and show that gentrification is associated with both business retention and disruption. I find that the majority of businesses stay in place, and displacement is no more prevalent in the typical gentrifying neighborhood. However, when businesses do leave gentrifying neighborhoods, their spaces tend to sit vacant for relatively longer periods of time. Gentrifying neighborhoods are more likely to attract new types of services than non-gentrifying and higher-income neighborhoods; and they more often attract chains to replace displaced businesses. However, as the neighborhood drill-downs show, there are still cases where neighborhoods undergoing gentrification lose businesses without the upside of new amenities.

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## I. Introduction

Much of the literature on gentrification has focused on how it impacts residents and housing. However, we know that the nature and quality of neighborhoods, especially those in urban settings, are also determined by the commercial enterprises that serve the community. The "corner store," an emblem of local retail, has long played an important economic and cultural role in neighborhood development and livelihood (Liebow, 1967). Retail services, particularly in mixed-use settings, not only provide material needs for those living nearby, but less-tangible social and cultural capital as well (Zukin et al., 2009; Hyra, 2008; Deener, 2007). Therefore, it follows that when neighborhoods undergo meaningful economic and social changes, like those that transpire under gentrification, there are surely implications for the local business environment. These potential changes are important not only for the business proprietors, but also for the residents that patronize their services and consume their goods.

We know that business location decisions, and their subsequent survival, are a function of the existing (and potential) consumer base in an area (Meltzer and Schuetz, 2012; Waldfogel, 2008). A gentrification-induced shift in its composition, certainly economically and often racially/ethnically, could mean several things for local businesses. These changes could be a boon for local businesses, if they bring in new consumers; however, if the new consumers also have different tastes and usher in higher rents, then the incumbent businesses could suffer. For residents, the prospect of new services, new employment opportunities and street vitality are weighed against the potential interruption in the culture and services on which they had historically relied.

To get at some of these tensions, I examine more closely the issue of business turnover and displacement under conditions of gentrification. I use microdata on business activity and neighborhood conditions in New York City to test what kinds of businesses tend to open, close or persist in the face of gentrification. I also drill down to three illustrative case neighborhoods, which reveal nuance beyond the average citywide effects. I find that gentrification can bring both opportunities and threats, for the businesses and the community more generally. Citywide, the majority of businesses stay in place over time. Furthermore, the rate of displacement/retention is no different across gentrifying and non-gentrifying neighborhoods.

However, when businesses do leave gentrifying neighborhoods, their spaces tend to sit vacant for relatively longer periods of time. Gentrifying neighborhoods more often attract chains to replace displaced businesses than non-gentrifying and higher-income neighborhoods and are more likely to attract services different than those that operated in the neighborhood prior to gentrification. However, as the neighborhood drill-downs show, there are still cases where neighborhoods undergoing gentrification lose businesses without the upside of new amenities.

## II. Neighborhoods and small business

### *Neighborhood-based small businesses*

Historically, small, local businesses have played an important role in the cultural and economic capital of urban neighborhoods.[1] Prior to the 1970s, before inner cities faced decades of disinvestment, local businesses, like corner stores, markets and eateries, were a central part of the neighborhood's fabric (Ehrenhalt, 1999; Oldenberg, 1999 and 2002; Lloyd, 2010; Sutton, 2010). In addition, they have long been considered a vehicle for entrepreneurship, especially among minority and immigrant populations (Sutton, 2010; Fairlie, 2012). These neighborhood businesses epitomize "local" not only in terms of their consumer base and proprietors (many of whom often come from the immediate community), but also their cultural and economic reach (Hyra, 2015; Hyra, 2008). This geographic immediacy, of their inputs and outputs, is consistent with Jacobs' argument (1961) that local small businesses are not only good for services and access to jobs, but are critical to the vitality of community life.

### *What happens to businesses when neighborhoods gentrify?*

Patch (2008) suggests that retail change, or "street gentrification," is an important harbinger of broader socioeconomic trends that has thus far been under-appreciated. Gentrification, a term coined by Glass (1964), originally referred to a phenomenon of socioeconomic transition: one where more affluent and more educated "gentry" enter a low-income neighborhood. These changes can bring new services and access to a wider choice of basic goods, more vital and safer streets and even local employment opportunities. However, gentrification can also disrupt

[1] Throughout "small business" refers not only to establishments with fewer than 100 employees (as defined by the Census), but also a set of businesses that tend to provide neighborhood services and goods. The current paper does not dedicate much attention to the small businesses that do not necessarily rely on the local community for their livelihood (for example, small technology or finance firms).

commercially-driven neighborhood identities and introduce services and products that do not serve incumbent residents. The commercial activity and residential composition of a neighborhood are closely tied, and, when a neighborhood gentrifies, the consumer base and costs of operation for a local business can shift as well (Meltzer and Schuetz, 2012; Zukin, 2008; Carree and Thurik, 1996; Hotelling, 1929). Here I lay out the mechanisms through which gentrification might affect the livelihood and composition of neighborhood-based small businesses.

Businesses: Changes in consumer demand

For existing businesses, a new pool of local residents could mean both more and less patronage. Waldfogel (2008) shows that preferences for retail services are strongly correlated with observable population characteristics, such as income, educational attainment and race/ethnicity. There is also empirical evidence to show that household residential preferences are influenced by local amenities, like commercial services (Meltzer and Capperis, 2016; Kolko, 2011). If, on net, the local consumer base has tastes that do not align with the services or goods that existing establishments provide, then local businesses could suffer. On the other hand, new residential activity could be a stabilizing force if it provides an injection of cash flow that the neighborhood was previously lacking. In addition, these socio-economic changes could draw new businesses and services into the neighborhood.[2]

Businesses: Changes in start-up and operating costs

Gentrification can also change the costs of operating or opening up a business. For existing businesses, the effect is very direct: due to increased demand for the area, rents can increase. Without a concomitant increase in revenues, the costs of operating could become unsustainable and force closure. It is important to note, that the pressures from rising commercial rents can take a different form than residential ones. Commercial leases tend to be much longer than residential ones (Genesove, 2003; Mooradian and Yang, 2000), and therefore businesses can often sustain operations at the original, lower rents as properties in the neighborhood otherwise

[2] For example, there is empirical evidence on how crime can deter commercial activity (Lens and Meltzer, 2016; Rosenthal and Ross, 2010; Bowes, 2007; Greenbaum and Tita, 2004; Fisher, 1991). It follows, then, that if businesses know or understand an area to be less crime-ridden, their likelihood of opening up there (all else constant) should increase.

appreciate. Therefore, any displacement could take longer to transpire. Rising rents (and new investments more broadly) can also influence the kinds of businesses that opt into the neighborhood, and by association, the range and prices of products that they sell. Alternatively, higher rents can also deter entry, leaving vacated commercial spaces empty for sustained periods of time.

***What is the empirical evidence?***

The empirical literature on gentrification and commercial activity is less developed than that on residential outcomes. Much of this is due to the fact that there is no census of businesses at a fine-grained level of geography that truly approximates a local neighborhood. We do know, however, that lower income and minority neighborhoods have fewer and, in certain cases, less diverse retail establishments, smaller average establishments, and a higher proportion of "unhealthy" restaurants (Meltzer and Schuetz, 2012; Block, Scribner, and DeSalvo, 2004; Lewis et al., 2005). In addition, banks and supermarkets tend to not locate in poorer ZIP codes, even after controlling for purchasing power (Powell et al., 2007; Zenk, 2005; Alwitt and Donley, 1997). Therefore, the empirical evidence confirms that as the demographics of an area change, so do the businesses that serve it.

Fewer studies have focused on the how commercial services *change* under conditions of gentrification. In general, initially low-valued neighborhoods that experience faster price appreciation and/or larger income gains also get more retail establishments (Meltzer and Schuetz, 2012; Schuetz, Kolko and Meltzer, 2012). Chapple and Jacobus (2009) and Zukin et al. (2009) all find that retail revitalization is most strongly associated with gains for middle-income neighborhoods (and, according to Zukin et al., largely for independent or local chain businesses). Meltzer and Capperis (2016) find that while there is more business churn in neighborhoods undergoing relative price appreciation, most of it is driven by new business births rather than business deaths or exits. The authors also find that retail churn is associated more with changes in the local consumer profile than in the commercial environment. Supply side factors matter too, and there is evidence that changes in local businesses are also driven by targeted investment (Koebel, 2002).

What are the implications for local residents and the businesses? [3] One of the most comprehensive attempts to document these changes on the ground is a compendium of case studies, from cities across the world, by Zukin et al. (2015). Not surprisingly, they find that the experiences of local businesses and consumers vary, depending on the socio-historical role of neighborhood businesses and the nature and degree of government intervention. A few other studies shed light on what gentrification-induced shifts in local retail services means for incumbent residents, in typically lower-income communities. Ellen and O'Regan (2011) observe that residents who stay in gentrifying census tracts report greater increases in their satisfaction with the neighborhood than those in other, non-upgrading low-income tracts. Another study (Dastrup et al., 2015) focuses on how gentrification affects the residents of public housing in New York City. They find that, while residents appreciate improvements in safety, they were more hesitant about how new retail and services benefitted them—the new commercial activity tended to cater to the new in-movers rather than incumbent residents and signaled future threats of displacement. Less directly related is a paper by Ding and Hwang (2016), in which the authors find that those who stay in neighborhoods undergoing price appreciation show significant improvement in their credit risk scores. This means increased access to credit and, possibly, a greater ability to patronize local businesses.

## III. Empirical strategy

While case studies have been invaluable in drilling down and understanding the processes for particular neighborhoods, they tell us very little about how gentrification, writ large, can affect small businesses across municipalities. Here, I look at neighborhoods within a dense and diverse municipality, New York City, and exploit variation in gentrification and business activity across space and over time. Specifically, I test whether or not gentrifying neighborhoods are more likely to experience business displacement than non-gentrifying neighborhoods. I consider the implications both for businesses and for the local residents that consume their services and goods.

[3] While not a focus in this paper, gentrification can also affect local job opportunities. Meltzer and Ghorbani (2016) test this for neighborhoods in the New York-Newark CSA, and find that incumbent residents, living in gentrifying census tracts, experience job losses in the immediate neighborhoods, but gain access to jobs at farther one-to-two-mile distances. Another set of related papers, on the local labor market impacts of Big Box entry, finds that the opening of a Wal-Mart or other large retailers is associated with net job and business losses and drops in retail wages (Dube, Lester, and Eidlin, 2007; Ficano, 2013; Haltiwanger, Jarmin, and Krizan, 2010; Neumark, Zhang, and Ciccarella, 2008).

While the forces of gentrification have been particularly acute in New York City, and the unusually high density an advantage for small businesses, the city exhibits great diversity in its types of neighborhoods and retail markets. Indeed, many New York City neighborhoods are comparable to those in other large U.S. cities. For example, while the median resident lives in a much denser neighborhood than someone in an otherwise comparable city, the range of densities reflects those experienced in other large cities (Capperis et. al., 2015). Typical education levels, unemployment rates, and racial/ethnic make-ups are comparable to those in other large cities; incomes are also generally comparable, with the exception of slightly higher median household incomes and lower poverty rates (Been at. al., 2013; Capperis et. al., 2014).

***Data***

The primary dataset for this analysis is the National Establishment Time Series (NETS), a longitudinal, establishment-level database that is constructed by Walls and Associates from the Dun & Bradstreet business register. Unlike publicly available government data on establishments, the NETS dataset does not suppress small-cell counts of employment and provides full street addresses for each establishment. In addition, NETS is more likely to capture nonemployer businesses than other public records (Neumark et al. 2005). Industry is reported at the 6-digit North American Industry Classification System (NAICS) level to allow for a fine-grained distinction across establishment types, as well as across chains and stand-alone businesses.[4] Most importantly for this analysis, because the NETS data are longitudinal and establishment-specific, I can track the movement of businesses into and out of very precise locations, i.e. single buildings. Specifically, the establishments are identified by a unique ID (a DUNS number), which stays with the establishment even as it changes addresses over time.[5]

[4] NAICS is a classification system for U.S. businesses, which identifies the industry for the establishment's primary activities. NAICS are self-declared by the business and exist "for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. economy" (https://www.sba.gov/contracting/getting-started-contractor/determine-your-naics-code).

[5] I recognize several limitations with using NETS. Other studies have advised against using it to identify very short-term changes in firm characteristics (and firm births specifically), and therefore I process any changes over periods of five or more years (Neumark et al., 2005). This will mitigate against any lags in the NETS data in observing new firm births (Yang and Aldrich, 2012). Furthermore, I note that the NETS data is less adept at capturing within-city moves (Kaufman et al., 2015); since I am not following businesses across space, and only within single fixed locations, this limitation should not affect the current analysis. Finally, since employment numbers in NETS are often rounded to an even number or even imputed, identifying changes (especially short-term) in employment is

I augment the NETS data with information on the properties' physical characteristics and assessments from the New York City Department of Finance's tax assessment roll files and the New York City Department of City Planning's Primary Land Use Tax Lot Output (PLUTO). I also merge in tract-level economic and demographic variables from the Geolytics' Neighborhood Change Database (1980-2000, decennially), the 2010 Census and the American Community Survey's three-year estimates from 2008 to 2010.

***Analytics***

I operationalize the neighborhood as the census tract, as defined in the 2010 Census, which is an area optimally populated by 4,000 people (U.S. Census Bureau, 2012). Previous studies have used the census tract to capture neighborhood communities and markets (Ellen and O'Regan, 2008; McKinnish, et al., 2010), as it is a level at which socio-demographic information is readily available over time. The census tract also captures a walkable market area in NYC, which, on average, can be traversed in five to ten minutes. This is consistent with my focus on neighborhood businesses and the proximate impact of localized economic change. I consider only mixed-use neighborhoods (i.e. census tracts with populations greater than 200 and with some kind of commercial activity).[6] In the end, I end up with 1,990 tracts, which constitutes nearly ninety-five percent of all census tracts in New York City.

I classify neighborhoods as gentrifying if they improve in their relative economic position over the course of the study period; this will capture any meaningful shift in local consumer characteristics. This is consistent with previous approaches (see Ellen and O'Regan, 2008; McKinnish et al., 2010; Meltzer and Schuetz, 2012) and with the (empirically supported)

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difficult (Neumark et al., 2005). NETS are better suited for identifying employment levels and changes over longer periods of time (a few years or more). While I do use the employment data reported in NETS, it is a secondary part of my analysis and I rely on levels.

[6] I retain selected commercial properties (store, loft and garage buildings) and mixed-use properties (residential and commercial together), and exclude wholly office and residential properties. I do this to ensure that I capture local, neighborhood-based businesses, rather than more corporate establishments. I select on the building classification rather than the type of actual commercial activity in order to retain areas that may be under-populated by businesses, but still set up to host them (indeed, the gentrifying neighborhoods might be disproportionately comprised of building area that is underutilized).

assumption that local commercial markets respond to changes in consumer demand.[7] Specifically, I (i) identify neighborhoods as "low-income" if they have average household incomes that are in the bottom two quintiles of the neighborhood income distribution in 1990 or 2000[8] and (ii) out of those low-income neighborhoods, identify those whose relative average household income (compared to the broader MSA) has increased by the end of the decade that follows (each analysis is conducted for the 1990s and 2000s separately). I rely on relative measures of income, and how those change over time, to account for the fact that macro metro area economic shifts may or may not be reflected equally at the neighborhood level (Rosenthal, 2008 and Ellen and O'Regan, 2008). Out of all the census tracts in the study area, between 905 and 941 are designated as low-income (for 1990 and 2000 respectively); out of those low-income tracts, about five percent are identified as gentrifying over the 1990s and almost thirty percent over the 2000s.[9]

To measure business retention and displacement, I consider the succession, or "lifecycle," of businesses within individual properties over the course of the study period, 1990-2011.[10] I divide the study period into four separate intervals of about five years each, and in turn observe business retention and displacement over these smaller five-year intervals. I consider five years a reasonable window over which to observe business succession, since the median lifespan of a neighborhood-based business is around five years as well.[11] I include only properties that contain their maximum number of businesses at the start of the five-year interval, because I

[7] I also replicate the analysis across strata that reflect other neighborhood differences (supply- and demand-related) that could be correlated with both gentrification and business displacement, such as property values, housing age, population growth and change in the share of the foreign born population (see Hammel and Wyly, 1996; Freeman, 2005; Lester and Hartley, 2014). In general, the differences across strata are non-existent or consistent with what is observed using the income-based gentrification metrics.

[8] Specifically, I use average household income for the tract, relative to average household income for the MSA.

[9] This income-based designation reflects other demographic, housing and commercial differences across gentrifying and non-gentrifying neighborhoods; and these differences vary depending on the decade. Furthermore, many of these trends for the neighborhoods that gentrify during the 2000s are already present in the 1990s. These findings demonstrate why it is important to consider gentrification processes over long periods of time (Zuk et al., 2015) and to segment the different time periods of change.

[10] I use the term "business" and "establishment" interchangeably here, to keep with the theme of "small businesses." However, in practice, a business can have multiple establishments (or locations); here I differentiate between multiple- and single-location businesses with the term "chain".

[11] Furthermore, the NETS data is not known to be reliable in its year-on-year changes; previous reviews and critiques of the NETS data have suggested that longer intervals, like five years, produce more accurate measures of business flows (Neumark et al., 2005).

cannot account for changes in or additions to the number of commercial units over time.[12] Finally, I construct metrics for single-business properties and multiple-business properties separately. I do this not only because the businesses that occupy them could behave differently, but also because the buildings in which they are located are likely distinct (in terms of size, location and classification).[13]

For each property, I construct rates of retention (*Stay*) and displacement over each five-year interval, the latter of which is operationalized in two ways: (i) leaving without a new establishment to replace them (*Leave*) and (ii) leaving with a replacement (*Replace*).[14] I disaggregate the displacement metric to better identify how the business's exit affects the local community—both in terms of the new service that replaces it and in terms of the vacant space it leaves behind. I use the business' 6-digit NAICS industry classification to identify the kind of goods or services it provides. I also use information on the number of reported employees for the establishment to capture the typical size of each business. This serves as a proxy not only for the size of the business (in terms of the number and perhaps variety of products offered), but also the number of potential local jobs. Note, that since I have restricted the property types to include only retail and mixed-used classifications, I am focusing on small businesses, i.e. those with

[12] Specifically, I can observe the number of establishments per property over time; if that number is higher at the end of the five-year interval (compared to the start) then I drop these properties from the analysis. My concern is over whether or not there are more vacant spaces available for commercial activity than what is observed by establishment activity. This restriction on the sample is not much of a concern for the current analysis since my focus is on business retention and displacement (and for incumbent businesses in particular), and not business entry and formation more generally. In addition, the omitted businesses are largely similar on observables compared to those represented in the sample (especially those located in multiple-establishment properties). The omitted businesses, however, do tend to locate in larger properties, tend to be newer, independent and more concentrated in insurance and professional services. Still, I note that the statistics presented here on business retention and displacement will be lower-bound estimates, since any businesses that enter the neighborhood into new spaces could also contribute to ongoing retention and/or displacement. I do replicate the analyses with a constant sample of properties, based on business occupation in 1990 (the start of the study period). The results are substantively the same and do not indicate any bias from properties/businesses that enter the sample later intervals in the study period. These results are available from the author upon request.

[13] These differences are confirmed in the data. In addition, it is slightly harder to identify new businesses that replace displaced businesses for multiple-business properties, since there is not always a one-to-one replacement and I do not have consistent information on the number of commercial units. The one-to-one replacement in single-business properties is a much cleaner identification and I wanted to keep that part of the analysis separate.

[14] *Stay* = $\frac{\#\_Estab\_Stay_t}{\#\_Estab\_Total_{t-5}}$ where *#_Estab_Stay* is the number of establishments that were in operation at *t-5* and at *t*; *Leave* = $\frac{\#\_Estab\_Leave_t}{\#\_Estab\_Total_{t-5}}$ where *#_Estab_Leave* is the number of establishments that were in operation at *t-5*, but not at *t* (and no other new establishment had re-occupied its commercial space by time *t*); and *Replace* = $\frac{\#\_Estab\_Leave\_Replace_t}{\#\_Estab\_Total_{t-5}}$ where *#_Estab_Leave_Replace* is the number of establishments that were in operation at *t-5*, but not at *t* (and with a new establishment in its commercial space by time *t*).

fewer than 100 employees (Caruso, 2012).[15] As another proxy for service type, I identify establishments that are stand-alone versus chain (i.e. linked to at least one other establishment through a common headquarters). This distinction is also important in light of the controversies around small business' vulnerability to chain stores, which are seen as more pervasive in gentrifying neighborhoods (Basker, 2005; Haltiwanger, Jarmin, and Krizan, 2010; Neumark et al., 2008).

The analysis is twofold. First, I exploit the larger sample of single- and multiple-business properties to look at the within-building succession of businesses over time. Second, I drill down to several neighborhoods that have undergone different degrees of economic change, to better understand the nature of the small business dynamics observed in the large-N sample.

## IV. Findings

### *Citywide*

Before looking at the association between business succession and gentrification, I establish some baseline retention and displacement rates for the overall sample. These are illustrated in Chart 1. In general, businesses are more likely to stay in place than leave; this is consistent across both decades and both types of properties (single- and multiple-establishment), although the retention rate does go down in the second half of the 2000s and for multiple-business properties more generally. Businesses are also consistently more likely to leave without replacement, meaning that space is vacant by the end of the five-year interval. This rate is relatively consistent across the decades, as is the share of those businesses that leave with a replacement establishment operating by the end of the five-year interval. However, the likelihood of replacement is substantially higher for multiple-business establishments (about double); this suggests that commercial spaces in single-business properties are more likely to sit vacant after a business' displacement.[16] I note that national retention rates of businesses within

[15] I rely on the definition of small business provided by the U.S. Census in their Statistics of U.S. Businesses, since they provide more fine-grained classifications than those provided by the Small Business Administration. Very small businesses are defined as those with fewer than 20 employees and small businesses are defined as those with fewer than 100 and more than 20 employees. I use a combination of these two categories to capture the class of businesses in the current analysis.

[16] In order to test whether or not these patterns vary across space, I replicate the same rates by borough (not shown here, but available from the author upon request). New York City is comprised of five, rather distinct boroughs: Manhattan, Staten Island, Brooklyn, Queens, and Bronx. The five boroughs largely show similar retention,

the first five years of operation fall at around 50 percent (Small Business Administration, 2014). The rates in the current analysis are higher largely because the sample is comprised of both older and newly opened establishments; when rates are calculated for newer establishments only (i.e. less than five years old) the rates are closer to the national rates (ranging between 50-60 percent) and the relative trends remain the same.

***Does gentrification matter for business retention and displacement?***

I now replicate the same set of statistics, but stratified across three groups: low-income and gentrifying, low-income and non-gentrifying and the balance of tracts, which are moderate-to-high-income. Single- and multiple-business properties are combined and I display here statistics that are contemporaneous with the decade of gentrification.[17]

Retention and displacement trends

Chart 2 displays retention and displacement rates across time, for both gentrifying and non-gentrifying neighborhoods (the underlying statistics are shown in Table 1). I first note that while the magnitude of retention and displacement rates vary somewhat across time, the relative positioning of their shares persists. That is, most businesses stay in place, and the smallest share leaves with replacement. Second, the overall patterns indicate consistency in retention and displacement rates across gentrifying and non-gentrifying neighborhoods. The most significant differences in retention rates exist during the second half of the 2000s, during which businesses in gentrifying neighborhoods actually exhibit higher retention rates (in substantive terms, however, this is only a one percentage point difference). In addition, businesses that stay in place in gentrifying neighborhoods during the 2000s tend to be older than those in non-gentrifying areas; the opposite is true for the 1990s.[18] Therefore, it is not the case that longstanding businesses are more vulnerable to gentrification-induced displacement. However,

displacement and replacement rates, which provides assurance that the results should not be driven by one borough in particular.

[17] For brevity of exposition, the displayed statistics are weighted averages of the single- and multiple-establishment property sub-samples. When the analyses are conducted on the sub-samples separately, the same patterns emerge. I also, where the data allowed, lagged the decade of gentrification and the results are substantively the same to those displayed.

[18] These differences are all significant at $p<.05$. When I look only at retention/displacement rates for new businesses (i.e. those operating fewer than 5 years), there is still no meaningful difference between gentrifying and non-gentrifying neighborhoods (one exception is the early 1990s, during which retention rates are higher in gentrifying neighborhoods for newer businesses).

separate analyses on only gentrifying neighborhoods show that those with faster commercial AV (i.e. rent) appreciation do display slightly lower rates of retention and higher rates of displacement without replacement, suggesting that rising rents could have something to do with business displacement under conditions of gentrification.[19]

What happens to the commercial spaces once businesses leave? While the rate of displacement without replacement universally goes up during the latter part of both decades, this increase is more pronounced for gentrifying neighborhoods; the lowest rates tend to be in the moderate/high-income neighborhoods. Again, these differences manifest themselves in fewer than a few percentage points.[20] Additional analyses (not shown here) indicate that most (i.e. upwards of 80 percent) vacancies are filled immediately. However, for those spaces left vacant, the duration of vacancy is often longer in gentrifying neighborhoods than non-gentrifying ones (and vacancies are always more prolonged in gentrifying neighborhoods compared to moderate/high-income areas).[21]

In order to check the robustness of these results, I also conduct multivariate regression analyses, estimating the likelihood that a business stays in place conditional on its neighborhood gentrifying (see Table 2). As above, I pool the single- and multiple-establishment property samples; but I control for business- and property-level characteristics (including the number of other businesses in the same building), as well as time (i.e. interval) and geographic (i.e. borough and smaller neighborhood) trends.[22] In the most parsimonious model, the coefficients on the

[19] These results are not displayed here, but are available from the author upon request.

[20] Most (i.e. 85-90 percent) businesses shut down rather than relocate to another space within New York City (or outside of the city). In addition, Meltzer and Capperis (2016) find that when businesses relocate within the city, they tend to move to neighborhoods with new housing investment and growing retail, suggesting more (and perhaps cheaper) spaces for commercial activity.

[21] These results are not displayed, but are available from the author upon request. The disproportionate vacancy duration in gentrifying neighborhoods is most pronounced in the later 2000s and least evident in the early 1990s. Spaces can sit vacant for as little as one year and well above ten years.

[22] I run regressions on the more restricted low-income tract sample as well as the full sample including moderate- and high-income tracts (the latter version is shown), and also disaggregated into single- and multiple-establishment property sub-samples; the results are consistent across all of the specifications. I also run the regressions where the dependent variable is specified as the probability of leaving; the results are consistent with those discussed above. Finally, I run a number of parsimonious specifications (omitting, for example the time and geographic controls) and the direction of the gentrification coefficients are consistent; the coefficients tend to be larger in magnitude (and more significant) in the more parsimonious models, but they are consistently attenuated as more controls are added to the model. For purposes of brevity, these results are not displayed here, but are available from the author upon request.

gentrification dummies (both relative to the moderate-high income neighborhoods) are negative and significant, which is consistent with what the bivariate tables showed. In addition, the difference between the two gentrification dummies is statistically zero. As more controls are added to the model, the coefficients on the gentrification dummies universally become insignificant; this shows that after controlling for other property, business and temporal-spatial variation, the retention rates do not vary significantly across any of the neighborhoods. These results are generally consistent with those from the bivariate analyses and reinforce the null gentrification effect.

Replacement businesses

I turn now to Table 3, which displays statistics on the businesses that leave and those that replace them, in order to get a sense of how the service and commercial environment changes for local residents.[23] Across the board, new businesses tend to be smaller than those that leave (i.e. have a higher ratio between the number of employees in the business that leaves and the number of employees in the business that replaces); while these ratios are highest in gentrifying neighborhoods, they are not significantly different from those in non-gentrifying neighborhoods. So, any job loss due to displacement is no bigger in the gentrifying areas. I also look at the correspondence between the industry classifications of the outgoing and incoming establishments to get a sense of how services turn over. I consider the narrowest 6-digit classification (for example, full-service restaurants) as well as the broad 2-digit classification (for example, Accommodation and Food Services). While the pattern is less consistent across the 1990s, displaced and incoming businesses are less likely to have the same NAICS classification in gentrifying neighborhoods, compared to non-gentrifying neighborhoods, in the 2000s.[24] There is a higher correspondence with respect to 2-digit NAICS codes, indicating that the spaces retain broader service consistency (for example, a food establishment can return, but it may serve very different kinds of food and in a different setting). This makes sense if the commercial space is built out for a particular activity (like a restaurant, food store or office). Overall, there is a

[23] I focus primarily on the statistics for the single-business properties, since the correspondence between businesses that leave and that replace is cleaner (the one-to-one replacement match is less reliable in the multiple-business properties due to the fact that the number of businesses that leave can differ from the number of replacers).
[24] This association is significant ($p<.01$) only in the second half of the 2000s.

slightly larger shift towards new services in gentrifying neighborhoods, compared to non-gentrifying neighborhoods.[25]

Finally, the likelihood that the new business is a chain varies by neighborhood classification and decade, as well. In the 1990s, replacement businesses are least likely to be chains in gentrifying neighborhoods; in the 2000s, this reverses and replacement businesses are more likely to be chains in gentrifying neighborhoods, compared to non-gentrifying areas. The highest replacement rate for chains, though, is in the moderate/high-income neighborhoods.

In sum, regardless of the neighborhood's gentrification status, businesses are more likely to stay in place over five-year intervals than not; this is particularly true for those businesses that have been operating for a longer time. Gentrification does not induce disproportionately more displacement among businesses than what typically takes place in low-income neighborhoods. In addition, when a business leaves a gentrifying neighborhood, its commercial space is more likely to stay vacant for a longer period of time; this not only means that those services are gone, but that the physical space is inactive and not contributing to street vitality. Most notably, replacement businesses in gentrifying neighborhoods are more likely than those in non-gentrifying neighborhoods to offer new types of services and are more likely to be chains (during the 2000s).

***Case neighborhoods***

The statistics presented thus far capture average effects across the entire sample of neighborhoods. However, it is possible that these broader patterns are obscuring important variation on a finer level. I identify three case neighborhoods that, within their broadly defined boundaries, (i) contain both gentrifying and non-gentrifying census tracts, and (ii) contain a commercial presence that also crosses the gentrifying and non-gentrifying tracts.[26] This design not only allows for a cleaner identification across gentrifying and non-gentrifying tracts (since

[25] This is on a property basis—it could be the case that as a neighborhood there is a reshuffling of similar services across properties.

[26] I use Neighborhood Tabulation Areas (NTAs), which were created by the New York City Department of City Planning to project populations at small geographies from 2000 to 2030. They are compilations of census tracts, and therefore their boundaries are coterminous. They span multiple census tracts, but are smaller than PUMAs and Sub-Borough Areas. For all of the case areas, except Astoria, I combine two NTAs (i.e. East Harlem South and East Harlem North) to constitute a larger, single neighborhood definition.

they all exist in the same macro-neighborhood, with similar infrastructure and localized trends), but is realistic in how gentrification can play out at the street level. It is not unusual to traverse a single neighborhood and cross street blocks that are starkly different in their degree of development and their general character. I focus on gentrification classifications from the 2000s, since there is a larger pool of tracts for this time period. I look at neighborhoods in three of the city's five boroughs: East Harlem in Manhattan, Sunset Park in Brooklyn and Astoria in Queens (see Figure 1). Together, they illustrate the variation in change within and across macro-neighborhoods.

For the three cases that follow, I show an abbreviated set of statistics on retention and displacement. In addition to comparing these rates across tract classification (i.e. low-income gentrifying and low-income non-gentrifying, both within the same macro-neighborhood), I also calculate the difference in rates across two decades, the 1990s and 2000s.[27] Therefore, the final column in each table represents a "difference-in-difference" of sorts, where I first compare retention and displacement rates in the 2000s (the decade of gentrification designation) to those in the 1990s (to capture historical rates) for gentrifying and non-gentrifying tracts; I then take this difference and compare it across the two neighborhood classifications. This approach controls somewhat for historical trends and baseline characteristics that could drive different outcomes, above-and-beyond what is associated with the presence or absence of gentrification.

*Case 1: East Harlem*

East Harlem is located in the northeast section of Manhattan, and historically has been an enclave for Hispanic residents. Public transit is moderately accessible, and will only improve once the new second avenue subway is complete (presumably, by 2017). Out of the case neighborhoods, East Harlem has the oldest housing stock, is the poorest, and houses the highest share of Black residents. More than half of the twenty-two census tracts that make up this macro-neighborhood were designated as low-income in 2000, and, of those tracts, nearly half were classified as gentrifying in the decade that followed. The gentrifying tracts underwent significant economic and demographic changes during both the 1990s and 2000s, compared to

[27] I do not include moderate-high income tracts as a comparison, because there are very few or no tracts in this income range in the case neighborhoods.

the non-gentrifying tracts. Specifically, population surged in the gentrifying tracts, as did the construction of new housing. The share of Hispanic households declined by about five percentage points in the gentrifying tracts, compared to an increase in the nearby non-gentrifying tracts; the white population increased about the same throughout the macro-neighborhood. College educated residents grew at a faster rate and poverty declined more dramatically in the gentrifying tracts. And, not surprisingly, residential rents and prices also grew more acutely in the gentrifying tracts; the 2000s also brought increases in commercial prices and AVs (i.e. rents), compared to price declines and very modest AV increases in the non-gentrifying tracts. Still, the gentrifying tracts saw a growth in retail establishments almost double that in non-gentrifying tracts.

Business retention rates in the gentrifying tracts of East Harlem were slightly lower than the citywide average during the 1990s: about 65 percent of establishments in single-establishment properties (compared to 72 percent for the city overall) stayed in place (retention rates in multiple-establishment properties were slightly higher at 68 percent, compared to 59 percent for the city overall).[28] In East Harlem, gentrification during the 2000s was associated with reduced business retention (see Table 4), compared to nearby tracts that did not gentrify. Specifically, the share of businesses that stayed in place decreased in the 2000s compared to the 1990s, for both gentrifying and non-gentrifying tracts; but the decline was more pronounced for the properties in the gentrifying tracts (by about five percentage points; a meaningful drop that brings the neighborhood even farther below the citywide mean). In addition, gentrifying tracts saw a larger decrease in the share of businesses that leave without any replacement, and by a magnitude that makes a meaningful difference (almost four percentage points for single-establishment properties, off of a base of 28 percent). There was also a relative increase in the number of businesses that leave with replacement (based on the single-business properties) in gentrifying tracts, albeit smaller in magnitude. Over the course of the 1990s and 2000s, the gentrifying tracts also witnessed a larger growth in the number of chains (although the non-gentrifying tracts still have a higher absolute number of chain stores).[29] And, older businesses were actually less

[28] These shares amount to 58 and 54 establishments for single- and multiple-establishment properties, respectively.
[29] The chain results are not shown.

likely to leave in the gentrifying areas than the non-gentrifying ones (even though the average business age is the same across the two types of tracts).

In order to understand how the types of businesses and their services change over time, I compile statistics on the neighborhood's composition of NAICS codes, for gentrifying and non-gentrifying tracts (see Table 5a). The first column of each panel shows the average concentration of the industry groupings[30] over the two decades and the remaining columns show the percentage change in the number of establishments, over three different time periods, for each industry grouping. The composition of services is very similar across gentrifying and non-gentrifying tracts, with the exception of manufacturing and other industrial activity. The group with the largest growth over the 2000s is manufacturing and industrial, which is largely driven by wholesale establishments (which started with a very small base). Otherwise, the largest gains for gentrifying tracts are seen in personal services and educational, health and social services, both of which exceed the gains in the non-gentrifying tracts. It is also worth noting that these are the very services that were relatively less prevalent, compared to non-gentrifying tracts, at the start of the 2000s. General retail and food establishments, on the other hand, started out with relatively larger shares of the commercial activity (compared to non-gentrifying tracts) and saw smaller gains in the gentrifying tracts.

But, are residents seeing a qualitative change in services? To test this, I consider five discrete types of businesses: grocery stores, drug stores, doctor's offices, full-service restaurants, and exercise facilities (gyms). The first three represent more necessity services, i.e. those that are more critical to have nearby for regular consumption, and the last two represent more discretionary services, i.e. those that are not necessary, but convenient to have nearby nonetheless. Table 5b shows how the availability of these services changes over time, in gentrifying and non-gentrifying tracts. In all cases, the gentrifying tracts exhibit much larger gains in these services than the non-gentrifying tracts, suggesting that economic changes in the neighborhood are associated with increases in both necessity and discretionary services.

[30] I combine related two-digit NAICS categories into broader groupings to reflect the general service/good provided. The groupings are created as follows: Retail = NAICS44+NAICS45; Service = NAICS51+NAICS52+NAICS53+NAICS54+NAICS55+NAICS56; Food & Entertainment = NAICS71+NAICS72; Personal Services = NAICS81; Education, Health & Social Services = NAICS61+NAICS62; Manufacturing & Industrial = NAICS31+NAICS32+NAICS33+NAICS42+NAICS48+NAICS49.

Physical access to grocery stores increases most significantly, and it is important to note that most of these establishments are classified as general grocery stores (not convenience stores).[31]

*Case 2: Sunset Park*

Sunset Park is a neighborhood in southwest Brooklyn that has been home to mostly Hispanic and Asian immigrants. It also includes large swaths of land zoned for manufacturing and has attracted increased investment in these areas. It has the highest share of Hispanic and Asian residents out of all of the case neighborhoods, and economically falls in the middle. Like East Harlem, most of the census tracts in the Sunset Park macro-neighborhood were low-income as of 2000; just under half of those twenty neighborhoods were designated as gentrifying. Even though poverty rates declined in the gentrifying tracts, compared to increases in nearby non-gentrifying tracts, population growth was comparatively slower. The share of white households declined, but less dramatically than in the non-gentrifying tracts, and the share of residents with a college degree increased more in the gentrifying tracts. The rate of housing construction was slightly higher in the gentrifying tracts, and housing costs modestly higher during the 2000s only. While relative commercial prices went down more in gentrifying tracts during the 2000s, commercial AVs (i.e. rents) went up. And while gentrifying tracts got more chains than non-gentrifying ones, their growth in general retail establishments was slower. Some of the biggest chains, like Home Depot and Costco, were attracted into the manufacturing section of the neighborhood.

The business retention and displacement patterns (see Table 6) are slightly different than those experienced by East Harlem, which had starker demographic shifts. Like the gentrifying tracts in East Harlem, those in Sunset Park also exhibit lower retention rates in the 1990s compared to the city overall (65 percent for single-establishment properties; rates for multiple-establishment properties are on par with the citywide rate).[32] Most notably, on net, business retention rates went down in gentrifying tracts compared to non-gentrifying tracts. Furthermore, the magnitude of the shift was larger in Sunset Park compared to East Harlem. While displacement rates went

[31] It is still possible that bodegas and other establishments that carry a range, but not a comprehensive supply, of food and produce self-classify as general grocery stores. Unfortunately, there is no way to distinguish these establishments in the data. However, regardless, there is an observed increase in food-carrying establishments, which does make a qualitative difference in the neighborhood.

[32] These shares amount to 77 and 66 establishments for single- and multiple-establishment properties, respectively.

down overall, displacement without replacement went up significantly among multiple-establishment properties (about 8 percentage points off of a 13 to 15 percent base). And, although the gentrifying areas did lose a substantial share of their older businesses, it was a smaller loss than that experienced by the non-gentrifying parts of Sunset Park. Personal services were also relatively less prevalent in the gentrifying sections of Sunset Park (see Table 7a), but they experienced about the same degree of growth as non-gentrifying tracts during the 2000s.[33] Food and entertainment establishments, however, grew at a faster rate in the gentrifying tracts. Similarly, any gains in discrete necessity services, like grocery stores or doctor's offices, are substantially bigger in the non-gentrifying tracts (see Table 7b). In fact, the gentrifying tracts have a relatively large loss in certain services, like drug stores and restaurants. These patterns could be due to the combination of rising commercial rents and relatively slower population growth in the gentrifying areas.

*Case 3: Astoria*

Finally, Astoria is a neighborhood in the western part of Queens, across the river from Manhattan. Ethnically, Astoria is quite diverse: there are large groups of Europeans, South Americans and Middle Easterners. It is considered more of a middle-class neighborhood, and has a smaller share of low-income tracts than the other case neighborhoods (about two-thirds, as of 2000). Astoria is comprised of a substantially whiter population, but it has the highest share of foreign-born residents out of all of the case neighborhoods. Of the seventeen low-income tracts, nearly half were designated as gentrifying during the 2000s. Even though its population increased during the 1990s, the gentrifying tracts actually saw a greater population decline during the 2000s (however it was a smaller decline than that in the higher income tracts nearby); these losses appear to have been driven by losses in the white population (both blacks and Hispanics increased their population shares). At the same time, poverty rates were declining more substantially in the gentrifying tracts, and the share of college-educated residents was increasing. There was a higher rate of new residential construction in the gentrifying neighborhoods, and marginally larger increases in rents. Residential prices were appreciating in the 2000s, albeit less than in the non-gentrifying low-income tracts. Commercial prices were

[33] Although, compared to the 1990s, the growth in gentrifying tracts was only marginally smaller compared to a substantial decline in growth in the non-gentrifying neighborhoods.

dropping more dramatically in the gentrifying tracts, but commercial AVs (i.e. rents) were increasing compared to declines in the rest of Astoria. Growth in the retail market was marginally higher in the gentrifying tracts compared to the non-gentrifying tracts (but more than double that in the higher-income tracts).

Like broader citywide trends, most establishments stayed in place during both the 1990s and 2000s. For single-establishment buildings, retention rates in gentrifying tracts were at 73 percent during the 1990s; for multiple-establishment buildings this number was lower at 66 percent.[34] During the 2000s (relative to the 1990s), gentrifying tracts in Astoria, on net, had lower business retention rates and a higher likelihood of businesses leaving without getting replaced (see Table 8). The magnitudes of these shifts were small, relative to what was observed in the other neighborhoods; for example, less than a five-percentage-point decline off of a 73 percent share of stayers is not dramatic for a decade's worth of change. Any decrease in the likelihood of displacement (with replacement) was small—less than one percentage point off of a 6-17 percent base. In addition, gentrifying tracts were no more likely to lose their older businesses (even though the businesses were older, on average, in the gentrifying tracts).

The growth in chain establishments was also lower in gentrifying tracts compared to the nearby non-gentrifying tracts (in fact, the number went down during the 2000s). Otherwise, industry-specific gains were more prevalent in the non-gentrifying tracts, although retail services grew slightly more in the gentrifying tracts (see Table 9a). Patterns for the discrete services tell a slightly different story: all of these businesses grew relatively more in the gentrifying tracts, especially the necessity businesses, like grocery stores, drug stores and doctor's offices (see Table 9b).

## V. Conclusions and policy implications

Local, small businesses are very much tied to their surrounding communities: physically, economically and culturally (Meltzer and Schuetz, 2012; Zukin et al., 2009; Hyra, 2008; Deener, 2007). Therefore, when neighborhoods undergo meaningful economic and social changes, such

[34] These shares amount to about 76 establishments in single-establishment buildings and 144 establishments in multiple-establishment buildings.

as those that take place under gentrification, one would expect local businesses to feel the effects. But is gentrification a threat or a boon to existing businesses? And what are the implications for the residents that patronize these services?

The results are mixed, and show that the nuances of gentrification cannot necessarily be observed in broader citywide trends. I find that the typical gentrifying neighborhood in New York City does not experience elevated rates of business displacement compared to a comparable non-gentrifying neighborhood. This is in line with the evidence on residential displacement, which does not show systematic displacement of low-income residents in the context of gentrification (Freeman et. al., 2015; Ellen and O'Regan, 2011; McKinnish et al., 2010; Freeman, 2005; Freeman and Braconi, 2004; Vigdor, 2002). It is also consistent with other research (Meltzer and Capperis, 2016) on neighborhood retail churn, a process that tends to be driven by new business entries (rather than business closures). However, when businesses do vacate a space, it tends to sit vacant for longer in gentrifying than non-gentrifying neighborhoods. Therefore, there are implications not only for the displaced businesses but also for the communities left with empty storefronts. For the businesses that replace the displaced establishments, they are more likely to introduce new types of services in gentrifying neighborhoods, compared to both non-gentrifying and higher-income neighborhoods. While gentrifying neighborhoods have relatively more chains that replace displaced businesses, chains constitute a very small share of activity overall (less than 5 percent of all the replacement businesses).

The case studies illustrate how idiosyncratic the process can be. Together, the neighborhood drill-downs show that tracts undergoing gentrification in the 2000s had relatively larger, but varied, declines in retention rates compared to non-gentrifying tracts. In addition, the tracts' socioeconomic changes attracted new businesses and increases in both necessity and discretionary services. This was particularly true in East Harlem, which experienced larger population and income surges. On the other hand, gentrifying tracts in Sunset Park experienced increased displacement without replacement relative to non-gentrifying tracts, and smaller growth in necessity services from the businesses that did move in. So, here, the neighborhood experienced the disruption of business turnover, but without the upside of more services.

Nonetheless, the results should be interpreted in the context of a large, dense city, which has experienced intense gentrification (especially during the 2000s); therefore, while the pressures from gentrification are particularly acute in New York City, the commercial markets are also relatively robust. The fact that displacement is not systematically higher in New York City's gentrifying neighborhoods bodes well for cities experiencing less aggressive gentrification; however, cities with less vibrant neighborhood retail markets could be more vulnerable to gentrification-induced displacement. While the drill-down analyses attempt to shed light on some of this variation, the reality is that neighborhoods in less dense or walkable cities might have a harder time supporting local retail markets, even in the absence of gentrification.

In conclusion, there does appear to be opportunity for the neighborhoods that gain quality-of-life services and that retain more businesses under conditions of gentrification—perhaps due to new and increased spending power locally. The threats are also palpable: the displacement that does occur can leave gentrifying neighborhoods with disproportionately more vacant spaces and without the promise of new amenities. And even in the neighborhoods where services grow and/or change, the new products, price points or cultural orientation could be more alienating than useful for incumbent residents. Therefore, even in the absence of systematic business displacement, gentrification can present challenges around the management of changing neighborhood services. Here, neighborhood-based organizations, like Business Improvement Districts and community development corporations, and real estate brokers can play a role in coordinating input from the community and conveying it to property owners. Moreover, new investment, which tends to happen in gentrifying neighborhoods, provides a critical opportunity for local government to negotiate the terms of development, including where commercial space is created and how it is used. This approach has increasingly been used with housing, where permitting or zoning allowances are contingent on affordable housing provision—a similar approach can be applied to the provision of commercial space and services.

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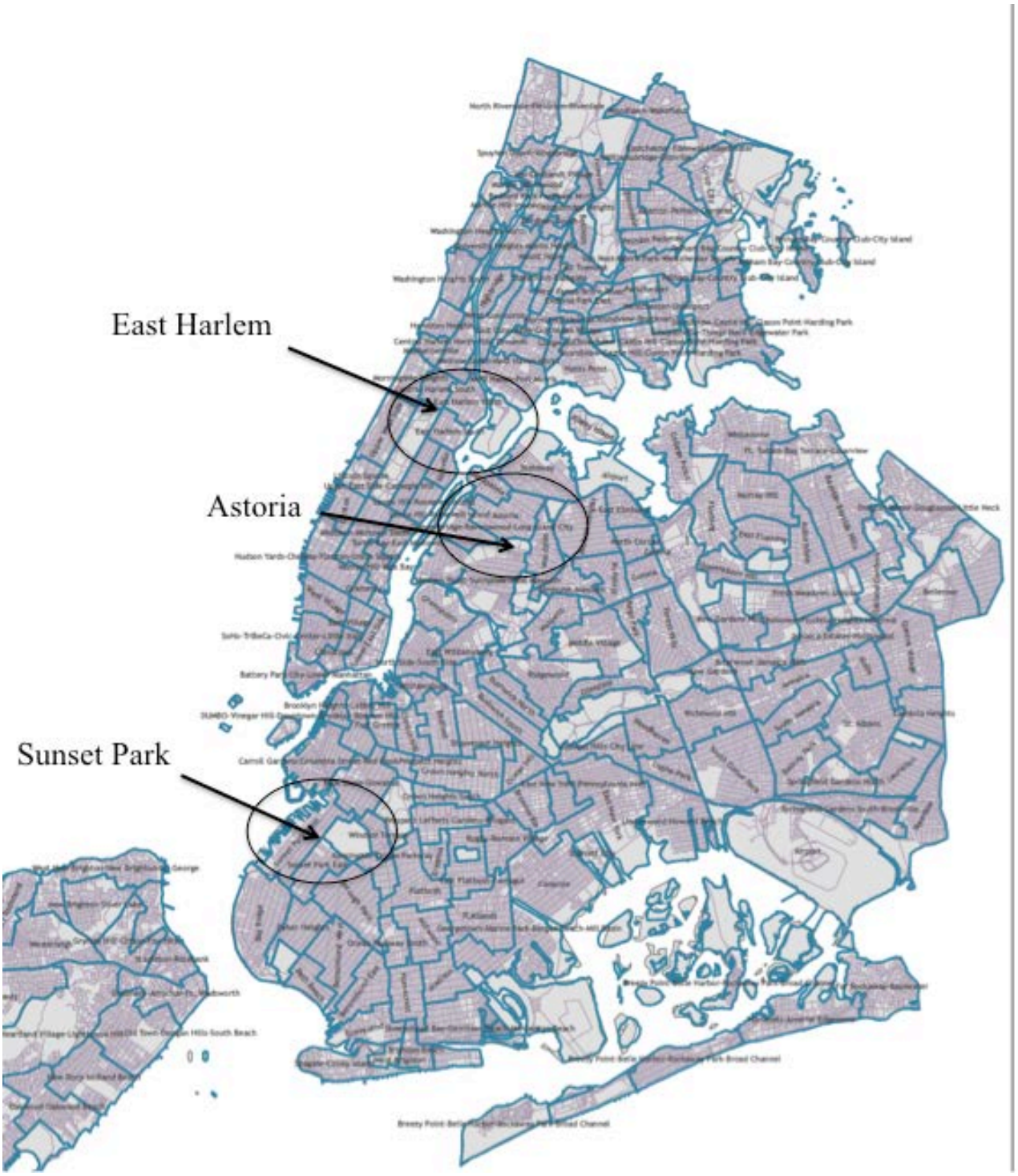
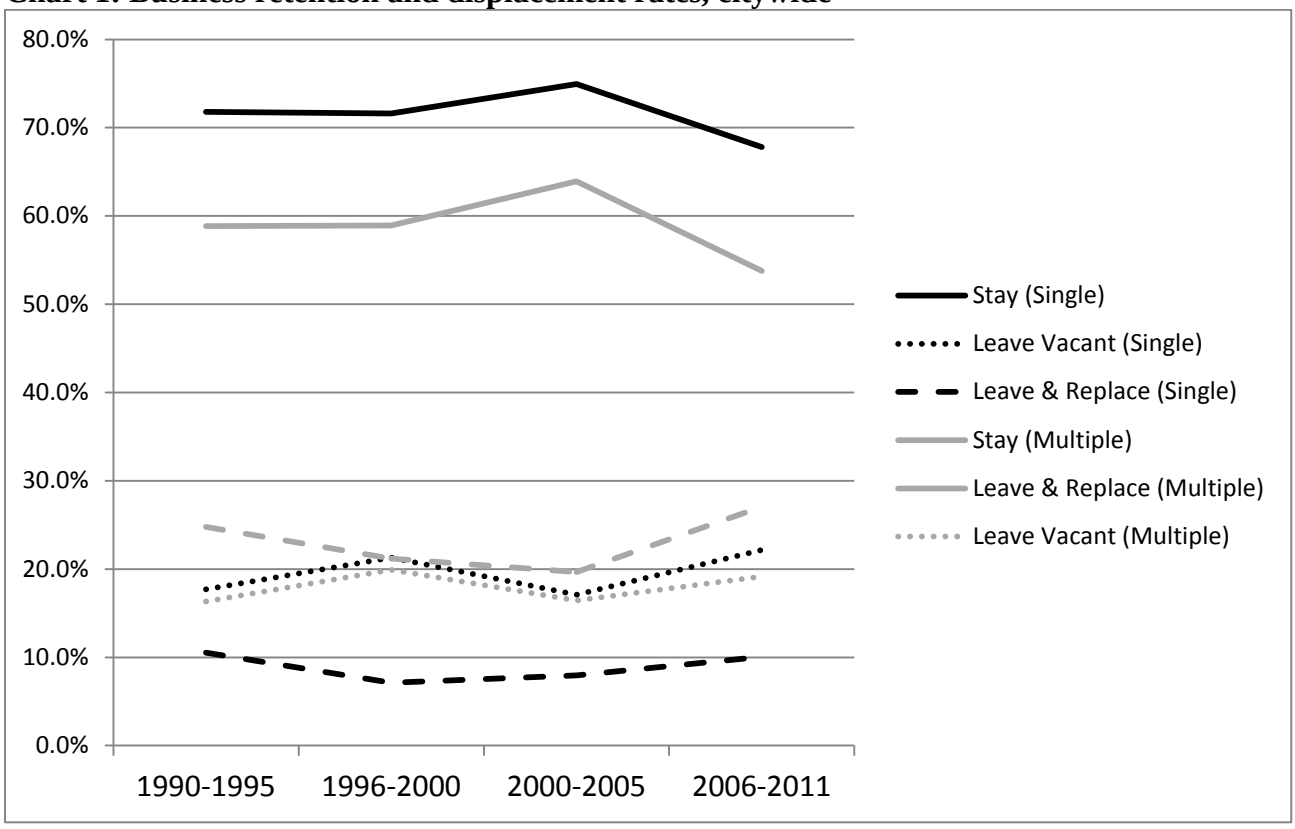
**Figure 1: Case neighborhoods**



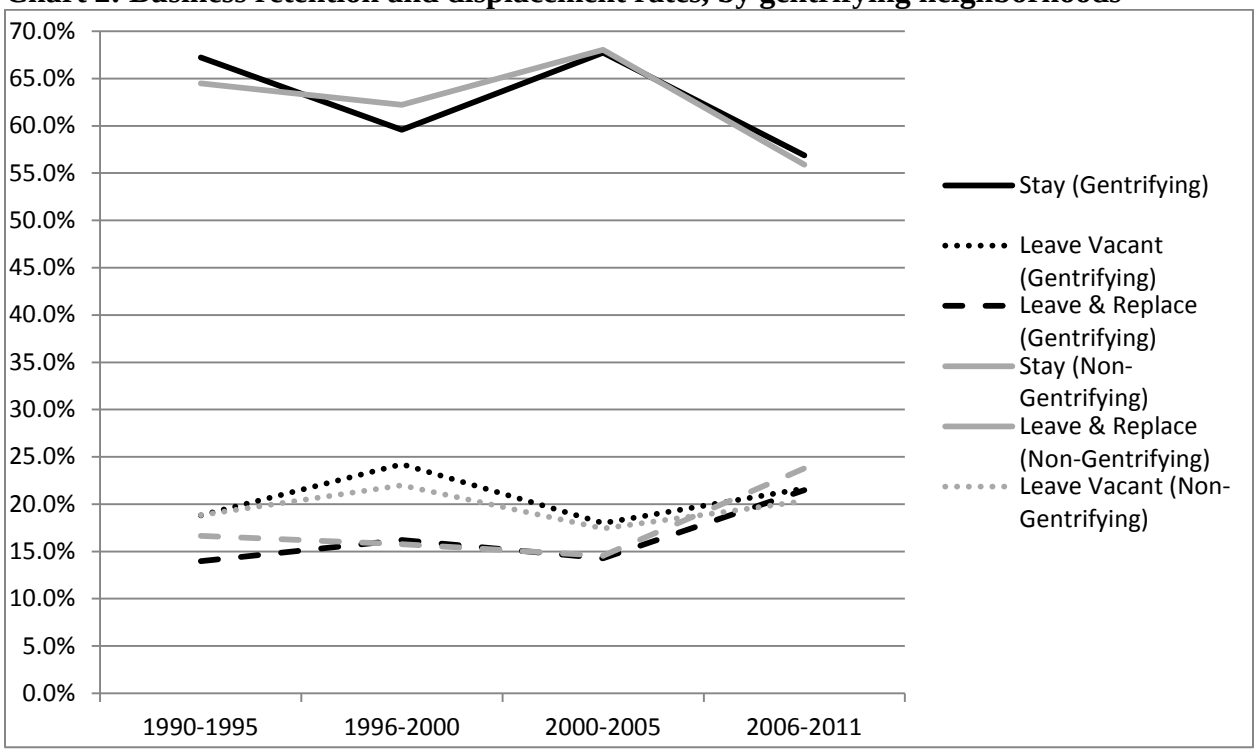

*Source*: Underlying shapefiles were obtained from the New York City Dept. of City Planning.

**Chart 1: Business retention and displacement rates, citywide**




*Source*: National Establishment Times Series dataset; author's calculations.

**Chart 2: Business retention and displacement rates, by gentrifying neighborhoods**




*Source*: National Establishment Times Series dataset; author's calculations.

**Table 1: Difference in business retention/displacement rates, by gentrifying neighborhoods**

| **Difference: Gentrifying and Non-Gentrifying** | Diff: Gent - Non-Gent. | Sig. | Diff: Gent - Non-Gent. | Sig. | Diff: Gent - Non-Gent. | Sig. | Diff: Gent - Non-Gent. | Sig. |
|---|---|---|---|---|---|---|---|---|
| | 1990-1995 | | 1996-2000 | | 2000-2005 | | 2006-2011 | |
| *Stay entire period* | 0.027 | | -0.027 | * | -0.003 | | 0.010 | *** |
| *Leave without replacement* | -0.001 | | 0.023 | * | 0.006 | | 0.013 | *** |
| *Leave with replacement* | -0.027 | | 0.004 | * | -0.003 | | -0.023 | *** |
| **Difference: Gentrifying and Moderate-High Income** | Diff: Gent - Mod./High | Sig. | Diff: Gent - Mod./High | Sig. | Diff: Gent - Mod./High | Sig. | Diff: Gent - Mod./High | Sig. |
| | 1990-1995 | | 1996-2000 | | 2000-2005 | | 2006-2011 | |
| *Stay entire period* | 0.037 | *** | -0.033 | *** | -0.002 | *** | -0.012 | *** |
| *Leave without replacement* | 0.036 | *** | 0.056 | *** | 0.021 | *** | 0.026 | *** |
| *Leave with replacement* | -0.073 | *** | -0.023 | *** | -0.020 | *** | -0.014 | *** |

*Notes*: Values shown are the differences in retention/displacement rates; statistics are based off of weighted averages of single- and multiple-establishment samples; * p<0.05, ** p<0.01, *** p<0.001.

**Table 2: Logit regressions**

| | Pr(Stay=1) | Pr(Stay=1) | Pr(Stay=1) | Pr(Stay=1) |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Gentrifying | -0.080*** | 0.019 | 0.023 | 0.004 |
| | (-4.71) | (0.86) | (1.04) | (0.15) |
| Non-Gentrifying | -0.053*** | 0.053*** | 0.048*** | 0.005 |
| | (-5.56) | (4.25) | (3.81) | (0.34) |
| # Establishments in Bldg. | -0.009*** | -0.009*** | -0.002*** | 0.0004 |
| | (-22.11) | (-18.78) | (-4.21) | (0.83) |
| # Employees | | -0.001** | -0.001*** | -0.001** |
| | | (-3.04) | (-3.56) | (-2.95) |
| Year Start | | -0.005*** | -0.005*** | -0.006*** |
| | | (-15.13) | (-14.48) | (-16.03) |
| Lot Frontage | | -0.001*** | -0.0004*** | -0.001*** |
| | | (-7.80) | (-4.52) | (-6.92) |
| Corner Location | | 0.046*** | 0.060*** | 0.036** |
| | | (3.68) | (4.65) | (2.77) |
| Chain | | -0.407*** | -0.323*** | -0.304*** |
| | | (-14.95) | (-11.72) | (-10.93) |
| Property NAICS index | | | 0.521*** | 0.509*** |
| | | | (24.78) | (23.01) |
| Constant | 0.584*** | 11.780*** | 11.690*** | 13.180*** |
| | (86.89) | (16.68) | (15.27) | (16.23) |
| Industry classification dummies | N | N | Y | Y |
| Time dummies | N | Y | N | Y |
| Geography dummies | N | Y | N | Y |
| N | 211,279 | 156,465 | 156,465 | 156,465 |

*Notes*: t statistics in parentheses; * p<0.05, ** p<0.01, *** p<0.001; sample includes the full sample of tracts and "Moderate-High Income" is omitted. NAICS index is a Herfindahl-type index that ranges between 0 and 1, where values closer to 1 represent more homogeneous industry mixes (single-establishment properties are assigned an index of 1).

**Table 3: Business replacement, by gentrifying neighborhoods**

| | # Estab. | Ratio of emp_leave/ emp_replace | Is the 6-digit NAICS the same? | Is the 2-digit NAICS the same? | Replacer a Chain? | # Estab. | Ratio of emp_leave/ emp_replace | Is the 6-digit NAICS the same? | Is the 2-digit NAICS the same? | Replacer a Chain? |
|---|---|---|---|---|---|---|---|---|---|---|
| | **1990-1995** | | | | | **1996-2000** | | | | |
| **Low Income & Gentrifying** | | | | | | | | | | |
| *Leave with replacement* | 93 | 0.70 | 9.7% | 26.9% | 10.2% | 226 | 1.43 | 11.1% | 27.9% | 4.0% |
| **Low Income & Non-gentrifying** | | | | | | | | | | |
| *Leave with replacement* | 2,850 | 1.36 | 13.7% | 27.3% | 9.4% | 5,142 | 1.00 | 9.9% | 20.6% | 8.6% |
| **Mod/High Income** | | | | | | | | | | |
| *Leave with replacement* | 4,595 | 1.46 | 12.8% | 21.7% | 11.0% | 6,820 | 0.96 | 9.0% | 17.2% | 10.8% |
| | **2000-2005** | | | | | **2006-2011** | | | | |
| **Low Income & Gentrifying** | | | | | | | | | | |
| *Leave with replacement* | 940 | 1.69 | 10.0% | 23.0% | 4.2% | 1,805 | 1.56 | 6.8% | 14.7% | 1.8% |
| **Low Income & Non-gentrifying** | | | | | | | | | | |
| *Leave with replacement* | 2,069 | 1.77 | 12.2% | 24.3% | 3.3% | 4,444 | 1.49 | 8.2% | 17.9% | 1.4% |
| **Mod/High Income** | | | | | | | | | | |
| *Leave with replacement* | 4,026 | 1.69 | 10.1% | 19.1% | 6.0% | 6,472 | 1.76 | 7.2% | 16.2% | 2.0% |

*Source*: National Establishment Times Series dataset, author's calculations.

**Table 4: East Harlem, retention and displacement rates**

| | Diff: Gent-Non-Gent. | Diff: Gent-Non-Gent. | Diff.: 2000s-1990s |
|---|---|---|---|
| | 1990s | 2000s | |
| **Single-Estab. Properties** | | | |
| *Stay entire period* | -0.031 | -0.087 | -0.056 |
| *Leave without replacement* | 0.038 | 0.003 | -0.035 |
| *Leave with replacement* | 0.022 | 0.032 | 0.010 |
| | | | |
| **Multiple- Estab. Properties** | | | |
| *Stay entire period* | 0.036 | 0.040 | 0.004 |
| *Leave without replacement* | 0.032 | 0.023 | -0.010 |
| *Leave with replacement* | -0.051 | -0.076 | -0.025 |

*Source*: National Establishment Times Series dataset; author's calculations.

**Table 5a: East Harlem, change in services, broad industries**

| | Gentrifying | | | | Non-Gentrifying | | | |
|---|---|---|---|---|---|---|---|---|
| NAICS grouping | Avg. Share (1990-2011) | % Change 1990-2011 | % Change 1990-2000 | % Change 2000-2011 | Avg. Share (1990-2011) | % Change 1990-2011 | % Change 1990-2000 | % Change 2000-2011 |
| Retail | 0.37 | 51.7% | -7.6% | 64.2% | 0.31 | 133.3% | 34.1% | 73.9% |
| Service | 0.24 | 251.5% | 71.2% | 105.3% | 0.25 | 364.7% | 80.9% | 156.9% |
| Food, entertainment | 0.07 | 285.7% | 185.7% | 35.0% | 0.08 | 285.0% | 120.0% | 75.0% |
| Personal services | 0.16 | 352.9% | 88.2% | 140.6% | 0.17 | 287.5% | 95.8% | 97.9% |
| Education, health, social | 0.08 | 120.6% | 0.0% | 120.6% | 0.08 | 147.1% | 29.4% | 90.9% |
| Manufacturing etc.. | 0.07 | 127.6% | -24.1% | 200.0% | 0.11 | 122.0% | 2.0% | 117.6% |

*Source*: National Establishment Times Series dataset; author's calculations.

*Notes*: % Change refers to the percent change in the number of establishments between the indicated end points; for example % Change 1990-2011 (for Retail) = $(\#\_Retail_{2011} - \#\_Retail_{1990}) \Big/ \#\_Retail_{1990}$.

**Table 5b: East Harlem, change in services, discrete services**

| | Gentrifying | | | | | | Non-Gentrifying | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | # Estab. 1990 | # Estab. 2000 | # Estab. 2011 | % Change 1990-2011 | % Change 1990-2000 | % Change 2000-2011 | # Estab. 1990 | # Estab. 2000 | # Estab. 2011 | % Change 1990-2011 | % Change 1990-2000 | % Change 2000-2011 |
| Grocery stores | 17 | 39 | 87 | 411.8% | 129.4% | 123.1% | 26 | 38 | 83 | 219.2% | 46.2% | 118.4% |
| Drug stores | 12 | 11 | 22 | 83.3% | -8.3% | 100.0% | 10 | 9 | 16 | 60.0% | -10.0% | 77.8% |
| Full-service rest. | 7 | 26 | 37 | 428.6% | 271.4% | 42.3% | 8 | 23 | 20 | 150.0% | 187.5% | -13.0% |
| Gyms | 0 | 0 | 4 | | | | 0 | 0 | 3 | | | |
| Doctor's offices | 21 | 26 | 56 | 166.7% | 23.8% | 115.4% | 18 | 17 | 33 | 83.3% | -5.6% | 94.1% |

*Source*: National Establishment Times Series dataset; author's calculations.

*Notes*: % Change refers to the percent change in the number of establishments between the indicated end points; for example % Change 1990-2011 (for Grocery stores) = $(\#\_Grocery_{2011} - \#\_Grocery_{1990}) \Big/ \#\_Grocery_{1990}$.

**Table 6: Sunset Park, retention and displacement rates**

| | Diff: Gent-Non-Gent. | Diff: Gent-Non-Gent. | Diff.: 2000s-1990s |
|---|---|---|---|
| | 1990s | 2000s | |
| **Single-Estab. Properties** | | | |
| *Stay entire period* | -0.068 | -0.005 | 0.063 |
| *Leave without replacement* | 0.064 | -0.002 | -0.067 |
| *Leave with replacement* | 0.000 | -0.032 | -0.032 |
| | | | |
| **Multiple- Estab. Properties** | | | |
| *Stay entire period* | 0.034 | -0.051 | -0.084 |
| *Leave without replacement* | -0.010 | 0.065 | 0.076 |
| *Leave with replacement* | 0.028 | -0.010 | -0.038 |

*Source***:** National Establishment Times Series dataset; author's calculations.

**Table 7a: Sunset Park, change in services, broad industries**

| | Gentrifying | | | | Non-Gentrifying | | | |
|---|---|---|---|---|---|---|---|---|
| NAICS categories | Avg. Share (1990-2011) | % Change 1990-2011 | % Change 1990-2000 | % Change 2000-2011 | Avg. Share (1990-2011) | % Change 1990-2011 | % Change 1990-2000 | % Change 2000-2011 |
| Retail | 0.26 | 115.9% | 49.2% | 44.7% | 0.35 | 135.9% | 42.3% | 65.8% |
| Service | 0.21 | 361.1% | 50.0% | 207.4% | 0.22 | 553.9% | 75.5% | 272.6% |
| Food, entertainment | 0.08 | 142.1% | 73.7% | 39.4% | 0.08 | 140.4% | 100.0% | 20.2% |
| Personal services | 0.23 | 208.9% | 77.8% | 73.8% | 0.15 | 288.1% | 122.6% | 74.3% |
| Education, health, social | 0.03 | 160.0% | 60.0% | 62.5% | 0.06 | 158.0% | 52.0% | 69.7% |
| Manufacturing etc.. | 0.20 | 67.2% | 14.8% | 45.7% | 0.13 | 241.3% | 50.0% | 127.5% |

*Source*: National Establishment Times Series dataset; author's calculations.

Notes: % Change refers to the percent change in the number of establishments between the indicated end points; for example % Change 1990-2011 (for Retail) = $(\#\_Retail_{2011} - \#\_Retail_{1990}) \Big/ \#\_Retail_{1990}$.

**Table 7b: Sunset Park, change in services , discrete services**

| | Gentrifying | | | | | | Non-Gentrifying | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | # Estab. 1990 | # Estab. 2000 | # Estab. 2011 | % Change 1990-2011 | % Change 1990-2000 | % Change 2000-2011 | # Estab. 1990 | # Estab. 2000 | # Estab. 2011 | % Change 1990-2011 | % Change 1990-2000 | % Change 2000-2011 |
| Grocery stores | 21 | 33 | 44 | 109.5% | 57.1% | 33.3% | 50 | 101 | 203 | 306.0% | 102.0% | 101.0% |
| Drug stores | 1 | 4 | 3 | 200.0% | 300.0% | -25.0% | 15 | 18 | 31 | 106.7% | 20.0% | 72.2% |
| Full-service rest. | 9 | 23 | 17 | 88.9% | 155.6% | -26.1% | 32 | 78 | 65 | 103.1% | 143.8% | -16.7% |
| Gyms | 0 | 0 | 2 | | | | 0 | 1 | 7 | | | 600.0% |
| Doctor's offices | 4 | 5 | 7 | 75.0% | 25.0% | 40.0% | 38 | 52 | 90 | 136.8% | 36.8% | 73.1% |

*Source*: National Establishment Times Series dataset; author's calculations.

*Notes*: % Change refers to the percent change in the number of establishments between the indicated end points; for example % Change 1990-2011 (for Grocery stores) = $(\#\_Grocery_{2011} - \#\_Grocery_{1990}) \Big/ \#\_Grocery_{1990}$.

**Table 8: Astoria, retention and displacement rates**

| | Diff: Gent-Non-Gent. | Diff: Gent-Non-Gent. | Diff.: 2000s-1990s |
|---|---|---|---|
| | 1990s | 2000s | |
| **Single-Estab. Properties** | | | |
| *Stay entire period* | 0.025 | 0.030 | 0.005 |
| *Leave without replacement* | -0.014 | -0.022 | -0.008 |
| *Leave with replacement* | -0.023 | -0.038 | -0.015 |
| | | | |
| **Multiple- Estab. Properties** | | | |
| *Stay entire period* | 0.025 | -0.013 | -0.039 |
| *Leave without replacement* | -0.046 | 0.007 | 0.054 |
| *Leave with replacement* | 0.032 | 0.035 | 0.003 |

*Source*: National Establishment Times Series dataset; author's calculations.

**Table 9a: Astoria, change in services, broad industries**

| | Gentrifying | | | | Non-Gentrifying | | | |
|---|---|---|---|---|---|---|---|---|
| NAICS categories | Avg. Share (1990-2011) | % Change 1990-2011 | % Change 1990-2000 | % Change 2000-2011 | Avg. Share (1990-2011) | % Change 1990-2011 | % Change 1990-2000 | % Change 2000-2011 |
| Retail | 0.27 | 60.0% | 24.2% | 28.8% | 0.32 | 40.8% | 10.2% | 27.8% |
| Service | 0.28 | 253.3% | 48.3% | 138.2% | 0.23 | 243.7% | 25.2% | 174.5% |
| Food, entertainment | 0.10 | 120.0% | 70.0% | 29.4% | 0.10 | 152.8% | 77.4% | 42.6% |
| Personal services | 0.14 | 114.7% | 64.7% | 30.4% | 0.14 | 161.6% | 78.1% | 46.9% |
| Education, health, social | 0.08 | 73.3% | 51.1% | 14.7% | 0.07 | 87.8% | 38.8% | 35.3% |
| Manufacturing etc.. | 0.13 | 151.7% | 60.0% | 57.3% | 0.13 | 121.2% | -8.2% | 141.0% |

*Source*: National Establishment Times Series dataset; author's calculations.

*Notes*: % Change refers to the percent change in the number of establishments between the indicated end points; for example % Change 1990-2011 (for Retail) = $(\#\_Retail_{2011} - \#\_Retail_{1990}) \Big/ \#\_Retail_{1990}$.

**Table 9b: Astoria, change in services, discrete services**

| | Gentrifying | | | | | | Non-Gentrifying | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | # Estab. 1990 | # Estab. 2000 | # Estab. 2011 | % Change 1990-2011 | % Change 1990-2000 | % Change 2000-2011 | # Estab. 1990 | # Estab. 2000 | # Estab. 2011 | % Change 1990-2011 | % Change 1990-2000 | % Change 2000-2011 |
| Grocery stores | 29 | 47 | 74 | 155.2% | 62.1% | 57.4% | 30 | 46 | 70 | 133.3% | 53.3% | 52.2% |
| Drug stores | 9 | 10 | 16 | 77.8% | 11.1% | 60.0% | 10 | 8 | 12 | 20.0% | -20.0% | 50.0% |
| Full-service rest. | 21 | 46 | 46 | 119.0% | 119.0% | 0.0% | 28 | 60 | 58 | 107.1% | 114.3% | -3.3% |
| Gyms | 0 | 1 | 8 | | | 700.0% | 1 | 0 | 13 | 1200.0% | -100.0% | |
| Doctor's offices | 34 | 50 | 59 | 73.5% | 47.1% | 18.0% | 37 | 54 | 63 | 70.3% | 45.9% | 16.7% |

*Source*: National Establishment Times Series dataset; author's calculations.

*Notes*: % Change refers to the percent change in the number of establishments between the indicated end points; for example % Change 1990-2011 (for Grocery stores) = $(\#\_Grocery_{2011} - \#\_Grocery_{1990}) \Big/ \#\_Grocery_{1990}$.