Bodegas or Bagel Shops?
Neighborhood Differences in Retail & Household Services

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Abstract

Social scientists studying the disadvantages of poor urban neighborhoods have tended to focus on the quality of publicly provided amenities, such as public schools and safety. However, the quantity and quality of local private amenities, such as grocery stores, restaurants, and banks s, can have important quality of life implications for neighborhood residents. The academic literature provides very little insight into the composition of retail services in urban neighborhoods. In the current paper we fill this gap by assessing how local retail access varies across neighborhoods in New York City. First, we combine data from the ZIP Business Patterns and several other sources to develop neighborhood-level metrics of "retail access", based on the amount, size, type and mix of retail and commercial activity. ." Second, we analyze how retail services vary across neighborhoods by income and racial composition. Third, we examine how retail services change over time, particularly in neighborhoods undergoing rapid economic growth. Preliminary results confirm findings from previous research, namely that lower-income and minority neighborhoods have fewer commercial establishments, smaller average establishments, less diversity across retail sub-sectors, and a higher proportion of "unhealthy" restaurants. However, the patterns vary by retail type and demographics. In addition, the rate of retail growth between 1998 and 2007 has been particularly fast in neighborhoods that were initially lower-valued and experienced relatively high housing price appreciation compared to the city overall.

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Section 1) Introduction

Social scientists studying the disadvantages of poor urban neighborhoods have tended to focus on the quality of publicly provided amenities, such as public schools and crime rates, or negative peer effects (Case and Katz 1991; Cutler, Glaeser and Vigdor 1999; Jargowsky 2003; Massey & Denton 1993; Wilson 1987). However, the quantity and quality of local private amenities, such as grocery stores, restaurants, banking facilities and other retail services, can have important quality of life implications for neighborhood residents. The "consumer city" literature suggests that attractive and abundant retail services affect a city's ability to attract and retain high-skilled residents; by extension the quality of neighborhood retail may impact the neighborhood's growth prospects (Glaeser et al. 2001; Glaeser and Gottlieb 2006). A smaller empirical literature has shown that low-income and minority neighborhoods are typically less well served by certain types of retail and household services (Alwitt and Donley 1997; Bartie et al 2007; Carr and Schuetz 2001; Helling and Sawicki 2003; Sloane et al 2005; Powell 2007; Zenk 2005). In general, the smaller number of retail outlets implies a more limited choice, and an apparent lack of competition has led some researchers to argue that "the poor pay more" for many basic goods and services (Caplovitz 1967; Hayes 2000; Kaufman et al 1997). Therefore understanding the extent and reasons behind differences in the amount and composition of neighborhood commercial activity is an important area for research.

To date, there has been little large-scale empirical work looking at disparities in retail services across neighborhoods of varying economic and demographic compositions. Moreover, there has been no work looking at the change in neighborhood retail services over time and how these changes correspond with economic and demographic changes in

the local population. Therefore, before we can explain the causes behind differences in neighborhood retail services, we should begin by measuring and describing these differences. The current paper moves the literature towards this end in two ways. First, we explore a number of approaches to measuring neighborhood "retail access" and compare various metrics over time and space. Second, while many previous studies focus on a single type of good or service, we consider access to a wide range of retail and household services. We combine publicly available data on business establishments at the ZIP code level with several New York City-specific data sources, including the location of all commercial and residential buildings, the location and corporate affiliation for several retail and food service chain establishments, residential population characteristics and sales values of residential properties. Using this combined dataset, we assess differences in retail access for approximately 170 neighborhoods, based on income and racial composition and differential growth rates in housing values.

Results confirm some findings from previous research, namely that lower-income and minority neighborhoods have a lower density of commercial establishments and employment, smaller average establishments, less diversity across retail sub-sectors, and a higher proportion of "unhealthy" restaurants. However, the patterns vary by retail type and demographics: the disparities are smaller for grocery stores, pharmacies and clothing than for food service. White-black disparities are generally larger than white-Hispanic disparities. While most neighborhoods in New York City saw an increase in retail activity between 1998 and 2007, the rate of retail growth has been particularly fast in neighborhoods that were initially lower-valued and experienced relatively high housing price appreciation compared to the city overall.

This paper proceeds in the following way. The next section provides a review of the relevant literature. Section 3 describes the data and methodology; Section 4 summarizes the results from the current analysis. Section 5 briefly discusses the characteristics of existing economic development policies in New York City, and Section 6 concludes.

Section 2) Literature Review

There are several possible reasons why retail activity may differ by underlying neighborhood characteristics. These fall into three categories: variation in characteristics of the local commercial market (such as set-up or operating costs), variation in purchasing power and preferences among local consumers (or residents), and institutional factors or public policies that influence commercial activity.

Characteristics of the local commercial market

The urban economics literature provides several models of firm decision-making and retail location that provide a theoretical framework for why neighborhood characteristics should affect the amount and composition of local retail outlets. Hotelling (1929) first described a simple spatial model of firm location in a linear city (later modified to accommodate a circular city). This model suggests that the density of stores depends on a variety of factors, including fixed costs of the store, buyer density and travel costs, all of which may vary by neighborhood economic conditions. One clear implication from the spatial location model is that there will be different market sizes, and thus different densities of store networks, for establishments selling various products, which will translate into a hierarchy of retail networks. Retail store networks will be

denser (that is, more locally based) for stores that have low fixed costs and sell goods that are highly standardized and frequently consumed, so that consumers will not be willing to travel long distances to purchase them (Berry 1967). In the classic example, the market area for ice cream vendors will be very small, due to the highly perishable nature of the good, so in equilibrium there will be a large number of vendors each with a small market area. On the other end of the spectrum, consumers should be willing to travel long distances to purchase goods such as cars or furniture (expensive and infrequently purchased goods), so that there will be a smaller number of establishments, each serving quite large geographic markets.

Wheaton and DiPasquale (1996) divide the hierarchy of store networks into three levels: (1) neighborhood stores whose customers are drawn primarily from within the immediate vicinity; (2) city-wide stores that drawn customers from within a single jurisdiction and (3) regional stores that have the largest market area. For this research, we focus on the types of establishments that serve primarily the residents who live in the immediate neighborhood, and therefore those establishments that will most likely turnover in response to changes in local resident composition. The goods most likely to be sold at neighborhood stores include groceries, health and beauty products, and general household items, such as cleaning and household supplies. These items are typically sold at grocery stores, supermarkets, convenience stores, pharmacies and general merchandise stores. In addition to retail, some service establishments primarily serve the immediate neighborhood, namely laundry and dry cleaning services, cash withdrawal points, coffee shops, delis and limited service restaurants, gyms, video rental outlets, beauty salons and barber shops and child care services.

Variation in consumer characteristics

For any given type of store/product, the Hotelling model implies that the density of store networks will be increasing in density of buyers (or that distance between stores will be decreasing in buyer density). The stylized model assumes that buyers are uniformly distributed and have homogeneous preferences (i.e. all consumers have the same underlying demand for goods and will purchase given goods at similar frequencies). In reality it is unlikely that all residents of a single neighborhood have the same demand function, either based on income/ability to pay or preferences, so estimating the density of actual rather than potential buyers within a given geographic area becomes more complicated. Waldfogel (2006) demonstrates that there is considerable heterogeneity across consumer preferences for such services as restaurants and media, and that preferences are strongly correlated with observable population characteristics, such as educational attainment and race/ethnicity. Using 5-digit zip-code level data on food and drinking establishments and population characteristics and proprietary data on consumer patronage behavior, he finds that there is an association between the mix of locally available chain restaurants and demographic mix by race and education.

This conclusion mirrors the findings of a sizable body of literature in public health that explores the differences in the locational decisions of food establishments across neighborhoods. Powell (2007), Zenk (2005) and Alwitt and Donley (1997) demonstrate that various retailers (namely banks and supermarkets) opt not to locate in poorer zip codes even after controlling for purchasing power—leading the authors to conclude that retail locational decisions may hinge on a host of factors in addition to an area's market potential. Interestingly, Alwitt and Donley found that fast food restaurants

were least likely to discriminate across neighborhoods, whereas Block, Scribner and DeSalvo (2004) and Sloane et al (2005) found that fast food restaurants were more likely to locate in poorer, predominately minority neighborhoods.

Berry & Waldfogel's (2003) research on product quality and market fragmentation suggests that as market size increases, the range of product variety and quality widens. They also find that the number of high-quality products grows with market size. Even though their study relies on city-level data, it suggests the importance of existing commercial market conditions on the entry and exit decisions of marginal commercial establishments.

Institutional Factors and Public Policies

The models described thus far assume only market factors in the transition of residential and commercial neighborhood characteristics, but a variety of federal, state and local public interventions have been used to try to stimulate business development and job growth, particularly in lower-income urban neighborhoods.

The largest and best known federal policy aimed at business development is the Empowerment Zones and Enterprise Communities Initiative, which in 1994 granted special designation to over 100 neighborhoods in economically and socially depressed urban or rural communities. The EZ/EC program provided a number of financial incentives, including federal income tax incentives, financing, technical assistance and training, designed to encourage establishment or expansion of businesses in EZ/EC areas (Hebert et al 2001). Empirical analysis of the EZ/EC program provides very mixed evidence on the program's effectiveness, but most find little or no effect on job or firm creation (Neumark and Kolko 2008; Dowall 1996; Busso and Kline 2008; Coopers &

Lybrand 1982; Glickman 1981). Bondonio (2003) also finds that gross flows of new and existing (surviving) establishments in EZ areas increase as a result of the policy, but that EZs may contribute to a higher rate of establishment failure, possibly offsetting the gains to remaining firms.

The other primary federal policy that provides economic development assistance to low-income neighborhoods is the Community Development Block Grant (CDBG) program, established in 1974. CDBG funds can be spent on a variety of activities designed to enhance neighborhood economic and social conditions broadly, so business creation and job growth are not the only or even primary targets of the program. As with the EZ evaluations, evidence on the effects of CDBG on growth in businesses in targeted neighborhoods is somewhat mixed: higher spending per poor resident on economic development strategy does seem to increase the number of businesses, but the effects vary by initial city and neighborhood conditions (Walker et al. 2002; Galster et al. 2004).

Many local governments in large cities, including New York City, have additional policies designed to encourage business creation or retention in targeted areas. New York has several property tax abatements that offer incentives for establishing or expanding commercial or industrial activities, primarily in Upper Manhattan (above 96th Street) and in the outer boroughs. Local governments can also change the feasibility and costs of commercial activity indirectly through zoning codes, by differentially allowing or restricting the uses and size of buildings.

It is worth noting that most economic development policies try to encourage business creation or expansion primarily to increase labor market opportunities for local residents, while our research focuses on local residents as potential consumers of goods

and services provided by these businesses. This suggests using somewhat different measures to identify the effects of programs: tax incentives that encourage new manufacturing plants might be "successful" from a job creation standpoint but will have no effect on the consumption patterns of neighborhood residents.

Section 3) Methodology and data description

In this paper we use data from the Census Bureau's ZIP Business Pattern series (an extension of the County Business Patterns data), as well as two New York City-specific datasets on commercial properties and chain establishments, to develop a set of metrics that describe neighborhood retail access. We then use those metrics to establish some stylized facts about the relationship between retail activity, income and ethnic composition in New York City, and how retail activity changes over time in the context of neighborhood economic transition. Given the relative scarcity of academic literature on neighborhood retail composition, developing accurate and nuanced measures of the amount, type and mix of retail activity is a necessary first step towards future research and a significant contribution to the literature. The first part of the empirical analysis develops several different metrics, presenting summary statistics for each and examining the correlation between them, to determine whether the choice of metric is likely to affect the outcome of analysis. In the second part of the analysis, we present descriptive statistics around two research questions:

1) How do retail patterns in New York City vary by neighborhood income and racial/ethnic composition? Do these patterns differ by retail category?

2) How has retail activity in New York City changed over time? How do the changes vary by baseline neighborhood economic characteristics and economic growth?

Development of retail metrics

Our primary source of data on retail and commercial activity is the ZIP Business Patterns (ZBP) dataset, collected annually by the Census Bureau. The ZBP data provide counts of the number of establishments in each industrial sector, broken out in several size categories based on the number of employees. [1] We are using the data from 1998 through 2007, which uses the North American Industrial Classification System (NAICS) to indicate industrial sector up to a 6-digit level of detail.[2] Because our main research focus is on retail that primarily serves the residents of the immediate neighborhood (rather than the type of retail that might attract customers from across the city), and because we are interested in quality of life implications, we have chosen to focus on four industry categories that meet these criteria: supermarkets (NAICS 6-digit code 445110), pharmacies and personal care stores (NAICS 3-digit code 446), clothing stores (NAICS 3-digit code 448), and food service establishments (NAICS 3-digit code 722). To provide some context we also look at the total number of establishments in retail (NAICS 2-digit 44-45) and food service and hospitality (NAICS 2-digit 72).

For each of these industrial groupings, we construct four metrics at the ZIP code level. We match each ZIP code to the land area of the ZIP Code Tabulation Area

[1] An establishment is defined as a "single physical location at which business is conducted or services or industrial operations are performed". A firm may have multiple establishments, each of which are counted separately.

[2] Prior to 1997 the ZBP use the Standard Industrial Classification (SIC) system, which differs in several ways from the NAICS. In general, the NAICS offers a more fine-grained level of detail that is helpful for our analysis, but makes it infeasible to match counts by industry category precisely between the two coding systems.

(ZCTA) from the 2000 census, which allows us to calculate the density of establishments per acre, by industry-ZIP-year (because land areas vary widely by ZCTA, simple counts of establishments may be misleading). Second, we estimate the total employment by industry-ZIP-year, using the counts of establishments in each size category, and again use the land area to calculate employment density.[3] Third, we combine the employment and establishment counts to calculate the average size of establishments by number of employees. Fourth, to measure the diversity of establishments, we construct a set of Herfindahl indices for each grouping. The Herfindahl index is calculated according to the equation shown below:

$$H = \sum_{i=1}^{n} s_i^2$$

where s_i is the share of establishments in category i for a given industrial grouping. The index values range from zero to one, with higher numbers indicating greater concentration or less diversity. For example, if all the establishments in a ZIP code were in the same industry, then the share for that industry would be equal to one, as would the value of the index. For the retail Herfindahl index, we use the share of establishments in each of the 12 three-digit NAICS categories within the 2-digit retail industry (NAICS code 44-45). For the food service Herfindahl index, we use each of the four 4-digit categories within the 3-digit food service category (NAICS code 722). The sub-categories within each index are shown in Table 1. All metrics are constructed annually at the ZIP code level.

[3] The size measure is a weighted average, using the midpoint of each size category multiplied by the number of establishments in the category. For the largest category, 1000 or more employees, we use 1000 as the average number. Very few establishments in New York City fall into this category, so any noise introduced by this approximation is likely to be small.

Our fifth metric of retail access draws on a different data source and focuses on geographic distance between residential and commercial properties. Using property-level data from the NYC Department of Finance Real Property Assessment Database and the NYC Department of City Planning PLUTO Database, which identify the location and use type of all properties in the city, we calculate the share of all residential building area within one-quarter and one-half mile of a commercial corridor. Using GIS mapping techniques, commercial corridors are identified as clusters of retail building area and properties classified under commercial zoning overlays (that permit retail use in mixed-use areas). A map of the retail corridors is displayed in Appendix Figure A.

The ZBP has two main advantages as a data source: because it is collected annually, it can be used to examine changes over time, and it is available for all ZIP codes across the country, allowing consistent analysis for multiple cities. A notable drawback to the ZBP, however, is that it provides no information on the type or quality of goods and services within each industrial category. For instance, one of the categories of interest is supermarkets. The 6-digit NAICS code for this category (445110) captures a wide range of store sizes and types, from branches of large national chains, such as Safeway and Kroger, to small, independently owned neighborhood stores or bodegas.[4] Although these stores will overlap somewhat in goods offered, bodegas generally carry a much narrower range of products than traditional supermarkets, and may differ from supermarkets (and from one another) by quality and price. The same is true for our other categories of interest (notably food service).

[4] In this paper, we use the term "bodegas" to refer to small stores that carry a limited selection of groceries, such as canned and frozen goods, pre-packaged basic dry goods, milk, sodas and beer, and household or personal items, such as cleaning supplies and toiletries. Some also offer limited selections of fresh produce, fresh baked goods, coffee, and deli sandwiches made to order.

To examine differences across neighborhoods in the quality of goods and services, we supplement the ZBP data with information on the location and corporate affiliation for a large number of regional and national chains in New York City, collected by the Center for an Urban Future (2009). From this database, we identify 98 chains that correspond to our categories of interest: all food services, some clothing and apparel (selected to cover a range of price points, adults of both genders and children, and with a large enough number of franchises to offer room for spatial variation), pharmacies, limited financial services (tax preparation), gyms and some home goods. The full list of chains selected is shown in Appendix Table A. We then aggregated the data to the ZIP code level, calculating the total number of chain establishments and, within that, the number of chain restaurants. Of the restaurants, we flag certain chains as "unhealthy" fast food (shown in Appendix Table A), and calculate the share of chain restaurants that are "unhealthy" (Neal 2006; Pillsbury 2010; Warde et al 1999). For illustration, we also identify four iconic chains – McDonalds, Subway, Dunkin Donuts and Starbucks. McDonalds is the most prevalent fast food chain with predominately unhealthy food choices (it is third out of all chains, after Dunkin Donuts and Subway). Subway also has a large number of locations and advertises itself as a healthier alternative that is still low-cost. Dunkin Donuts and Starbucks both offer coffee and baked goods (and we make no claims about their comparative health values), but at different price points, in quite different environments, and their marketing strategies target different clienteles. To identify some quality differences within our category of greatest interest, supermarkets, we augmented data from the CUF chain database with online searches to assemble a list of locations for a large number of grocery stores present in New York City. The list of

store names is shown in Appendix Table B. We use this to calculate the number of chain supermarkets in each ZIP code, and identify several chains as "upscale"; these chains typically carry more organic or locally provided foods, have a large fresh produce section, and offer hard-to-obtain or expensive specialty items.

One of the purposes of this paper is to determine what types of metrics should be used to describe retail access, and whether the choice of metric is likely to affect the patterns observed. Having created five separate metrics for several industry categories, we calculate pairwise correlations between all the retail metrics.

Testing the relationship between retail activity and neighborhood characteristics

To identify patterns of commercial activity across neighborhoods in New York City, we calculate summary statistics of each of the metrics described above and compare them in several ways. As described in Section 2, we expect that the amount and type of retail activity will vary by purchasing power and consumer preferences. Thus we will compare retail metrics across neighborhoods with underlying differences in variables that proxy for purchasing power and preferences, specifically household income and racial/ethnic composition.[5] All data on population characteristics for ZIP codes are taken from the 2000 census of population and housing. As shown in Table 3, ZIP code areas in New York City exhibit significant differences from one another in underlying population characteristics, such as population density, income and ethnic composition. The measures of retail activity and access also vary substantially across neighborhoods. In addition, the average population of a ZIP code in New York City is approximately 45,000, large enough to be a market area for neighborhood stores.

[5] We run similar analyses based on educational attainment and get substantially similar results to the income analysis. Results available upon request from authors.

To understand how differences in two key characteristics, income and racial/ethnic composition, affect patterns or retail activity, we compare retail metrics by these characteristics. Specifically, we compare the average value for each of our retail metrics (density of establishments and employment, average size, Herfindahl index, residential access, and the counts of various chains) for ZIPs in which average household income is less than 80% of the average income for New York City to ZIPs with average household income above 80% of the city average income ($58,505 in constant 2000 dollars). To assess the correlation with ethnic composition, we compare retail metrics for ZIPs that are super-majority white (at or above 60%) with ZIPs that have a super-majority black or Hispanic residents. Because New York City has significant numbers of residents who identify themselves as both black and Hispanic (such as Dominicans) or white and Hispanic, the Hispanic group is not mutually exclusive from black or white.

Changes in retail activity over time

In addition to comparing level differences in retail metrics, we are interested in how retail presence has changed over time, and whether those changes reflect underlying differences in neighborhood characteristics. Thus we calculate the percent change in each of our retail metrics from 1998 to 2007 (annual changes tend to be quite small and somewhat noisy). To analyze these changes in retail we stratify the sample in two ways: by initial economic status as of 1998 and by transition in economic status between 1998 and 2007. Since we do not have any measures of income at the ZIP Code level after 2000, we use instead residential housing sales data to identify the initial and change in economic status for each neighborhood in New York City.[6] We obtain NYC Department

[6] The decennial Census has not yet released its 2010 results and the American Community Survey will not report income at the ZIP Code level until releasing three-year averages in late 2010.

of Finance residential sales data for all New York City ZIP Codes from the Furman Center for Real Estate and Urban Policy at New York University. This data provides us with the average price per unit for all residential sales transactions in New York City between 1998 and 2007. From this data, we construct relative measures of neighborhood housing values for every neighborhood *i* in year *t*:

$$RelativeZIP_AvgPricePU_{i,t} = ZIP_AvgPricePU_{i,t} / NYC_AvgPricePU_t$$

In order to differentiate neighborhoods based on their initial economic status, we calculate this ratio for all ZIP Codes in 1998 and classify neighborhoods with relative average housing values less than 0.8 as "Low Value". Neighborhoods with relative average housing values greater than or equal 0.8 are classified as "Moderate/High Value".

We then classify the neighborhoods based on their relative change in housing values between 1998 and 2007. We classify neighborhoods as "Upgrading" if they experience a percentage gain in average housing values (absolute, not relative) that is greater than the percentage change in average housing values for the city overall (housing values for New York City on average increased by 120% between 1998 and 2007). Neighborhoods with percentage changes in average housing values less than those experienced for the city overall are classified as "Stable/Lagging".

Since we are interested in observing how changes in retail manifest themselves in low-income neighborhoods, we first compare changes in the retail metrics across low-income neighborhoods that are upgrading and stable/declining. In addition, we want to compare changes in retail activity to those experienced by relatively higher income

neighborhoods. Therefore, we also calculate the difference in change between low-income upgrading and stable/declining neighborhoods and compare this to the same difference across moderate-high income neighborhoods. The initial retail landscapes are quite different across low- and moderate/high-income neighborhoods (retail activity is significantly lower in low-income neighborhoods), and therefore we conduct this simplified "difference-in-difference" in order to avoid any upward bias in our estimates of retail change in low-income neighborhoods.

Additional data issues

A possible concern with the ZBP data is the consistency of the industrial classification system. According to the census, in the surveys used to construct the ZBP database, establishments are self-classified by employee or contact at the company, based on revenues. This raises the possibility that similar types of establishments may be classified differently, particularly for establishments engaged in multiple activities. For instance, as described above, bodegas could be classified as grocery stores, because they sell food items. Many but not all of these stores also prepare and sell some fresh food, such as made-to-order deli sandwiches, coffee and bagels. Depending on the share of revenues received from these activities (or the knowledge of the employee filling out the survey), a bodega may be counted in the ZBP as either grocery store (NAICS code 4451) or limited service restaurant (NAICS code 7222), while performing largely similar functions. Similar ambiguity in the NAICS codes may be present for other types of

establishments as well. Classification of the same establishment may also change over time, even if the establishment does not change functions.[7]

Section 4) Results

In this section, we provide summary statistics of the various retail metrics to describe the amount, type and mix of retail activity in New York City. We describe variation in retail metrics across neighborhoods by income and ethnic composition, and changes over time, stratified by economic growth. We also provide a more detailed description of retail activity in one neighborhood that has received considerable attention for recent gentrification and increased residential and commercial investment: Central Harlem.[8]

How can we characterize retail activity in New York City?

All neighborhoods in New York City have at least some amount of commercial activity; there are no entirely residential neighborhoods in the city. However, there is considerable variation in the quantity of commercial activity, measured by the density of establishments and shown in Figure 1. Table 3 also displays a selection of the retail metrics and demonstrates that neighborhoods across the city are diverse in terms of retail density, the size of retail establishments and the diversity of stores and services. While residents, on average, have great access to retail (nearly 90% of all residential space is

[7] Our related research using a longitudinal establishment database, the NETS dataset, confirms that establishments do change their NAICS classification over time, although overall numbers of these changes are fairly small.

[8] All of the results described in this section are robust to analyses that (i) exclude predominantly office- and retail-occupied midtown Manhattan zip codes and (ii) exclude zip codes with low populations (less than 200) and low retail activity (less than 50 establishments).

within ¼ mile of a retail corridor), there are neighborhoods where this is the case for less than 10 percent of residentially-occupied space.

Because one of the purposes of this analysis is to determine what metric or combination or metrics should be used to characterize retail, it is worth asking to what degree the various metrics are correlated with one another, both within and across industry categories. If the retail metrics are not strongly correlated, that implies that the choice of metric (in our analysis, intended to serve as the dependent variable) may affect the results of the analysis. In Table 4, we show simple pairwise correlation coefficients between each metric for groceries, all retail establishments, all food service establishments, and chains. In general, the measures of establishment density across the categories are highly correlated (ranging from .59 to .94), which suggests that there is co-location among different types of retail. However, the other metrics, such as size, are not as consistently or strongly associated. Moreover, neither retail diversity (as measured by the Herfindahl index) nor retail access (as measured by distance to a retail corridor) is highly correlated with the other metrics. This suggests the need for a multi-dimensional approach to characterizing neighborhood retail activity.

How does retail activity in New York City vary by income?

To develop a better understanding of the relationships between household income and retail activity, we compare all the retail metrics for neighborhoods with average household income above and below 80% of the city average income in 2000 ($58,505).[9] In Table 5 we display the results for the primary retail and food service metrics.

[9] All of the results comparing low- and moderate/high-income neighborhoods, as defined above, are robust to analyses comparing retail metrics across neighborhoods with (i) income below and above the citywide median income and (ii) share of college-educated residents above and below the share of college-educated residents for the entire city.

Consistent with theory and previous case studies, relatively higher income neighborhoods have higher densities of both establishments and employment and larger establishments on average (for retail and food service). And these disparities are consistently larger for food services. In addition, the Herfindahl indices are lower in higher income neighborhoods, suggesting that they have access to a more diverse pool of retail and food services. Although both low- and moderate/high-income neighborhoods have considerable access to retail corridors, low-income neighborhoods have significantly more access. Together, these results suggest that residents in relatively low-income neighborhoods have retail activity nearby, but that it is less dense and comprised of smaller and less diverse options (both of which could have implications for the quality and cost of the goods and services).

Next we drill down to finer industry categories and compare retail activity across low- and middle/high-income neighborhoods. These results are displayed in Table 6. Overall, the pattern echoes that for retail and food service more generally. The density (in terms of establishments and employment) is significantly higher in relatively high-income neighborhoods, and the magnitude is the largest for food services; none of the other differences compare, in terms of magnitude, with the differences found among retail establishments more broadly (which are consistently much larger). The retail establishments are also larger in higher income neighborhoods, a pattern that is particularly stark for grocery stores. The groceries, however, are slightly denser in lower income neighborhoods, and there is not a statistically significant difference in the density of large grocery stores across the two types of neighborhoods (this result, however, is not replicated using the employment density measure). Therefore, it appears that lower

income neighborhoods are not as severely disadvantaged when it comes to "necessity" services and goods, such as groceries and drugstores; restaurants and food establishments, however, disproportionately locate in higher income neighborhoods.

Finally, we compare the prevalence of chain stores and restaurants across low- and middle/high-income neighborhoods. The results in Table 7 indicate that higher income neighborhoods have more chain stores and restaurants. In addition, chains in poorer neighborhoods tend to be more unhealthy (33% compared to 22% of chain restaurants in higher income neighborhoods). Note that the difference in McDonalds locations is about three times that for Subway locations. Dunkin Donuts are more prevalent than Starbucks in both types of neighborhoods, but the Starbucks-Dunkin Donuts ratio is the highest in middle/high-income neighborhoods (0.62 compared to 0.04 in low-income neighborhoods and 0.48 citywide). While we cannot make a clear-cut comparison on the health aspects of Starbucks versus Dunkin Donuts, the latter certainly offers a lower-cost option and markets itself to a different clientele. The difference in the number of gyms is also stark: middle/high-income neighborhoods have, on average, one gym, while low-income neighborhoods have just 0.26. This result, together with the statistics on chain food stores, conveys a rather unhealthy environment for residents in low-income neighborhoods. Finally, we see that lower income neighborhoods actually have significantly more chain supermarkets, but it turns out that they have no "upscale" markets. While poorer neighborhoods likely do not suffer from lack of access to a Whole Foods or Zabar's, this may point to disparities in access to fresh produce or organic foods.

<u>How does retail activity in New York City vary by race/ethnic composition?</u>

We replicate the same analyses across neighborhoods stratified by predominant race/ethnicity. Table 8 displays the results for the primary retail and food service metrics. Consistent with the income results, neighborhoods with predominantly black and Latino residents have lower establishment and employment densities and smaller establishments than those with predominantly white residents (with the exception of food service establishments which are not significantly different in size between predominantly white and black neighborhoods). Predominantly white neighborhoods also have more diverse retail and food service activity than predominantly black neighborhoods (as indicated by the lower Herfindahl index); retail diversity in Latino neighborhoods, however, is no different than that in predominantly white neighborhoods. On the other hand, residents in predominantly black and Hispanic neighborhoods on average live closer to retail corridors. In sum, neighborhoods with predominantly minority populations (which also tend to be poorer) have more physical access to retail establishments, but the stores and services are less prolific, smaller and less diverse.

Table 9 shows the results for finer retail categories, and indicates that overall minority neighborhoods have relatively lower densities (for establishments and employment) and smaller establishments for local basic services like groceries, drugstores, clothing and food services. One exception is groceries, which are more densely located in Latino neighborhoods relative to predominantly white neighborhoods; they do tend to be smaller, which could represent mostly bodega or deli-type outfits rather than general supermarkets (on average 6 employees compared to almost 17 in predominantly white neighborhoods). As with the income results, these differences tend to be the largest for food service establishments.

The last set of results for chain stores and restaurants are displayed in Table 10. Predominantly black and Hispanic neighborhoods have significantly fewer chains and considerably more "unhealthy" chain restaurants (nearly 40% and 31% for black and Latino neighborhoods, respectively, compared to 14% for predominantly white neighborhoods). Consistent with the income results, predominantly minority neighborhoods have fewer Starbucks relative to Dunkin Donuts, fewer gyms and no "upscale" supermarkets. They do, however, have more chain groceries overall, although the previous set of results suggests that they are, on average, smaller.

How does retail activity in New York City vary over time?

In this section we review the results from the dynamic analysis, which looks at changes in retail activity between 1998 and 2007 for low- and moderate/high-valued neighborhoods undergoing economic transitions.[10] The first column of Table 11 shows the changes in four retail metrics for the city as a whole, and columns 2 and 3 show the metrics for low-valued neighborhoods that are either upgrading or stable/lagging. The fourth column displays the difference in retail change across upgrading and stable/lagging neighborhoods. We present the statistics for four retail categories, in order to pick up any variation among types of service.[11]

Both upgrading and stable/lagging low-valued neighborhoods are growing in terms of retail activity. This is consistent with most of New York City, and the outer-boroughs in particular, where most of the low-valued neighborhoods are located (see

[10] All of the results for the dynamic analysis are robust to analyses that (i) exclude predominantly office- and retail-occupied midtown Manhattan zip codes, (ii) exclude zip codes with low populations (less than 200) and low retail activity (less than 50 establishments), and (iii) other thresholds for low- and moderate/high-valued neighborhoods (specifically 60%, 10% and 120% of the average price per unit for New York City overall),

[11] We cannot use the chains or supermarket data in the dynamic analysis, because we have that data for only one point in time (2009).

Figure 2). Moreover, upgrading neighborhoods are generally outpacing the stable/lagging neighborhoods. Few of these differences, however, are statistically significantly different from zero. Upgrading neighborhoods are receiving significantly more food service and clothing establishments (per acre) compared to stable/lagging neighborhoods, but the change in density and size of retail establishments more generally is indistinguishable across the two types of neighborhoods. In addition, all low-valued neighborhoods are becoming more homogeneous in terms of retail and food services (the Herfindahl index is increasing), but the upgrading neighborhoods are doing so at a slower rate (the difference is significant at the 5% level for retail diversity). This reflects the general trend towards larger chains (which might actually offer a wider range of product options within each store location). That said, the more substantial changes in retail activity for economically upgrading neighborhoods are consistent with increasing buying power and, perhaps, shifts in consumer preferences, i.e. towards larger, chain stores.

As a second comparison, we calculate the same statistics for moderate/high-valued neighborhoods and derive the difference in retail change between the neighborhoods that were upgrading and stable/lagging (displayed in the last column of Table 11). We then compare this difference to the difference in retail change calculated for the low-valued neighborhoods (i.e. compare the two right-hand columns of Table 11). Overall, both low- and high/moderate-valued neighborhoods exhibit the same change patterns across upgrading and stable/declining neighborhoods. Low-valued and upgrading neighborhoods, however, are generally outpacing their stable/lagging comparison neighborhoods more so than high-valued and upgrading neighborhoods. This is most true for establishment and employment densities (except for food services,

which is growing at a relatively slower pace for low-valued and upgrading neighborhoods). Except for clothing establishments, higher valued and upgrading neighborhoods are outpacing comparable stable/lagging neighborhoods in establishment size more so than low-valued neighborhoods. These results suggest that while lower-valued neighborhoods are growing relatively faster in terms of retail density, they are not attracting as many larger businesses (again, this might be due to differential location choices of larger chains). Lastly, while retail activity in higher valued and upgrading neighborhoods is becoming more homogeneous compared to similar stable/lagging neighborhoods, it is doing so at a pace slower than low-valued and upgrading neighborhoods (compared to similar stable/lagging neighborhoods). The opposite is true for diversity of food services.

In sum, low-valued neighborhoods appear to fare better (in terms of retail activity) if they are economically upgrading, compared to similar, economically stable/lagging neighborhoods, and in the case of retail density and diversity, compared to other moderate/high-valued neighborhoods.

Describing retail in one gentrifying neighborhood: Harlem

To further illustrate retail patterns in low-income but economically upgrading neighborhoods, we examine one particular neighborhood, Central Harlem, which has received considerable attention in both the academic and popular press (see Freeman and Braconi 2004; Freeman 2006). In addition, within our neighborhood change classification system, Harlem is considered a “low-valued” and “upgrading” neighborhood. During the last decade, Harlem has seen large volumes of new residential construction as well as rehabilitation of historic brownstone houses. The *New York Times*

reported sales prices for newly built condominiums in the neighborhood up to $800 per square foot shortly before the recent recession (Arieff 2009), with one record-breaking sale of an $8 million penthouse (Barbanel 2008). The purchase of high-end residential real estate implies the arrival in the neighborhood of affluent households, who might be expected to consume relatively expensive shopping and entertainment options. The neighborhood's main commercial corridor, 125th Street, has an active Business Improvement District (BID); Table 12 summarizes the list of current businesses provided by the BID's website.[12]

Along the approximately 1.2 miles of 125th Street between Lexington and Amsterdam Avenues, the BID lists 185 establishments. The largest category of retail is clothing, with stores ranging from national chains (H&M, American Apparel, Old Navy, Marshall's) to locally owned boutiques (The Brownstone Woman) to discount stores (Jimmy Jazz, PayHalf). The list includes ten grocery/food stores, all small independent bodegas (several large chain supermarkets are located in Harlem, but not along 125th St). More than half of the restaurants are coffee shops or fast food chains, including three McDonalds but also two Starbucks (both of which opened within the last five years). Healthy food options are scarce; even among the sit-down restaurants several specialize in soul food, not known for its healthfulness. Services are dominated by parking garages and beauty/barber shops, particularly nail salons and hair braiding centers. Several of the large national banks are represented, including Bank of America, Chase, Citibank and TD Bank. Also present are two pawnshops and two check-cashing outlets. A recently completed major rezoning of the area attempts to market 125th Street as a destination for arts and entertainment, building around the legendary Apollo Theatre, although the arts

[12] Unfortunately it is not possible to obtain information on BID participants over time.

are currently a small share of the overall commercial activity. Overall, the businesses along 125th Street accommodate a fairly wide variety of household shopping needs and a range of price points. Although much of the activity is targeted at low- to moderate-income consumers, the newer arrivals (Starbucks, H&M) are more upmarket than many long-standing establishments, as might be expected for a neighborhood in transition.

Section 5) How are current economic development policies targeted?

New York City currently has a number of economic development policies designed to encourage commercial activity in targeted neighborhoods. Below we briefly outline the purpose, eligibility guidelines, and supported activities for four of the most important programs: the Industrial and Commercial Abatement Program (ICAP), Community Development Block Grants (CDBG), the Upper Manhattan Empowerment Zone (EZ) and various programs provided by the New York City Department of Small Business Services. We then discuss some general implications of our research for the design of economic development programs.

In dollar terms, the largest economic development program in New York City is the Industrial and Commercial Abatement Program (formerly the Industrial and Commercial Incentive Program). ICAP/ICIP has existed since 1984 (Finance 2010), with estimated annual costs around $500 million (NYC Independent Budget Office 2008). The program is intended to encourage investment in physical development or rehabilitation of commercial or industrial buildings in designated areas, through property tax abatements for new construction or substantial renovation. Geographic boundaries for eligible projects vary somewhat by use type and activity, but generally include all

areas in the four outer boroughs and Manhattan north of 96th Street. As a tax program, ICAP is administered through the Department of Finance.

The Upper Manhattan Empowerment Zone (UMEZ) was established in 1995 as part of the first wave of federal Empowerment Zones, with initial funding of $300 million. It covers parts of northern Manhattan (Central and East Harlem, Inwood) and the South Bronx (High Bridge Park). The UMEZ offers a variety of tax incentives and direct loans for businesses and not-for-profit organizations within the Zone. Recent lending has targeted small businesses, artists and cultural organizations, including the Museo El Barrio. UMEZ has also provided funding for building and streetscape improvements in East Harlem through the Main Streets program, and has occasionally issued tax-exempt bonds for larger redevelopment projects (Upper Manhattan Empowerment Zone Development Corporation 2008, 2010).

Like the UMEZ, the Community Development Block Grant is a federally funded program, which provides approximately $250 million per year to New York City. Funds are administered through the city's Department of Small Business Services, and can be used for all manner of programs with the majority of the funds going to housing, community services, and planning. Economic development programs receive a relatively small proportion of the funds, $6.548 million in 2010 (The Council of the City of New York: Finance Division 2009). The primary economic development program is Avenue NYC, which is intended to attract business investment and create public/private partnerships in low- or moderate-income areas (The Council of the City of New York: Finance Division 2009). Neighborhoods in all five boroughs have received funding, although most recipient neighborhoods are outside of Manhattan.

In addition to administering some of the city's CDBG funds, the New York City Department of Small Business Services (SBS) offers a variety of other programs aimed at fostering business development and expansion. Some of the services include bbusiness planning, advice and technical assistance for financing and legal review, certification of Minority/Women-owned Business Enterprises, and help in navigating federal, state and local regulations. SBS also operates career centers to train and connect workers with employers and oversees and supports the city's 64 Business Improvement Districts (BIDS).

The purpose of this paper is not to evaluate the success of existing economic development policies, but based on our results, we pose several questions about how future programs might be designed. First, should eligibility be defined through geographic boundaries? Several existing programs, such as the UMEZ and ICAP, define specific parts of the city that are eligible for assistance. Our results have shown that there are significant disparities in retail access based on neighborhood income and race/ethnicity. As shown in Figure 3, although there is some geographic clustering of poor and minority neighborhoods, rigid geographic boundaries are somewhat of a blunt instrument if the intent is to target investment towards these neighborhoods. In addition, retail markets may span broader or distinct areas than those defined by racial or economic clusters.

A second question is whether policies should target or favor businesses based on size. Many traditional economic development policies are intended to help small, locally owned "mom and pop" businesses. Such assistance is thought to improve opportunities for entrepreneurs and assist wealth building within the community. However, our

research finds that poor and minority neighborhoods currently have much smaller average stores for nearly all the retail categories examined. This implies a smaller range of product choices within each store, and to the extent that economies of scale exist, may result in higher prices than in larger establishments. Moreover, larger stores by definition offer more opportunities for employment. Thus, although small-business friendly policies may be popular among business owners, it is not clear that they are advantageous for either consumers or potential workers in low-income neighborhoods. Alternatively, perhaps the public programs could subsidize certain types of products (for example healthier ones) for smaller businesses that cannot offer those goods at competitive prices.

Thirdly, should economic development policies treat all types of commercial activity as equally desirable? For instance, the ICAP applies to all commercial and industrial properties. In this paper, we have focused on specific categories of commercial activity that are most relevant to household consumption and quality of life. Policies that encourage manufacturing or business incubation may provide employment opportunities but will not directly address the discrepancies in access to grocery stores, clothing or healthy food service options. Targeted policies around health-related retail, such as Mayor Bloomberg's Green Carts program, may be more effective at alleviating consumption disparities than more broadly framed tax abatements. Policymakers should consider whether the primary purpose of each program is to encourage jobs or benefit consumers, and whether these goals are mutually inclusive.

Other than these general observations, we are limited in our ability to make specific policy recommendations based on our results. Although we have presented quite robust evidence that substantial disparities in retail access exist by neighborhood race and

income, our research does not explain the causes of these disparities. Understanding the reasons is critical to developing appropriate policy. One possible hypothesis is that operating costs are higher for stores in low-income neighborhoods (for instance, due to higher security or insurance costs, higher transportation costs in less accessible locations, or employee turnover). Increasing police presence or improving transit infrastructure might be appropriate responses to lower these types of costs. On the other hand, relatively larger growth in retail activity in lower-valued neighborhoods might be due to relatively lower rents, which can present opportunities for fostering business entrepreneurship (and in targeted retail sub-sectors). Another possibility is that the size or construction quality of existing buildings in low-income neighborhoods makes them less well suited to retail use (particularly for large stores with infrastructure requirements, such as grocery stores), raising the start-up costs. If that is the case, targeting assistance to building reconfiguration could be an effective means of encouraging larger retail stores. Our results show that disparities are much smaller for stores selling low-value necessity items – grocery stores and drugstores – which we would expect to have a lower elasticity of demand with respect to income than clothing and restaurants. This suggests that lack of purchasing power, or at least lack of discretionary income, plays a large role. The most direct solution for that is providing greater income support to low-income families. In short, without a better understanding of why disparities in retail access exist, it is difficult to formulate the correct policy response.

Section 6) Conclusions and directions for future research

Scholars have dedicated a great deal of rigor and thought to understanding the nature of and mechanisms behind residential neighborhood change. While we expect commercial amenities to change along with the residential population, and anecdotal evidence generally supports this, essentially no quantitative research has focused on neighborhood commercial change. In the current paper, we aim to fill this gap by providing a much-needed assessment of local retail establishments and the neighborhoods they serve. First, we construct and compare various metrics of "retail presence", and find that a single measure is not sufficient for capturing the multidimensional nature of retail presence. While the densities of establishments and employment are strongly and positively correlated, measures of size, access and diversity are generally negatively and weakly correlated with density measures.

Second, we analyze how retail services vary across neighborhoods with different economic and demographic characteristics. Results show that low-income neighborhoods have lower densities of both establishments and employment, smaller average establishment size and less diverse retail composition. However, the size of disparities varies by retail category: poor neighborhoods are more disadvantaged in food service than in retail, and within retail, the differences are smallest for basic necessities, such as grocery stores and pharmacies. Low-income neighborhoods have fewer chain stores and restaurants, somewhat contrary to conventional wisdom. Supporting prior findings, a much higher proportion of chain restaurants in poor neighborhoods are unhealthy fast food establishments, and there are many fewer gyms available. Low-income neighborhoods actually have a higher number of chain supermarket branches, but are less likely to have upscale supermarkets, possibly a proxy for food quality. Similar

disparities exist when comparing predominantly white neighborhoods to predominantly black and Latino ones, with the discrepancies generally larger for black neighborhoods.

Third, we examine changes in retail activity over time. We find that by almost all measures, retail access has improved in New York City between 1998 and 2007, and that it improved particularly rapidly in low-value neighborhoods that experienced upgrading, or gentrification. This suggests that retail is quite sensitive to changes in neighborhood economic or demographic characteristics.

A number of areas remain for future research. This paper focuses exclusively on New York City, which stands from many other U.S. cities in its size, density, and integration of residential and commercial activities throughout virtually all neighborhoods. Thus an important next step is to conduct similar analyses and verify whether the relationships between income, race and retail access hold true in other cities. Second, as new neighborhood-level data becomes available from the 2010 census (and the 2005-08 average of the ACS), it will become possible to examine more directly how retail patterns have changed in neighborhoods undergoing economic and demographic change (i.e. gentrification and decline). This may help to illuminate some of the causes behind the disparities – if low incomes are the main source of limited retail access, then retail should increase in neighborhoods experiencing rising incomes. Additional research in this area should help policymakers better construct programs to help residents in low-income and minority neighborhoods gain access to a broader range of goods and services, healthier food options and generally improve neighborhood quality of life.

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Figure 1: Density of retail establishments by ZIP Code (2007)

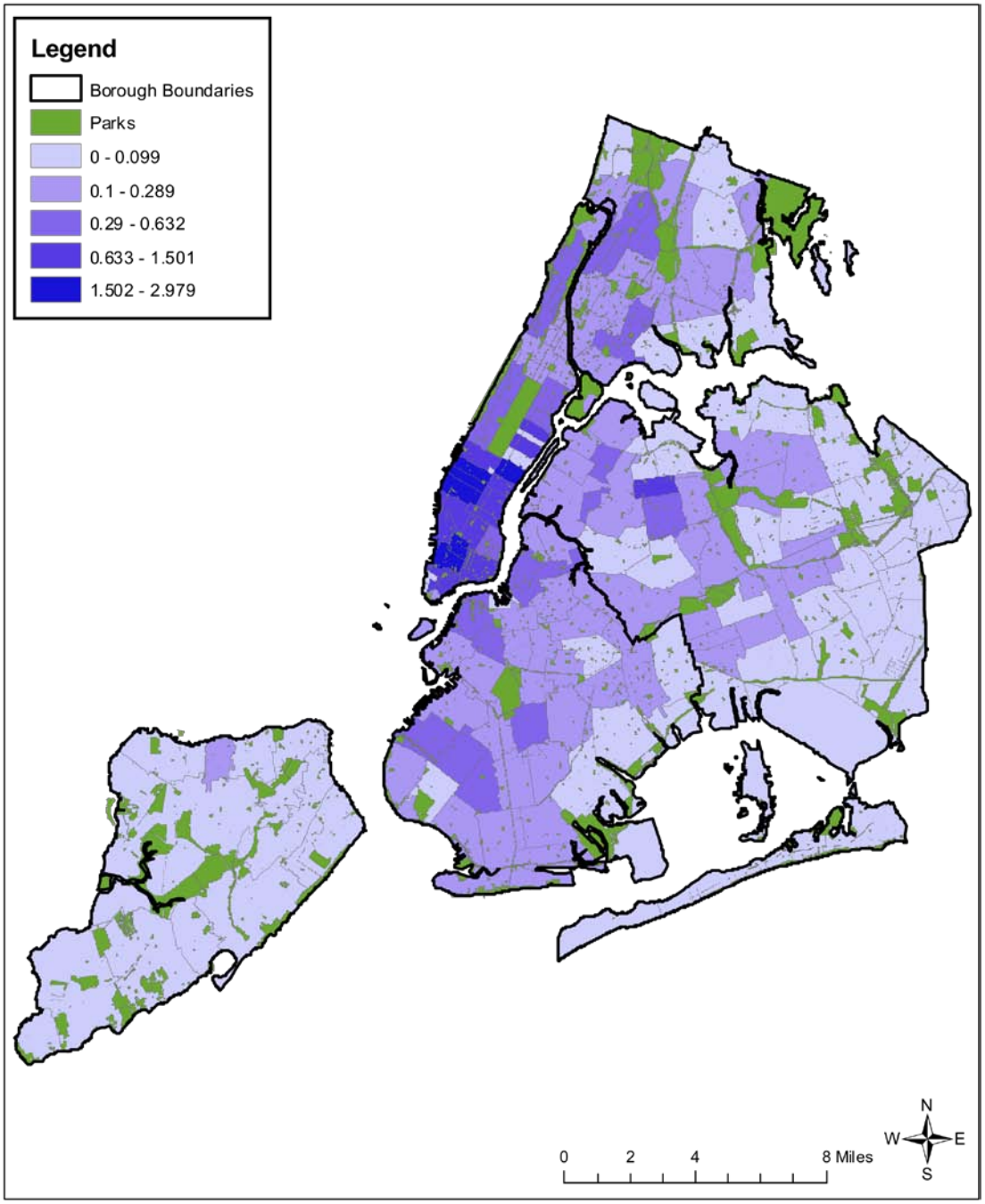

Figure 2: Percentage change in retail establishment density (1998-2007)

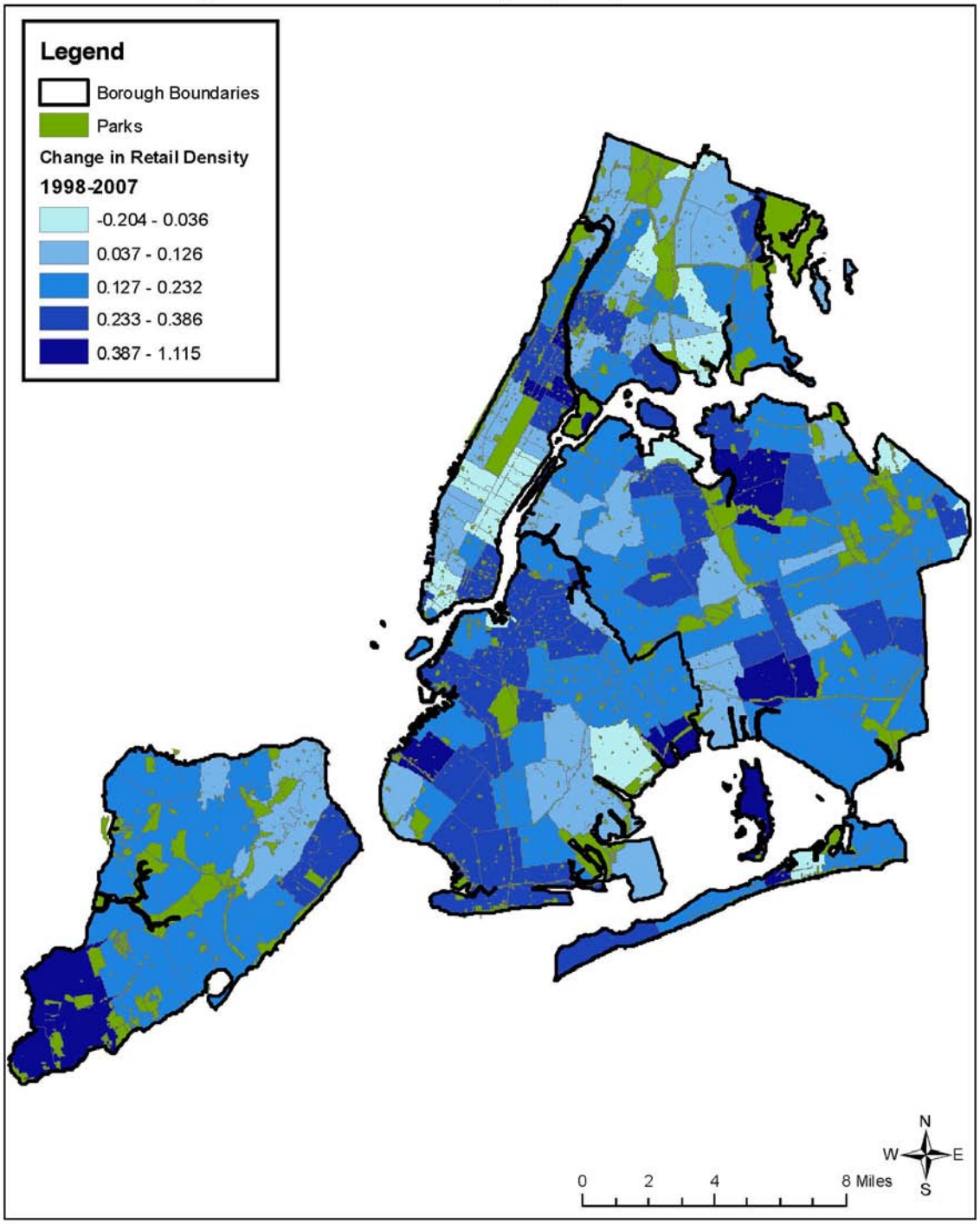

Figure 3: Density of retail establishments (2007) and Average HH Income (2000)

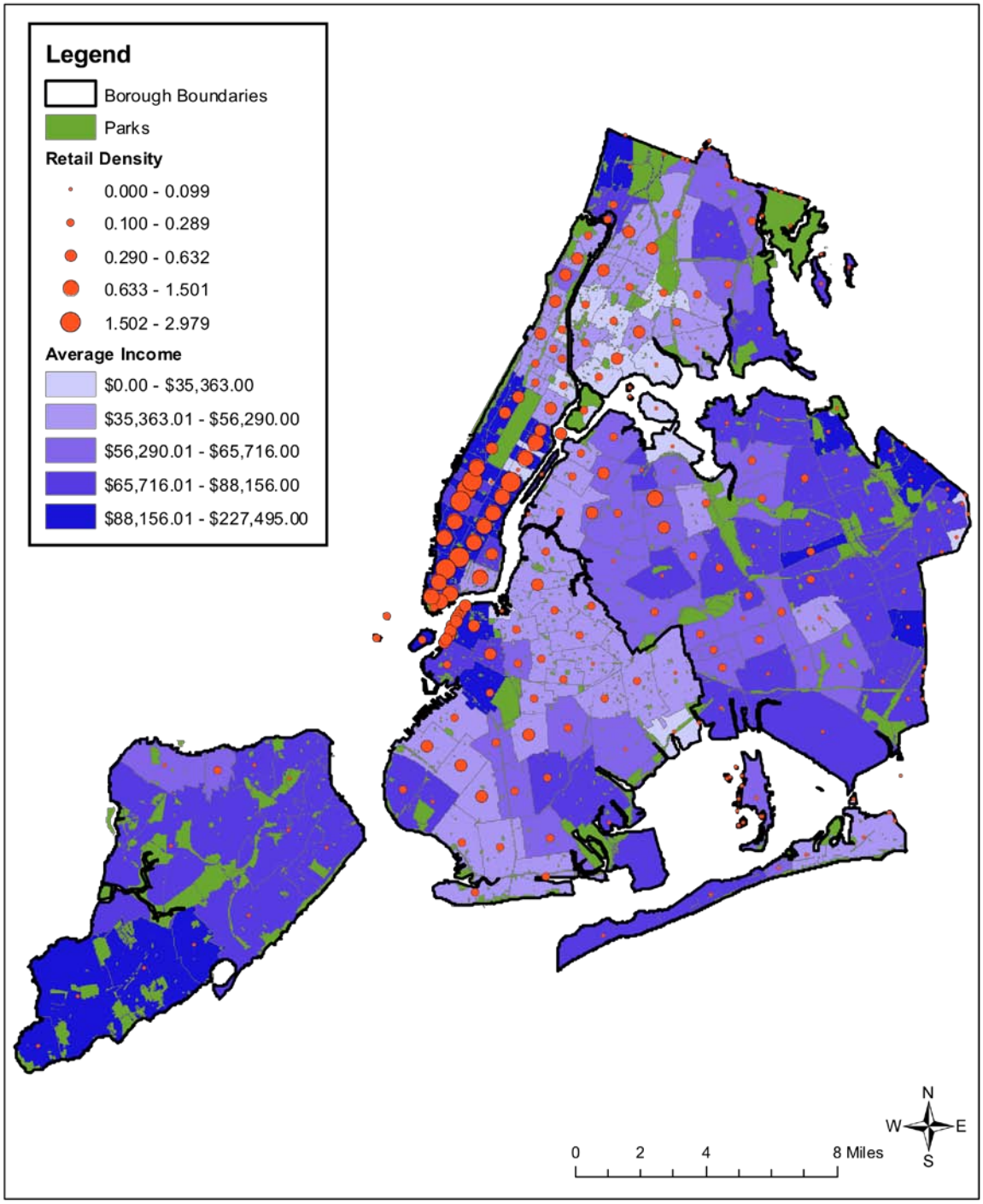

Table 1: Retail and food service sub-sectors

NAICS code	Industry sub-sector
44	Retail
441	Motor Vehicle & Parts Dealers
442	Furniture & Home Furnishings Stores
443	Electronics & Appliance Stores
444	Building Material, Garden Equip
445	Food & Beverage Stores
446	Health & Personal Care Stores
447	Gasoline Stations
448	Clothing & Clothing Accessories Stores
451	Sporting Goods, Hobby, Book, & Music Stores
452	General Merchandise Stores
453	Miscellaneous Store Retailers
454	Nonstore Retailers
722	Food service
7221	Full-Service Restaurants
7222	Limited-Service Eating Places
7223	Special Food Services
7224	Drinking Places (Alcoholic Beverages)

Source: NAICS

Table 2: Variable definitions and sources

Variable	Definition	Source
Primary retail metrics		
Est/land	# of establishments in ZIP divided by land area (acres)	ZBP (1998-2007), Census 2000
Emp/land	# of establishments in ZIP divided by land area (acres)	ZBP (1998-2007), Census 2000
Emp/est	Total employment in ZIP divided by total estabs	ZBP (1998-2007)
Herfindahl	Herfindahl index of diversity for retail, food service	ZBP (1998-2007)
Share res w/in 1/4 mile commercial	% of residential sq. ft. w/in 1/4, 1/2 mile of commercial corridor	GIS calculations using RPAD
Chain retail metrics		
Chain stores	# of retail estabs in selected chains	CUF, 2009
Chain restaurants	# of restaurant estabs in selected chains	CUF, 2009
% unhealthy	# of fast food chains/total chain restaurants	CUF, 2009
Gyms	# of estabs in selected gym chains	CUF, 2009
Chain groceries	# of estabs in selected grocery chains	Authors' search online
% upscale	# of upscale groceries/# chain groceries	Authors' search online
Population characteristics		
Medium-upper income	ZIP income >= 80% of NYC average household income	Census (2000)
Low income	ZIP income < 80% of NYC average household income	Census (2000)
White	>60% ZIP population white (non-Hispanic?)	Census (2000)
Black	>60% ZIP population black (non-Hispanic?)	Census (2000)
Hispanic	>60% ZIP population Hispanic (all races)	Census (2000)
Low-value	ZIP average (residential) sales price < 80% NYC average price	DoF residential sales data (1998), Furman Center
Upgrading	ZIP % change in avg. hsg. val. > NYC % change in avg. hsg. val. (1998-2007)	DoF residential sales data (1998-2007), Furman Center
Stable/Lagging	ZIP % change in avg. hsg. val. <= NYC % change in avg. hsg. val. (1998-2007)	DoF residential sales data (1998-2007), Furman Center

Table 3: Summary statistics of all variables

Variable	Mean	Std. Dev.	Min	Max	n
Population	44,964	26,866	16	106,415	178
Pop/acre	60.48	44.96	0.13	277.81	178
Avg HH inc	$73,941	$37,183	$0	$227,494	178
BA plus	29.4	20.7	0.0	100.0	178
Poverty rate	19.6	13.1	2.6	100.0	178
Pct. White	48.8	28.1	1.4	100.0	178
Pct. Black	24.5	27.7	0.0	93.9	178
Pct. Hispanic	23.8	20.0	0.0	79.9	178
Sales price per unit, 1998	$252,010	$231,578	$24,931	$2,130,190	171
% change in sales prices, 1998-2007	138.2%	160.5%	-26.6%	1354.2%	170
Est/land (Retail)	0.30	0.49	0.00	2.79	178
Emp/land (Retail)	3.10	6.33	0.02	48.36	178
Emp/est (Retail)	9.31	4.57	2.50	29.26	178
Herfindahl (Retail)	0.20	0.11	0.10	1.00	178
Share of Res within 1/4 mile	0.85	0.22	0.02	1.00	162
Share of Res within 1/2 mile	0.93	0.17	0.10	1.00	123
Chain stores (per acre)	0.04	0.07	0.00	0.36	178
Chain restaurants (per acre)	0.03	0.05	0.00	0.29	178
% unhealthy	0.24	0.16	0.00	0.75	173
Gyms (per acre)	0.00	0.00	0.00	0.04	178
Chain groceries (per acre)	0.00	0.01	0.00	0.04	178
% upscale	0.03	0.11	0.00	0.80	143

Table 4: Correlation of selected retail metrics

	Grocery			All retail			Food svce						
Variable	Est/land	Emp/land	Emp/est	Est/land	Emp/land	Emp/est	Est/land	Emp/land	Emp/est	Herf retail	Chain Store dens	% unhealthy	Starbucks-DD
Grocery													
Emp/land	0.587												
Emp/est	-0.143												
All retail													
Est/land	0.727	0.573	0.026										
Emp/land	0.615	0.642	0.148	0.935									
Emp/est	-0.040	0.424	0.663	0.136	0.289								
Food svce													
Est/land	0.697	0.660	0.102	0.898	0.867	0.178							
Emp/land	0.569	0.629	0.158	0.820	0.862	0.244	0.916						
Emp/est	0.204	0.448	0.298	0.338	0.432	0.627	0.388	0.529					
Herf retail	0.293	0.285	0.137	0.292	0.315	0.103	0.392	0.398	0.347				
Chain store dens	0.658	0.579	0.061	0.816	0.837	0.220	0.903	0.853	0.410	0.300			
% unhealthy	-0.149	-0.289	-0.231	-0.278	-0.300	-0.212	-0.316	-0.295	-0.221	-0.361	-0.302		
Starbucks-DD	0.484	0.654	0.263	0.666	0.702	0.246	0.747	0.822	0.483	0.516	0.717	-0.370	
% res units w/in 1/4 mile of retail corridor	0.452	0.238	-0.261	0.297	0.231	-0.215	0.275	0.213	-0.029	0.077	0.267	-0.085	0.150

Note: Correlation coefficients. ZBP metrics from 2007.

Table 5: Primary retail metrics by income

	NYC	Middle-upper income	Low income	Difference
Est/land				
Retail	0.310	0.333	0.230	0.103***
Food Service	0.184	0.213	0.084	0.129***
Emp/land				
Retail	3.278	3.671	1.878	1.793***
Food Service	3.239	3.959	0.673	3.287***
Emp/est				
Retail	9.516	9.879	8.224	1.655***
Food Service	12.283	13.221	8.972	4.250***
Herfindahl				
Retail	0.217	0.209	0.244	-0.036***
Food Service	0.434	0.424	0.470	-0.045***
Share of Res within				
1/4 mile	0.853	0.830	0.935	-0.105***
1/2 mile	0.930	0.922	0.972	-0.050***
n =	178	139	39	

Notes: "Middle-upper income" defined as greater than 80% of NYC average household income.
*, **, *** indicate statistical significance at the 10%, 5% and 1% levels, respectively

Table 6: Retail metrics by sub-category and income

	NYC	Middle-High income	Low income	Difference
Est/land				
Groceries	0.039	0.036	0.049	-0.013***
Large Groceries	0.004	0.004	0.003	0.001
Drugstores	0.022	0.023	0.018	0.005***
Clothing	0.053	0.060	0.032	0.028***
Food Service	0.184	0.213	0.084	0.129***
Emp/land				
Groceries	0.434	0.453	0.364	0.089***
Large Groceries	0.284	0.311	0.187	0.124***
Drugstores	0.289	0.329	0.147	0.182***
Clothing	0.772	0.923	0.252	0.672***
Food Service	3.239	3.959	0.673	3.287***
Emp/est				
Groceries	13.42	14.79	8.53	6.26***
Drugstores	13.70	14.97	9.19	5.78***
Clothing	11.07	11.60	9.24	2.36***
Food Service	12.28	13.22	8.97	4.25***
n =	178	139	39	

Notes: "Middle-upper income" defined as greater than 80% of NYC average household income. All numbers are average values for ZIP code. *, **, *** indicate statistical significance at the 10%, 5% and 1% levels, respectively, based on t-test for difference in means.

Table 7: Chain stores & restaurants by income

	NYC	Middle-high income	Low income	Difference
Chain Stores (#)	21.88	23.40	16.49	6.91***
Chain Restaurants (#)	14.98	16.04	11.18	4.86***
"Unhealthy" (%)	24.2	21.6	32.9	-11.3***
Notable chains (% of total)				
McDonalds	6.7	6.0	9.4	-3.4***
Subway	8.8	8.5	9.8	-1.3***
Starbucks	3.8	4.7	0.6	4.1***
Dunkin Donuts	12.1	12.4	11.1	1.3***
Starbucks-DD Ratio	0.48	0.62	0.04	0.58***
Gyms (#)	0.85	1.02	0.26	0.77***
Chain Groceries (#)	2.83	2.50	3.97	-1.47***
"Upscale" (%)	3.4	4.6	0.0	4.6***
n =	178	139	39	

Notes: "Middle-upper income" defined as greater than 80% of NYC average household income. All numbers are average values for ZIP code. *, **, *** indicate statistical significance at the 10%, 5% and 1% levels, respectively, based on t-test for difference in means.

Table 8: Primary retail metrics by predominant racial/ethnic group

	White	Black	Hispanic	Difference, White-black	Difference, White-Hispanic
Est/land					
Retail	0.427	0.103	0.253	0.324***	0.174***
Food Service	0.286	0.036	0.071	0.249***	0.215***
Emp/land					
Retail	5.228	0.712	1.648	4.516***	3.579***
Food Service	6.026	0.429	0.595	5.597***	5.431***
Emp/est					
Retail	10.239	8.071	6.843	2.168***	3.396***
Food Service	13.701	15.284	8.398	-1.582	5.304***
Herfindahl					
Retail	0.211	0.263	0.218	-0.052***	-0.008
Food Service	0.417	0.522	0.441	-0.105***	-0.024***
Share of Res within					
1/4 mile	0.832	0.846	0.964	-0.014	-0.133***
1/2 mile	0.911	0.945	1.000	-0.034***	-0.089***
n =	76	26	16		

Notes: Predominant racial/ethnic group defined as greater than 60% of population. All numbers are average values for ZIP code. *, **, *** indicate statistical significance at the 10%, 5% and 1% levels, respectively, based on t-test for difference in means.

Table 9: Retail metrics by sub-category and predominant racial/ethnic group

	White	Black	Hispanic	Difference, White-black	Difference, White-Hispanic
Est/land					
Groceries	0.041	0.026	0.060	0.015***	-0.020***
Large Groceries	0.006	0.002	0.003	0.004***	0.003***
Drugstores	0.027	0.010	0.021	0.017***	0.006***
Clothing	0.078	0.013	0.035	0.065***	0.043***
Food Service	0.286	0.036	0.071	0.249***	0.215***
Emp/land					
Groceries	0.58	0.21	0.36	0.37***	0.23***
Large Groceries	0.42	0.11	0.15	0.32***	0.27***
Drugstores	0.44	0.10	0.19	0.34***	0.25***
Clothing	1.31	0.10	0.31	1.21***	1.00***
Food Service	6.03	0.43	0.59	5.60***	5.43***
Emp/est					
Groceries	16.65	9.47	6.19	7.19***	10.46***
Drugstores	16.02	12.70	8.41	3.32***	7.61***
Clothing	12.55	8.85	8.26	3.71***	4.29***
Food Service	13.70	15.28	8.40	-1.58***	5.30***
n =	76	26	16		

Notes: Predominant racial/ethnic group defined as greater than 60% of population. All numbers are average values for ZIP code. *, **, *** indicate statistical significance at the 10%, 5% and 1% levels, respectively, based on t-test for difference in means.

Table 10: Chain stores & restaurants by race/ethnicity

	White	Black	Hispanic	Difference, White-black	Difference, White-Hispanic
Chain Stores (#)	26.07	15.54	16.81	10.53***	9.25***
Chain Restaurants (#)	17.63	10.85	10.94	6.79***	6.69***
"Unhealthy" (%)	14.1	39.5	30.7	-25.4***	-16.6***
Notable chains (%)					
McDonalds	4.9	7.4	10.8	-2.6***	-6.0***
Subway	8.3	7.0	12.1	1.3***	-3.8***
Starbucks	6.6	1.5	0.6	5.2***	6.0***
Dunkin Donuts	12.1	9.8	13.5	2.3***	-1.4**
Starbucks-DD Ratio	0.945	0.103	0.052	0.842***	0.893***
Gyms (#)	1.38	0.38	0.38	1.00***	1.01***
Chain Groceries (#)	2.36	3.19	3.50	-0.84***	-1.14***
"Upscale" (%)	7.7	0.0	0.0	7.7***	7.7***
n =	76	26	16		

Notes: Predominant racial/ethnic group defined as greater than 60% of population. All numbers are average values for ZIP code. *, **, *** indicate statistical significance at the 10%, 5% and 1% levels, respectively, based on t-test for difference in means.

Table 11: Does retail access improve in low-value neighborhoods that upgrade?

		% Change in Housing Values (1998-2007)		Difference, Upgrading-Stable/Lagging	
	NYC	Upgrading	Stable/ Lagging	Low-Value ZIPs	Mod/High-Value ZIPs
% Change Est/acre					
Retail (44)	0.143	0.245	0.182	0.062	0.009
Food service (72)	0.406	0.646	0.458	0.187*	0.175*
Groceries	0.246	0.311	0.313	-0.002	-0.075
Clothing	0.251	0.783	0.195	0.588*	0.217
% Change Emp/acre					
Retail (44)	0.459	0.523	0.374	0.149	0.362**
Food service (72)	1.062	1.013	1.635	-0.622	0.211
Groceries	0.540	0.792	0.382	0.410	0.254
Clothing	1.114	2.278	0.426	1.852	-0.254
% Change Emp/est					
Retail (44)	0.192	0.212	0.096	0.115	0.313***
Food service (72)	0.346	0.177	0.457	-0.280	0.039
Groceries	0.308	0.317	0.148	0.169	0.295
Clothing	0.545	0.555	0.270	0.285	-0.292
% Change Herfindahl					
Retail (44)	1.040	0.718	0.982	-0.264**	-0.111
Food service (72)	0.024	0.009	0.014	-0.005	-0.087*
n	171	31	64	95	76

Notes: ZIPs in columns 1 and 2 had initial housing values (1998) < 80% NYC avg. "Upgrading" defined as ZIP % change in average housing value > NYC % change in average housing value (1998-2007). Stable/Lagging defined as ZIP % change in average housing value ≤ NYC % change in average housing value (1998-2007).
*, **, *** indicate statistical significance at the 10%, 5% and 1% levels, respectively, based on t-test for difference in means.

Table 12: Retail composition along 125th St, Harlem (2010)

Retail	93	Food service	26	Services	66
Groceries	10	Coffee shop & fast food	14	Arts & entertainment	7
Chain groceries	0	McDonalds	3	Financial services	13
Drugstores	6	Subway	1	Pawnshops/check cashing	4
Clothing	60	Starbucks	2	Beauty/barber	23
Other	17	Dunkin Donuts	1	Parking/car service	16
		Other restaurants	12	Other	7

Source: Authors' tabulations based on data from www.125thstreetbid.com.

Appendix Tables

Figure A: Retail Corridors, New York City

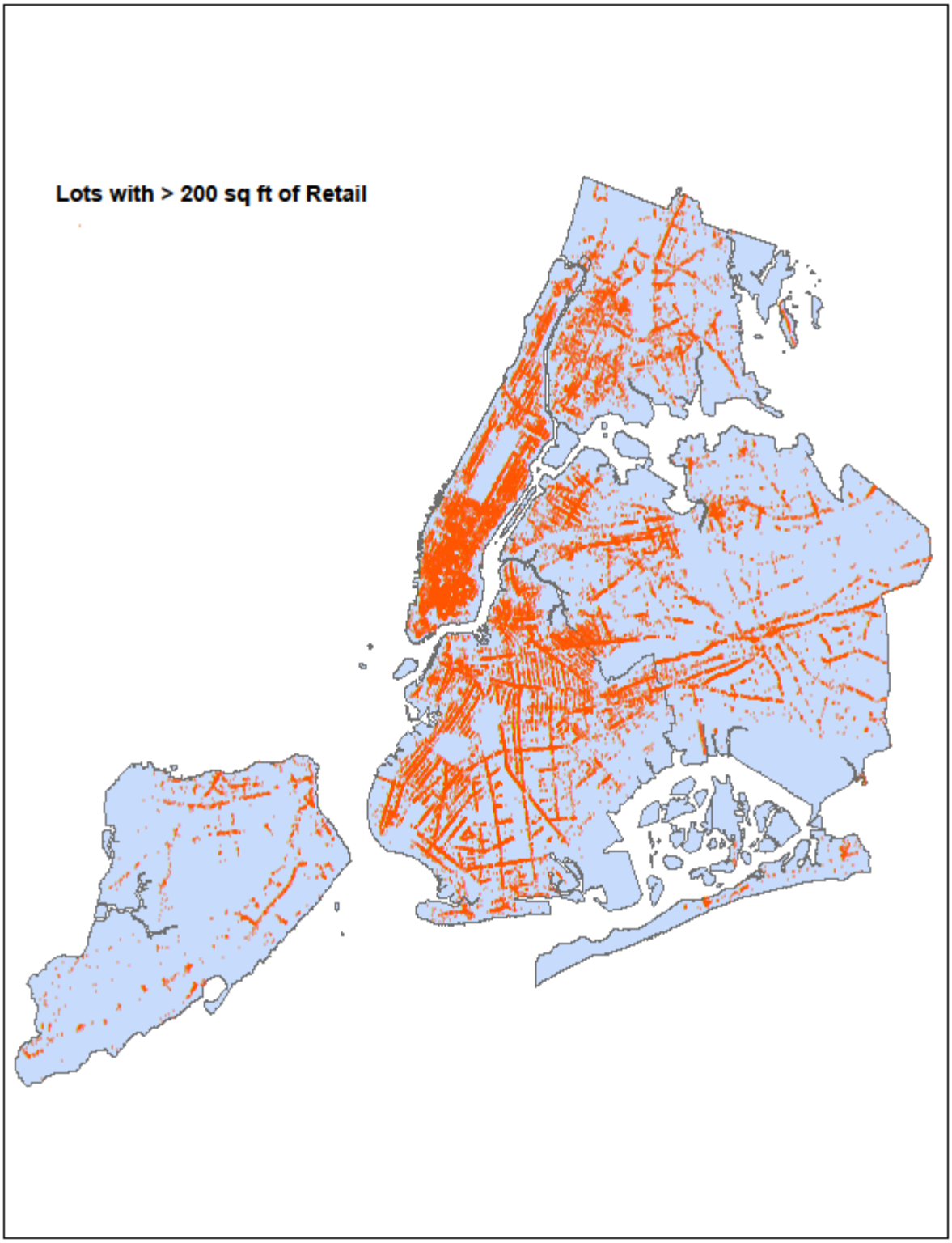

Table A: Chain stores and restaurants in database

Category	Chain name
Clothes & shoes	AMERICAN APPAREL, ANN TAYLOR, BANANA REPUBLIC, BROOKLYN INDUSTRIES, FOOT LOCKER, GAP, H&M, MARSHALLS, OLD NAVY, PAYLESS, THE CHILDRENS PLACE, URBAN OUTFITTERS
Drugstore	CVS, DUANE READE, RITE AID, WALGREENS
Financial services	H&R BLOCK, JACKSON HEWITT, LIBERTY TAX
Food/beverage: Fast food	AUNTIE ANNIES*, BURGER KING*, CROWN FRIED CHICKEN*, DOMINOS*, FIVE GUYS*, GOLDEN KRUST*, KFC,* MASTER WOK*, MCDONALDS*, NATHANS*, PAPA JOHNS*, PIZZA HUT*, POPEYES*, PRETZEL TIME*, RANCH1, SBARRO*, TACO BELL*, WENDYS*, WHITE CASTLE*
Food/beverage: Other	7-ELEVEN, APPLEBEE'S, ARTHUR TREACHER, AU BON PAIN, BASKIN ROBBINS, BEN AND JERRYS, BLIMPIE, BOSTON MARKET, CARVEL, CHEVY'S, CHIPOTLE, CHUCK E. CHEESE, COLD STONE CREAMERY, COSI, CRUMBS, DALLAS BBQ, DUNKIN DONUTS, FAMIGLIA, FRIDAYS, GLORIA JEANS COFFEE, GODIVA, HAAGEN-DAZS, HALE AND HEARTY, HARD ROCK CAFÉ, IHOP, JAMBA JUICE, JOHNNY ROCKETS, JUAN VALDEZ, LE PAIN QUOTIDIEN, MRS FIELDS, OLIVE GARDEN, OUTBACK, PANERA BREAD, PAX WHOLESOME, PINKBERRY, PRET A MANGER, QUIZNOS, RED LOBSTER, STARBUCKS, SUBWAY, TASTI D-LITE, TIM HORTON, TWO BOOTS, UNO'S
Gyms	BALLY'S TOTAL FITNESS, CRUNCH, CURVES, DAVID BARTON, EQUINOX, GOLD'S GYM, LUCILLE ROBERTS, NY SPORTS CLUB
Home goods	HOME DEPOT, RENT-A-CENTER

* Denotes “unhealthy” fast food restaurant.
Source: Center for an Urban Future 2009.

Table B: Supermarket chains in database

Supermarket name
Associated Supermarkets
Bravo
Citarella*
Costco
C-Town
D'Agostino*
Fairway
Fine Fare
Food Emporium
Garden of Eden*
Gourmet Garage*
Gristedes
Key Food
Morton Williams
Pathmark
Trader Joe's
West Side Market
Western Beef
Western Beef/Junior's
Whole Foods*

* Denotes “upscale” supermarket.
Source: Center for Urban Futures 2009, additional online research by authors.

Table C: Does retail access improve in high-value neighborhoods that upgrade?

	% Change in Housing Values (1998-2007)		
	Upgrading	Stable/Lagging	Difference
% Change Est/acre			
Retail (44)	0.042	0.033	0.009
Food service (72)	0.392	0.217	0.175
Groceries	0.077	0.152	-0.075
Clothing	0.259	0.042	0.217
% Change Emp/acre			
Retail (44)	0.507	0.145	0.362
Food service (72)	0.575	0.364	0.211
Groceries	0.716	0.462	0.254
Clothing	1.037	1.291	-0.254
% Change Emp/est			
Retail (44)	0.426	0.113	0.313
Food service (72)	0.168	0.129	0.039
Groceries	0.646	0.350	0.295
Clothing	0.537	0.829	-0.292
% Change Herfindahl			
Retail (44)	1.204	1.315	-0.111
Food service (72)	-0.039	0.048	-0.087
n	18	58	

Notes: All ZIPs had initial housing values (1998) >= 80% NYC avg. "Upgrading" defined as ZIP % change in avg. hsg. val. > NYC % change in avg. hsg. val. (1998-2007). Stable/Lagging defined as ZIP % change in avg. hsg. val. ≤ NYC % change in avg. hsg. val. (1998-2007).