Are Local Retail Services an Amenity or a Nuisance?

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Abstract

Much of the public finance literature on neighborhood disparities and service provision focuses on the availability and quality of *public* goods and amenities. However, there is little research on how *private* services affect the quality and desirability of particular neighborhoods. Are they considered a nuisance or an amenity, and is this value capitalized into residential property values? Using a rich, micro-dataset on property sales transactions and business activity in New York City, I estimate the impact of neighborhood retail services on property values. Preliminary results suggest that proximity to overall commercial activity is associated with lower residential prices, but retail services located at least 1/2 mile away from the property sale are associated with higher prices. This suggests that having retail services nearby is considered an amenity, but not when they are in the immediate vicinity. This result is largely driven by frequently consumed services or goods, which exhibit a price premium at about 1/4 mile radius. Restaurants are valued at very close distances, as are personal services; banking services, however, are more valued at further distances. Chain retailers induce positive price effects, at further distances; it appears that immediate proximity can be price demeaning.

I. Introduction

Much of the public finance literature on neighborhood disparities and service provision focuses on the availability and quality of *public* goods and amenities (Cutler, Glaeser and Vigdor 1999; Jargowsky 2003; Massey & Denton 1993; Wilson 1987). However, there is little research on how *private* services affect the quality and desirability of particular neighborhoods (for residents and businesses). The access to and variety of nearby retail services, like a supermarket, pharmacy or laundromat, can be part of a household location decision, just as public safety, sanitation and transportation are. How are these local services valued? Do they improve neighborhood quality of life, and if so, are all services valued similarly? The valuation of these services also has significant public finance implications. The proximity and nature of local retail services can impact local property and land values and, in turn, the tax revenue that is generated off of them. It is not clear, particularly in an urban setting, whether the traditional "separation of uses" is preferred over more new-urbanist, mixed use communities. Theoretical predictions are ambiguous: retail services can be both positively capitalized (the "amenity effect") and negatively capitalized (the "nuisance effect"). Which effect is dominant and does it vary depending on the type of and proximity to services? This paper is the first to empirically test these questions.

I rely on parcel-level sales data, as well as establishment-level retail data, both of which span over two decades.[1] Therefore, I can identify *changes* in property values against *changes* in local retail services, over a very extensive time period and at very small geographies, all of which helps to more precisely identify the effect of retail services on prices. For the current analysis, I focus on properties in Brooklyn, one of the five boroughs of New York City, and a diverse representation of neighborhoods and retail activity.

Preliminary results suggest that proximity to overall commercial activity is associated with lower residential sales prices, but retail services do not uniformly push down prices. Retail services located at least 1/2 mile away from the property sale are associated with higher prices,

[1] Ongoing work will replicate the current analyses using assessed values, which are derived from the property's rental income and therefore a reasonable proxy for rents (in the absence of actual comprehensive rent data).

suggesting that having retail services nearby is considered an amenity, but not when they are in the immediate vicinity. This result is largely driven by frequently consumed services or goods, which exhibit a price premium at about 1/4 mile radius. Restaurants are valued at very close distances, as are personal services; banking services, however, are more valued at further distances. Chain retailers induce positive price effects, but most significantly at further distances; it appears that immediate proximity can be price demeaning. Therefore, any amenity effect from retail services depends not only on their proximity, but their nature; some services might be perceived as more of a nuisance (or, at least, less price enhancing than others).

The paper proceeds in the following way. Section II provides some theoretical background and Section III presents a review of the relevant empirical literature. Section IV describes the data and empirical strategy and Section V presents the preliminary results. Section VI concludes.

II. Theoretical framework: are retail services an amenity or a nuisance?

Theoretically, the direction (and degree) of price capitalization for local retail services is ambiguous. Unlike most (quality-provided) public services, which are overwhelmingly positively capitalized into property values, private services can be viewed as both a benefit and a nuisance for local residents.

Retail Services as a local nuisance

Traditional zoning and land use management approaches have assumed that any mix of use is undesirable (and, by association, exerts a downward pull on home prices). This framing is consistent with the notion that retail services would be considered a nuisance and a depressing factor on prices. The presence of retail activity is often associated with negative externalities, which can interrupt the quiet and single-use of otherwise residential communities. Retail can bring with it noise, litter, odors, and increased street traffic, and its proximity to residential homes violates any traditional sense of separation of uses. For all of these reasons, I expect retail services to be negatively capitalized into nearby homes.

Retail services as a local amenity

More recently, in the advent of new urbanist planning and a resurgence of urban living, the separation of uses has become less prevailing. When households choose a residential location, they consider a package of desirable property and locational characteristics. Local retail services can be included among these locational characteristics, and nearby access to them can be viewed as an asset rather than a nuisance. Having a supermarket, pharmacy or laundromat, i.e. services that are frequented often (Berry 1967), nearby can markedly affect quality of life and these amenity-based benefits should be reflected in the price of the home. Jane Jacobs also discusses the importance of an active street scape to discourage crime and illicit activities and to promote vibrancy (1961). A local retail presence can facilitate this, and the safety benefits can bestow meaningful and positive price effects onto the local residential properties.

Qualifications

The strength of the amenity effect as compared to the nuisance effect is qualified by three important features. First, the positive/negative capitalization will depend on the *type* of retail. That is, the quality-of-life enhancement, both in terms of access to a useful household service and in terms of safety or vibrancy, will be more prominent with establishments that provide these neighborhood services and goods and that promote a desirable level and nature of pedestrian traffic. Namely, a local deli or grocery store is likely more valued than a furniture store (in terms of frequency of use and neighborhood convenience). Similarly, a deli or grocery store will likely bring a quieter, less offensive form of street life than a bar or restaurant. Second, the *amount* or *mix* of retail might matter. Perhaps it is not the individual retail establishment that matters, but the package of retail services. Price capitalization could respond to the mix of nearby retail services. Households will most likely prefer a variety of services rather than multiple establishments with the same service; therefore diversity in local services would endow more value. Third, the degree of capitalization will depend on *proximity* to the retail service(s). In this case, closer may not always be better; indeed, there may be a moderate distance from the retail services that bestows the most value. The service should be close enough to preserve convenience, but with enough of a buffer to distance from the potential noise and activity. That said, cities are inherently mixed-use and therefore the integration of retail and residential may be more accepted (and reflected more favorably in house prices).

III. Empirical literature

Capitalization of private neighborhood services and amenities

The empirical literature on the capitalization of private services and amenities is less prolific and much of the work has focused on the values of amenities such as open space or parks (Jim and Chen 2006; Wu et. al. 2004; Asabere and Huffman 1996; Grudnitski 1997; Benson et. al. 1998). These studies largely find that proximity to open space or greenery is positively capitalized into property values. Jim and Chen's (2006) findings, however, suggest that the usability of the space might matter as much or more than just proximity. We also know that crime, one of the possible nuisance byproducts from retail, tends to devalue residential properties nearby. The findings from these studies generally show that crime is associated with a decline in residential property values, but the magnitude and significance of the effect differs by type of crime (for example, Thaler 1978; Taylor 1995; Lynch and Rasmussen 2001).

The body of work on how mixed land use and new urbanist planning affect house prices is perhaps most directly related to the capitalization of retail services. These studies take a hedonic regression approach and incorporate the neighborhood land use characteristics as one of the locational controls in the model. One of the earliest attempts to price mixed land use externalities was by Cao and Cory (1982) in a cross-sectional analysis of single-family homes in Tucson, Arizona in 1970. They find that the amount of industrial and commercial (as well as multi-family and public-use) land is positively associated with nearby residential property values. They interpret these findings to indicate that there is some optimal mix of land use in which the land is most productively used, and it does not necessarily conform to the traditional separation of uses under Euclidean Zoning.

More recently, studies have developed more precise metrics for "mixed-use" and the topography, or walkability, of the local community. Song and Knaap (2003) empirically test for the utility of new urbanism by estimating hedonic pricing models for nearly 200 neighborhoods in Washington County, Oregon. They include in their model, among other covariates, an index of land use mix, other measures of accessibility to commercial uses, and a general walkability index. While no single metric gets specifically at the location and nature of retail services, they

consider a range of amenities (and disamenities) and how proximity to these various uses can impact property values. The authors find that differences in the composition of urban form are indeed capitalized into housing prices. Specifically, and related to my central question of retail valuation, residents will pay more for better pedestrian access to commercial uses (but they pay less for neighborhoods that themselves contain more commercial uses). This is consistent with the results from their other paper, which tests more broadly for the effect of mixed land uses on single-family housing values (2004) and from another study by Song and Sohn (2007), who use retail land use classification as a proxy for retail services. Koster and Rouwendal (2012) conduct a similar study in the Netherlands, using semiparametric estimation methods, and find a 2.5 percent price premium for houses located in mixed-use neighborhoods; this premium is particularly prominent for houses near land occupied by business service and leisure activities. Similarly, Rauterkus and Miller (2011) test for the impact of walkability on land values and find a positive effect. In particular, prices are higher for neighborhoods closer to the central business district, in older historic areas and near university campuses.

Ellis et. al. (2006) do specifically test for an association between retail land use and neighborhood satisfaction, the latter measured by a series of survey-based questions. Their results indicate that retail land use, within 1,500 feet of single-family homes, is negatively correlated with neighborhood satisfaction although it is mitigated by the intervening presence of trees or shrubs. A series of cross-sectional hedonic analyses exploit data on actual retail businesses and include as covariates measures of accessibility to those services (Jang and Kang 2015; Chiang et. al. 2015; Shimizu et. al. 2014). The results are mixed, largely depending on the characteristics of the housing sub-market (i.e. price of the home) and the type of retail service (department versus convenience stores). In related studies, Jim and Chen (2006) find no effect on housing prices from nearby traffic noise; they interpret this as a price adjustment or even indifference to these nuisances over time or extended use. And Wu et. al. (2004) find that proximity to commercial districts has no significant effect on housing prices; they explain this as a mixed effect, in that the positive aspects of proximity to services could be countered by the negative nuisance effects, resulting in a null finding.

The research correlating neighborhood economic characteristics with retail activity can also shed some light on how local residents value nearby retail services. For example, Meltzer and

Schuetz (2012) find that lower-income and minority neighborhoods in New York City have fewer retail establishments, smaller average establishments, a higher proportion of "unhealthy" restaurants, and in certain cases, less diversity across retail sub-sectors. In addition, the rate of retail growth between 1998 and 2007 was particularly fast in neighborhoods that were initially lower-valued and experienced relatively high housing price appreciation compared to New York City overall. Schuetz et. al. (2012) find that high poverty neighborhoods have lower employment density for retail overall, supermarkets, drugstores, food service and laundry facilities. Average establishment size increases with median income for all retail types. Neither income levels nor poverty rates consistently predict retail employment growth, but neighborhoods that experience income upgrading do see larger gains in retail employment. These findings preliminarily suggest that retail is a normal good; that is, retail is viewed as an amenity for which higher income households are willing to pay more.

The take-away from the existing empirical body of work is ambiguous and incomplete in its treatment of neighborhood retail activity. I move the literature forward by employing a rich longitudinal micro-dataset that allows us to track pricing for a range of housing types and density of retail services, in the context of a diverse urban setting.

IV. Data and empirical strategy

Data

I construct and analyze a comprehensive and longitudinal database of commercial activity and property values in neighborhoods across New York City. For this particular analysis, I focus on one borough of the city, Brooklyn. This borough is the largest in terms of population and is comprised of diverse neighborhoods (economically, demographically and physically), yet is generally representative of New York City as a whole. It offers a rich testing ground for this kind of analysis: it both provides enough scale to exploit micro-variation and is also manageable enough for dealing with idiosyncratic behaviors that can often be obscured in massive datasets. In some neighborhoods, strong price growth accompanied notable demographic changes, while other neighborhoods remained stable. In Greenpoint/Williamsburg, for example, the average

price per unit of a two- to four-family home more than tripled from 2000 to 2013, while the white share of population increased and the Hispanic share decreased. Bensonhurst, a relatively income-diverse neighborhood, had the city's highest share of population living in racially integrated census tracts in 2010, as Hispanics and Asians made up an increasing proportion of the local population. The neighborhoods of Brownsville and Bushwick had the fifth and sixth highest respective poverty rates in 2012, but since 2000, Bushwick has seen an influx of households earning more than $60,000, above the city's median household income. I am anticipating that any work done on the Brooklyn sample will inform my approach when I move to a larger, citywide sample (for which I have equally rich and expansive data).

I rely on two core datasets. First, I use a proprietary dataset, the National Establishment Time Series (NETS) database, with the location, type and opening/closing dates for nearly the universe of businesses across New York City. The dataset is constructed by Walls and Associates from the Dun & Bradstreet business register. Unlike publicly available government data on employment, the NETS include little or no suppression of employment in small industry or geographic cells and provide full street address information for each establishment, which I also geocode. In addition, industry is reported at the 6-digit NAICS level, and a headquarters identifier permits classification of establishments according to firm size and structure. Finally, because the NETS are longitudinal and report data on businesses at annual intervals, I can measure gross employment and establishment changes at the business level, not just net changes.

Second, I possess data for all property sales transactions over the past two decades through affiliations with the Furman Center for Real Estate and Urban Policy at New York University and special arrangements with the New York City Department of Finance. Property sales transactions are recorded through a combination of deed transfers and real property transfer tax returns filed with the City Register's office. Each filing contains a parcel identifier for the property sold, the effective date of the transaction, the price, the names of the grantor and grantee, an indicator of property type and size (particularly to identify rental, condominium, cooperative, and mixed-use properties), and additional circumstances of the transfer that allow us to determine whether or not a sale is arm's length. Using a standardized parcel identifier, I am able to add on parcel-level physical characteristics—such as lot size, gross square footage,

presence of an elevator, age, and year of last alteration—from the Department of Finance's Tax Roll files as well as land use characteristics—specifically whether a property has been landmarked or included in a historic district—from the Department of City Planning's PLUTO database. Similarly rich parcel-level information is available for the assessed values dataset (also obtained from the City's Department of Finance), which I plan to use in replicating the current analysis.

Variable construction

The dependent variable of interest will measure property values and, specifically, the sales prices of actual, arms-length transactions of residential properties. I log transform this variable to better fit the non-normal distribution of the data (and to make more meaningful the interpretation of the coefficients). All dollar amounts have been adjusted to 2013 dollars.

The independent variable of interest is nearby retail activity, which will be operationalized in several ways. First, to capture the *magnitude* of retail access I calculate the number of retail establishments in close proximity to the property sale. Using the spatial coordinates of both sales and retail establishments, I draw rings of three different radii (1/8, 1/4, and 1/2 mile) around every sale in the sample and count the number of establishments within each pre-determined distance. For perspective, a person walking in a straight line at about 3 miles per hour could walk 1/8 mile in just over four minutes, 1/4 mile in just over eight minutes, and 1/2 mile in about 17 minutes. I then use these ring-based aggregates to create three mutually exclusive establishment counts, which allow us to observe the effect of retail access across space. Specifically, counts are constructed for establishments within 1/8 mile of the sale (variables with the extension "*_e*"), between 1/8 and 1/4 mile of the sale (variables with the extension "*_qnet*") and between 1/4 and 1/2 mile of the sale (variables with the extension "*_hnet*"). I construct these counts for (i) total commercial establishments and (ii) total retail establishments (generally defined as retail goods except online retailers in NAICS 44-45, financial services in NAICS 522, fitness services in NAICS 713, food services except catering in NAICS 722, and personal and laundry services in NAICS 812; see Appendix A for full listing).

In addition to measures of establishment volume and density I create variables to capture the variety in *types* of retail. I disaggregate the total counts described above in various ways. First, I distinguish among businesses based by whether they provide necessity or discretionary goods or services (notated as "*_neccess*" and "*_discret*", respectively) and whether the good or service is consumed frequently or infrequently (notated as "*_freq*" and "*_infreq*", respectively). Necessity (discretionary) describes services/goods that are relatively less (more) dispensable and regularly (irregularly) consumed. Necessity establishments include commercial banks, food markets, apparel, and drug stores; discretionary ones include specialty foods, home furnishings, hobby stores, automotive goods, and restaurants. Retailers with frequently consumed goods and services include food markets, drug stores, and restaurants; examples of those with infrequently consumed goods and services are home furnishings, automotive goods, and apparel. Frequently patronized establishments largely include necessity services and some discretionary ones. Second, I further disaggregate the type of service by categorizing businesses into broader categories: restaurants (notated as "*_rest*"), financial services (i.e. banks, check cashing; notated as "*_fin*"), personal care services (i.e. pharmacies, Laundromats; notated as "*_ps*") and food and beverage stores (i.e. supermarkets, corner stores; notated as "*_fb*"). Third, I classify businesses based on their ownership structure: specifically, whether they are a chain or independently-operated establishment (notated as "*_chain*" and "*_indep*", respectively).

Empirical Strategy

The regression analysis will follow a standard hedonic framework, where the nearby retail activity variable(s) will operate as locational characteristics ($\boldsymbol{Retail}_{it}$) that contribute to the valuation of a particular residential property. I will also include property-specific characteristics ($\boldsymbol{X}_{it}$), including size, number of units, frontage, number of stories, type of housing (i.e. one- to four- family versus larger multifamily), age, time since a physical alteration, whether or not the building has an elevator and whether or not it lies in a historic district.[2] I also include micro-neighborhood, i.e. census tract, dummies (n) and broader zip-year (z,t) fixed effects. These controls will absorb any heterogeneity that is not captured by the specified covariates and ensure

[2] Future iterations will include other controls, such as localized crime rates and broader neighborhood characteristics (both demographically and structurally). I am limited with what I can include with respect to socioeconomic characteristics, since they are only available every 10 years, while the analysis relies on annual changes to identify any retail effect.

that any property sale is compared to an otherwise similar sale within the same micro-neighborhood.

The baseline regression equation will take the following form:

$$\ln P_{inzt} = \beta_0 + \beta_1(\boldsymbol{X}_{it}) + \beta_2(\boldsymbol{Retail}_{it}) + d_n + d_{z,t} + \varepsilon_{it}$$

Since I have the benefit of longitudinal data (both for retail activity and property sales), I identify *changes* in prices off of *changes* in retail activity. This approach will also temper any bias from contemporaneous changes in the neighborhood that affect both prices and retail.

<u>Future analyses: mitigating against endogeneity</u>

Thus far, I have considered retail as an exogenous amenity (Brueckner et. al. 1999). However, if it is the case that retail follows residential investment (and locates based on the socioeconomic characteristics of those residents), then it needs to be treated as endogenous in order mitigate against any bias in estimating the direct effect of retail activity on prices. To improve upon the above "naïve" model, I plan to employ an instrumental variables strategy to better isolate the effect of retail on prices (rather than the opposite). Specifically, I will instrument for change in retail activity in the surrounding neighborhood using a Bartik instrument (1991), which essentially imputes an exogenous shock on local labor demand. I interact national-level changes in retail- and service-sector employment with the neighborhood's (i.e. the ring's) baseline retail- and service-sector composition:

$$Bartik_{j,t} = \frac{\sum_k \left[E_{j,k,t-1} \left(\frac{E_{k,t}}{E_{k,t-1}} - 1 \right) \right]}{\sum_k E_{j,k,t-1}}$$

where, k denotes the industry (in this case the ones that fall under service and retail 2- and 3-digit NAICS industry classifications) and j indexes the neighborhood (or ring). Furthermore, a neighborhood's own growth is not calculated as part of the instrument. I am implicitly equating changes in labor demand with changes in retail activity (which is presumably a function of both

labor demand and supply), and rely on the fact that this Bartik-type shock will be correlated with changes in neighborhood retail activity but not with changes in within-neighborhood house prices. Future analyses will incorporate these analyses into the overall estimation strategy.

V. Preliminary results

There is great diversity in property prices across the borough of Brooklyn. This variation is likely explained by a host of structural and locational factors, with retail access being the one of interest here. Figures 1 and 2 illustrate the spatial variation in prices and retail activity; the correlation between the two is less clear. Indeed the correlation coefficient is on the lower end, hovering between .22 and .29, depending on the radius of proximity.

Baseline and exposure to retail generally

I start with a standard hedonic framework and display the results for the regression results including only property characteristics and geographic and temporal controls (see Table 1). The first column displays the hedonics, without any geographic or temporal controls. The coefficients are generally in the expected directions: prices increase when, controlling for other factors, the property is bigger, has fewer units, is older (unless it has been recently alterations), is in a building with an elevator and is either landmarked or located in a historic district. The next two columns progressively add in geographic and temporal controls. Most of the coefficients maintain their magnitude, sign and significance, with the most notable exception of property type. Now one- to four-family homes (and mixed use properties) have higher prices than condos or coops (the omitted category). I proceed with the fully specified model, displayed in column three, because it more comprehensively controls for unobservables at the neighborhood level, which could be correlated with retail presence and prices over time.

Next, I add in measures of retail access as another covariate to test for its price effect, controlling for other property and locational characteristics. These results are displayed in Table 2. First, I add in a count of total commercial establishments nearby; I include, in separate regressions, controls for the total number of establishments within 1/8, 1/4, and 1/2 miles (see columns 1-3).

This will pick up any general effect of locating near commercial activity, whether or not that activity is characterized by neighborhood services and stores. This is also a reasonable proxy for the extent of nearby commercial zoning.[3] The results show that the most significant effect of nearby commercial activity is at a radius of 1/8 mile: it is negative and small in magnitude. An additional commercial establishment reduces price by about .01 percent (or $53, based on the mean price in the sample). This effect decreases in magnitude (and significance) as the distance radius increases, and it even turns positive when considering commercial activity within a 1/2 mile radius. Therefore, commercial activity, in very close proximity, does appear to be associated with lower prices.

Since my research question pertains specifically to neighborhood retail services, I further refine the estimation model to include a measure of nearby retail activity, controlling for overall commercial presence. First, I simply add in a count of retail establishments, for the same radii (displayed in columns 4, 6 and 8). Second, I calculate the share of retail establishments, as a proportion of total commercial establishments (displayed in columns 5, 7 and 9). The results show that there is a differential effect from retail activity (versus commercial generally) and it varies by distance as well. Access to retail has a positive association with prices (unlike generally commercial activity), and it is more pronounced when the retail is located further away from the property. Specifically, at the closest proximity (1/8 mile) there is no significant effect (albeit a positive coefficient); at larger radii (1/4 and 1/2 miles), the magnitude of the coefficient and its sign remain about constant, but the estimate is more precise. This could be picking up a price premium when retail is nearby, but not "around the corner"; or, as the ring catchment area gets larger, I could just be benefitting from larger cell size and more power. As a share of total commercial establishments, retail activity seems to push prices down (especially at closer distances). This, however, could be driven by the fact that retail activity tends to co-locate with commercial activity more generally, and so this share metric could simply be picking up the negative effect of nearby commercial businesses (as was observed in the first three models in Table 2).

For the reasons highlighted so far, the retail metrics are not entirely satisfying. Most fundamentally, the total and retail counts until now have been cumulative; that is the measures of

[3] In future analyses I will incorporate actual measures of zoning and commercial overlays.

establishments within 1/2 mile of the property sale also include those establishments within 1/8 and 1/4 miles. To better measure any spatial variation in the effect of retail access on prices, we redefine the radii as mutually exclusive "donuts" (or "net" counts), such that the establishment counts within 1/8 mile are not included in the 1/4 mile radius, which are in turn not included in the 1/2 mile radius. These results are displayed in the final column of Table 2, and this "net" calculation of retail establishments will be carried out for the remaining regressions. I control for total commercial activity within 1/2 mile of the property sale. As before, nearby commercial activity has a negative effect on prices. Nearby retail activity though, is positively associated with prices, and this premium peaks at a 1/4 mile distance: for every additional retail establishment between 1/8 and 1/4 mile of a property, its price increases by .03 percent. This is equivalent to about $160 increase in sales price. Retail located in the immediate vicinity (i.e. 1/8 mile) has a negative sign, but is not significantly different from zero in its magnitude, and retail located slightly further away at 1/2 mile has a slightly smaller (and significant) effect than retail located at a 1/4 mile radius. Therefore, having retail services nearby is considered an amenity, but perhaps most significantly when they are not in the immediate vicinity (so, within walking distance, but not "around the corner").

Type of service

I understand that retail activity is not uniform and certain types of services or goods might be perceived as more beneficial than others—in other words, buyers might be more willing to locate near certain retail establishments over others. Next, I test for any differentiating effect across retail types. First, I distinguish between retail services and goods that would be considered necessities (versus luxuries, or discretionary ones) and those are more frequently consumed (versus infrequently). Both specifications attempt to get at the degree to which the nature or regularity of consumption makes the good or service more or less desirable in close proximity. These results are displayed in Table 3. I see that, controlling for nearby retail and commercial activity, close proximity to necessity services does not significantly affect prices (and the magnitude on the coefficient varies only marginally by distance). I do, however, see an effect from being located near services that are more frequently consumed (i.e. grocery stores, pharmacies). This premium peaks at about 1/4 mile, such that having these services and stores nearby, but not "around the corner" is the preferred context; however having them in the

immediate vicinity is valued more than having them 1/2 mile away. For an additional retail establishment, that is frequently patronized, the price increase by about .05 percent (or $267, based on the sample mean). This is consistent with the expectation that neighborhood services tend to be more frequently consumed, and can therefore thrive off of more concentrated markets (like the immediate neighborhood).

To further disentangle the nature of the service or good and its impact on prices, I classify retail establishments into four types, based on the services or goods they provide: restaurants (both sit-down and take-out), food and beverage stores, financial services, and personal services. These results are displayed in Table 4. The most significant price effect from being near a restaurant occurs at the shortest distance, or 1/8 mile; having a restaurant at longer distances has no significant effect (even though the magnitudes are still positive). An additional restaurant within 1/8 mile increases prices by about .3 percent, or $1,507. Food/beverage stores do not show any significant effect (although the coefficients are positive, suggesting an amenity effect, but at some distance), and proximity to personal services has a positive, albeit null, effect at the smallest radius (i.e. 1/8 mile). It appears, however, that as distance increases from these services, the price premium declines. Specifically, prices go down by about .14 percent with every personal service establishment about 1/4 mile from the property. This suggests that residents value proximity to more frequently consumed goods or services, and in particular those that fulfill general quality of life needs. Proximity to financial services induces price declines at all distances, but the magnitude of the effect decreases as the retail gets further away. At the smallest radius, 1/8 mile, an additional financial service establishment is associated with a 1.8 percent decline in prices (about $9,000, based on the sample mean).

Finally, I differentiate between chain and independently owned establishments. This classification, while admittedly imprecise, attempts to capture something about the size, selection and perhaps ambiance of the retail establishment. I imagine that chains might have more selection, lower prices, but perhaps less character in their street presence and more standardization in their products. There is also a long-standing perception of chains as absent of neighborhood charm, which certain residents or consumers might value. These results are displayed in Table 5. The positive coefficients on the net chain counts, at varying distances, suggest that immediate proximity to the chain is less preferred over some kind of distance.

Specifically, the magnitude is the largest and the significance the highest for chain presence at the 1/2 mile radius. And, while insignificant, the coefficient for the chain business count within 1/8 mile is negative. Therefore, there is a price premium for being further away from the chain establishment. Specifically, a chain establishment located 1/2 mile from the property, increase its value by about .13 percent. This is consistent with the notion that chains might bring an undesirable sensibility to the neighborhood (despite their services or goods); it could also be picking up, however, the type of street environment (i.e. "characterless", stark signage) or other commercial clustering that often accompanies chain establishments and that might be unappealing to residents.

VI. Conclusion

Urban neighborhoods are unique in their inherent mixed use. This suggests that households that live in these neighborhoods likely value the proximity of private commercial amenities. That said, there is a dearth of knowledge on how residential communities interact with and value local retail services, and more specifically, how these services are capitalized into residential property values. I exploit a very detailed and rich dataset on retail activity and property values to disentangle these questions and understand more broadly how local retail services might contribute to neighborhood quality of life. Future analyses will attempt to more precisely estimate the impact of retail on prices, replicate the analyses with assess values (which are derived from the property's rental income), and expand the sample across more boroughs, and more diverse neighborhoods, of New York City.

Preliminary results suggest that proximity to overall commercial activity is associated with lower residential sales prices, but retail services do not uniformly push down prices. Retail services located at least 1/2 mile away from the property sale are associated with higher prices, suggesting that having retail services nearby is considered an amenity, but not when they are in the immediate vicinity. This result is largely driven by frequently consumed services or goods, which exhibit a price premium at about 1/4 mile radius. Restaurants are valued at very close distances, as are personal services; banking services, however, are more valued at further

distances. Chain retailers induce positive price effects, at further distances; it appears that immediate proximity can be price demeaning. Therefore, any amenity effect from retail services depends not only on their proximity, but their nature; some services might be perceived as more of a nuisance (or, at least, less price enhancing than others).

While the marginal effects appear quite small, I can scale them up to have a better sense of what effect clusters of retail establishments might have on prices. For example, 58 retail establishments are located within 1/4 mile of the average property sale; based on the estimated coefficient from above, this amounts to a $9,300 price premium for properties located within close proximity of those services. This number is meaningful, not only for property owners, but, aggregated across all property transactions in the city, for municipal fiscal standing as well. My preliminary results certainly suggest that quality of life in urban neighborhoods not only depends on housing and infrastructure, but the neighborhood businesses that serve it.

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Figure 1: Retail price per square foot

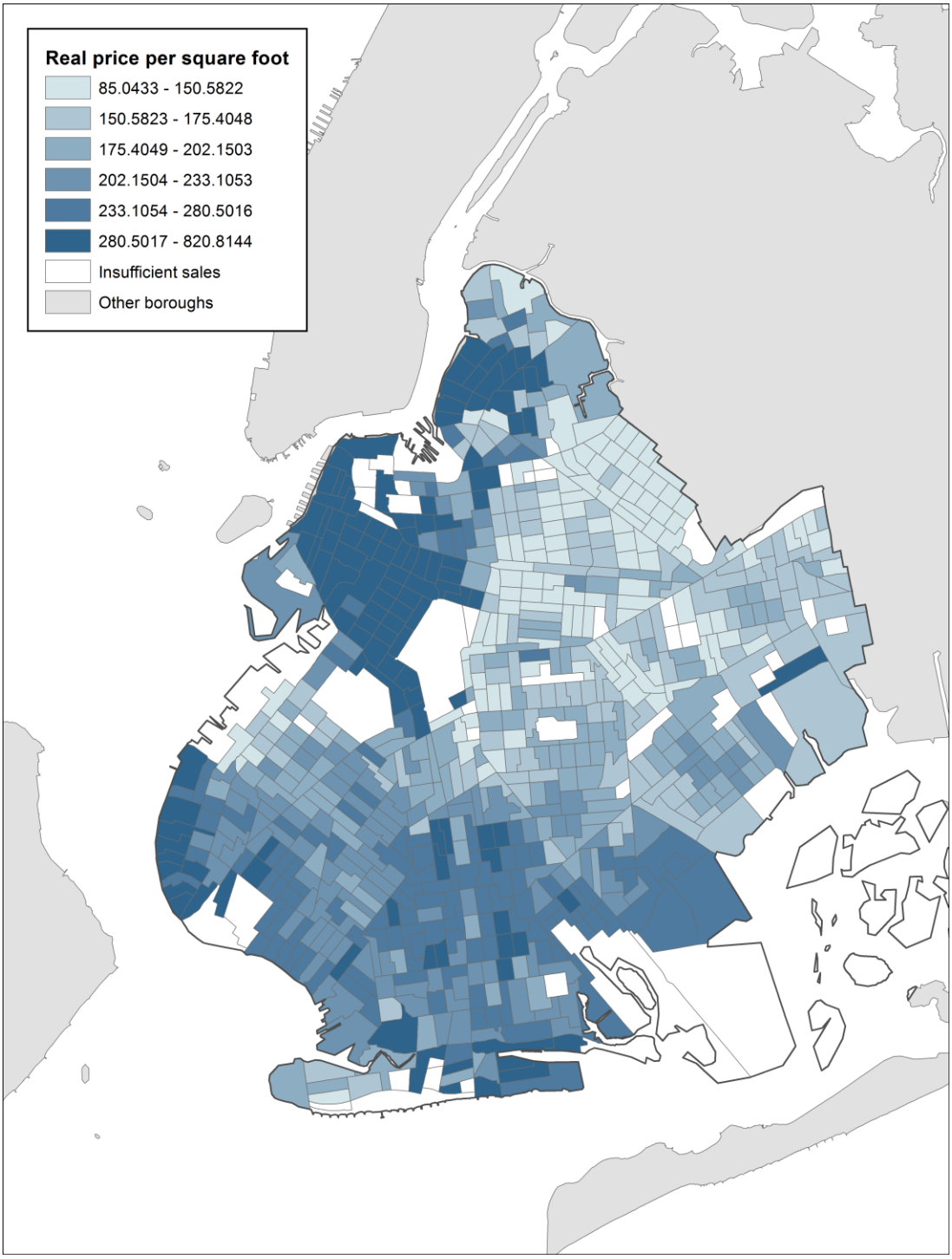

Figure 2: Retail price per square foot and retail activity

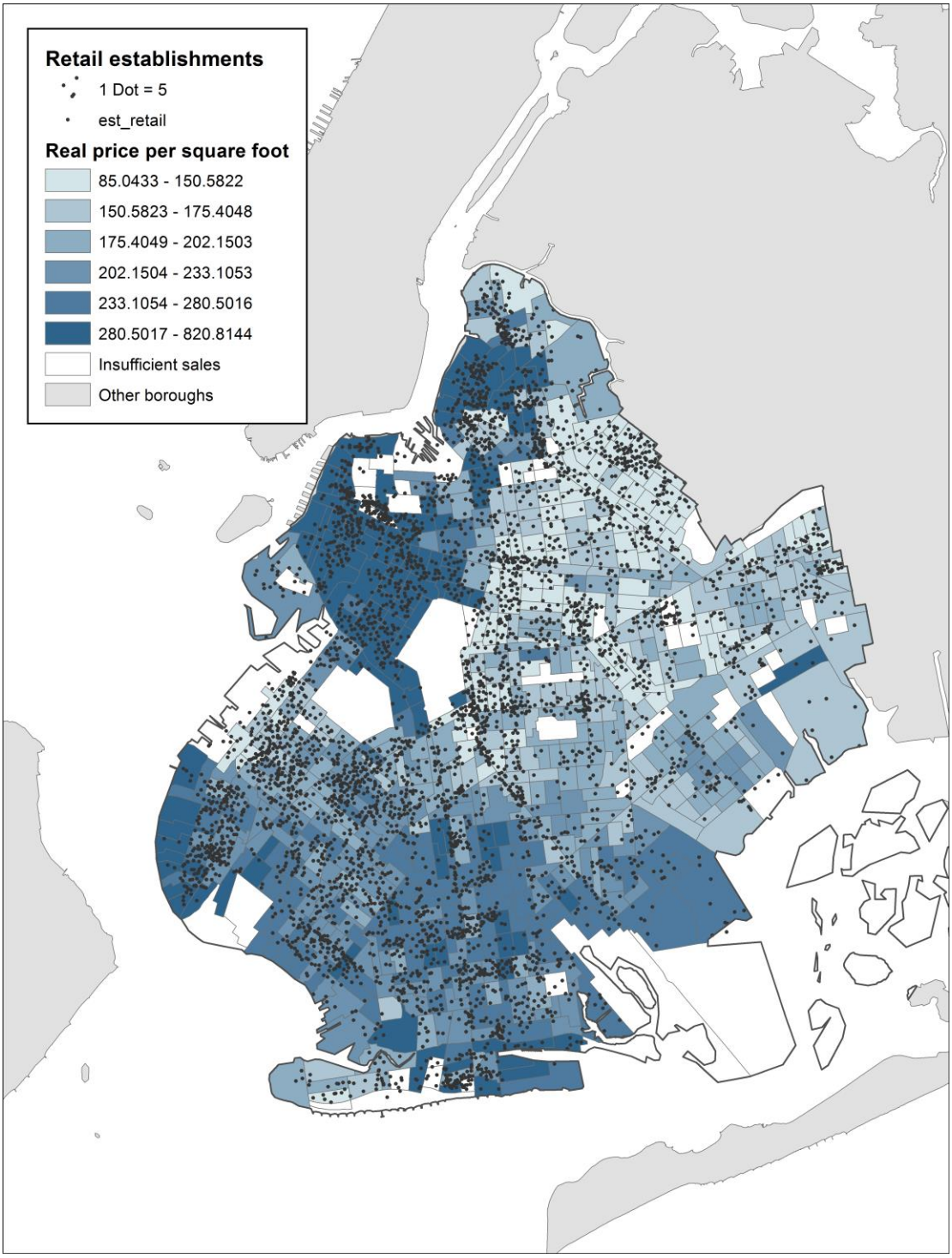

Table 1: Hedonic regression results

	NO TIME/GEO CONTROLS	ZIP-YR F.E.	ZIP-YR F.E. & TRACT DUMMIES
	(1)	(2)	(3)
VARIABLES	log of real price	log of real price	log of real price
log of unit SF	0.471***	0.476***	0.451***
	(0.00263)	(0.00958)	(0.00946)
log of res. units in building	-0.0432***	-0.0109*	0.00501
	(0.00232)	(0.00598)	(0.00584)
lot frontage (ft.)	0.000512***	0.000703***	0.000660***
	(2.54e-05)	(9.25e-05)	(0.000114)
building stories	0.0164***	-0.00109	0.00344*
	(0.000555)	(0.00208)	(0.00189)
res_1_4	-0.232***	0.146***	0.218***
	(0.00847)	(0.0228)	(0.0228)
res_rent	-0.547***	-0.0762***	0.0121
	(0.00966)	(0.0270)	(0.0269)
res_mix	-0.0575***	-0.0227	0.0615*
	(0.0216)	(0.0310)	(0.0316)
building age	0.00233***	0.00114	0.00374***
	(0.000480)	(0.00103)	(0.000916)
building age sq.	-2.12e-05***	-1.27e-05	-3.36e-05***
	(4.03e-06)	(8.46e-06)	(7.22e-06)
building effective age	-0.00398***	-0.000932	-0.00437***
	(0.000496)	(0.00113)	(0.00105)
building effective age sq.	2.10e-05***	6.18e-06	3.39e-05***
	(4.10e-06)	(9.05e-06)	(7.98e-06)
is elevator building	0.229***	0.154***	0.143***
	(0.00712)	(0.0183)	(0.0174)
historic district or landmarked	0.409***	0.326***	0.221***
	(0.00527)	(0.0134)	(0.0105)
Constant	9.615***	9.152***	9.269***
	(0.0179)	(0.0617)	(0.0622)
Observations	243,457	243,457	243,457
R-squared	0.208	0.387	0.436
Number of zip_yr		1,109	1,109

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 2: Hedonic regression results, with retail metrics

VARIABLES	(1) log of real price	(2) log of real price	(3) log of real price	(4) log of real price	(5) log of real price	(6) log of real price	(7) log of real price	(8) log of real price	(9) log of real price	(10) log of real price
est_total_e	-0.000108*			-0.000159						
	(6.14e-05)			(0.000110)						
est_total_q		-8.89e-06				-8.54e-05				
		(2.55e-05)				(5.74e-05)				
est_total_h			5.85e-06					-4.26e-05		
			(1.21e-05)					(2.72e-05)		
est_retail_e				0.000220						-0.000152
				(0.000271)						(0.000163)
est_retail_e_sh (share of total)					-0.108***					
					(0.0174)					
est_retail_q						0.000284**				
						(0.000140)				
est_retail_q_sh (share of total)							-0.134***			
							(0.0329)			
est_retail_h								0.000184**		
								(7.47e-05)		
est_retail_h_sh (share of total)									-0.0227	
									(0.0640)	
est_retail_qnet										0.000277***
										(0.000102)
est_retail_hnet										0.000175**
										(7.21e-05)
est_total_h										-4.21e-05
										(2.74e-05)
log of unit SF	0.452***	0.451***	0.451***	0.452***	0.437***	0.452***	0.437***	0.451***	0.437***	0.451***
	(0.00948)	(0.00950)	(0.00954)	(0.00948)	(0.0119)	(0.00948)	(0.0119)	(0.00952)	(0.0119)	(0.00953)
log of res. units in building	0.00488	0.00494	0.00517	0.00477	0.00564	0.00441	0.00567	0.00466	0.00535	0.00476
	(0.00584)	(0.00584)	(0.00586)	(0.00582)	(0.00662)	(0.00578)	(0.00660)	(0.00580)	(0.00661)	(0.00579)
lot frontage (ft.)	0.000653***	0.000658***	0.000662***	0.000655***	0.000504***	0.000654***	0.000509***	0.000661***	0.000513***	0.000657***
	(0.000113)	(0.000114)	(0.000114)	(0.000114)	(9.47e-05)	(0.000114)	(9.52e-05)	(0.000114)	(9.58e-05)	(0.000114)
building stories	0.00328*	0.00344*	0.00349*	0.00332*	0.00474**	0.00353*	0.00490**	0.00338*	0.00492**	0.00319*
	(0.00183)	(0.00187)	(0.00189)	(0.00185)	(0.00198)	(0.00187)	(0.00197)	(0.00189)	(0.00199)	(0.00189)
res_1_4	0.216***	0.217***	0.219***	0.216***	0.202***	0.216***	0.202***	0.217***	0.203***	0.217***

	(0.0228)	(0.0228)	(0.0230)	(0.0228)	(0.0255)	(0.0227)	(0.0255)	(0.0229)	(0.0255)	(0.0230)
res_rent	0.0103	0.0116	0.0130	0.0100	0.0326	0.0101	0.0312	0.0112	0.0315	0.0112
	(0.0270)	(0.0270)	(0.0272)	(0.0269)	(0.0312)	(0.0270)	(0.0312)	(0.0271)	(0.0312)	(0.0271)
res_mix	0.0606*	0.0611*	0.0623*	0.0598*	0.0647*	0.0588*	0.0621*	0.0603*	0.0621*	0.0613*
	(0.0317)	(0.0317)	(0.0318)	(0.0316)	(0.0350)	(0.0316)	(0.0351)	(0.0318)	(0.0351)	(0.0317)
building age	0.00378***	0.00376***	0.00373***	0.00379***	0.00496***	0.00380***	0.00497***	0.00368***	0.00493***	0.00366***
	(0.000917)	(0.000914)	(0.000915)	(0.000919)	(0.000930)	(0.000919)	(0.000937)	(0.000920)	(0.000934)	(0.000917)
building age sq.	-3.38e-05***	-3.38e-05***	-3.36e-05***	-3.39e-05***	-4.26e-05***	-3.41e-05***	-4.27e-05***	-3.33e-05***	-4.26e-05***	-3.30e-05***
	(7.22e-06)	(7.19e-06)	(7.21e-06)	(7.22e-06)	(7.34e-06)	(7.23e-06)	(7.38e-06)	(7.26e-06)	(7.37e-06)	(7.24e-06)
building effective age	-0.00441***	-0.00439***	-0.00435***	-0.00441***	-0.00619***	-0.00438***	-0.00616***	-0.00430***	-0.00610***	-0.00429***
	(0.00104)	(0.00104)	(0.00104)	(0.00105)	(0.00106)	(0.00105)	(0.00106)	(0.00105)	(0.00106)	(0.00105)
building effective age sq.	3.42e-05***	3.41e-05***	3.37e-05***	3.42e-05***	4.97e-05***	3.39e-05***	4.96e-05***	3.34e-05***	4.90e-05***	3.33e-05***
	(7.96e-06)	(7.91e-06)	(7.95e-06)	(7.97e-06)	(8.11e-06)	(7.99e-06)	(8.12e-06)	(8.01e-06)	(8.15e-06)	(7.99e-06)
is elevator building	0.144***	0.143***	0.143***	0.145***	0.0974***	0.143***	0.0996***	0.143***	0.0995***	0.143***
	(0.0174)	(0.0174)	(0.0174)	(0.0172)	(0.0178)	(0.0173)	(0.0181)	(0.0173)	(0.0180)	(0.0172)
historic district or landmarked	0.222***	0.221***	0.221***	0.223***	0.195***	0.223***	0.195***	0.221***	0.197***	0.221***
	(0.0105)	(0.0104)	(0.0105)	(0.0105)	(0.0114)	(0.0104)	(0.0115)	(0.0105)	(0.0115)	(0.0105)
Constant	9.272***	9.270***	9.265***	9.272***	9.512***	9.271***	9.522***	9.268***	9.497***	9.269***
	(0.0622)	(0.0619)	(0.0616)	(0.0622)	(0.0786)	(0.0620)	(0.0784)	(0.0617)	(0.0784)	(0.0617)
Observations	243,457	243,457	243,457	243,457	180,351	243,457	180,391	243,457	180,391	243,457
R-squared	0.436	0.436	0.436	0.436	0.413	0.436	0.412	0.436	0.412	0.437
Number of zip_yr	1,109	1,109	1,109	1,109	733	1,109	733	1,109	733	1,109

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3: Hedonic regression results, retail by service type

VARIABLES	(1) log of real price	(2) log of real price	(3) log of real price
est_retail_e	-0.000152	0.000199	-0.000366
	(0.000163)	(0.000501)	(0.000393)
est_retail_qnet	0.000277***	0.000506**	-5.55e-06
	(0.000102)	(0.000255)	(0.000191)
est_retail_hnet	0.000175**	0.000421**	0.000438***
	(7.21e-05)	(0.000188)	(0.000121)
est_total_h	-4.21e-05	-4.98e-05*	-4.60e-05*
	(2.74e-05)	(2.80e-05)	(2.73e-05)
necess_e		-0.000595	
		(0.000803)	
necess_qnet		-0.000380	
		(0.000397)	
necess_hnet		-0.000405	
		(0.000273)	
freq_e			0.000352
			(0.000534)
freq_qnet			0.000450*
			(0.000264)
freq_hnet			-0.000388***
			(0.000144)
log of unit SF	0.451***	0.452***	0.451***
	(0.00953)	(0.00957)	(0.00953)
log of res. units in building	0.00476	0.00450	0.00487
	(0.00579)	(0.00580)	(0.00578)
lot frontage (ft.)	0.000657***	0.000660***	0.000658***
	(0.000114)	(0.000114)	(0.000114)
building stories	0.00319*	0.00308	0.00311*

	(0.00189)	(0.00190)	(0.00188)
res_1_4	0.217***	0.215***	0.217***
	(0.0230)	(0.0230)	(0.0229)
res_rent	0.0112	0.00988	0.0125
	(0.0271)	(0.0273)	(0.0271)
res_mix	0.0613*	0.0596*	0.0624**
	(0.0317)	(0.0319)	(0.0317)
building age	0.00366***	0.00361***	0.00360***
	(0.000917)	(0.000915)	(0.000915)
building age sq.	-3.30e-05***	-3.29e-05***	-3.27e-05***
	(7.24e-06)	(7.24e-06)	(7.24e-06)
building effective age	-0.00429***	-0.00423***	-0.00426***
	(0.00105)	(0.00104)	(0.00104)
building effective age sq.	3.33e-05***	3.30e-05***	3.31e-05***
	(7.99e-06)	(7.99e-06)	(7.96e-06)
is elevator building	0.143***	0.143***	0.142***
	(0.0172)	(0.0172)	(0.0171)
historic district or landmarked	0.221***	0.220***	0.221***
	(0.0105)	(0.0104)	(0.0105)
Constant	9.269***	9.268***	9.273***
	(0.0617)	(0.0617)	(0.0617)
Observations	243,457	243,457	243,457
R-squared	0.437	0.437	0.437
Number of zip_yr	1,109	1,109	1,109

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4: Hedonic regression results, retail by service clusters

VARIABLES	(1) log of real price	(2) log of real price	(3) log of real price	(4) log of real price
est_rest_e (restaurants)	0.00288**			
	(0.00112)			
est_rest_qnet (restaurants)	0.000846			
	(0.000597)			
est_rest_hnet (restaurants)	0.000209			
	(0.000380)			
est_fb_e (food and beverage)		-0.000311		
		(0.000792)		
est_fb_qnet (food and beverage)		0.000325		
		(0.000414)		
est_fb_hnet (food and beverage)		-0.000134		
		(0.000254)		
est_ps_e (personal services)			0.00107	
			(0.000651)	
est_ps_qnet (personal services)			-0.00139***	
			(0.000374)	
est_ps_hnet (personal services)			-0.000991***	
			(0.000243)	
est_fin_e (banking services)				-0.0184***
				(0.00509)
est_fin_qnet (banking services)				-0.00643*
				(0.00342)
est_fin_hnet (banking services)				-0.00359*
				(0.00200)

est_retail_e	-0.000543**	-9.33e-05	-0.000372*	-1.21e-06
	(0.000213)	(0.000207)	(0.000224)	(0.000168)
est_retail_qnet	0.000175	0.000227*	0.000636***	0.000334***
	(0.000117)	(0.000120)	(0.000136)	(0.000106)
est_retail_hnet	0.000139*	0.000198**	0.000455***	0.000188***
	(7.55e-05)	(8.94e-05)	(9.85e-05)	(7.25e-05)
est_total_h	-3.88e-05	-4.25e-05	-5.77e-05**	-3.79e-05
	(2.64e-05)	(2.74e-05)	(2.77e-05)	(2.77e-05)
log of unit SF	0.452***	0.451***	0.452***	0.451***
	(0.00956)	(0.00954)	(0.00953)	(0.00953)
log of res. units in building	0.00436	0.00476	0.00516	0.00510
	(0.00578)	(0.00579)	(0.00580)	(0.00577)
lot frontage (ft.)	0.000659***	0.000658***	0.000656***	0.000656***
	(0.000114)	(0.000114)	(0.000114)	(0.000114)
building stories	0.00332*	0.00320*	0.00297	0.00336*
	(0.00193)	(0.00189)	(0.00189)	(0.00193)
res_1_4	0.215***	0.217***	0.217***	0.217***
	(0.0230)	(0.0230)	(0.0229)	(0.0230)
res_rent	0.00953	0.0115	0.0116	0.0109
	(0.0273)	(0.0272)	(0.0271)	(0.0271)
res_mix	0.0593*	0.0615*	0.0614*	0.0606*
	(0.0320)	(0.0318)	(0.0318)	(0.0317)
building age	0.00360***	0.00366***	0.00365***	0.00364***
	(0.000916)	(0.000917)	(0.000919)	(0.000917)
building age sq.	-3.29e-05***	-3.31e-05***	-3.29e-05***	-3.30e-05***
	(7.24e-06)	(7.24e-06)	(7.24e-06)	(7.23e-06)
building effective age	-0.00421***	-0.00429***	-0.00425***	-0.00426***
	(0.00105)	(0.00104)	(0.00105)	(0.00105)
building effective age sq.	3.30e-05***	3.33e-05***	3.29e-05***	3.30e-05***
	(7.99e-06)	(7.98e-06)	(8.00e-06)	(7.99e-06)
is elevator building	0.145***	0.143***	0.142***	0.142***
	(0.0170)	(0.0172)	(0.0171)	(0.0171)
historic district or landmarked	0.219***	0.221***	0.221***	0.222***

	(0.0104)	(0.0105)	(0.0104)	(0.0105)
Constant	9.265***	9.269***	9.270***	9.265***
	(0.0618)	(0.0618)	(0.0618)	(0.0615)
Observations	243,457	243,457	243,457	243,457
R-squared	0.437	0.437	0.437	0.437
Number of zip_yr	1,109	1,109	1,109	1,109

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5: Hedonic regression results, retail by chain/independent status

VARIABLES	(1) log of real price	(2) log of real price
est_retail_e	-0.000152	-3.99e-05
	(0.000163)	(0.000195)
est_retail_qnet	0.000277***	0.000212*
	(0.000102)	(0.000126)
est_retail_hnet	0.000175**	6.46e-05
	(7.21e-05)	(9.20e-05)
est_total_h	-4.21e-05	-3.55e-05
	(2.74e-05)	(2.77e-05)
chain_e		-0.00164
		(0.00112)
chain_qnet		0.000798
		(0.000635)
chain_hnet		0.00126**
		(0.000488)
log of unit SF	0.451***	0.451***
	(0.00953)	(0.00953)
log of res. units in building	0.00476	0.00485
	(0.00579)	(0.00583)
lot frontage (ft.)	0.000657***	0.000659***
	(0.000114)	(0.000115)
building stories	0.00319*	0.00318*
	(0.00189)	(0.00191)
res_1_4	0.217***	0.217***
	(0.0230)	(0.0230)
res_rent	0.0112	0.0120
	(0.0271)	(0.0272)
res_mix	0.0613*	0.0616*

	(0.0317)	(0.0318)
building age	0.00366***	0.00371***
	(0.000917)	(0.000918)
building age sq.	-3.30e-05***	-3.34e-05***
	(7.24e-06)	(7.25e-06)
building effective age	-0.00429***	-0.00433***
	(0.00105)	(0.00105)
building effective age sq.	3.33e-05***	3.36e-05***
	(7.99e-06)	(8.00e-06)
is elevator building	0.143***	0.143***
	(0.0172)	(0.0173)
historic district or landmarked	0.221***	0.221***
	(0.0105)	(0.0104)
Constant	9.269***	9.272***
	(0.0617)	(0.0616)
Observations	243,457	243,457
R-squared	0.437	0.437
Number of zip_yr	1,109	1,109

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Appendix A: NAICS codes

NAICS 2007	Description	Infrequent	Frequent	Necessity	Discretionary
441	Motor Vehicle and Parts Dealers	X			X
4421	Furniture Stores	X		X	
4422	Home Furnishings Stores	X			X
44311	Appliance, Television, and Other Electronics Stores	X		X	
44312	Computer and Software Stores	X			X
44313	Camera and Photographic Supplies Stores	X			X
444	Building Material and Garden Equipment and Supplies Dealers	X			X
44413	Hardware Stores*		X	X	
4451	Grocery Stores		X	X	
44521	Meat Markets		X	X	
44522	Fish and Seafood Markets		X	X	
44523	Fruit and Vegetable Markets		X	X	
44529	Other Specialty Food Stores		X		X
4453	Beer, Wine, and Liquor Stores		X		X
44611	Pharmacies and Drug Stores		X	X	
44612	Cosmetics, Beauty Supplies, and Perfume Stores		X		X
44613	Optical Goods Stores		X	X	
446191	Food (Health) Supplement Stores		X		X
446199	All Other Health and Personal Care Stores	X		X	
44711	Gasoline Stations with Convenience Stores		X	X	
44719	Other Gasoline Stations	X			X
4481	Clothing Stores	X		X	
4482	Shoe Stores	X		X	
4483	Jewelry, Luggage, and Leather Goods Stores	X			X
4511	Sporting Goods, Hobby, and Musical Instrument Stores	X			X
4512	Book, Periodical, and Music Stores		X		X
4521	Department Stores		X		X
4529	Other General Merchandise Stores		X	X	
4531	Florists		X		X
45321	Office Supplies and Stationery Stores		X		X

45322	Gift, Novelty, and Souvenir Stores		X		X
4533	Used Merchandise Stores	X			X
45391	Pet and Pet Supplies Stores		X		X
45392	Art Dealers	X			X
45393	Manufactured (Mobile) Home Dealers	X			X
45399	All Other Miscellaneous Store Retailers	X			X
52211	Commercial Banking		X	X	
52213	Credit Unions		X	X	
53223	Video Tape and Disc Rental		X		X
54194	Veterinary Services	X			X
71312	Amusement Arcades	X			X
71394	Fitness and Recreational Sports Centers		X		X
71395	Bowling Centers	X			X
7221	Full-Service Restaurants		X		X
7222	Limited-Service Eating Places		X		X
7224	Drinking Places (Alcoholic Beverages)		X		X
812111	Barber Shops		X	X	
812112	Beauty Salons		X	X	
812113	Nail Salons		X		X
812199	Other Personal Care Services		X		X
81231	Coin-Operated Laundries and Drycleaners		X	X	
81232	Drycleaning and Laundry Services (except Coin-Operated)		X	X	
81291	Pet Care (except Veterinary) Services	X			X

*Hardware stores are an exception within NAICS 44413. By searching for "hardware" within the establishment name, I code these establishments as "frequent" and "necessities." Otherwise, like the rest of NAICS 444, I code other establishments within 44413 (primarily tool retailers) as "infrequent" and "discretionary."