When Institutional Investors Come To Town: The Local Effects of Buy-to-Rent Properties

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January 22, 2024

Abstract

This study explores the effect of institutional buy-to-rent (B2R) investors in the single-family rental market on housing prices. By analyzing property transactions from 2012 to 2019 in the Atlanta metropolitan area, I provide reduced-form evidence on the magnitudes and underlying mechanisms of the local price spillovers caused by the presence of B2R investors. I find that the presence of an additional B2R-owned property within 150 meters increases price growth by 2-3%. The impact is stronger in neighborhoods with more black population and lower housing prices. The observed local spillover effects are mostly driven by reduced housing supply and positive amenity changes caused by B2R investors, less by immediate competition or increased demand by B2R investors.

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1 Introduction

Large institutional buy-to-rent (B2R) investors entered the single-family rental sector since 2012, disrupting the market that has long been dominated by small mom-and-pop investors. This shift in housing market structure has led to large public disapproval. A statement from the White House in 2021 stated that "Large investor purchases of single-family homes and conversion into rental properties speeds the transition of neighborhoods from homeownership to rental and drives up home prices for lower cost homes, making it harder for aspiring first-time and first-generation home buyers, among others, to buy a home. At the same, these purchases are unlikely to meaningfully boost supply in the lower-cost portions of the rental market, as investors charge more for rent to recoup higher purchase costs."

However, the institutional investors have voiced strong disagreement with these assertions, arguing that they are unfairly blamed for the broader housing crisis primarily driven by housing supply shortages. They point out that they only own a small share of single-family homes at the aggregate level and thus have a minimal impact on the housing market. Moreover, their rental business simply responds to the growing market demand for more rental options, rather than creating barriers to the path of homeownership.

The center of the debate hinges on a key empirical question: Does the entry of large buy-to-rent investors drive up local housing prices, thereby raising the barriers of homeownership? To answer these question, this paper provides reduced-form evidence on the spillover effects of buy-to-rent investment properties on housing prices of nearby properties. Furthermore, it distinguishes the underlying mechanisms that drive the changes in housing prices, offering insights into how housing market dynamics are affected by large-scale investment activities.

This paper examines the spillover effects using a comprehensive dataset of property transactions from CoreLogic in the Atlanta metropolitan area from 2012 to 2019. I focus on the Atlanta region because it represents other similar cities in the Sunbelt region that experience a significant influx of institutional buy-to-rent investors. High-growth cities in the Sunbelt region are characterized by their relatively newer housing stock, an appealing feature for institutional investors because these newer properties likely face lower maintenance costs. Moreover, the Sunbelt cities were hit particularly hard by the foreclosure crisis, resulting in undervalued properties that reduce acquisition costs for these investors.

To estimate the spillover effects of B2R properties, I exploit the quasi-random variation in the timing and location of buy-to-rent properties. I use a hedonic regression to compare housing prices of two properties in the same neighborhood sold at the same time but differ in the number of nearby buy-to-rent properties. The first identification assumption is that institutional investors cannot perfectly control which specific house to purchase in a given

neighborhood because they cannot force the incumbent owner to sell the property to them. The second identification assumption is that houses within a small area are similar enough to experience similar housing price growth. I find that the presence of one to three buy-to-rent properties within a 150-meter radius increases the sale price of the focal property by two to three percent. Buy-to-rent properties located more than 1200 meters away have negligible impact on the focal property, highlighting the localized nature of the spillover effects.

The main threat to the baseline hedonic approach is that houses within a small neighborhood can experience differential price growth, driven by a correlation between housing demand shocks and unobserved property and nearby neighborhood characteristics. For example, one house near a beautiful lake might experience higher price appreciation compared to another house slightly further away if there is a positive demand for houses with closer access to natural amenities. To mitigate the influence of such confounding factors, I use a repeat-sale specification to difference out any time-varying factors that are common to properties in the same neighborhood. Econometrically, this is equivalent to include a triple neighborhood-purchase year-sale year fixed effect. The repeat-sale results suggest that the presence of buy-to-rent properties within a 150-meter radius increases the housing price growth rate by one to two percentage point.

I further explore the variation in the spillover effects across different neighborhoods. I find that neighborhoods with low socioeconomic status experience stronger spillovers from the entry of buy-to-rent investors. For instance, in neighborhoods with a higher share of black residents, the presence of buy-to-rent properties within 1200 meters increases the sale price of the focal property by as high as ten percent. In neighborhoods in the bottom quartile of housing prices in 2010, the entry of buy-to-investors increases the housing prices by ten to fifteen percent. The results are consistent with the business strategy of B2R investors targeting entry-level homes in undervalued communities, particularly those more affected by the foreclosure crisis.

To understand the underlying causes of the positive spillovers, I distinguish the roles of different potential mechanisms through which buy-to-rent properties influence local housing prices. I identify three main channels. First, buy-to-rent investors increase the level of competition in the local housing market. The rationale is intuitive: assume the pool of houses for sale is fixed, an influx of additional prospective home buyers pushes up housing demand and push prices upward as a result. Second, buy-to-rent investors reallocate housing units from the for-sale market to the for-rent market, lowering the inventory of homes available for sale in subsequent years. This reduction in housing stock shifts the supply curve in the for-sale market to the left and leads to higher prices. Third, buy-to-rent properties can change local amenities. On one hand, investors often undertake renovations and updates to

standardize and modernize acquired properties. These improvements can enhance the overall appeal of the local area, potentially attracting more homebuyers to the neighborhood. On the other hand, the increase in rental properties might be perceived negatively by some potential homeowners, which could the lower the desirability of adjacent properties.

To isolate these three potential channels, I leverage the timing of buy-to-rent property acquisitions. The competition channel is expected to operate contemporaneously because it is directly related to the immediate increase in housing demand, whereas the supply and amenity channels would typically take place after some delay. I find that the competition channel matters less and is hyper-local. An additional purchase by buy-to-rent investors within the same year increases the housing price of properties within 150 meters by one to three percent, and it has no significant effect on more distant properties. On the contrary, buy-to-rent property acquired one to two years ago increases the housing prices of properties within 1200 meters by one to four percent. The results suggest that the supply and amenity channels are more influential in driving housing price changes.

Related literature This paper is related to the literature that investigates the emergence and influence of buy-to-rent investors on the housing market. Studies such as Mills et al. (2019), Oosthuizen (2023), Chilton et al. (2018), Christophers (2023), Colburn et al. (2021), and Fields and Vergerio (2022) have documented the birth and growth of buy-to-rent investors following the foreclosure crisis. These institutional investors, with substantial financial resources, capitalized on the low property prices during the foreclosure crisis to create large portfolios of single-family homes, particularly in the Sunbelt regions. Allen et al. (2018) note that these institutional investors often purchase properties at a discount rate. Lambie-Hanson et al. (2019) and Mills et al. (2019) find that the entry of investors improves local housing market conditions in the immediate aftermath of the foreclosure crisis, but the long-term implications of their presence are debatable. As buy-to-rent investors continue to expand their portfolios, they become major figures in some local housing markets, with some even owning entire blocks of single-family homes, highlighting their growing footprint and potential influence on the local market.

This paper aims to evaluate the longer term impact of buy-to-rent investors on the local housing markets, an area that haw drawn increasing attention in recent years. Gurun et al. (2023) and Austin (2022) use the merger and acquisition decisions of institutional investors as the exogenous variation to estimate the impact of ownership concentration on local housing prices and rents. DâLima and Schultz (2022) and Ihlanfeldt and Yang (2021) analyze the price growth in neighborhoods with a higher share of buy-to-rent properties with other neighborhoods, yet they do not address the potential selection issue that investors

endogenously select into neighborhoods with higher potential price growth. Although these studies attempt to answer similar questions, I use a different empirical strategy to assess the price spillover effects of buy-to-rent properties. I consider my study as complementary to the existing literature. I use property-level housing price data and exploit the quasi-random location of buy-to-rent properties to evaluate the spillover effects at a much granular level.

The paper also contributes to the literature on the externalities of local housing markets. The value of a property not only depends on its own features, but also on the characteristics of nearby properties and environment. A substantial body of literature has documented the negative externality from locating near foreclosed properties, poorly maintained homes, and toxic factories (Anenberg and Kung (2014), Fisher et al. (2015), Gerardi et al. (2015), Campbell et al. (2011), Autor et al. (2014), and Currie et al. (2015)). This paper applies a methodology similar to this strand literature and examines the externalities from buy-to-rent properties. It finds that the presence of buy-to-rent investors imposes positive externalities on nearby properties by increasing their property values. While this is good for incumbent homeowners who sell their properties, it also escalates the housing costs of potential individual home buyers.

2 Conceptual framework

In this section, I present a simple model to illustrate the possible effects and mechanisms instigated by buy-to-rent investors. Consider a scenario where two distinct markets exist for single-family homes: one catering to owners and another to renters. Due to technological developments and financial advantages, buy-to-rent investors reallocate housing units from the for-sale market to the for-rent market.

I first consider the impact of buy-to-rent investors on the for-sale market. As shown in the left panel of Figure 1, the initial equilibrium price in the for-sale market before the entry of buy-to-rent investors is p at time $t = 0$. In period $t = 1$, B2R investors enter the market and shift the demand curve to the right (shown in the top left panel of Figure 1), causing the price to increase to p'. This captures the contemporaneous competition channel of investors. In period $t = 2$, there are fewer homes available on the for-sale market because buy-to-rent investors reallocate these housing units to the rental market and thus lower the housing stock in the for-sale market. The supply curve shifts to the left (shown in the middle left panel of Figure 1), and causes the prices to rise even further to p''. In addition to the competition and reallocation channel, the presence of buy-to-rent investors can change the values of local amenities and shift the demand curve to either direction. On one hand, most homeowners do not like living near rental properties because of the belief

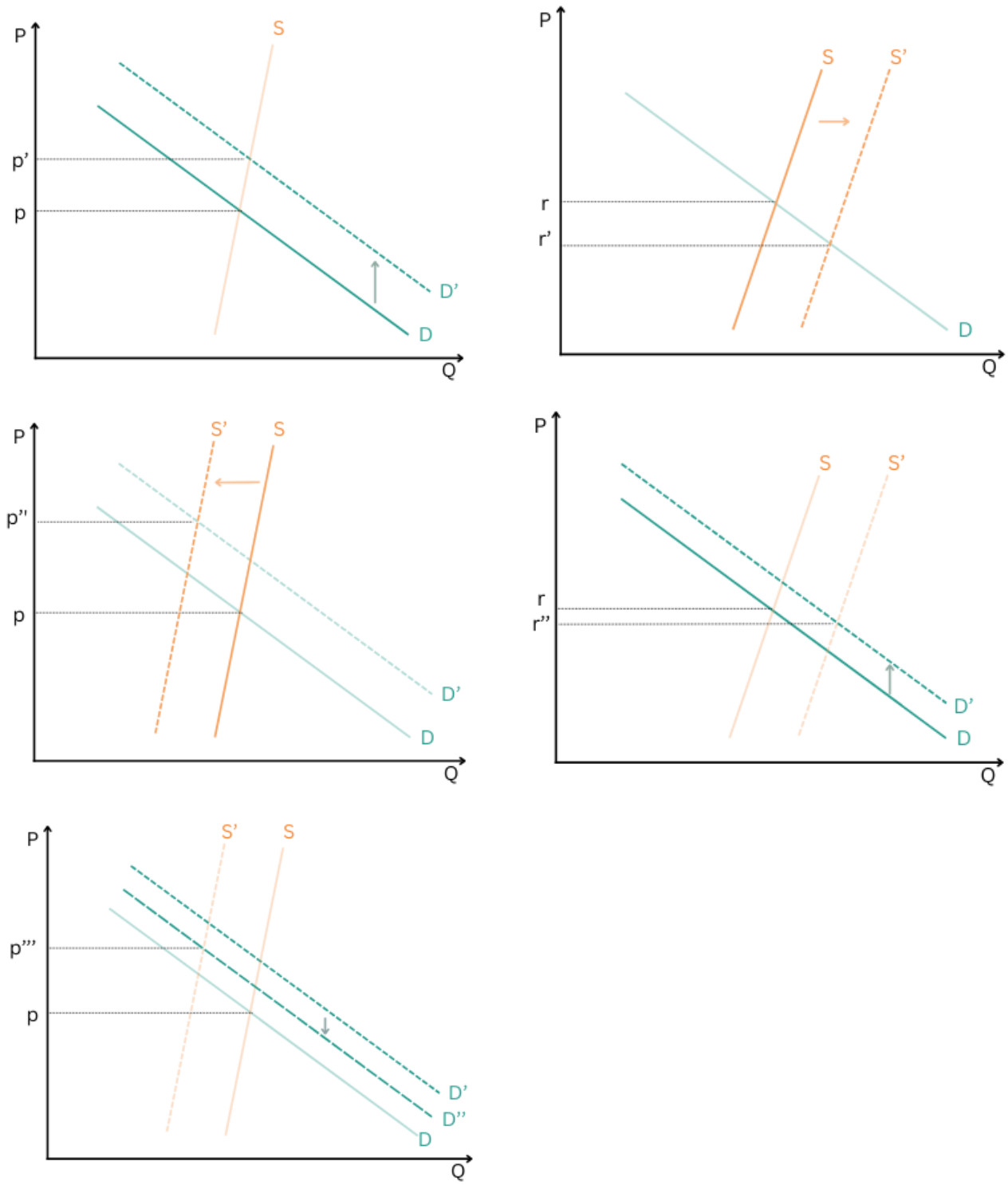
that renters are less invested in the local community, so the influx of renters may make the area to be less attractive for potential individual homebuyers. On the other hand, buy-to-investors often undertake substantial renovations on the properties, enhancing the aesthetic appeal of the local neighborhood and increasing the average home value. Depending on the relative magnitude of these two amenity effects, the demand curve can further shift to either direction and change prices. If the net amenity effect is negative, the demand curve will shift downwards (as shown in the bottom left panel of Figure 1) and thus lower prices below p''. In the long term, there can also be supply responses from real estate developers and homebuilders to increase housing supply in the for-sale market. The supply response would depend on local supply elasticity and is unlikely to materialize in the short term.

Then I consider the impact in the for-rent market. In period $t = 0$, the rental market is in equilibrium at price r. The equilibrium rent is higher than the initial equilibrium price in the for-sale market, $r > p$. Buy-to-rent investors are financially motivated to capitalize on the arbitrage opportunity and reallocate housing units to the rental market. The reallocation channel is reflected by the right-shifted supply curve in the top right panel in Figure 1. Given the supply increase in the rental market, rent would be lower under a perfect competitive environment. These institutional investors create a new market for professionally-managed single-family rentals, expanding the housing options of households. The upgrades they carry out also affect the attractiveness of the rental option to residents. As a result, the demand curve can shift rightward. The magnitude depends on the elasticity of substitution between owning and renting, and also the substitution between renting from small mom-and-pop landlords and professionally managed corporations. Moreover, the entry of these large corporations can transform the rental market towards a more monopolistic competitive environment given that they often own a large number of homes in one local area. It is possible that these large corporations can leverage their market power to increase rent. Therefore, the net impact on rent depends on the relative magnitude of these competing forces.

Figure 1: A stylized model of buy-to-rent investors

(a) For-sale market

(b) For-rent market



3 Data and descriptive facts

In this section, I describe the data sources used for the empirical analysis and the procedure to identify large institutional buy-to-rent investors. I also show the descriptive facts of the growth and spatial distribution of buy-to-rent properties.

3.1 Data

The main dataset used in this study are property transaction records between 2012 and 2019 from CoreLogic. The CoreLogic property transaction data provides detailed information for each property sale, including the transaction date, property address, property type, buyer name, seller name, and sale price. I restrict the sample to all single-family homes that are arms-length transactions. I also merge each transacted property with CoreLogic Assessor files to obtain detailed property characteristics, including the number of bedrooms, bathrooms, square footage, lot size, and year built.

I use the buyer name on each transaction to identify properties bought by large buy-to-rent investors. I first identify a set of large corporate buy-to-rent investors from industry reports, newspapers, the internet, and academic papers (such as Mills et al. (2019) and Gurun et al. (2023)). I find 14 largest institutional investors in the Atlanta metro area, with four of them as Real Estate Investment Trust (REITs) and ten as private equity and investment firms. The list of corporations includes Invitation Homes, Main Street Renewal, Progress, Tricon, American Homes 4 Rent, Front Yard, FirstKey, Home Partners of America, Sylvan, Roofstock, VineBrook, Promise Homes, Lafayette, and RESICAP.

The challenge in identifying property acquisitions by each corporation is that each corporation operates through a myriad of subsidiary entities, which are the entities actually responsible for acquiring properties. Moreover, these subsidiaries have many name variations, adding to the difficulty in identifying property acquisitions. For example, the company Invitation Homes rarely purchases properties directly under its corporate name. Instead, it uses subsidiaries like Tabert LLC, SWH 2017-1 Borrower, CAH 2014 1 Borrower, IH3 Property Borrower, and SFR ATL Owner 5 LP for property acquisitions. To find the subsidiaries linked to each corporation, I search each corporation in Mergent Online, a database that provides information on business descriptions and subsidiaries, to find a list of subsidiaries. I then employ an iterative searching algorithm to find all subsidiaries to address potential missing data in Mergent. I search each subsidiaries found on Mergent in the CoreLogic transaction data using buyer's name, find the common buyer's mailing addresses associated with each subsidiary, and then use the mailing address to identify other subsidiaries associated with the corporation. To confirm that these subsidiaries indeed belong to the corporation, I

verify the names and addresses on Georgia's business registration records from the Office of the Secretary of the State. I also randomly choose properties and check them on Zillow and Realtor.com to verify these properties are rental properties owned by these corporations.

After identifying properties acquired by these large buy-to-rent investors, I calculate the number of homes owned by these investors (shown in Table 1). If the company is public, its annual reports provide the count of properties they own at the city level. To validate my identification approach, I compare the number of properties I identify from CoreLogic with the numbers stated in the annual reports for public companies. Only three out of the total fourteen corporations are public – Invitation Homes, Tricon, and American Homes 4 Rent. Among these three public companies, I am able to find over 96 percent of all properties owned by them. The coverage rate for Invitation Homes is over 100 percent. This may be attributed to the timing difference in reporting records from the two data sources, or the fact that some of newly acquired properties are not yet in operation.

Table 1: Number of properties owned by large institutional investors as of 2019, Atlanta CBSA

Company	CoreLogic	Annual Report	Coverage
Invitation Homes	13759	12555	109.59%
Main Street Renewal	5507	-	-
Progress	5484	-	-
Tricon	5050	5253	96.14%
American Homes 4 Rent	4960	4977	99.66%
Front Yard	4173	-	-
FirstKey	3406	-	-
Home Partners of America	2413	-	-
Sylvan	1490	-	-
Roofstock	775	-	-
Others	2086	-	-

Notes: This table presents the total number of properties owned by large buy-to-rent investors as of 2019. The second column gives the number of properties I identify from CoreLogic property transaction data. The third column gives the official numbers from the annual reports of public companies. Only three companies, Invitation Homes, Tricon, and American Homes 4 rent are public, so the rows are empty for non-public companies in the third column. The last column gives the ratio of the second column to the third column.

I use the 2010 American Community Survey (ACS) from the IPUMS NHGIS to measure sociodemographic characteristics at the Census block group and tract levels. Specifically, I retrieve data on the age composition, racial composition, share of college educated individuals, median household income, homeownership rate, median housing value, and housing stock composition.

3.2 Descriptive facts

In this section, I present four descriptive facts about the large institutional buy-to-rent investors. First, since the creation of the single-family rental business model in 2012, institutional buy-to-rent investors have significantly increased the size of their portfolio. Figure 2 shows that the number of buy-to-rent properties has increased from zero in 2011 to over 45,000 in 2020. The investors keep expanding their portfolio and show no sign of a slowdown in their acquisition. At the aggregate level, the institutional buy-to-rent investors only own 2.7 percent of all single-family homes in the region, but this masks significant geographical variation in the location of buy-to-rent properties.

Figure 2: Growth of large institutional buy-to-rent investors in Atlanta CBSA

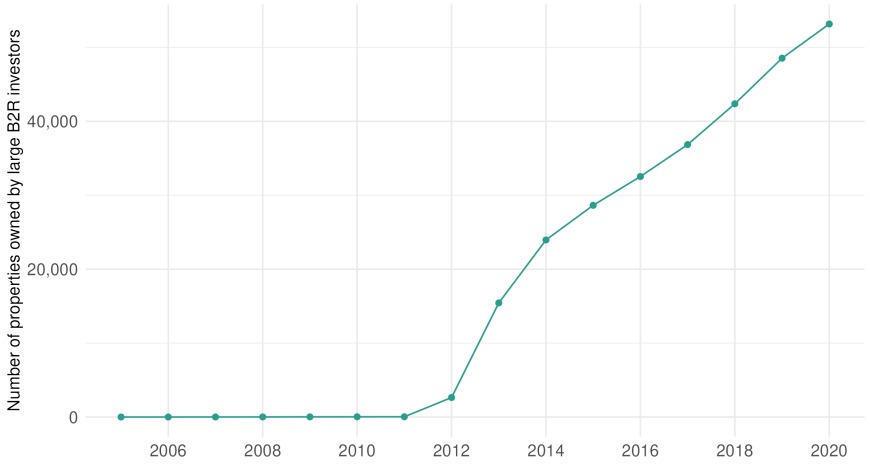
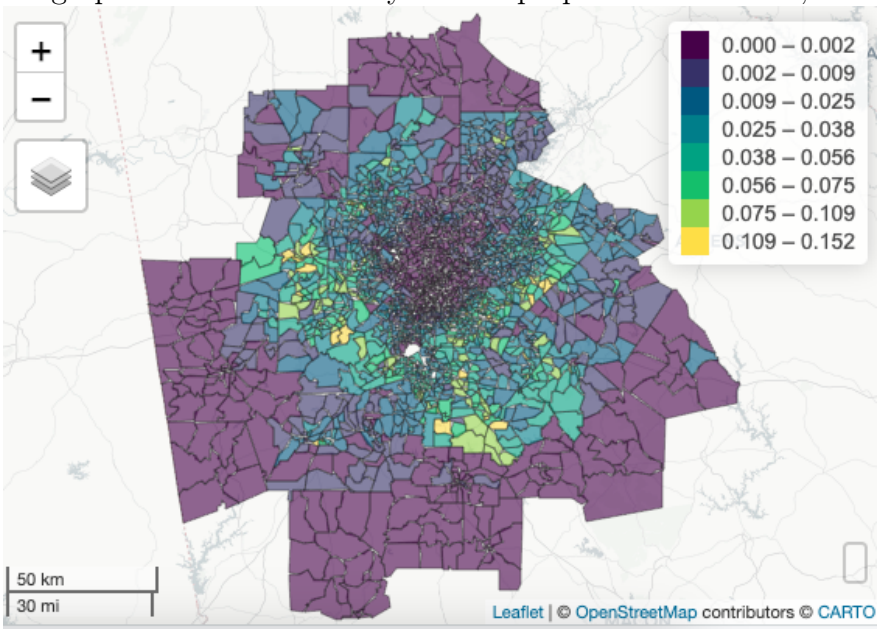


Figure 3 shows the share of buy-to-rent properties owned by institutional investors at the Census block group level in 2019 in the Atlanta CBSA. There is substantial geographical variation in ownership concentration. While the majority of downtown areas and outskirt suburbs does not have any footprint of institutional investors, investors own a large share of single-family homes in neighborhoods right outside the central business districts. Their ownership share can be as high as ten percent in some neighborhoods. It is important to note that neighborhoods with a high share of buy-to-rent properties are in the southern, western, and eastern regions. These areas are characterized by a high minority population and were hit hard by the foreclosure crisis. In contrast, the northern neighborhoods that are occupied by more white affluent residents are barely touched by institutional investors. The geographical distributional pattern confirms the endogenous acquisition process of investors. Instead of adopting a random acquisition strategy, the investors strategically target properties in undervalued communities with high growth potentials.

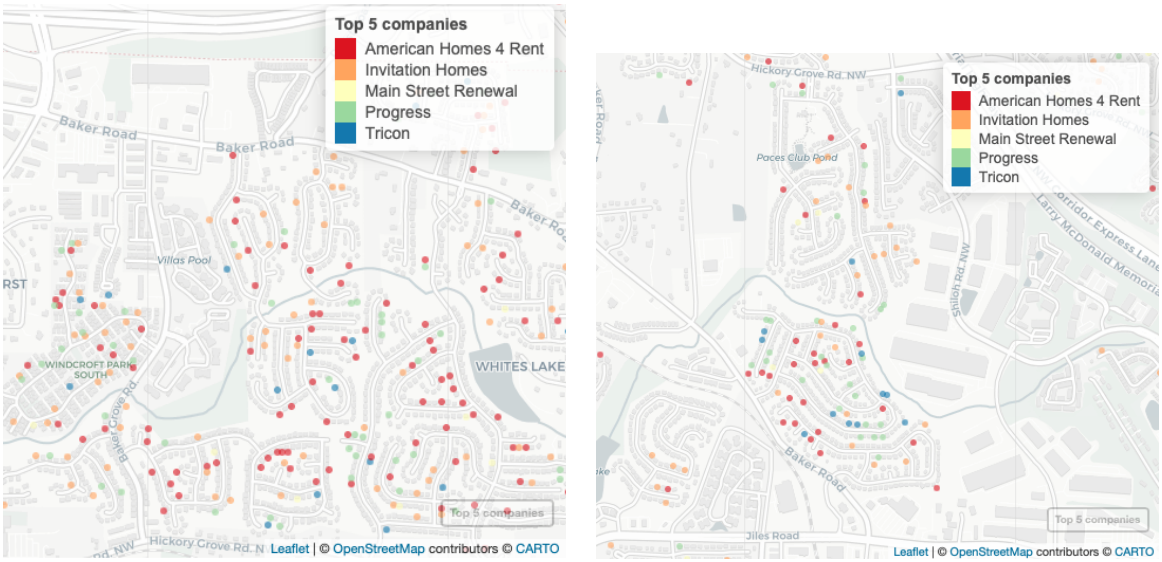
Figure 3: Geographical variation of buy-to-rent properties as of 2019, Atlanta CBSA



Notes: This figure shows the geographic distribution of buy-to-rent properties in the Atlanta CBSA as of 2019. Each polygon represents a Census block group. The color represents the share of buy-to-rent properties calculated as ratio of the number of buy-to-rent properties to all single family homes. Darker purple color represents a lower share, while lighter green and yellow colors represent higher shares.

While institutional investors strategically target certain neighborhoods, they cannot perfectly control which properties they can acquire. The reason is simple: they cannot force incumbent owners to sell their properties to them. Ideally, the investors would prefer to acquire homes that are geographically close to each other because such clustering would lower management and maintenance costs. Figure 4 shows two examples of the exact locations of buy-to-rent properties. Each dot represents a property owned by one of the five largest institutional investors. There is indeed a lot of clustering happening at the neighborhood level, but there also exist substantial hyper-local variations at the street level in the number of buy-to-rent properties and the companies that own them. This lends support to the empirical strategy that the exact location of buy-to-rent properties is as good as randomly assigned.

Figure 4: Examples of the exact locations of B2R-owned properties



Notes: This figure gives two examples of the exact locations of buy-to-rent properties in the Atlanta CBSA. Each dot represents a property owned by one of the largest five buy-to-rent corporations.

Lastly, I look at the property characteristics of single-family homes acquired by institutional buy-to-rent investors, and compare them with the average characteristics of all single-family homes in Atlanta. Table 2 shows that the average interior size of B2R-owned homes is 1,945 square feet, which is approximately 400 square feet smaller than the average single-family home. The lot size for B2R-owned homes also tends to be smaller, consistent with the fact that buy-to-rent properties are closer to the city center and properties in these regions have smaller lots compared to homes in outskirt suburbs. Buy-to-rent properties also tend to be newer properties that are built after 1995. Perhaps the biggest difference between buy-to-rent properties and average homes is in their market values. The average value of buy-to-rent properties is around $160,000, about $60,000 less than the average value of all properties. All the evidence combined suggests that buy-to-rent investors are more likely to acquire starter homes. These homes are exactly the type of homes that are ideal for first-time homeowners. As a result, this acquisition pattern can have a significant impact on the path to homeownership.

Table 2 also shows that the standard deviations of all property characteristics are much smaller for buy-to-rent properties. This pattern suggests that buy-to-rent investors intentionally acquire properties with similar features. The uniformity of properties aligns with the conjecture that it is more efficient to manage and advertise similar properties.

Table 2: Property characteristics of single-family homes in Atlanta CBSA

	B2R-owned SFH			All SFH		
	Median	Mean	Sd	Median	Mean	Sd
Living square feet	1,836	1,945	616	2,018	2,354	1,384
Lot size in sqft	11,761	14,302	10,957	15,814	48,978	119,976
Num of bedrooms	3	3.4	0.68	3	4	4.137
Num of bathrooms	3	2.6	0.67	3	2.7	1.36
Num of rooms	6	6.65	1.42	6	7	2.41
Year built	1999	1995	14.67	1994	1988	22.77
Market value ($)	154,370	160,815	65,866	180,496	225,305	188,151

Notes: This table shows the summary statistics of single-family homes owned by buy-to-rent investors (the left panel) and all single-family homes (the right panel) in the Atlanta CBSA.

4 Local spillover effects of B2R properties

In this section, I describe the empirical strategy to recover the causal impact of buy-to-rent properties on nearby housing prices, and present the baseline results.

4.1 Baseline hedonic approach

The goal of the empirical analysis is to measure the local price spillovers stemming from the entry of buy-to-rent investors on neighboring properties. The identification challenge is that buy-to-rent investors endogenously select into certain neighborhoods and purchase properties that align with their business model. Ideally, we want to compare two identical properties within the same neighborhood, differing only in their exposure to buy-to-rent properties nearby. The empirical strategy aims to replicate the ideal experiment as much as possible.

To address the endogeneity issue, I utilize quasi-random variations in the exact locations of buy-to-rent properties. As discussed in the last Section, buy-to-rent investors do not have perfect control over which properties they can acquire at the hyper-local street level. Similarly, incumbent homeowners cannot dictate who purchases their neighbors' houses. This creates quasi-random variations in the number of buy-to-rent properties within these hyper-local areas. The key identification assumption is that the exact location and timing of buy-to-rent entry within a homogenous neighborhood is as good as random.

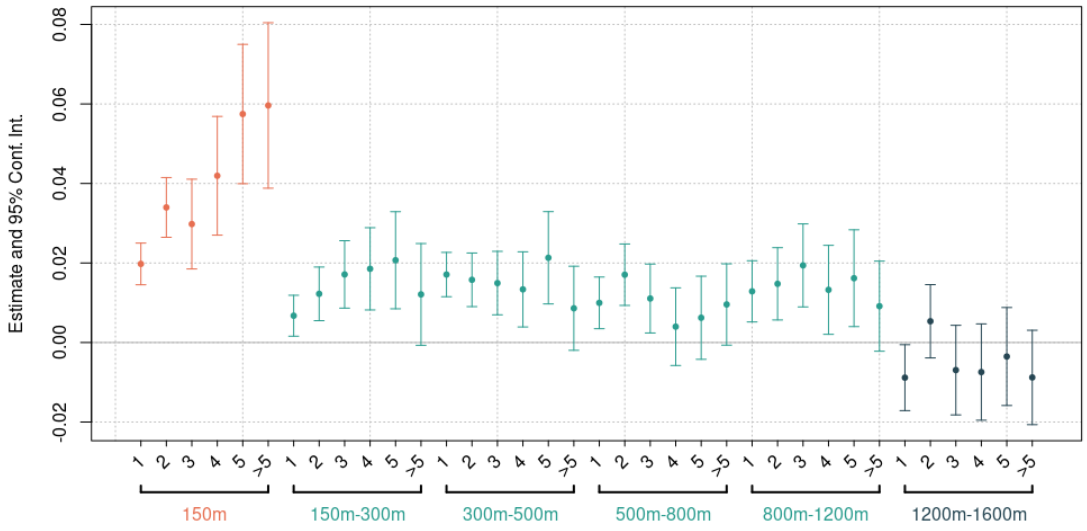
For property i in neighborhood c that was sold in time t, I run the following regression:

$$\log p_{ict} = \sum_{d} \sum_{j} \beta_{dj} \mathbf{1}(N_{it}^{d} = j) + \delta X_{it} + \alpha_{ct} + \epsilon_{ict}. \tag{1}$$

p_{ict} indexes the sale price of property i located in neighborhood c sold at time t. N_{it}^{d} is the total number of properties owned by buy-to-rent investors within distance d when property i was sold in t. I discrete the distance to six non-overlapping bins, $d = \{$150m, 300m, 500m, 800m, 1200m, 1600m$\}$. j indexes the number of buy-to-rent properties, and it takes discrete values $j \in \{0, 1, 2, 3, 4, 5, > 5\}$. The discretization allows me to flexibly capture the nonlinear effect associated with different numbers of buy-to-rent properties. X_{it} represents a set of control variables. It includes the property characteristics of property i, such as the number of bedrooms, bathrooms, square footage, lot size, and age of the building. X_{it} also includes the total number of properties within each distance bin to capture density variations in the adjacent neighborhood. To control for potential within-neighborhood variations in housing prices, I include the average housing prices within 500 meters of property i. α_{ct} are neighborhood-time fixed effects to control for unobserved demand shocks that vary by neighborhood and time of sale. Additionally, I restrict the analysis sample to all non-distressed sales (i.e., exclude foreclosures and short sales) and sales to buy-to-rent investors. The parameters of interests are β_{dj}, which capture the spillover effects from different numbers of buy-to-rent properties j in each distance bin d.

Figure 5 plots the coefficients by distance bin and number of buy-to-rent properties. I use census tract to define neighborhoods and calendar year to capture time fixed effects. It shows that buy-to-rent properties within 150 meters have the most significant impact on property values. Having one buy-to-rent properties within 150 meters increases the sale prices by 2 percent, and having five or more buy-to-properties within 150 meters increases the prices by 6 percent. Buy-to-rent properties located 150 meters away but within 1200 meters still have positive spillover effects on property values, but the effects are more muted. Having five buy-to-rent properties within a 150 to 300-meter radius increases property values by 2 percent, the same magnitude as having one buy-to-rent properties within 150 meters. Buy-to-rent properties that are located 300 to 1200 meters have similar effects on property values, with the average impact ranging from 1 to 2 percent. Buy-to-rent properties located 1200 meters away do not have a significant nor meaningful impact on property values.

Figure 5: Hedonic price spillover effects of B2R properties by distance and number of B2R properties



Notes: This figure plots the coefficients and 95% confidence intervals of the hedonic regression Equation (1). It shows the results by distance bin and number of adjacent buy-to-rent properties. The top numbers in the x-axis represents the number of buy-to-rent properties, while the bottom numbers in the x-axis represents the six non-overlapping distance bins.

Table 3 shows the baseline results with different specifications. Give that there is a large number of coefficients to be estimated, I cluster the number of buy-to-rent properties into three bins [1-3], [4-5], and over 5. To highlight the most important results, I only show the coefficients where $d = 150m$. Column (1) uses census tract by year fixed effects, and control for property characteristics. The results are largely similar to Figure 5. The immediate proximity to buy-to-rent properties increases the property value by 2.7 to 6.3 percent. Column (2) adds control for the total number of properties within 500 meters to capture density variations in the local area. The coefficients are similar to Column (1). Column (3) adds property values within 500 meters to control for potential variations in property values, and the coefficients remain at similar magnitudes.

Since housing markets exhibit strong seasonality patterns, Column (4) uses calendar year and quarter as the measure for time fixed effects. Comparing two properties transacted at different times of the year may capture the seasonality effects and confounds the actual price spillovers from buy-to-rent investors. After adjusting for seasonality, the coefficients are still of similar magnitudes to the baseline specification. Column (5) uses zip codes as a proxy for neighborhoods. This specification compares properties within a broader area than census tracts. Still, the coefficients are statistically significant and remain similar to

previous specifications.

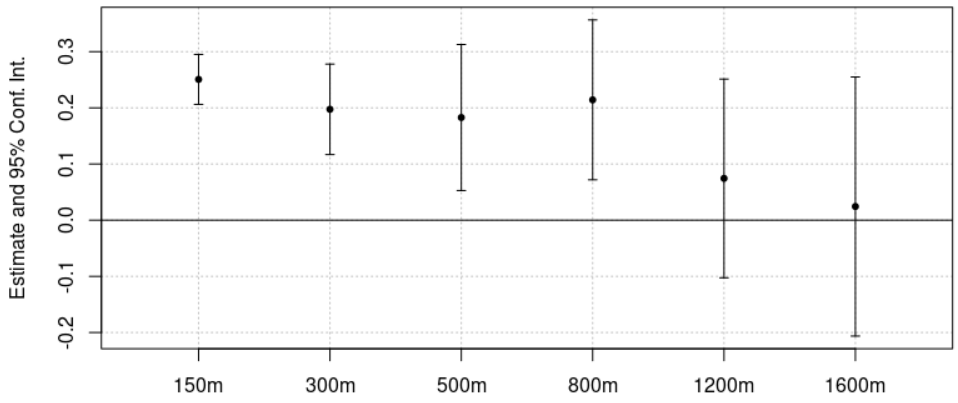
Table 3: Hedonic spillover effects of B2R properties

	(1)	(2)	(3)	(4)	(5)
N(B2R in 150m)					
$[1, 3]$	0.0267***	0.0269***	0.0343***	0.0265***	0.0178***
	(0.0041)	(0.0042)	(0.0031)	(0.0026)	(0.0052)
$[4, 5]$	0.0462***	0.0493***	0.0588***	0.0501***	0.0422***
	(0.0095)	(0.0100)	(0.0077)	(0.0067)	(0.0126)
> 5	0.0627***	0.0740***	0.0736***	0.0610***	0.0693***
	(0.0159)	(0.0164)	(0.0126)	(0.0104)	(0.0179)
Controls:					
Number of B2R in 150-1600m	×	×	×	×	×
Property characteristics	×	×	×	×	×
Number of SFHs within 500m		×	×	×	×
Average log price within 500m			×	×	×
Fixed effect	Tract-Year	Tract-Year	Tract-Year	Tract-YearQuarter	ZIP-Year
N	817,511	817,511	803,774	803,774	799,316
Overall R^2	0.53	0.53	0.60	0.63	0.59
Within R^2	0.15	0.15	0.27	0.25	0.35

Notes: This table reports regression results from the hedonic regression Equation (1). Each column uses a different specification with different controls and fixed effects. All specifications include the number of buy-to-rent properties in various distance bins, but I only report the results on the buy-to-rent properties within 150 meters to highlight the results. I also include property characteristics in all specifications.

Figure 6 presents the coefficients using the share of properties owned by buy-to-rent investors as the independent variable. Using the continuous share of buy-to-rent properties directly captures the density variation in the adjacent neighborhood. Consistent with the baseline finding, buy-to-rent properties located further away have no effects on property values. When the share of buy-to-rent properties within 150 meters increases by 10 percent, the property values increases by 2.5 percent. The effects are slightly smaller for buy-to-rent properties located 150 meters away but still statistically significant and positive.

Figure 6: Hedonic price spillover effects of share of B2R-properties



Notes: This figure plots the coefficients and 95% confidence intervals of the hedonic regression Equation (1) using the share of buy-to-rent properties in various distance bins as the independent variable.

4.2 Repeat-sale approach

The hedonic approach relies on the identification assumption that two properties within the same neighborhoods are similar to each other enough that they should experience the same price growth over time. Although I control for observed property characteristics, it is possible that there exist other unobserved property characteristics that drive differential price growth trends. For example, the house near a local grocery store or Starbucks might experience higher price growth compared to another house that is located slightly further away if potential homebuyers place a greater value on the proximity to business amenities. There also exist many property characteristics that are not observed in the data but can have a big impact on property values. For example, properties with central air conditioning system and newer roofs can have higher values.

Therefore, I employ a repeat-sale specification to control for unobserved property and nearby neighborhood characteristics. The method is similar to the repeat-sale specification in Gerardi et al. (2015). In the repeat-sale analysis, I only include properties that are transacted at least two times during the sample period. For property i in neighborhood c

that was transacted in time t and $t+k$, the hedonic regressions in these two periods are

$$\log p_{i,c,t} = \sum_d \beta_{d,t} N^d_{i,t} + \delta X_{it} + \alpha_{c,t} + \epsilon_{i,c,t},$$
$$\log p_{i,c,t+k} = \sum_d \beta_{d,t+k} N^d_{i,t+k} + \delta X_{it} + \alpha_{c,t} + \epsilon_{i,c,t+k}.$$

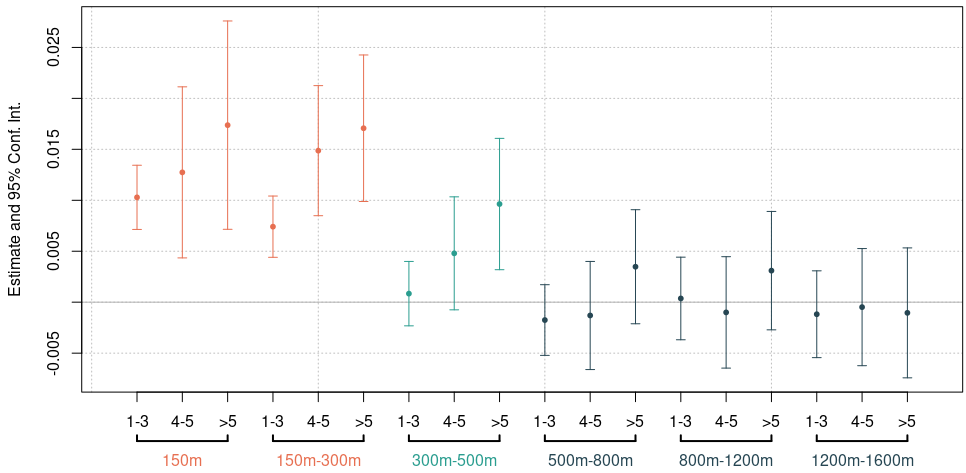
Taking the difference of these two equations gives the repeat-sale specification,

$$\log \frac{p_{i,c,t+k}}{p_{i,c,t}} = \sum_d \beta_d \cdot \Delta N^d_{i,t,t+k} + \alpha_{c,t,t+k} + \epsilon_{i,c,t,t+k} \tag{2}$$

The parameter of interests β_d measures the difference in housing price appreciation caused by the differential exposure to buy-to-rent properties. The repeat-sale specification difference out all property characteristics that affect housing prices if they do not vary over time, as well as any time-invariant neighborhood characteristics. The triple fixed effects control for unobserved time-varying shocks that are common to properties transacted in t and $t+k$ in neighborhood c. Intuitively, the repeat-sale approach compares the price growth of two properties within the same neighborhoods that were purchased and sold in the same years, but differing in the growth of nearby buy-to-rent properties between the two transaction dates.

Figure 7 shows the coefficients using the repeat-sale specification. Having buy-to-rent properties within 500 meters increases the housing price appreciation rate. When institutional investors purchase one to three more properties within 150 meters during the two transaction dates, the sale price growth increases by 1 percentage point. The spillover effects on price appreciation rate increase when institutional investors purchase more properties nearby. Similar to the hedonic results, the strength of the spillover effects decreases with distance. Buy-to-rent properties located further than 500 meters do not appear to affect price growth rates anymore.

Figure 7: Repeat-sale price spillover effects of B2R-properties



Notes: This figure plots the coefficients and 95% confidence intervals of the repeat-sale regression Equation (2). It shows the results by distance bin and number of adjacent buy-to-rent properties. The top numbers in the x-axis represents the number of buy-to-rent properties, while the bottom numbers in the x-axis represents the six non-overlapping distance bins.

5 Mechanism and heterogeneity

In this section, I run additional empirical analysis to distinguish different mechanisms driving the spillover effects, and explore neighborhood heterogeneities.

5.1 Mechanism

As illustrated in Section 2, there are three forces through which positive externalities from the buy-to-rent properties operate: competition channel, supply reduction due to reallocation, and changes in local amenities. I exploit the timing of buy-to-rent property acquisitions to distinguish these mechanisms.

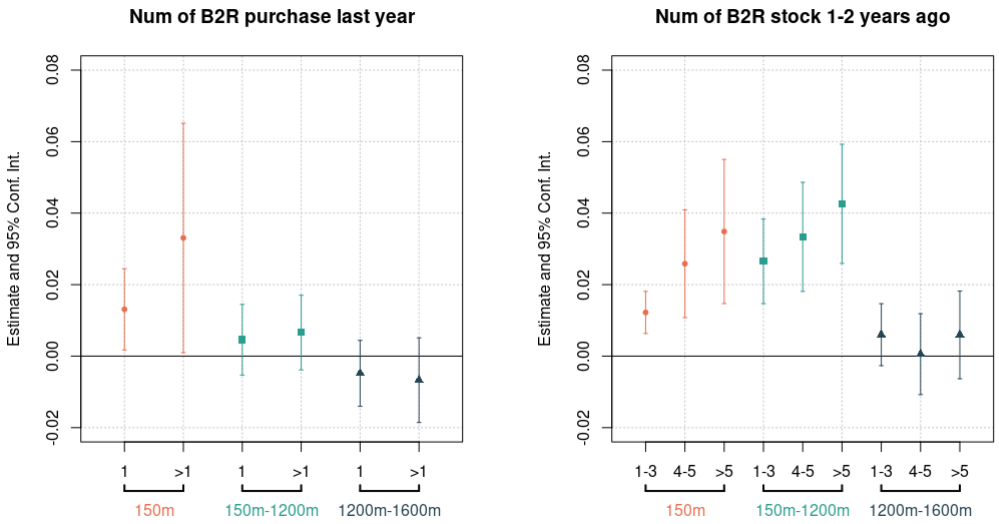
The competition channel is expected to take effect at the time of purchase. When buy-to-rent investors shop for properties, they directly compete with other homebuyers who look for housing in the same area in the same time. So I use the number of buy-to-rent purchases in the same year to capture the competition effect. Mathematically, I run the baseline hedonic regression Equation (1) with the number of newly acquired buy-to-rent properties in the same year as the independent variable.

On the contrary, the supply and amenity channels are likely to take effect with a time lag. Buy-to-rent investors reallocate housing unit to the rental market and do not put these

homes back on the for-sale market. This leads to a decrease in the housing stock available for sale in subsequent years. It also takes time for any renovations and residential compositional change to take place. Therefore, I use the number of buy-to-rent properties acquired one to two years ago as the independent variable to capture the supply and amenity channels. In the future, I plan to obtain building permits data from the local governments to directly measure renovations.

Figure 8 plots the coefficients and 95% confidence intervals from the two hedonic regressions using the number of buy-to-rent properties acquired within last year and one to two years ago as the independent variables, respectively. The left panel shows that contemporaneous buy-to-rent property acquisitions within 150 meters increases property values by one to three percent, and contemporaneous buy-to-rent property acquisitions further than 150 meters have close to zero impact on property values. The right panel shows that the presence of buy-to-properties acquired one to two years ago within 1200 meters increases property values by one to four percent, while buy-to-rent properties further than 1200 meters have minimal impact on property values. The results show that all three channels – competition, supply, and amenity – are at work in affecting housing prices in the presence of buy-to-rent properties. However, the changes in available housing stock and perceived neighborhood amenities induced by buy-to-rent properties are more influential on price appreciation.

Figure 8: Mechanisms driving the spillover effects of B2R properties



Notes: Figure 8 presents the coefficients and confidence intervals of hedonic regressions examining the impact of buy-to-rent properties on housing prices. Each dot represents the coefficients, and each bar represents the corresponding 95% confidence intervals. The left panel uses the buy-to-rent properties acquired within the last year of property sales as the independent variable, and the right panel uses buy-to-rent properties acquired one to two years before property sales. Each panel also distinguishes buy-to-rent properties within different distance bins around the sold property.

5.2 Neighborhood heterogeneity

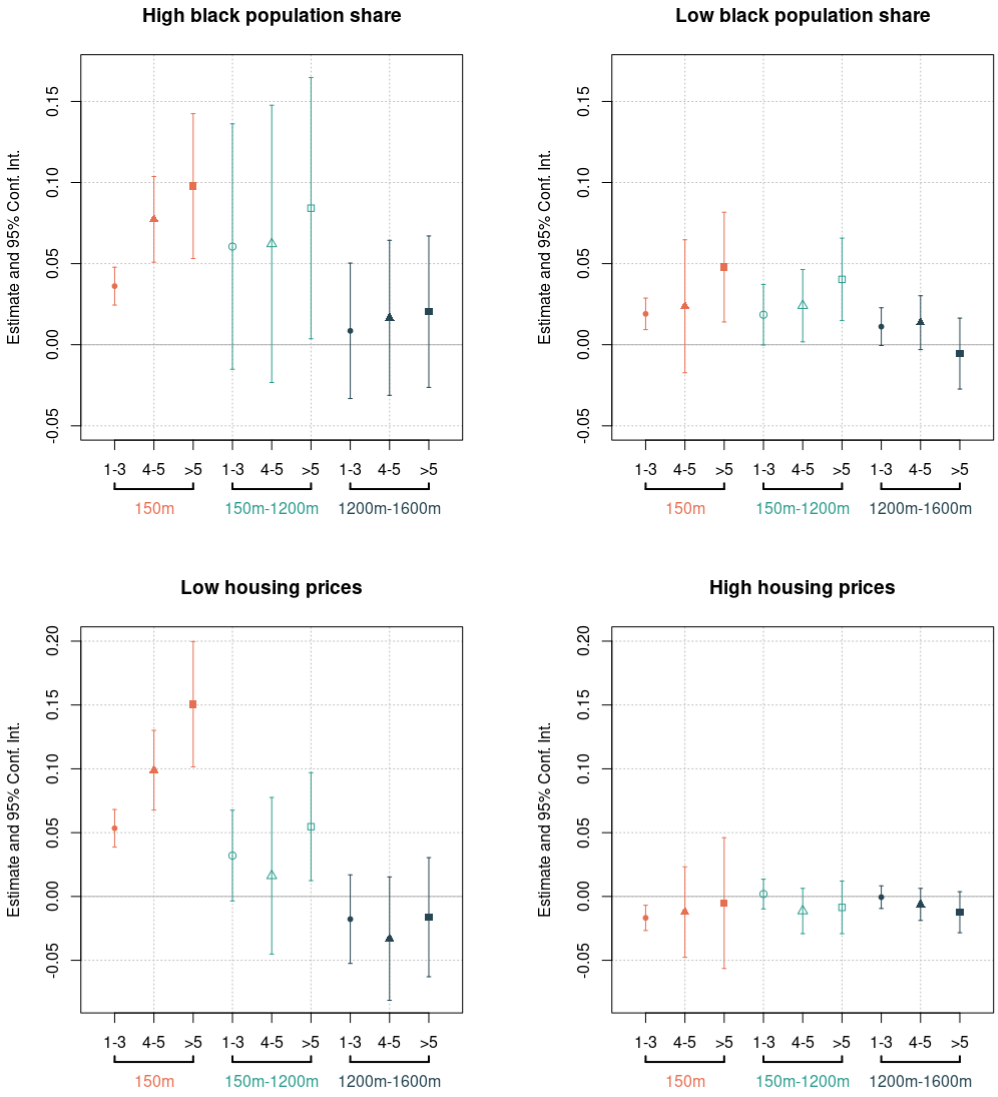
Having examined the average spillover effect of buy-to-rent properties on property values of nearby houses, I will now investigate whether properties in different neighborhoods are affected differently by the entry of buy-to-rent investors. I define neighborhoods using Census tracts. I use neighborhood characteristics from the 2010 American Community Survey, and group neighborhoods into quartiles based on their share of black residents and housing prices.

Figure 9 displays the coefficients and confidence intervals of the spillover effects from buy-to-rent properties in different neighborhoods. I rerun the baseline regression Equation (1) for neighborhoods with different racial composition and housing prices separately. The top two panels show the results in neighborhoods at the top and bottom quartiles based on their share of black population. Neighborhoods with a higher share of black residents, that is, neighborhoods with more than 43% black residents, tend to experience larger positive price spillovers from buy-to-rent investors. The magnitudes of positive spillovers are about twice as large in neighborhoods with a higher black population share compared to neighborhoods with a lower black population share.

The bottom two panels of Figure 9 plot the results for neighborhoods in the highest and

lowest quartiles based on their housing prices. The bottom right panel shows that properties in neighborhoods with lower initial housing prices in 2010 experience large positive spillover effects from the entry of buy-to-rent investors. Specifically, in neighborhoods below the 25th percentile in housing prices, the presence of buy-to-rent properties within 150 meters increase property prices by five to fifteen percent. Conversely, neighborhoods above the 75th percentile in housing prices show no significant changes in response to the presence of buy-to-rent properties. This pronounced difference reveals that cheaper neighborhoods are more susceptible to price spillovers caused by the influx of buy-to-rent investors, raising concerns about housing affordability for low- and middle-income households.

Figure 9: Neighborhood heterogeneity of the spillover effects



6 Conclusion

This paper investigates the impact of buy-to-rent investors on local housing markets. By leveraging the quasi-random variation in the location and timing of buy-to-rent property acquisitions, this paper examines the spillover effects the buy-to-rent properties have on nearby property prices. The main finding is that buy-to-rent properties contribute to local housing price appreciation, particularly in neighborhoods with more black population and lower housing prices. The positive price spillovers are mainly driven by supply reduction and positive amenity improvements. While existing homeowners benefit from property appreciation, it also raises barriers to homeownership for prospective buyers.

In recent years, many policy discussions have focused on restricting the property acquisitions of institutional investors, driven by concerns that these investors deter homeownership and raise local rents. The reduced-form results show that regulating investor behavior could help mitigate price increases. However, it is unclear whether limiting investor behavior would simply pass these properties to small mom-and-pop landlords, rather than returning them to the for-sale market. Moreover, to evaluate the impact of such regulations, it is important to consider their effects on the rental market and housing supply, which I deter to future research.

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