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The financialization of single-family rental housing: An examination of real estate investment trusts' ownership of single-family houses in the Atlanta metropolitan area

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ABSTRACT
Single-family rental housing (SFR) is becoming increasingly prevalent in suburban neighborhoods. Historically, small-scale investors have owned SFR, but since the 2008 housing crisis, it has become increasingly financialized—dominated by large, global investment firms. In the wake of the housing crisis, a new type of SFR investor emerged: the real estate investment trust (REIT). SFR REITs funnel large amounts of global capital into local housing markets. This paper presents an examination of the four largest publicly traded SFR REITs' investments in the Atlanta metropolitan area. Using exploratory spatial data analysis methods, the study examines the intensity and locations of statistically significant spatial clusters of SFR owned by REITs. Then, a generalized linear mixed model is used to identify the property, neighborhood, and school district characteristics associated with houses owned by SFR REITs. Findings indicate that overall, houses owned by SFR REITs are highly spatially clustered in neighborhoods forming a U shape surrounding the city of Atlanta, and the locations of the spatial clusters vary for the four SFR REITs. Moreover, property, neighborhood, and school district characteristics differ among properties owned by each of the SFR REITs.

Single-family rental housing (SFR) represents an increasing share of U.S. housing stock; in the wake of the 2008 housing crisis, the number of renter-occupied single-family houses in the United States increased by more than 2.5 million between 2009 and 2016 (U.S. Census Bureau, 2009, 2016). Historically, small-scale investors have owned SFR, but since the housing crisis, it has become increasingly financialized—dominated by large, global investment firms. This structural shift marks the increased delocalization of rental housing markets through substantial *global* capital investment in *local* housing markets. Since the housing crisis, speculative short-term "buy low and sell high" investment strategies have given way to longer-term "buy and hold" strategies, an evolution marked by the emergence of publicly traded real estate investment trusts (REITs) focused on single-family rental housing (Fields & Uffer, 2016; Wijburg, Aalbers, & Heeg, 2018). Publicly traded SFR REITs extract profit from single-family housing in a much different way than investors did through mortgage debt and securitization before the housing crisis.

In the aftermath of the housing crisis, large institutional investment firms bought portfolios of heavily discounted distressed single-family houses, and a new institutional asset class was created: single-family rental housing (Fields, 2018; Mills, Molloy, & Zarutskie, 2019). Enabled by U.S. government policies, SFR REITs channel large amounts of global capital into the acquisition, leasing, and operation of SFR in search of returns for their shareholders through dividends and capital appreciation. SFR REITs have rapidly matured in their 7-year existence into a highly profitable real estate sector. SFR REITs have their origins in the housing crisis, but since then, the

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financialization of single-family rental housing has intensified; SFR REITs have grown quickly in size and in influence over local housing markets and are evolving into a stabilized ownership model.

Publicly traded SFR REITs operate very differently from small-scale investors and private equity firms, and they have significant market advantages. Chief among these advantages are highly favorable federal tax treatment and the ability to raise large sums of cash in the capital markets at lower rates than other types of investors. SFR REITs concentrate ownership of single-family rental housing units in specifically targeted markets to achieve important economies of scale. This concentration, combined with professional management and the use of digital technology, may allow SFR REITs to operate more efficiently than other types of investors. As public companies, SFR REITs have a fiduciary obligation to maximize shareholder wealth. This pressure to deliver financial returns combined with SFR REITs' near-oligopolistic power over some local housing markets in the context of an ongoing housing shortage and increasing demand for rental housing may lead to increased unaffordability and instability for households. The implications of SFR REITs as corporate landlords have heretofore gone largely unexamined, but given their power and potential impact, this new type of investor warrants critical attention.

SFR REITs link global capital, local housing markets, and households. The objective of this study is to empirically examine the implications of the investment strategies of publicly traded SFR REITs. The study begins with an examination of the nature and magnitude of single-family housing owned by the four largest publicly traded SFR REITs in the United States: Invitation Homes, American Homes 4 Rent, Front Yard Residential, and Tricon American Homes. Using data on all single-family residential properties in the Atlanta-Sandy Springs-Roswell, Georgia, metropolitan statistical area—one of the markets where SFR REITs control the most properties—this study uses exploratory spatial data analysis methods to examine and identify statistically significant spatial clusters of REIT-controlled SFR units. Then the study uses a generalized linear mixed model to examine the association of the physical characteristics of the properties, the socioeconomic characteristics of the neighborhoods, and the quality of the school districts in which they are located with ownership by each of the four SFR REITs. The implications of SFR REIT ownership of single-family rental housing for local housing markets and households are then discussed.

Background

The financialization of housing

Financialization, broadly construed, is the increasing dominance of finance and its resultant structural transformations of economies, firms, and households (Aalbers, 2019b). At the level of the economy, financialization represents a shift away from productive industries to speculative investments. As Harvey (1982) argues, when signs of overaccumulation in the primary circuit (e.g., production and manufacturing) emerge, capital switches to the secondary circuit, the built environment (e.g., housing), in search of higher profits. At the level of the firm, financialization takes place through prioritization of shareholder value for corporate governance. At the household level, it manifests through increased involvement of credit and debt markets in everyday life (Janoschka, Alexandri, Orozco Ramos, & Vives-Miro, 2019).

Housing is a key component of financialization. The financialization of housing represents a shift from the perception of housing as a lived, social space to an instrument for profitmaking, "a conflict between housing as home and as real estate" (Madden & Marcuse, 2016, p. 4). The United Nations Human Rights Council (2017, p. 3) similarly defines the financialization of housing as:

> [S]tructural changes in housing and financial markets and global investment whereby housing is treated as a commodity, a means of accumulating wealth and often as security for financial instruments that are traded and sold on global markets.

The financialization of housing transforms the quotidian spaces of dwelling into liquid and commodified assets (Janoschka et al., 2019). The financialization of housing is about understanding "the process by which financial actors, markets, practices, measurements, and narratives are increasingly becoming dominant" (Aalbers, 2019a, p. 377).

Financialization is a historically reoccurring process that originated in the 1970s (Aalbers, 2019b). In the years preceding the 2008 housing crisis, increased household mortgage debt bolstered the U.S. housing market. Increased access to mortgage debt increased competition for houses, resulting in higher property prices (Aalbers, 2008). Mortgage securitization—the pooling of mortgage debt and the sale of the cash flows to investors as securities (e.g., collateralized debt obligations) traded on secondary mortgage markets—further released the exchange value of otherwise illiquid single-family houses. The financialization of housing through mortgage debt and the securitization of that debt fueled the growth of the U.S. economy until house prices began to falter, triggering the global financial crisis. The housing crisis underscores the nature of boom and bust cycles of capital accumulation through real estate speculation by global financial actors and exposes the interdependencies of financial markets, real estate, and housing markets (Aalbers, 2016).

The short-term speculation that characterized the financialization of housing in the years preceding the global financial crisis was replaced with longer-term investment strategies in its aftermath (Wijburg et al., 2018). Moreover, post-crisis capital flows are further distinguished by the intensification of the link between local property and global flows of capital (Beswick et al., 2016). Institutional investors acquired large numbers of deeply discounted foreclosed and REO properties, often targeting low-value properties in low-income neighborhoods (Ellen, Madar, & Weselcouch, 2015; Immergluck, 2018; Immergluck & Law, 2014a, 2014b) and then converting those previously owner-occupied single-family houses into SFR, creating a new asset class (Fields, 2018). Waldron (2018, p. 208) describes this massive amount of global capital channeled into distressed property markets as "accumulation by repossession."

Pre-crisis financialization centered on homeownership; rental housing, particularly single-family rentals, is an important object of post-crisis financialization. Rental housing offers investors advantages of scale, well-established metrics, income streams, and a robust institutional framework (Fernandez & Aalbers, 2016). The financialization of rental housing has given rise to "global corporate landlords" (Beswick et al., 2016, p. 322) that, Fields and Uffer (2016) contend, magnify existing inequalities in housing affordability. Wijburg et al. (2018) identify REITs as central actors in the shift of financialization from speculation to long-term investment. The development of REITs often follows financial crises as a means of pooling investment risk, as the REIT regimes in Spain, Ireland, and France exemplify (Janoschka et al., 2019; Waldron, 2018; Wijburg, 2019). REITs can be viewed as a mechanism of state-sponsored value transfer from local housing markets (and households) to global capital markets, as a "network of social relations that create the legislative, institutional, political, and cultural conditions that enable the extraction of value and wealth from the urban built environment" (Waldron, 2018, p. 216).

Real estate investment trusts

A REIT is a firm engaged in real estate investment that acts as a pass-through entity, distributing its taxable earnings and gains to its shareholders (Brueggeman & Fisher, 2011). In the United States, REITs were first authorized by U.S. Public Law 86–779, § 10(k), Section 856–858, enacted in 1960 and subsequently amended several times. Under U.S. law, a REIT is a firm for which the beneficial ownership is held through transferable shares. To qualify as a REIT for tax purposes, a firm must pay out at least 90% of its taxable income to shareholders. Equity REITs own and manage real property, often specializing in a specific property type (e.g., apartment buildings, shopping centers, etc.). Some REITs are privately held; others are publicly traded. Individuals, pension funds, and large corporate investors may buy shares of a REIT, earning dividends from the stream of income and capital appreciation generated from the real estate.

In the wake of the housing crisis, a new type of REIT emerged: one that focuses specifically on SFR. The five largest publicly traded SFR REITs in the United States, in order of size, are: Invitation Homes Inc., controlled by the multinational private-equity firm The Blackstone Group; American Homes 4 Rent; Front Yard Residential Corporation, known until 2017 as Altisource Residential Corporation; Tricon American Homes, a subsidiary of a Canadian firm, Tricon Capital Group Inc.; and Reven Housing REIT Inc.[1] Shares of Invitation Homes, American Homes 4 Rent, and Front Yard Residential trade on the New York Stock Exchange; shares of Tricon Capital Group are traded on the Toronto Stock Exchange; and shares of Reven Housing REIT are traded on the NASDAQ stock market.

In their short history, SFR REITs have been profitable; however, the SFR REIT sector is still developing, and its long-term viability as a competitive alternative to private SFR ownership is uncertain. Several factors contribute to the profitability of SFR REITs. An undersupply of housing combined with increasing rates of households seeking rental housing has intensified demand for rental housing. That demand, rising mortgage rates, and the removal of some tax incentives for homeownership portend continued housing cost inflation, or rising rents. Moreover, because of REITs' highly favorable tax treatment—they are generally exempt from federal taxes as long as they retain their status under IRS regulations—they may offer higher yields for investors than stocks.

Little empirical research has addressed the spatial aspects of the financialization of single-family rental housing through SFR REIT ownership in the United States. An exception is the work of Chilton, Silverman, Chaudhry, and Wang (2018) that examines REIT ownership of SFR in six counties in the Nashville, Tennessee, area. The authors find SFR REIT-owned properties to be geographically concentrated. They find spatial concentrations to be located in places with newer houses and more highly educated residents with high incomes. This is somewhat contrary to Immergluck's (2018) study of SFR (owned by both private and public entities) in which he finds low-value REO sales to be concentrated in lower-income neighborhoods. But the Chilton et al. (2018) conclusions are more in line with those of Immergluck and Law (2014b), who find that the location of REO sales shifted between 2008 and 2011 as more foreclosed properties became available in less distressed neighborhoods.

Data and methods

The Atlanta-Sandy Springs-Roswell, Georgia, metropolitan statistical area (MSA) was selected as the geographic focus of this study because it is a region where SFR is highly concentrated and has increased rapidly in number (Immergluck, 2018). Publicly traded SFR REITs are particularly active in the Atlanta MSA. According to their 2018 SEC filings, more than 15.5% of all SFR owned by the four largest SFR REITs in the United States is in the Atlanta area. The study focuses on properties owned by the four largest publicly traded SFR REITs: Invitation Homes, American Homes 4 Rent, Front Yard Residential, and Tricon American Homes.[2]

The entire 30-county MSA is the focus of the exploratory spatial data analysis (ESDA). This study examines all single-family houses owned by the four largest SFR REITs in the Atlanta MSA as of December 31, 2018. Property tax records for all single-family residential properties located in all 30 counties were obtained from CoreLogic, which compiles and maintains property data. The data include characteristics of the houses as well as the names and addresses of the owners. Using the list of subsidiary firm names included in each SFR REIT's form 10-K filings (2013–2018) as well as matching the mailing addresses listed to a list of addresses used by each SFR REIT, properties owned by each of the four SFR REITs were identified. These point data were geocoded and spatially associated with the census tract and school district in which the properties are located and aggregated to a regular one-mile-by-one-mile grid using geographic information systems software. The resultant dataset includes 1,550,499 single-family residential properties. These data were then used in the ESDA to examine comprehensively the locations and concentrations of SFR overall.

The ESDA uses global and local indicators of spatial autocorrelation to examine the extent of statistically significant spatial clusters of SFR REIT-owned properties. A test for measuring global spatial autocorrelation is the Moran's *I* statistic (Anselin, 1988; Getis, 2010; Moran, 1950). The Moran's *I* statistic provides a single measure of the degree of clustering present in a set of spatially located observations. A local indicator of spatial association (LISA) is used to determine the locations and spatial extent of clusters of SFR REIT-owned properties (Anselin, 1995). LISA statistics provide a measure—per areal unit—of the tendency of one area to have a rate of SFR REIT ownership correlated with the rate in nearby areas. LISA statistics indicate the spatial location of statistically significant local clusters of SFR REIT-owned properties as well as spatial outliers—areas with high rates of SFR REIT-owned properties located adjacent to areas with low rates and vice versa. Moran's *I* and LISA statistics were calculated for all SFR REIT-owned properties aggregated to a regular one-mile-by-one-mile grid, then separately for each of the four SFR REITs to examine differences in the spatial clustering of SFR REIT-owned properties among firms.

After establishing the spatial locations and clustering of the SFR REIT-owned properties, the study then uses a generalized linear mixed model to identify the determinants of REIT-owned SFR considering property characteristics, neighborhood characteristics, and school district quality. The multivariate analysis focuses on single-family housing in a subset of the 20 most populous counties. These counties, noted in Table 2, contain 96% of single-family houses in the 30-county MSA (U.S. Census Bureau, 2016). Each observation was matched by census tract to demographic and socio-economic data obtained from the 2017 American Community Survey 5-year estimates and to foreclosure rate data (2007 through mid-2008) obtained from the U.S. Department of Housing and Urban Development Office of Policy Development and Research. Additionally, each observation was matched by its high school district to average SAT scores in 2017 obtained from the Georgia Department of Education. And the distance to the Atlanta central business district (CBD) was calculated for each property. Properties with missing data (4.2%) were not included in the analysis.

The unit of analysis in the multivariate portion of this study is the single-family house (N = 1,485,124). The dependent variable is defined as a discrete variable that equals 1 if the property is owned by a SFR REIT and 0 otherwise. Individual house characteristics include the log of the assessed property value, house floor area, and floor-area ratio (FAR); distance to the Atlanta CBD; and the time period in which the house was built. Characteristics of the neighborhood (census tract) in which each house is located include the log of the median house value; the percentage of non-Hispanic black, Asian, and Hispanic residents; the percentage of families with incomes below the poverty level; the percentage of the population younger than 18 (children); and estimated foreclosure rate (i.e., foreclosure starts for 2007 through mid-2008 divided by the number of mortgages). The quality of the school district in which each house is located is measured by whether a district's average SAT score is in the highest quintile of all Atlanta-area districts. A generalized linear mixed model was used to account for the correlation of observations within geographic levels (i.e., the census tract level and school district level).

SFR REIT ownership of single-family rental housing

Invitation Homes, American Homes 4 Rent, Front Yard Residential, and Tricon American Homes are particularly active investors in SFR nationally and in the Atlanta metropolitan area, which each firm identifies as one of its core markets (American Homes 4 Rent, 2019; Front Yard Residential Corporation, 2019; Invitation Homes Inc., 2019; Tricon Capital Group Inc., 2019). These SFR REITs concentrate their operations in markets with forecasted population, employment, and household formation growth as well as a persistent undersupply of housing, aiming for markets with potential for growth in rental rates and house price appreciation.

SFR REITs have grown through the continued acquisition of single-family houses and have further consolidated their power through the acquisition of other firms. In 2015, two large SFR REITs, Starwood Waypoint Residential Trust and the privately held REIT Colony American Homes, merged to form Colony Starwood Homes, a public company with an asset value of $7.7 billion (Gopal & Perlberg, 2015). In 2016, American Homes 4 Rent merged with another SFR REIT, American Residential Properties, to form the largest SFR REIT at that time (Lane, 2016). Invitation Homes began operating in 2012 and incorporated in 2016. It completed its initial public offering of common stock in 2017 and later that year completed a merger with Colony Starwood Homes to eclipse American Homes 4 Rent as the largest SFR owner and operator (Invitation Homes Inc., 2018). Also in 2017, Tricon Capital Group acquired Silver Bay Realty Trust for $1.4 billion (Lane, 2017). As the dust settled from this spate of mergers, Invitation Homes emerged as the largest publicly traded SFR REIT in the United States, the owner of more than 80,000 SFR units (Invitation Homes Inc., 2019). Invitation Homes and American Homes 4 Rent together own 80% of the REIT-owned single-family houses in the United States.

As of December 31, 2018, SFR REITs owned more than 165,000 SFR units in the United States (American Homes 4 Rent, 2019; Front Yard Residential Corporation, 2019; Invitation Homes Inc., 2019; Reven Housing REIT Inc., 2019; Tricon Capital Group Inc., 2019). Table 1 presents the numbers of SFR units owned by each of the five SFR REITs (including Reven Housing REIT). According to the firms' SEC filings, SFR REITs owned only 2,698 single-family houses in the Atlanta area in 2013, a number that grew by the end of 2018 to 25,628, or 1.7% of all single-family housing in the MSA. Invitation Homes owns 12,250 properties, or nearly half of the SFR owned by REITs in the Atlanta area. American Homes 4 Rent, Front Yard Residential, and Tricon American Homes own roughly equal numbers of SFR units in the Atlanta area: 4,779, 4,361, and 4,191, respectively. Although SFR REITs own a small percentage of single-family housing overall in the United States, they are disproportionately concentrated in some local housing markets, such as the Atlanta metropolitan area.

The local spatial concentrations of SFR REIT-owned properties

The nature and magnitude of single-family houses owned by SFR REITs vary across the metropolitan landscape of Atlanta. The number of SFR REIT-owned properties ranges from as few as 0 in several counties to over 6,000 in Gwinnett County. Table 2 presents the numbers of single-family residential properties and SFR REIT-owned properties by county.[3]

SFR REIT-owned properties were mapped and aggregated to their respective census tracts. Figure 1 (left) presents the percentage of single-family housing stock owned by SFR REITs within each census tract in the MSA. The rates of SFR REIT ownership range from 0% in many tracts to 8.7%. Census tracts with the highest rates of SFR REIT ownership form a ring around the city of Atlanta, covering much of the inner-ring suburban area. The highest rates of SFR REIT ownership are in south and eastern Gwinnett and DeKalb counties (southeast of the city) as well as Paulding, Douglas, and Cobb counties (west of the city). Relatively devoid of substantial concentrations of SFR REIT ownership is the core of the region: the city of Atlanta and northern Fulton and DeKalb counties.

The property-level point data were aggregated to a one-mile-by-one-mile regular grid, and the percentages of SFR units owned by REITs per grid cell were calculated. Figure 1 (right) presents the

Table 1. Single-family rental housing (SFR) owned by real estate investment trusts (REITs).

	Invitation Homes		American Homes 4 Rent		Front Yard Residential		Tricon American Homes		Reven Housing REIT		All SFR REITs	
Year	Atlanta	U.S.	Atlanta	U.S.	Atlanta	U.S.	Atlanta	U.S.	Atlanta	U.S.	Atlanta	U.S.
2013	1,163	5,325	1,461	23,268	0	0	65	3,256	9	177	2,698	32,026
2014	2,516	11,417	2,257	34,599	165	3,960	799	5,030	9	395	5,746	55,401
2015	2,475	12,881	2,802	38,780	1,753	6,516	891	7,100	9	527	7,930	65,804
2016	7,517	48,298	4,039	47,303	2,661	8,603	1,062	7,765	9	624	15,288	112,593
2017	12,428	85,570	4,521	50,929	3,123	12,574	3,648	15,109	47	799	23,767	164,981
2018	12,250	80,807	4,779	50,838	4,361	15,445	4,191	17,414	47	965	25,628	165,469

Sources: The data were reported in the 10-K forms and annual reports filed by each of the SFR REITs.
(American Homes 4 Rent, 2014, 2015, 2016, 2017, 2018, 2019; Colony Starwood Homes, 2016; Front Yard Residential Corporation, 2015, 2016, 2017, 2018, 2019; Invitation Homes Inc., 2017, 2018, 2019; Reven Housing REIT Inc., 2014, 2015, 2016, 2017, 2018, 2019; Starwood Waypoint Residential Trust, 2014, 2015; Tricon Capital Group Inc., 2014, 2015, 2016, 2017, 2018a, 2019)

Table 2. SFR REIT-owned single-family housing by county in the Atlanta metropolitan area.

				SFR REIT-owned Properties				
			Single-family	All REITs	Invitation Homes	American Homes 4 Rent	Front Yard Residential	Tricon American Homes
No.	County	Incl. in multi-variate analysis	#	#	#	#	#	#
1	Barrow	X	22,651	243	102	85	11	45
2	Bartow	X	27,456	85	52	0	28	5
3	Butts		6,552	0	0	0	0	0
4	Carroll	X	27,498	83	9	1	4	69
5	Cherokee	X	73,435	1,447	750	524	16	157
6	Clayton	X	75,359	1,207	123	27	866	191
7	Cobb	X	190,887	3,228	1,789	829	195	415
8	Coweta	X	42,883	229	152	63	9	5
9	Dawson		8,224	1	1	0	0	0
10	DeKalb	X	168,914	2,703	1,186	51	986	480
11	Douglas	X	40,637	1,450	759	176	192	323
12	Fayette	X	37,113	176	117	23	24	12
13	Forsyth	X	65,573	559	368	146	16	29
14	Fulton	X	220,512	1,967	870	156	670	271
15	Gwinnett	X	226,792	6,129	3,744	1,423	321	641
16	Hall	X	49,904	220	150	56	13	1
17	Haralson		7,177	0	0	0	0	0
18	Heard		2,020	0	0	0	0	0
19	Henry	X	69,651	2,002	827	540	154	481
20	Jasper		4,063	0	0	0	0	0
21	Lamar		4,531	0	0	0	0	0
22	Meriwether		5,973	0	0	0	0	0
23	Morgan		4,959	0	0	0	0	0
24	Newton	X	33,814	830	417	9	141	263
25	Paulding	X	47,058	1,776	745	474	175	382
26	Pickens		10,131	0	0	0	0	0
27	Pike		4,790	0	0	0	0	0
28	Rockdale	X	26,255	592	313	57	92	130
29	Spalding	X	18,784	12	0	0	11	1
30	Walton	X	26,903	242	149	9	17	67
	Total		1,550,499	25,181	12,623	4,649	3,941	3,968

percentage of SFR REIT-owned properties per square mile. The percentage of single-family houses owned by SFR REITs varies from 0% to 35.3%, suggesting that at this smaller-scale spatial resolution, SFR REITs are having a concentrated influence on the tenure options of households. The highest rates of SFR owned by REITs per square mile are found in Gwinnett, Douglas, Cherokee, and Paulding counties—all suburban counties surrounding the urban core. The square mile with the highest rate of SFR REIT property ownership is in Paulding County; of the 170 single-family houses located there, 60 are owned by SFR REITs. Eighty-seven percent of the SFR units in that cluster are new construction. They were built in 2014 and are owned by American Homes 4 Rent. In fact, the areas with the second- and third-highest percentages of SFR are also places with relatively new SFR (built in 2013); Invitation Homes owns the majority of the SFR in these two areas.

SFR REIT-owned properties are unevenly spatially distributed within the Atlanta metropolitan area. ESDA methods statistically test this observation and then identify the specific places where SFR REIT-owned properties are clustered. First, a test of global spatial autocorrelation (i.e., spatial clustering), the Moran's I statistic, was calculated for all SFR REIT-owned properties per square mile area in the MSA, using a first order queen contiguity spatial weights matrix in GeoDa software. The Moran's I test statistic reveals whether areas with high rates of SFR REIT-owned properties are located in close proximity to other similar areas. The Moran's I statistic of 0.4743 is highly statistically significant ($p < .001$); SFR owned by REITs is highly spatially clustered. Moran's I statistics for the properties owned by the four SFR REITs individually also indicate that the SFR

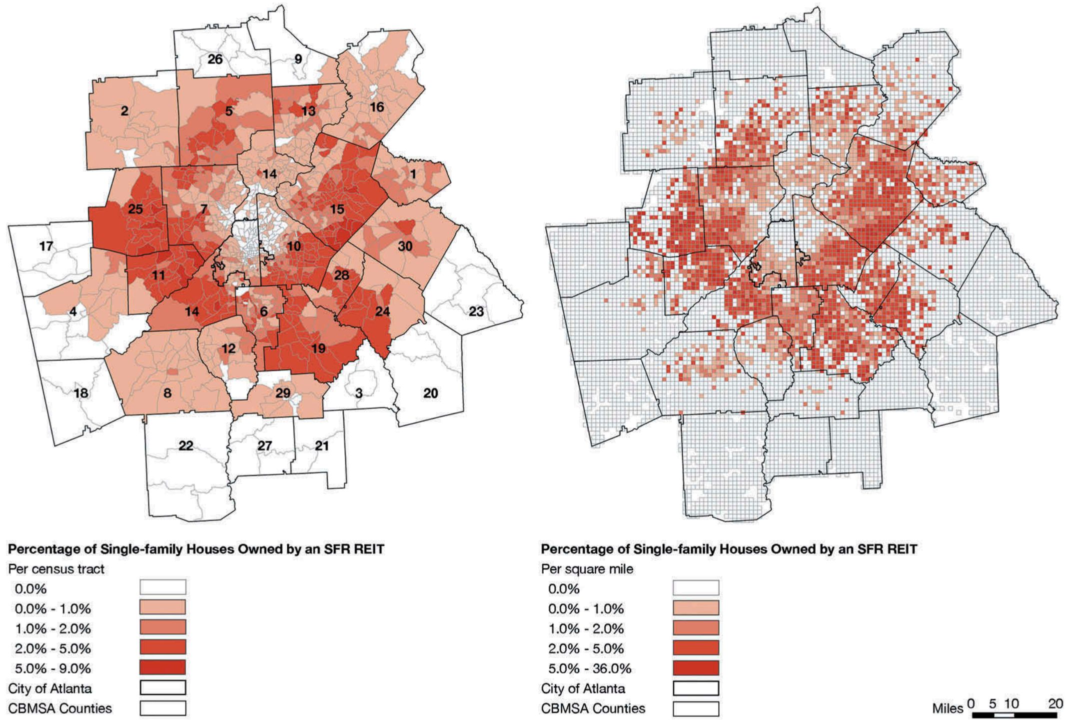

Figure 1. Percentage of single-family houses owned by a SFR REIT per census tract (left) and square mile (right) in the 30-county Atlanta area.

Note: Counties are indicated by numbers and correspond to those in Table 2.

units they each own are highly spatially clustered as well ($p < .001$), i.e., 0.3684, 0.2497, 0.4086, and 0.2862, respectively. Table 3 presents the results of the global spatial autocorrelation analysis. An examination of the z-values allows us to compare the intensity of clustering among the four SFR REITs. The spatial clustering of Front Yard Residential (z-value = 70.86) and Invitation Homes (z-value = 64.17) is greater than that of Tricon American Homes (z-value = 52.26) and American Homes 4 Rent (z-value = 48.41). This finding is not surprising; it reveals in part the consistency of the strategies the SFR REITs use to determine the types of properties and locations they target for acquisition. The second part of this study, described below, examines the property and neighborhood characteristics associated with each firm's SFR portfolio.

To examine the locations of statistically significant spatial clusters, a LISA statistic for each square mile for the percentage of SFR REIT-owned properties as well as the percentage of properties owned by the four SFR REITs individually were calculated, and the spatial clusters were mapped. Figure 2 presents the statistically significant spatial clusters ($p < .05$) of all SFR REIT-owned properties in the Atlanta MSA. The red areas indicate square miles where high rates of SFR REIT ownership are next to other areas with

Table 3. Results of the global spatial autocorrelation analysis (Moran's *I*).

	Moran's *I*	SD	*z*-value	Pseudo *p*-value
All SFR REITs	0.4743	0.0056	84.601	0.001
Invitation Homes	0.3684	0.0057	64.174	0.001
American Homes 4 Rent	0.2497	0.0052	48.411	0.001
Front Yard Residential	0.4086	0.0058	70.855	0.001
Tricon American Homes	0.2862	0.0055	52.256	0.001

SD = standard deviation; determined by 999 permutations.

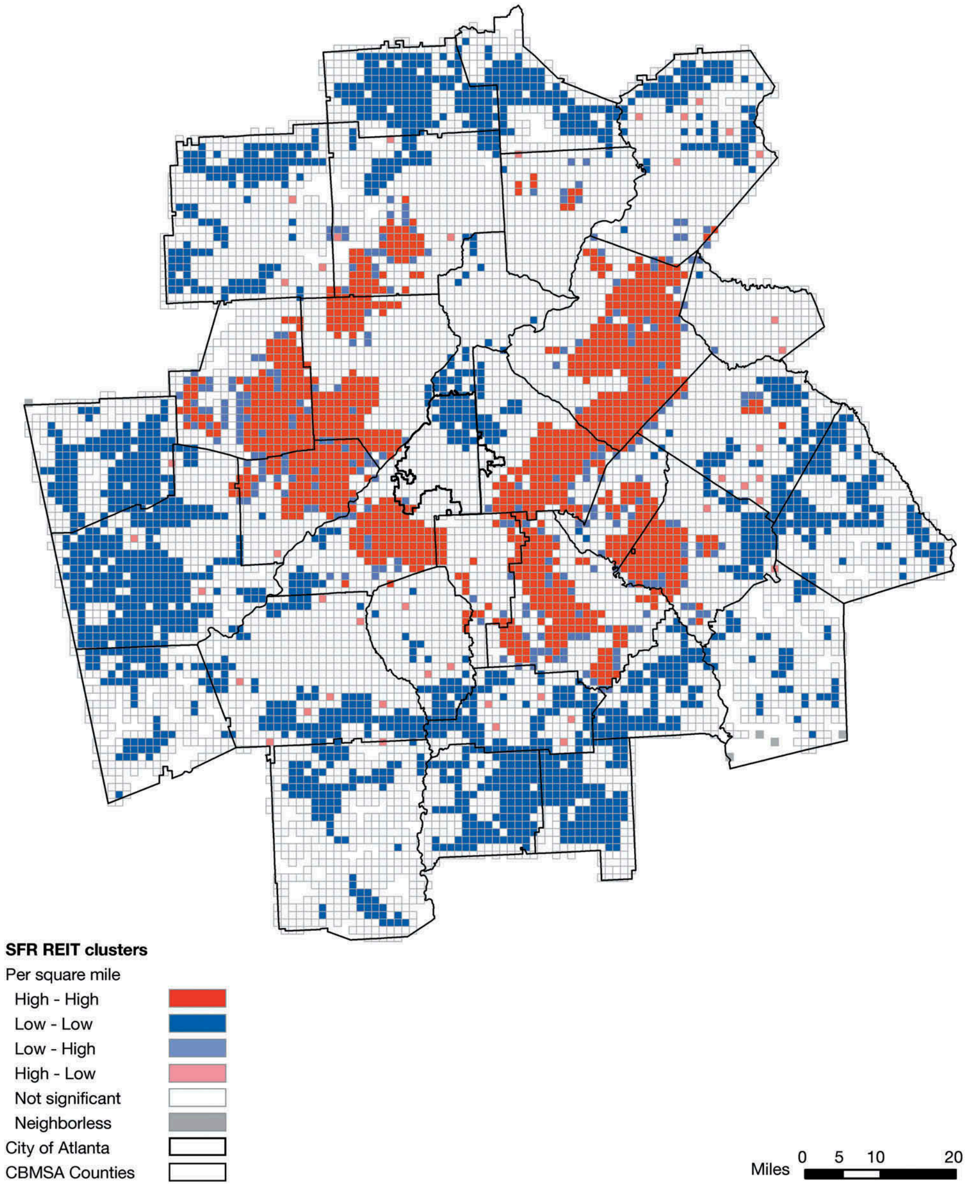

Figure 2. Statistically significant spatial clusters of SFR REIT-owned single-family houses ($p < .05$) in the 30-county Atlanta area.

similarly high rates. The spatial clusters form a U-shaped belt extending from Cherokee County northwest of the city counterclockwise to Gwinnett County northeast of the city. Although there are SFR REIT-owned properties in the city proper, there are no spatial clusters there. This is somewhat contrary to Immergluck's (2018) finding of increases in SFR in the city of Atlanta, but it reveals that SFR REIT ownership is most concentrated outside the city limits. Dark blue squares indicate places with low rates of SFR REIT-owned homes located near other areas with low rates, which encompasses much of the outer ring of counties. The light blue and pink areas highlight outliers—areas with low rates of SFR REIT ownership next to areas with high rates (and vice versa). Outlying low-high areas are found primarily directly adjacent to large clusters of SFR REIT-owned properties. High-low areas are located in isolated pockets throughout the band outside the contiguous concentrations of SFR REIT ownership. These outliers indicate that while SFR REIT ownership is highly clustered, small pockets of SFR REIT-owned houses are also found outside those clusters.

LISA statistics were calculated for each of the four SFR REITs individually. These maps are presented in Figure 3: Invitation Homes (upper left), American Homes 4 Rent (upper right), Front Yard Residential (lower left), and Tricon American Homes (lower right). The pattern of spatial clusters of Invitation Homes–owned SFR resembles the pattern for all SFR REITs because Invitation Homes owns such a large percentage of the total SFR. Invitation Homes–owned SFR is clustered in counties west and east of the city of Atlanta. SFR owned by American Homes 4 Rent is clustered in eastern Gwinnett County as well as Paulding, Cobb, and Cherokee counties. SFR owned by Front Yard Residential is more intensely clustered than other REITs', as indicated by the Moran's *I* score comparisons discussed above. The spatial clusters of Front Yard Residential–owned SFR form a dense pattern in southern DeKalb County, eastern south Fulton County, and almost the entirety of Clayton County. This pattern is markedly different from those of Invitation Homes and American Homes 4 Rent. The SFR controlled by Tricon American Homes clusters in Paulding, Cobb, and Douglas counties and in the counties southeast of the city of Atlanta.

A multivariate analysis of SFR REIT-owned properties

The study uses a generalized linear mixed model to estimate the association of the characteristics of single-family residential properties and the characteristics of the neighborhoods and school districts in which they are located with SFR REIT ownership. Table 4 presents the mean and standard deviation of the independent variables used in the regression analysis for all single-family residential properties and SFR REIT-owned properties, as well as SFR owned by Invitation Homes, American Homes 4 Rent, Front Yard Residential, and Tricon American Homes.

Single-family houses owned by SFR REITs are smaller on average than single-family houses overall in the 20 most populous Atlanta-area counties (1,895 sq. ft. and 2,089 sq. ft., respectively). Of the four REITs, American Homes 4 Rent owns the largest houses (2,154 sq. ft.), and Front Yard Residential the smallest (1,521 sq. ft.), on average. The average FAR of the properties ranges from 0.133 (Front Yard Residential) to 0.193 (American Homes 4 Rent); the average FARs for all four REITs are higher than the average for all single-family residential properties. The distance to the CBD from SFR REIT-owned properties is similar to that of all single-family residential properties (22.5 and 22.7 miles, respectively); properties owned by American Homes 4 Rent are farthest (25.5 miles), on average, while those owned by Front Yard Residential are closest (16.4 miles).

The age of the houses owned by the four REITs differs substantially from that of single-family houses overall in the Atlanta area. Overall, 31.0% of houses were built after 1999, 49.4% were built from 1970 to 1999, 16.3% were built from 1940 to 1969, and the remainder (3.3%) were built before 1940. More than 97% of the houses owned by Invitation Homes, American Homes 4 Rent, and Tricon American Homes were built after 1969. All of the houses owned by American Homes 4 Rent were built after 1969, and 61.0% were built after 1999. The houses owned by Front Yard Residential are substantially older on average than those owned by the other three REITs—77.1% were built from 1970 to the present, and only 18.8% were built after 1999.

The neighborhoods of the four REITs' properties differ from one another on average in median house values. The median house value in the census tracts of SFR REIT-owned properties is lower than that of houses overall in the Atlanta area. Of the four REITs, the median neighborhood house value is the lowest in neighborhoods of Front Yard Residential–owned properties and highest in those of American Homes 4 Rent–owned properties. The racial and ethnic compositions of the neighborhoods in which the four REITs' properties are located also differ substantially. American Homes 4 Rent properties are located, on average, in neighborhoods with the lowest percentage of non-Hispanic black residents and the highest percentages of Asian and Hispanic residents.

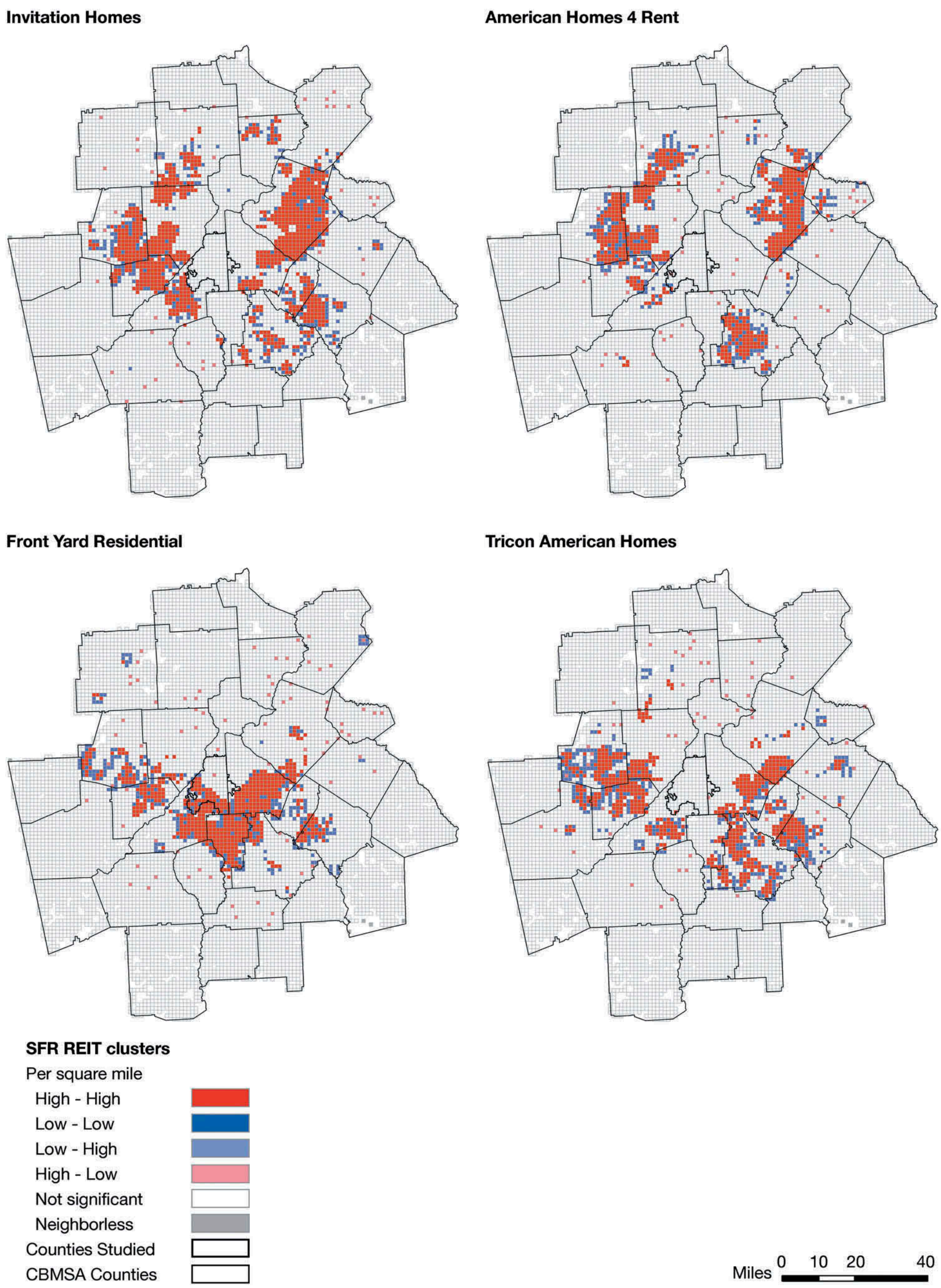

Figure 3. Statistically significant spatial clusters of SFR REIT-owned single-family houses ($p < 0.05$) in the 30-county Atlanta area. SFR owned by Invitation Homes (upper left), American Homes 4 Rent (upper right), Front Yard Residential (lower left), and Tricon American Homes (lower right).

Conversely, Front Yard Residential properties are in neighborhoods with the highest percentage of black residents and the lowest percentages of Asian and Hispanic residents. The percentage of families living in poverty is highest in the neighborhoods of Front Yard Residential-owned properties and lowest in the neighborhoods of those owned by American Homes 4 Rent. The percentage of

Table 4. Descriptive statistics.

	All SF Properties		SFR REIT-owned		INVH-owned		AMH-owned		RESI-owned		TAH-owned	
	N = 1,485,124		N = 25,174		N = 12,622		N = 4,646		N = 3,930		N = 3,967	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Property Characteristics												
Log of house floor area (100 sq. ft.)	3.04	0.43	2.94	0.31	2.99	0.30	3.07	0.28	2.72	0.27	2.86	0.26
Log of FAR	−2.11	1.07	−1.86	0.86	−1.86	0.81	−1.65	0.74	−2.02	0.95	−1.93	0.97
Distance to CBD	22.69	10.98	22.50	8.22	23.41	8.07	25.45	6.66	16.39	7.95	22.21	7.57
House constructed before 1940	0.03	0.18	0.00	0.05	0.00	0.05	0.00	0.01	0.01	0.10	0.00	0.04
House constructed 1940–1969	0.16	0.37	0.05	0.22	0.03	0.16	0.00	0.03	0.22	0.41	0.03	0.16
House constructed 1970–1999	0.49	0.50	0.51	0.50	0.51	0.50	0.39	0.49	0.58	0.49	0.58	0.49
House constructed in 2000 and later	0.31	0.46	0.43	0.50	0.46	0.50	0.61	0.49	0.19	0.39	0.40	0.49
Neighborhood Characteristics												
Log of median house value ($1,000)	5.20	0.51	5.02	0.34	5.09	0.31	5.17	0.28	4.70	0.33	4.93	0.28
Percentage non-Hispanic black	31.65	28.89	42.36	28.50	38.22	27.41	30.24	21.29	65.53	26.44	46.70	27.55
Percentage Asian	5.08	7.03	3.82	5.19	4.15	5.44	4.66	5.53	2.48	4.02	3.09	4.64
Percentage Hispanic	9.53	10.05	10.01	9.02	10.51	9.58	10.75	7.86	8.38	8.72	9.13	8.40
Percentage families in poverty	9.48	7.95	10.18	6.93	9.21	6.21	7.90	5.19	15.11	8.91	11.02	6.18
Percentage population under 18	25.62	4.58	26.70	3.91	26.61	3.83	27.17	3.29	26.33	4.81	26.82	3.77
Percentage of foreclosures, 2008	5.26	2.85	6.30	2.43	5.81	2.22	5.06	1.75	8.69	2.24	6.91	2.12
School District Characteristics												
Avg. SAT score in highest quintile	0.396	0.489	0.455	0.498	0.532	0.499	0.628	0.483	0.144	0.351	0.315	0.464

Note: SD = standard deviation; INVH = Invitation Homes; AMH = American Homes 4 Rent; RESI = Front Yard Residential; TAH = Tricon American Homes.

children in the neighborhoods of SFR REIT properties is higher than that for the region overall, yet it differs by less than 1% among the four REITs.

Substantial portions of large institutional investors' initial SFR portfolios were purchased in bulk through policies such as the Federal Housing Finance Agency's REO-to-rental program. The rate of foreclosure starts from 2007 through mid-2008, per census tract, is included as an independent variable in order to estimate the association between neighborhoods that were negatively affected by foreclosures relatively early in the housing crisis—neighborhoods where high rates of distressed housing sales took place—and REIT investment. Summary statistics indicate that the rates of foreclosure were lowest in the neighborhoods of American Homes 4 Rent properties and highest in those of Front Yard Residential properties.

Finally, the measure of school quality used in this study—whether the house is located in a school district with an average SAT score in the highest quintile—differs substantially among the properties owned by the four REITs. Only 14.4% of properties owned by Front Yard Residential are located in the top school districts, whereas 62.8% of the properties owned by American Homes 4 Rent are. For Invitation Homes and Tricon American Homes, the figures are 53.2% and 31.5%, respectively.

A generalized linear mixed model with a binary distribution and a logit link was run using the dataset of all single-family residential properties in the 20-county study area. Separate models were run to test the association of the independent variables with SFR REIT-owned properties and those owned by each of the four SFR REITs separately. Regression results are presented in Table 5. Overall, smaller houses are more likely to be owned by SFR REITs than larger houses, as are houses with larger FARs—houses that are relatively large compared to their lots, controlling for characteristics of the houses' neighborhoods and school districts. Properties farther from the Atlanta CBD are more likely to be owned by a SFR REIT; however, the odds ratio is very close to 1 (i.e., 1.010), indicating that the increase in odds ratio associated with a one-mile increase in distance is very small, *ceteris paribus*. Houses built after 1999 are more likely to be owned by SFR REITs than older houses, a finding that is highly statistically significant. Single-family houses located in neighborhoods (i.e., census tracts) with lower overall house values are more likely to be owned by a REIT. The percentages of non-Hispanic black and Asian residents, as well as the percentages of families living in poverty, population under 18, and foreclosure starts (2007 through mid-2008) are statistically significant; however, the odds ratios are very close to 1, indicating that the increase in odds associated with a 1% increase in each of the variables is very small. Lastly, results indicate that houses located in school districts with average SAT scores in the highest quintile of all districts are more likely to be owned by a SFR REIT than those that are not. The odds of a SFR REIT owning a house located in one of the top school districts are 2.1 times those of one that is not.

When the results of the logistic regression analysis for each of the four SFR REITs are examined, distinct profiles of SFR owned by the REITs emerge. The four SFR REIT portfolios differ substantially in house size (floor area) and the time period in which the house was built, as well as neighborhood median house value, foreclosure start rate, and school district quality.

Smaller houses are more likely to be owned by each of the four REITs. The association of house floor area is more pronounced for Front Yard Residential–owned houses than for those owned by American Homes 4 Rent. A 100-sq.-ft. increase in floor area decreases the odds that the house is owned by Front Yard Residential by 80.8% and decreases the odds that it is owned by American Homes 4 Rent by 57.0%. Houses built after 1999 are more likely to be owned by Invitation Homes, American Homes 4 Rent, and Tricon American Homes than houses built before 1940, from 1940 to 1969, and from 1970 to 1999, findings that are highly statistically significant. This association differs for Front Yard Residential; the odds that a house is owned by Front Yard Residential are 1.6 times greater for houses built from 1970 to 1999 than for houses built after 1999.

Although houses in neighborhoods with lower house values are more likely to be owned by a SFR REIT, this association is not statistically significant for houses owned by American Homes 4 Rent. The odds ratio is statistically significant and lower for houses owned by Front Yard Residential and

Table 5. Results of the generalized linear mixed models (N = 1,485,124).

	SFR REIT-owned (0, 1)			INVH-owned (0, 1)			AMH-owned (0, 1)			RESI-owned (0, 1)			TAH-owned (0, 1)		
Variables	Coeff.	Sig.	Odds Ratio	Coeff.	Sig.	Odds Ratio	Coeff.	Sig.	Odds Ratio	Coeff.	Sig.	Odds Ratio	Coeff.	Sig.	Odds Ratio
Property Characteristics															
Log of house floor area (100 sq. ft.)	−1.185	0.01	0.306	−1.118	0.01	0.327	−0.845	0.01	0.429	−1.648	0.01	0.192	−1.592	0.01	0.204
Log of FAR	0.289	0.01	1.335	0.345	0.01	1.413	0.388	0.01	1.474	0.146	0.01	1.157	0.278	0.01	1.321
Distance to CBD	0.010	0.05	1.010	0.019	0.05	1.019	0.030	0.01	1.030	−0.011		0.989	0.023	0.01	1.023
House constructed before 1940	−2.322	0.01	0.098	−2.476	0.01	0.084	−4.259	0.01	0.014	−1.102	0.01	0.332	−3.232	0.01	0.039
House constructed 1940–1969	−1.415	0.01	0.243	−1.929	0.01	0.145	−4.926	0.01	0.007	−0.109		0.896	−2.100	0.01	0.122
House constructed 1970–1999	−0.242	0.01	0.785	−0.281	0.01	0.755	−0.608	0.01	0.545	0.475	0.01	1.609	−0.099	0.05	0.906
Neighborhood Characteristics															
Log of median house value ($1,000)	−0.782	0.01	0.458	−0.485	0.01	0.616	−0.336		0.715	−0.872	0.01	0.418	−0.718	0.01	0.488
Percentage non-Hispanic black	0.012	0.01	1.012	0.012	0.01	1.012	0.023	0.01	1.023	0.019	0.01	1.019	0.020	0.01	1.021
Percentage Asian	−0.009	0.05	0.991	−0.020	0.05	0.980	0.000		1.000	−0.025	0.01	0.975	0.003		1.003
Percentage Hispanic	−0.005	0.10	0.995	0.006	0.10	1.006	0.009		1.009	−0.002		0.998	0.005		1.005
Percentage families in poverty	−0.027	0.01	0.973	−0.033	0.01	0.968	−0.048	0.01	0.953	−0.014	0.01	0.986	−0.030	0.01	0.971
Percentage population under 18	0.024	0.01	1.024	0.009	0.01	1.009	0.037	0.01	1.038	0.008		1.008	0.010		1.010
Percentage of foreclosures, 2008	0.084	0.01	1.088	0.040	0.01	1.040	0.014		1.014	0.134	0.01	1.143	0.123	0.01	1.131
School District Characteristics															
Avg. SAT score in highest quintile	0.765	0.10	2.149	0.956	0.10	2.601	1.364	0.10	3.910	0.352		1.422	0.899		2.457
Constant	1.822	0.01	6.185	−0.176	0.01	0.838	−4.540	0.01	0.011	1.031		2.804	−0.179		0.836
Random effects: School district	1.130			1.626			3.552			0.475			2.147		
Random effects: Census tract	0.243			0.280			0.509			0.186			0.230		

Note: Coeff. = coefficient; Sig. = statistical significance; INVH = Invitation Homes; AMH = American Homes 4 Rent; RESI = Front Yard Residential; TAH = Tricon American Homes.

Tricon American Homes, and for SFR REITs overall, than it is for houses owned by Invitation Homes.

The foreclosure start rate at the beginning of the housing crisis is positively associated with SFR REIT ownership overall and for each of the four REITs. The increase in odds associated with a 1% increase in the foreclosure rate is higher for properties owned by Front Yard Residential and Tricon American Homes, with odds ratios of 1.143 and 1.131, respectively, than it is for Invitation Homes and SFR REITs overall, with odds ratios of 1.040 and 1.088, respectively. The foreclosure rate is not statistically significantly associated with properties owned by American Homes 4 Rent.

School district quality is statistically significantly associated only with houses owned by Invitation Homes and American Homes 4 Rent. The odds of Invitation Homes owning a house located in one of the top school districts are 2.6 times those of one that is not, and the odds of American Homes 4 Rent owing a house in one of the top school districts are 3.9 times those of one that is not. School district quality is not a statistically significant determinant of houses owned by Front Yard Residential and Tricon American Homes.

Discussion

The financialization of single-family housing has transitioned from investment in mortgage debt and securitization of that debt to longer-term profitmaking from rental revenue. In the post-housing crisis era, this is manifested in the concentrated ownership of high numbers of SFR units by large publicly traded SFR REITs. After continued acquisition of single-family houses and a cascade of firm mergers, at the end of 2018 publicly traded REITs owned more than 165,000 SFR units, over 25,600 in the Atlanta area alone. Although SFR REITs own a small percentage of single-family housing overall, the SFR they control is highly spatially clustered. Whereas SFR REITs are interested in maintaining a geographically diversified portfolio to reduce risk that might affect a particular market, they are also intent on establishing "critical mass" within each target market to maximize profitability (American Homes 4 Rent, 2019, p. 2). The percentage of single-family houses owned by SFR REITs per square mile ranges from 0% to over 35%. Areas with high rates of SFR REIT ownership form a U-shape northwest to northeast of the city of Atlanta, encompassing much of the inner ring suburban neighborhoods. Tests of global spatial autocorrelation confirm that overall, SFR REIT-owned single-family houses are significantly spatially clustered, and the intensity of the clustering varies by SFR REIT. Front Yard Residential and Invitation Homes are the most highly clustered of the four SFR REITs.

The effects of SFR REIT-owned properties on local neighborhoods are likely to be most acute where SFR REIT-owned properties are highly spatially concentrated. Statistically significant clusters of single-family houses owned by SFR REITs are located west of Atlanta in Paulding, Cobb, and Douglas counties as well as east of the city in Gwinnett and DeKalb counties. But when statistically significant clusters for each of the SFR REITs are viewed separately, strikingly differing patterns emerge. SFR owned by American Homes 4 Rent is located in Paulding, Cobb, Cherokee, Gwinnett, and Henry counties. This pattern is quite different from the clusters of SFR owned by Front Yard Residential, which are located primarily south of Atlanta in Clayton, southern DeKalb, and southern Fulton counties.

Overall, smaller houses, houses that are larger relative to their lots, and houses that are farther away from the Atlanta CBD are more likely to be owned by a SFR REIT. Houses built after 1999 are more likely to be owned by a SFR REIT than older houses. And properties located in neighborhoods with lower median house values are more likely to be owned by a SFR REIT. Properties located in the top school districts are significantly more likely to be owned by a SFR REIT than those that are not. But the association of property, neighborhood, and school district characteristics varies for each of the four REITs. This is most pronounced when comparing properties owned by American Homes 4 Rent with properties owned by Front Yard Residential.

Overall, properties in neighborhoods with lower house values are more likely to be owned by a SFR REIT, but this association is not statistically significant for properties owned by American Homes 4 Rent. Moreover, houses built between 1970 and 1999 are more likely to be owned by Front Yard Residential than houses built after 1999, unlike the other three SFR REITs. Properties in the top school districts are 3.9 times more likely to be owned by American Homes 4 Rent than those that are not, but the quality of the school district is not significantly associated with properties owned by Front Yard Residential.

The SFR owned by the four REITs at the end of 2018 included units acquired through bulk distressed property purchases, through subsequent acquisitions, and through mergers with other firms. SFR REITs continually cull the SFR they own through ongoing sales of properties that do not fit the firms' investment strategies. The four SFR REITs have very different SFR acquisition profiles, as evidenced by their current portfolios and the nature of their spatial concentrations. The analysis indicates that SFR units owned by American Homes 4 Rent are larger, farther away from the Atlanta CBD, and newer than those owned by the other three SFR REITs. This finding is in accordance with the firm's stated business and growth strategies—SEC filings note an acquisitions process that focuses on housing built after 2000, with at least three bedrooms and two bathrooms, sold for between $150,000 to $450,000, and in areas with above-average median incomes and well-regarded school districts (American Homes 4 Rent, 2019). Moreover, the SFR is located in neighborhoods with higher-value housing, fewer families living in poverty, and higher-quality schools, in accordance with the firm's SEC filings that state that SFR in these areas "will attract tenants with strong credit profiles, produce high occupancy and rental rates and generate long term property appreciation" (American Homes 4 Rent, 2019, p. 2). The current stock of SFR owned by American Homes 4 Rent is in neighborhoods that had the lowest percentage of foreclosures at the peak of the housing crisis, revealing the firm's transition from distressed SFR acquisitions to newer, larger SFR units in wealthier neighborhoods. In fact, in 2017 American Homes 4 Rent began to focus heavily on newly constructed "built for rental" properties built by the firm or acquired from third-party developers, rather than properties acquired through foreclosure auctions (American Homes 4 Rent, 2019, p. 1). This profile is similar to that of Invitation Homes.

The investment profiles of American Homes 4 Rent and Invitation Homes contrast sharply with Front Yard Residential's. SFR units owned by Front Yard Residential are the smallest and oldest. The SFR is located in neighborhoods that have the lowest median house values, the highest percentages of non-Hispanic black residents, and the highest percentages of families living in poverty. In contrast to the business strategy stated by American Homes 4 Rent, Front Yard Residential does not explicitly describe the characteristics of properties targeted for acquisition. Rather, it articulates as its strategy opportunities to buy portfolios of single-family houses at attractive yields, indicating a continued focus on discounted properties and an overarching intention to achieve economies of scale through the acquisition of large portfolios of SFR (Front Yard Residential Corporation, 2019). SFR units owned by Front Yard Residential at the end of 2018 continued to be located in neighborhoods that were hard hit by the foreclosure crisis, suggesting that Front Yard Residential acquired distressed SFR units and retained ownership of them, continued to acquire SFR in these neighborhoods, or both.

Conclusion

Since the global financial crisis, the financialization of single-family housing has shifted from investments in mortgage debt and securitization to longer-term investments, such as SFR. SFR REITs link global capital, local housing markets, and households in the post-crisis financialization of housing. The practices revealed in this analysis have important implications for local housing markets and households, affecting housing affordability, stability, and quality.

States have played a central role in the resolution of real estate crashes through the socialization of private banking losses (e.g., the REO-to-rental program) as well as through the creation of financial instruments (e.g., REITs) that directly bind local housing markets to global financial markets

(Waldron, 2018). No large-scale nationwide owners and operators of SFR existed in the United States before 2012, due in part to the challenges associated with the establishment of a sufficiently large portfolio of SFR. The sale of foreclosed single-family houses by the U.S. Housing Finance Agency in the aftermath of the 2008 housing crisis gave birth to SFR REITs. These initial bulk sales provided the seed for SFR REITs to quickly establish large portfolios through discounted acquisitions of properties, allowing them to overcome issues related to achieving sufficient scale for highly profitable SFR ownership. Moreover, the favorable tax treatment of SFR REITs bolstered their financial returns, and SFR REITs' publicly traded status afforded them advantages over small-scale SFR owners. The U.S. government provided the institutional framework for the tremendous growth of SFR REITs, which, combined with limited tenant protections under state and local laws in many of the SFR REITs' target markets, has allowed SFR REITs to quickly achieve dominance in some local housing markets.

The density of SFR owned by SFR REITs within markets is very important to the firms' business strategies to achieve efficiencies in acquisition, maintenance, and leasing. Substantial numbers of SFR units in a market are necessary to establish the critical mass needed to realize cost efficiencies on a par with other types of equity REITs (e.g., apartment REITs). The SFR market has historically been highly fragmented, and small-scale investors have difficulty achieving the economies of scale of SFR REITs. SFR REITs have reached high levels of concentrated ownership through continual acquisition of SFR units, as well as through mergers with other SFR REITs. Moreover, SFR REITs have access to large amounts of capital to invest and grow very quickly: for example, through a joint venture with a sovereign wealth fund and a state pension fund, Tricon American Homes is set to acquire more than 10,000 SFR units (Tricon Capital Group Inc., 2018b). As the SFR REIT sector matures, the continued need to compete with SFR REITs may drive small- and mid-scale SFR investors to sell their portfolios to REITs, resulting in further consolidation of SFR ownership in the hands of a few firms. Given the importance of scale to their business models, there is reason to expect that SFR REITs will continue to grow in size and increase their influence on local housing markets.

SFR REITs' investments began in neighborhoods hard hit by the 2008 housing crisis—many of which were home to low-income people of color. Although the spatial concentrations of SFR owned by REITs have shifted during their 7-year history to include newly built housing, clusters remain in neighborhoods hardest hit by the housing crisis, particularly SFR owned by Front Yard Residential. Low-income black and Hispanic residents, women, and immigrants were disproportionately affected by the housing crisis, losing substantial wealth. Residents who lost their homes to foreclosure, as well as newly forming households burdened by debt and underemployment, were forced into a highly competitive rental housing market. The emergence of SFR as an option for households may present opportunities in tenure choice, but the control of the SFR market in the hands of a few large firms—and their near-oligopolistic control of SFR in some neighborhoods—may result in persistently increasing rents for households in an already precarious position in the housing market.

SFR REITs continually evaluate and liquidate non-strategic or underperforming SFR units and those located in inefficient markets, in particular properties acquired through bulk purchases that do not meet investment criteria to maximize shareholder returns. The proceeds from property sales are used to invest in other acquisitions, repurchase common stock, and distribute dividends to shareholders (Front Yard Residential Corporation, 2019). The sales of large numbers of single-family houses in neighborhoods where SFR REITs' holdings are concentrated may depress house prices in those markets. Moreover, the churning of these properties, particularly those in neighborhoods hard hit in the housing crisis, has the potential to create instability for households (Fields, 2017).

An economic rationale for REIT ownership of SFR is that the size and concentration of SFR portfolios could lead to more efficient management of the properties, which could then translate into lower housing costs for tenants. However, the demands for profit by shareholders of the SFR REITs may divert the cost savings. Initially, financial returns stemmed from the discounted prices at which bulk portfolios of SFR were acquired. As the housing market has recovered from the crisis, these acquisition price discounts have diminished. As house prices increase, SFR REITs are faced with higher acquisition costs. Thus, SFR REITs must increase their net operating income—the difference between income and expenses—to maintain the same rate of return, expressed as the ratio of net operating income to value. Thus, as house prices rise, SFR REITs will be under pressure to commensurately raise rents, and their concentrated presence in some local markets may give them the discretion to do so.

In addition to raising rents, SFR REITs may increase net operating income by reducing expenses; the ability to contain expenses, as well as the capacity to demonstrate scalability, is critical to the viability of the SFR REIT model. SFR REITs may be better equipped to maintain their holdings than small-scale owners, having capital reserves on hand for such purposes. But whereas expense reductions may be achieved through increased efficiency, they may also be realized through the deferral of maintenance and repairs, particularly if the properties are no longer profitable, leading to a diminution of the physical quality of SFR units. Combined with the concentration of SFR REIT-owned properties, disinvestment could negatively affect the physical quality of entire neighborhoods.

Each of the four SFR REITs studied states specifically its intention to lower costs through more efficient management and adoption of digital technologies. The use of highly automated property management may be problematic for renter households, however (Fields, 2019). Through use of digital technology combined with the non-local nature of the property owner, SFR REITs may be more likely than other types of landlords to automatically assess fees and penalties, limiting tenants' options in times of hardship. In fact, Raymond, Duckworth, Miller, Lucas, and Pokharel (2016) found that large corporate investors in SFR were more likely to file eviction notices than smaller investors, which the authors attribute to their use of the notices as a collection strategy, related to automation and their use of digital technology.

Vast quantities of global capital are channeled into local housing markets—specifically single-family houses—through SFR REITs, exemplifying the post-crisis financialization of housing. This study demonstrates the important role of SFR REITs in the financialization of housing at the level of the economy, the firm, and the household. In the aftermath of the housing crisis, SFR REITs presented a novel way for capital to flow back into single-family houses and for a new round of exchange value to be extracted from them. At the level of the firm, SFR REITs demonstrate the prioritization of shareholder value—the continued production of dividends and capital appreciation—in firm strategies. SFR REITs draw households into the financialization of housing even though those households may have no direct interactions with mortgage markets. Market density and efficiency of operation are essential for the continued profitability of SFR REITs as a sector; however, the highly localized concentrations of SFR REIT-owned properties combined with pressure to increase income and reduce costs may increase unaffordability, create greater instability, and decrease quality of housing. Given the national reach of the four largest SFR REITs and the consistent deployment of their business strategies in their target markets, similar findings are likely in the other local housing markets in which SFR REITs hold large concentrations of SFR.

This study is a first step in understanding the implications of this new type of corporate landlord. Additional research is needed to understand the effects that the presence of SFR REITs have on single-family house sales prices and rents. Moreover, longitudinal comparisons of SFR REIT clusters are important to understand when and where REITs begin to sell off SFR en masse so that proactive actions can be taken to temper the effects on local housing markets. Additional research is needed to understand how SFR, particularly that owned by large publicly traded REITs, affects the competing concerns of expanding access to suburban neighborhoods through increased rental opportunities and of potentially reducing opportunities for homeownership.

Notes

1. Tricon Capital Group is a large real estate firm that encompasses three business segments: Tricon American Homes, Tricon Housing Partners, and Tricon Lifestyle Rentals. While the company is not strictly a SFR REIT, as are the other three firms examined herein, Tricon American Homes is included in this study since it is a public company that owns a substantial number of SFR units in Atlanta.

2. Reven Housing REIT owns so few SFR units in the Atlanta MSA that its properties were not included in this analysis.
3. The numbers of SFR units reported in the firms' SEC form 10-K filings or annual reports differ from the figures found in the CoreLogic property tax record data. The number of SFR units owned by Invitation Homes in the property tax records is 3.0% greater (373 SFR units) than the number indicated in the firm's 2018 10-K filing. The overestimation may be due to Invitation Homes' selling properties in 2018 for which the transfer was not yet recorded in the property tax records, or to errors in the records. The number of properties in the dataset owned by American Homes 4 Rent, Front Yard Residential, and Tricon American Homes are fewer than in the 2018 10-K filings – 2.8% (130 SFR units), 10.7% (420 SFR units), and 5.6% (223 SFR units) less, respectively. This is likely due to errors in the property tax records or ambiguous owner names, with owners not listed as subsidiaries of the SFR REIT in the SEC filings.

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