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Large-Scale Buy-to-Rent Investors in the Single-Family Housing Market: The Emergence of a New Asset Class?

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Abstract

In 2012, several large firms began purchasing single-family homes with the stated intention of creating large portfolios of rental property. We present the first systematic evidence on how this new investor activity differs from that of other investors in the housing market. Many aspects of buy-to-rent investor behavior are consistent with holding property for rent rather than reselling quickly. Additionally, the large size of these investors imparts a few important advantages. In the short run, this investment activity appears to have supported house prices in the areas where it is concentrated. The longer-run impacts remain to be seen.

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1. Introduction

In the aftermath of the financial crisis and Great Recession, the supply of vacant homes far exceeded the demand for owner-occupied homes. This severe imbalance presented a unique opportunity for investors to purchase large numbers of single-family homes, often at distressed prices. In 2012, a handful of large private-equity-backed investors began purchasing single-family properties with the stated intention of creating portfolios of rental property that would be substantially larger than any previously-seen holdings of such property.[1] These investors argued that the drop in the home ownership rate was likely to persist, strengthened by tight mortgage financing conditions and greater economic uncertainty, making the market for single-family rentals a good long-term investment prospect. In addition, they argued that they would be able to manage these large portfolios more efficiently than smaller investors due to economies of scale and technological innovations that had reduced the cost of managing large groups of scattered-site properties.[2]

This paper presents the first systematic evidence on the purchase behavior of these new investors, which we refer to as large-scale "buy-to-rent" investors.[3] Our goal is to assess to what extent these investors are following a business model that is distinct from other investors in the housing market and what the short-run impact of these investors has been in the housing markets

[1] Although there has always been a sizable market for single-family rentals, most purchase and rental activity has occurred at a small scale. According to the 1996 Property Owners and Managers Survey, three quarters of all single-family detached rental units were owned by individuals or partnerships that owned fewer than 10 units.

[2] See, for example, the most recent annual reports of four large buy-to-rent investors that have gone public as REITS- American Homes 4 Rent (https://www.americanhomes4rent.com/), American Residential Properties (http://www.amresprop.com/investor-relations/investor-overview), Starwood Waypoint Residential Trust (http://www.starwoodwaypoint.com/), and Silver Bay Realty Trust (http://www.silverbayrealtytrustcorp.com/).

[3] Schnure (2014) discusses the factors that spurred buy-to-rent activity, but his analysis focuses on changes in the stock of single-family rental property; he uses only limited data on purchases by these investors. Allen, Rutherford, Rutherford and Yavas (2015) examine purchases in Florida by "institutional investors," which they define as any entity that purchased more than 10 properties in a year, regardless of the intention to convert to rental. Bracke (2015) analyzes "buy-to-let" purchases, which he identifies as any purchase with a rental listing within six months, using data from the UK. He does not distinguish by investor size.

in which they concentrate. While we cannot yet empirically assess the longer-run impact of buy-to-rent investor activity, we discuss the potential longer-term implications of buy-to-rent investors for the housing market and financial system.

Despite the large amount of attention that these purchases have attracted, we find that buy-to-rent investors have been a very small share of the aggregate market, comprising 1 to 2 percent of all single-family purchases from 2012 to 2014. In contrast, purchases by other investors accounted for 18 to 19 percent of single-family home purchases during the same period.[4] However, buy-to-rent investors have a much more noticeable presence in a small number of metropolitan areas where their purchases are concentrated. For example, in metropolitan areas like Atlanta where they have been most active, they accounted for 12 percent in 2013, compared to 18 percent for other investors in the same market. Thus, in a few markets these purchases have become frequent enough to have a noticeable effect on housing market outcome

Along a host of measurable dimensions, we find evidence that buy-to-rent investors are following a different business model than other investors in the single-family housing market. Many of our empirical results are consistent with the notion that buy-to-rent investors are creating large portfolios of rental property, whereas other investors are more likely to be motivated by the short-term return from house price appreciation. For example, buy-to-rent investors are much less likely to resell a property within 24 months of purchase. In addition, their purchases are more geographically concentrated (both across and within metropolitan areas)

[4] We also estimate that buy-to-rent investors owned about 0.14 percent of the housing stock in 2014, whereas corporate investors owned 6 percent and individual investors owned 6 percent.

and they tend to purchase homes in neighborhoods where fewer residents can qualify for a mortgage.

Another important distinction between the business model followed by buy-to-rent investors and that followed by other investors is the use of mortgage financing. Because buy-to-rent investors are large institutions that typically have easier access to capital, they do not need to rely on mortgage financing to purchase homes. By contrast, other corporate investors finance roughly 20 percent of their purchases with mortgages, and individual investors finance 40 percent of their purchases with a mortgage.[5]

Buyers paying cash at the time of purchase have at least two major advantages in the housing market: they can purchase property at foreclosure auctions, where the price discount can be substantial, and home sellers prefer bids that are not contingent on the approval of mortgage financing. Moreover, the large size of buy-to-rent investors gives them access to a wider variety of financing sources, including private equity, bank lines of credit, and public bonds, than is available to most smaller investors, even conditional on both groups not using a mortgage. Greater access to capital, as well as a business model predicated on lowering costs and increasing the rental value of the acquired homes over time, could give buy-to-rent investors an advantage over other investors in that they are willing to pay slightly higher prices.[6] In fact,

[5] As we will discuss below, the absence of mortgage financing does not mean that buy-to-rent investors do not take on debt in order to finance their purchases. Rather, they obtain financing in advance from both lines of credit and issuances of bonds.

[6] The buy-to-rent investor model is consistent with certain aspects of the private equity business model, in which investors reorganize purchased businesses over a number of years with the aim of substantially increasing their profitability and value. See, for example, Acharya et al (2013), Guo et al (2011), and Kaplan and Stromberg (2009).

we find that buy-to-rent investors pay higher prices than other investors, conditional on housing unit characteristics and foreclosure status.

Because buy-to-rent investors are following a business model that is new to the single-family housing market, it is important to consider how the effects of this activity may differ from the effects of traditional investors. Indeed, some have already raised concerns about potential effects on housing affordability and neighborhood quality.[7] It is beyond the scope of this paper to assess all potential effects, and buy-to-rent activity is too new for longer-term consequences to be observed. Nevertheless, we take a step toward assessing the short-run effects of this activity by examining changes in housing market conditions following increases in buy-to-rent activity. We find that ZIP code house prices rise more after an increase in buy-to-rent activity than after an increase in the purchase activity of other investors, consistent with the notion that buy-to-rent investors reflect a more permanent increase in housing demand than other investors. Although this result suggests that buy-to-rent activity has supported the housing recovery in the areas where it is concentrated, we cannot completely rule out the interpretation that buy-to-rent investors were better at picking neighborhoods that would have experienced larger price increases anyway. We also find no evidence that rent growth is higher in ZIP codes with a larger increase in buy-to-rent activity or where buy-to-rent investors own a larger fraction of the rental stock.

[7] See, for example, the press release "Rents on the Rise in Riverside" by staff of Representative Takano of California (http://takano.house.gov/media-center/press-releases/rep-takano-releases-rent-on-the-rise-in-riverside-report), the report "When Wall Street Buys Main Street" by authors at the Center for American Progress (http://www.americanprogress.org/wp-content/uploads/2014/02/WallStMainSt_Report.pdf), as well as a number of media articles including http://www.salon.com/2013/11/06/wall_street_slumlords_outrageous_new_scheme_how_they_could_wreck_economy_again/ and http://www.washingtonpost.com/blogs/wonkblog/wp/2013/11/08/wall-street-figured-out-how-to-securitize-your-rent-should-you-worry/

Another important issue to consider is the potential impact of buy-to-rent investors on the financial system. Most of these investors have issued bonds backed pools of single-family rental properties in their portfolios, an innovation in securitized debt financing. The emergence of these bonds has sparked debate about how such bonds should be rated and how they should be treated under regulatory capital requirements. To date, the issuance of single-family rental bonds have been fairly limited, and the bonds have received good credit ratings. Nevertheless, concerns about these securities will become even more salient if buy-to-rent activity continues to expand and if buy-to-rent investors increasingly rely on these bonds and other forms of debt to finance their activity.

2. Measuring Investor Activity in the U.S. Single-Family Housing Market

Our data are derived from two databases constructed by CoreLogic: a national database of property transactions and a national database of county property tax assessors' records. The information in these two databases includes property-level characteristics for the majority of parcels in the United States, as well as the transaction history for each parcel. We use data on single-family residential property from January 1, 2000 through December 31, 2014. We define single-family property as detached homes; we exclude townhouses, condominiums and other property types that might be considered to be single-family for other purposes, but for which rental is already more common. Three steps are important for constructing the final dataset that we use in our analysis: identifying whether the purchaser of a property is an investor, classifying investors into multiple types, and cleansing the data related to each transaction.

In a loose sense, we think of investors as any purchaser that does not intend a personal use for the housing unit. Thus, investors include purchasers that are not individuals—which we refer

to as "corporate" investors—as well as individuals that intend to lease the property and individuals that intend to resell the property without leasing or occupying it. We group these two types of individual investor together because we have no way to distinguish between them. To identify corporate investors, we use an indicator developed by CoreLogic that denotes whether the buyer of a property is a corporate entity.[8] We exclude transactions that we judge not to be arms-length, which we identify as transfers between homebuilder subsidiaries as well as purchases by securitized mortgage trusts, government entities, banks, credit unions, home owner associations, property owners associations, master associations, churches, and corporation relocation services.[9] These exclusions are important, as they reduce the number of transactions that we attribute to corporate investors by 59 percent.

To identify individual investors, we examine the legal mailing address of all properties that were not purchased by corporate investors.[10] If an address is reported as the buyer's legal mailing address for three or more transactions, then that legal mailing address is assumed to be the primary residence of an individual investor, and all other transactions in which that legal mailing address is used by the buyer are assumed to be investor purchases.[11] Further, in order to differentiate individual investors from wealthy individuals that own multiple homes for personal use, we require

[8] For example, whether the name includes abbreviations such as "Inc", "LLC", or "LP".

[9] We also exclude a few transactions that we judge to be errant records from the Mortgage Electronic Registration System (MERS), which we identify as transactions that report MERS or variants of the MERS abbreviation as the buyer of the property.

[10] The legal mailing address is the address on record with the county to which property taxes and other legal notices are mailed. We check every legal mailing address against a standard address verification service in order to cleanse the mailing address on record from typographical errors and other such anomalies in the recorded address.

[11] The requirement regarding addresses is not constrained to single-family homes, even though single-family homes are the only type of purchase included this analysis. For example, if a property is the legal mailing address for two single family homes and a residential condominium, this address is considered to be the residence of an individual investor.

that no more than one third of the properties associated with a suspected individual investor address can be larger than 3,000 square feet.[12]

The second step in creating our dataset is to classify corporate investors into categories by size, which we define based on the number of single-family properties that they purchase in a year. Doing so requires grouping purchases together according to the buyer's name on record. In deeds records, a buyer's name can be recorded inconsistently for a variety of reasons including typos, character substitutions, abbreviations, numerical translations, and alternate names. If not properly addressed, these recording anomalies lead to a substantial undercount of the total number of properties purchased by each buyer, and an overestimate of the number of unique buyers. Consequently, we use standard data cleansing technology to create a "master" name for the name of the buyer recorded on each deed. Using these "master" names, we define four categories of corporate investors: large investors that purchase more than 50 properties, medium-sized investors that purchased between 11 and 50 properties, small investors that purchased between 3 and 10 properties, and micro investors that purchased 1 or 2 properties. Table 1 reports the fraction of purchases made by each type of corporate investor in our sample period.

[Insert Table 1 here]

We identify the purchases made by eight large buy-to-rent investors using an in depth review process.[13] We focus our analysis on eight buy-to-rent investors that appear frequently in media reports on buy-to-rent activity or because their business model is known to be the same as

[12] This restriction reduces our estimate of individual investor transactions by 16 percent. 3,000 square feet is roughly the 90th percentile of the distribution of housing unit size of the single-family housing stock.

[13] This methodology is based on an algorithm developed by staff at Amherst Holdings, which is an active investor in single-family rental, to monitor investor activity.

the rest of the buy-to-rent investors, both in terms of financing and operations.[14] Since these investors use numerous asset companies (such as Limited Liability Companies and Limited Partnerships) to buy and hold their residential properties, obtaining an accurate count of the purchases made by these entities requires aggregating the transactions of all of their associated asset companies. To identify the asset companies of publicly traded companies, we use lists of asset company names as reported in documents filed with the SEC. For private companies, we pull properties for rent from their websites, look up the buyer of record in the CoreLogic database, and identify patterns of asset company names used to purchase these properties. Our estimated purchases cumulate to 88 percent of all single-family property held by these eight entities, as reported in publicly-available documents and media accounts. See Appendix Table 1 for details.[15]

Finally, we cleanse data errors and anomalies from the data set. The first anomaly we address is bulk sales, which are sales of multiple properties in a single transaction. Typically, the transaction price recorded on the deed of an individual property is the price for the entire bulk sale. We define a bulk sale as a group of more than 3 properties with the exact same transaction price, sale date, and buyer name where the recorded price is more than $225,000.[16] In these cases, we modify the transaction price to reflect the average price per house paid. In our sample, 0.5 percent of transactions from 2012 to 2014 were bulk sales. We further clean the transaction price by treating a price as missing if it is greater than $10 million, if the reported unit size is less than 300

[14] The companies included in the large buy-to-rent category are American Homes 4 Rent, American Residential Properties, Colony American Homes (a subsidiary of Colony Capital), Invitation Homes (a subsidiary of The Blackstone Group), Main Street Renewal (a subsidiary of Amherst Holdings LLC), Progress Residential, Silver Bay Realty Trust, and Starwood Waypoint Residential Trust.

[15] Other buyers might also use asset companies to purchase properties, but we have no way to identify these cases. Consequently, some purchases that we attribute to micro or small investors might actually be purchases by larger companies. This type of error should bias us against finding differences across investor types.

[16] We cannot identify bulk sales of 2 or 3 properties because it is difficult to know whether 2 or 3 homes with the same buyer name, purchase price and purchase date are part of a bulk transaction or purchases of similar properties by the same investor that just happen to have occurred on the same date.

square feet, or if the derived price per square foot is more than or less than three standard deviations above the average price per square foot in the metropolitan area.[17] While we remove these transaction prices to prevent our analysis of price per square foot from becoming skewed by outliers, we include these transactions in our analysis of the number of transactions.

To assign each property to a geographic location, we first check every property address against a standard address verification service in order to reduce errors in the recorded address. Once an address is verified, we use the latitude and longitude of each property, census tract shape files, and standard spatial mapping techniques to derive the census tract in which each property is located. We use the county on record and the definitions of Core Based Statistical Areas published in 2013 to determine the metropolitan area of each property. In our sample, 88 percent of transactions are located in metropolitan areas; 8 percent are in micropolitan areas, and 4 percent are in rural areas. Because housing markets in micropolitan and rural areas are quite different than metropolitan markets, we limit our sample to metropolitan areas.

3. Aggregate Statistics on Market Share and Characteristics of Buy-to-Rent Transactions

3.1 Aggregate Investor Purchases

Figure 1 shows the fraction of single-family home sales attributable to each type of investor from 2000 to 2014. The most common type of investor is the individual investor. Their share of purchases rose from 4 percent in the early 2000s to 8 percent in 2011, and then decreased a little in the following three years. The rise in the share of purchases by individual investors during the housing boom is consistent with Houghwout, Lee, Tracy and van der

[17] Roughly 1 percent of transaction prices in each year meet one of these criteria.

Klaauw (2011) and Bhutta (forthcoming), who document an increase in investor purchases using data on individuals that have mortgages for multiple properties on their credit records.[18] Bayer, Geissler and Roberts (2013) also show that the fraction of investors—which they define as a buyer that purchases at least two properties that are resold within the next two years—in the Los Angeles housing market rose during the housing boom. And Chinco and Mayer (2014) show increases in the fraction of out-of-town second home buyers in 21 large metropolitan areas from 2000 to 2007.

Insert Figure 1 here.

In contrast to the individual investors, the share of purchases by corporate investors was fairly flat during the housing boom. All together these investors accounted for about 5½ percent of purchases from 2000 to 2006, indicating that business investors have always had a presence in the single-family housing market, albeit a small one. Purchases by these investors became a larger share of the market from 2007 to 2010, and then flattened out at around 11 percent of all single-family home sales from 2010 to 2014. It is worth noting that the raw number of purchases made by these investors rose during the 2007-2010 period; their share of the market did not increase merely because purchases by other types of buyers contracted. Thus, corporate investors were generally becoming more active in the single-family housing market during the housing crisis and the subsequent years.

Like other types of corporate investors, the large buy-to-rent investors also expanded their purchase activity in the years following the housing crisis. Their activity began somewhat

[18] Houghwout, Lee, Tracy and van der Klaauw (2011) report a much higher fraction of investors than we find because they define investors to include all individuals with multiple residential properties, whereas we do not include individuals that seem to be purchasing second homes.

later than other business investors, as they did not account for a noticeable share of aggregate purchases until 2012, when their purchases amounted to 1 percent of all single-family transactions.[19] Their aggregate share of purchases rose to 2 percent in 2013 and then fell back to 1 percent in 2014. Media reports attribute the slowdown in buy-to-rent purchase activities to an increase in house prices as well as capital constraints and a pause for investors to evaluate the performance of their current portfolio.[20]

All told, buy-to-rent investors spent $16 billion to purchase homes from 2012 to 2014. These investors have also spent funds on renovating properties. Information released with the issuance of bonds backed by these properties indicates that renovation expenditures and transaction costs averaged 20 percent of a home's purchase price, suggesting that aggregate outlays on renovation from 2012 to 2014 cumulate to an additional $3 billion.[21] Another expense reportedly incurred by these investors is the development of new technology to coordinate the purchase, renovation, and management of these properties. We do not have any data on these expenditures, but the need to develop such technology means that expenditures on the purchase and renovation of property are likely to understate the total investment made by these firms.

3.2 Characteristics of Buy-to-Rent Transactions

[19] A few of these investors did purchase a small number of properties in 2011, but these purchases never amounted to more than ½ percent of all single-family transactions in any metropolitan area.

[20] For example, Silver Bay and American Residential Properties both pointed to capital constraints in their 2014:Q4 earnings calls. http://seekingalpha.com/article/2072973-silver-bay-realty-trusts-ceo-discusses-q4-2013-results-earnings-call-transcript?part=single, http://seekingalpha.com/article/2997376-american-residential-properties-arpi-ceo-stephen-schmitz-on-q4-2014-results-earnings-call-transcript?part=single

[21] Specifically, the average investor cost basis was 20 percent higher than the average purchase price. This analysis is based on 21 bonds issued by 7 of the 8 buy-to-rent investors that we track, and covers 84,000 housing units.

One aspect of the business model of buy-to-rent investors that sets them apart from the traditional investor is their stated intention to hold the property as a rental unit for a number of years rather than re-sell in the owner-occupied market. In fact, Figure 2 shows that only 7 percent of properties purchased by these investors in 2012 were resold within 24 months.[22] This percentage is comparable to the propensity of non-investors to resell within 24 months, and much lower than the propensities of other corporate investors, who resold between 38 and 62 percent of their 2012 purchases within the next 24 months. These results hold in a regression framework where we control for Census tract fixed effects and the propensity of the investor to purchase Real Estate Owned by banks (REO), short sales, or properties at a foreclosure auction (see Appendix Table 2).

Insert Figure 2 here.

Another difference between buy-to-rent investors and other investors is that they tend to focus on different segments of the market. As shown in Table 2, roughly half of buy-to-rent purchases in 2012 and one third of purchases in 2013 and 2014 were through foreclosure auctions.[23] Large and medium-sized corporate investors also purchased a comparable fraction of property at these auctions, but smaller corporate investors and individual investors were not as active in these auctions. Larger investors have at least two important advantages in purchasing properties at foreclosure auctions. The first is that large firms have access to cash at a lower cost than small firms, and properties at these auctions must be purchased with cash. The second

[22] According to industry practitioners, buy-to-rent investors generally resell homes to refocus their portfolio or trim non-core assets.

[23] CoreLogic creates flags for whether a property is purchased at a foreclosure auction, a bank-owned property, or a short sale. Foreclosure sales are determined from information recorded on the deed, such as whether it is a foreclosure deed or trustees deed. Short sales are determined based on previous mortgage amounts and the transaction price.

advantage of large firms stems from the fact that the rules of the auction process are set by each county and differ substantially across locations. Navigating the auction process requires a substantial investment of time, and this fixed cost is easier to bear if one is planning to purchase a large number of properties.

Insert Table 2 here.

The fact that buy-to-rent investors do not depend on mortgage financing can be seen in Figure 3, as nearly 100 percent of their purchases were financed without a mortgage.[24] The same is true for other large corporate investors. Other corporate investors also purchased most of their property without mortgage financing, while about 60 percent of homes purchased by individual investors were not financed with a mortgage. The ability to purchase homes without a mortgage imparts an advantage to these investors, not only because it allows them to participate in foreclosure auctions, but also because the need to obtain approval from a mortgage lender can lead to substantial delays in the purchase process and increase the risk that a sales contract will fall through. Thus, sellers prefer buyers that do not depend on mortgage financing.

Insert Figure 3 here.

Of course, a lack of mortgage financing at the time of purchase does not mean that purchases by buy-to-rent investors do not use debt financing. Some of these investors obtained financing through bank loans, which were typically structured as revolving credit facilities. More recently, these investors have begun issuing bonds backed by a pool of rental properties in

[24] Most counties record the origination of a mortgage, so CoreLogic determines whether a property was mortgage-financed by linking these records to the purchase transaction.

their current portfolios.[25] As of July 2015, seven of the eight buy-to-rent investors in our sample had issued at least one such bond. These bond issuances have generally received favorable credit ratings and have been met with sizeable investor demand. The cumulative amount securitized adds up to 74 percent of the estimated value of the rental properties in these pools.

Returning to Table 2, buy-to-rent investors are also more likely to purchase short sales than other business investors. Discussion with industry practitioners indicates that buy-to-rent investors are less likely to back out of a contract because they have deeper pockets than smaller investors. When sellers of short sales receive multiple bids they are more likely to choose a buyer with a reputation for consistently closing a contract, giving buy-to-rent investors an advantage in purchasing short sales. This advantage in the market for short sales may not extend to other large corporate investors because, as we show below, the purchases of these investors are less concentrated geographically. With their purchases spread out in more markets, they may not be able to build a reputation for closing as easily as the buy-to-rent investors.

In contrast to foreclosures and short sales, buy-to-rent investors are less likely than other investors to purchase REO. One possible explanation for this result is that properties flowing through the foreclosure process are typically bought during the auction if they are desirable to buy-to-rent investors, so these properties never revert to the bank. Thus, properties that become REO generally do not meet the specifications of buy-to-rent investors.

Although we have emphasized the propensity of buy-to-rent investors to purchase foreclosed property and short sales, it is worth keeping in mind that they do not buy distressed

[25] Unlike the case of REITs, bond investors do not have an equity position in the properties. Should a property be sold, which is possible in some cases in most contracts, the proceeds must be used to pay off a portion of the bond principal amount or another property of similar value must be substituted into the collateral backing the bond.

property exclusively. In 2012 nearly one third of their purchases were non-distressed property, and in 2013 and 2014 roughly half of their purchases were non-distressed. One reason why buy-to-rent investors may be willing to forgo the price discount typically associated with distressed sales is if the property in question fits in well with an existing portfolio of rental properties. In addition, prospective buyers can walk through homes listed on the Multiple Listings Service, giving investors an opportunity to assess the required renovation costs. This opportunity is typically not available for properties purchased through foreclosure auctions, providing another incentive for investors to purchase non-distressed properties.

Turning to the physical characteristics of properties purchased, Table 3 shows that homes bought by buy-to-rent investors tend to be somewhat larger than homes bought by other investors, and roughly comparable to the size of homes bought by non-investors. Similarly, buy-to-rent investors are much less likely than other purchasers to buy a 2-bedroom home; instead they tend to favor 3- and 4-bedroom homes. But while the structures purchased by buy-to-rent investors tend to be bigger than those purchased by other investors, the lot sizes tend to be smaller. These results signal that homes purchased by buy-to-rent investors tend to be in denser areas than homes purchased by other investors.[26]

Another difference between buy-to-rent investors and other investors is that homes purchased by buy-to-rent investors tend to be substantially newer. Nearly half of homes purchased by these investors from 2012 to 2014 were built in 2000 or later, whereas only 20 percent of homes purchased by other buyers were this new.[27] Even after controlling for

[26] Although buy-to-rent purchases tend to be concentrated in the South and metropolitan areas in the South tend to be less dense than in other regions, homes purchased by buy-to-rent investors tend to be in denser neighborhoods than the typical neighborhood in the same metropolitan area.

[27] In a few instances, buy-to-rent investors have purchased new homes in bulk directly from homebuilders. For examples, see http://www.wsj.com/articles/SB10001424052702303843104579171791879768178 and

metropolitan area or tract fixed effects, we still find that homes purchased by buy-to-rent investors are newer than other homes.

[Insert Table 3 here]

Finally, we examine purchase price. Because distressed property usually sells at a discount relative to non-distressed property, one would expect the prices paid by buy-to-rent investors to be lower than average. Indeed, Table 3 shows that buy-to-rent investors pay less per square foot compared to individual investors and non-investors. To control for the differences in type of sale and property characteristics, we calculate the average price per square foot by year, census tract, and investor type, and regress these averages on the fractions of REO, foreclosures, and short sales purchased by each investor type in that area, average characteristics of the properties purchased by each investor type in that area, Census tract indicators, and a set of indicators for investor type; the omitted categorical variable is individual investors. In order to compare across investor types more easily, purchases by non-investors are excluded. As shown in Table 4, after controlling for these characteristics buy-to-rent investors pay somewhat more than individual investors, while other corporate investors pay much less than individual

http://seekingalpha.com/article/2215653-american-residential-properties-arpi-ceo-steve-schmitz-on-q1-2014-results-earnings-call-transcript?part=single. However, these cases are rare, as purchases from homebuilders amount to less than 1 percent of buy-to-rent purchases in our data. Also, only about 3 percent of homes purchased by buy-to-rent investors were built in 2009 or later.

investors.[28] Thus, buy-to-rent investors pay more than all other types of investors, even after controlling for property distress, other property characteristics and location.[29]

Insert Table 4 here.

The higher prices paid by buy-to-rent investors vis-à-vis other types of investors is consistent with the notion that buy-to-rent investors are willing to pay higher prices to acquire homes that may better fit their existing portfolio, in order to provide the best cash flow and largest expected returns over the long term. Moreover, their lower operational or financing costs might allow them to pay higher prices and therefore outbid competition from smaller investors.[30]

4. Where Do Buy-to-Rent Investors Purchase Homes?

4.1. Geographic Concentration of Investor Purchases

Although buy-to-rent activity is a very small share of the aggregate housing market, it is concentrated in a relatively small number of metropolitan areas, and in these areas buy-to-rent purchases are a more substantial share of sales. In 2012, three quarters of all buy-to-rent purchases were in only 10 metropolitan areas (out of the 346 where the total number of single-family sales was greater than 500). These purchases spread out a little in subsequent years, with three quarters of purchases occurring in 15 metropolitan areas in both 2013 and 2014. The black curve in Figure 4 illustrates the concentration of buy-to-rent purchases in 2013 by plotting the cumulative

[28] Our results are consistent with Allen, Rutherford, Rutherford and Yavas (2015), who find that investors pay lower prices than non-investors in a sample of home sales in Florida. They do not explicitly compare buy-to-rent investors to other types of investors. Similarly, in UK data Bracke (2015) finds that "buy-to-let" investors (regardless of size) pay lower prices than other homebuyers, who are primarily non-investors.

[29] These results hold when the dependent variable is the median price per square foot rather than the average, indicating that the results are not driven by outliers.

[30] Lambson, McQueen and Slade (2004) show that out-of-state buyers pay a premium relative to local buyers, which they posit to be attributable to higher search costs, inferior local knowledge, and/or unrealistic beliefs about market values. Our results are consistent with theirs in that buy-to-rent investors are less likely to be local buyers than other types of investors, but it is not clear that any of their proposed explanations would apply to the case of buy-to-rent investors.

distribution of metropolitan areas against the cumulative distribution of purchases. For comparison, the other lines in the graph show the distributions for other investor types. At any given cumulative share of purchases, the purchases of buy-to-rent investors are in fewer metropolitan areas than all other investor types.

Insert Figure 4 here.

Buy-to-rent purchases are also concentrated within the metropolitan areas where these investors focus. To illustrate this concentration, in the spirit of Duranton and Overman (2005) we calculate the distance between each pair of properties purchased by each type of investor. Because buy-to-rent investors tend to purchase properties in denser neighborhoods, the simple distribution of distance between pairs does not give an accurate view of the strategies followed by various investors. To account for differences in neighborhood density, we categorize the pairs by distance and estimate an ordered logit regression of these categories on an indicator for buy-to-rent investor as well as the logarithm of housing unit density in the Census tract of each housing unit in the pair.[31] Then we predict the probability of being in each distance category as a function of investor type and median housing unit density in the metropolitan area. Thus, we obtain estimates of the distribution of distance holding housing unit density fixed across investor types. Calculating the distance between each pair of homes in an investor's portfolio is quite time-intensive, so these results are limited to 20 metropolitan areas with the largest number of cumulative buy-to-rent purchases through 2014. As shown in Figure 5, homes purchased by buy-to-rent investors are more likely to be within 25 km (15 miles), and especially within 2 to 15 km, of one another than homes purchased by other investors.[32]

[31] We estimate the ordered logit regression separately by metropolitan area.

[32] The figure reports averages across the 20 metropolitan areas. Results vary considerably across locations; buy-to-rent purchases are substantially closer to one another in 12 metropolitan areas and are roughly the same distance as purchases by other investors in 8 metropolitan areas.

Insert Figure 5 here.

4.2. Characteristics of metropolitan areas where buy-to-rent investors concentrate

We next examine the types of metropolitan areas that buy-to-rent investors target. Figure 6 shows maps depicting the fraction of single-family sales in each metropolitan area that were purchased by buy-to-rent investors. In 2012 this investment activity was most prominent in Phoenix and Atlanta, where the purchase shares were about 6 percent. In 2013, buy-to-rent purchases rose to 12 percent of the market in Atlanta and expanded to a number of other metropolitan areas in the Southeast including Jacksonville, FL and Charlotte, NC. In 2014, the metropolitan areas with the largest shares were still in the Southeast. Appendix Table 3 lists the top 10 metropolitan areas by buy-to-rent share in each year, along with the total number of buy-to-rent purchases and total number of single-family purchases. These 10 metropolitan areas account for 62 percent of all buy-to-rent transactions in 2012, 47 percent of transaction in 2013, and 49 percent in 2014.

To get a sense of the type of market where buy-to-rent investor activity is concentrated, we estimate Tobit regressions of the share of buy-to-rent purchase activity on a variety of metropolitan area characteristics.[33] For ease of interpretation, all continuous independent variables are scaled to have a mean of zero and standard deviation of one. Regressions are estimated separately for each year, but the results turn out to be fairly similar across years. As shown in Table 5, buy-to-rent investors were more likely to purchase homes in markets that had a low price-to-rent ratio and a large fraction of homes in negative equity in the previous year. These results are consistent with

[33] Since such a large fraction of metropolitan areas have no buy-to-rent purchases, the coefficients of an OLS regression would be biased.

the idea that buy-to-rent investors focus on areas that experienced sizeable house price declines during the housing bust and have an ample supply of distressed property.[34]

Buy-to-rent shares are also higher in metropolitan areas with more than 100,000 single-family housing units.[35] Conversations with a few industry participants suggest that these investors may focus on large metropolitan areas because these locations have a larger inventory of homes on the market from which to assemble a portfolio of property. Another striking result is that buy-to-rent shares are higher in metropolitan areas that experienced faster population growth from 1980 to 2010 and with a larger fraction of residents with a college degree, likely because these characteristics are correlated with favorable local economic conditions. Finally, buy-to-rent shares are higher in metropolitan areas with low average property tax rates, although this relationship is only significant in the 2014 sample.[36] Although the sample used in Table 5 includes only about half of all metropolitan areas in the US, the results are little changed when we expand the sample by dropping the tax rate and using a price-to-rent ratio from the American Community Survey rather than Zillow.

To give a sense of how well the characteristics in the regression explain the variation in purchase shares across metropolitan areas, Figure 7 plots the actual share of buy-to-rent purchases in 2013 against the share that would be predicted from the regression in column 2. The correlation

[34] Schnure (2014) argues that housing market stress contributed to growth in single-family rental because the multifamily stock was not large enough to satisfy rental demand in these areas. In support of this theory, he shows that purchases made by the public buy-to-rent investors were more common in metropolitan areas with larger prior declines in the number of single-family owner-occupants. We find a similar correlation in our data when we do not control for other variables, but this correlation disappears after controlling for the fraction of homes in negative equity. It is likely that the fraction of homes in negative equity is strongly correlated with the housing market stress that Schnure describes.

[35] Roughly half of the metropolitan areas in this sample have more single-family units than this cutoff. In unreported results, we find little difference among more narrowly-defined size categories.

[36] We calculate property tax rates from tax bills and assessed property values reported in the CoreLogic data.

between the actual and predicted share is 0.67, indicating that the regression serves as a fairly accurate descriptor of buy-to-rent shares. Results for other years are similar.

Insert Figure 7 here.

Next, we examine the metropolitan area choices of other investors. To this end, we estimate OLS regressions of the fraction of purchases made by each investor type on the same metropolitan area characteristics discussed above. Because the results turn out to be quite similar for each year, Table 6 reports the results from regressions that combine data from 2012 through 2014 and include year fixed effects. Similar to buy-to-rent investors, many other investors also have greater purchase shares in larger metropolitan areas with lower price-to-rent ratios and a greater fraction of homes in negative equity, although the magnitudes of these correlations tends to be smaller. Otherwise, buy-to-rent investors are the only type of investor that have higher shares in metropolitan areas with high population growth, a large fraction of residents with a college degree or more, and low property tax rates. Whereas the correlation between predicted and actual buy-to-rent shares in this specification is 0.68, the correlation between predicted and actual shares for other investor types ranges from 0.26 to 0.47.

4.3. Census tract analysis

While the metropolitan area analysis provides useful insight into the general patterns of buy-to-rent purchases across the US, housing markets are far more local than an entire metropolitan area. Consequently, next we present data on the neighborhoods where buy-to-rent activity has been strong. In this analysis, we focus on the metropolitan areas where the share of buy-to-rent purchases was greater than 0.5 percent because buy-to-rent purchases were negligible

in most neighborhoods outside of these metropolitan areas.[37] We use Census tracts defined according to the 2010 Census to define neighborhood boundaries.

Table 7 shows regressions similar to those of Table 5 where each observation is a Census tract rather than a metropolitan area. All dependent variables are expressed relative to the metropolitan area mean or median, so the coefficients can be interpreted as explaining the location choice of buy-to-rent investors conditional on having chosen a particular metropolitan area.[38] All characteristics except for crime rates and school quality are from the 5-year samples of the American Community Survey. Crime rates and school quality are provided by Location, Inc.[39] Standard errors are clustered by metropolitan area to account for potentially-correlated unobserved variables within each metropolitan area.

Like the metropolitan area results, we find that buy-to-rent investor shares tend to be higher in neighborhoods with a low price-to-rent ratio. We do not have data on distressed inventory at this level of geographic detail, but it is likely that the price-to-rent ratio is correlated with the distressed inventory. Buy-to-rent shares are higher in neighborhoods with low poverty rates and a small fraction of adults with less than a high school degree, suggesting that these investors do not invest in neighborhoods where the population is too poor to provide a stable stream of rental income. Similarly, buy-to-rent shares are higher in neighborhoods with a larger fraction of households with children, likely because such households tend to move less frequently and are therefore more likely to renew leases (Molloy, Smith and Wozniak 2011, Van Dijk, Folmer, Herzog

[37] For example, 99 percent of all buy-to-rent transactions in 2013 occurred in one of these metropolitan areas. There were 35 metropolitan areas with a buy-to-rent share greater than 0.5 percent in 2012, 70 in 2013, and 47 in 2014.

[38] Results are similar when we include metropolitan fixed effects instead of expressing variables relative to their metropolitan mean or median.

[39] Location, Inc. assembles data from a large number of local police districts in order to compute crime rates by Census tract. Their school quality estimates use data from a nationwide test to normalize local scores from state-specific tests.

and Schlottmann 1989). While buy-to-rent investors avoid unusually poor neighborhoods, they are also less active in areas with low crime rates and highly-rated schools, perhaps because residents of these neighborhoods are more likely to be homeowners. Finally, we find that buy-to-rent investors are more likely to be active in neighborhoods with a newer housing stock and less likely to be active in neighborhoods with an older housing stock, corroborating the evidence presented above that buy-to-rent investors focus on newer housing.

Insert Table 7 here.

Columns 2, 4 and 6 add credit scores to the regressions. Our baseline specification does not include credit scores because we do not have this information by Census tract using the 2010 Census definitions. Including this information based on 2000 tract definitions requires dropping a number of Census tracts that did not exist in the old definitions.[40] We find that buy-to-rent shares are lower in neighborhoods with a large fraction of individuals above the 75th percentile of the metropolitan area credit score distribution. This result is also consistent with the notion that most individuals in these areas have strong enough credit to buy homes.

Table 8 compares the neighborhood-level correlates of buy-to-rent investors to those of other investors. As with the metropolitan-level regressions, most investors have larger purchase shares in neighborhoods with lower price-to-rent ratios. Otherwise, the characteristics of neighborhoods where other investors tend to invest are different from those where buy-to-rent investors tend to invest. Specifically, other investors tend to buy homes in neighborhoods with more adverse economic characteristics. For example, they tend to have larger shares in areas with higher unemployment rates, while they do not have lower shares in areas with high poverty rates. Also unlike buy-to-rent investors, most other investors tend to purchase property in older

[40] Moreover, the boundaries of some tracts changed, adding noise to the estimates of credit score.

neighborhoods. Finally, other investors tend to purchase homes in neighborhoods where residents are at the lower end of the credit score distribution, whereas buy-to-rent investor activity is most prevalent in neighborhoods with more people between the 25th and 75th percentiles.

Insert Table 8 here.

In summary, buy-to-rent investors are much more concentrated in a small number of metropolitan areas and neighborhoods than other types of investors. Buy-to-rent investors appear to place a greater emphasis on metropolitan areas where the return to investment is more promising, large portfolios of property can be more easily assembled, and the economic environment is stronger. At the neighborhood level, they focus on areas with middle-of-the-road characteristics—areas that are not so poor that residents will not provide a steady income stream, but not so rich that residents will choose to buy homes rather than rent. By contrast, other investors tend to purchase homes in neighborhoods with more adverse economic characteristics.

6. Buy-to-Rent Investor Activity and Changes in House Prices, Rents and Vacancies

In this section, we examine the evolution of housing market conditions in locations with varying degrees of buy-to-rent investor activity in order to get a sense of the effect that these investors may have had on the market. Although it is difficult to determine the effects of this activity without exogenous variation in the activity of buy-to-rent investors, nonetheless we think that these descriptive statistics can help shed light on the likely signs and magnitudes of any possible effects.

To examine house prices and rents, we use data at the ZIP code level from Zillow. Zillow uses a combination of property characteristics and repeat-sales techniques to estimate the value and rental amount for every residential property, and reports monthly medians of these estimates

for roughly 15,000 ZIP codes. We convert the price and rent data to annual averages to reduce noise. Our baseline specification regresses the change in the logarithm of house prices or rents from 2012 to 2014 on the change in the share of purchases made by each type of investor from 2011 to 2012. The baseline specification also controls for lags of the dependent variable because house price and rent changes may be serially-correlated and investor shares might be partly determined by past changes in prices and rents.[41]

As reported in column 1 of Table 9, locations with a larger increase in buy-to-rent activity in 2012 experienced higher house price appreciation over the next two years. Even though the baseline regression controls for lagged house price increases, one might be concerned that the coefficient on the change in the buy-to-rent share is biased upward because buy-to-rent investors chose to purchase homes in locations where house prices would have risen by more anyway. One way to address this concern is to include metropolitan area fixed effects, which control for many unobserved differences across locations that might be correlated with buy-to-rent investors' decisions to invest in an area. A second way to address this concern is to include characteristics of ZIP codes that might influence investor activity as well as have an independent effect on house prices. We use the tract-level regressions described above as a guide for which controls to include; the specific variables are listed in the notes of the table. Including the metropolitan area fixed effects reduces the estimated correlation somewhat, but it remains positive and significant (column 2). Including the additional time-varying controls does not affect the coefficient on the buy-to-rent share (column 3).

We suspect that the specification with metropolitan fixed effects and a rich set of controls may underestimate the effect of buy-to-rent activity for two reasons. First, an increase in investor

[41] The regressions examining the change in house prices include 3 lags, but the regressions for the change in rent include only one lag because the rent data are not available prior to 2011.

demand in one ZIP code might push prospective buyers into neighboring ZIP codes, raising house prices in all locations. Any such market-wide effects on house prices will be absorbed by the metropolitan area fixed effects. Second, if the characteristics included in the regression explain a lot of the variation in the buy-to-rent share, then we cannot identify the effect of the buy-to-rent share separately from these characteristics. Consequently, we think that the actual effect of buy-to-rent investors on house prices is likely greater than the estimates in specifications with fixed effects and a rich set of controls, although less than in the specifications with few controls. Using the average of the baseline specification and the specification with metropolitan area fixed effects, a 5 percentage point increase in the buy-to-rent share—a magnitude that is large but not uncommon in the sample—is associated with 2 percentage point higher house price appreciation from 2012 to 2014.[42] The average house price gain in this sample was 13 percent with a standard deviation across locations of 11 percent, so an effect of 2 percentage points is noticeable but not large.

It is worth noting that in no specification do we find a meaningfully positive correlation between house prices and the change in the purchase share of other types of investors.[43] It seems plausible that buy-to-rent investors had a larger net effect on house prices than other investors because each purchase removes one unit from the market, whereas many of the properties purchased by other investors were resold in the market within the next year or two. Thus, the permanent effect of other investors on housing demand is smaller.

Columns 4 to 6 of Table 9 reports specifications where the dependent variable is the change in rent. In this case, the buy-to-rent share is not highly correlated with subsequent changes in rents.

[42] When we examine the change from 2012 to 2013 and the change from 2013 to 2014 separately, coefficients are somewhat larger in the first year than in the second year.

[43] This result is not simply because buy-to-rent shares tend to be smaller, and therefore have a larger coefficient. For example, the 95th percentile of the distributions of increases in the small, micro, or individual investor shares were 4, 5, and 6 percentage points, respectively. Increases of these magnitudes are never associated with more than ½ percentage point higher house price appreciation.

Although we estimate a coefficient that is significantly different from zero in one specification, the magnitude of this coefficient is small. One interpretation of this result is that buy-to-rent investors are supplying rental units in locations where rental demand is rising, so the net increase in supply is roughly met by an increase in demand. These results do not support the concern voiced by some groups that buy-to-rent investors have such concentrated portfolios that they have enough market power to raise rents above the level warranted by a competitive market. To investigate this idea further, we calculate a proxy for price-setting power in the rental market by dividing the cumulative number of homes purchased by buy-to-rent investors by the total number of rental units in the ZIP code as reported in the American Community Survey. We find no evidence that rent growth was higher in areas where buy-to-rent investors own a substantial share of rental units (see Appendix Table 4). Moreover, recent rent increases reported by a number of the public buy-to-rent investors have been in line with the increases seen in the tenant's rent component of the Consumer Price Index and Zillow's measure of median rents.[44]

Columns 7 to 9 of Table 9 report specifications where the dependent variable is the change in the vacancy rate. We obtain vacancy rate data by Census tract from the US Postal Service, which defines vacant addresses as those which have not collected mail in at least 90 days. One important aspect of this measure is that it includes addresses that are not on the market for sale or for rent, such as those that are vacant for seasonal reasons. Nevertheless, we think that changes in the USPS vacancy rate provide a reasonable proxy for changes in underutilization of the housing

[44] For example, the 2014:Q4 earnings calls for American Homes 4 Rent and American Residential Properties both cited average rent increases for renewals of around 4 percent, while the Silver Bay earnings call reported an average increase of 3 percent. The Consumer Price Index for rent of primary residence rose 3.5 percent over the 12 months ending in December 2014.

stock. Because the data are provided at the Census tract level, we estimate these regressions at the tract level.[45]

Insert Table 9 here.

In most specifications, we generally find that tracts with a larger increase in buy-to-rent activity experienced a larger decline in vacancy in the subsequent year, whereas the correlation for other types of investors is either positive or zero. This result is consistent with the idea that buy-to-rent investors have a more permanent effect on local housing demand than other types of investors. However, unlike the house price regressions, the magnitude of this correlation is tiny. Even in the regression with no controls, a 5 percentage point increase in the buy-to-rent share is associated with a 0.2 percentage point decline in the vacancy rate. One could argue that this estimate is biased downward because the vacancy rate includes many homes that are not intended to be occupied full time, and so it will not be as sensitive to market conditions as a vacancy rate that includes only homes that are for sale or for rent. The USPS does not collect information on reason for vacancy, so we cannot directly account for this problem. However, if we control for the fraction of seasonally vacant units and the fraction of vacant units that are held off the market for other reasons from the 2010 Census, the coefficient on the change in the buy-to-rent share only increases by a small amount.

To summarize, the evidence suggests that buy-to-rent investors contributed to a net increase in housing demand from 2012 to 2014, resulting in somewhat higher house prices and slightly lower vacancy rates. Thus, these investors may have helped to support the housing recovery in areas where they were highly concentrated. Buy-to-rent investors appear to be unique

[45] The controls in this regression are somewhat different than those in the regressions using ZIP code data because we do not have the same data at the tract level. Specifically, these regressions use median house value and rent from the 2008-2012 ACS rather than Zillow's estimates of house value and rent. Also, these regressions do not control for the price-to-rent ratio, foreclosures, or the fraction of homes in negative equity.

among investors in this respect, perhaps because they were much less likely to resell their property within the next two years.

7. Discussion and Longer-Run Implications

Our empirical analysis has indicated that large-scale buy-to-rent investors are following a very different business model than other investors in the single-family housing market. In particular, many aspects of buy-to-rent investor activity are consistent with their stated intention to create large pools of single-family rental property. The creation of large pools of single-family rental property goes against the conventional wisdom that such pools are inefficient because managing scattered-site housing units is much more costly than managing multifamily property (Williams 1993).[46] Several factors appear to have helped buy-to-rent investors overcome the traditional obstacles. First, the large inventory of homes on the market in the aftermath of the housing crisis made it easier for buy-to-rent investors to create geographically-concentrated pools of similar properties. Second, technological developments that occurred in the 2000s such as cloud computing, the widespread use of personal mobile devices, and mobile internet connectivity have allowed for scattered-site property renovation, maintenance, and management to occur in a much more flexible, efficient manner.[47]

[46] Coulson and Fisher (2012) find evidence that single-family units tend to be owner-occupied because homeowners demand higher quality housing units than renters and single-family units tend to be larger and higher quality than multifamily units. The recent expansion of single-family rental suggests that quality preferences are not the only explanation for the strong correlation between structure type and tenure. Of course, buy-to-rent investors have not entered the market for very high quality single-family units, and we would expect these units to remain predominantly owner-occupied for the reason that Coulson and Fisher suggest.

[47] For examples see the annual reports of the publicly traded buy-to-rent investors – American Homes 4 Rent, American Residential Properties, Silver Bay Realty Trust, and Starwood Waypoint Realty Trust. Research showing that technology that enhances firms' ability to monitor scattered activity, leading to a change in ownership structure, includes Baker and Hubbard (2004).

A number of community groups have raised concerns that buy-to-rent activity will crowd out purchases by homeowners or nonprofits (which typically resell to low-income households), that concentrated ownership of rental property will allow investors to raise rents above competitive-market levels, that large firms cannot adequately monitor or maintain their property to meet the quality standards of the community, and that community participation will suffer from an influx of renters, who tend not to be as active in local communities as homeowners (DiPasquale and Glaeser 1999).[48]

We do find evidence consistent with the view that these investors have boosted house prices in the areas where they are concentrated. Higher prices may have made it more difficult for some households or nonprofits to buy homes in these areas. On the other hand, this activity also increased the supply of high-quality rental housing, which may benefit a different segment of the population by providing households a way to live in single-family housing and consume the local amenities typically provided in single-family neighborhoods, even if they cannot obtain a mortgage. In addition, other homeowners in the neighborhood likely benefit from the boost to house prices imparted by buy-to-rent investors. And higher house values could boost local property tax revenues, unless local governments offset the increase in house values with a lower tax rate.[49] We leave it to further research and policy analysis to weigh the aggregate welfare consequences of the rise in prices—we merely point out here that the aggregate effect is not

[48] An additional concern that is sometimes raised is that the buy-to-rent investors will attempt to sell large blocks of homes after house prices rise, leading to another downturn in prices. We view this outcome as unlikely given the inability of landlords to sell property occupied by renters and the clear dis-incentive for investors to do anything that will drive down prices.

[49] In most states, a homestead tax exemption or credit allows owner-occupiers to pay lower property taxes than absentee owners (Nikaj 2013). Therefore, the shift toward single-family rental could boost local property tax revenues even if it had no effect on house prices. However, if large-scale buy-to-rent investors are mainly displacing smaller investors rather than owner-occupants, there would be no effect on property tax revenues through this channel.

obvious. As for the potential effects of buy-to-rent investors on rental affordability, we find no evidence that these investors are raising rents above competitive market levels. Our estimates suggest that they do not have enough market power to do so, so the potential effect on rents is important to monitor if buy-to-rent activity continues to expand.

Large-scale buy-to-rent activity is too new to assess longer-term consequences, such as those on neighborhood quality or on community participation. It is worth noting that investors have a large incentive to maintain their properties, as they will need to attract new tenants when previous tenants leave. Also, to the extent that buy-to-rent investor purchases are aimed at properties that are attractive to families, these renters may participate more in the community than the typical renter. Nevertheless, clearly these issues are worth examining as time goes on.

One important feature of the buy-to-rent business model is the use of alternative methods of financing as compared to the traditional small-scale investor. Buy-to-rent investors never use mortgage financing for initial purchase of properties, which imparts a significant advantage in the housing market because home sellers prefer bids that are not subject to approval by a mortgage lender. Moreover, mortgage financing cannot be used to purchase homes at foreclosure auctions, giving cash buyers access to an inventory of homes for sale at substantially-reduced prices. Rather buy-to-rent investors raise financing in advance of bidding on properties for sale, including financing from private equity, bank lines of credit, and public bonds. Greater access to financing, in addition to lower expected operating costs and higher expected rental income, may have allowed buy-to-rent investors to outbid smaller investors, as we find that buy-to rent investors pay higher prices than other investors conditional on housing unit location and quality.

Another set of issues worth considering with regard to buy-to-rent investors' financing methods is the potential implications for financial stability. The bonds issued by buy-to-rent investors are new to the financial system, and as such they are difficult to rate. Even more difficult to assess are the bonds collateralized by the single-family rental properties of multiple borrowers, which have been recently floated by the firms that are lending to smaller buy-to-rent investors. To date, the issuance of these bonds has only totaled $12 billion dollars, which is modest compared to issuance of other mortgage-backed securities and not large enough to date to pose a significant financial stability risk.[50] Moreover, buy-to-rent investors' leverage ratios, measured as total debt value divided by total asset value, are not excessively high compared to average leverage ratios in the REIT sector.[51] In addition, a general concern with the emergence of cheap credit in the single-family rental market is that it might lead to the kinds of booms and busts in the single-family housing market that are documented in the more traditional corporate buyout private equity investment space (see, for example, Kaplan and Stein 1993 and Axelson et al. 2010), especially if buy-to-rent investors make greater use of leverage in the form of bonds and bank loans.[52]

To the extent that technological improvements, economies of scale, and lower financing costs have substantially reduced the operating costs of buy-to-rent investors relative to smaller investors, large portfolios of single-family rental property may become a permanent feature of the real estate market. As such, the events of the past three years may signal the emergence of a new

[50] According to the Federal Reserve's Financial Accounts of the United States, the outstanding amounts of single-family and multifamily MBS were $6.3 trillion and $409 billion, respectively, in the fourth quarter of 2014. Bonds backed by single-family rental are also small relative to MBS flows: gross issuance of MBS backed by mortgages on single-family property totaled $964 billion in 2014, while gross issuance of MBS backed by mortgages on multifamily rental property were $83 billion (source: *Inside MBS & ABS* 07/03/2015 and 07/24/2015).

[51] According to the financial statements of the publicly traded buy-to-rent investors, leverage ratios range from 0.2 to 0.55. The average leverage ratio for REITs is around 0.5 (e.g.,Boudry, Kallberg, and Liu (2010)) .

[52] Because the properties purchased by buy-to-rent investors are geographically concentrated, these investors are more exposed to idiosyncratic local economic shocks than if they held geographically diverse pools. Most investors have mitigated this risk to some degree by owning pools in multiple markets, but their holdings are still not as geographically diversified as, say, holders of mortgage-backed securities.

class of real estate asset. A similar transformation occurred in the market for multifamily structures in the 1990s, when large firms began to purchase multifamily property and created portfolios of professionally-managed multifamily units that were traded on public stock exchanges as REITs. A few single-family portfolios have been sold to the public as REITs, and industry reports contend that more such transactions are in the making.[53] Moreover, a few of the large-scale buy-to-rent investors have established lending arms to extend credit to smaller buy-to-rent investors. The extension of a new and potentially lower cost of debt financing to a larger set of potential investors may spur a further expansion of buy-to-rent activity.[54]

In summary, given the novelty of large portfolios of single-family rental property and the potential for this investor activity to expand, it is essential to understand the potential impacts on housing markets, local communities, and markets for securities backed by residential real estate. Our analysis takes a step in this direction by examining how large-scale buy-to-rent investment activity differs from other types of investment in single-family property. Clearly, more work could be done to measure the economies of scale in this market as well as the potential benefits and costs to local residents and communities. In the end, only time will tell whether the recent purchases of large-scale buy-to-rent investors reflect the emergence of a new asset class or whether the business model will fail to be viable over the longer-term.[55]

[53] In addition, there may be a trend towards consolidation as smaller investors sell portfolios of rental homes to larger buy-to-rent investors. For example, American Homes 4 Rent acquired Beazer Homes' single family rental portfolio in July 2014 and Silver Bay Realty Trust acquired the single-family rental portfolio owned by The American Home in 2015.

[54] For an example of the lower interest rates obtainable through Wall Street financing relative to other nonbank sources of financing for buy-to rent activity, see http://www.newsday.com/classifieds/real-estate/big-equity-firms-loosen-reins-on-lending-to-landlords-1.8723458.

[55] For two opposing views of the potential size of the lending market for buy-to-rent investors see http://www.housingwire.com/articles/27772-single-family-rental-securitization-market-boasts-trillion-dollar-potential%29 and http://www.urban.org/urban-wire/single-family-rental-securitization-market-wont-exceed-20-billion.

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Table 1
Classification of Corporate Investors

Investor Type	Range of Units Purchased in One Year	Median Number of Units Purchased in One Year	Percentile of 2000-2014 Distribution
Micro	1 - 2 Units	1	< 38%
Small	3 - 10 Units	4	38% - 60%
Medium	11 - 50 Units	18	60% - 79%
Large	51+ Units	93	>=79%

Table 2
Type of Properties Purchased by Investor Type

	Foreclosure	Short Sale	REO	Non-distressed
		Panel A: 2014		
B2R	0.315	0.081	0.094	0.509
Large	0.390	0.021	0.152	0.438
Medium	0.397	0.027	0.187	0.389
Small	0.242	0.038	0.205	0.515
Micro	0.150	0.043	0.162	0.645
Individual	0.063	0.055	0.206	0.675
Non-Investor	0.007	0.046	0.082	0.865
		Panel B: 2013		
B2R	0.344	0.115	0.077	0.465
Large	0.342	0.051	0.248	0.358
Medium	0.347	0.056	0.214	0.383
Small	0.251	0.066	0.210	0.473
Micro	0.149	0.069	0.173	0.609
Individual	0.058	0.107	0.208	0.626
Non-Investor	0.007	0.073	0.099	0.820
		Panel C: 2012		
B2R	0.524	0.074	0.085	0.317
Large	0.431	0.036	0.253	0.280
Medium	0.469	0.043	0.202	0.286
Small	0.317	0.060	0.232	0.391
Micro	0.188	0.066	0.212	0.533
Individual	0.077	0.130	0.264	0.529
Non-Investor	0.009	0.102	0.136	0.753

Note. Each cell reports the fraction of single-family purchases made by investor type that are foreclosures, short sales, real-estate-owned (REO) transactions, or non-distressed sales.

Table 3
Characteristics of Properties Purchased, 2012 to 2014

	Buy-to-Rent	Large	Medium	Small	Micro	Individual	Non-Investor
Average price per square foot ($)	83	69	71	84	109	112	126
Median price per square foot ($)	76	58	45	51	59	74	94
Average square footage	1,756	1,473	1,442	1,434	1,508	1,496	1,732
Median square footage	1,857	1,638	1,628	1,641	1,835	1,671	1,969
Average lot size (sqft)	9,541	14,114	15,947	17,836	27,358	21,405	29,136
Median lot size (sqft)	7,410	8,712	8,276	8,276	8,751	8,145	10,017
Fraction 1 bedroom	0.001	0.007	0.010	0.013	0.016	0.015	0.009
Fraction 2 bedroom	0.030	0.144	0.181	0.192	0.195	0.188	0.139
Fraction 3 bedroom	0.612	0.589	0.568	0.557	0.525	0.554	0.530
Fraction 4 bedroom	0.314	0.215	0.195	0.189	0.195	0.201	0.258
Fraction 5+ bedroom	0.044	0.045	0.046	0.049	0.070	0.043	0.063
Fraction built 2000 or later	0.483	0.232	0.216	0.179	0.165	0.196	0.263
Fraction built 1980-1999	0.334	0.227	0.191	0.183	0.187	0.228	0.259
Fraction built 1950-1979	0.160	0.353	0.373	0.390	0.377	0.372	0.323
Fraction built pre-1950	0.022	0.188	0.221	0.248	0.271	0.205	0.155

Table 4
Purchase Price by Investor Type

Dependent Variable	Ln(Average price/square foot)			Ln(Average price/square foot)			Ln(Average price/square foot)		
Year	2012			2013			2014		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
B2R investor	0.044**	0.202**	0.158**	0.019**	0.091**	0.090**	-0.010**	0.054**	0.029**
dummy	(0.006)	(0.012)	(0.011)	(0.005)	(0.008)	(0.008)	(0.006)	(0.008)	(0.009)
Large investor	-0.203**	-0.080**	-0.039**	-0.262**	-0.171**	-0.055**	-0.231**	-0.134**	-0.063**
dummy	(0.011)	(0.014)	(0.013)	(0.009)	(0.010)	(0.010)	(0.010)	(0.011)	(0.011)
Medium investor	-0.270**	-0.146**	-0.099**	-0.304**	-0.223**	-0.143**	-0.303**	-0.192**	-0.125**
dummy	(0.011)	(0.014)	(0.013)	(0.009)	(0.011)	(0.010)	(0.011)	(0.012)	(0.012)
Small investor	-0.198**	-0.123**	-0.081**	-0.230**	-0.172**	-0.106**	-0.218**	-0.158**	-0.114**
dummy	(0.009)	(0.011)	(0.011)	(0.007)	(0.009)	(0.008)	(0.009)	(0.010)	(0.010)
Micro investor	-0.150**	-0.128**	-0.071**	-0.152**	-0.150**	-0.080**	-0.133**	-0.131**	-0.080**
dummy	(0.009)	(0.010)	(0.010)	(0.007)	(0.008)	(0.007)	(0.008)	(0.009)	(0.009)
Share investor		-0.298**	-0.372**		-0.337**	-0.321**		-0.350**	-0.312**
purch. foreclosed		(0.019)	(0.017)		(0.015)	(0.014)		(0.016)	(0.015)
Share investor		-0.310**	-0.252**		-0.489**	-0.254**		-0.400**	-0.207**
purchases REO		(0.020)	(0.016)		(0.015)	(0.012)		(0.017)	(0.014)
Share investor		0.202**	-0.137**		0.090**	-0.137**		0.072**	-0.101**
purch. short sale		(0.020)	(0.016)		(0.014)	(0.011)		(0.019)	(0.017)
Ln(Avg. house		0.314**	-0.055**		0.239**	-0.057**		0.154**	-0.099**
age)		(0.011)	(0.016)		(0.009)	(0.012)		(0.011)	(0.015)
Avg. number of		0.029	-0.013		0.066**	-0.033**		0.050**	-0.028**
bedrooms		(0.019)	(0.009)		(0.007)	(0.006)		(0.011)	(0.009)
Avg. number of		0.087**	-0.015		0.106**	0.003		0.065**	-0.016
bathrooms		(0.015)	(0.012)		(0.008)	(0.009)		(0.011)	(0.013)
Constant	4.352**	3.141**	4.746**	4.496**	3.380**	4.839**	4.481**	3.796**	4.983**
	(0.007)	(0.060)	(0.066)	(0.006)	(0.041)	(0.053)	(0.007)	(0.053)	(0.064)
Census tract fixed effects?	No	No	Yes	No	No	Yes	No	No	Yes
Dep. variable mean	4.24	4.26	4.26	4.36	4.36	4.36	4.35	4.35	4.35
Dep. variable std. dev,	0.678	0.716	0.716	0.642	0.659	0.659	0.595	0.599	0.599
Observations	30,506	23,801	23,801	44,935	35,989	35,989	27,674	22,995	22,995
Adjusted R^2	0.030	0.132	0.622	0.039	0.138	0.617	0.037	0.109	0.558

Note: Results are from OLS regressions of the logged average price per square foot paid by investor type by Census tract as a function of investor type and the average characteristics of the properties purchased by each investor type in a Census tract. Each Census tract must have non-zero B2R investor purchases. Standard errors are clustered at the Census tract level. The data are taken from CoreLogic. ** denotes significance at the 1 percent level.

Table 5
Metropolitan Area Correlates of Buy-to-Rent Share

	2012	2013	2014
Price/Rent Ratio[t-1]	-0.008*	-0.013**	-0.012**
	(0.003)	(0.004)	(0.003)
% first mortgages in negative equity [t-1]	0.006*	0.011**	0.004*
	(0.004)	(0.003)	(0.002)
Single-family housing stock > 100,000 [t-1]	0.028**	0.031**	0.026**
	(0.006)	(0.006)	(0.004)
Change in ln(population) 1980 to 2010	0.008**	0.011**	0.010**
	(0.002)	(0.003)	(0.002)
Fraction of Pop. less than HS Degree[t-1]	0.003	0.002	0.002
	(0.003)	(0.004)	(0.003)
Fraction of Pop. College Degree or more[t-1]	0.004	0.012**	0.009**
	(0.003)	(0.004)	(0.003)
Property tax rate [t-1]	-0.005	-0.007	-0.005*
	(0.003)	(0.003)	(0.002)
Number of observations	191	200	198
Mean of dependent variables	0.003	0.009	0.005
Standard deviation of dependent variable	0.010	0.022	0.011
Root Mean Squared Error	0.017	0.030	0.017
Chi^2 statistic of model	89	102	115
P-value of model	0.000	0.000	0.000
Log likelihood of model	81	112	129
Log likelihood of constant-only model	36	61	72

Note. Results are from Tobit regressions where the dependent variable is the fraction of single-family home sales purchased by buy-to-rent investors in a metropolitan area. All continuous independent variables are scaled to have a mean equal to 0 and a standard deviation equal to 1. * and ** denote significance at the 5 and 1 percent levels, respectively. The price/rent ratio is from Zillow. The fraction of mortgages in negative equity is from CoreLogic MarketTrends. The property tax rate is calculated by the authors from CoreLogic tax assessor data. The remaining variables are from the decennial Census or American Community Survey.

Table 6
Metropolitan Area Correlates of Investor Shares, 2012 to 2014

	Buy-to-Rent	Large	Medium	Small	Micro	Individual
Price/Rent Ratio[t-1] (Zillow)	-0.009*	-0.003**	-0.005**	-0.005**	-0.002	-0.009**
	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
% first mortgages in negative equity [t-1]	0.008**	0.003**	0.002**	0.001	0.002**	0.012**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
Single-family housing stock > 50,000 [t-1]	0.004	-0.000	0.001	0.001	0.002**	-0.000
	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
Change in ln(population) 1980 to 2010	0.010**	0.000	-0.000	0.000	0.001	-0.000
	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
Fraction of Pop. less than HS Degree[t-1]	0.030**	0.006**	0.006**	0.003**	-0.001	-0.004
	(0.003)	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)
Fraction of Pop. College Degree or more[t-1]	0.008**	0.000	0.001**	0.001*	0.001	0.003*
	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
Property tax rate [t-1]	-0.005**	-0.000	-0.000	-0.000	0.000	0.004**
	(0.002)	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)
Year = 2013	0.020**	0.000	-0.001	0.001	0.001	-0.004
	(0.003)	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)
Year = 2014	0.009*	0.002	-0.002	-0.000	0.003*	-0.009**
	(0.004)	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)
Number of observations	662	662	662	662	662	662
Mean of dependent variables	0.005	0.013	0.017	0.026	0.041	0.060
Standard deviation of dependent variable	0.015	0.015	0.013	0.013	0.013	0.037
Adjusted R^2	--	0.158	0.224	0.158	0.051	0.197
Root Mean Squared Error	0.024	0.013	0.012	0.012	0.013	0.033

Note. Results are from regressions where the dependent variable is the fraction of single-family home sales purchased by each investor type in a metropolitan area, pooling data from 2012, 2013 and 2014. Column (1) is a Tobit regression; all other columns are Ordinary Least Squares. All continuous independent variables are scaled to have a mean equal to 0 and a standard deviation equal to 1. * and ** denote significance at the 5 and 1 percent levels, respectively.

Table 7
Neighborhood Correlates of Buy-to-Rent Share

	2012		2013		2014	
	(1)	(2)	(3)	(4)	(5)	(6)
Price/Rent Ratio relative to MSA	-0.015**	-0.011	-0.016**	-0.010*	-0.022**	-0.018**
	(0.005)	(0.006)	(0.004)	(0.004)	(0.003)	(0.004)
% housing units with kids relative to MSA	0.021**	0.018**	0.024**	0.020**	0.023**	0.019**
	(0.003)	(0.004)	(0.003)	(0.003)	(0.002)	(0.002)
% Pop. less than HS Degree relative to MSA	-0.006	-0.006	-0.008*	-0.006	-0.017**	-0.010**
	(0.005)	(0.006)	(0.004)	(0.004)	(0.004)	(0.004)
% Pop. with HS Degree or equivalent relative to MSA	0.007*	0.009**	0.014**	0.017**	0.012**	0.015**
	(0.003)	(0.003)	(0.004)	(0.004)	(0.003)	(0.003)
% Pop. College Degree or more relative to MSA	-0.005	0.005	-0.002	0.008	-0.003	0.009**
	(0.005)	(0.008)	(0.004)	(0.005)	(0.003)	(0.003)
Unemployment rate relative to MSA	-0.002	-0.004	-0.002	-0.003	-0.004	-0.005*
	(0.002)	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)
Poverty rate relative to MSA	-0.006	-0.009**	-0.004	-0.007**	-0.011**	-0.014**
	(0.003)	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)
% HU built 2000 or later relative to MSA	0.008**	0.006*	0.007**	0.004	0.014**	0.012**
	(0.002)	(0.003)	(0.002)	(0.003)	(0.004)	(0.004)
% HU built 1949 or earlier relative to MSA	-0.013**	-0.010**	-0.018**	-0.014**	-0.027**	-0.021**
	(0.002)	(0.002)	(0.003)	(0.003)	(0.004)	(0.004)
Property crime rate below 25th percentile	-0.007	-0.003	-0.010**	-0.004	-0.012**	-0.010
	(0.006)	(0.006)	(0.004)	(0.004)	(0.005)	(0.006)
Property crime rate above 75th percentile	-0002	-0.006	0.003	-0.005	-0.006*	-0.006
	(0.006)	(0.006)	(0.005)	(0.005)	(0.003)	(0.004)
Violent crime rate below 25th percentile	-0.014**	-0.006	-0.014**	-0.006*	-0.013**	-0.002
	(0.003)	(0.003)	(0.002)	(0.003)	(0.003)	(0.003)
Violent crime rate above 75th percentile	0.008	0.009	0.006	0.003	0.007	0.003
	(0.005)	(0.005)	(0.004)	(0.004)	(0.005)	(0.007)
School quality below 25th percentile	0.006	0.001	-.004	-0.006	-0.019**	-0.023**
	(0.005)	(0.007)	(0.005)	(0.006)	(0.006)	(0.007)
School quality above 75th percentile	-0.017**	-0.017*	-0.015**	-0.008	-0.010*	-0.000
	(0.006)	(0.007)	(0.004)	(0.005)	(0.005)	(0.007)
% Pop credit score<10th percentile [t-1]		0.000		0.008		0.010*
		(0.006)		(0.004)		(0.005)
% Pop credit score>10th, <25th percentile [t-1]		0.001		-0.001		0.001
		(0.004)		(0.004)		(0.004)
% Pop credit score>75th percentile [t-1]		-0.022**		-0.015**		-0.011*
		(0.006)		(0.005)		(0.005)
Number of observations	16032	10470	22119	14566	14055	8732
Mean of dependent variables	0.021	0.017	0.031	0.025	0.019	0.013
Standard deviation of dependent variable	0.041	0.037	0.056	0.049	0.041	0.033
Root Mean Squared Error	0.078	0.078	0.095	0.088	0.075	0.069
F statistic of model	84	52	31	21	44	71
P-value of model	0.000	0.000	0.000	0.000	0.000	0.000
Log likelihood of model	1811	585	2384	1257	1951	821
Log likelihood of constant-only model	574	-129	612	189	-80	-283

Note. Results are from Tobit regressions where the dependent variable is the fraction of single-family home sales purchased by buy-to-rent investors in a Census tract. * and ** denote significance at the 5 and 1 percent levels, respectively. Standard errors are clustered by metropolitan area.

Table 8
Neighborhood Correlates of Investor Shares, 2012 to 2014

	Buy-to-Rent	Large	Medium	Small	Micro	Individual
Price/Rent Ratio relative to MSA	-0.012**	-0.010**	-0.007**	-0.003**	0.003**	-0.006**
	(0.004)	(0.002)	(0.001	(0.001)	(0.001)	(0.002)
% housing units with kids relative to MSA	0.020**	0.007**	0.004*	0.003*	-0.003	0.000
	(0.003)	(0.002)	(0.002	(0.001)	(0.001)	(0.002)
% Pop. less than HS Degree relative to MSA	-0.007*	-0.005*	0.000	-0.001	0.000	0.005*
	(0.004)	(0.003)	(0.002	(0.001)	(0.002)	(0.002)
% Pop. with HS Degree or equivalent relative to MSA	0.014**	0.006**	0.004**	0.001	0.000	-0.002
	(0.003)	(0.002)	(0.001	(0.001)	(0.001)	(0.003)
% Pop. College Degree or more relative to MSA	0.007	0.002	0.003	0.004**	0.011**	0.003
	(0.005)	(0.003)	(0.002	(0.001)	(0.002)	(0.004)
Unemployment rate relative to MSA	-0.004	0.006**	0.005**	0.004**	0.003*	0.002
	(0.002)	(0.002)	(0.001	(0.001)	(0.001)	(0.001)
Poverty rate relative to MSA	-0.008**	-0.003**	-0.002	0.002	0.006**	0.002
	(0.002)	(0.001)	(0.001	(0.001)	(0.001)	(0.002)
% HU built 2000 or later relative to MSA	0.007*	-0.001	-0.003**	-0.004**	-0.001	-0.006**
	(0.003)	(0.002)	(0.001	(0.001)	(0.001)	(0.002)
% HU built 1949 or earlier relative to MSA	-0.013**	-0.002	0.003**	0.004**	0.006**	0.002
	(0.003)	(0.001)	(0.001	(0.001)	(0.001)	(0.001)
Property crime rate below 25th percentile	-0.005	-0.001	-0.003	-0.001	-0.002	-0.004
	(0.005)	(0.003)	(0.002	(0.001)	(0.002)	(0.003)
Property crime rate above 75th percentile	-0.006	-0.001	-0.001	0.001	0.003**	0.001
	(0.004)	(0.002)	(0.001	(0.001)	(0.001)	(0.002)
Violent crime rate below 25th percentile	-0.006*	-0.001	0.002	0.000	0.001	-0.003
	(0.003)	(0.003)	(0.002	(0.001)	(0.001)	(0.002)
Violent crime rate above 75th percentile	0.006	0.006	0.008**	0.009**	0.009**	0.001
	(0.004)	(0.003)	(0.002	(0.003)	(0.003)	(0.002)
School quality below 25th percentile	-0.008	0.004	0.008**	0.003	0.000	0.002
	(0.005)	(0.005)	(0.002	(0.002)	(0.003)	(0.003)
School quality above 75th percentile	-0.009	-0.007*	-0.004*	-0.005**	-0.003	0.003
	(0.005)	(0.003)	(0.002	(0.002)	(0.002)	(0.003)
% Pop credit score<10th percentile [t-1]	0.005	0.009**	0.004*	0.006**	0.002	0.001
	(0.004)	(0.002)	(0.002	(0.001)	(0.002)	(0.002)
% Pop credit score>10th, <25th percentile [t-1]	0.001	0.012**	0.012**	0.008**	0.007**	-0.001
	(0.004)	(0.003)	(0.002	(0.002)	(0.001)	(0.004)
% Pop credit score>75th percentile [t-1]	-0.017**	-0.002	0.000	-0.003	-0.006**	-0.007**
	(0.004)	(0.003)	(0.002	(0.001)	(0.002)	(0.002)
Year = 2013	0.021**	-0.010	-0.011**	-0.003	-0.001	-0.020**
	(0.008)	(0.006)	(0.003	(0.002)	(0.002)	(0.007)
Year = 2014	-0.012	0.010	-0.006	0.002	0.011**	-0.030*
	(0.010)	(0.007)	(0.004	(0.003)	(0.003)	(0.012)
Number of observations	14477	14477	14477	14477	14477	14477
Mean of dependent variables	0.025	0.024	0.027	0.037	0.053	0.078
Standard deviation of dependent variable	0.049	0.045	0.043	0.045	0.053	0.067
Root Mean Squared Error	0.089	0.071	0.059	0.055	0.057	0.073
F statistic of model	23	23	63	78	49	9
P-value of model	0.000	0.000	0.000	0.000	0.000	0.000
Log likelihood of model	1158	3840	7197	11171	14522	12841
Log likelihood of constant-only model	192	2876	6069	10029	13555	12492

Note. Results are from Tobit regressions where the dependent variable is the fraction of single-family home sales purchased by each investor type in a Census tract, pooling data from 2012, 2013 and 2014. * and ** denote significance at the 5 and 1 percent levels, respectively. Standard errors are clustered by metropolitan area.

Table 9
Changes in House Prices, Rents and Vacancy Rates, 2012 to 2014

	Δln(House Price)			Δln(Rent)			ΔVacancy Rate		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Δ B2R share 2011 to 2012	0.49**	0.33**	0.33**	-0.00	-0.09**	0.00	-0.04**	-0.01**	-0.01**
	(0.04)	(0.03)	(0.03)	(0.03)	(0.02)	(0.03)	(0.00)	(0.00)	(0.00)
Δ large share 2011 to 2012	0.04	-0.04*	0.04*	0.02	-0.01	-0.01	0.00	0.01**	0.00*
	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)
Δ medium share 2011 to 2012	0.01	0.04	0.03	-0.03	-0.02	-0.03	-0.00	-0.00	-0.00
	(0.03)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.00)	(0.00)	(0.00)
Δ small share 2011 to 2012	-0.03	-0.00	0.00	0.02	0.01	0.02	-0.00	-0.00	-0.00
	(0.04)	(0.03)	(0.02)	(0.03)	(0.02)	(0.02)	(0.00)	(0.00)	(0.00)
Δ micro share 2011 to 2012	0.00	0.05	0.04	0.04	0.01	0.00	-0.00	-0.00	-0.00
	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.00)	(0.00)	(0.00)
Δ ind share 2011 to 2012	0.08**	0.04*	0.03	0.02	0.00	0.01	0.00	0.00	0.00
	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)
Dependent Var. 2010 to 2012	0.22**	0.04**	-0.15**	0.01*	-0.02**	-0.03**	-0.01**	-0.07**	-0.05**
	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Dependent Var. 2008 to 2010	-0.32**	-0.23**	-0.28**	--	--	--	-0.15**	-0.13**	-0.10**
	(0.01)	(0.01)	(0.01)				(0.00)	(0.00)	(0.00)
Dependent Var. 2006 to 2008	-0.32**	-0.14**	-0.16**	--	--	--	--	--	--
	(0.01)	(0.01)	(0.01)						
MSA FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Other controls	No	No	Yes	No	No	Yes	No	No	Yes
# Obs	7462	7276	6848	8882	8470	6311	54338	51252	50275
Adjusted R^2	0.57	0.23	0.34	0.00	0.00	0.10	0.03	0.03	0.02
Mean(DV)	0.13	0.13	0.13	0.06	0.06	0.06	-0.002	-0.002	0.02
SD(DV)	0.11	0.11	0.11	0.06	0.06	0.06	0.017	0.015	1.11
Unit of observation	ZIP	ZIP	ZIP	ZIP	ZIP	ZIP	Tract	Tract	Tract

Note. In columns with MSA fixed effects, the statistic reported for Adjusted R^2 is the within-group R^2. Controls in columns 3 and 6 are ln(house price$_{2008}$), ln(rent$_{2012}$), fraction of mortgages in negative equity$_{2012}$, price/rent ratio$_{2012}$, fraction with a credit score in the lowest decile$_{2012}$, fraction with a credit score between the 10th and 25th percentiles$_{2012}$, fraction with a credit score above the 75th percentile$_{2012}$, and the following variables from the 2008-2012 ACS: fraction with less than a high school degree, fraction with a college degree or more, unemployment rate, an indicator for median income below the 25th percentile, an indicator for median income above the 90th percentile, and fraction of households with children. Controls in column 9 are the following variables from the 2008-2012 ACS: ln(median house value), ln(median rent), fraction of households with children, fraction with less than a high school degree, fraction with a college degree or more, ln(median income), unemployment rate, poverty rate, fraction of homes built pre-1950, fraction of homes built post-2000, and the following variables from Location Inc.: property crime rate in the lowest 25 percentile, property crime rate in the highest 25 percentile, violent crime in the lowest 25 percentile violent crime in the highest 25 percentile, school quality in the lowest 25 percentile and school quality in the highest 25 percentile.

Figure 1
Share of Single-Family Purchases by Investor Type

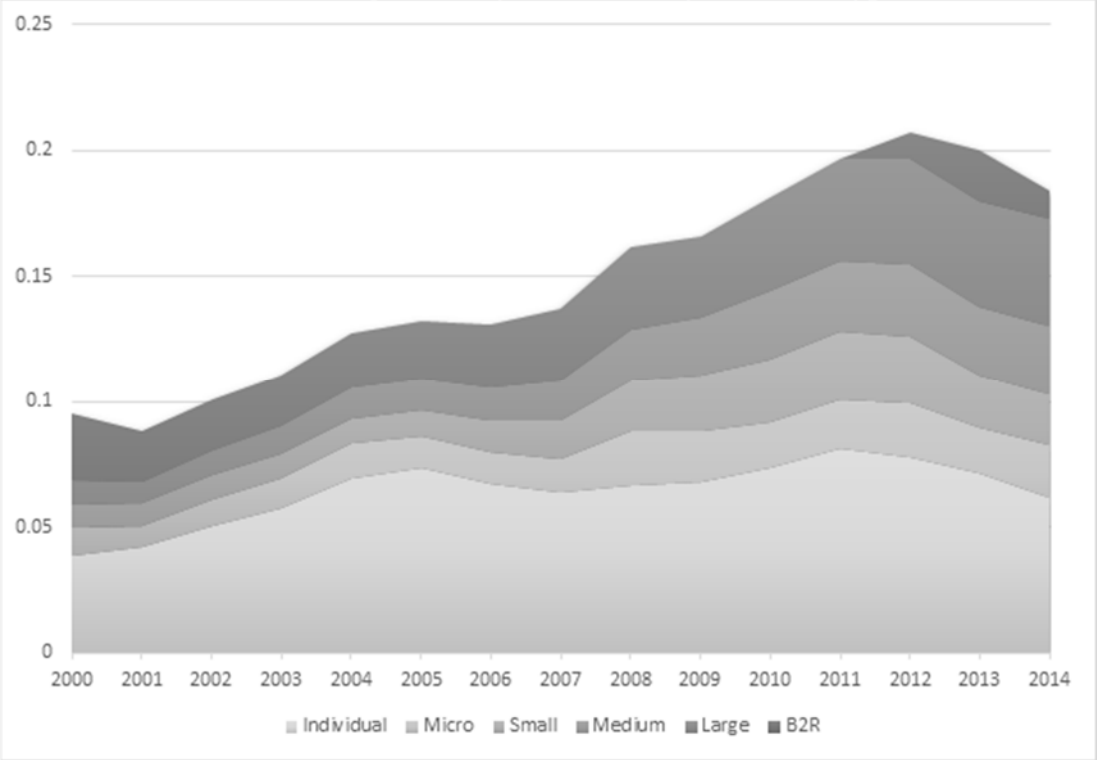


Figure 2
Fraction of Purchases Resold Within 12 or 24 Months

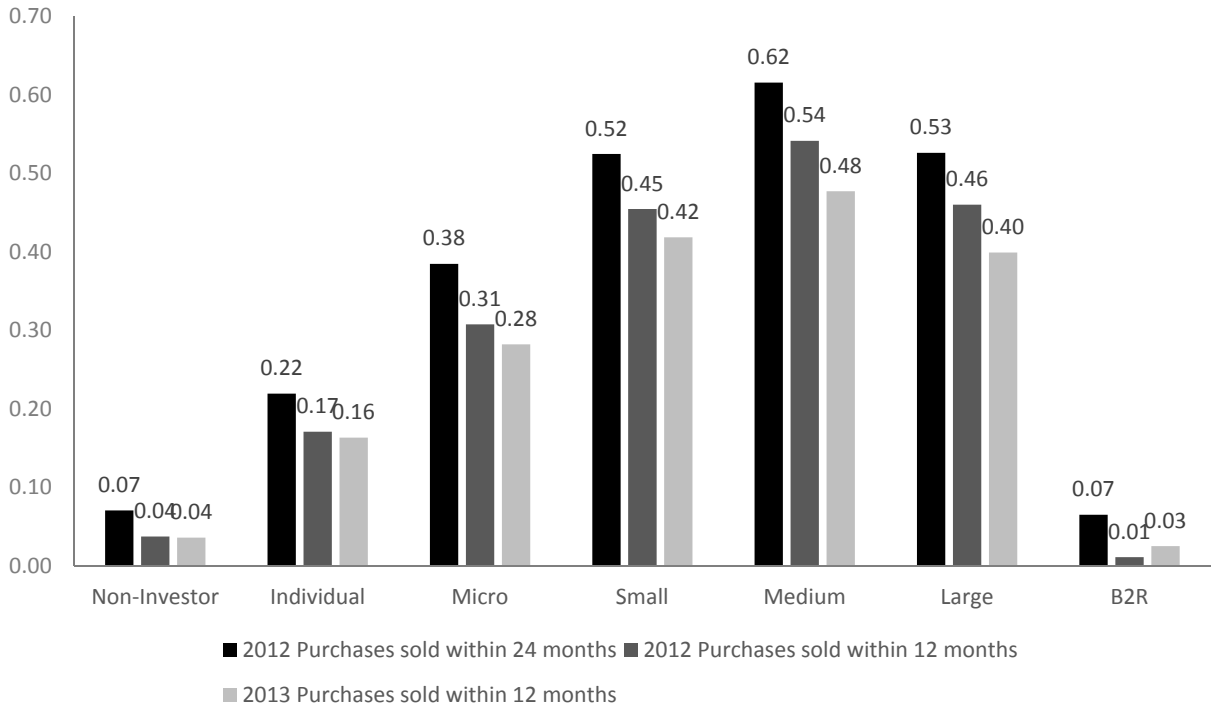


Figure 3
Fraction of Purchases without Mortgage Financing, 2012 to 2014

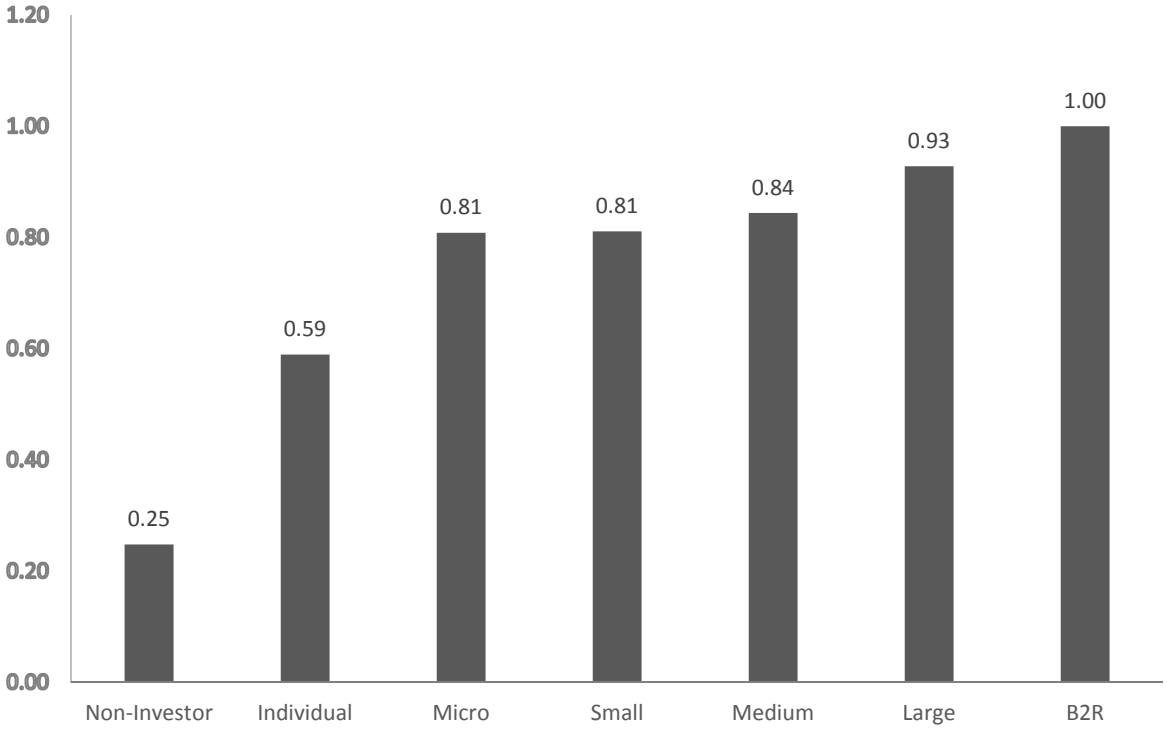


Figure 4

Investor Concentration by Metropolitan Area in 2013

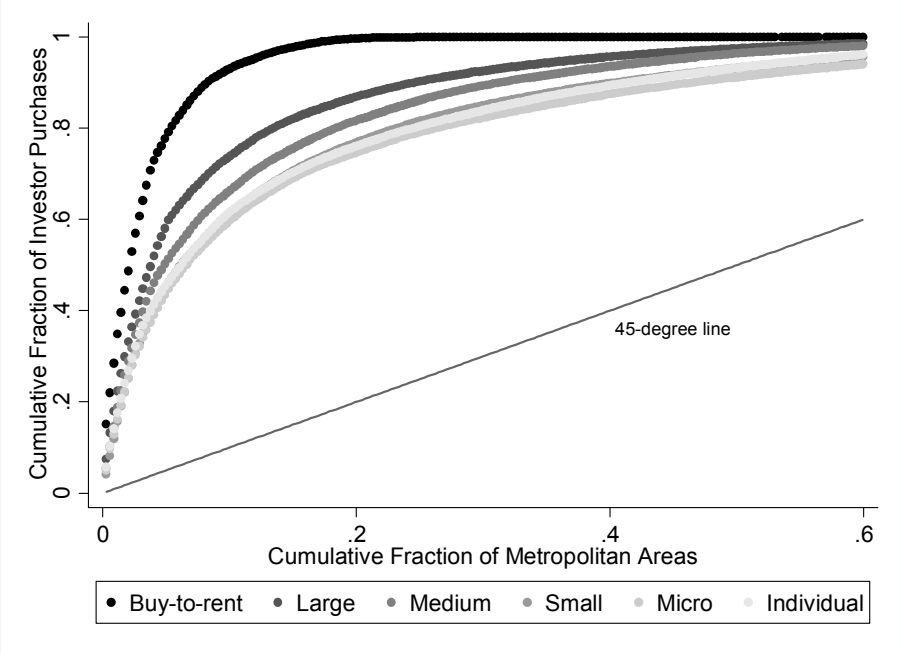
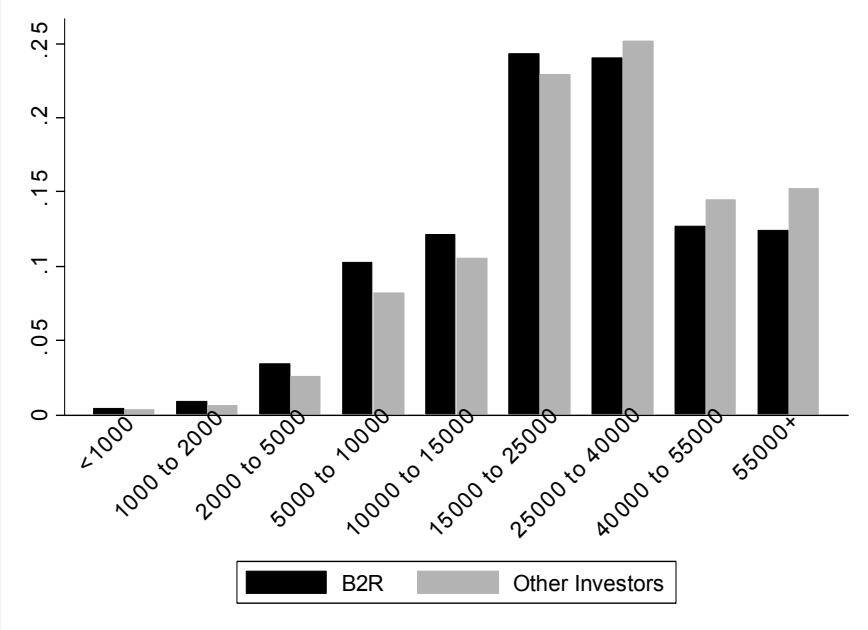
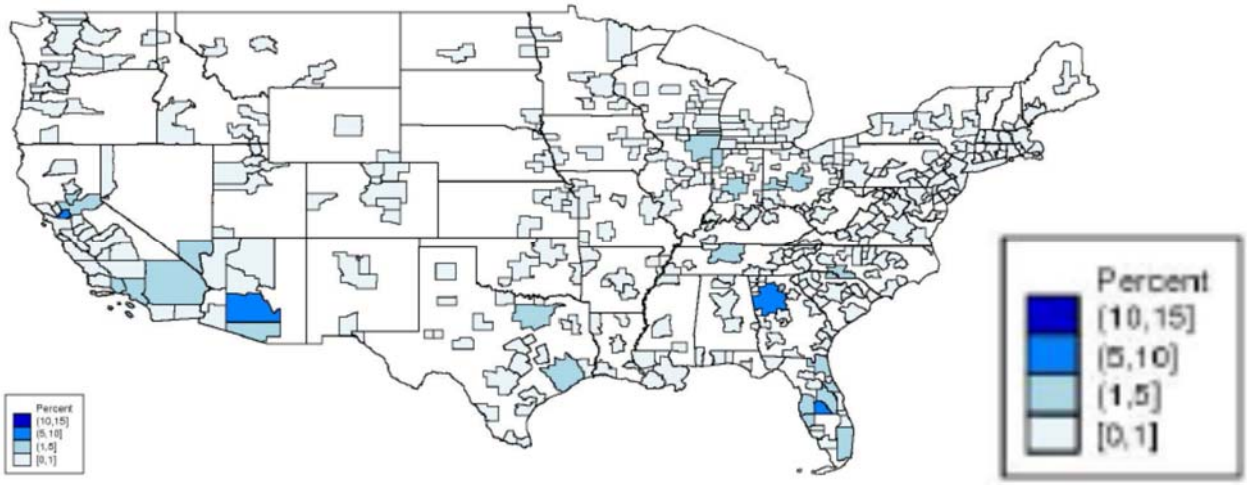


Figure 5
Distance between Pairs of Homes Purchased by Buy-to-Rent and Other Investors

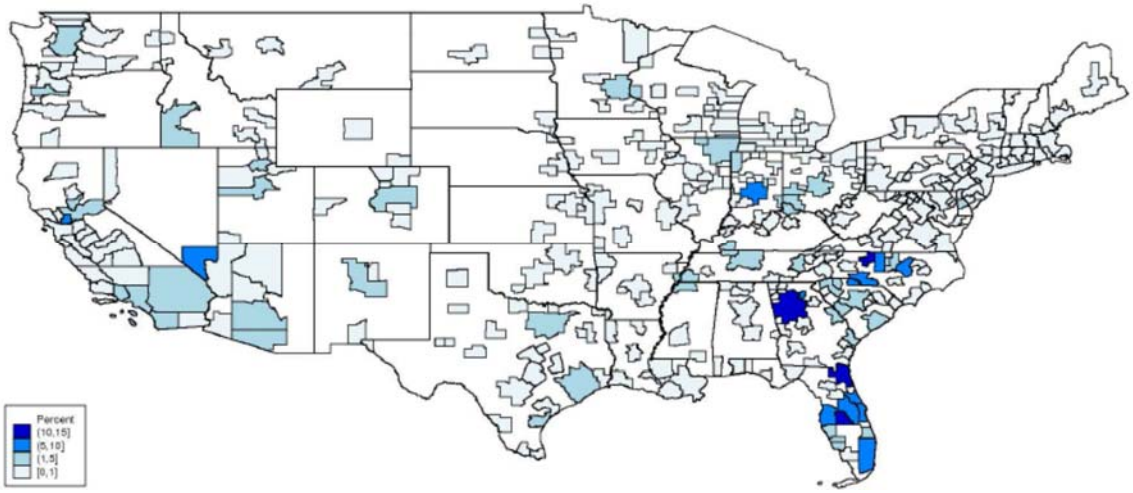


Note. Based on the 20 metropolitan areas with the largest number of cumulative buy-to-rent purchases through 2014. The figure shows the predicted probability that a pair of homes is in each distance category based on ordered logit regressions that control for ln(housing unit density) in the tract where each home in the pair is located. X-axis shows distance in meters. See text for details.

Figure 6
Buy-to-Rent Shares Across Metropolitan Areas
2012



2013



2014

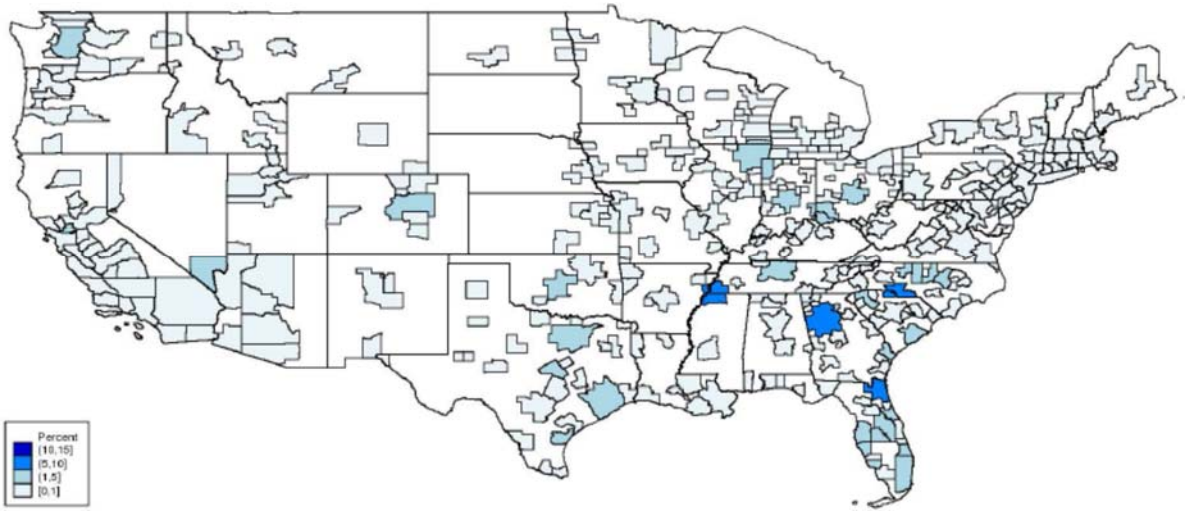
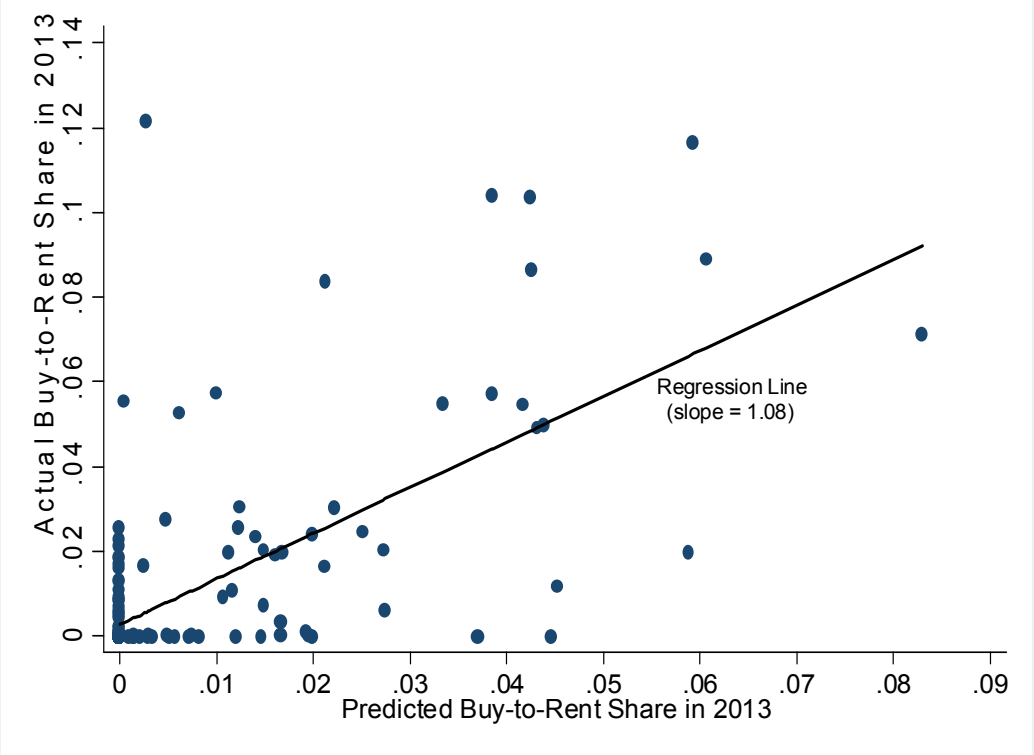


Figure 7
Actual and Predicted Buy-to-Rent Share in 2013



Appendix Table 1
Sample Coverage of Buy-to-Rent Investor Holdings, as of 12/31/2014

Investor Name	Number of Properties in Sample	Number of Properties Reported in Media or Public Documents	Percentage
American Homes 4 Rent	32,104	34,599	92.79%
American Residential Properties	7,747	8,893	87.11%
Blackstone (Invitation Homes)	40,955	45,000	91.01%
Colony American Homes	16,466	18,000	91.48%
Main Street Renewal	2,836	4,500	63.02%
Progress Residential	11,030	12,500	88.24%
Silver Bay Realty Trust	6,045	6,780	89.16%
Starwood Waypoint Realty Trust	7,938	12,326	64.40%
Total	**125,121**	**142,598**	**87.74%**

Appendix Table 2
Propensity to Re-sell Properties by Investor Type

Share of homes purchased in	2012		2012		2013	
And sold within	12 months		24 months		12 months	
	(1)	(2)	(3)	(4)	(5)	(6)
B2R investor dummy	-0.280**	-0.258**	-0.278**	-0.254**	-0.225**	-0.211**
	(0.005)	(0.005)	(0.005)	(0.005)	(0.003)	(0.004)
Large investor dummy	0.305**	0.301**	0.299**	0.300**	0.210**	0.210**
	(0.007)	(0.008)	(0.007)	(0.008)	(0.006)	(0.007)
Medium investor dummy	0.394**	0.382**	0.389**	0.379**	0.372**	0.353**
	(0.006)	(0.007)	(0.006)	(0.007)	(0.006)	(0.006)
Small investor dummy	0.323**	0.315**	0.330**	0.324**	0.318**	0.307**
	(0.006)	(0.007)	(0.006)	(0.007)	(0.005)	(0.006)
Micro investor dummy	0.195**	0.194**	0.206**	0.211**	0.171**	0.169**
	(0.005)	(0.006)	(0.006)	(0.006)	(0.004)	(0.005)
Share investor purch. foreclosed	0.230**	0.218**	0.240**	0.240**	0.207**	0.189**
	(0.007)	(0.009)	(0.007)	(0.009)	(0.006)	(0.007)
Share investor purchases REO	0.142**	0.140**	0.141**	0.151**	0.122**	0.124**
	(0.008)	(0.011)	(0.009)	(0.011)	(0.007)	(0.009)
Share investor purch. short sale	0.069**	0.081**	0.044**	0.095**	0.123**	0.116**
	(0.011)	(0.013)	(0.011)	(0.014)	(0.008)	(0.010)
Ln(avg. price per square foot)	0.106**	0.012	0.085**	-0.007	0.077**	-0.008
	(0.004)	(0.007)	(0.004)	(0.006)	(0.003)	(0.006)
Constant	-0.321**	0.081**	-0.177**	0.199**	-0.201**	0.177**
	(0.020)	(0.030)	(0.019)	(0.028)	(0.016)	(0.027)
Census tract fixed effects?	No	Yes	No	Yes	No	Yes
Dependent variable mean	0.387	0.387	0.423	0.482	0.341	0.341
Observations	30,506	30,506	30,506	30,506	44,935	44,935
Adjusted R^2	0.437	0.487	0.443	0.443	0.350	0.403

Note: Results are from OLS regressions of the share of homes purchased by an investor class within a census tract that are subsequently re-sold as a function of the share of purchases by that investor class in the census tract that are distressed properties and the natural logarithm of the average price per square foot paid by each investor class in a given Census tract. Each Census tract must have non-zero B2R purchases in the year considered. Standard errors are clustered at the Census-tract level. * and ** denote significance at the 5 and 1 percent levels, respectively.

Appendix Table 3
Metropolitan Areas with the Largest Share of Buy-to-Rent Purchases

Metropolitan Area Name	Buy-to-Rent Share	Buy-to-Rent Purchases	Total Single-Family Purchases
Panel A: 2014			
Charlotte-Gastonia-Rock Hill, NC-SC	6.6	1,837	27,999
Jacksonville, FL	6.6	1,519	23,162
Memphis, TN-MS-AR	5.1	806	15,760
Atlanta-Sandy Springs-Marietta, GA	5.0	3,912	77,671
Miami-Fort Lauderdale-Pompano Beach, FL	4.2	2,797	66,249
Lakeland-Winter Haven, FL	4.2	368	8,794
Orlando-Kissimmee-Sanford, FL	4.2	1,405	33,814
Raleigh-Cary, NC	4.1	718	17,487
Tampa-St. Petersburg-Clearwater, FL	3.8	1,776	46,295
Vallejo-Fairfield, CA	3.2	158	4,931
Panel B: 2013			
Winston-Salem, NC	12.2	682	5,575
Atlanta-Sandy Springs-Marietta, GA	11.6	9,461	81,824
Lakeland-Winter Haven, FL	10.5	929	8,859
Jacksonville, FL	10.3	2,190	21,262
Orlando-Kissimmee-Sanford, FL	8.9	2,996	33,613
Tampa-St. Petersburg-Clearwater, FL	8.9	3,941	44,395
Charlotte-Gastonia-Rock Hill, NC-SC	8.3	2,325	27,905
Vallejo-Fairfield, CA	7.3	400	5,493
Las Vegas-Paradise, NV	7.2	2,660	37,065
Miami-Fort Lauderdale-Pompano Beach, FL	6.0	4,060	67,323
Panel C: 2012			
Phoenix-Mesa-Glendale, AZ	6.5	6,137	94,521
Atlanta-Sandy Springs-Marietta, GA	6.4	4,287	66,744
Vallejo-Fairfield, CA	5.4	357	6,605
Lakeland-Winter Haven, FL	5.3	410	7,696
Tampa-St. Petersburg-Clearwater, FL	5.0	1,781	35,843
Tucson, AZ	3.8	469	12,419
Orlando-Kissimmee-Sanford, FL	3.7	1,056	28,840
Las Vegas-Paradise, NV	3.1	1,222	39,924
Sacramento--Arden-Arcade--Roseville, CA	3.0	1,032	34,391
Jacksonville, FL	2.9	453	15,553

Appendix Table 4
Correlation of Rent Growth in 2014 with Buy-to-Rent Share of the Rental Market

	(1)	(2)
Buy-to-rent share	0.062*	-0.060*
	(0.027)	(0.025)
Rent growth in 2013	-0.032**	-0.163**
	(0.007)	(0.010)
MSA FE and other controls	No	Yes
Number of observations	16,110	9,218
Buy-to-rent share >= 10%	0.001	-0.005
	(0.006)	(0.005)
Rent growth in 2013	-0.032**	-0.163**
	(0.007)	(0.010)
MSA FE and other controls	No	Yes
Number of observations	16,110	9,218

Note. The unit of observation is the ZIP code. The buy-to-rent share is calculated as the cumulative number of purchases in 2011, 2012 and 2013 divided by the average number of rental-occupied housing units from 2008 to 2012. The buy-to-rent share is greater than 10% in roughly 0.5 percent of ZIP codes.