Micro Evidence Relating to House Rents, Prices & Investors from a Matched Dataset

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Abstract: We examine matched rent-price ratios and rent transaction prices for single family houses in Miami-Dade County during March 2006 - April 2014. The primary data consists of both a property sale and a subsequent rental within 240 days of the sale. Each of the buyers in the sample are investors since each property included have a rental event implying they are not owner occupied. A subset of the data from 2009 - April 2014 allows us to identify whether a buyer belongs to an organization or is an entity purchasing a large volume of properties. In the regression models we examine the relationship between housing and market characteristics and the impact larger investors have on single family rents and rent-price ratios. We also calculate gross returns for properties that sell a second time in the data.

Introduction

In this project, we investigate matched house prices and rents in a market where investors purchased residential properties with the objective of buying to rent versus flipping. Entities such as New York-based Blackstone Group (NYSE: BX) and California-based American Homes 4 Rent (NYSE: AMH) and other national and local entities acquired hundreds of single-family dwellings in some markets particularly hard hit by the housing recession. We examine a matched sample of single-family sales and subsequent rental of properties to measure rent-price ratios directly and examine these actual rent-price ratios prior to, during and after the Great Recession (March 2006-April 2014). Our primary sample includes only investor properties where the property is sold and rented within 240 days after the sale.

Initially we find rent-price ratios doubled from the 2006/2008 period relative to 2010 with most of the increase attributed to falling housing prices. The peak rent-price ratios occurred in 2011 with a return to growth in rent and prices in 2012 and a slight decrease in rent-price ratios during 2012, 2013 and the first four months of 2014.

Next we examine whether size in terms of the number of purchases by the investors impact the rental rates, the rent-price ratios and/or the sales price in the market relative to properties purchased and rented by single-purchase buyers/renters using data from 2009-April 2014. The sample is restricted given that Miami-Dade County Property Appraiser's office provided a complete record of grantee and grantor to their sales dataset starting in 2009. There are a few instances of grantee or grantor information prior to 2009. This data allows us to identify purchases by investors by name and thus the number of purchases by each entity. The results for this smaller sample indicate that investor size does not influence sale price, rents or rent-price ratios. Larger investors in terms of number of properties

purchased do not appear to have any statistical impact on the markets in this sample that consists only of investors both small and larger. They do not unduly influence rents or prices in this market. We plan to add a model where we take the number of buy to rent (BTR) properties as a subset of all houses sold during the 2009-2014 period to examine if BTR properties sale at lower or higher prices than other single family houses. Prior research indicates that investors are able to purchase at lower prices compared to individuals purchasing single family homes for their own account, but not necessarily for rental.

Our final set of results provide new information on the returns to BTR properties that coincides with their increased popularity. We identify a subset of BTR properties that sold a second time during the period 2006 to 2019. We calculate the price-rent ratio and the capital gains yield for this sample. Results are show in Table 4. The mean time to next sale is forty-nine months with a gross return of approximately 20% for the sample of approximately 3000 resales.[1] The capital gains yield is about 8% and the income yield is about 12%. Using a flat rent, the number of months between sales, the first sale price and the second sale price, we calculate an IRR of 19.57%, similar to the 20% above. The first part of the sample that includes initial sales and rentals in the August 2005-2010 time period is considerably different. We calculate an IRR of 2.86%, with a rent-price ratio of 8.38% and a capital gain of negative 6.70%. This occurs during the boom and subsequent downturn. The initial sale for the second half occurs during 2010 through 2014, with the second sale occurring through March 2019. Returns of 16.03% for the income yield and 23.01% for the capital gain yield results in approximately a 39% gross return. The IRR in this half is 36.27%. These results are consistent with a declining market in the first half. The second half of the sample is marked by lower initial prices, moderately increasing rents and higher

[1] The 20% is similar to the weighted average return of 23.8% calculated from Table 4 of Bayer, et al, (2020).

prices for the second sale. In addition to the descriptive statistics on IRR, Total Yield, Income Yield (rent to price ratio), Annual Capital Gains Yield and Total gains yield (ignoring compounding), we examine the relationship between property characteristics and returns in a statistical model.

We are aware of two papers that have matched sales with subsequent rental of the same units. Bracke (2015) creates a matched data set with different property types in central London and directly measures their rent-price ratios with results indicating that rent-price ratios are higher for smaller and lower-value properties. Our results indicate that larger properties in terms of square feet have marginally higher rent-price ratios, with lower value properties having higher rent-price ratios consistent with Bracke's (2015) results. Bracke (2019) with a similar matched data set examines whether investors in buy to rent properties increase prices of other properties. Empirical results such as Allen (2018) indicate that investors buy properties at lower prices compared to individuals after controlling for a large number of property characteristics, but the impact of investors size or activity on rent for the property and the rent-price ratio remains unexamined?. Do investors pass along this savings in price to renters or are they able to charge market rates and earn abnormal returns based on the low transaction price. Thus, it is not clear whether entrance by big players would impact, improve or decrease rent-price ratios or rental prices in the market. More specifically, we examine the rent and rent-price ratio for investors who acquire multiple single-family dwellings relative to individual investors in the market with investor size determined by the number of purchases in the market.

Larger players potentially bring liquidity, transactional efficiencies (i.e., sophisticated targeting of potential acquisition properties, superior negotiation skills and experience, streamlined closings, etc.), and operational efficiencies (i.e., property and

portfolio management expertise) to local housing markets that individual investors in those markets may not have. On the one hand, purchases by big players could increase the overall demand in the market and push the prices and rents upwards. On the other hand, big players have some monopsony advantage and might be able to utilize their buying / bargaining power and negotiation skills to purchase properties at a discount to market value and consequently be able to offer lower rents since they purchase at lower prices.

Review of the Literature

Prior to 2008 and currently most single family rentals were owned by individuals or smaller local investors. Acquiring and maintaining a portfolio of single family homes may involve higher costs and more complex logistics compared to the costs and logistics of typical small local investors or investors in multi-family rental portfolios. It is well documented that during the financial crisis and the subsequent recovery, larger investors took a new interest in purchasing single family homes to rent. When prices of single family houses dropped and inventories increased, this investment strategy became more profitable, and multiple larger scale investors became active in this area, buying large portfolios of distressed properties across the nation. One of the largest, Invitation Homes (NYSE: INVH) began investing in single family homes in 2012, and as of the second quarter of 2019 had grown the single family rental home portfolio to a net value over $16 billion. American Homes 4 Rent (NYSE: AMH) was founded in 2011 and has grown its single family rental portfolio to nearly $8 billion as of the second quarter of 2019. Single family rental investors typically focus on affordable and middle tier homes, and in 2018, investors are estimated to have purchased 20% of homes in the bottom third of the market.[2] At the same time, new

[2] Core Logic estimate, https://www.nytimes.com/interactive/2019/06/20/business/economy/starter-homes-

home construction of affordable "starter" homes has been limited due to the lower profit margins in this category.

Because these developments are fairly recent, there is a relatively small set of related literature. A growing portion of this literature focuses on the question of whether or not investors in single family homes use market power or other advantages to the detriment of individual home buyers and renters. The negative impact on individuals might result from higher prices and gentrification in previously affordable neighborhoods, or because investors are able extract surplus rents. At the same time, larger scale investment may afford higher operating efficiency, which would allow higher profits without higher rents.

Investor Purchases and Prices

One strand of recent research examines the impact of investors on single family housing prices. Bracke (2019) examines the question of whether investors who buy to rent push up prices, forcing other buyers out of the market; or whether they provide liquidity and contribute to market clearing. He includes both single family properties and individual units in multifamily properties in the United Kingdom, and finds that buy to rent investors do not pay more on average than other purchasers. Comparing an identified group of buy to rent purchasers to a mixed group of investors and individual purchasers, he finds that in a matched repeat sales comparison, the buy to rent group purchases at a discount between 1.6% and 3.9%. Allen et al. (2018) examine investor purchases relative to individual purchases in Miami-Dade county Florida, and find that investors buy single family properties at discounts between 7.7% and 13.6%, with larger portfolio investors obtaining the largest discounts. The analysis shows that investors purchase real estate owned (REO) properties at

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deeper discounts than individuals purchasing REOs. Allen, et al. (2018) also provides census tract evidence that the presence of investor buyers in a market is associated with marginally higher property values.

Similarly, G'Lima and Schultz (2019) examine the impact of eight large scale real estate investors on housing prices in 7 US states; and find evidence consistent with the hypothesis that buy to rent investors provide liquidity and reduce local supply, resulting in price appreciation of nearby houses. Using Zillow data on repeat sales of houses in close geographic proximity to houses purchased by large scale buy to rent investors, they find that returns on repeat sales completed after a nearby investor buy to rent purchase are higher than repeat sales completed before. Interestingly, this price appreciation is not entirely driven by investor purchase of foreclosed properties which might have previously been neglected. Repeat sale returns for properties close to non-foreclosed homes purchased by investors are almost as large as returns when the nearby investor purchased property is foreclosed. D'Lima and Schulz (2019) note that the large scale buy to rent investors typically spend $20,000 to $25,000 renovating single family properties prior to renting them. In addition to providing liquidity and reducing inventory, large scale investors may contribute to higher property values in part by this additional investment in repairs and renovation. The authors interpret these findings positively, in part because the data studied is from the depths of the mortgage crisis when inventories were extremely high.

Mills, Molloy, and Zarutskie (2019) examine the 2012-2014 activity of the eight largest buy to rent investors as well as smaller investor groups in single family properties. While the analysis focuses on the primary reasons for the increase in larger scale buy to rent investments in single family homes (high inventory levels, tight mortgage financing conditions, and technological reductions in acquisition and managerial costs); it also

provides evidence that prices rise more in zip codes that had previously had more purchase activity by buy to rent investors.

Gay (2015) studies data from the Chicago area MLS in the 2007-2014 time period. Contrary to the results of Bracke (2019) and Allen et al (2018) discussed above, his results indicate that investors both buy and sell at higher prices than individuals. Interestingly, the premium is positively related to foreclosure rates in the neighborhood. Clusters of investor purchasing activity are associated with higher prices of nearby properties. In addition, when investors sell properties, they do so at a premium to non-investors; and the premium cannot be fully explained by a proxy for renovations or improvements made by the investor. Using a measure of affordability based on people's income within a defined area, the conclusion is that the increase in investor activity leads to higher home prices, and has a negative effect on housing affordability for lower income households.

Taken as a whole, these recent studies indicate that investor purchases of single family homes are associated with either no price impact or marginally higher prices, and may contribute to housing affordability problems in some areas.

Rent to Price and Returns to Investors

Xiao and Xiao (2019) study three large mergers of institutional single family rental investors. They find that in the year following the merger, neighborhoods with more overlap of properties by the merging firms, and therefore higher market power post-merger, experience a greater increase in rent (1.6% increase) compared to non-overlapping neighborhoods also covered by the merging firms. The difference in rent increase is weaker in neighborhoods where the merged firm has competition from other institutional owners. This is consistent with the hypothesis that increased market power of institutional single

family rental investors allows them to extract surplus rents. However, the analysis also shows that after the merger completion, neighborhoods with more overlap of properties by the merging firms experienced a significantly larger drop in burglaries, theft, and vandalism compared to non-overlapping neighborhoods covered by the merging firms. This suggests that the higher market power allows both higher rents and higher quality rental service; and is also suggestive of gentrification effects related to institutional investment in single family neighborhoods.

Eisfeldt and Demers (2018) use 1986 to 2016 city level (American Housing Survey) and zip code level (Core Logic) data to examine rental yields and price appreciation. The analysis of city level data indicates that rental yields are higher, but price appreciation is lower in lower price tier cities. House price appreciation increases with price tier, but rental yields decrease with price tier. Each component contributes roughly equally to total returns. Rental yields have lower volatility than price appreciation. At the zip code level, house price appreciation is strongly tied to city level outcomes, and declines with price tier within the city. This is consistent with observed gentrification and loss of affordable housing to lower income individuals in a number of cities as investors seek higher rental yields in lower income neighborhoods.

Bracke (2015) uses unit level data to examine prices and rents in Central London and finds that rental yields differ within the same geographical area. Rent-price ratios are lower for properties in apartment blocks and multilevel buildings, possibly because of lower maintenance costs due to economy of scale, as well as different amenities offered. Consistent with the results of Eisfeldt and Demers (2018) discussed above, Bracke finds that rental yields are also lower for properties in more prestigious and expensive neighborhoods. This is presumably driven by lower renter risk, lower vacancy rates, higher property appreciation

expectations, as well as the fact that a larger proportion of value in these areas is composed of land value, which requires little maintenance. Again, these findings suggest that investors have incentives to purchase in lower income and more affordable neighborhoods in order to maximize the rental yields on single family rental portfolios.

Hattapoglu and Hoxha (2014) utilize two unique datasets from different neighborhoods in Houston, TX, to study how the formation of households' expectations regarding price appreciations affects housing market prices. Their results suggest that appreciation expectations are based on past price appreciation but at the same time they depend on the fundamental factors such as, locational and structural. Thus, market participants display a hybrid behavior of rational and adaptive expectations. They also show that these expectations could lead to unstable price and price-to-rent levels.

Broader analysis of rental housing units provide evidence suggests that rents exhibit mean reversion, and that the best predictor of rent level is initial rent (Verbrugge, Dorfman, Johnson, Marsh, Poole and Shoemaker, 2017). Similarly, Otto and Stapledon (2017) find that rent- price ratios are predictive of future growth rates of rents. Other analyses studying U.S. data have also found evidence of predictability in rents (Clark 1995, Sinai and Souleles 2005, and Gallin 2008). Due to competition from other institutional investors and smaller local investors, increased market power may still only allow limited ability to raise rents, and some perceived benefit or rental service may be required to justify significantly higher rents.

There is also a growing theoretical literature studying various aspects of the price-rent-to ratio in housing markets. Kishor and Morley (2015) focus on factors that determine price-rent ratio, Huang, Ka Yui Leung and Tse (2018) model joint determination of rent-to-price ratio and the turnover rate, Williams (2019) emphasizes the procylical volatility of

prices and price-rent ratios, Gilbukh, Haughwout and Tracy (2017) examine the potential for the price-to-rent ratio to be used as a macroprudential tool, Liu, Wang, and Zha (2019) investigate how a credit supply shock can generate large comovements between the house price and the price-to-rent ratio.

Data

In most research regarding rent and price, the data does not allow for matching a specific house with a specific rent. Since price and rent information is typically obtained for different properties, this makes it more difficult to determine the impact of investor size in the market collectively. We overcome this shortcoming by matching sales with subsequent rents within a 240-day window for the same property to create a dataset that allows us to examine how larger buyers in a local housing market impact rents and rent-price ratios relative to smaller and typically local investors.

In order to conduct the empirical analysis, we obtain data from a number of datasets. The transaction/sales dataset contains information on properties in Miami-Dade County, Florida, from March, 1971 through March 2019.[3] Miami-Dade County Property Appraisal sells their property data sets for a relatively low price and provides a number of property characteristics. The datasets includes names of the grantee and grantor from 2009. They also includes transaction price, transaction date, a unique property ID (Folio number), deed book and deed page, property address, square feet of the building, square feet of the land, number of bedrooms, number of bathrooms, number of stories, year built, effective year built, DORcode (type of variable which allows us to identify single family homes and

[3] In this data grantee and grantor information is typically available after December 2009. There are a few observation before this date that include buyer and seller information and a few after that date are missing grantee grantor information often due to state confidentiality regulations.

townhouses) and SalesCode (type of sale variables: Transfer qualified as arm's length; Corrective deed, quit claim deed, etc.; Auction/Deeds from financial institutions; Deeds executed by bankruptcy trustees; Transaction involving affiliated parties; Sale not exposed to the open-market; and Forced sale or sale under duress).[4] A second dataset from Miami-Dade contains information about properties with pools that we use to create a pool dummy variable. A third set of yearly datasets are obtained from the Florida Department of Revenue (FDOR). Each year, every Florida County provides a dataset that contains the assessed value of the land and assessed value of each property to FDOR. We use the FDOR Miami-Dade datasets to estimate the percentage of value from the land and match with the sales dataset by year and by property ID (*remains to be completed*). The dataset also contains a quality description each year that we match with the sales data to obtain an estimate of the quality of the property.[5] In addition, census block group is available in the FDOR datasets and we use the census block group to control for location. We match the data from the above-described datasets with information from the local MLS rental information by the tax district's property information numbers (Folio number). We extract rent, asking rent, list date for the rental, rental date, time-on-the-market, bedrooms, bathrooms, dummies for property condition from the MLS remarks section and identify single family homes and townhouses using MLS style codes. To identify distressed properties, we primarily use the FDOR "SalesCode" that allows us to classify properties by quit claim deeds, deeds from financial institutions; deeds executed by bankruptcy trustees and forced sale or sale under duress as noted above.

[4] See "Real Property Transfer Qualification Codes for use by DOR & Property Appraisers Beginning January 1, 2012" at: http://dor.myflorida.com/dor/property/rp/dataformats/pdf/salequalcodes12.pdf

[5] Unfortunately while we try to use this variable, we are not convinced that it is a reliable measure of quality based on the regression results in some cases. Fortunately, other coefficients are only marginally impacted by the inclusion/exclusion of this set of dummy variables of relative quality.

We assume that all rental properties are purchased by investors. Using a first cut of sales rented within 240 days from the purchase date that have grantee names we count the number of purchases by each grantee to identify larger investors. We also create a dummy variable to classify grantees that are identified as a LLC, LP, Inc. or Corporation in an attempt to control for individuals and entities, however it is often the case that LLCs or LPs purchase only one property during the sample period, thus we rely more on the number of purchases to identify larger investors. We identify investors with 1 purchase, investors with 2 purchases, investors with 3 to 9 purchases and investors with 10 to 299 purchases.

We remove from the data obvious outliers and other problem data such as properties that were sold as a group with the sale price indicated as the price for the entire group, or properties missing square feet. The entire dataset including any sold property that could be matched before a rental occurs consists of approximately 46,426 single family houses and townhouses. There is large variation in this measure with some sales occurring as early as 1960 with a rental during 2006-April 2014. We concentrate on properties with a rental within 240 days of a sale. We exclude all monthly rents below $500 or above $12,500 and all sales with a price below $20,000 and above $4,000,000.

While we show descriptive statistics for the full set of rental properties in Table 1, for our primary analysis we keep only sales that had a rental within 240 days after the sale occurred. This resulted in 9,362 matches. Of these 9,362 matches, we cannot identify the grantee of approximately 30% of the matches.[6]

[6] In the initial sample there are 46,426 matched by a county FOLIO number. Of these 34,486 are missing grantee information primarily because the sale date is prior to 2009 when Miami-Dade County started providing the grantee information consistently. However 2,751 of the ones missing grantee information have a rental with 240 days of the sale. We classify these as unknown, but keep them in the sample of transactions of matched rental and sales. We identify 11,940 with grantee name. Of these, 6,611 are rented in 240 days of the sale. The joint number of sales with rentals with 240 days is 9,362 (2,751+6,611).

Table 1 provides descriptive statistics for the full sample of rentals, the sample of matched sales and rentals and a subset of matched sales and rentals with a second sale price in the sales data that is available through March of March of 2019. The average number of days for the full sample is 1,859, with about half the properties renting within 3.5 years of the sale. The samples with less than 241 days between the purchase and rental had time on the market of approximately 50 days with the full sample renting within 61 days on average. Rents are about $170 per month less for the matched sample than the full sample. Prices for the matched sample are approximately $240,000 compared to $261,000 for the full sample. The higher prices and higher rents for the full sample may be driven by the fact that the full sample of 46,426 rentals includes larger homes that are marginally more likely to have a pool, and are much less likely to be a distressed sale. The higher percentage of distress sales in the matched data sets may be because a large number of the complete rental data set were purchased on average 5 years before the rent incident with some rentals purchased as early as 1960, though most were purchased after 1998.

For the matched sample with a second sale in the data the initial sale is the highest at $264,924 and the second sale averages $290,227. However, the matched data set with a second sale does not have higher rent than the matched data set without a second sale, nor does it have significantly more square footage, bedrooms, or bathrooms. The matched data set with a second sale is slightly more likely to be a waterfront home compared to matched rentals that do not have a second sale.

The mean annual rent to price ratio for the matched data set without a second sale is 13.4%, while the rent to price ratio for the matched data set with a second sale is 12.8%. This is a gross measure that does not include transaction costs of the sale, renovation, maintenance or repairs to the property, or listing and rental costs. The mean rent to price

ratio in this sample is higher than that found in other studies, for example, Bracke (2015) finds gross rent to price ratios for a sample of single family houses and apartments between 4.6% and 5.8% in London during the 2006 to 2012 period, and Eisfeldt and Demers (2018) find rent to price ratios between 2.92% and 6.12% in the full sample of national aggregate 1986-2014 data. Eisfeldt and Demers (2018) do note that the rent to price ratios for Miami are significantly higher than their full sample, with rent to price ratios between 11% and 14% depending upon the data source. This is similar to our findings.

Graph 1 shows changes in average annual rent and price over the sample period for the full sample and rent to price ratios for the matched data set of 9,362 sales and subsequent rentals within 240 days. Between March of 2006 and March of 2014, average annual rent trends upward, increasing approximately $2,800 or 11% over the time period. Average sale prices decline precipitously between 2006 and 2010, falling by approximately 50% before rising more gradually in the 2011 to 2014 period. In the time series of mean rent to price ratios shown in Panel C, there is a dramatic increase in rent to price that corresponds to the decline in sales price from late 2006 through the end of 2009. Rent to price averages for the matched sample are approximately 6% in 2006 and 2007, then peak at over 18% in early 2010 with a decline to approximately 12% in early 2014. It is clear that a significant portion of the variation in rent to price ratios in this sample is driven by the effects of the financial crisis on house values with rents relatively stable or growing.

Table 2 provides summary statistics by year for the matched sample. As discussed above, rent to price ratios increase over the sample period, doubling from 2006 to 2011, primarily as a result of the price drop in the Great Recession. After 2011 they are slowly descending thru 2014, primarily as a result of the increasing prices. In this matched sample average annual rents increase from $22,286 to $23,138 over the eight years at a compound

rate of 0.47% per year. Average annual rents dropped from 2006 to 2009 and then started increasing. During this period (2006-2009) rents decreased at a rate of 3.81% per year. Average sale prices during this time are $358,433 in 2006 and $207,998 for 2013 and the first quarter of 2014, approximately a decline of 7.5% per year, though average sale prices reached their bottom in 2011 at $175,259 and if we use the $196,150 average price for the first quarter of 2014, increased at an annual rate about 3.75% per year.

Graph 2 shows the univariate relation between the sale price and the percent rent to price. Rent to price ratios are highest for the most affordable houses, and decline steeply as price increases above $100,000. Rent to price ratios decline at a decreasing rate as price approaches $200,000. Now that real estate prices have recovered from the lows of the Great Recession, investors clearly have incentive to maximize rent to price ratios by investing in affordable homes.

In Table 3, returns are presented for the matched sample a first sale and a rental within 240 day and a second sale after the initial purchase and rental. There are 3,252 transactions. We treat the rent to price ratio as the income yield or rental yield, and also calculate the annualized capital gain between the first sale and the second sale. The gross returns for the full sample and the second half of the sample are quite impressive, though they might not be much better than what flippers in a market might earn. Total yield is calculated as rent to price plus the annual capital gain. Total yields of 21.63% are calculated for the full sample, while for the first half of the sample, approximately 2005-2010, yields are only 4.45%. The second half of the sample (2010-2014) yields are approximately 39%. We also calculate the IRR for each observation assuming the rent is the same each month and report the averages in Table 3. They are similar to the total of the income yield and the capital gains yield, but slightly lower since we used the number of

months and assumed the rent was the same throughout the time period, so this possibly overstates or understates depending on the time period. For the full sample, we see an IRR of 20.33% and a 35.75% for the second half of the sample. Note that we are dividing the time period of when the first sale occurs not when the second sale occurs, the 2nd sale may occur from 2006 to the first quarter of 2019 where the sale price data ends. The average time between sales is 48 months in this sample. One item of interest is when we aggregate the IRR according to the number of purchases, the group with no grantee information has an IRR of 3.10% with sales primarily August 2005-2008 and rents 2006-2008. Groups with 1, 2, or 3 purchase earned approximately 30%, while the group with 4 to 9 purchase earned 35.62% and the group with 10 plus purchases earned about 38.25% in gross returns. The low in returns to observations without grantee information are in part due to the overlap of this group with the earlier time period when prices were falling, and the average capital loss was approximately $33,000. The higher returns to larger investors are investigated further in the regression analysis in the next section.

4. Methods

We estimate a model with census block group fixed effects and sale year or rent year fixed effects. The initial empirical model we estimate allows us to compare whether the size of the investor who purchases the property matters, and takes the following form:

$$y_i = \beta_0 + \beta_1 I_i + \beta_2 C + \beta_3 D + \beta_4 SC + \Sigma \beta i R_i + \Sigma \beta i P_i + \Sigma \beta i X_i + \varepsilon_i, \quad (1)$$

where the dependent variable *y* is the rent to price, or rent or sales price, or in the case of returns it is the IRR, rent to price, or annual capital gain. *I* is a dummy variable indicating an investor purchased the property with variations (unknown, small, medium, larger), *C* is a dummy variable indicating the house is purchased with cash, *D* is a dummy

for a distressed property, SC is a dummy for significant change after the sale, *R* is a dummy indicator for rent quartiles, *P* is set of dummy indicators for price quartiles. The vector X_i includes a full set of housing characteristics, including size, effective age, bathroom and bedroom counts, and pool, plus other characteristics derived from the MLS remarks about the rental property. The last term in (1), ε is a random error term.

We first measure and examine rent-price ratios during the entire sample period while ignoring investor size since our grantee data does not start until 2009. Next we estimate hedonic rent and rent-price models using fixed effects to test for relationships between rent and investor type and between rent-price ratios and investor type for the period 2009- April 2014.

In a first set of regressions presented in Table 4, the dependent variable is the annual rent to price ratio (model 1) for the single-family dwellings in the transaction with a large set of independent variables to examine what impacts rent. Alternatively, the dependent variable will be the log of annual rent (model 2), and log of purchase price (Model 3). Table 5 repeats the models using only matched sample of rents that occurred within 240 days of the sale.

In Table 6 we examine the impact of the similar variables on our measure of gross rental yield – IRR or total yield, income yield and capital gains yield as described in the univariate statistics of Table 3.

5. Results

Table 4 presents the results of the first set of regressions examining rent to price, log of annual rent, and initial sale price for the full set of 42,426 observations in which there was a sale and a subsequent rental. However, in the full sample, the rentals on average occur

approximately five years after the initial purchase. This is possibly due to a number owners renting properties that they may have purchased a number of years ago as either an owner-occupied property that they eventually decided to rent or as an investment property they have held for a number of years and continue to rent, ending up as a rental in our data of rentals during March 2006 – April 2014.

In the first model, the dependent variable is annual rent to price. As expected, rent to price ratios are negatively related to the price, as shown by the significant negative coefficients for the indicators of higher price group quartiles compared to the lowest. Rent to price ratios are also significantly higher for properties rented after a distress sale.

Comparing identified investor groups (one purchase, two purchases, three to nine purchases, and ten or more purchases) to the unidentified group in which grantee data is not available, we find that the group of investors with the most purchases (10 or more) earn a lower rental yield. But purchasers registered as LLCs, LPs, INCs, or Corporations earn a significantly higher rental yield, thus if they are larger investors, the net effect would be close zero.

As expected, rental yields are negatively related to square footage, consistent with Bracke (2015), but positively related to the number of bedrooms or bathrooms, above average and excellent quality, and the inclusion of a pool. Rental yields are positively related to descriptions in the rental listing indicating that the property is unique, updated, remodeled, renovated, or upgraded. Thus, a portion of higher rents observed in this sample is likely explained by improvements to the property that we cannot directly measure, and costs that are significant. Unfortunately we do not have the data to determine these costs and thus we are unable to deduct them from gross returns. There are estimates of $20,000 to $25,000 per house, D'Lima W. and P. Schultz. 2019.

The second model presented in Table 4 examines the determinants of logged annual rent. In this case, price, size, number of bedrooms, bathrooms, presence of a pool, quality, improvements (updated, remodeled, renovated, or upgraded), and being located on a waterfront are positively related to log rent. Large investors and investors registered as LLCs, LPs, INCs, or Corporations do not earn significantly higher or lower rents compared to unidentified purchasers (*note, change the control dummy to 1 purchase next version*). Interestingly, a description of the property being in a "Great Location" is negatively related to log rent. As this is a description added by the agent presenting the listing, it may not accurately distinguish properties that truly are in a great location. Townhomes also rent for less than single family homes.

The third model presented in Table 4 examines the log of the sale price in the sale prior to renting. Sale prices are positively related to rent subsequently earned. Sale prices are also negatively related to all investor groups identified, relative to the unidentified purchaser group. Taken together with the results of Models 1 and 2, this suggests that investors do not consistently rent at higher prices than an unidentified purchaser group, however they do consistently purchase at significantly lower prices.

Sale price is also negatively related to age, being a townhouse rather than a single family home, and having a pool. This unexpected result may be caused by a higher percentage of pools being installed in older homes that sold earlier in the sample at lower prices. Sale price is also negatively related to descriptions of the property as updated, remodeled, or renovated in the rental listing. This suggests that between the rental and the sale, improvements were made, and the property was in need of updates at the time of the sale.

Table 5 shows the same set of regressions models as Table 4, however, the sample is

reduced to only those observations in which the initial sale transaction is followed by a rental within 240 days (9,328 observations). The dependent variable in Model 1 is annual rent to price. Again, rent to price decreases with price quartile, but increases with rent quartile. Rent to price is not significantly higher for larger investors (purchase 10 or more properties), but it is higher for properties owned by LLCs, LPs, INCs, or Corporations, relative to the unidentified investor group. Properties with more bedrooms, with a pool, with below average quality, and distressed and remodeled properties earn higher rental yields. The result related to low quality suggest that this group is affordable relative to rental potential at the time of sale, while the positive coefficient on the indicator that the property has been remodeled indicates some additional investment in improvements between the sale and the rental. Again, as expected, holding bedrooms constant, square footage is negatively related to rent to price. In this regression, age is positively related to rent to price. Results in models 2 and 3 show that age is negatively related to both rent and sale price, however the magnitude of the negative effect on sale price in the denominator outweighs the negative effect on rent in the numerator, driving the rent to price ratio up.

The dependent variable in Model 2 of Table 5 show that log rents increase with price quartile. Log rent is also positively related to all investor groups except LLCs, LPs, INCs, or Corporations relative to unidentified purchasers. Square footage, number of bedrooms, number of bathrooms, pool, descriptions of the property as unique, beautiful/wonderful/gorgeous, updated, remodeled, renovated or upgraded are all positively related to log rent. An indicator of a townhouse rather than a single family home is negatively related to log rent, as is an indicator that the listing agent for the rental has less than three years of experience. Unexpectedly, an indicator of below average quality compared to average quality is significantly positively related to log rent.

Above average and excellent quality are also associated with higher log rent compared to average quality. In most cases, the quality variables behave as expected, with the exception of the below average indicator discussed above. As mentioned in footnote 4, there may be some issues with this measure of quality.

In model 3, we examine the determinants of log sales price for the sale transaction prior to the rental event. As we found in the full sample regressions presented in Table 4, log sale price increases with rent quartile. We find that all identified investor groups except the large (ten or more purchases) purchase at significantly lower prices than unidentified purchasers. Interestingly, the marginally higher log rent and significantly lower log purchase prices for most investor groups do not result in a significantly higher rent to price ratio for investors as a whole, with the exception of the registered LLCs, LPs, INCs and Corporations.

Log sale price is positively affected by square footage, number of bathrooms, and above average or excellent quality. It is negatively affected by age, an indicator of distress, and an indicator that the property is remodeled prior to the rental. As with the regressions in Table 4, this may indicate that the property was dated or in poor repair at the time of sale, and was remodeled after the sale but prior to the rental.

Table 6 presents new evidence on gross returns. We estimate IRR, Total Yield, Rent to Price, Annual Capital Gain, and Total Capital Gain as discussed earlier in the presentation of Table 3. Because this data set is based on a match to grantee data that is primarily available after 2009, most of the observations in this set of regressions have an initial purchase between January 2009 and April 2014. Rents are treated as an annuity. The second sale can occur any time after 2009 through early 2019. Also, in this data, most of the properties purchased by the largest investors are not re-sold. While the regression models include all the determinants of rent and price included in the previous models, the primary

variable of interest in this set of regressions is the effect of investor groups on returns.

The rent to price regression is presented in Model 3. In this smaller sample, the results with regard to price quartiles and rent quartiles are similar to those we found in the larger matched sample. The estimated coefficients for the investor size groups are not significant in this specification, except for the indicator of ten or more purchases. The estimated coefficient is marginally negative at less than one percent impact on the price to rent ratio.

In Model 4, the dependent variable is the annual capital gain. Here we find that the investor groups who purchase fewer properties (one or two) obtain lower annual capital gains. The investors classified as LLCs, LPs, INCs, or Corporations earn higher annual capital gains. As we discussed in the purchase price regressions in Tables 4 and 5, all investor groups purchase at lower prices than the unidentified purchasers. Interestingly, this lower purchase price does not lead to higher capital gains for most investor groups. Similar to Eisfeldt and Demer's (2018) finding that price appreciation declines with price tier at the zip code level, we find that annual capital gain is lower in the highest two price quartiles compared to the lowest.

The dependent variable in Model 2 is the total yield. With the exception of the one property purchase investor group, the remaining investor size groups obtain the same total yield. Thus, in this sample, size/activity does not appear to produce higher total yields. Again, this excludes most of the investors in the largest size category, as they held most of their properties for rental during the sample period. The investor group categorized as LLCs, LPs, INCs, or Corporations does earn a significantly higher total yield of 3.9%. This is largely driven by the capital gain component of total yield.

Conclusion

Price-rent ratio is a critical indicator of future market expectations and speculative market behavior. However, price-rent ratios are difficult to measure accurately as it is difficult to obtain comparable rents for owner-occupied housing. In this paper, we overcome this problem by using a unique data set that consists of both a property sale and a subsequent rental within 240 days of the sale. Each of the buyers in the sample are investors since each property included have a rental event implying they are not owner occupied. A subset of the data also allows us to identify whether a buyer belongs to an organization or is an entity purchasing a large volume of properties. Using matched rent-price ratios for single family houses in Miami-Dade County during March 2006 - April 2014, we examine the relationship between housing and market characteristics and the impact larger investors have on single family rents and rent-price ratios. We also calculate gross returns for properties that sell a second time in the data.

Using matched rent-price ratios for single family houses in Miami-Dade County during March 2006 - April 2014, we measure rent-price ratios directly and examine these actual rent-price ratios prior to, during and after the Great Recession. We also investigate the relationship between housing and market characteristics and the impact larger investors have on single family rents and rent-price ratios.

Between March of 2006 and March of 2014, average annual rent trends upward, increasing 11% over the time period. Average sale prices decline precipitously between 2006 and 2010, falling by approximately 50% before rising more gradually in the 2011 to 2014 period. Rent to price averages approximately 6% in 2006 and 2007, then peak at over 18% in early 2010 with a decline to approximately 12% in early 2014. It is clear that

a significant portion of the variation in rent to price ratios in this sample is driven by the effects of the financial crisis on house values with rents relatively stable or growing.

Larger players potentially bring liquidity, transactional efficiencies (i.e., sophisticated targeting of potential acquisition properties, superior negotiation skills and experience, streamlined closings, etc.), and operational efficiencies (i.e., property and portfolio management expertise) to local housing markets that individual investors in those markets may not have. On the one hand, purchases by big players could increase the overall demand in the market and push the prices and rents upwards. On the other hand, big players have some monopsony advantage and might be able to utilize their buying / bargaining power and negotiation skills to purchase properties at a discount to market value and consequently be able to offer lower rents since they purchase at lower prices. Our results indicate that investor size does not influence sale price, rents or rent-price ratios.

To estimate the price-rent ratio and the capital gains yield, we identify a subset of buy to rent properties that sold a second time during the period 2006 to 2019. The mean time to next sale is forty-nine months with an IRR of 19.57% where the capital gains yield is about 8% and the income yield is about 12%. The first part of the sample that includes initial sales and rentals in the August 2005-2010 time period yields IRR of 2.86%, with a rent-price ratio of 8.38% and a capital gain of negative 6.70%. This occurs during the boom and subsequent downturn. For the second half of the sample, 2010 through 2014, we obtain returns of 16.03% for the income yield and 23.01% for the capital gain yield, resulting in approximately a 36.27%. IRR. These results are consistent with a declining market in the first half. The second half of the sample is marked by lower initial prices, moderately increasing rents and higher prices for the second sale.

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Table 1 - Summary Statistics for the Complete Samples Including Observations Without Grantee Information.
Descriptive statistics for the single-family and townhome sample of both Sales and Rentals. Sales are for the complete sample from March 2006 through April 2014. Rentals are from March 2006 through April2014. The data for the Sales is from the Miami-Dade County Appraisal District and the Florida Department of Revenue Tax Roll Data Files. The rental data is from the MLS and from the Florida Department of Revenue Tax Roll Data Files. Excluding residential properties with missing characteristics and obvious outliers the complete sales sample includes 174,407 properties with prices between $20,000 and $4,000,000. There are 46,426 rentals with monthly rents between $500 and $12,500. Of primary interest is the subsample where sales & rentals are matched, and the subsample where only matched properties with a second sale occurs by 2019. The MLS Rental data and Miami-Dade County Sales data classify properties differently and we use the MLS classification in the Rental data and Miami-Dade County classification in the Sales Dataset.

Summary Statistics of Key Variables	Matched Dataset Sales & Rentals	Matched Dataset when there is a Second Sale	Complete DataSet Sales 2006-2014	Complete DataSet Rentals 2006-2014
Number of Observations:	9,362	3,255	174,407	46,426
Mean Asking Rent (monthly)	1,866	1,860	-	2,047
Mean Rent (monthly)	1,810	1,799	-	1,974
Mean Sale Price before Rented or Sale Price for the Sample	239,655	264,924	266,233	261,474
Mean gross annual rent-price ratio	0.134	0.128	-	0.127
Mean Second Sale Price if Sold after Rented	-	290,227	-	-
Mean Values for Variables below:				
Square Feet (mean)	1,702	1,709	1,895	1,807
Effective Age (mean)	23.63	22.62	28.39	26.34
Bedrooms	2.974	2.925	3.210	2.970
Bathrooms	2.245	2.242	2.048	2.275
Stories	1.233	1.255	1.274	1.236
Pool	0.343	0.354	0.191	0.373
Distress sale (includes REO, quitclaim)	0.322	0.296	0.284	0.141
Property Characteristics changed Significantly after Transfer	0.030	0.032	0.055	0.033
Townhouse	0.321	0.328	0.164	0.292
Days on the Market (Rent Sale date - Rent List date)	48.46	50.25	-	60.70
Days between Sale date and Rental date	104.32	104.90	-	1859.35
Percent Rent Overpriced (Rent SP- Rent LP)/Rent SP	-0.030	-0.028	-	-0.030
List Agent Rookie	0.218	0.244	-	0.162
List Agent Experienced	0.622	0.592	-	0.704
Year Leased	2010.75	2009.96	-	2010.08
Year Sold 1st time	2010.44	2009.66	2009.92	2004.99
Year Sold 2nd time	-	2013.75	-	-
Waterfront	0.175	0.192	-	0.191
Dummy variables calculated from MLS rental remarks:				
Beautiful, Wonderful, Gorgeous	0.467	0.481	-	0.479
Unique	0.030	0.035	-	0.037
Great Location	0.182	0.175	-	0.205
Updated	0.085	0.070	-	0.095
Remodeled	0.130	0.119	-	0.109
Renovated	0.078	0.083	-	0.066
Upgraded	0.066	0.069	-	0.070

Table 2, Summary Statistics by Year for the Matched Sample

Rent Year	Observations	Mean Rent to Price Ratio	Median Rent to Price Ratio	Mean Annual Rent	Median Annual Rent	Observatio	Mean Sale Price	Median Sale Price
2005						136	334,596	279,250
2006	755	0.078	0.065	22,286	19,200	866	358,433	300,000
2007	769	0.067	0.059	22,210	19,800	650	386,140	335,827
2008	479	0.078	0.069	22,472	19,200	549	324,032	275,000
2009	776	0.122	0.103	19,837	17,400	868	217,929	157,500
2010	960	0.143	0.116	19,858	16,920	959	207,147	138,903
2011	1154	0.175	0.158	20,236	17,400	1202	175,259	118,300
2012	1329	0.164	0.149	21,571	18,600	1606	203,165	140,050
2013	2258	0.148	0.132	22,956	20,400	2344	212,626	173,050
2014_April	882	0.140	0.122	23,138	21,600	182	196,150	133,000
All Years	9362	0.134	0.113	21,725	19,200	9362	239,655	182,100

Table 3 Average Gross Returns across time and Groups

Groups by Date of Purchase and Groups by number of Purchases when Grantee is Identified	Internal Rate of Returrn**	Annual Rent to Price Plus Annualized Capital Gain	Annual Rent to Price Ratio	Annualized Capital Gain/Loss Rate	N
Means First Half of Sample (2005 - 2010)	4.90%	4.45%	9.22%	-4.77%	1626
Means Second Half of Sample (2010 - 2014)	35.75%	38.82%	16.36%	22.46%	1626
Means Full Sample (2005 - 2014)	20.33%	21.63%	12.79%	8.85%	3252
Standard deviation First Half of Sample	35.57%	37.62%	6.21%	34.99%	1626
Standard deviation Second Half of Sample	83.28%	84.75%	8.75%	81.34%	1626
Standard deviation Full Sample	65.86%	67.77%	8.38%	64.07%	3252
No Grantee Available (Primarily Aug 2005-2008)	3.10%	2.33%	8.92%	-6.59%	1322
1 Purchase	30.30%	32.62%	14.54%	18.08%	975
2 Purchases	29.74%	32.73%	15.71%	17.02%	346
3 Purchases	30.13%	32.61%	14.51%	18.10%	146
4 to 9 Purchases	35.62%	38.95%	16.69%	22.27%	231
10 Plus Purchases	38.25%	41.60%	16.90%	24.70%	250

**Because our data does not include capital expendures, closing costs, depreciation or taxes, our estimates of returns represent the upper bound of average gross returns.

	Average Months Between Sales	Average 1st Sale Price	Average Monthly Rent	Average 2nd Sale Price	N
Means First Half of Sample*	60	$333,128	$1,855	$300,130	1626
Means Second Half of Sample*	37	$196,896	$1,743	$280,822	1626
Means Full Sample*	48	$265,012	$1,799	$290,476	3252

*First Purchase occurs during August 2005 - March 2014; Second Sale occurs during May 2006 - March 2019

Table 4, Full Sample with fixed effects models, dependent variables are Rent to Price ratios, log of annual rent and log of saleprice.

	(1) Annual Rent to Price		(2) Log Annual Rent		(3) Log Sale Price	
VARIABLES	coef	tstat	coef	tstat	coef	tstat
Second price group quartile	-10.427**	-174.35	0.052**	20.71		
Third price group qualtile	-15.424**	-212.79	0.085**	30.04		
Fourth price group quartile	-19.473**	-214.40	0.152**	44.32		
Second rent group quartile	1.619**	25.31			0.166**	24.85
Third rent group quartile	3.228**	42.15			0.311**	39.72
Fourth rent group quartile	5.184**	54.05			0.470**	48.71
One purchase	0.307**	3.32	0.014**	4.88	-0.066**	-6.75
Two purchases	0.203	1.89	0.011**	2.77	-0.090**	-7.94
Three to nine purchases	0.192	1.79	0.000	0.07	-0.121**	-10.63
Ten or more purchases	-0.402**	-2.98	-0.001	-0.26	-0.066**	-4.64
LLC, LP, INC, or Corporation	0.368**	4.76	0.002	0.59	-0.022**	-2.70
Square feet (100s)	-0.012**	-3.80	0.004**	28.56	0.022**	67.38
Age (10s of years)	-0.004	-0.23	-0.016**	-21.39	-0.028**	-15.86
Bedrooms	0.501**	15.10	0.103**	71.97	0.009*	2.51
Baths	0.360**	9.07	0.132**	74.40	0.049**	11.79
Stories	-0.056	-1.28	-0.013**	-6.73	-0.002	-0.44
Pool	0.382**	8.86	0.052**	26.84	-0.020**	-4.35
Minimum/Low Cost Quality	-0.019	-0.30	-0.020**	-7.10	0.005	0.93
Below Average Quality	0.070	1.11	0.059**	20.92	0.003	0.47
Above Average Quality	0.266**	3.25	0.094**	25.72	0.024**	2.88
Excellent Quality	0.926**	8.79	0.134**	28.32	0.079**	7.41
Water Front	-0.060	-1.10	0.031**	12.73	0.066**	11.52
Beautiful Wonderful Georgeous	0.120**	3.46	0.031**	20.00	0.008*	2.08
Unique	0.243**	2.66	0.033**	8.00	0.011	1.12
Greate Location	-0.039	-0.91	-0.010**	-5.03	-0.002	-0.48
Updated	0.265**	4.35	0.034**	12.49	-0.023**	-3.51
Remodeled	0.494**	8.75	0.030**	11.63	-0.045**	-7.48
Renovated	0.404**	5.65	0.036**	11.14	-0.024**	-3.12
Upgraded	0.164*	2.45	0.021**	6.97	0.013	1.82
Distress sale (includes REO, quitclaim)	0.903**	15.40	-0.001	-0.29	-0.187**	-30.58
Property Characteristics changed Significantly after Transfer	-0.244*	-2.42	-0.019**	-4.43	-0.117**	-11.01
Listing agent - Rookie (1-3 years exp.)	-0.015	-0.24	0.001	0.40		
Listing agent experienced (5 plus years)	-0.023	-0.44	0.005*	2.05		
Townhouse	-0.116*	-2.07	-0.038**	-15.10	-0.042**	-7.18
Rental days on the Market	0.000	0.69	0.000**	2.96		
Constant	19.118**	109.22	9.248**	1,447.72	11.477**	678.10
Year Dummies, Rental Date	√		√			
Year Dummies, Sale Date	√				√	
Census Block Group Fixed effects	√		√		√	
Observations	46,139		46,139		46,139	
R^2	0.794		0.865		0.756	

Table 5, Matched Sale and Rental within 240 Days sample with fixed effects models, dependent variables are Rent to Price ratios, log of annual rent and log of saleprice.

	(1) Annual Rent to Price		(2) Log Annual Rent		(3) Log Sales Price	
VARIABLES	coef	tstat	coef	tstat	coef	tstat
Second price group quartile	-11.073**	-79.59	0.054**	10.55		
Third price group qualtile	-16.013**	-96.02	0.094**	15.40		
Fourth price group quartile	-19.333**	-89.37	0.158**	19.95		
Second rent group quartile	1.638**	10.74			0.189**	11.95
Third rent group quartile	3.139**	16.29			0.354**	18.07
Fourth rent group quartile	4.943**	19.63			0.478**	18.59
One purchase	0.666**	4.14	0.032**	5.37	-0.081**	-4.90
Two purchases	0.247	1.32	0.028**	4.01	-0.077**	-4.00
Three to nine purchases	0.353	1.88	0.022**	3.09	-0.101**	-5.27
Ten or more purchases	-0.269	-1.27	0.027**	3.41	-0.027	-1.24
LLC, LP, INC, or Corporation	0.434**	3.77	0.003	0.79	-0.029*	-2.38
Square feet (100s)	-0.025*	-2.53	0.006**	15.06	0.025**	25.14
Age (10s of years)	0.112*	2.31	-0.017**	-9.23	-0.032**	-6.43
Bedrooms	0.380**	4.56	0.085**	28.35	-0.000	-0.04
Baths	0.211	1.93	0.125**	30.87	0.050**	4.35
Stories	-0.073	-0.69	-0.010*	-2.44	0.005	0.41
Pool	0.393**	3.70	0.036**	9.02	-0.006	-0.53
Minimum/Low Cost Quality	0.242	1.36	-0.000	-0.02	-0.020	-1.14
Below Average Quality	0.350*	2.17	0.064**	10.73	0.003	0.18
Above Average Quality	0.087	0.39	0.091**	11.03	0.094**	4.07
Excellent Quality	0.337	0.97	0.124**	9.49	0.289**	7.95
Water Front	-0.020	-0.15	0.021**	4.31	0.026	1.90
Beautiful Wonderful Georgeous	0.118	1.41	0.018**	5.83	-0.014	-1.63
Unique	0.096	0.39	0.028**	3.02	0.020	0.78
Greate Location	-0.008	-0.07	-0.009*	-2.22	0.013	1.10
Updated	0.252	1.57	0.033**	5.43	0.007	0.43
Remodeled	0.653**	5.05	0.017**	3.59	-0.063**	-4.66
Renovated	0.303	1.84	0.014*	2.19	-0.028	-1.64
Upgraded	0.008	0.05	0.024**	3.87	0.026	1.49
Distress sale (includes REO, quitclaim)	0.822**	8.00	0.005	1.22	-0.180**	-16.99
Property Characteristics changed Significantly after Transfer	-0.451	-1.64	-0.002	-0.25	-0.188**	-6.65
Listing agent - Rookie (1-3 years exp.)	-0.007	-0.05	-0.014**	-2.71		
Listing agent experienced (5 plus years)	0.172	1.48	-0.004	-0.89		
Townhouse	-0.113	-0.86	-0.034**	-6.85	-0.023	-1.65
Rental days on the Market	0.002	1.92	0.000	0.16		
Constant	19.584**	51.00	9.211**	662.12	11.355**	306.65
Year Dummies, Rental Date	√		√			
Year Dummies, Sale Date	√				√	
Census Block Group Fixed Effects	√		√		√	
Observations	9,328		9,328		9,328	
R-squared	0.820		0.884		0.792	

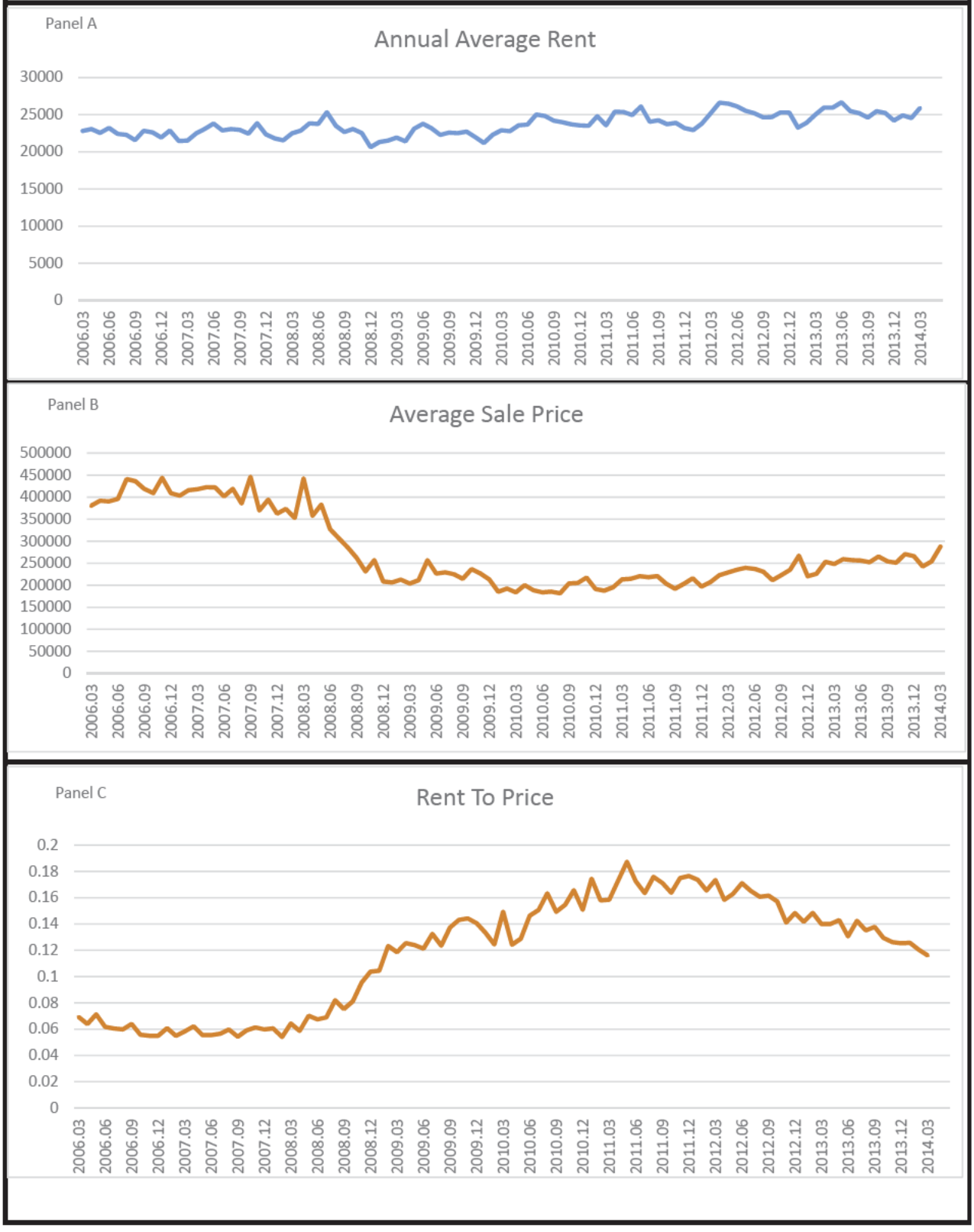
Table 6, The sample is matched Sale and Rentals within 240 Days of the first sale with a repeat sale on average at 48 months. The regressions are fixed effects models where the dependent variables are Rent to Price ratios, log of annual rent and log of saleprice. In this set of regressions the return data is trimmed at the 1% and 99% levels to reduce the effect of outliers at a loss of 78 observations.

	(1) IRR		(2) Total Yield		(3) Rent to Price		(4) Annual Capital Gain		(5) Total Capital Gain	
VARIABLES	coef	tstat	coef	tstat	coef	tstat	coef	tstat	coef	tstat
Second price group quartile	31.260**	17.98	36.339**	19.80	10.971**	41.68	25.368**	14.64	87.316**	21.91
Third price group qualtile	-20.511**	-13.55	-22.955**	-14.37	-4.954**	-21.62	-18.001**	-11.93	-58.859**	-16.97
Fourth price group quartile	-35.660**	-17.24	-39.296**	-18.00	-8.107**	-25.88	-31.189**	-15.12	-98.328**	-20.74
Second rent group quartile	8.548**	5.07	9.190**	5.16	1.601**	6.27	7.589**	4.51	7.263	1.88
Third rent group quartile	13.034**	5.89	14.193**	6.07	3.104**	9.26	11.089**	5.02	16.015**	3.16
Fourth rent group quartile	20.780**	7.11	22.626**	7.33	5.121**	11.57	17.505**	6.01	34.383**	5.13
One purchase	-5.042*	-2.28	-5.417*	-2.32	-0.342	-1.02	-5.075*	-2.30	-11.608*	-2.29
Two purchases	-3.058	-1.74	-3.328	-1.80	0.122	0.46	-3.451*	-1.97	-10.444**	-2.60
Three to nine purchases	0.148	0.07	-0.022	-0.01	-0.147	-0.48	0.125	0.06	-7.937	-1.70
Ten or more purchases	0.824	0.34	0.662	0.26	-0.845*	-2.33	1.507	0.63	-5.366	-0.98
LLC, LP, INC, or Corporation	3.509*	2.50	3.910**	2.64	0.330	1.55	3.580*	2.56	5.639	1.75
Square feet (100s)	0.602**	5.16	0.660**	5.36	-0.010	-0.55	0.670**	5.76	3.204**	11.98
Age (10s of years)	-0.453	-0.75	-0.456	-0.72	0.112	1.23	-0.568	-0.95	2.088	1.51
Bedrooms	-0.519	-0.53	-0.399	-0.38	0.378*	2.54	-0.777	-0.79	1.175	0.52
Baths	-0.493	-0.38	-0.333	-0.24	0.286	1.45	-0.619	-0.48	-4.004	-1.34
Stories	-2.166	-1.88	-2.276	-1.87	-0.160	-0.92	-2.115	-1.84	-2.610	-0.99
Pool	0.912	0.70	0.904	0.66	0.264	1.34	0.639	0.49	-0.921	-0.31
Minimum/Low Cost Quality	0.078	0.04	-0.107	-0.05	0.046	0.16	-0.152	-0.08	-7.740	-1.80
Below Average Quality	-0.093	-0.05	0.648	0.33	0.591*	2.09	0.057	0.03	11.848**	2.77
Above Average Quality	-0.153	-0.05	-0.246	-0.08	-0.219	-0.48	-0.027	-0.01	-2.663	-0.39
Excellent Quality	2.120	0.54	1.426	0.34	-0.100	-0.17	1.526	0.39	9.761	1.08
Water Front	0.058	0.04	-0.111	-0.07	-0.170	-0.74	0.059	0.04	-2.511	-0.72
Beautiful Wonderful Georgeous	0.614	0.62	0.713	0.68	0.116	0.77	0.597	0.60	-1.399	-0.61
Unique	-0.633	-0.23	-0.491	-0.17	0.341	0.82	-0.832	-0.31	-4.449	-0.71
Greate Location	-0.091	-0.07	-0.045	-0.03	0.042	0.21	-0.087	-0.07	2.912	0.96
Updated	-0.283	-0.13	-0.423	-0.18	0.019	0.06	-0.442	-0.20	-1.664	-0.33
Remodeled	-1.366	-0.80	-1.290	-0.72	0.444	1.73	-1.735	-1.02	3.850	0.99
Renovated	2.192	1.07	2.359	1.09	0.425	1.37	1.934	0.94	-0.767	-0.16
Upgraded	0.405	0.21	0.125	0.06	-0.380	-1.32	0.505	0.27	-10.019*	-2.30
Distress sale (includes REO, quitclaim)	2.429	1.87	2.902*	2.12	1.131**	5.75	1.770	1.37	3.092	1.04
Property Characteristics changed Significantly after Transfer	2.417	0.77	2.426	0.73	-0.748	-1.57	3.174	1.01	-10.782	-1.49
Listing agent - Rookie (1-3 years exp.)	-0.473	-0.31	-0.232	-0.14	-0.037	-0.16	-0.195	-0.13	5.668	1.60
Listing agent experienced (5 plus years)	-1.367	-1.01	-1.167	-0.82	-0.006	-0.03	-1.161	-0.86	6.913*	2.23
Townhouse	-0.047	-0.03	-0.247	-0.16	0.094	0.42	-0.341	-0.23	-2.506	-0.73
Rental days on the Market	0.008	0.76	0.009	0.88	0.003*	1.99	0.006	0.63	0.013	0.55
Number of Months between Sales	-0.125**	-6.60	-0.103**	-5.16	-0.002	-0.64	-0.101**	-5.36	0.599**	13.80
_Is1year_2005	11.146**	2.89	10.242*	2.51	-0.828	-1.42	11.071**	2.88	-19.505*	-2.21
_Is1year_2006	-1.844	-0.69	-4.092	-1.44	-0.704	-1.73	-3.389	-1.26	-40.907**	-6.63
Is1year_2007	-7.273**	-2.60	-9.448**	-3.19	-0.663	-1.56	-8.785**	-3.14	-35.715**	-5.56
Is1year_2008	-6.819*	-2.42	-8.006**	-2.69	-0.438	-1.03	-7.568**	-2.69	-18.114**	-2.80
_Is1year_2009	-6.212**	-2.83	-7.475**	-3.23	-1.143**	-3.44	-6.332**	-2.89	-18.632**	-3.70
_Is1year_2010	-3.966	-1.93	-4.599*	-2.12	0.012	0.04	-4.612*	-2.25	-12.115*	-2.57
_Is1year_2011	0.577	0.31	0.505	0.26	0.404	1.45	0.101	0.06	-2.751	-0.65
_Is1year_2013	2.272	1.23	2.552	1.31	-0.617*	-2.21	3.168	1.73	9.906*	2.35
_Is1year_2014	11.199	1.86	11.054	1.74	-1.468	-1.61	12.522*	2.09	-8.176	-0.59
Constant	19.128**	4.15	17.699**	3.64	8.902**	12.76	8.797	1.91	-24.515*	-2.32
Year Dummies, Rental Date	√		√		√		√		√	
Census Block Group fixed effects	√		√		√		√		√	
Observations	3,174		3,174		3,174		3,174		3,174	
R-squared	0.637		0.664		0.874		0.581		0.734	

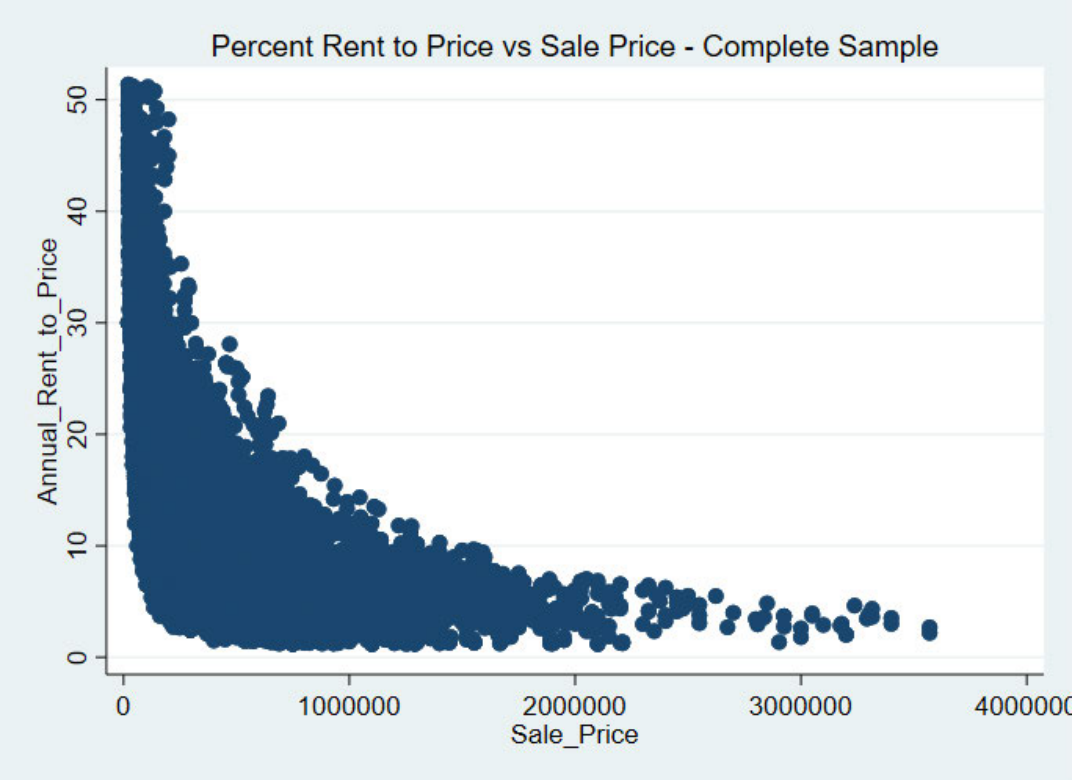
Graph 1

Rents, Price, and Rent to Price for the Sample Period

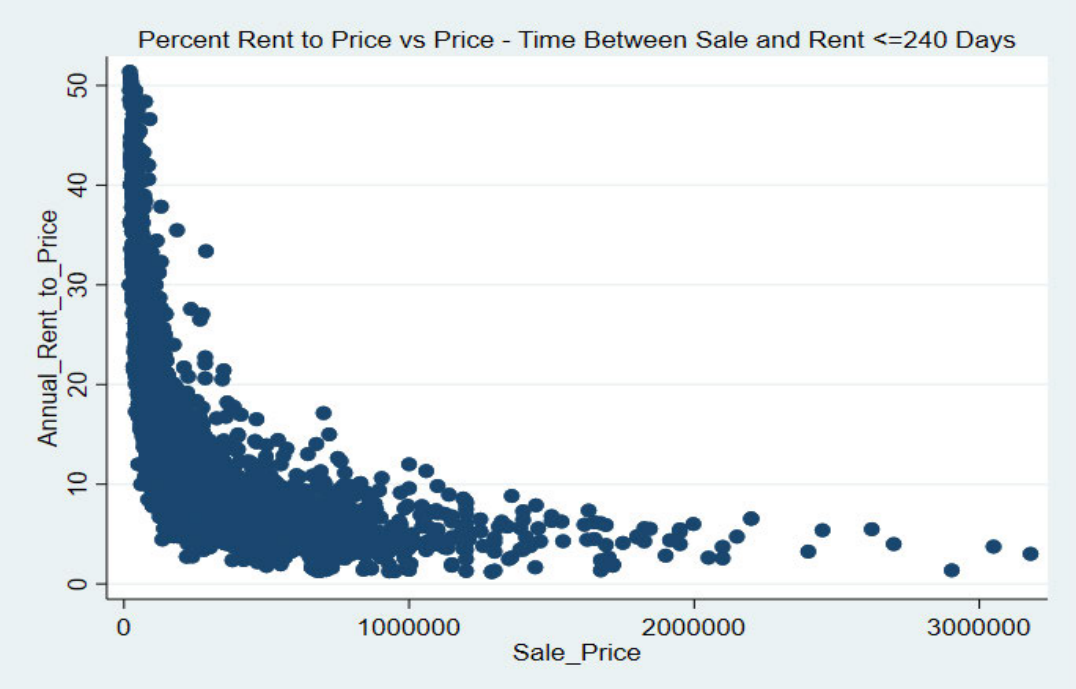
Average rents are for the full sample of rentals; average sale price is for the full sample of sales over the March 2006 - April 2014 period and rent to price ratios are based on the sample of properties that sold and rented within 240 days after the sale date.



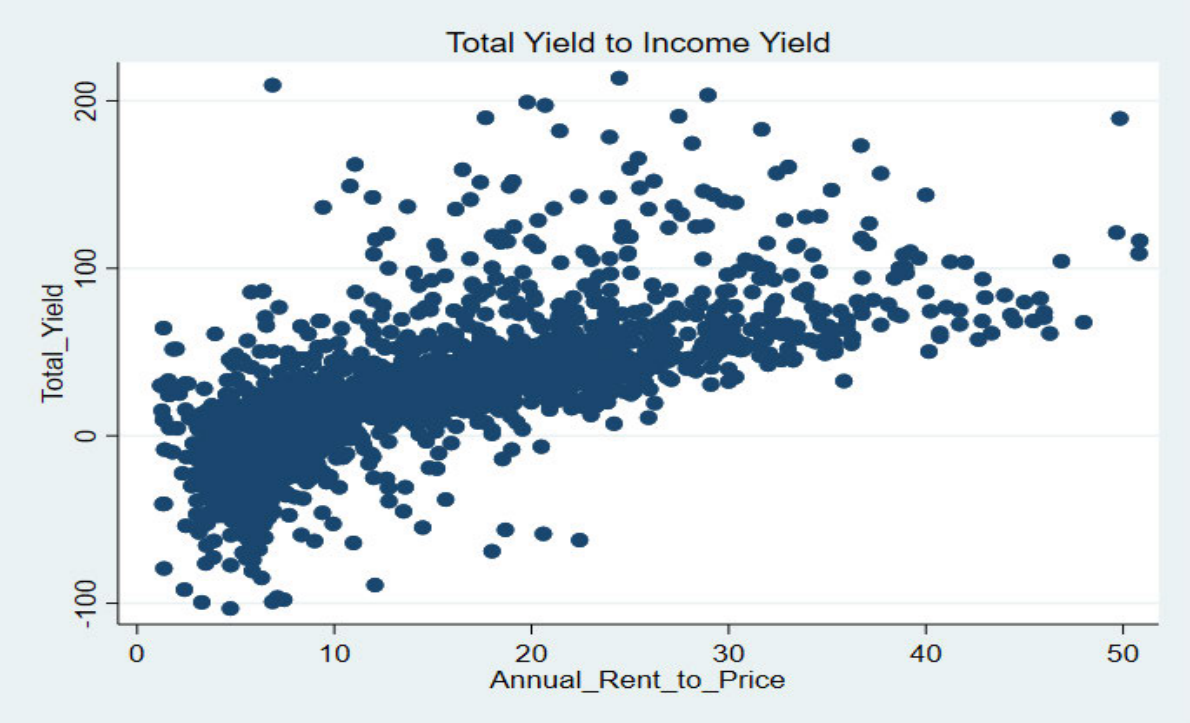
Graph 2 Complete Sample of rentals.



Graph 3 Matched Sample with Rent within 240 days of the Sale.



Graph 4 Total Yield to Rent to Price/Income Yield for the Matched Sample with a Second Sale.



Graph 5 Total Yield to Capital Gain for the Matched Sample with a Second Sale.