Conflicts of Interest in Residential Real Estate Transactions: New Evidence

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Abstract

Rutherford and Yavas (2005) and Levitt and Syverson (2008) document premiums of approximately 3.5% for real estate agents that sell their own houses. The general argument is that agents exploit their information advantage when selling their properties. We examine the other side of the transaction comparing the price paid by real estate agents buying houses to purchases by individuals. We find that in the Miami-Dade County MLS market real estate agents purchase houses at prices approximately 4.0 % below the prices paid by individuals. We show that agent-buyers gain from their informational advantage even when the seller is represented by another informed agent. In addition, consistent with prior literature, we find that owner agents sell houses they own at a price premium of approximately 3.5%. Our results suggest that listing agent's failure to protect seller's best interests becomes greater when the buyer of seller's property is another agent. We also find that agent to agent transactions occur at market values, offsetting any competitive advantage an agent might have in the market. These results suggest that the degree of the conflict of interest between the principals and agents in real estate transactions is greater than previous estimates. We estimate total agency cost to be 7.7%, capturing agency costs on both buying and the selling side of a transaction.

Keywords: Agent Buyers, Individual Buyers, Investors • Housing Prices • Buyer Power

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1. Introduction

Agents are often considered experts in their field and may use their informational advantage when transacting with other individuals who are not experts. Professional agents are expected to be relatively well informed regarding the value of assets and provide their clients with expertise when selling or purchasing assets. In general, agents have a responsibility to represent the interest of their principals to the best of their ability, that is, in the same way they would represent themselves. In Florida, agents have a responsibility to "disclose known facts that materially affect the value of a residential real estate property and are not readily observable to the buyer. In addition, there is a "duty to deal honestly and fairly." Under the disclosure clause, it is assumed that an agent has an obligation to disclose their "vast knowledge and licensing" to circumvent taking advantage of buyers or sellers who are not licensed. The National Association of Realtors Code of Ethics, Article 4 also indicates that a Realtor disclose their Realtor status when buying or selling for their own account.

In a world of perfect information, an agent would pay the same price and use the same effort for his client's property as he would in selling or buying his own property. That is, equivalent assets will be transacted at the same price and remain in the market for the same length of time regardless of whether or not they are sold and/or purchased by a real estate agent.

Earlier studies on potential agency problems in residential brokerage industry have largely focused on the misalignment of incentives between the seller and the agent. This agency problem between the seller and his agent has been empirically documented in two recent studies. Rutherford et al. (2005) and Levitt and Syverson (2008) provide empirical evidence that agents obtain higher prices when selling their own assets, suggesting that agents may exploit their informational advantage, or expend more effort on selling their own properties, despite their fiduciary responsibility to represent the interest of their principals in the same way they would represent themselves.

However, there is a bigger, and somewhat absurd, misalignment of incentives between the buyer and the agent she works with. The reason is that, as in the case of the seller's agent, the buyer's agent typically receives a percentage of the price as commission. Thus, the commission system fails to align not only the magnitude, but also the direction of the interests of the buyer and her agent.

In this paper, we offer the first direct empirical evidence of the agency problem between the buyer and her agent. We utilize a comprehensive data set that allows for the identification of properties purchased by agents. Thus, our unique date set allows us to investigate the purchase price differences, and to directly test whether real estate agents expand the same effort level and use their informational advantage for the benefit of their buyer clients the same way they would for themselves.

The empirical results in this paper show that real estate agents purchase houses at prices approximately 4.0% below the prices paid by individuals. This result is critical for a number of reasons. First, it shows that incentive problems exist on the buying side as they do on the selling side. Agents pay less for similar properties than their buyer clients. Second, it shows not only that listing agents don't obtain similar prices for their clients' properties as they do for their own properties, listing agent's failure to protect the best interests of the seller becomes aggravated when the buyer of his client's property is another agent. That is, not only does the listing agent not treat the seller's listing as his/her own, the listing agent also fails to protect seller's interests against another agent; agents purchasing from non-agent sellers that are nevertheless represented by a listing agent are able to purchase at lower prices of approximately 4.0%. In other words, agent-buyers may gain from their informational advantage even when the seller is represented by another informed agent. These results establish that the agency problems in residential real estate are broader than suggested by Rutherford et al. (2005) and Levitt and Syverson (2008). In addition, we also find that the price premium the agents enjoy when selling their own properties to non-agents is similar to the results in Rutherford et al. (2005) and Levitt and Syverson (2008). Rutherford et al. (2005) report that agent-owned houses sell at a price premium of approximately 4.5% while Levitt and Syverson (2008) report a premium of 3.7%.

We show that, when we control for agent purchases, the price difference remains at approximately 3.5%.

In a small subset of the sample where the property is owned and sold by a real estate agent and a different real estate agent purchases, the coefficient for price premium is statistically insignificant. Additional analysis suggests no difference in prices when a property is sold by an agent and purchased by an agent. Thus, agent to agent sales transact at market prices, whereas selling agent to non-agent transactions obtain a price premium of 3.5% and non-agent to purchasing agent transactions sell for a 4% discount. %. We also find that agent to agent transactions occur at market values, offsetting any competitive advantage an agent might have in the market. We estimate total agency cost to be 7.7%, capturing agency costs on both buying and the selling side of a transaction.

The agency problem in markets for real assets has been the focus of various recent studies. The general conclusion of the earlier models is that although the percentage commission system ensures the interests of the agent to be in the same *direction* as those of the client, it fails to align the *magnitude* of the interests of the agent with those of the client. For example, Geltner et al. (1991), Anglin and Arnott (1991) and Miceli (1991) point out the agency problems with respect to the agent's search effort level and argue that the agent will expend less than the efficient level of effort for the seller while Arnold (1992) studies the pricing aspect of the agency problem and shows that the agent's reservation price for the seller's house will generally be different than the seller's reservation price. The source of the agency problem in these models can be summarized as follows. The seller wants to maximize the selling price while minimizing the time the asset stays on the market. The agent, on the other hand, seeks to maximize his expected commission revenue while minimizing the time on the market. Given that the agent receives a small portion of the transaction price as commission, the agent's goal of maximizing the expected commission may diverge from the seller's goal of maximizing the selling price. This divergence of interests gives strong incentives to brokers to 'get the deal done' quickly, and try to convince the seller to accept a suboptimal price. In fact, Bernheim and

Meer (2008) find that a seller's use of a broker results in a decrease in the selling price by 5.9 to 7.7 percent.[1]

A recent study by Han and Hong (2015) identify another consequence of asymmetric information in residential brokerage market. They focus on in-house transactions where both the seller (listing) agent and buyer agent work for the same brokerage company. Since in-house transactions help brokerage firm clear inventories faster and secure commissions from both ends of a transaction, brokerage firms often pay a higher portion of the commission to reward agents engaged in in-house transactions. The authors find evidence that an agent's promotion of internal listings imposes a substantial cost on buyers. The buyer agents utilize their informational advantage to direct buyers' interest to internal listings, even when this results in a suboptimal match for buyers.

As indicated earlier, agency problems between the seller and his agent have been empirically documented in Rutherford et al. (2005) and Levitt and Syverson (2008). These studies show that agents obtain higher prices when selling their own assets. The current paper offers an additional empirical test of the agency problem in real estate brokerage. We focus on the agency problem on the buying side of real estate transactions. Our unique data set allows us to investigate whether real estate agents are able to use their information to their advantage when purchasing a property even when a seller is represented by an informed real estate agent.

The current paper contributes to a wider and growing literature on the role of asymmetric information in real estate markets. The role of asymmetric information in housing and mortgage markets has gained a significant amount of attention since the recent financial crisis. Garmaise and Moskowitz (2004), for instance, show that participants in real estate markets resolve asymmetric

[1] Earlier studies on the impact of employing an agent on the transaction price offer mixed results. While Bernheim and Meer (2008) find negative impact, Frew and Jud (1987) find a positive impact, and Hendel, Nevo, and Ortalo-Magné (2009) find no effect on the transaction price. Elder et al (2000) focus on the impact of buyer's use of a broker and find that buyer brokers have no effect on home prices.

information problems by purchasing nearby properties and properties with long histories while avoiding transacting with informed brokers. On the other hand, Bayer, Geissler and Roberts (2011), Chinco and Mayer (2012), Kurlat and Stroebel (2015) and Stroebel (2015) examine how informed real estate traders or lenders can exploit their superior information in their transactions. An, Deng and Gabriel (2011) offer evidence of adverse selection problems in commercial mortgage securitization while Elul (2009), Keys et al. (2010), Agarwal, Chang and Yavas (2012), Albertazzi, et. al., (2015) and Ambrose, Conklin and Yoshida (2015) offer evidence of adverse selection in residential mortgage securitization. A related line of research investigates agency issues associated with mortgage securitization (Keys et al. 2010; Mian and Sufi 2011; Mian, Sufi, and Trebbi 2010).[2]

Relative to this literature, the current paper is the first to document asymmetric information problems between buyers and buyer agents in residential real estate markets. It also is the first to combine the agency problems on buying and selling side of the transactions, and ascertaining that earlier papers by Rutherford et al. (2005) and Levitt and Syverson (2008) underestimate the degree of summative agency problems in residential real estate markets.

The next section of the paper reviews agency problems between the buyer and her broker and proposes empirical predictions. The third section of the paper provides an overview of the data. In section four we discuss the estimation of the models using data from 34,655 Multiple Listing Service (MLS) listings from Miami-Dade County Florida during the years 2009 through September 2013. An important feature of this data set is that we are able to identify 4,517 (13.03%) of the observations as real estate agent purchases. The empirical results presented in section five show that agent-purchased

[2] We indirectly contribute to a related body of literature that looks that has provided evidence on the behavior of asymmetrically informed agents in financial markets (e.g, Lin and Howe, 1990; Seyhun, 1992; Easley, Hvidkjaer, and Ohara. 2002; Kelly and Ljungqvist, 2012, and Choi, Jin, and Yan, 2013). The current study also contributes to the literature on middleman that relied on asymmetric information and search frictions to explain the role of intermediaries in various markets (e.g., Biglaiser, 1993; Yavas, 1994, 1996; Li, 1998; Shevchenko, 2004).

houses sell no faster than other houses, but they do sell at a price discount of approximately 4.0% below the price of a comparable house not purchased by a real estate agent. The final section of the paper summarizes the results and offers some concluding remarks.

2. Real Estate Agents Purchasing in the Single-Family Housing Market

Real estate markets are characterized by imperfect information. Buyers and sellers do not know each other's location or reservation prices. Furthermore, since real estate is a heterogeneous good and households have idiosyncratic tastes, the final transaction price will depend on the characteristics of the buyer and seller at the negotiation table as well as the market conditions. These uncertainties, coupled with the fact that most people get involved in a real estate transaction on a very infrequent basis, create a market for intermediaries, namely real estate agents, who specialize in facilitating real estate transactions.

The vast majority of real estate transactions in the US go through an MLS (Multiple Listing Service). An MLS is owned and operated by an association of local of real estate brokers, and is a vehicle for member brokers to share information about their listings. That is, under MLS, the member brokers combine their listings and create a single pool of listings, and by doing so they create a platform where (almost) all the sellers and buyers are brought together.

However, the primary purpose of an MLS is to provide a facility for brokers to cooperate with each other in selling their listings. It is a mechanism through which listing brokers offer compensation to buyer brokers who bring a buyer for their listed property. The listing broker typically charges the seller 6% of the transaction price and offers 40-60% of his/her commission to the broker representing the buyer. The commission rate that is offered by the listing broker to buyer brokers is published within the MLS.

In this paper, we focus on the buy side of real estate transactions and investigate the agency problems between the buyer and her agent. What is striking about the buy side is that the buyer's agent

receives a percentage of the price as commission. This creates an obvious conflict of interest. The buyer wants to minimize the purchase price and the time the asset stays on the market. The buyer agent, on the other hand, seeks to maximize his expected commission revenue while minimizing the time on the market. Given that the agent receives a small portion of the transaction price as commission, the agent's goal of maximizing the expected commission will conflict with the buyer's goal of minimizing the selling price. Since the agent's effort level is not directly observable and the agent has asymmetric information about the market value of the asset, this divergence can lead to shirking by the agent. As a result, the agent may be motivated to convince the buyer to accept a suboptimal purchase price at the bargaining in order to facilitate a faster sale and obtain a higher commission.

What is ironic is that in most states the broker that the buyer works with while searching for a house is typically a sub-agent of the listing broker, who is an agent of the seller. In other words, the buyer broker is expected to represent the best interests of the seller, not the buyer. This often leads to confusion for the buyer, if they understood the agency relationship, and occasionally led some buyers to file legal complaints against buyer brokers for misrepresentation. As a reaction, many brokers today offer exclusive buyer agency contract to buyers, under which they are committed to represent the best interests of the buyer, instead of being a subagent of the seller. Oddly, even under exclusive buyer agency contract, the buyer agent's commission is still typically a percentage of the price and the buyer agent's commission is still being paid by the seller.

In Florida, where the data for the current study comes from, the apparent conflict of interest and the confusing relationship between the buyer and buyer broker led to a change in state statutes in July 2003. The new Florida Statutes, states: "It shall be presumed that all licensees are operating as *transaction brokers* unless a single agent or no brokerage relationship is established, in writing, with a

customer."[3] A transaction broker is not an agent of either party in the legal sense of the word, but merely helps to facilitate a transaction between the buyer and seller. Most brokers in Florida today prefer to only work as transaction brokers in order to avoid the liability issues associated with the traditional sub-agency relationship.

Compared with listing brokers and buyer brokers who are both agents or sub-agents of sellers, brokers who serve as transaction brokers do not have the *legal liability* to represent the best interests of sellers. Thus, they are not required to try their best to obtain a higher price for the seller when they are helping a buyer to find a home. However, since brokers still receive a percentage of the price as commission, they still have the *financial incentives* to convince the buyer to agree to pay a higher price than they would otherwise.

Earlier papers by Rutherford et al. (2005) and Levitt and Syverson (2008) use data from Texas and Illinois, respectively, and document premiums of approximately 3.5% for real estate agents that sell their own houses. This is very similar to the premium we obtain for agent owned houses in the current study. The results of these three studies indicate that having transaction brokers do not help buyers eliminate or reduce the price premium they pay when they purchase agent owned houses. That is, eliminating legal liability, without eliminating the financial incentives, for the buyer brokers to represent the best interests of sellers has not been an effective policy in protecting buyers against the informational disadvantage they face in dealing with sellers who are agents.

Empirical Predictions

In this section we propose several predictions that allow us to analyze empirically the importance and outcome of information asymmetries between buyers and buyer agents. These predictions follow from the simple theoretical model we offer in the appendix.

[3] http://www.leg.state.fl.us/Statutes/index.cfm?App_mode=Display_Statute&URL=0400-0499/0475/Sections/0475.278.html

The first prediction follows from the fact that agents will exhort greater effort when purchasing for their own account and make a more effective use of their asymmetric information advantage in price negotiations. As a result, they will obtain a lower price for themselves.

Prediction 1: Real estate agents will purchase houses at lower prices than individuals.

If the agents are able to purchase at lower prices, and if lower prices are not due to unobservable inferior characteristics of the properties they purchase, then they should enjoy greater capital gains when they sell their properties.

Prediction 2: Real estate agents should obtain higher appreciation for their properties.

The data we have enables us to replicate the analysis of Rutherford et al. (2005) and Levitt and Syverson (2008). Rutherford et al. (2005) study uses data from Texas while Levitt and Syverson (2008) study is based on data from Illinois. Buyer brokers in these two states typically serve as subagents of the seller.[4] In Florida, on the other hand, transaction brokerage is the default case unless the broker and her client agree to an alternative contract where the broker will have fiduciary responsibility to represent her client's interests. Thus, while brokers are a neutral party in transactions in Florida, they have legal liability to represent the best interests of their clients in Illinois and Texas. Since the client (principal) is typically the seller, this should lead to a better alignment of interests of the seller and broker in Texas and Illinois than in Florida. As a result, when comparing the price premium that agents receive when selling their own properties, we should see a bigger price premium

[4] Texas allows for transaction brokerage when the broker is representing both parties in a transaction. In The History of The Texas Real Estate License Act, the Texas Real Estate Commission, on September 2005, amendments were made, page 14, item 7: "A broker who agrees to represent both a buyer and a seller must agree to act as an intermediary." Texas Statutory – TRELA 1101.558.

in the current study than those reported in Rutherford et al. (2005) and Levitt and Syverson (2008). However, brokers in all three states receive a percentage of the price as commission, paid by the seller. Thus, they have the same financial incentives in the three states.

Prediction 3: Financial incentives would prevail over fiduciary responsibilities; price premium for the agent-owned properties in Florida should be similar to that in Rutherford et al. (2005) and Levitt and Syverson (2008).

3. Data

In order to conduct the empirical analysis, we obtain data from a number of datasets. The primary data are MLS sales for Miami-Dade county. The MLS data lacks grantor and grantee information that is needed to identify real estate agent purchases (*REAP*). However, Miami-Dade county has maintained grantor and grantee information in their sales data since approximately 2008. We match the Miami-Dade county data from 2009 through September 2013 with the MLS dataset using the property's unique property ID (Folio Number)[5]. The Miami-Dade sales dataset includes grantee and grantor information, sales price, date of sale, a unique property ID (Folio number), deed book and deed page, property address, DORcode (type of property), SalesCode (type of sale),[6] square feet of the building, square feet of the land, number of bedrooms, number of bathrooms, number of stories, year built, and effective year built. 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

[5] The rationale for the time period is that grantor and grantee information is available from January 2009 and we extracted the data in September/October 2013.

[6] See for example "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

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. The datasets also contain a quality description each year that we match with the sales data to obtain an estimate of the quality of the property.[7] In addition, census block and census block group are available in the FDOR datasets and we use census block group to control for location. We match the data from the above-described datasets with the local MLS data by the tax district's property information numbers. The MLS dataset includes time on the market, sales price, list price, cash sale and REO sale and listing and selling agent IDs.[8] We also create dummy variables for the type of transfer based on the FDOR transfer qualification codes. The initial coding is in SAS with visual verification in Excel. In addition we match the grantee information with a list of Real Estate Agents obtained from the Florida Real Estate Commission. Names are initially matched in SAS and verified in Excel.[9]

The data set contains 34,655 MLS sales from 2009 through September 2013. Transactions with a price below $20,000, a price of $10,000,000 or greater or properties with lot square footage less than 645 square feet and properties with two or more living units were also deleted. Properties with more than 1,095 days on the market were deleted along with transactions with missing data. The final sample of 34,655 sales includes 4,517 agent purchases and 2,696 owner agent sales.

We present variables used in the analysis and their description in Table 1. Table 2 provides descriptive statistics for the full sample, real estate agent purchases and other buyers with a difference in means t-test. Sales prices are lower for agent purchases ($260,265 vs. $325,031), but they are also

[7] We assume that the quality measure is at best a relative measure of quality, not an absolute measure of quality.
[8] The cash percentage is approximately 41% for the MLS sales. This numbers is consistent with the 43% estimate by Realty Trac, August 29, 2013 (http://www.inman.com/2013/08/29/all-cash-deals-on-the-rise/).
[9] Agent names from the Florida Real Estate Commission are matched with the grantee names provided by Miami-Dade county in their sales database. In any matching by names there is the possibility of error. If a matched grantee is not a real estate agent, but has the same name as an agent and is coded as a real estate agent purchase, then the bias is toward 0 for that coefficient. Ideally, the MLS or county would require that a buyer reveal he or she is a real estate agent and record this in the MLS or county records.

smaller, with fewer bedrooms, and bathrooms. Agent purchased properties have fewer stories and a lower percentage with a pool which is consistent with lower valued properties relative to other purchased properties. A higher percentage of agent purchased properties are vacant, are REO sales, need work, are of average quality and are purchased with cash compared to other buyer purchased properties.

One variable of interest that has generated a number of articles in the popular press is the cash transaction.[10] In Table 2, we note that real estate agents pay cash for about 41% of their purchases and other purchasers buy with cash in about 29% of their transactions over the 2009-2013 sample period, so the difference suggests that agents use cash at a higher rate than other buyers use cash in this market. Controlling for cash transactions is important because paying with cash gives the buyer a competitive advantage when negotiating the price of a home because of two reasons. First, a cash buyer may present less risk to the seller of the deal falling apart due to the mortgage-contingency clause in a sales contract. Second, a cash purchase may reduce the time required to complete the transaction because cash buyers do not have to spend time to obtain a loan approval for the purchase. As a result of these two reasons, a seller would be willing to accept a lower price when she faces a cash buyer. Indeed, Asabere, Huffman, and Mehdian (1992) and Lusht and Hansz (1994) report discounts for cash financing of 13 and 16 percent, respectively.

In the first set of regressions and the probit model, we compare agent purchases to non-agent purchases. Most of the remaining regression have controls for *REAP*s with the control group being individual grantees purchasing a house for their own account in the dataset. The only exception is when we compare "properties owned by an agent and sold to an agent" to "properties owned by an

[10] For example a report by Goldman Sachs, in the Mortgage Analyst, August 14, 2013 titled "How much upside to purchase mortgage originations?" estimates an increasing percentage of cash transactions with approximately 30% cash transactions in 2009 and roughly 58% in the summer of 2013. RealtyTrac, August 18, 2014 state: "Among metropolitan statistical areas with a population of at least 500,000, those with the top six highest percentages of cash sales were all in Florida: Miami-Fort Lauderdale-Pompano Beach (64.1 percent)" is the highest.

agent and sold to a non-agent" and when we compare "properties owned by an agent and sold to an agent" to properties owned by a non-agent and sold to an agent" with these results presented in Table 8.

4. Methods

We initially estimate a model with census block group fixed effects and sale year month fixed effects. The initial empirical model we estimate allows us to compare agent purchased properties to properties purchased by other buyers, and takes the following form:

$$y_i = \beta_0 + \beta_1 \textit{RE Agent Purchase} + \beta_2 \textit{RE Agent Own} + \Sigma\, \beta i\, Q_i + \Sigma\, \beta i\, TS_i + \Sigma\, \beta i\, X_i + \Sigma\, \beta i\, R_i + \varepsilon_i, \qquad (1)$$

where the dependent variable y is the logged sales price (Tables 4, 7 and 8), or time on the market (Table 5 and 6). *RE Agent Own is* a dummy for a property owned by a real estate agent and *Q* is a set of variables describing the relative quality of a property in a given year and *TS* is a set of additional variables describing the type of sale. The vector X_i for the sales price model includes a full set of housing characteristics as indicated in Table 5. These include physical characteristics such as size, effective age, bathroom and bedrooms, and pool. R_i is a vector of dummy variables created from real estate agent public remarks, and ε is a random error term.

In addition, in Table 4 and 5 we replace the *REAP* variable with two binary variables defined in Table 1 that refine the type of real estate agent purchaser into *Smaller REAP (one or two purchases) and Larger REAP, (3 or more purchases).* These binary variables take the value of 1 if the transaction involves grantees who fit the size categories defined above and 0 otherwise. The omitted category in Table 4 and Table 5 is the individual single-purchase buyers. The purpose of this categorization of *REAP* variable is to identify and differentiate the impact of agent purchasers who transact frequently and act as investors. In addition the regression models include a set of dummy variables for the sale

year and month for the sale price models along with dummy variables for each census block group. The time on the market models include list year and month in place of sale year and month in the price models and include DOP as a dependent variable. The primary reason to estimate a time on the market model is as a robustness test. The dummy variables for sale year and month, or list year and month, and census block are not reported in the tables.

We also estimate a Probit model to examine the characteristics associated with *REAP*s versus other grantees as follows:

$$\text{Prob}\,(REAP) = \pi(X, OwnerAgent, Q, TS), \quad (4)$$

In Equation (4), the dependent variable Prob (REAP) is the probability of a real estate agent purchasing the property, and *X, Q, and TS* are as defined above and in Table 1.

5. Empirical Results

The results of the Probit model, provided in Table 3, marginally indicates that overpriced properties and properties listed by experienced agents are less likely to be purchased by REAPs. REO properties and cash purchases are more likely to be purchased by a real estate agent. The results in the Probit model provide no evidence that agents purchase more or less often from owner agents. That is, agent buyers do not particularly try to avoid, or attracted to, houses owned by other agents. It appears that REAPs are better equipped to compete for distressed properties, prefer properties that are average or below average in quality, and more frequently purchase with cash.

Results obtained from the initial regression model in Table 4 indicate that REAPs are purchasing properties at approximately a 4.7% discount relative to other buyers after controlling for physical characteristics, a proxy for quality, and for types of sales along with REO and Cash. In the second model we include dummy variables describing or commenting on the quality and attractiveness of certain aspects of the property, created from the MLS "public remarks". The coefficient on REAP decrease to 4.0%. We then split the REAP variable into two groups, REAP grantees that purchased 1

or two properties and REAP grantees that purchased 3 or more properties. The results in model 3 indicate that agents purchasing 3 or more properties are able to obtain a larger discount than agents purchasing 1 or 2 properties when we compare them to the group of other buyers. All remaining regression have controls for the MLS public remarks and for *REAP*s with the control group being individual grantees purchasing a house for their own account in the dataset.

In this data we also have owner agents selling their own properties. The results are similar to those found by Rutherford and Yavas (2005) and Levitt and Syverson (2008), with a premium of approximately 3.5% for real estate agents that sold their own property through the MLS.

The other variables are as expected, with cash purchases, lower quality and older properties selling for lower prices and larger houses selling for higher prices. More bedrooms or more bathrooms are also associated with higher prices.

There is a small sample (276 transactions) of the 4,517 REAPs that sell in the dataset. We include this set of owner agent properties separately from the Owner Agent Sales and label it Subsequent Sale after Purchase by Agent. This variable has a coefficient of approximately 3.9% in the sale price model, indicating that the subsequent sale by a purchasing agent (now an owner agent) sells at a similar price as other owner agent sales in the data. The small sample of REAP resales may overstate the capital gain, but if we take the broader measure of Owner Agent, that coefficient is a 3.5% premium, again indicating a substantial capital gain for properties sold by an agent relative to properties purchased by an agent. These results are consistent with findings by Kurlat and Stroebel (2015) that real estate agent who are buyers of residential real estate are able to earn abnormal capital gains compared to individuals in the same market.[11]

[11] It is possible that higher capital gains enjoyed by agent buyers are due to more spending by agents on repairs and maintenance after the purchase. We address this concern by including a number of variables in our analysis that capture characteristics and conditions of the property and whether the property was remodeled.

The quality proxy variables have the expected signs compared to average quality, with fair quality selling at about a 22% discount, above average quality properties selling at a 3.6% premium and excellent quality properties selling at a 10.9% premium.

In Table 5, we study the days each property stayed on the market (DOM). We conduct fixed effects regression analysis and a Weibull duration model. Both models show that agent purchases are on the market the same amount of time as a typical property in the sample. Another variable of interest in Table 5 is the degree of overpricing (DOP) variable, which measures the percentage by which the list price exceeds the expected list price estimated from a regression model. The coefficients in both models of days on the market indicate that while overpricing has a significant and negative impact on the number of days the property stays on the market, the magnitude of the impact is very small.

In Table 6, we provide statistics for new variables that we use in place of Owner Agent and Agent Purchasing. In Table 7, using the full sample and the variables in equation one, we provide the estimates of the new variables (keeping all other variables as in Table 4 and Table 5 models). We find no statistical difference in the price of a property that is owned by an agent and purchased by an agent. When an agent sells to an agent, we obtain the same price as individuals selling to other individuals. When an agent owns the property and sells to a non-agent, we see a premium of 3.6% that is consistent with our prior estimate of 4.0% for REAPs. We identified a number of listings where the list and sale agent are the same. In Florida, we do not classify this as dual agency, but simply as transaction brokerage. We examined what happens when the listing and selling agent are the same and an agent purchases this property. We found that if the listing and selling agent are the same, then an agent purchasing the property obtains an even better deal. In this case, the purchasing agent buys at a discount of -5.4%, suggesting the listing and selling agent is helpful to his fellow agent and either recommends to his client to accept a lower price or may provide information to the buyer that allows him to purchase at a deeper discount. In the case where the list and sale agents are different and agent purchases, the REAP obtains a 3.5% discount, closer to the 4% we saw above.

6. Robustness Test

It is possible that agent-buyers obtain lower prices because they target sellers who are more desperate to sell. To investigate this argument, we examine days on the market (DOM), the number of days each property stayed on the market before it was sold. We find in the difference in means test that DOM is slightly shorter (155 days versus 160 days) for the properties purchased by agents indicating that the properties purchased by agents have been on the market slightly shorter, not longer. We also examine whether the terms Motivated (seller) /Reduced (price) were mentioned in the MLS public remarks and find no statistical difference between agent-purchased properties and other sales. In the Sales Price fixed effects regression model, the coefficient on DOM is -0.000, but statistically significant, suggesting that longer times on the market are associated with a very small reduction in price. However, the coefficient is so small that taking the average days on the market times the coefficient results in less than 1 day, so essentially there is no impact. However, in our fixed effect models and a Weibull duration model of DOM reported in Table 5 we find that an agent purchasing is not associated with shorter or longer DOM. All three models have an Agent Purchase coefficient close to zero and it is insignificant. Thus, we find no support for the possibility that sellers selling to agents might be different with more of an urgency to sell than sellers selling to non-agents. In unreported results from a 3SLS estimation of price and time on the market, we find results that are consistent with the fixed effects and Weibull model presented in Table 5. REAPs take the same amount of time to market as properties purchased by individuals

One other possible explanation for the lower prices obtained by agent buyers is that they simply identify and target mispriced / below-market priced properties, as opposed to using their asymmetric information to increase their bargaining power and convince the seller to accept a lower price at the negotiation stage. To check for this possibility, we compare two measures of mispricing for agent buyers and non-agent buyers: Listing Price-to-Selling Price ratio and Listing Price-to--Estimated

Selling Price ratio. We find that these two ratios are not different across the properties purchased by agents and non-agent buyers.

It is possible that we may not be controlling for all the property characteristics, though our result on the owner agent variable is consistent with Rutherford and Yavas (2005) and Levitt and Syverson (2008). Though the sample is small, 2,696 agent owned properties with an average sale price of $406,722 or $159 per square foot with 321 of those purchased by an agent with an average price of $350,641 or $140 per square foot, we are able to compare prices of properties owned by an agent & sold to an agent with properties owned by an agent & sold to a non-agent. Since the owner agents didn't know who the future buyer would be at the time he purchased the property (i.e., they did not purchase properties with a certain set of characteristics based on their conjecture of whether or not the future buyer would be an agent), this comparison yields the pure impact of whether the buyer is an agent or not. That is, a comparison of these two groups would serve a nice robustness test against the argument that buyer agents are paying less simply because they are buying 'different' (lower quality) properties, and seller agents are enjoying higher prices simply because they are selling 'different' (higher quality) properties. We estimate a fixed effects model and present the results for only the variable of interest in Table 8a. All variables estimated in the regression model in Table 4 are included in the analysis of Table 8a, except owner agent and agent purchase variables. Our variable of interest is a dummy variable representing properties owned by an agent and sold to an agent compared to the group of properties owned by an agent and sold to a non-agent. In this small sample, our results indicate that the group of properties owned by an agent and sold to an agent sell for 7.7% less than properties owned by an agent and sold to a non-agent.

As an extension of the comparison above, we compare properties owned by an agent and sold to an agent with properties owned by a non-agent and sold to an agent. This includes all properties purchased by an agent. In this case the results are present in Table 8b and the coefficient is -0.001 and the t-statistic is -0.06, again including all additional other variables. This indicates that the group of

properties owned by an agent and sold to an agent have similar prices to the group of properties owned by an individual or non-agent and sold to an agent.

As a robustness test, in Table 9, we expand the sample of Table 8 to include all owner agent properties and all purchasing agent properties and run a fixed effect sales price model. In this model, we also include a control for those 321 properties sold by an agent and purchased by an agent. The results indicate overall that a purchasing agent buys at a discount of 7.66% relative to what an owner agent sells their properties. For the 321 properties sold by an agent and purchased by an agent, the properties sell at market. Thus, one can interpret the 7.66% difference between the price paid by purchasing agents and the price obtained by agents selling their own properties as the total potential agency cost in the market, capturing the agency cost between the agent and his client on both buying and the selling side of a transaction. The results of Table 9 are consistent with the results presented in Table 8 where we break the sample into groups owned by an agent and sold to an agent relative to two other groups, one owned by an agent and sold to a non-agent and the other owned by a non-agent and sold to an agent.

6. Conclusion

Our results indicate that real estate agents purchase residential real estate at discounts relative to individuals (single-purchase buyers) during the years 2009 through 2013. We find that REAPs obtain substantial discounts of 4.0% and that Owner Agent properties sell at significant premiums of 3.5%, with a subset of the REAPs selling a second time as an Owner Agent property with a premium of 3.9%. In either case we contend that real estate agents use their informational advantage to purchase at discounts and sell at premiums. Comparing the prices of agent-purchased properties with agent-owned properties, we find that agents purchase at a 7.7% discount relative to selling prices of agent-owned properties. However, agent to agent transactions occur at market values, offsetting any competitive advantage an agent might have in the market. We believe 7.7% discount serves as a proxy

for the total potential agency cost in the market, capturing agency costs on both buying and the selling side of a transaction.

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Appendix

A Simple Model of Agency Problem between Buyer and Buyer Broker

The purpose of this appendix is to offer a simple model to show the incentive problems between the buyer and the buyer agent. Consider a risk-neutral agent who chooses an effort level to find a property that matches the buyer's needs and to obtain a low price for the property. In order to study whether the agent represents the interest of his client in the same way that he would represent himself, we first study the case in which the agent is buying a property for himself and then compare this to the case in which the agent is helping a buyer to find a property. The purpose here is not to design the efficient and incentive compatible contract between the buyer and the agent. Rather, we take the current commission structure in the industry as given and compare the effort level choices of the agent depending on whether he is the buyer of the property or not.

Let L represent the search effort of the broker. The probability of finding a property that fits the specifications of the buyer is an increasing function of the search efforts of the broker and is given by $\Theta(L)$ where $\Theta'>0$ and $\Theta''<0$. The cost of search effort, $C(L)$, is strictly increasing and convex ($C'>0$, $C''>0$) with $C'(0)=0$.

Suppose the buyer values the house at P_b. If an acceptable match is found, the buyer and seller bargain over the price. Is assumed that bargaining will result in a trade as long as there are gains from trade, i.e., as long as the buyer's valuation exceeds the seller's valuation, $P_b > P_s$. The negotiated price divides the surplus $P_b - P_s$ such that the buyer receives ω portion of it, and the seller receives $1-\omega$ portion of it. This implies that the negotiated price will be $P = P_s+(1-\omega)(P_b-P_s)$. For simplicity, we will assume equal division of surplus, $\omega=½$.[12] This yields a negotiated price of $P = ½(P_s+P_b)$ when buyer with valuation P_b meets seller with valuation P_s. The valuations of the parties are private information. For the buyer, the valuation of the seller, P_s, is a random draw from the density probability function $f(Ps)$ with the support $[\underline{P}_s(L), \bar{P}_s]$ and $\underline{P}_s'(L) < 0$. That is, lower bound of the distribution is a decreasing function of the effort level of the broker. A higher effort level leads to the possibility of contacting sellers who have a lower valuation of the property, which in turn leads to lower expected purchase price of the property.

We assume the buyer works with only one broker in searching for a house to buy. This is in line with what we typically observe in housing markets, and eliminates the need to introduce competing brokers in the model. We assume the buyer broker is a member of the local multiple listing service and helps buyer search through, inspect and visit listings posted on the multiple listing service. Following the current practice in the industry, if a transaction occurs, the buyer broker receives k percentage of the price as commission from the listing agent for securing a buyer for the property, which is typically 40-60% of the total commission the listing agent has negotiated with the seller. We assume that the total commission rate and the buyer agent's share of the commission, k, are determined in the market and taken as exogenous by the players.

[12] It can be shown that the equal split of the surplus in this simple setup is the bargaining solution proposed by Nash (1950), Kalai and Smorodinsky (1975) and Rubinstein (1982).

When buying on his own account, the agent with valuation P_b chooses effort level L^O to maximize his payoff:

$$(1) \qquad \prod(L^o) = \Theta(L^o) \int_{\underline{P}_s(L^o)}^{P_b} \frac{1}{2}(P_b - P_s) f(P_s) dP_s - C(L^o).$$

If the agent is helping a buyer with valuation P_b, his surplus from the transaction will simply be his commission revenue, k percent of the transaction price, $kP=k½ [P_b+P_s)]$. In that case, the agent chooses effort level L^N to maximize:

$$(2) \qquad \prod(L^N) = \Theta(L^N) \int_{\underline{P}_s(L^N)}^{P_b} k\frac{1}{2}(P_b + P_s) f(P_s) dP_s - C(L^N)$$

Applying the Leibnitz's Rule, the agent's effort choices for the two cases are given by the first order conditions:

$$(3) \qquad \Theta'(L^o) \int_{\underline{P}_s(L^o)}^{P_b} \frac{1}{2}(P_b - P_s) f(P_s) dP_s - \Theta(L^o)\underline{P}_s'(L^o)\frac{1}{2}(P_b - \underline{P}_s(L^o)) f(\underline{P}_s(L^o)) = C'(L^o)$$

and

$$(4) \quad \Theta'(L^N) \int_{\underline{P}_s(L^N)}^{P_b} k\frac{1}{2}(P_b + P_s) f(P_s) dP_s - \Theta(L^N)\underline{P}_s'(L^N)\frac{1}{2}(P_b + \underline{P}_s(L^N)) f(\underline{P}_s(L^N)) = C'(L^N).$$

This simple model yields the following results:

Result 1: $L^{O*} > L^{N*}$. The broker will exert more effort level when he is buying on his own account than when he is helping a client to buy.

To prove Result 1, note that when the seller with valuation P_s sells to buyer with valuation P_b at price $P= P_s+(1-\omega)(P_b-P_s)$, the seller receives the surplus $P-P_s=½(P_b-P_s)$. Since the seller pays the buyer broker's commission (as well as listing broker's commission), the seller would not sell unless his surplus from the sale is at least as large as the brokerage commission he needs to pay. Thus, $=½(P_b-P_s)>½(P_b+P_s)$. This leads to marginal revenue of effort (left hand side) in equation 3 to exceed

marginal revenue in equation 4, resulting in a higher effort level by the broker when he is buying on his own account.

Result 1 is not testable directly since the effort level of the broker is not observable. The model predicts that a higher effort level by the broker will lead to a shorter time to find a property that matches the buyer's needs. Unfortunately, we do not have data on how long the buyer and the broker search until they find a house to purchase. However, we have the data to test the following implications of Result 1.

Result 2: The transaction price will be smaller when the broker is buying on his own account than when he is helping a client to buy.

Result 2 is a straightforward outcome of Result 1 and the fact that $P_s'(L) < 0$.

Result 3: Upon selling his house, the broker will enjoy higher capital gains than individual sellers.

Result 3 is follows directly from Result 2.

Table 1 - Variables and Description

Variable	Description
List Price	list price of the house.
Sales Price	selling price of the house, expressed as ln(sp) in the regression models.
Size of house in 100's of square feet	number of square feet divided by 100.
Age of house in 10's of years	year of sale minus effective year built divided by 10.
Bedrooms	number of bathrooms.
Bathrooms	number of bedrooms.
Stories	number of stories.
Pool	dummy variable indicating the presence of a pool.
Vacant	dummy variable indicating the house is vacant.
Lot Size feet in 1,000's of square feet	land square feet reported by the appraisal district, divided by 1,000.
Percentage land value	appraisal district land value divided by total assessed value, multiplied by 100
Fair quailty	dummy variable indicating the appraisal district's "Minimum/Below Average" rating of property improvement quality.
Average quality	dummy variable indicating the appraisal district's "Average" rating of property improvement quality.
Above Average quality	dummy variable indicating the appraisal district's "Above Average" rating of property quality.
Excellent quality	dummy variable indicating the appraisal district's "Excellent" rating of property improvement quality.
Cash	dummy variable indicating a cash purchase.
Transfer qualified as arm's length by deed	dummy variable indicating transfer is qualified per exam of deed (arm's length, Appraiser Salescodes).
Deeds executed by bankruptcy trustees	dummy variable indicating transfer is from a bankruptcy trustee, etc. (Appraisal District Salescodes).
Sale not exposed to the open-market	dummy variable indicating transfer is not exposed to the open market (Appraisal District Salescodes).
Forced sale or sale under duress	dummy variable indicating transfer is forced, under duress or to prevent foreclosure (Appraisal District Salescodes).
REO sale	dummy variable indicating transfer is classified as a REO sale.
Individual Purchase	dummy variable indicating a grantee that purchased a property during the sample period.
Agent Purchase	dummy varialbe indicating a real estate agent purchasing 1 or more properties during the sample period.
Smaller REAP	Real Estate Agent Purchasing 1 or two properties.
Larger REAP	Real Estate Agent Purchasing 3 or more properties.
Owner Agent	dummy variable indicating a property owned and sold by a real estate agent.
REAP_subsequent sale	dummy variable indicating the subsequent sell of a real estate agent purchased property (REAP_owned).
REAP_Buyers Agent	dummy variable indicating the agent purchasing is also the buyer's agent on the transaction.
Days on the Market	calculated number of days from list date until date sold.
Degree of overpricing (DOP)	residual from a list price equation x 100.
List Agent Rookie	dummy variable indicating listing agent has less than four years of experience.
List Agent Experienced	dummy variable indicating listing agent has more than five years of experience.

Table 1 - Variables and Description - continued

Variable	Description
Sale Agent Rookie	dummy variable indicating sales agent has less than four years of experience.
Sale Agent Experienced	dummy variable indicating sales agent has more than five years of experience.
Sale Year and Month	sale year and month of sale.
List Year and Month	list year and month of listing.
Short Sale	dummy variable indicating a short sale of the property.
Needs Work	dummy variable indicating in the listing remarks that the house needs repairs or work is required.
Corporation Owned	dummy variable indicating in the listing remarks that the house is owned by a corporation.
Sold As-Is	dummy variable indicating in the listing remarks that the house is sold as-is.
Institution Owned	dummy variable indicating in the listing remarks that the house is owned by an institution.
Upgraded	dummy variable indicating in the listing remarks that the house is upgraded.
Renovated	dummy variable indicating in the listing remarks that the house is renovated.
Updated	dummy variable indicating in the listing remarks that the house is updated.
Good Condition	dummy variable indicating in the listing remarks that the house is in good condition.
Nice Home	dummy variable indicating in the listing remarks that the house is a nice home.
Beautiful, Wonderful, Gorgeous	dummy variable indicating in the listing remarks that the house is beautiful, wonderful, or gorgeous.
Remodeled	dummy variable indicating in the listing remarks that the house is remodeled.
Buyer Verify	dummy variable indicating in the listing remarks that the buyer is to verify housing condition.
Bonus	dummy variable indicating in the listing remarks that a bonus is available.
Motivated/Reduced	dummy variable indicating in the listing remarks that the seller is motivated or price is reduced.
Desirable Neighborhood	dummy variable indicating in the listing remarks that the house is located in a desirable neighborhood.
Great Location	dummy variable indicating in the listing remarks that the house is well located.
Builder	dummy variable indicating in the listing remarks that the owner of the property is a builder.
Same listing and selling agent	dummy variable indicating that the listing agent id matched the selling agent id in the mls data.
Sale price/List price	sales price divided by list price ratio.
Sale price/Estimated Sale Price	sale price divided by the estimated sale price ratio.
(Sale price-List Price)/List Price	discount from the list price ratio or ((sale price minus list price) divided by list price).

Table 2 - Descriptive Statistics

Descriptive statistics for the full sample and subsamples of properties purchased by real estate agents and properties not purchased by real estate agent. The data is from three data sources, Miami-Dade County Appraisal District, Florida Department of Revenue Files and MLS data. Excluding residential houses with missing characteristics and obvious outliers the sample includes 34,655 houses sold during January 2009-September 2013, with 30,138 sales purchased by a buyer other than a real estate agent. The remaining 4,517 sales are purchased by a real estate agent during the time period. We do not report the month year dummy variables or census block group dummies below for brevity. There are 57 months and 1,157 census block groups in the sample. The t-statistics are calculated to test the null: mean(other buyer purchase) - mean(real estate agent purchase)=0. Statistics with significance at the 1% level are denoted with a ** and the 5% level are denoted with a *.

	Full Sample, n=34,655	Other buyers, n=30,138	RE Agent Purchase, n=4,517	
Summary Statistics of Key Variables	Mean	Mean	Mean	t-statistics
List Price	341,952	351,031	281,369	8.59 **
Sale Price	316,589	325,031	260,265	9.15 **
Size of house in 100's of square feet	21.349	21.509	20.283	7.78 **
Age of house in 10's of years	3.236	3.217	3.365	-4.68 **
Bedrooms	3.322	3.331	3.262	5.10 **
Bathrooms	2.174	2.188	2.075	7.88 **
Stories	1.193	1.197	1.164	5.26 **
Pool	0.298	0.303	0.260	5.93 **
Vacant	0.415	0.408	0.468	-7.69 **
Lot Size feet in 1,000's of square feet	9.942	9.980	9.688	1.68
Percentage land value	31.538	31.608	31.074	2.10 *
Fair quailty	0.064	0.063	0.075	-3.23 **
Average quality	0.542	0.537	0.575	-4.74 **
Above Average quality	0.274	0.277	0.254	3.15 **
Excellent quality	0.120	0.124	0.096	5.38 **
Cash	0.302	0.286	0.408	-16.70 *
Transfer qualified as arm's length by deed	0.584	0.596	0.507	11.31 **
Deeds executed by bankruptcy trustees	0.014	0.014	0.014	0.32
Sale not exposed to the open-market	0.004	0.003	0.008	-5.02 **
Forced sale or sale under duress	0.010	0.009	0.012	-1.71
REO sale	0.388	0.378	0.459	10.53 **
Individual Purchase	0.870	1.000	-	-
Agent Purchase	0.130	-	1.000	-

Table 2 - Descriptive Statistics - continued

	Full Sample, n=34,655	Other buyers, n=30,138	RE Agent Purchase, n=4,517	
Summary Statistics of Key Variables	Mean	Mean	Mean	t-statistics
Sale Agent Rookie	0.144	0.144	0.15	-1.16
Sale Agent Experienced	0.73	0.73	0.71	2.23 *
Sale Year and Month	2010.988	2010.991	2010.965	1.22
List Year and Month	2010.593	2010.596	2010.578	0.79
Short Sale	0.296	0.297	0.288	1.29
Needs Work	0.062	0.057	0.09	-9.29 **
Corporation Owned	0.03	0.03	0.02	0.30
Sold As-Is	0.503	0.500	0.521	-2.54 *
Institution Owned	0.076	0.078	0.062	3.74 **
Upgraded	0.060	0.061	0.052	2.33 *
Renovated	0.087	0.088	0.08	1.60
Updated	0.13	0.13	0.11	4.73 **
Good Condition	0.065	0.066	0.053	3.30 **
Nice Home	0.073	0.076	0.056	4.67 **
Beautiful, Wonderful, Gorgeous	0.374	0.383	0.314	8.98 **
Remodeled	0.103	0.106	0.09	3.71 **
Buyer Verify	0.01	0.01	0.02	-3.08 **
Bonus	0.031	0.031	0.034	-1.11
Motivated/Reduced	0.079	0.079	0.075	1.05
Desirable Neighorhood	0.050	0.052	0.039	3.56 **
Great Location	0.199	0.199	0.19	0.71
Builder is owner per public remarks	0.03	0.04	0.03	3.35 **
Same listing and selling agent	0.236	0.230	0.276	-6.79 **
Sale price/List price	0.959	0.960	0.953	0.67
Sale price/Estimated Sale Price	1.062	1.061	1.063	-0.02
(Sale price-List Price)/List Price	-0.041	-0.040	-0.05	0.67

Table 3 - Real Estate Agent Purchase (REAP) Probit Model

Probit model where the dependent variable (real estate agent purchase=1, 0 otherwise) is as a real estate agent that purchased at least one property during the fifty seven month sample period, January 2009 - September 2013. The model includes monthly dummy variables (not reported for brevity) and dummy variables (not reported for brevity) to control for location. The estimates of the coefficients are presented in the table, with t-statistics reported using heteroskedasticity-robust standard errors. Statistics with significance at the 1% level are denoted with a ** and at the 5% level are denoted with a *.

Independent Variable	Model 1, Probit	Model 1, Reporting Marginal Effects	t-statistics
Constant	-1.091**		-10.38
Size	-0.004	-0.001	-1.40
Square_feet_squared	0.000	0.000	1.55
Age	0.033	0.007	1.58
Age_squared	-0.003	-0.001	-1.00
Land Square Feet	0.000	0.000	0.46
Land Percentage	0.000	0.000	0.29
Bedrooms	0.016	0.003	1.01
Bathrooms	-0.028	-0.006	-1.45
Stories	-0.043	-0.009	-1.53
Pool	-0.016	-0.003	-0.66
Fair quailty	0.025	0.005	1.19
Above Average quality	-0.091	-0.018	-1.68
Excellent quality	-0.020	-0.004	-0.67
Vacant	0.062	0.013	1.22
Owner_Agent	0.024	0.005	0.71
Cash Purchase	0.083**	0.017**	3.93
REO Sale	0.274**	0.060**	14.50
Degree of Overpricing (DOP)	-0.004**	-0.001**	-7.12
List Agent Rookie	0.042	0.009	1.23
List Agent Experienced	-0.003*	-0.001*	-2.22
Sale Year Month fixed effects	Yes		
Location fixed effects	Yes		
Number of Observations	34,655		
Pseudo R2	0.0272		
Log - pseudolikelihood	-13,048		

Table 4- Real Estate Agent Purchases - Sale Price Models

Single Family fixed effects regression models based on the complete sample. We first examine REAPs without a control for agent remarks in the first model. In models two and three we define a single grantee purchase as an individual purchase except when the entity is a agent purchasing for their own account. In Model three we separate the agent purchase variable into a group where an agent purchases 1 or 2 properties and a group where an agent purchases 3 or more properties. The data is for Miami-Dade county, January 2009-September 2013. A real estate agent involved in the transaction as a grantee or buyer is our primary varible of interest. We obtain data from Miami-Dade County Appraisal Districts, the Florida Department of Revenue (FDOR) and a local MLS. All models include month/year dummy variables (not reported for brevity) to control for potential serial effects and all regressions include dummy variables for Census block group (not reported for brevity) to control for location. The estimates of the coefficients are presented in the table, with t-statistics reported using heteroskedasticity-robust Huebner/White standard errors. Statistics with significance at the 1% level are denoted with a ** and at the 5% level are denoted with a *.

Independent Variable	Model 1-All Sales		Model 2-All Sales		Model 3-All Sales	
Constant	11.726**	382.85	11.643**	395.23	11.642**	395.52
Agent Purchase	-0.047**	-10.02	-0.040**	-8.98		
Agent Purchase 1 or 2 properties					-0.026**	-4.97
Agent Purchase of 3 or more properties					-0.068**	-9.13
Owner Agent Sell	0.040**	7.33	0.035**	6.68	0.035**	6.66
Size of house in 100's of square feet	0.029**	26.59	0.030**	27.68	0.030**	27.74
Size squared	-0.000**	-12.21	-0.000**	-12.24	-0.000**	-12.24
Age of house in 10's of years	-0.077**	-11.03	-0.075**	-11.04	-0.075**	-10.98
Age squared	0.004**	4.80	0.004**	5.59	0.004**	5.53
Lot Size feet in 1,000's of square feet	0.009**	9.68	0.009**	9.30	0.009**	9.30
Percentage of Appraisal district value from land	-0.001	-1.49	-0.000	-0.90	-0.000	-0.90
Bedrooms	0.017**	5.12	0.015**	4.68	0.015**	4.70
Bathrooms	0.013**	3.26	0.015**	3.92	0.016**	3.94
Stories	0.028**	5.34	0.030**	5.88	0.030**	5.90
Pool	0.075**	17.54	0.071**	17.30	0.071**	17.28
Fair quailty	-0.223**	-3.61	-0.206**	-3.34	-0.207**	-3.34
Above Average quality	0.036**	2.80	0.034**	2.76	0.034**	2.76
Excellent quality	0.109**	6.05	0.100**	5.68	0.100**	5.70
Deeds executed by bankruptcy trustees	-0.048**	-3.37	-0.031*	-2.26	-0.031*	-2.27
Sale not exposed to the open-market	-0.139**	-4.31	-0.134**	-4.36	-0.132**	-4.32
Forced sale or sale under duress	-0.192**	-11.60	-0.158**	-9.87	-0.157**	-9.83
REO sale	-0.050**	-13.45	-0.027**	-7.28	-0.027**	-7.24
Cash purchase	-0.133**	-34.57	-0.116**	-31.69	-0.115**	-31.45
Vacant	-0.031**	-8.43	-0.039**	-10.40	-0.039**	-10.45
List Agent Rookie	-0.000	-0.06	0.000	0.04	0.001	0.09
List Agent Experienced	0.003	0.65	0.007	1.38	0.007	1.41

Table 4- Real Estate Agent Purchases - Sale Price Models - continued

Independent Variable	Model 1-All Sales		Model 2-All Sales		Model 3-All Sales	
Sale Agent Rookie	0.007	1.29	0.005	0.89	0.005	0.87
Sale Agent Experienced	0.002	0.53	0.001	0.33	0.001	0.35
Short Sale			-0.015**	-4.58	-0.016**	-4.68
Needs Work			-0.121**	-17.04	-0.120**	-16.98
Corporation Owned			-0.005	-0.41	-0.004	-0.37
Sold As-Is			-0.010**	-3.53	-0.010**	-3.52
Institution Owned			0.083**	10.67	0.083**	10.65
Upgraded			0.049**	8.99	0.048**	8.94
Renovated			0.065**	11.89	0.065**	11.85
Updated			0.049**	11.04	0.049**	11.01
Good Condition			0.017**	3.23	0.016**	3.17
Nice Home			0.018**	3.70	0.018**	3.68
Beautiful, Wonderful, Gorgeous			0.049**	16.50	0.049**	16.51
Remodeled			0.085**	17.40	0.084**	17.37
Buyer Verify			-0.038**	-3.10	-0.039**	-3.16
Bonus			0.010	1.10	0.010	1.11
Motivated/Reduced			-0.011*	-1.99	-0.010	-1.93
Desirable Neighorhood			0.007	1.06	0.007	1.04
Great Location			0.004	1.08	0.004	1.02
Days on the Market	-0.000**	-18.50	-0.000**	-14.36	-0.000**	-14.36
Builder is owner per public remarks	0.063**	7.14	0.035**	4.06	0.035**	4.04
Same listing and selling agent	-0.035**	-9.02	-0.031**	-8.51	-0.031**	-8.54
Sale Year/Month fixed effects	Yes		Yes		Yes	
Location Census block group fixed effects	Yes		Yes		Yes	
Number of Observations	34,655		34,655		34,655	
R^2	0.966		0.969		0.969	

Table 5- Real Estate Agent Purchases - Days or time on the Market Models

Single Family fixed effects regression models based on the complete sample. The dependent varialbe is log of time on the market (DOM). In model one we define a single grantee purchase as an individual purchase except when the entity is an agent purchasing for their own account. In Model two we separate the agent purchase variable into a group where an agent purchases 1 or 2 properties and a group where an agent purchases 3 or more properties. Model three is a parametric estimation an accelerated failure time Weibull duration model with the same set of variables as Model 1. The data is for Miami-Dade county, January 2009-September 2013. A real estate agent involved in the transaction as a grantee/buyer is our primary varible of interest. We obtain data from Miami-Dade County Appraisal Districts, the Florida Department of Revenue (FDOR) and a local MLS. All models include listing month/year dummy variables (not reported for brevity) to control for potential serial effects and all regressions include dummy variables for Census block group (not reported for brevity) to control for location. The estimates of the coefficients are presented in the table, with t-statistics reported using heteroskedasticity-robust Huebner/White standard errors. Statistics with significance at the 1% level are denoted with a ** and at the 5% level are denoted with a *.

Independent Variable	Model 1		Model 2		Model 3	
Constant	4.789**	93.96	4.788**	93.95	1.647**	49.66
Agent Purchase	0.001	0.09			0.003	1.17
Agent Purchase 1 or 2 properties			0.011	0.85		
Agent Purchase of 3 or more properties			-0.019	-1.04		
Owner Agent Sell	-0.015	-1.07	-0.015	-1.08	0.001	0.38
Size of house in 100's of square feet	0.008**	4.88	0.008**	4.88	0.001**	5.22
Size squared	-0.000	-0.31	-0.000	-0.31	-0.000	-0.71
Age of house in 10's of years	0.039**	3.70	0.039**	3.71	0.007**	3.66
Age squared	-0.001	-1.07	-0.001	-1.07	-0.000	-0.64
Lot Size feet in 1,000's of square feet	0.001	0.86	0.001	0.85	0.000	1.65
Percentage of Appraisal district value from land	-0.001	-1.20	-0.001	-1.20	-0.000	-1.29
Bedrooms	-0.007	-1.00	-0.007	-0.99	-0.002	-1.60
Bathrooms	0.017*	2.03	0.017*	2.03	0.004*	2.55
Stories	0.057**	4.60	0.057**	4.59	0.013**	5.27
Pool	-0.020*	-2.02	-0.020*	-2.02	-0.005*	-2.48
Fair quailty	-0.027	-0.52	-0.027	-0.52	0.001	0.09
Above Average quality	0.016	0.81	0.016	0.82	0.007	1.84
Excellent quality	0.009	0.30	0.009	0.31	0.009	1.69
Deeds executed by bankruptcy trustees	-0.149**	-5.19	-0.149**	-5.19	-0.033**	-5.31
Sale not exposed to the open-market	0.102	1.56	0.102	1.57	0.019	1.88
Forced sale or sale under duress	0.225**	4.91	0.225**	4.92	0.046**	6.85
REO sale	-0.391**	-39.21	-0.391**	-39.19	-0.077**	-39.24
Cash purchase	-0.117**	-13.39	-0.116**	-13.30	-0.012**	-7.23
Vacant	-0.093**	-9.84	-0.093**	-9.84	-0.020**	-10.64
List Agent Rookie	0.026	1.42	0.026	1.44	0.006	1.68
List Agent Experienced	-0.062**	-4.82	-0.062**	-4.82	-0.015**	-5.82

Table 5- Real Estate Agent Purchases - Days or time on the Market Models - continued

Independent Variable	Model 1		Model 2		Model 3	
Sale Agent Rookie	0.016	1.20	0.016	1.19	0.004	1.52
Sale Agent Experienced	0.058**	5.38	0.058**	5.38	0.016**	7.17
Short Sale	0.317**	36.86	0.317**	36.84	0.058**	35.24
Needs Work	0.012	0.78	0.012	0.79	0.001	0.23
Corporation Owned	0.055	1.91	0.055	1.92	0.006	1.16
Sold As-Is	-0.036**	-4.90	-0.036**	-4.89	-0.007**	-4.71
Institution Owned	-0.215**	-11.44	-0.216**	-11.44	-0.034**	-9.50
Upgraded	-0.043**	-2.87	-0.044**	-2.89	-0.008**	-2.72
Renovated	0.093**	7.47	0.092**	7.46	0.014**	5.78
Updated	-0.052**	-4.85	-0.052**	-4.85	-0.011**	-5.06
Good Condition	-0.020	-1.42	-0.020	-1.43	-0.005	-1.73
Nice Home	-0.005	-0.38	-0.005	-0.38	-0.003	-1.08
Beautiful, Wonderful, Gorgeous	-0.027**	-3.41	-0.027**	-3.41	-0.006**	-3.85
Remodeled	-0.064**	-5.35	-0.064**	-5.36	-0.011**	-4.55
Buyer Verify	0.107**	3.46	0.107**	3.45	0.028**	3.70
Bonsus	-0.015	-0.77	-0.015	-0.77	-0.005	-1.34
Motivated/Reduced	0.044**	3.39	0.044**	3.40	0.008**	3.10
Desirable Neighorhood	-0.004	-0.24	-0.004	-0.25	-0.000	-0.09
Great Location	-0.016	-1.73	-0.016	-1.74	-0.002	-0.97
Degree of Overpricing (DOP)	-0.001**	-4.45	-0.001**	-4.49	-0.000**	-4.39
Builder is owner per public remarks	-0.012	-0.59	-0.013	-0.61	-0.001	-0.23
Same listing and selling agent	-0.010	-1.08	-0.010	-1.08	0.003	1.88
List Year/Month fixed effects	Yes		Yes		Yes	
Location Census block group fixed effects	Yes		Yes		Yes	
Log likelihood					19,750	
Wald chi^2 (model)					70,000	
AIC					-36,975	
P					8.34	
Number of Observations	34,655		34,655		34,655	
R^2	0.328		0.328			

Table 6- Descriptive Statistics for variables added to Table 5 and coefficient estimates presented in Table 7 below

Additional Variables	Sample mean n=34,655	Numer of Observations
Owned by Agent and an Agent Purchased	0.009	321
Owned by Agent and a Non-Agent Purchased	0.069	2,375
List and Sale agents are different and an Agent Purchased	0.094	3,272
List and Sale agents are the same and an Agent Purchased	0.036	1,245
REAP_Subsequent Sale	0.008	276

Table 7 Real Estate Agent Purchases - Price & DOM Models

Fixed effects regression models based on the complete sample. Model 1 is a price model and Model 2 is a time on the market model. The variables in Table 6 above are substitued for Agent Purchase and Owner Agent Variables. All other variables are the same as in Table 4 and Table 5. The results for the other variables are essentially the same.

Independent Variable	Model 1, ln(Price)		Model 2, ln(Dom)	
Constant	11.420**	512.66	4.789**	93.97
Owned by Agent and an Agent Purchased	0.023	1.81	0.051	1.30
Owned by Agent and a Non-Agent Purchased	0.036**	8.20	-0.021	-1.44
List and Sale agents are different and an Agent Purchased	-0.035**	-8.43	0.001	0.08
List and Sale agents are the same and an Agent Purchased	-0.054**	-6.95	-0.021	-0.93
REAP_Subsequent Sale	0.039**	3.36	-0.071	-1.66
Sale Year/Month fixed effects	Yes		Yes	
Location Census block group fixed effects	Yes		Yes	
Number of Observations	34,655		34,655	
R2	0.938		0.328	

Table 8a- Sale Price Model, Comparison of two groups, One group includes properties owned by an agent and sold to an agent and the second group includes properties owned by an agent and sold to a non-agent.

Single Family fixed effects regression models based a sample that includes properties owned by an agent and sold to an agent compared to properties owned by an agent and sold to a non-agent. We include all variables in Table 4, except for Agent Purcahse and Owner Agent. The variable of interest is the dummy variable that indicates the group of properties owned by an agent and sold to an agent. Only the result for this variable is shown in the table below. The full tables are available upon request. Statistics with significance at the 1% level are denoted with a ** and at the 5% level are denoted with a *.

Independent Variable	Model 1	
Constant	11.465**	145.34
Group of properties owned by an agent and sold to an agent relative to group of properties owned by an agent and sold to a non-agent.	-0.077**	-4.98
Sale Year/Month fixed effects	Yes	
Location Census block group fixed effects	Yes	
Number of Observations	2,696	
R^2	0.967	

Table 8b- Sale Price Model, Comparison of two groups, One group includes properties owned by an agent and sold to an agent and the second group includes properties owned by a non-agent and sold to an agent.

Single Family fixed effects regression models based a sample that includes properties owned by an agent and sold to an agent compared to properties owned by a non-agent and sold to an agent. We include all variables in Table 4, except for Agent Purcahse and Owner Agent. The variable of interest is the dummy variable that indicates the group of properties owned by an agent and sold to an agent. Only the result for this variable is shown in the table below. The full tables are available upon request. Statistics with significance at the 1% level are denoted with a ** and at the 5% level are denoted with a *.

Independent Variable	Model 1	
Constant	11.381**	170.17
Group of properties owned by an agent and sold to an agent relative to group of properties owned by a non-agent and sold to an agent.	-0.001	-0.06
Sale Year/Month fixed effects	Yes	
Location Census block group fixed effects	Yes	
Number of Observations	4,517	
R^2	0.945	

Table 9- Sale Price Models with only properties Owned by and Agent or Purchased by an Agent

Single Family fixed effects regression model using a sample of all owner agent properties and all purchasing agent properties. We examine REAPs compared to owner agent properties with a seperate control for properties owned by an agent and purchased by an agent again compared to owner agent properties. The sample consists of 6,892 properties, with 2,375 agent owned properties and another 4,196 agent purchase properties. The remaining 321 properties are owned by an agent and purchased by an agent. All models include sale month/year dummy variables (not reported for brevity) to control for potential serial effects and all regressions include dummy variables for Census block group (not reported for brevity) to control for location. The estimates of the coefficients are presented in the table, with t-statistics reported using heteroskedasticity-robust Huebner/White standard errors. Statistics with significance at the 1% level are denoted with a ** and at the 5% level are denoted with a *.

Independent Variable	Model 1	
Constant	11.458**	223.92
Agent Purchase	-0.077**	-11.97
Owner Agent Sell & Agent Purchase	0.013	0.97
Size of house in 100's of square feet	0.042**	18.20
Size squared	-0.000**	-6.71
Age of house in 10's of years	-0.069**	-6.33
Age squared	0.003*	1.98
Lot Size feet in 1,000's of square feet	0.003**	3.58
Percentage of Appraisal district value from land	0.003**	4.81
Bedrooms	0.006	0.93
Bathrooms	0.011	1.53
Stories	0.017	1.64
Pool	0.084**	10.85
Fair quailty	-0.128	-1.91
Above Average quality	0.030	1.82
Excellent quality	0.101**	3.77
Deeds executed by bankruptcy trustees	-0.009	-0.32
Sale not exposed to the open-market	-0.144**	-3.54
Forced sale or sale under duress	-0.181**	-6.22
REO sale	-0.019*	-2.49
Cash purchase	-0.137**	-19.18
Vacant	-0.055**	-7.19
List Agent Rookie	-0.003	-0.20
List Agent Experienced	0.016	1.61

Table 9- Sale Price Models with only properties Owned by and Agent or Purchased by an Agent - continued

Independent Variable	Model 1-All Sales	
Sale Agent Rookie	0.001	0.11
Sale Agent Experienced	0.004	0.48
Short Sale	-0.014*	-2.02
Needs Work	-0.147**	-11.42
Corporation Owned	-0.010	-0.45
Sold As-Is	-0.013*	-2.22
Institution Owned	0.092**	5.32
Upgraded	0.050**	4.82
Renovated	0.050**	4.35
Updated	0.054**	6.39
Good Condition	0.034**	3.14
Nice Home	0.020*	2.07
Beautiful, Wonderful, Gorgeous	0.053**	8.87
Remodeled	0.083**	9.55
Buyer Verify	-0.060*	-2.05
Bonsus	0.035	1.79
Motivated/Reduced	-0.022*	-2.02
Desirable Neighorhood	0.013	1.04
Great Location	0.010	1.56
Days on the Market	-0.000**	-9.14
Builder is owner per public remarks	0.028	1.83
Same listing and selling agent	-0.043**	-6.19
Sale Year/Month fixed effects	Yes	
Location Census block group fixed effects	Yes	
Number of Observations	6,892	
R^2	0.947	