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Karl L. Guntermann
W.P. Carey School of Business, Arizona State

Alex R. Horenstein
ITAM School of Business, Instituto Tecnológico Autónomo de México

Crocker H. Liu Ph.D.
Cornell University, chl62@cornell.edu

Adam D. Nowak
W.P. Carey School of Business, Arizona State

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Abstract
The current study explores the investment performance of short-term investors known as flippers in the residential real estate market as well as the impact that flippers have on the housing market. The study finds that investors who buy and then subsequently resell properties within a short period of time tend to generate returns in excess of the market by purchasing properties at a discount from distressed sellers. Flippers purchase properties discounted an average of 7% in the market. This discount reflects the ability of flippers to identify underpriced properties which supports the information advantage story. When using all-cash purchases, the price is further discounted 12% and properties purchased at foreclosure are discounted an additional 20% for a total discount of 39%. These investors use debt financing to further magnify the return on their properties. Flippers also have the ability to sell properties at a 5% premium even after controlling for equity, search costs, and home improvements. However, the realized excess price appreciation is inversely related to an investor's time horizon with higher (lower) returns associated with shorter (longer) holding periods. As more flippers enter the housing market, the study finds that a higher number of foreclosures occur in neighborhoods that have a higher frequency of flipping activity. Further, following the collapse of the housing market, flippers purchased properties at foreclosure and flipped them at a significant profit. In summary, flippers manage to earn positive excess returns both in hot and cold housing markets.

Keywords
Cornell, flippers, real estate investments, short-term investments, foreclosures

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Karl L. Guntermann, Alex R. Horenstein, Crocker Liu and Adam D. Nowak*

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* W.P. Carey School of Business, Arizona State (karl.guntermann@asu.edu), ITAM School of Business, Instituto Tecnológico Autónomo de México (alex.horenstein@itam.mx), School of Hotel Administration, Cornell University (chl62@cornell.edu) and W.P. Carey School of Business, Arizona State (adnowak@asu.edu), respectively. Address correspondence to Adam Nowak, W.P. Carey School of Business, Arizona State University, 350 E. Lemon St., Tempe AZ 85287-3906. Phone: (219) 765-6019, Fax: (480) 965-8539, adnowak@asu.edu. We wish to thank the Center for Real Estate Theory and Practice at ASU for providing me with the necessary transaction data. We are grateful for very helpful comments from Kevin Donovan and Charles Trzcinka as well as comments from participants at the 2008 ASU brown bag seminar and the Office of the Comptroller of the Currency seminar. All errors are our own.

1 Introduction

While the housing literature recognizes that both consumption and investment motives drive the acquisition of owner-occupied housing[1] and the structure of consumer portfolios[2], little is known about owners often called "flippers" who neither consume housing benefits nor capture these benefits via renting the house to others. For these owners, profit is the only motive for buying and then quickly reselling a house. In contrast to investors who plan to rent the home in the short run and then sell the home once a certain level of price appreciation is attained, flippers are analogous to speculators who provide liquidity to the market through taking advantage of asymmetrical information and/or deviations from fundamentals.

The goal of this paper is to study the investment performance of flippers and their impact on the housing market. More specifically, we examine several factors which account for the large returns that flippers experience including i) purchasing properties at a discount, ii) selling properties at a premium, iii) the impact of property improvements, in addition to iv) the housing market return factor using a repeat sales paradigm. Since these strategies are available to all individuals, not just flippers, we also explore additional market frictions that can result in discounts or premiums but restrict individuals from becoming flippers. These frictions include sufficient equity capital, access to financing, ability to use sweat equity (able to refurbish houses themselves), possessing an information advantage as well as better aligning incentives with agents.

Using comprehensive house transaction level data from the Phoenix metropolitan area from 1988 through 2010, our analysis shows that flippers have a short term holding period with a 4 month median and flippers realize a median, annualized price appreciation on their properties

[1]See Ranney (1981), Schwab (1982), Henderson and Ioannides (1983), Poterba (1984), Wheaton (1985), and Bosch, Morris, and Wyatt (1986)

[2]See for example Brueckner (1997)

of 102%. Despite these large returns, only a small number of flippers are present in the Phoenix market. In fact, flippers make up less than 0.2% of all transactions. Although rising market prices do contribute to flipper profits, factors not related to market prices explain nearly twice the variation in property price appreciation. The profits that flippers realize are partly due to purchasing properties at a 7% discount in the market with an additional 12% discount obtained for all-cash purchases, and a further 20% discount achieved when properties are purchased at foreclosure. The study also finds that flippers use debt financing to further magnify the return on their properties. On average, flipper returns increase four and a half times when leverage is used; the median return for flippers who use leverage is 159% compared to a 36% return for all-cash purchases. The presence of the 7% discount, which arises after controlling for financing (12% discount) and foreclosures (20% discount), suggests that flippers are able to identify and purchase mispriced properties, further increasing returns. The residual flipper discount is evidence that flippers possess an ability to identify mispriced houses in the marketplace which supports the informational advantage story. After controlling for equity, search costs (mortgage payments) and property improvements, flippers are found to sell their properties at a premium. This premium is evidence that flippers are able to sell their properties at larger than expected prices, thereby increasing returns.

Further, this residual flipper premium is evidence that flippers receive larger sale prices through either a superior matching ability (possibly associated with the actions of real estate agents) or decreased frictions associated with the principal-agent problem. However, the realized excess profit is inversely related to an investor's time horizon; Higher (lower) returns are associated with shorter (longer) holding periods. As more flippers enter the housing market, the study finds that a higher number of foreclosures occur in neighborhoods that have a higher

frequency of flipping activity. Following the collapse of the housing market, flippers purchase properties at foreclosure and flip them at a significant profit. Consequently, flippers manage to realize profits in excess of the market regardless of market conditions (hot or cold).

The study proceeds as follows. Section 2 provides a literature review of the various components of housing returns and how these factors arise including those associated only with flippers due to market frictions. Section 3 presents a theoretical model using the models of Krainer (2001) and Krainer and LeRoy (2002) as our point of departure. This section also provides testable implications with a more detailed discussion of the first order conditions associated with our model found in Appendix A. A description of the data follows in Section 4 while Section 5 sketches out the methodology used to explore flipper activity in the housing market. Section 6 reports the empirical results including the relationship between flipper activity and foreclosures within subdivisions and flipper performance in hot and cold markets. Section 7 concludes.

2 Literature Review

Although real estate is idiosyncratic in nature, there are factors common to all properties which affect individual prices. Bailey, Mouth and Nourse (1963) and Case and Shiller (1989) describe house prices as a combination of a common market factor and an idiosyncratic term. Piazzesi and Schnieder (2009) develop a model where individual homeowners are able to trade on price momentum in the market. These studies thus suggest that it is possible flippers are able to generate profits due to the market momentum.

Case and Shiller (1989) use a repeat-sales regression (RSR) to estimate market prices for real estate. Any discount or premium to the expected market price is captured by the error term in the RSR. It is possible flippers generate returns by purchasing their properties at a discount. A

number of studies have documented a discount for properties purchased at foreclosure; in these studies the discount attributed to foreclosure is around 20%.[3] In addition, the choice of financing used to purchase the house can also affect the sale price. Asabere, Huffman and Mehdian (1992) and Forgery, Rutherford and VanBuskirk (1994) document houses purchased without financing sell at a 13.4% and 14% discount respectively. Recently, *The Wall Street Journal* on February 8, 2011 also reported on the use of all-cash financing by buyers to generate discounts for distressed properties. Despite these discounts, foreclosure sales and all-cash purchases are discounts common to all individuals; it is not related to any ability to identify mispricing that only flippers might possess.

Flippers can also generate returns by selling properties at a premium. Previous studies have documented the relation between a homeowner's equity in his current house and the required down payment for the purchase of his next house. Stein (1995) develops a model where individuals choose listing prices based on the equity in their house. Larger listing prices are associated with a lower probability of sale. Individuals who require sale proceeds for a down payment on their next house will choose lower listing prices in order to capture the surplus from moving. Genesove and Mayer (1997) also document a positive relationship between selling price and the loan-to-value ratio (LTV).

A number of search models have been developed in which sellers search for buyers. These studies demonstrate how increasing search costs can lead to shorter search horizons and smaller prices.[4] If flippers are able to secure loans with lower mortgage payments (or no mortgage payments at all) they will have reduced search costs and will thus be able to sell their

[3] See Clauretie and Daneshvary (2009), Forger, Rutherford and VanBuskirt (1994), Springer (1996), Carroll, Clauretie and Neill (1997) and Pennington-Cross (2006).

[4] See Turnbull, Sirmans (1993), Krainer and LeRoy (2000), Krainer (2002), Lambson, McQueen, Slade (2004), Clauretie, Thistle (2007), Ihlanfeldt, Mayock (2010)

properties for larger prices. These sources of premiums discussed above are common to all individuals in the real estate market. Both flippers and non-flippers can have large equity stakes in their houses which will allow them to fish for larger prices.

Additionally, it might be the case that the presence of a premium is not indicative of any characteristics of flippers, but instead related to changes in the property itself. Case and Quigley (1991) discuss the impact that property improvements can have on a repeat-sales index. Peek and Wilcox (1991) account for changes in house quality in order to estimate a constant-quality house price index. It is commonly believed that flippers make property improvements after purchasing a property either through sweat equity[5] or professional means. If this is the case, properties which have been improved will be associated with increased prices. Once again, all individuals, not just flippers, are allowed to make property improvements which can increase the value of these properties.

Some factors which can produce discounts or premiums in the market can also preclude individuals from becoming flippers. Down payments on houses can vary from 5% to 20% of the sale price. On a $200,000 house, this translates into a $10,000 to $80,000 down payment. This large initial investment can prevent individuals without adequate capital from flipping houses. Even if individuals are able to provide the initial investment but do require some financing, they will be forced to make mortgage payments until the property is sold. Therefore, the total amount required for investment includes the down payment in addition to the present value of the mortgage payments. Besides this, flippers might possess an informational advantage which allows them to identify mispriced houses. Grossman and Stiglitz (1980) state investors will

[5]Sweat equity refers to homeowners who make value-added improvements to their home using their own efforts or "sweat".

purchase information when it is optimal to do so; Kyle (1985) demonstrates how individuals with superior information can capture profits in the market.

In addition to factors unique to flippers which allow them to purchase properties at a discount, there are certain features in the real estate market which might provide flippers with an advantage when selling their property. Anglin and Arnott (1991) describe the principal-agent problem inherent in the real estate brokerage market. Levill and Syverson (2008) find houses sold by real estate agents sell at a 3.7% premium. If flippers are able to perfectly align the incentive of their real estate agent, or if they are real estate agents themselves, they will shift the equilibrium from an incentive-compatible equilibrium to a first-best equilibrium and capture some or all of the social surplus.

In summary, the previous literature suggests that the observed returns that flippers realize could arise as the result of i) overall market momentum, ii) purchasing the property at a discount as the result of foreclosure or all-cash financing, iii) selling the property at a premium, and iv) property improvements that flippers make to the property. However, frictions can also exist which might not only limit the number of flippers in a given market but could also account for a portion of the returns that flippers realize. These barriers to entry include capital constraints, the costs of agency, holding, and search and an information advantage among others.

3 Theory and Testable Implications

Individuals selling their property face a tradeoff between the selling price and the probability of selling. The larger the listing price, the longer the expected time until sale. The risk-neutral seller must choose a sale price to maximize the present value of his house. Formally,

$$V(C) = \max_{\{P\}} \{\pi(P)P + \beta(1- \pi(P))(V(C) - C)\} \quad (1)$$

Here, V is the value of having the house on the market, P is the listing price, $\pi(P)$ is the probability of sale as a function of P, β is the time discount factor and C is an individual-specific per-period holding cost of not selling the property. Individuals who are forced to move into a new house because of personal, medical, occupational or other reasons must still make mortgage payments on the previous house until it is sold. The variable C is designed to capture these costs.

The probability of sale is determined from the buyer's search problem. As in Krainer (2001) and Krainer & LeRoy (2002), the buyer visits one house per period. After visiting this house, the buyer sees the per-period flow of services that will be received in perpetuity and decides whether or not to purchase at the listed price, P. This flow of services is distributed uniformly over the unit interval and captures the idiosyncratic valuation of residential real estate. For a given flow of services, ε, the value to the buyer of purchasing the house at price P is

$$W(\varepsilon) = \varepsilon/(1-\beta) - P \tag{2}$$

The buyer will purchase the property if $W(\varepsilon)$ is positive. For a given price, P, the probability the buyer will purchase the property is then

$$\pi(P) = 1-P(1-\beta) \tag{3}$$

The seller evaluates his probability of sale from this relationship. The probability of sale is affine and decreasing in P.

The seller will solve equation (1) for the optimal choice of P, P*, taking (3) as given. In the appendix, it is shown that P* is a decreasing function of C. From the first order conditions, one can show that P* is a decreasing, linear function of C. Further, the probability of sale, $\pi(P^*)$, is increasing in P*. Sellers facing increasing holding costs will reduce their listing price which

will increase the probability of sale. This lowered listing price provides an opportunity for flippers to purchase the property at a discount from the sellers who have large holding costs.

Flippers do not receive any flow of services from owning the property. Once they purchase a property, flippers begin acting as sellers and solve the seller problem in (1). Flippers are assumed to have no holding costs associated with the property, C=0. In this setup, flippers will purchase the property if

$$\beta V(0) - P > 0 \tag{4}$$

The appendix shows there exists a cutoff holding cost, C_L, with associated optimal price, $P^*(C_L)$, such that $\beta V(0)=P^*(C_L)$. Flippers who see a listing price of $P^*(C_L)$ in the market will purchase the property with positive expected profits. However, non-flippers who view the house and do not perceive a large flow of services from the property will not purchase the property, even at $P^*(C_L)$. The large holding costs and the resulting low listing price create flipper discounts in the market.

Figure I displays the optimal price and probability of sale for various holding costs. The optimal price declines as the holding costs increase. The probability of sale also increases as the holding cost increases. Figure II displays the discount for homeowners facing various holding costs. Figure II also displays the expected time-on-market for various holding costs. The time-on-market decreases sharply before leveling off for larger holding costs. Individuals who face larger holding costs will list their houses at reduced prices. If flippers know the true market value of houses in the absence of holding costs, they can identify and purchase houses at a discount.

Flippers can also earn excess profits in the market by selling at a premium to market prices. Previous research has discussed the principal agent problem which arises when real

estate agents enter into the selling process. If flippers are able to provide incentives for real estate agents to steer clients towards their properties, they will be able to mitigate the agency costs. In this setting, real estate agents who steer clients towards flipper properties will have a greater probability of matching. This greater probability of matching is represented in the model by placing a lower bound on the flow of services received.[6] The appendix shows P* is increasing in the lower bound for ε.

Figure III displays the optimal price and probability of sale for various lower bounds. The optimal price increases as the lower bound increases. The probability of sale also increases as the lower bound increases. With improved search technology, homeowners will not only sell their properties for larger prices but also sell their properties in a shorter amount of time.

Figure IV displays the premium and time-on-market for homeowners with improved search technology. When individuals have improved search technology, they will receive a premium on the properties they sell. However, equation (2) shows there is an upper bound on the price homeowners can charge for the property. Because of this, the premium, as a percentage of the zero lower bound case, is also bounded from above.

The maximum premium a flipper can obtain is less than 5% while flippers can purchase at a 6% discount with small holding costs. Although the premium is bounded, as Figures III and IV show, the probability of sale increases dramatically and the expected time on market decreases as the lower bound on the flow of services increases. With a lowered expected time on market, flippers who are financially constrained and require the sale proceeds for future down

[6] Alternatively, real estate agents could show the house to N>1 potential buyers per period. In this case, the probability of sale would be $\Pr(\max\{\varepsilon 1,\ldots,\varepsilon N\}<P(1-\beta))$. However, this is analogous to specifying an alternative distribution for the single buyer's flow of services where the probability of being matched is greater than when only a single buyer views the property with flow of services drawn from the unit interval.

payments will be able to flip more properties over a given amount of time. This becomes important with substantial all-cash discounts.

The above results imply flippers will purchase properties at a discount in the market. This discount is a result of the seller's holding costs for the property; these holding costs are not directly observed by flippers, but flippers are able to observe discounted prices as a result of these holding costs. Further, the price flippers pay (discount) is expected to decrease (increase) as the seller's holding costs increase. When flippers have improved search technology, they are also expected to sell properties at a premium. The excess returns flippers earn are expected to increase and the selling time is expected to decrease with this improved search technology.

4 Data Description

The data comes from the Maricopa County assessor's office and includes transaction information on single-family houses sold in the Phoenix metro area. There are over 1.8 million observations associated with real estate transactions between 1988 and 2010. Each observation includes the transaction date, sale price, down payment, buyer and seller names, and geographic location of the property in addition to other information on property attributes and financing.

For some observations, information fields are either partially missing or incorrectly entered. To remove erroneous information, the data is screened with both data errors and econometrically leveraged observations - outliers[7] - removed. Observations are econometrically leveraged if they have an abnormally large or small sale price, down payment or price appreciation which can influence regression results; it can be the case these econometrically

[7] Outliers are properties with any sale above $10,000,000 and below $10,000. Further, properties with annualized price appreciation more than 500% and less than -75% are removed. Also, transactions where the down payment is more than the sale price are removed.

leveraged observations are data entry errors. First, observations missing any or all information on transaction date, sale price, down payment, buyer and seller name, buyer and seller code or location are deleted. Note, because a RSR is employed, sale pairs must be formed taking into account deleted transactions. After deleting problematic observations, the 1.5 million observations which remain represent the cleaned data set.

After cleaning the data, the next step is to identify flippers in the data. ***Flip sales*** are defined as those sales in which a house is purchased by someone other than a bank, developer or government agency and subsequently sold within twelve months of purchase.[8] There are 30,328 identified flip sales in the cleaned data set. These flip sales are used to identify flippers using the 'seller name' field in the database. However, not all trades within twelve months are made by flippers; some of these sales represent homeowners whose original intention was not to make a quick sale. These individuals are ex-post flippers in contrast to ex-ante flippers who intend to make a quick sale at the time of purchase; therefore, it is necessary to identify ex-ante flippers using additional information. Seller names are used to aggregate the total number of sales by name. Using information gathered from seller names, flippers are identified using two criteria: 1) flippers must have executed 2 or more flip sales, and 2) more than 51% of total properties that a flipper purchases – total sales regardless of the eventual holding period – must be flip sales. There are 921 flippers identified using the abovementioned identification process. These flippers purchased and then resold 3,459 houses.

Table I contains information on sale pairs; each sale pair is indexed by a first and second sale. The sale pairs are divided into categories where the purchaser in the second sale is a flipper (Non-Flipper to Flipper), the seller in the first sale is a flipper (Flipper to Non-Flipper), the seller

[8] Flip sales are defined by the holding period regardless of the individual selling the property. Because of this, flippers can execute both flip sales and non-flip sales, and non-flippers can execute both flip sales and non-flip sales.

in the first sale purchased the property from a flipper (Following Purchase from Flipper) as well as all other sale pairs.

This table shows 40.5% of all properties purchased by flippers are all-cash purchases and 30.0% of the properties are purchased at foreclosure. Also, individuals who sell to flippers have -12.3% in excess returns while flippers sell their properties with 14.4% in excess returns[9]. These statistics and previous results in the literature suggest both all-cash and foreclosure purchases can produce positive excess returns. In addition to excess returns, Table I shows the median annualized, predicted price appreciation was 27.4%, which is larger than the 6.4% in the typical sale-pair. Thus, flippers also sold their houses during periods when the market was rising the fastest. In absolute terms, 90% of all properties sold by flippers had positive price appreciation with a median change in value of $37,708 over 4 months.

Since flippers might make property improvements while they own the property, building permit data for property improvements is collected for the cities of Phoenix and Scottsdale to explicitly control for these improvements. A summary of the permit data is displayed in Table II and Table III. The cities of Phoenix and Scottsdale are the only two cities with readily accessible building permit information. There are 10,083 total building permits which are matched to properties from the assessor's office data. Of these, 66 permits are for properties that flippers purchased.

In addition to transaction information, the data from the assessor's office also contains information on foreclosures. There are 181,551 recorded foreclosures between 1988 and 2010. These foreclosures are concentrated in the latter part of the sample with 21,180 foreclosures

[9] Excess returns are in excess of the return on the repeat-sales index computed for the Phoenix metro area.

alone in the year 2008. These foreclosure sales represent 35% of the total number of sales during 2010.

5 Methodology

To determine the factors which influence discounts and premiums in the marketplace, a RSR is employed. In the RSR, the *seller* buys the property at time t and sells the property to the *buyer* at time t+Δ. The following model for the change in the log price of sale pair j is used

$$P_{jt+\Delta} - P_{jt} = \alpha + M_{jt+\Delta} - M_{jt} + X_j\beta + e_j \quad (5)$$

The model is similar in spirit to the Capital Asset Pricing (CAPM) model used to calculate Jensen's alpha where alpha (the intercept term) in the current case is the estimated price appreciation in excess of the growth rate for prices in the overall housing market which we hereinafter refer to as excess price appreciation (EPA). Given the large number of observations, the model is estimated using least squares, and standard errors are computed using the asymptotic methods in White (1980).

The value $M_{jt+\Delta} - M_{jt}$ corresponds to the changes in the single-family house price index measured on a monthly basis. These index values are estimated using a similar repeat sale procedure to that in Case and Shiller (1989). In this setup, the difference in index values is analogous to a multi-period market return in the capital asset pricing model. However, market returns are not observable and must be estimated. Estimating equation (1) requires estimating the house price index - under the assumption of a unit loading on the market return - and other coefficients simultaneously.

Returns come from both market returns, $M_{jt+\Delta} - M_{jt}$, as well as factors specific to the parties involved in the transaction. The vector X contains dummy variables with information on the parties involved and the nature of the transaction. Because the flippers are identified using

the holding period, it is necessary to control for holding period in the estimation process. Not controlling for holding period could mistakenly associate the returns determined by holding period with the returns to flippers. The variables *One Year, Two Years, Three Years, Four Years* and *Five Years* are determined by the holding period of all non-flippers. The variable *One Year* is equal to zero if the buyer is selling the property within one year of purchase. The other variables are defined in a similar manner. With these holding period variables, the estimated index values are index values conditional on holding period.

To control for financing, an *All Cash* dummy variable is included which controls for all-cash purchases. If the seller purchased the property with all cash and the buyer did not, *All Cash* is equal to -1. If the buyer purchased the property with all cash and the seller did not, *All Cash* is equal to 1. If both parties purchased the property with all cash, *All Cash* is equal to zero.[10] The coefficient on *All Cash* is expected to be negative.

Foreclosure effects can also influence prices. Because of this, three dummy variables are included which control for foreclosures: *Foreclosure, Foreclosure5* and *Foreclosure15*. The value of *Foreclosure* is computed in the same manner as the variable *All Cash*. The variable *Foreclsoure5* (*Foreclosure15*) is equal to one if the age of the house at the time of the second sale in the sale-pair is between 5 years and 15 years (more than 15 years) and zero otherwise. *Foreclosure5* and *Foreclosure15* are included to control for property deterioration associated with older properties. Clauretie and Daneshvary (2009) find the condition of properties worsens and the discount associated with foreclosure increases as the age of the property increases. They also find that when property condition is not taken into account, the estimated coefficient on foreclosure is one third larger. Since both all-cash purchases and sales at foreclosure have been

[10] Including the initial LTV did not change the estimation results.

found to lower the sale price in the prior literature, the signs on all of these coefficients are expected to be negative.

To test for any discount that flippers receive when purchasing a property, the variable *Flipper Discount* is included. This variable is equal to one if the buyer is a flipper and the seller is a non-flipper and is equal to zero otherwise. The *Flipper Discount* coefficient measures any discount that flippers receive after controlling for financing and foreclosure sales. To test the holding cost theory, the variables *Flipper Discount90* and *Flipper Discount95* are included. The variable *Flipper Discount90* (*Flipper Discount95*) is equal to one if the original LTV the seller used to purchase the house is between 0.90 and 0.95 (more than 0.95) and zero otherwise. *Flipper Discount90* and *Flipper Discount95* measure the additional discount flippers receive from sellers who are increasingly distressed. Under the null hypothesis that flippers purchase properties from distressed sellers, and that this discount increases the more distressed the seller is, the coefficients on *Flipper Discount, Flipper Discount90* and *Flipper Discount95* are expected to be negative.

The variable *Flipper Sale* is included to control for properties sold by flippers. This variable is equal to one if a flipper is selling the property to a non-flipper and is equal to zero otherwise. Also, the variables *Flip Sale6* and *Flip Sale12* are included. The variable *Flip Sale6* (*Flip Sale12*) is equal to one if a flipper is selling the property to a non-flipper within 6 months of purchase (between 6 and 12 months of purchase) and is equal to zero otherwise. It is not necessary that the identified flippers are pure flippers who purchase all properties intending to sell them quickly. The variables *Flip Sale6* and *Flip Sale12* are intended to capture the EPA for those properties which flippers purchase and sell in a relatively short amount of time (this EPA is in addition to the one year EPA captured by *One Year*). As shown above, with superior search

technology larger premiums are negatively correlated with the holding period. Under the null hypothesis that flippers have a superior search technology, the coefficients on *Flip Sale6* and *Flip Sale12* are expected to be positive.

To test for any premium above market value that flippers receive requires looking at properties which are purchased from flippers and then resold. If flippers sell the property above the predicted market price, then the individuals who purchase the property will sell their property at a discount upon resale; alternatively, the individuals who purchase this property on resale will receive a discount. The variable *Flipper Premium* is included to test for any premium flippers charge when selling their properties. This variable is equal to one if the seller had previously purchased the property from a flipper. Under the null hypothesis that flippers charge a premium, the coefficient on *Flipper Premium* is expected to be negative.

It may be the case flippers purchase a property, make improvements to the property and then sell the property. The sale price would reflect these improvements; any estimated premium would capture the effects of the property improvements. Building permit information is used to control for the change in property value. The variable *Remodel* includes the log of the stated change in property value as reported on the building permit. The coefficient for *Remodel* is expected to be positive and close to unity.

6 Results

The estimation results from equation (5) are displayed in Table IV. In addition to the coefficient estimates, the associated percentage price increases are reported as in Halvorsen and Palmquist (1980). The coefficients on *One Year* and *Two Years* are both positive and significant at the 1% level. All properties sold within one year of purchase have an excess price

appreciation[11] (EPA) of 6.88%, and those properties sold between one and two years after purchase have an EPA of 1.74%. The remaining EPA for holding periods less than 5 years is not statistically significant. Previous studies have documented both positive and negative relationships between the property's time on market and the eventual selling price[12], but our results show a definitive negative relation between homeowner holding period and sale price for the first two years of homeownership.

Two possible explanations are offered for the EPA for non-flippers with one to two year holding periods. The first explanation is related to the identification procedure used in the paper for flippers. Individuals who flip only one property cannot be identified as flippers using the procedure above. The coefficients on *One Year* and *Two Years* can be interpreted as the EPA for properties flipped by individuals who subsequently decide not to flip anymore. These individuals stop because of reasons related to profits, expected profits or other reasons. The positive coefficient on *One Year* suggests that those individuals who no longer continue to flip still earn positive EPA; however, the EPA captured by *One Year* and *Two Years* are less than the EPA for identified flippers.

In addition to a robust measure of flipper EPA, the coefficients on *One Year* and *Two Years* can be associated with individuals who receive a flow of services from a house they purchase, and who also fish for potential buyers in the market. Stein (1995) discusses how individuals with large loan balances will fish for large prices to capture benefits associated with moving.

[11] As previously stated, the excess price appreciation is the price appreciation in excess of the growth rate for prices in the overall housing market.

[12] Clauretie & Thistle (2009) contains a summary of previous results in the literature.

The coefficient estimates for all-cash and foreclosure purchases are also reported in Table IV. All-cash purchases will receive a discount of 12.14%. This discount is similar to the 13.4% reported in previous studies. Flippers use all-cash financing 40% of the time in the data. These all-cash purchases lower the price paid by flippers which provides them with a source of excess profit.

The results further show that foreclosure purchases provide an additional source of excess return. Properties purchased at foreclosure which are less than 5 years old will sell for a 20% discount. The estimates for *Foreclosure5* and *Foreclosure15* indicate the foreclosure discount increases with the underlying property's age; the foreclosure discount for older properties is large at 13.31%. When the property's age acts as a proxy for property condition, the results are consistent with Clauretie and Daneshvary (2009). The additional discount for older properties in foreclosure is attributed to a deteriorated property condition; the 20% discount for newer foreclosed properties should be interpreted as the discount for properties in good condition which are sold at foreclosure. Of the 618 foreclosure purchases by flippers, 93 properties are less than 5 years old and 406 properties are more than 15 years old.

After controlling for all-cash and foreclosure factors, the coefficient on *Flipper Discount* indicates that flippers still purchase properties at a 7.71% discount. The magnitude of the unconditional discount for flippers is slightly less than the all-cash discount. This discount is evidence that flippers are able to identify underpriced properties in the market. Although all-cash purchases and foreclosure purchases can augment excess price appreciation for flippers, it is not necessary flippers use these methods to produce EPA. However, the results in Table IV indicate that the discount flippers receive increase when the individuals selling to flippers purchase their properties with larger LTV ratios. Individuals who purchase their house with a

LTV greater than 0.95 sell to flippers at a 8.83% discount which is in addition to the unconditional 7.72% discount. Further, this EPA for flippers selling within one year is in addition to the 6.88% premium for all houses sold within one year after purchase.

There is evidence that properties sold by flippers have positive EPA. Table IV shows that the unconditional EPA for flippers is insignificant at the 10% confidence level. However, the EPA for flippers who sell their properties in less than 6 months is 16.03%. The excess price appreciation is 10.45% for properties that flippers sold between 6 months and 12 months after purchase. From the theory above, the larger EPA associated with shorter holding period can be associated with improved search technology.

Table IV presents additional evidence that individuals who purchase properties from flippers will subsequently sell these properties at prices below market value. The coefficient on *Flipper Premium* is -4.86%. This value indicates individuals who purchase properties from flippers will then experience a 4.86% discount when selling the property. This discount can be significant when the purchaser uses a large LTV ratio. The next section discusses the impact this can have on foreclosures.

It is conceivable that flippers make significant improvements to the properties they purchase. To control for this, building permit information is obtained for the cities of Scottsdale and Phoenix. This permit data contains information on the assessed increase in property value from the county assessor as the result of these improvements. The assessed increase in property value is added to the vector X in equation (5). With this information, equation (5) is estimated using only sale-pairs from the cities of Scottsdale and Phoenix. The estimation results are reported in Table V. The *Remodel* coefficient is positive but not close to unity. Furthermore, the signs on all of the other coefficients are the same as the signs on the coefficients in Table IV.

This supports the hypothesis that flipper profits remain after controlling for property improvements.

The results in Tables IV and V display the returns in the absence of transaction costs. However, individuals who purchase and sell properties must pay a real estate agent commission. Commissions are paid to the real estate agent and can range from 4% to 6%; with the buyer and seller often splitting the commission. The results in Table IV indicate flippers selling within one year continue to have a positive EPA when subtracting 6% for the real estate agent commission. Further, the data in Table I show the median profits for flippers are $34,445 after subtracting a 6% real estate commission.

Foreclosures and Flipping

This section documents that a positive relationship exists between flipper activity and foreclosures within subdivisions. Using subdivisions as a geographic identifier is more precise than using zip codes. Dispersion in homeowner attributes including income, wealth and preferences can be large within zip codes but is much smaller at the subdivision level. Further, the attributes of houses are typically more homogeneous within a subdivision in general.

The preceding analysis evidences that properties purchased from flippers are bought at a premium to the market value. This premium reduces the equity individuals believe they have in their houses. The initial equity an individual has in a house purchased for price P is equal to (1-LTV)P. If the homeowner sells his house immediately, P would decline by 4.86% but the loan balance would not. Therefore the actual equity is (0.9514 – LTV)P. The equity is therefore reduced; if the LTV is more than 0.9514, the homeowner will have negative equity. To the extent foreclosure is related to negative equity, there will be a positive relationship between foreclosures and flipping activity.

The data used includes observations on subdivisions including the number of houses, housing turnover and flipper sales within subdivisions between 2004 and 2009. The observation units are subdivisions. Due to a lack of trading activity, subdivisions with less than ten houses are excluded. This results in 11,939 subdivisions remaining with a total of 738,314 houses. There are a total of 3,056 flipper purchases within these subdivisions over the time period. A total of 70,155 foreclosures are recorded in these subdivisions. The sales are divided into two time periods: before 2006 and after 2006. These correspond approximately to time periods prior to and subsequent to the peak of the housing bubble.

The first way to model the relationship between the number of foreclosures per subdivision and flipper activity per subdivision is with a Poisson distribution. The Poisson distribution has previously been used to model foreclosures and defaults (see for example Ambrose, Capone and Deng (2001) and Longstaff, Mithal and Neis (2006)). Specifically, the density function for the number of foreclosures in subdivision *i*, y_i, is given by

$$P\left(Y_i = y_i \middle| x_i\right) = \frac{e^{-\lambda_i}\lambda_i^{y_t}}{y_i!} \tag{6}$$

The variable λ_i is defined as

$$\ln \lambda_i = x_i' \beta \tag{7}$$

The vector x_i contains a constant and covariates. These covariates include the number of houses in subdivision *i*, the number of houses in subdivision *i* squared, the turnover[13] of housing in subdivision *i*, the number sales by flippers in subdivision *i* and the median home price in subdivision *i* between 2004 and 2006. The parameter vector β, particularly the coefficient for

[13] Turnover is defined as the total number of sales in subdivision *i* between 2004 and 2006 divided by the total number of houses in subdivision *i*.

flipper sales, is of interest. A positive value on the coefficient for flipper sales indicates a positive co-movement between the number of flipper sales and the expected number of foreclosures.

The estimated coefficients for equation (6) are listed in the 'Poisson' column of Table VI. The values for the coefficients represent the expected percent change in the number of foreclosures for a one unit increase in the variable. Each additional flipper transaction increases the expected number of foreclosures by 14.5%. The median number of expected foreclosures from the Poisson model is 3.094. At this level, the marginal increase in expected foreclosures from an additional flipper sale is 0.45.

A second method to model the number of foreclosures is to use the negative binomial model of Cameron and Trivedi (1986). In the data, there are a large number of subdivisions with zero foreclosures; in general, the Poisson distribution does not support a large probability of zero foreclosures. The negative binomial distribution uses two parameters for the mean and variance of the distribution which can allow for a large number of zero observations; the standard Poisson distribution requires that the mean and variance are identical. The conditional mean for each observation is modeled using

$$\ln\left(\lambda_i\right) = x_i'\beta + \ln\left(u_i\right) + \varepsilon_i \qquad (8)$$

The variable $\ln(u_i)$ is a subdivision specific effect which shifts the conditional mean of the subdivision. This individual effect allows for differences in the mean and variance of the distribution providing for a larger percentage of zero observations.

The impact of flipper activity on the number of foreclosures using the negative binomial distribution is similar to their impact when the Poisson distribution is used. The estimated coefficients in (8) are listed in the 'Negative Binomial' column of Table VI. Each additional

flipper purchase increases the expected number of foreclosures by 18.1%. The median number of expected foreclosures from the negative binomial model is 2.83. Using this number of expected foreclosures, the expected increase from one more flipper purchase is 0.51.

A final way to model the relationship between the number of foreclosures per subdivision and the number of flipped houses in a subdivision is to use a zero-inflated Poisson distribution as described in Lambert (1992). The zero-inflated Poisson distribution differs from the typical Poisson distribution in that there is a certain probability ψ that the number of foreclosures will be zero with certainty; with probability 1-ψ, the number of foreclosures is drawn from a Poisson distribution. Specifically, the Poisson distribution has density

$$P\left(Y_i = y_i \middle| x_i\right) = \frac{e^{-\lambda_i} \lambda_i^{y_i}}{y_i!} \tag{9}$$

Here y_i is the number of foreclosures in subdivision i. The variable λ_i is defined as

$$\ln \lambda_i = x_i' \beta \tag{10}$$

As previously mentioned, the probability of a subdivision having zero foreclosures with certainty is equal to ψ. The probability ψ is modeled using the following logit function.

$$\psi = \frac{\exp\left(x_i' \beta\right)}{1 + \exp\left(x_i' \beta\right)} \tag{11}$$

The variables in x_i are the same as above. Here, the logit model predicts the probability of a neighborhood having zero foreclosures with certainty given the covariates. One can classify a neighborhood into two groups: prone to foreclosures and the type not prone to foreclosures. The probability of a neighborhood not prone to foreclosures is ψ. Neighborhoods have no foreclosures if they are more stable; the variables in x_i provide a measure of this stability.

The parameters in (9) and (10) are estimated using maximum-likelihood methods. The estimated coefficients are reported in the column labeled 'Zero-Inflated Poisson' in Table VI. The estimation results indicate the number of flipper sales is positively related to the number of foreclosures in a particular neighborhood. The increase in the expected number of foreclosures is related to the expected number of foreclosures in neighborhood *i* multiplied by the parameter of interest. Each additional flipper sale increases the expected number of foreclosures by 13.4%. The median expected number of foreclosures for all neighborhoods is 3.12 foreclosures per neighborhood. At this median number of foreclosures, the change in the expected number of foreclosures given one additional flipped house is 0.41.

The parameters for the logit model provide additional information on the relationship between flip sales and foreclosures. The estimated coefficients for equation (9) are reported in the 'logit' column in Table VI. The estimated coefficients indicate that each additional flipper sale decreases the probability of being a neighborhood not prone to foreclosures by a factor of 0.6[14]. Therefore, the probability of a subdivision having more than one foreclosure increases greatly when there is flipper activity in the subdivision.

Price Appreciation and Return on Equity

Flippers purchase houses for financial gain. Price appreciation represents one way to measure this gain. A house price index is designed to track the price appreciation for generic properties by the purchase and sale dates. An alternative measure of financial gain is the return on equity (ROE). The amount of initial equity a homeowner has in his house is the initial down payment plus closing costs. If flippers work with a real estate agent, a 4-6% commission will be paid. The ROE is equal to the net income from the investment in the property divided by the

[14] Exp(-0.9242) = 0.6031

initial equity position in the investment. For a house purchased at time 1 for price P^1 and sold at time 2 for price P^2, the ROE is calculated as

$$ROE = \frac{P^2 - P^1 - \left(P^1 - DP\right)r}{DP} \tag{12}$$

Here, DP is the down payment, or equity, in the investment and r is the interest rate on the mortgage. Equation (12) can also be written in term of price appreciation (PA) and the loan-to-value ratio (LTV)

$$ROE = \frac{PA}{1 - LTV} - \frac{LTV}{1 - LTV}r \tag{13}$$

From equation (13), it is clear that the amount of leverage used can have a significant impact on the ROE. When there is no borrowing (all-cash), the LTV is equal to zero, and the ROE will equal the price appreciation; in the absence of borrowing, the term including r in equation (13) disappears because there are no mortgage payments. Because the gain from price appreciation is based on the original price of the house and not the original amount of equity, the ROE remains positive when the price appreciation is equal to the mortgage rate. Consequently, flippers who use all-cash purchases receive price discounts which can increase the expected price appreciation. However, the use of all-cash purchases eliminates any leverage effect in the ROE.

Table VII shows the median gross price appreciation for flippers is 35.38%. Assuming an interest rate of 6%, the median ROE for flippers is 36.65%. The all-cash discount present in the market suggests there is a tradeoff between leverage and price appreciation; flippers will decrease leverage if they are able to purchase at a discount and increase expected price appreciation. Table VII also shows price appreciation tends to decrease as the amount of leverage increases. However, the ROE for flippers increases as the leverage increases. Thus,

from a ROE perspective, the use of leverage increases ROE more than any discount from all-cash purchases.

However, flippers using mortgage financing are subject to certain frictions. Flippers who require financing will only be able to flip properties if they can secure financing. Lender approval can delay or even negate the transaction. Because of this, flippers who use all-cash financing will be able to more quickly purchase all properties they identify as sufficiently discounted. Therefore, the above results for flippers who use financing are conditional on financing approval.

Flipper Performance in Hot and Cold Markets

Flippers purchased the majority of their houses prior to 2006. Table VIII shows the total number of flipper purchases by year. The years before 2006 mark a period of rising house prices. During this time period, flippers earned their lowest excess returns. To estimate excess returns, equation (1) is re-estimated with the dummy variables in X as well as additional dummy variables controlling for the year that flippers purchased the property. The estimation results for the year of purchase coefficients are reported in Table IX. The results in Table IX reveal that during the years 2003 to 2005, the unconditional EPA for flippers was either negative or not statistically different form zero. Further, Table VIII shows that flippers did not purchase a large number of foreclosures during this period.

Following the peak of the housing market in 2006, flippers temporarily reduced their purchases. With the collapse of the housing market in 2007 and continuing into 2008, flippers were still able to identify mispriced houses. The Case-Shiller house price index for Phoenix decreased 18% between January 2007 and January 2008 and further declined 35% between

January 2008 and January 2009. However, Table VIII shows the median price appreciation for flippers was positive during these time periods. Table IX shows that flippers who bought properties realized excess returns of 15%, 21% and 16% when purchasing in 2007, 2008 and 2009 respectively.

Table VIII also shows that starting in 2007 and continuing through 2009, flippers began to increase their purchases of properties at foreclosure. Table IX shows flippers purchasing properties and reselling them within one year had excess returns of 15%, 21% and 17% in 2007, 2008 and 2009 respectively. With the housing market crash in 2007, flippers remained in the market but switched their trading strategy. Flippers increased their purchases of foreclosed properties making significant returns on these purchases. Tables VIII and IX reveal that flippers were able to earn positive returns in excess of the market by switching the type of properties they purchase.

7 Conclusion

This paper builds on previous research describing different of types of individuals buying and selling houses. There is evidence that flippers enjoyed positive returns upwards of 33% in excess of the appreciation in the overall housing market. These returns can arise from either property selection ability or from fishing for larger prices. These returns are a combination of buying at a discount and selling at a premium. Absent all-cash financing and foreclosure purchases, flippers purchase at a 7.7% discount which increases to 16.5% discount if the individual selling to the flipper used a LTV greater than 0.95 to purchase the home. The 7.7% discount reflects the ability of flippers to identify underpriced properties which supports the information advantage story. Flippers are also able to take actions which can generate discounts. Using all-cash financing will create a discount of 12.1%. Also, flippers can purchase a property

at foreclosure which provides an additional 20% discount. These excess return results continue to hold after controlling for property improvements.

The study also documents that flippers have a significant impact on the overall housing market. The number of sales by flippers in the market is directly related to the number of foreclosures in a given subdivision. When neighborhoods are characterized as either stable with no probability of foreclosure or unstable with a positive probability of foreclosure, each additional flipper transaction decreases the probability of a community falling into the stable neighborhood category by a factor of 0.6.

The use of financing is important for flippers. Flippers who use all-cash financing receive a discount which increases price appreciation. However, flippers who use leverage magnify their return on equity (ROE). The median ROE for flippers who use leverage is 158.7% which is four and a half times larger than the 35.8% ROE for all-cash purchases. A tradeoff thus exists between leverage and price appreciation that arises due to the all-cash discount.

Further, there is evidence that flippers are able to earn excess returns in both hot and cold markets. When markets are hot, flippers tend to avoid foreclosure properties in earning positive excess returns. However, when markets are cold, flippers purchase more properties at foreclosure. The excess returns for purchasing foreclosure properties are significantly positive and provide flippers with an additional 10% in excess returns.

In summary, flippers are able to earn excess returns even in cold markets through changing their tactics to focus more on foreclosure transactions. Although the trading strategy differs in hot and cold markets, flippers manage to earn positive excess returns in both situations.

Appendix

Claim 1: P* is a decreasing function of C

First, the value function is non-increasing in C. Let P^2 and P^1 be the prices which maximize equation (1) for $C^2 > C^1$. Substituting P^2 and P^1 into (1) and solving for $V(C^2)$ and $V(C^1)$

$V(C^1) = [1-\beta + \beta\pi(P^1)]^{-1}[\pi(P^1)P^1 - [1-\pi(P^1)]\beta C^1]$

$\geq [1-\beta + \beta\pi(P^2)]^{-1}[\pi(P^2)\, P^2 - [1-\pi(P^2)]\beta C^1]$

$\geq [1-\beta + \beta\pi(P^2)]^{-1}[\pi(P^2)\, P^2 - [1-\pi(P^2)]\beta C^2]$ (the strict inequality holds only if $1-\pi(P^2) > 0$, but we have that $1-\pi(P^2) \geq 0$)

$= V(C^2)$

The first inequality follows because P^2 is not optimal given C^1. The second inequality is a result of $C^2 > C^1$ and $1-\pi(P^2) \geq 0$. The last line uses the definition of $V(C^2)$.

From the first order conditions

$$1 + \beta[1-\beta][V(C) - C] = 2(1-\beta)P^* \qquad \text{(A1)}$$

Since V(C) is non-increasing in C, the left-hand side is decreasing in C. This implies the right-hand side is decreasing in C which proves P* is decreasing in C. QED

Claim 2: There exists a cutoff holding cost, C_L, with associated optimal price, $P^*(C_L)$, such that $\beta V(0)=P^*(C_L)$.

The first step is to show that there exists an optimal price which is above $\beta V(0)$. The second step is to show that there is a C^{MAX} such that $\beta V(0) > P^*(C^{MAX})$. Using the result that $P^*(C)$ is decreasing and continuous; the intermediate value theorem can be applied.

First, solving equation (1) in terms of V(0) with the optimal choice of P^0

$\beta V(0) = \beta[1-\beta+ \beta\pi(P^0)]^{-1}\pi(P^0)P^0$

$< [1 + \beta(1 - \pi(P^0))]^{-1}\pi(P^0)P^0$

$\leq P^0$

The first inequality follows because $\beta < 1$. The second inequality is because $\pi(P^0) \leq 1$ and $1 + \beta(1 - \pi(P^0)) \geq 1$. Thus, when C=0, $\beta V(0)$ is below P^0.

Next, suppose $P^* > 0$ for all $C > 0$. By equation (A1), this can only be true if V(C) is increasing after some point. However, we have already shown V(C) is non-increasing. Therefore, it must be the case that $P^*(C) = 0$ for all $C > C^{MAX}$. We also have, $V(0) \geq V(C^{MAX}) = 0$. Substituting equation (3) into equation (1) shows that the objective function is strictly concave. By Lemma 3.7 in Stokey, Lucas and Prescott, the price function is continuous in C. By the intermediate value theorem, there exists a C_L such that $\beta V(0) = P^*(C_L)$. QED

Claim 3: P* is increasing in the lower bound for ε

When a non-zero lower bound is placed on the buyer valuations, the value function for the sellers is modified. The probability of sale is $\lambda(E) = (1-E)^{-1}[1 - P(1-\beta)] = (1-E)^{-1}\pi(P)$. The value function for individuals with a lower bound of E on the valuations potential buyers arrive with is

$$V(E) = \max_{\{P\}} \lambda(E)P + [1- \lambda(E)]\beta V(E) \quad \text{(A2)}$$

From the first order conditions

$$1 + (1-\beta)\beta V(E) = 2(1-\beta)P^* \quad \text{(A3)}$$

If V is increasing in E, then P* is increasing in E. Given a lower bound for the distribution, $0 < E < 1$, the value function obeys the following relationship for optimal price P*.

$$V(E) = [1-\beta + \beta\lambda(E)]^{-1}\lambda(E)P^* \quad \text{(A4)}$$

Using (A4)

$V(E) = [1-\beta + \beta\lambda(E)]^{-1}\lambda(E)P^*$

$= [(1-E)^{-1}(1-E)(1-\beta) + \beta(1-E)^{-1}\pi(P^*)]^{-1}(1-E)^{-1}\pi(P^*)P^*$

$= [(1-E)(1-\beta) + \beta\pi(P^*)]^{-1}\pi(P^*)P^*$

Thus, V(E) is increasing in E. From (A3), P* is increasing in E. QED.

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Figure I

The optimal sale price and the probability of sale are displayed for various holding costs. The sale price is computed by maximizing equation (1). The probability of sale is computed using equation (3) with the optimal sale price chosen using equation (1). Holding costs represent the cost to the homeowner of holding on to the property into the next period. The time period corresponds to one month.

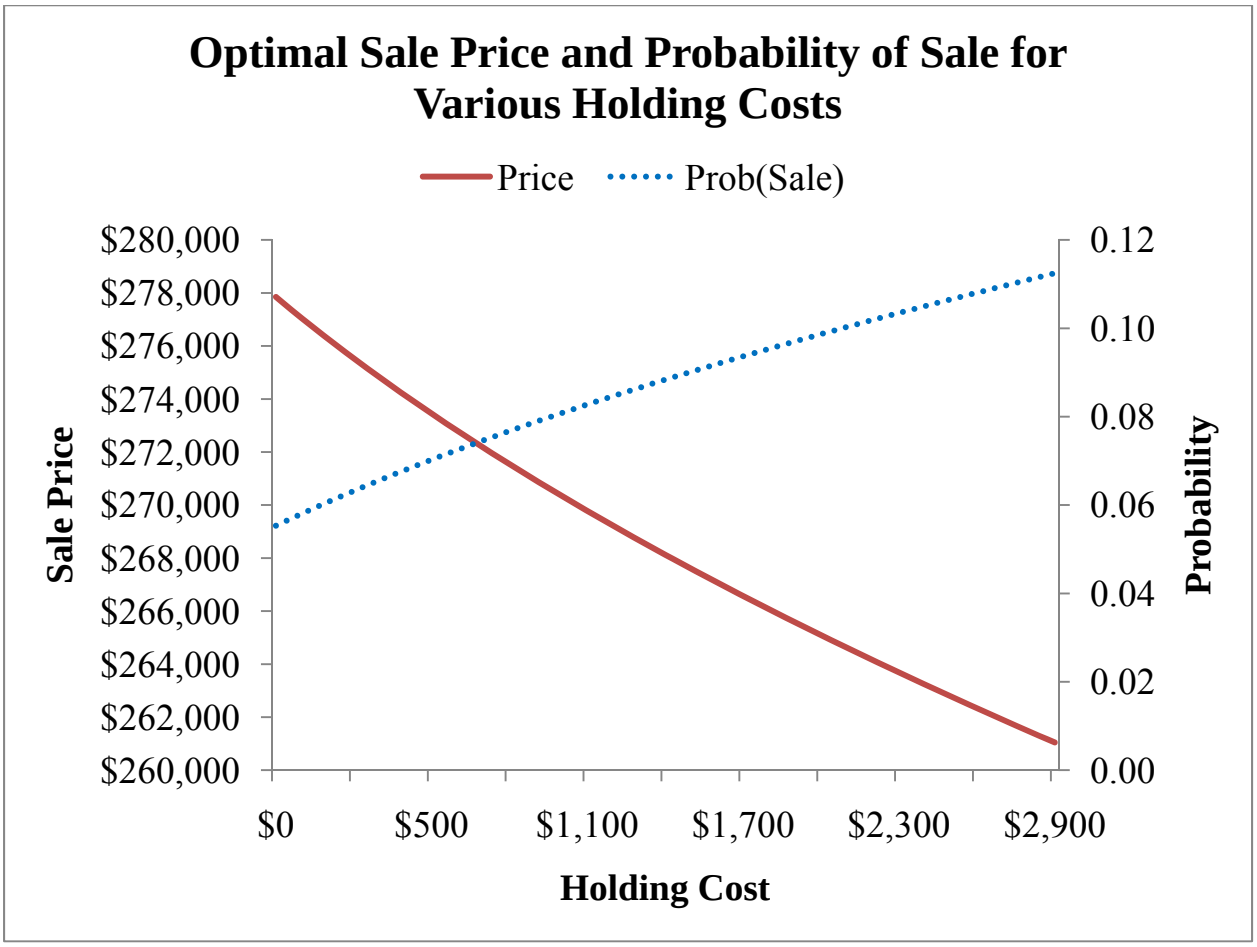

Figure II

The discount to the zero holding cost price and the time-on-market are displayed. First, optimal sales costs are computed using various holding costs. Then, these prices are expressed as percentage discounts relative to the optimal price when there are zero holding costs. Time-on-market is computed as the expected number of periods before a sale is made. The time period corresponds to one month.

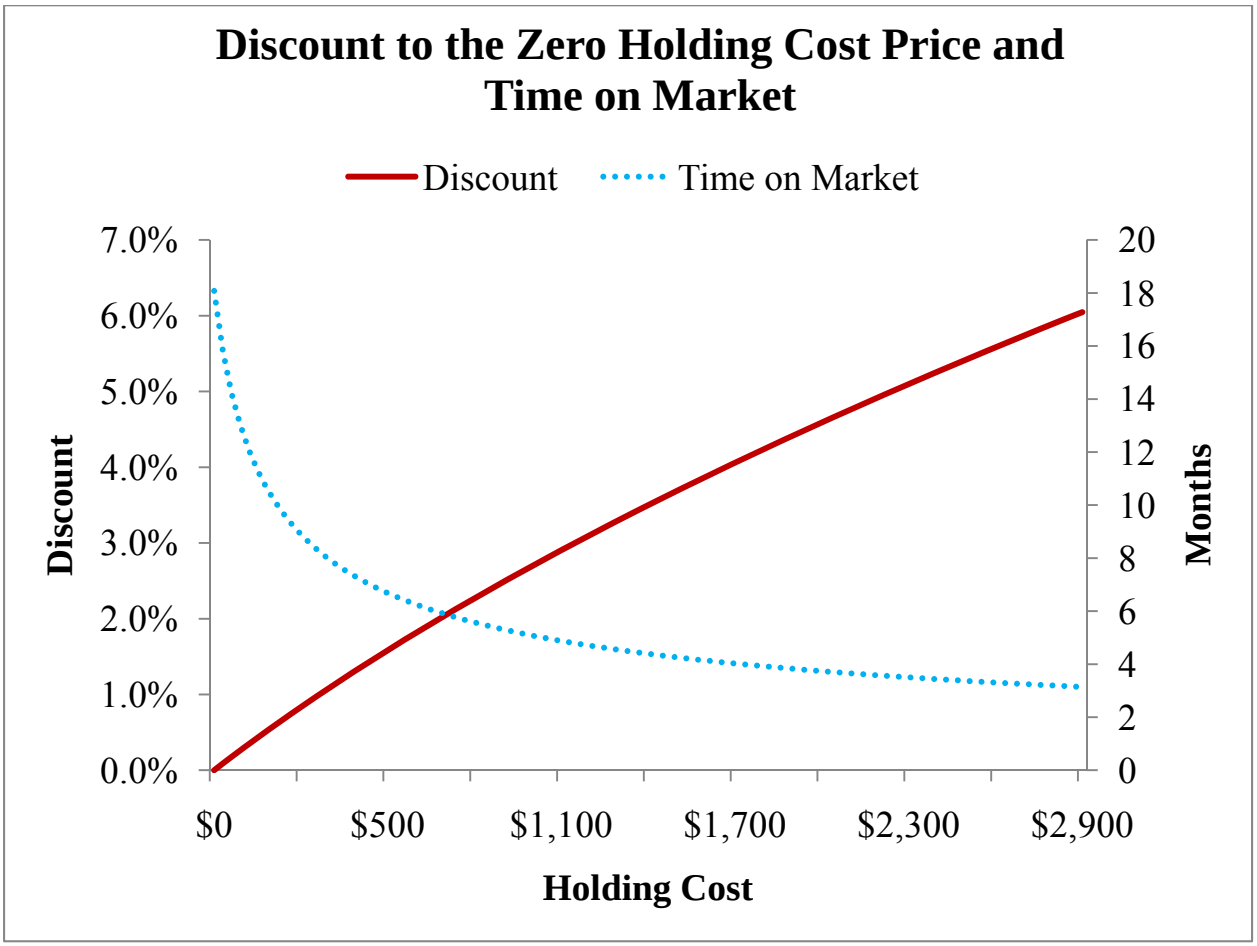

Figure III

The optimal sale price and the probability of sale are displayed for various lower bounds in the distribution of the flow of services to buyers. The sale price is computed by maximizing equation (1). The probability of sale is computed using equation (3) - conditional on all flows of services being above the specified lower bound - with the optimal sale price chosen using equation (1). Lower bounds represent an unconditional increased probability of buyers receiving large flows of services from the property. The time period corresponds to one month.

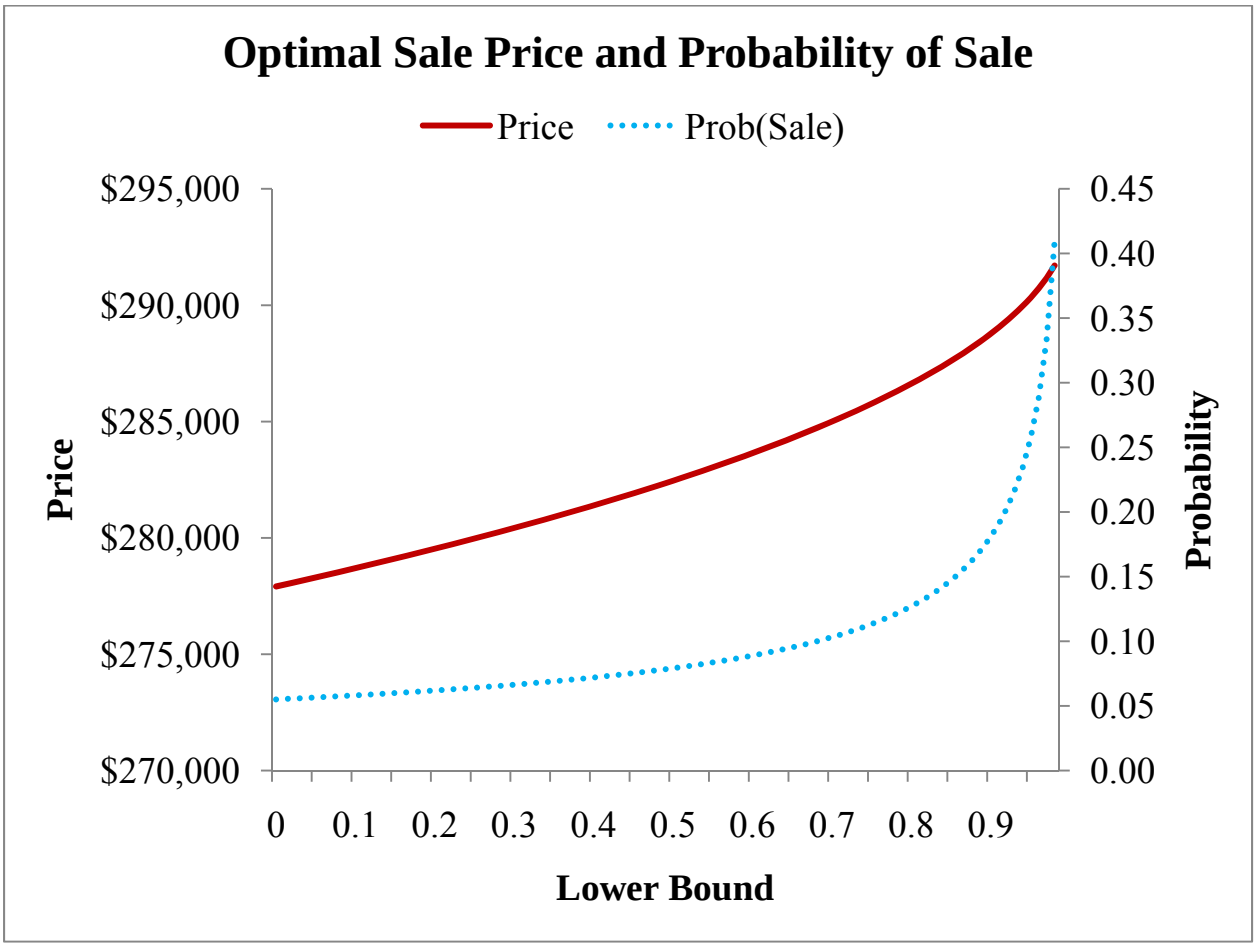

Figure IV

The premium to the zero-bound price and the time-on-market are displayed. First, optimal sales costs are computed using various bounds. Then, these prices are expressed as percentage discounts relative to the optimal price when the lower bound is zero. Time-on-market is computed as the expected number of periods before a sale is made. The time period corresponds to one month.

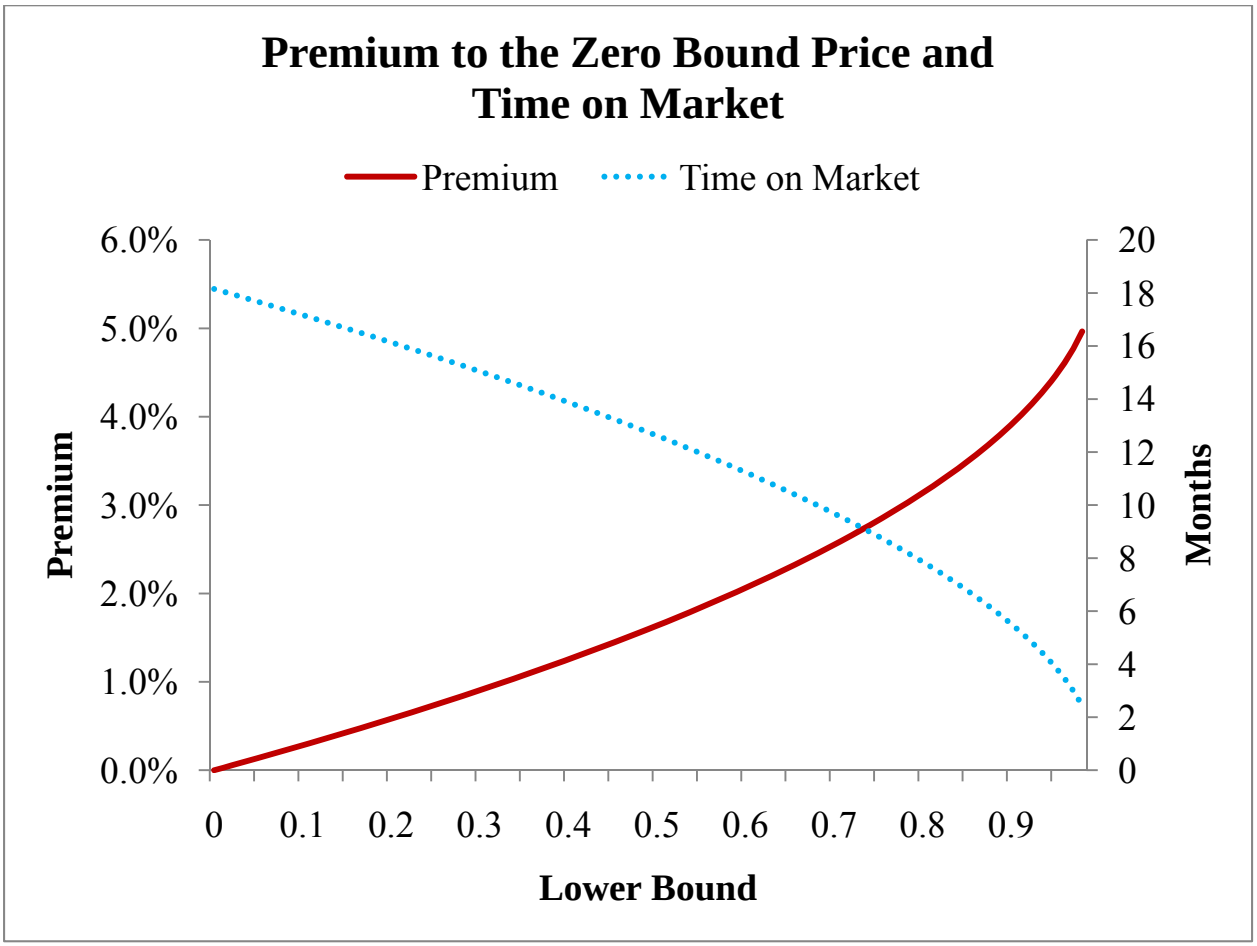

Table I
Statistics for the Transactions Before and After Flipper Transactions

This table contains information on sale pairs; each sale pair is indexed by a first and second sale. The sale pairs are divided into categories where the purchaser in the second sale is a flipper (Non-Flipper to Flipper), the seller in the first sale is a flipper (Flipper to Non-Flipper), the seller in the first sale purchased the property from a flipper (Following Purchase from Flipper) as well as all other sale pairs. The statistics include number of sale pairs, percentage of sale pairs where the seller in the first sale purchased the house without financing (All-Cash Sales in First Sale), the seller in the second sale purchased the house at foreclosure(Foreclosure Sale), median and standard deviation return on equity (ROE), actual price appreciation (PA), predicted price appreciation using the change in the repeat-sales index (Predicted PA), returns in excess of the change in the repeat-sales index (Excess Return), actual change in the property value and number of months the seller in the first sale held the property.

	Non-Flipper to Flipper	Flipper to Non-Flipper	Following Purchase from Flipper	All Other Sale Pairs
Observations	2,055	2,477	615	536,540
All-Cash Sales in First Sale	6.3%	40.5%	4.2%	9.0%
Foreclosure Sale	30.0%	2.5%	32.9%	12.2%
Median ROE	49.7%	36.65%	15.8%	147.5%
Median PA	14.6%	35.4%	6.3%	28.0%
Standard Deviation PA	64.6%	39.8%	52.7%	53.6%
Median Annualized PA	3.6%	103.0%	2.7%	6.4%
Median Predicted PA	24.4%	7.7%	12.1%	23.8%
Median Annualized Predicted PA	6.2%	27.4%	6.4%	6.4%
Median Excess Return	-12.3%	14.4%	-5.0%	-1.1%
Standard Deviation Excess Return	30.2%	27.4%	26.1%	22.2%
Median Change in Property Value	$18,483.1	$37,708.2	$11,269.7	$36,680.7
Standard Deviation Change in Property Value	$110,315.4	$52,197.1	$125,649.6	$115,492.6
Median Months Held	49.6	4.0	34.0	44.6

Table II
Total Number of Permits for Non-Flippers and Flippers

The number of building permits and the number of flip sales with permit information. There are 102 total flip sales with matched building permit information.

	Total Permits		Permits for Flip Sales	
City	Count	Percentage of Total	Count	Percentage of Total
Phoenix	9,322	92.45%	60	90.90%
Scottsdale	761	7.54%	6	9.09%
Total	10,083	100.00%	66	100.00%

Table III
Increase in Property Value arising from Capital Improvements

The increase in property value as the result of building permit information on capital expenditures (property improvements) for the house is reported in this table. The mean % of purchase price and median % of purchase price measure the percentage improvement in property value based upon the purchase price before the permit issue date. The mean level increase and median level increase measure the dollar amount of capital expenditure stated in the building permit.

City	Mean % of Purchase Price	Median % of Purchase Price	Mean Level Increase	Median Level Increase
Phoenix Non-Flip	24.1%	9.4%	$31,106	$12,615
Scottsdale Non-Flip	24.5%	12.5%	$59,564	$30,120
Phoenix Flip	17.8%	12.1%	$17,631	$11,813
Scottsdale Flip	5.0%	2.2%	$17,132	$6,175

Table IV
Estimating Returns in Excess of the Residential Real Estate Market

This table presents evidence from regressions explaining price appreciation for repeat sales. The sample consists of all properties sold between January 1990 and December 2010 with non-missing data on sale price, sale date and down payment, sale prices more than $10,000 and sale prices less than $10,000,000. The independent variables include binary variables indicating the two sale dates for the repeat sale. Additional independent variables include a binary variable indicating the net all-cash purchases in the sale pair, the net foreclosure sales in the sale pair, variables indicating if the foreclosed property is between 5 and 15 years (Foreclose5) or older than 15 years (Foreclose15), if a flipper is buying the property (Flipper Discount), if a flipper is buying the property from someone who purchased with a LTV>0.90 (Flipper Discount90), if a flipper is buying the property from someone who purchased with a LTV>0.95 (Flipper Discount95), if a flipper is selling the property (Flipper Sale), if a non-flipper bought the property form a flipper (Flipper Premium), if a flipper is selling the property within one year of purchase (Flipper 1 Year Holding Period) and dummy variables indicating holding period (One Year,…, Five Years).

	Estimate	$(e^{Estimate}-1)x100\%$	Std. Error	T-Stat	P Value
Intercept	0.02534	2.57%	0.00197	12.85	<.0001
One Year	0.06653	6.88%	0.00214	31.05	<.0001
Two Years	0.01727	1.74%	0.00173	9.98	<.0001
Three Years	0.00259	0.26%	0.00149	1.74	0.0821
Four Years	0.00096	0.10%	0.00131	0.73	0.4652
Five Years	0.00091	0.09%	0.00119	0.76	0.4465
All-Cash	0.11455	12.14%	0.00092	124.07	<.0001
Foreclose	0.18229	20.00%	0.00242	75.46	<.0001
Foreclose5	0.01494	1.51%	0.0026	5.74	<.0001
Foreclose15	0.12498	13.31%	0.00266	47	<.0001
Flipper Discount	-0.0802	-7.71%	0.00934	-8.59	<.0001
Flipper Discount90	0.02151	2.17%	0.0189	1.14	0.2549
Flipper Discount95	-0.0924	-8.83%	0.01271	-7.27	<.0001
Flipper Sale	0.02603	2.64%	0.02056	1.27	0.2054
Flip Sale6	0.14872	16.03%	0.02147	6.93	<.0001
Flip Sale12	0.0994	10.45%	0.02423	4.1	<.0001
Flipper Premium	-0.0498	-4.86%	0.0096	-5.19	<.0001
Observations	541,687				
R^2	0.7755				

Table V

Estimating Returns in Excess of the Residential Real Estate Market

Including Property Improvements

This table presents evidence from regressions explaining price appreciation for repeat sales. The sample consists of all properties sold between January 1990 and December 2010 with non-missing data on sale price, sale date and down payment, sale prices more than $10,000 and sale prices less than $10,000,000. The independent variables include binary variables indicating the two sale dates for the repeat sale. Additional independent variables include a binary variable indicating the net all-cash purchases in the sale pair, the net foreclosure sales in the sale pair, variables indicating if the foreclosed property is between 5 and 15 years (Foreclose5) or older than 15 years (Foreclose15), if a flipper is buying the property (Flipper Discount), if a flipper is buying the property from someone who purchased with a LTV>0.90 (Flipper Discount90), if a flipper is buying the property from someone who purchased with a LTV>0.95 (Flipper Discount95), if a flipper is selling the property (Flipper Sale), if a non-flipper bought the property form a flipper (Flipper Premium), if a flipper is selling the property within one year of purchase (Flipper 1 Year Holding Period), dummy variables indicating holding period (One Year,…, Five Years) and a variable which indicates the change in property value from building permit (Remodel).

	Estimate	$(e^{Estimate}-1)x100\%$	Std. Error	T-Stat	P Value
Intercept	0.02629	2.66%	0.00363	7.25	<.0001
One Year	0.08576	8.95%	0.00385	22.27	<.0001
Two Years	0.02529	2.56%	0.00317	7.98	<.0001
Three Years	0.0066	0.66%	0.00272	2.42	0.0154
Four Years	0.00249	0.25%	0.00238	1.05	0.2953
Five Years	-0.0023	-0.23%	0.00216	-1.05	0.2919
All-Cash	0.13905	14.92%	0.00173	80.44	<.0001
Foreclose	0.18795	20.68%	0.00555	33.86	<.0001
Foreclose5	0.02898	2.94%	0.00646	4.48	<.0001
Foreclose15	0.17861	19.56%	0.00531	33.66	<.0001
Flipper Discount	-0.0758	-7.30%	0.01483	-5.11	<.0001
Flipper Discount90	0.00104	0.10%	0.0291	0.04	0.9715
Flipper Discount95	-0.1079	-10.23%	0.01989	-5.43	<.0001
Flipper Sale	0.06129	6.32%	0.02951	2.08	0.0378
Flip Sale6	0.08012	8.34%	0.03111	2.58	0.01
Flip Sale12	0.05003	5.13%	0.03527	1.42	0.156
Flipper Premium	-0.0426	-4.17%	0.01378	-3.09	0.002
Remodel	0.00754	0.76%	0.00033	22.97	<.0001
Observations	205,105				
R^2	0.7524				

Table VI

Impact of Flippers on Foreclosures

This table shows evidence of the relationship between flipped houses and foreclosures between 2004 and 2009. The sample consists of all flipper sales between 2004 and 2006 and all foreclosures between 2006 and 2009. The estimated parameters from equations (6), (7) and (9) are displayed below. The dependent variable is the number of foreclosures in a subdivision between 2006 and 2009. The explanatory variables include the total number of houses in subdivision *i*, the turnover in housing between 2004 and 2006, the median house price between 2004 and 2006 and the total number of flip sales. The column 'Poisson' uses a Poisson distribution with covariates to describe foreclosures. The column 'Negative Binomial' uses a negative binomial distribution with covariates to describe foreclosures. The columns 'Zero-Inflated Poisson' and 'Logit' are the results from a Zero-Inflated Poisson model as described in Lambert (1992). Foreclosures in subdivision *i* are either zero with certainty or drawn from a Poisson distribution. The 'Zero-Inflated Poisson' column displays the coefficients when the foreclosures are drawn from the Poisson distribution. The 'Logit' column displays the coefficients for the logit model which determine the probability of a subdivision having zero foreclosures with certainty. Standard errors are in brackets below the coefficients.

	Poisson	Negative Binomial	Zero-Inflated Poisson	Logit
Intercept	-0.4547***	-0.9186***	-0.2124***	0.6176***
	[0.0135]	[0.0256]	[0.0292]	[0.1357]
Houses	0.0180***	0.0219***	0.0164***	-0.0282***
	[0.0001]	[0.0003]	[0.0003]	[0.0018]
Houses2	0.0001***	0.0001***	-0.0002***	0.0007***
	[<0.0001]	[1 E -5]	[1 E -6]	[0.0005]
Turnover	1.7795***	2.0871***	1.6514***	-2.5046***
	[0.0111]	[0.0263]	[0.0251]	[0.1821]
Median Price	-0.1116***	-0.1054***	-0.0950***	0.0830***
	[0.0021]	[0.0032]	[0.0050]	[0.0105]
Flip Sales	0.1357***	0.1664***	0.1260***	-0.9242***
	[0.0032]	[0.0100]	[0.0076]	[0.1452]
N Obs	11,939	11,939	11,939	11,939
Non-Zero Obs	9,403	9,403	9,403	9,403
Zero Obs	2,536	2,536	2,536	2,536

Significance at the 1%, 5% and 10% level is represented by ***, **and * respectively.

Table VII

Price Appreciation and Return on Equity

This table shows the median price appreciation and median return on equity for flipper sales. The return on equity is calculated with an interest rate of 6%. Flippers sales are sorted by the LTV the flipper uses to purchase the property. The median price appreciation is largest when the LTV = 0.00 and tends to decrease as the LTV increases. The median return on equity is smallest for LTV = 0.00 and rises as the LTV increases.

LTV	Count	Median Price Appreciation	Median Return on Equity
ANY	2,477	35.38%	36.65%
LTV = 0.00	1,002	35.86%	35.86%
LTV > 0	1,475	26.17%	158.66%
0.00 < LTV < 0.80	200	27.13%	66.95%
0.80 ≤ LTV < 0.90	242	26.49%	143.62%
0.90 ≤ LTV < 0.95	260	24.86%	220.44%
0.95 ≤ LTV < 0.99	450	25.33%	1101.20%
LTV = 1.00	323	28.47%	N / A

Table VIII

The Number and Composition of Flipper Purchases and Sales by Year

This table shows the number of flipper purchases by year, the percentage sold within one year and the percentage purchased at foreclosure between the years 2000 and 2009. The second column shows the total number of repeat-sale purchases by flippers in the market while the third column shows the percentage of these purchases sold within one year of purchase. The fourth columns shows the percentage of these purchases that were foreclosures. The fifth column shows the median price appreciation for all properties sold.

Purchase Year	Observations	Percent Flip Sales	Percent Foreclosure Purchases	Median Price Appreciation
2000	86	89.33%	0.90%	25.52%
2001	76	91.67%	1.00%	23.22%
2002	114	86.11%	0.00%	31.18%
2003	108	80.51%	0.00%	20.75%
2004	295	89.80%	0.80%	22.94%
2005	399	94.25%	0.40%	28.01%
2006	101	85.37%	6.00%	26.42%
2007	21	82.61%	27.30%	23.35%
2008	202	87.97%	82.20%	30.71%
2009	512	94.23%	83.00%	42.93%

Table IX

Excess Returns for Flippers by Year of Purchase

This table presents results from regressions explaining price appreciation for repeat sales. The sample consists of all properties sold between 1998 and 2009 with non-missing data on sale price, sale date, down payment sale prices more than $10,000 and sale prices less than $10,000,000. The independent variables include binary variables indicating the two sale dates for the repeat sale, the binary variables in Tables IV and V (unreported) and binary variables indicating in what year the flipper purchased the property (Purchase in 2000, Purchase in 2001, etc.).

Variable	Estimate	$(e^{Estimate}-1)x100\%$	Std. Err.	T-Statistic	P-Value
Purchase in 2000	-0.0209	-2.07%	0.02703	-0.77	0.4388
Purchase in 2001	0.03898	3.97%	0.02531	1.54	0.1236
Purchase in 2002	0.0247	2.50%	0.02225	1.11	0.2669
Purchase in 2003	-0.0384	-3.76%	0.02023	-1.9	0.0579
Purchase in 2004	-0.0601	-5.84%	0.01817	-3.31	0.0009
Purchase in 2005	-0.0412	-4.04%	0.01936	-2.13	0.0333
Purchase in 2006	0.00765	0.77%	0.02607	0.29	0.7691
Purchase in 2007	0.14365	15.45%	0.04528	3.17	0.0015
Purchase in 2008	0.19438	21.46%	0.02884	6.74	<.0001
Purchase in 2009	0.15545	16.82%	0.02147	7.24	<.0001