

# Speculators and Middlemen: The Role of Intermediaries in the Housing Market

Patrick Bayer\*    Christopher Geissler†    James W. Roberts‡

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## Abstract

We document and study the strategy and performance of two distinct types of investors in Los Angeles between 1988-2009 who purchased homes with the intention of quickly re-selling: *middlemen* buy at below-market prices from motivated sellers and re-sell quickly; *speculators* target periods and areas of rapid market appreciation. Unlike that of middlemen, speculative activity increased sharply in the housing boom and was strongly associated with subsequent price bubbles at both the metropolitan and neighborhood levels. We present evidence suggesting that speculation fueled excess short-term appreciation rather than reflected the ability of speculators to predict when and where such appreciation would occur.

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\*Department of Economics, Duke University and NBER. Contact: patrick.bayer@duke.edu.

†ISO New England. Contact: christopher.s.geissler@gmail.com.

‡Department of Economics, Duke University and NBER. Contact: j.roberts@duke.edu.

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# 1 Introduction

In his famous description of the boom and bust in the 1637 Dutch tulip market, Charles Mackay (1841) commented that at its peak, “Nobles, citizens, farmers, mechanics, seamen, footmen, maid-servants, even chimney-sweeps and old clotheswomen, dabbled in tulips.”<sup>1</sup> The notion that excessive short-term trading by inexperienced investors signifies and may contribute to a speculative bubble endures to this day.<sup>2</sup>

A recent study by Haughwout, Lee, Tracy, and van der Klaauw (2011) suggests that exactly such a flood of amateur investment may have occurred late in the housing boom of the 2000s, as a large number of homeowners began buying second homes with the intention of quickly re-selling or “flipping” them for a profit. Using detailed data drawn from credit reports, Haughwout, Lee, Tracy, and van der Klaauw (2011) document that, in the states that experienced the largest booms and busts, over 50 percent of the homes sold at the height of the boom were purchased by individuals who already had a mortgage on another property. The sheer number of homeowners who began dabbling in real estate investment raises the real possibility that such speculation may have fueled the boom, helping to drive prices to record heights in many markets and default and foreclosure rates to record levels in the subsequent bust.<sup>3</sup>

The possible contribution of real estate investors to the bubble has led some policymakers to propose restrictions on their activity.<sup>4</sup> Yet, such restrictions may inadvertently hamper the many welfare-enhancing roles that intermediaries play in markets that are subject to important search and informational frictions. In the housing market, intermediaries that buy with the intention of re-selling after a short holding period may (i) provide liquidity to the market as *middlemen*, purchasing from motivated sellers with high holding costs and waiting more patiently for the right buyer, (ii) make substantial physical improvements to homes, thereby helping to restore the housing stock in older neighborhoods and (iii) seek

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<sup>1</sup>See Mackay (1841), page 94.

<sup>2</sup>See, for example, Kindelberger (1978), page 25, who in his “anatomy of a typical crisis” notes that bubbles are frequently characterized by “More and more firms and households that previously had been aloof from these speculative ventures” beginning to participate in the market.

<sup>3</sup>A number of recent papers document general facts about housing booms and busts (e.g. Himmelberg, Mayer, and Sinai (2005), Glaeser (2013), Sinai (2013)). While a number of factors certainly contributed to the recent rise and fall in housing prices, there is no current consensus as to the primary sources (e.g. Landoight, Piazzesi, and Schneider (2011), Ferreira and Gyourko (2011), Glaeser (2013), Glaeser, Gottlieb, and Gyourko (2013)). We use the term “bubble” throughout the paper to refer to a sharp rise and subsequent fall in prices, not to imply that the associated market actors were irrational *per se*.

<sup>4</sup>For example, a 2006 HUD regulation (Federal Register, volume 71, page 33,138) prevented FHA financing for houses sold within 90 days of purchase. Partly in response to the weak housing market, HUD waived this restriction in 2010 (Federal Register, volume 75, page 28,633). More broadly, anti-speculative policy prescriptions such as transaction taxes have been suggested in other speculative markets. See, for example, Tobin (1974), Tobin (1978), Eichengreen, Tobin, and Wyplosz (1995) or Summers and Summers (1988).

to exploit superior information about market fundamentals as *rational speculators*. In this last role, intermediaries may improve market efficiency by keeping prices more in line with market fundamentals (Fama (1965)).

It is entirely possible, however, that most of the investors that entered the market near the recent peak played none of these welfare-enhancing roles. With access to equity in their primary homes or easy mortgage credit more generally, many of these investors may simply have been betting that the boom would continue for a while longer, gambling in many cases with only a limited amount of their own money. As Edward Glaeser (2013) noted in his Richard T. Ely lecture, speculation is a natural and common feature of real estate markets and does not, in and of itself, indicate irrationality on the part of investors or signify a problem with the functioning the market. Instead, it is the information content of this speculation that matters. If, in fact, this new class of speculators bought homes without exploiting any meaningful information about market fundamentals, there is essentially no scope for their activity to have improved market efficiency, regardless of whether they behaved rationally. Thus, whether speculators acted with superior information emerges as a key test for understanding their impact on the market during the recent boom.

The goals of this paper are to identify the activity of real estate investors operating in the distinct economic roles described above, to study their strategies and sources of returns, and to examine their contribution to the recent housing bubble. Intermediaries play a crucial role in the formation of a market’s microstructure. Despite a sizable theory literature modeling their existence and impact on a market’s functioning,<sup>5</sup> the formal empirical study of the way that intermediaries match seller and buyer, by purchasing from the former to re-sell to the latter, and their influence on market outcomes has been limited by the proprietary nature of their activities. In this context, an attractive feature of the housing market is that many aspects of housing transactions, including sales prices, the names of the buyer and seller, information about any liens on the property (i.e., mortgages), and many property attributes (collected by the local tax assessor) are part of the public record, allowing a rich characterization of the activities of intermediaries in this setting.

For our analysis, we use comprehensive transaction data from the Los Angeles metro area from 1988-2009 (more than three million transactions in all). We focus primarily on the behavior of a set of individuals that we observe re-selling two or more properties after short holding periods, using the common colloquial name “flippers” to refer to investors employing any of the investment strategies described above. We introduce a novel research design using properties that sell repeatedly during the study period to decompose the observed price

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<sup>5</sup>See, for example, Rubenstein and Wolinsky (1987), Spulber (1996a); see Spulber (1996b) for a broad overview of the topic.

growth during the flipper’s holding period into four components: (i) the discount relative to market price at the time of purchase, (ii) the premium relative to market at the time of sale, (iii) the market return during the holding period, and (iv) physical improvements made to the property by flippers. Our research design distinguishes any costly improvements that a flipper may have made (which are not directly observed in the data) by measuring the extent to which any above-market appreciation that a flipper earns at sale persists through a subsequent sale of the same property.

Our analysis reveals the presence of two very distinct types of investors in the market corresponding to the roles of middlemen and speculators. The behavior and sources of returns for flippers that we identify as middlemen closely mirror those predicted by economic theory. In particular, they purchase properties at prices well-below market value and re-sell them quickly at, or above, market prices. The steep discount that they receive by buying from (presumably) desperate or “motivated” sellers accounts for the majority of their returns. Market timing, on the other hand, is not an important source of their returns; in fact, they operate more intensely during periods when prices are stagnant or declining and systematically target submarkets that are appreciating slower than the rest of the metro area.

By contrast, speculators enter the market at an increasing rate as prices rise in the boom. Relative to market prices, they do not buy at much of a discount or sell at a premium, but instead earn most of their return based on where and when they buy. They earn the market rate of appreciation over the period that they hold the property, which is significantly longer than that of middlemen. Speculators operate primarily during boom times and purchase homes in submarkets of the Los Angeles area that experience both an above average rate of appreciation in the short term (next 1-2 years) and a sharp decline in the intermediate term (3-5 years).

These submarket results are striking and imply that speculative activity is strongly associated with local housing price bubbles. Such a correlation, of course, does not distinguish whether speculators cause these local bubbles or whether the causation runs in the opposite direction - that they are simply adept at identifying times and places where homes are set to appreciate especially quickly in the short term. Notice, however, that the latter explanation depends critically on the notion that speculators are well-informed. This suggests an indirect approach to gauging the direction of causation in the relationship between speculation and house price dynamics: testing whether speculators act with superior information relative to other market actors.<sup>6</sup>

Motivated by this discussion, we close the paper by presenting evidence that the specu-

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<sup>6</sup>In a recent working paper, Chinco and Mayer (2012) propose an alternative approach for testing the impact of speculators on the formation of housing bubbles that requires using data from multiple MSAs. As our findings are consistent with theirs, we see the two different approaches as complementary in this regard.

lators that entered the market late in the housing boom were not especially well-informed or sophisticated. First, as suggested by the evidence in Haughwout, Lee, Tracy, and van der Klaauw (2011), we document that the vast majority of speculators had little apparent experience in real estate investment. That amateur investors are unlikely to have access to superior information is implicit in the idea that their entry into a market is a telltale sign of a speculative bubble.

More directly, the behavior of speculators provides no indication that they were able to foresee the peak of the market. Remarkably, not only did purchases by speculators proceed at near record rates right up to the peak,<sup>7</sup> but there is also no change in the rate at which they sold their existing holdings. Moreover, because sales of their properties fell dramatically after the market peak, speculators were left holding a very large fraction of the purchases that they made in the years just before the peak, giving up both the initial investment that they made in the property and the substantial gains due to market appreciation that they would have received had they been able to correctly anticipate the market peak.<sup>8</sup>

In this way, we find no indication that the speculators that poured into the market late in the boom had access to superior information. This is consistent with the notion that many of these investors had very limited experience and may have simply been swept up in the exuberance of the boom. That these speculators were not particularly well-informed helps to rule out the reverse direction of causality, thereby providing indirect evidence that speculation caused local housing price bubbles. It also casts doubt on the likelihood that they improved efficiency by transmitting any valuable information to the market. As we emphasize below, our test is not predicated on, and the results do not imply, that speculators acted irrationally from an *ex ante* perspective. We are only interested in whether speculators appear to be acting on the basis of superior information, and the results strongly suggest the answer is “no.”

Our paper brings together the literature on house market dynamics and speculation. Housing comprises a large share of individuals’ wealth: by one recent account (Bostic, Gabriel, and Painter (2009)), by 2004 housing had grown to make-up more than 50 percent of a typical household’s wealth. Yet in comparison to the large empirical literature that studies the role of individual investors in traditional financial markets during bubble-like episodes (e.g. Temin and Voth (2004) who study the South Sea bubble, Garber (1989) who studies

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<sup>7</sup>While some of this activity may have been fueled by easy mortgage credit access, the average loan-to-value (LTV) ratio for speculators at the market peak remained near 80 percent, suggesting that many investors did have some of their own money at stake.

<sup>8</sup>This portion of our analysis is very much in the spirit of Temin and Voth (2004) and Brunnermeier and Nagel (2004). In contrast to our results, Temin and Voth (2004) study a sophisticated investor who successfully profited from “riding” the South Sea bubble and Brunnermeier and Nagel (2004) find that hedge funds were able reduce their exposure to tech stocks before the dotcom bubble burst.

the Dutch tulip bubble or Brunnermeier and Nagel (2004), Greenwood and Nagel (2009) or Griffin, Harris, Shu, and Topaloglu (2011) who, along with others, study investor behavior during the dotcom bubble), there are relatively few papers that directly study real estate investors' behavior during, and potential impact on, housing bubbles.<sup>9</sup> In so doing, our paper improves our understanding of the micro foundations of housing price dynamics, which economists increasingly recognize as having meaningful effects on real economic activity (Iacoviello (2005), Campbell and Cocco (2007), Mian and Sufi (2010), Liu, Wang, and Zha (forthcoming), Glaeser (2013)).

The paper proceeds as follows. To frame the empirical analysis, Section 2 presents a simple theoretical discussion of the economic roles of flippers as middlemen and speculators. Section 3 describes the data. Section 4 outlines the research design that will allow us to identify flipper returns and their sources. Section 5 gives our primary empirical results. Section 6 studies the robustness of our findings. Section 7 explores the possibility that uninformed speculators caused local housing price bubbles. Section 8 concludes.

## 2 A Conceptual Framework

To frame the empirical analysis, it is helpful to present a conceptual discussion that highlights the potential economic roles of flippers as middlemen and speculators.

### 2.1 Flippers as Middlemen

Housing markets are a classic example of a thin market for high-valued durable goods and, as a result, the home-selling problem is generally modeled in a search theoretic framework.<sup>10</sup> When selling a home, a household lists the property for sale and waits for offers from buyers to arrive, determining its reservation price (i.e., minimum acceptable offer) as a function of market conditions and its motivation to sell or holding costs. In general, holding costs for comparable properties vary across sellers depending on how quickly they need to relocate, their consumption value from residing in the house (if they continue to do so), and their borrowing costs.

Flippers who purchase a property with plans to immediately put the house back on the market face an analogous home-selling problem to that of other home-owners. As a result, flippers will be able to profitably bid above the seller's reservation price only when their

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<sup>9</sup>Recent work, developed independently of our own, that also investigates investor behavior during the recent housing bubble includes Haughwout, Lee, Tracy, and van der Klaauw (2011) and Chinco and Mayer (2012). Glaeser (2013) provides a detailed overview of a number of other interesting episodes of real estate speculation in American history and the corresponding academic literature.

<sup>10</sup>For example, see Goetzmann and Peng (2006).

holding costs are lower than that of the seller. The holding costs of flippers will generally be governed by their borrowing costs or, more generally, their cost of capital.

Because flippers do not receive consumption value from residing in the home, their holding costs will generally be greater than those of a large fraction of sellers who can continue to reside in their home while waiting for offers to arrive and face little pressure to sell quickly. A motivated seller, however, may have a holding cost that exceeds those of flippers if, for example, the seller needs to relocate to a new city or sell a house quickly to settle a divorce.<sup>11</sup> When transaction costs are sufficiently low, a flipper's maximum bid will exceed the reservation price of sufficiently motivated sellers, and flippers will be able to purchase the property with the intention to immediately re-list it for sale, waiting more patiently than the existing home-owner for a strong offer to arrive.

The economic function of flippers that buy properties from especially motivated sellers, hold them for a short period, and then sell them to a buyer that places a sufficiently high value on the property is that of a middleman. When flippers operate as middlemen, motivated sellers are dynamically matched to future buyers that place a higher value on the property (on average) than those who the seller would have sold to in the absence of flippers. In this capacity, flippers provide liquidity to the market, essentially providing a price floor that is a function of their cost of capital and market conditions, and their presence generally improves the economic efficiency of the market.

## 2.2 Flippers as Speculators

The theoretical finance literature supports (at least) two broad rationales for the existence of speculators in the housing market. Most obviously, efficient market theory admits an economic role for speculators that have access to better information than the broad set of agents participating in a market. Given the decentralized nature of the housing market, with many individuals taking part in the home buying or selling process only a handful of times during their lives, it is straightforward that some market professionals might be especially well-informed or be able to process information in a sophisticated way that generates arbitrage opportunities. In the classic theory of efficient markets, speculators, acting on the basis of their superior information, serve to align prices more closely with market fundamentals, generally improving the efficiency of the market (Fama (1965)).

Modern finance theory admits a wider range of strategies for speculators and a more

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<sup>11</sup>Springer (1996) finds that distressed sellers deal more quickly and sell for less than other sellers. Glower, Haurin, and Hendershott (1998) find that when a seller takes a new job, she sells faster than average, indicating a higher holding cost.

ambiguous understanding of their impact on welfare and efficiency.<sup>12</sup> A starting point for much of modern finance theory is the presence of a set of naïve market actors, noise traders, who are subject to expectations and sentiments that are not justified by information about market fundamentals. By following simple strategies, such as chasing trends, or by sticking to rules of thumb, noise traders can create distortions between prices and market fundamentals.

In this setting, potential arbitrageurs face multiple risks. Even if they are aware that prices have temporarily deviated from fundamentals, there is a risk that they may deviate further in the short-run (depending on the beliefs and activity of the noise traders) before eventually falling back in line with fundamentals. It is not always optimal, therefore, for arbitrageurs to simply take a short position on any observed market deviations from fundamentals.

In fact, it can be optimal to pursue a much wider range of strategies. If, for example, noise traders engage in positive feedback trading - i.e., have a tendency to extrapolate or to chase the trend, it can be optimal for rational speculators to jump on the bandwagon (DeLong, Shleifer, Summers, and Waldmann (1990)). By buying as noise traders begin to get interested in a market, speculators actually fuel the positive feedback trading that motivates the noise traders. And, by selling as the market nears a peak, speculators speed the return of the market to the fundamentals. In this case, rational speculators take advantage of the noise traders by strategically selling before the noise traders realize the bubble is about to burst. In this way, the welfare consequences of the existence of speculators need not be positive. To the extent that their actions fuel bubbles and increase volatility in the market, speculators tend to decrease welfare and market efficiency.

The strategies used by these distinct types of investors directly influence when and where they operate. Because flippers generally do not reside in the property while holding it, they will only purchase properties when their expected returns, whether achieved by buying low from motivated sellers or speculating on market appreciation, exceed their expected holding and transactions costs. For middlemen, opportunities to buy may occur under any market conditions, provided they are able to identify especially motivated sellers (those with higher holding costs than their own). Speculators will require expected market appreciation to be sufficiently high to justify their purchases and, therefore, will be active in only those times and places where conditions are right.

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<sup>12</sup>See Shleifer and Summers (1990), Barberis and Thaler (2003) and Shiller (2003) for summaries of this literature.

### 3 Data

The primary data set that we have assembled for our analysis is based on a large database of housing transactions compiled by Dataquick Information Services, a national real estate data company. Dataquick acquires data from public sources like local tax assessor offices, and they have provided us with the complete census of housing transactions in the five largest counties in the Los Angeles metropolitan area (Los Angeles, Orange, Riverside, San Bernardino, and Ventura), between 1988 and 2009. For each transaction, the data contain the names of the buyer and seller, the transaction price, the address, the transaction date, and numerous characteristics including, for example, square footage, year built, number of bathrooms and bedrooms, lot size and whether the house has a pool. While we are able to observe the date, price and names of the buyer and seller for every transaction in the data, a drawback of the data is that Dataquick only maintains a current assessor file and overwrites historical information on house characteristics. This means that because the data were purchased in 2009, we observe housing characteristics as they were that year, and consequently we cannot see how they may have evolved over time. This data limitation will partially motivate our research design to control for unobserved investment in houses that is explained below.<sup>13</sup>

From the original census of transactions, we drop observations if a property was subdivided or split into several smaller properties and re-sold, the price of the house was less than \$1,<sup>14</sup> the house sold more than once in a single day, the price or square footage was in the top or bottom one percent of the sample, there is a potential inconsistency in the data such as the transaction year being earlier than the year the house was built, or the sum of mortgages is \$5,000 more than the house price, as this may indicate that the buyer intends to do substantial renovations.

Table 1 provides summary statistics for our primary data set based on a full sample of over 3.5 million transactions between 1988-2009. Homes in Los Angeles tend to be newer and more expensive than those in many other American cities. The vast majority of buyers take out a mortgage, with an average LTV of 78.6 percent. Finally, the homes that were sold at least once during the sample period turned over on average every 9 to 10 years.

Figure 1 shows the basic dynamics of prices and transaction volume for the Los Angeles metropolitan area over the study period. The price index is computed with our data using a standard repeat sales method that we describe in Section 4. Following a rapid increase

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<sup>13</sup>A research design to address the possibility of unobserved improvements to properties would be necessary even if Dataquick kept track of housing attributes on a continuous basis, as many home improvements (e.g., a renovated kitchen or bathroom) would not generally affect the more basic attributes of the home (e.g., lot size, square footage) collected by the tax assessor.

<sup>14</sup>A price of zero suggests that the seller did not put the house on the open market and instead transferred ownership to a family member or friend.

	Mean	Std. Dev
Price	280,823	195,478
Square Footage	1,605	615
Transaction Year	1999.8	4.99
Year Built	1970.2	21.2
Has Loan?	0.908	0.289
LTV	0.786	0.288
Number of Transactions	2.20	1.17

Table 1: The table shows transaction-level summary statistics for data that cover five counties in the Los Angeles area (Los Angeles, Orange, Riverside, San Bernardino, and Ventura) based on 3,544,615 transactions from 1988-2009. LTV is measured relative to the price paid at the time of initial purchase.

in prices in the late 1980s, the early 1990s were a “cold” market period for Los Angeles, with prices declining by roughly 30 percent between 1992 and 1997 and transaction volume averaging only a little more than 30,000 houses per quarter during this period. Starting in the late 1990s and continuing until early 2006, the Los Angeles housing market experienced a major boom, with house prices more than tripling and transaction volume nearly doubling. Just two years later almost all of the appreciation in house prices from the previous decade had evaporated and transaction volume had fallen to record low levels (less than 20,000 houses per quarter). In the analysis below, we will reference the three key market periods evident in Figure 1: the “cold” market period in the early 1990’s (1992-1998), the “hot” or boom market period in the late 1990’s and early 2000’s (1999-2005) and the “post-peak” period (2006-2009).

### 3.1 Flippers

A basic measurement challenge for anyone wishing to study the behavior of investors in the housing market in these data is identifying such agents in the first place. One clever approach utilized by Haughwout, Lee, Tracy, and van der Klaauw (2011) is to examine credit reports and look for cases where the same individual is observed to hold mortgages on multiple properties. While some instances of second home purchases may be motivated by reasons other than pure investment (e.g., vacation properties, first homes purchased for children), by carefully documenting the pattern of new home purchases by individuals who own multiple properties, these authors are able to provide a reasonable proxy for the amount of investor activity in the market at a given point in time. Haughwout, Lee, Tracy, and van der Klaauw (2011) document that a large fraction of new mortgage originations (over 50 percent in some markets) in 2004-2006 in the states that experienced the largest housing booms/busts were

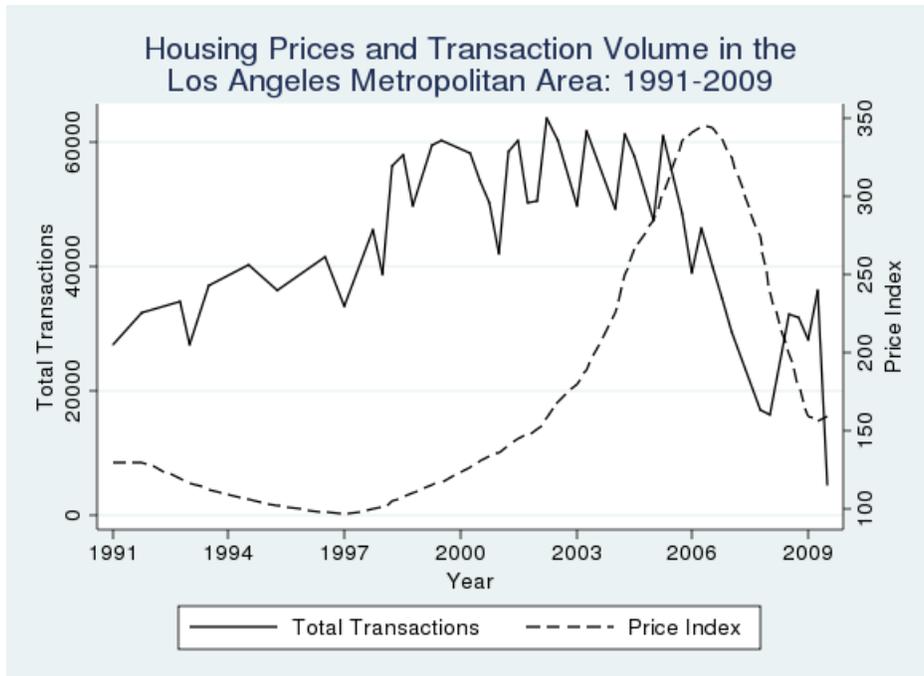


Figure 1: Quarterly transaction volume in five counties in the Los Angeles area (Los Angeles, Orange, Riverside, San Bernardino, and Ventura).

made to individuals who already owned at least one house.

Figure 2 reports the time series for three distinct proxies for flipper behavior in the Los Angeles market between 1991-2009 derived from our transaction data set. The first of these, labeled “Second Homes”, is constructed in the spirit of Haughwout, Lee, Tracy, and van der Klaauw (2011) by identifying individuals that own two homes at the same time. In particular, we categorize a home as a second home if the buyer’s name matches that of an individual that we also observe to be simultaneously holding another property in our data set. A fundamental problem with this definition, of course, is that for an individual to be observed as a home-owner at all, they need to have purchased a home since the beginning of our study period in 1988. Thus, our measure of “Second Homes” is likely to substantially understate the amount of actual second home purchases, especially near the beginning of the sample period. For this reason, it is important not to over-interpret the trends in the measure. However, even subject to this limitation, our measure of second home purchases closely tracks that of Haughwout, Lee, Tracy, and van der Klaauw (2011), rising to a peak of nearly 30 percent of the market in 2006.<sup>15</sup>

Many housing market investors ought not to be considered flippers since there are moti-

<sup>15</sup>A second limitation of our definition of second home purchases is that it is based on name matches and, therefore, might be overstated because of false matches of different individuals with the same name. The qualitative pattern of a sharp peak in the presence of second home purchasers in 2004-2006, however, is not meaningfully affected by the exclusion of the most common names observed in the data set.

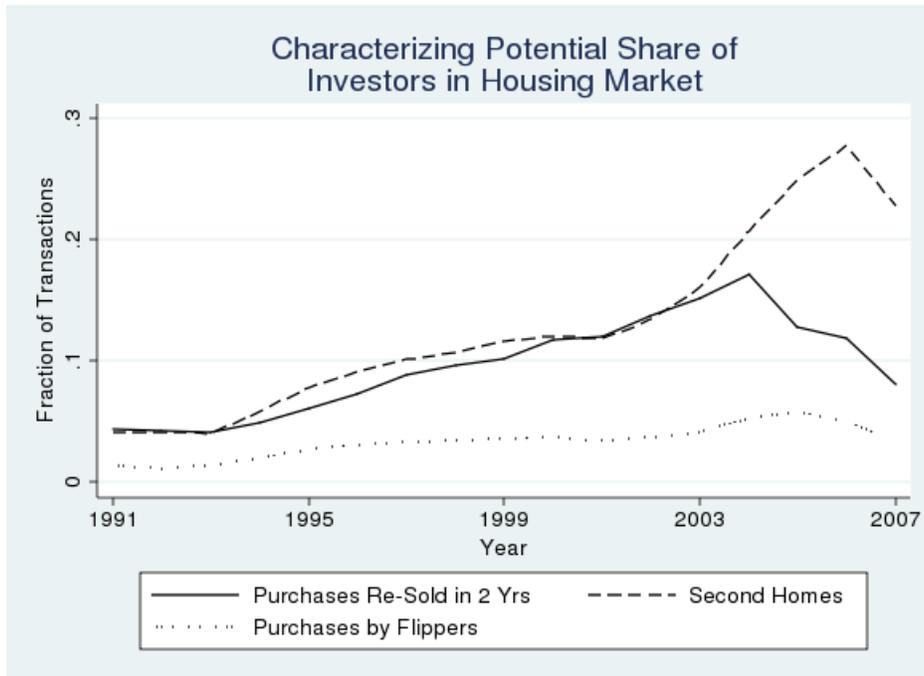


Figure 2: The figure plots three data series that serve as proxies for investor and flipper activity. “Purchases Re-Sold in Two Years” plots the fraction of all homes purchased in a given quarter that are re-sold within two years. “Second Homes” plots the fraction of new purchases by individuals with names matching those of a current home-owner in the data set. “Purchases by Flippers” plots the fraction of homes purchased by individuals that are identified as flippers, defined in the text, for the purposes of our analysis. The data cover five counties in the Los Angeles area (Los Angeles, Orange, Riverside, San Bernardino, and Ventura).

vations aside from speculation, arbitrage or property improvement that can drive investment in housing. One concrete example is the aim to rent the property. To identify flippers, therefore, we look for evidence that an individual is generally engaged in a strategy of purchasing homes with the intention of re-selling the property after a relatively short holding period. In this spirit, we generate a second time series shown in Figure 2, “Purchases Re-Sold in Two Years” which simply reports the fraction of all homes (regardless of the buyer) purchased in a given quarter that are re-sold within two years. Well over 15 percent of all homes purchased near the peak of the boom in 2003-2005 were re-sold within two years, a rate that is more than triple the corresponding rate for the cold market period of 1991-1994, when home prices were declining. While certainly a portion of the buyers that re-sell homes within two years of purchase are owner-occupants rather than investors, this time series provides a proxy for flipper-like behavior in the market throughout the cycle and is economically significant.

For the vast majority of our analysis, we focus not on flipped homes *per se*, but on a set of individuals and firms that we identify as flippers. We identify flippers using two pieces of

information in our data set: the period of time that a house was held and the names of buyers and sellers. We define a flipper to be anyone that we observe buying and selling at least  $X$  different properties while holding them for less than  $Y$  years. For most of our analysis we set  $X=2$  and  $Y=2$ , (i.e., flippers are those who have bought and sold at least two properties, each with a holding period of less than two years), but we also explore in detail how flipper behavior, strategy, and returns are affected by variation in  $X$  and  $Y$ .

Limiting our definition of flippers to individuals that we observe buying and selling multiple homes after a short holding period provides a conservative measure of flipper activity, as we certainly miss any individuals who engage in this activity only once during the sample period or who tend to hold properties for slightly longer periods of time. We do so to make sure that we avoid (as much as possible) counting normal owner-occupants as flippers. The final data series, “Purchases by Flippers” shown in Figure 2 reports the fraction of housing transactions in each quarter that were made by individuals that we define as flippers. Note that this measure includes all homes purchased by flippers regardless of how quickly these homes are re-sold. This time series generally tracks housing market conditions, peaking at over 5 percent of all purchases in 2006, a rate that is 4-5 times higher than the rate of flipper activity in the early 1990s.

Overall, the three broad metrics of aggregate investor or flipper activity shown in Figure 2 show a consistent pattern of pro-cyclical behavior, with purchases by these agents reaching a maximum at the peak of the housing boom, at levels that are roughly three times the level activity observed during the market trough in the early 1990s. Below we will identify investor types whose strategies and participation over the housing cycle will differ from one another.

### 3.2 Purchase Activity by Flippers

In the analysis that follows, we document considerable heterogeneity in flipper behavior, strategy, and outcomes that is strongly associated with experience. Figure 3 shows the percentage of all homes purchased in a given quarter by flippers in four experience categories. We define the category Flipper 1 as those flipping 2 or 3 houses, Flipper 2 as those flipping 4-6 houses, Flipper 3 as those flipping 7-10 homes, and Flipper 4 as those flipping 11 or more homes. For the purposes of this definition, we count a purchase as a flipped home if it was re-sold within two years and we categorize flippers on the basis of their activity over the full sample period. The sum of all four data series presented in Figure 3 produces the total count of flipper purchases shown in Figure 2.

Figure 3 clearly illustrates that the dynamics of flipper activity depends on experience. The purchase activity by more experienced flippers (Flipper 3 and Flipper 4) is relatively constant over the study period, actually peaking in the colder market period of the mid-

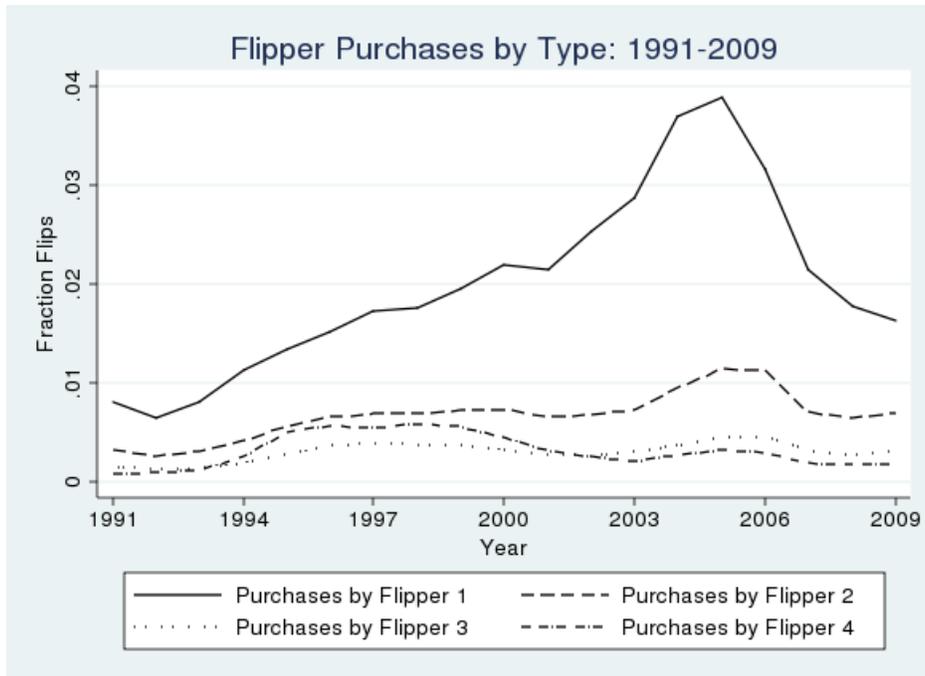


Figure 3: Flipper sales over time by type: The figure plots flipper sales by year. Flipper 1: 2-3 flips in study period, Flipper 2: 4-6 flips, Flipper 3: 7-10 flips, Flipper 4: 11 or more flips. The data cover five counties in the Los Angeles area (Los Angeles, Orange, Riverside, San Bernardino, and Ventura).

1990s. This pattern of activity is consistent with the view that the more experienced flippers tend to operate as middlemen, looking for opportunities to buy from motivated sellers with higher holding costs than their own, opportunities that are just as (or perhaps more) likely to arise in cold versus hot market conditions.

The purchase activity by inexperienced flippers (Flipper 2 and especially Flipper 1) is highly pro-cyclical, rising from a very small percentage of the overall market in the early-mid 1990s to almost 5 percent of the market in 2004-2006. This pattern of activity is consistent with the view that many inexperienced investors were drawn into the market during the boom period. While this measure of activity is not enough to establish the motives of these flippers, the timing of their purchases is certainly consistent with a view that they are seeking to make a quick speculative gain on the basis of market appreciation.

It is worth noting at the outset that our definition of flipper experience is far from perfect. In particular, our measure of experience is based on activity over the full study period. Thus, many of the flippers that we categorize as inexperienced may, in fact, ultimately become more experienced if they continue to flip homes after our study period ends. Moreover, survival in the flipping business is likely to be non-random, with more profitable flippers being more likely to survive long enough in the business to reach the higher experience categories. In

our analysis below, we will explicitly address these and other issues that arise due to our definition of flipper experience.

A final aspect of flipper purchase activity that is important to describe at the outset of our analysis is the heterogeneity in the attributes of homes purchased by flippers of each type. To this end, Table 2 summarizes some basic characteristics of the homes purchases by flippers of each type.

Flipper Type	All Flips				All Houses
	1	2	3	4	
Year Built	1965.1 (23.2)	1959.8 (23.6)	1955.4 (23.6)	1949.6 (22.6)	1971.0 (20.9)
Year Bought	2001.9 (3.19)	2001.4 (3.56)	2001.0 (3.71)	1999.6 (3.81)	2000.2 (5.00)
Square Feet	1,504 (592)	1,438 (513)	1,360 (516)	1,284 (440)	1,563 (592)
N	25,181	5,678	2,322	2,596	2,187,081

Table 2: The table shows house-level summary statistics by type of flipper for data that cover five counties in the Los Angeles area (Los Angeles, Orange, Riverside, San Bernardino, and Ventura). Standard deviations are shown in parentheses. The right hand column includes only those homes that sell at least twice.

As the table makes clear, flippers, especially experienced flippers, generally purchase properties that are somewhat older and smaller than the homes that sell at least twice during our study period. The research design that we present below for estimating the sources of flipper returns is motivated in large part by the very real possibility that flippers may systematically purchase older homes or “fixer-uppers” that can benefit from substantial renovations or improvements before being re-sold. We also take additional steps to ensure that we compare the sources of returns for flippers for comparable houses.

### 3.3 Flipper Holding Times

Before turning to our analysis of the sources of flipper returns, we present a final descriptive characterization of the heterogeneous behavior of flippers at each experience level. Table 3 reports the fraction of homes sold by flippers of each type within 1-4 years of the purchase. The table reports these statistics for our main study period of 1992-2005 and separately for purchases made in the cold market period of 1992-1998 and the hot market period of 1999-2005. To measure holding periods of up to four years, it is, of course, necessary to restrict attention to homes that were purchased at least four years from the end of the sample in 2009.

Flipper Type	All 1992-2005				Cold 1992-1998				Hot 1999-2005			
	1	2	3	4	1	2	3	4	1	2	3	4
Sell Within:												
1 Year	0.263	0.269	0.321	0.571	0.227	0.312	0.429	0.684	0.308	0.302	0.328	0.562
2 Years	0.447	0.370	0.410	0.636	0.367	0.379	0.487	0.738	0.531	0.429	0.438	0.633
3 Years	0.512	0.443	0.474	0.676	0.425	0.435	0.532	0.763	0.597	0.504	0.507	0.679
4 Years	0.556	0.490	0.519	0.705	0.486	0.488	0.576	0.789	0.643	0.560	0.566	0.714

Table 3: The table reports the fraction of the homes purchased by flippers of different types sold with 1, 2, 3, and 4 years, respectively, in the Los Angeles area (Los Angeles, Orange, Riverside, San Bernardino, and Ventura counties).

The figures reported in Table 3 show that flippers of all types hold a significant fraction of the properties that they purchase for more than four years. This may reflect the fact that these investors intend to hold some properties as rental units or may reflect the fact that one of the purchases that we observe in the data is the flipper’s primary residence.

Table 3 also reveals significant heterogeneity in holding periods by both flipper type and market conditions. Experienced flippers, in particular those in category Flipper 4, are much more likely to re-sell homes after very short holding periods. In fact, they sell close to 57 percent of all of the homes they purchase within the first year and more than 70 percent within four years. During the cold market, this pattern is even more pronounced as Flipper 4’s sell almost 70 percent of their purchases within a year and almost 80 percent within four years. This pattern is consistent with the notion that Flipper 4’s purchase many homes with the intent to put them immediately back on the market and that these experienced flippers serve the economic function of middlemen, seeking to buy cheaply from motivated sellers and re-sell quickly.

By contrast, the figures for inexperienced flippers are qualitatively very distinct. Flipper 1’s, for example, sell only 26 percent of their purchases within a year of purchase, a figure that steadily rises to 56 percent by the four year mark. This pattern of behavior is more consistent with a strategy of buying properties with the intention of capturing market appreciation, a strategy which, of course, requires a reasonable holding period.

## 4 Measuring the Sources of Flipper Returns - Research Design

Having documented time series pattern of purchase activity by flippers and experiences, we turn next to an analysis of the sources of their returns. At the outset, it is important to note several key limitations that shape the interpretation of the results of our analysis. In particular, we do not observe whether a home is rented to a tenant during a holding

period, any transactions costs that a flipper might pay while buying and selling a house, and the borrowing costs that a flipper faces when procuring a mortgage in order to purchase a property. Thus, we will not be able to calculate the actual profit that a flipper earns on each investment.

Instead, we will focus only on the components of the returns that are associated directly with the purchase, holding, and sale of the property. In particular, we seek to identify (i) the discount that flippers get (relative to the average sales price in the market in the corresponding period at the time of purchase), (ii) the market return that they earn over the period that they hold the property and (iii) the premium that they get at the time of sale (again relative to the average sales price in the market at the time). By measuring these sources of flipper returns, we seek to categorize flippers on the basis of their motivation and strategy to identify whether they appear to be operating as middlemen or speculators.

An important complicating factor is that flippers may systematically make physical improvements to the properties that they purchase, improvements which are unobserved in our data set for the reasons mentioned in Section 3. The concern is that a naïve analysis of the sources of flipper returns from buying, holding, and selling a property might wind up counting money that flippers invested in improving a property as part of their return.

To address this problem, we develop a research design that aims to uncover the sources of flipper returns from buying, holding, and selling a property in the (potential) presence of unobserved investment. The method is based on a repeat sales index which we first review.

Case and Shiller (1987) introduced the repeat sales regression to generate a price index:

$$\log(p_{it}) = \alpha_t + \gamma_i + \varepsilon_{it} \tag{1}$$

In equation 1,  $\alpha_t$  are quarter fixed effects and  $\gamma_i$  are house-level fixed effects. Exponentiating the estimated time fixed effects gives the price index for each quarter, which can be normalized to 1 in any quarter. This framework requires that quality is constant for each house across sales. Additionally, it assumes that the market evolves homogeneously across different regions of a metropolitan area.

We modify this framework by first introducing controls for whether the buyer or seller is a flipper. In equation (2),  $b_{kit}$  is a dummy for if the buyer is a flipper of type  $k = \{1, 2, 3, 4\}$  and  $s_{kit}$  is a dummy equaling one if a flipper of type  $k$  is the seller. This estimated coefficients related to flipper activity will provide estimates of the discount that flippers get when buying (should  $\hat{\beta}_{1k} < 0$ ) and the premium they command when selling (should  $\hat{\beta}_{2k} > 0$ ), provided that house quality is constant over time. If, however, flippers purchase houses and then invest heavily to improve them before putting them back on the market, these parameter estimates

will be biased. In particular, we would expect  $\beta_{1k}$  to be negative because the true house quality in this period would be less than the estimated quality. Similarly,  $\beta_{2k}$  would likely be positive because the true quality in this period would be greater than the quality estimated. The researcher may, therefore, infer that flippers are buying at a discount and selling at a premium when they are simply investing more than the average homeowner.

$$\log(p_{it}) = \alpha_t + \gamma_i + \beta_{1k}b_{kit} + \beta_{2k}s_{kit} + \varepsilon_{it} \quad (2)$$

Because of this concern, we adapt this framework to control for the possibility of unobserved investment in the property by the flipper by estimating

$$\log(p_{it}) = \alpha_t + \gamma_i + \beta_{1k}b_{kit} + \beta_{2k}s_{kit} + \beta_{3k}a_{kit} + \varepsilon_{it}. \quad (3)$$

where we introduce  $a_{kit}$ , which is equal to one if, in any previous period, we see a flipper of type  $k$  purchase house  $i$ . This variable, therefore, controls for any improvements made by the flipper that extend beyond average homeowner investment since  $\beta_{3k}$  captures the change in house quality between when the flipper purchased and sold the home. This is the specification we estimate to compute the price index that appeared in Figure 1.

In the standard repeat sales framework, a house only helps to identify the time series of market appreciation when it sells at least twice; otherwise it can only identify its corresponding house fixed effect. However, to identify the coefficients corresponding to sources of flipper returns and investment,  $\beta_{1k}$ ,  $\beta_{2k}$  and  $\beta_{3k}$  in equation 3 homes must sell at least four times, with at least one non-flipper to non-flipper transaction before and after a flipper buys and sells the house. To see why, consider Figure 4, which gives two examples of houses that sell four times, at instances A, B, C and then D. Suppose that at A both transacting parties are non-flippers; at B the house is sold to a flipper by the non-flipper; at C the flipper sells the house to a non-flipper; and at D it is sold to a non-flipper by the non-flipper. The observation before the flipper buys is used to identify the original house quality and the observation after the flipper sells is used to identify the new house quality. The two panels differ in terms of the inference one would make about the existence of unobserved investment in each home. The left panel shows a flipper who buys below market price in period B and is able to sell above market price in C without making any improvements. The right panel, on the other hand, gives an example where the flipper makes improvements, which can be seen by noting that the price at D continues to stay above its expected price, conditional on the price at A. If we did not account for this improvement, it would appear that the flipper sold the house for above market value when in fact he sold it for exactly market value.

Several important features of this research design are worth noting. First, because our

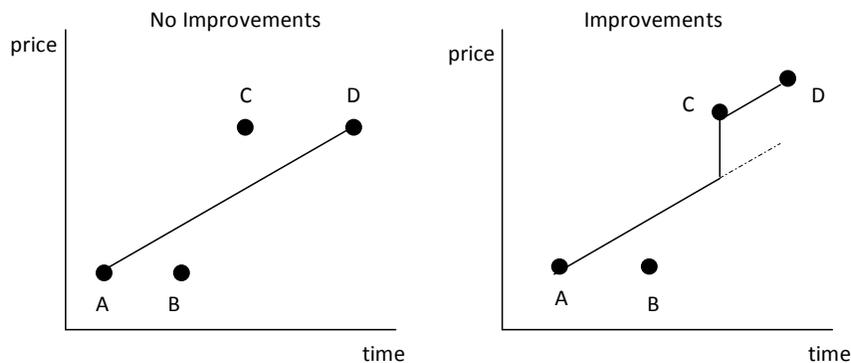


Figure 4: The left panel depicts a case in which the flipper did not make improvements between periods B and C and the right panel provides an example in which the flipper did.

estimates of the sources of flipper returns will be based on houses that have sold at least four times during the sample period and fit this ABCD structure, then by construction, the period of time that the previous owner held a property before selling to a flipper is limited (as the sale at point A must be within the study period). This excludes a set of houses that may have been neglected over a long period of time by an owner (i.e., “fixer-uppers”) from contributing to our estimates of the sources of flipper returns.<sup>16</sup> While flippers, especially those seeking to make significant physical improvements, may in fact target such homes for purchase, they will not generally be the ones that identify the sources of returns given our research design.<sup>17</sup>

A related concern is that flipper improvements may be underestimated if these improvements depreciate significantly under the care of the next home-owner, that is, between C and D. Of course, once again by construction, the length of time between when a flipper sells the house and when the house is re-sold by the subsequent buyer is limited by the fact that the sale at point D needs to take place within the study period. This provides a limited window for any physical improvement made by the flipper to have depreciated between points C and D. As a robustness check, we also report results when we restrict the duration between periods C and D to test how sensitive are the results to varying lengths of time over which investments may depreciate.

<sup>16</sup>In fact a comparison of the housing attributes of homes that meet the ABCD structure reveals considerably less heterogeneity in the houses that flippers purchase versus the average homes that sell in the market as a whole. The average year built of the homes purchased by Flipper 4’s increases from 1949 to 1956, for example, when the sample is limited to just homes that meet the ABCD structure.

<sup>17</sup>For the analysis of the sources of flipper returns (but, importantly, not the counts presented throughout the paper), we drop any purchases from banks or firms that might be associated with a foreclosure. We do this because of concerns that these homes may have been systematically run-down by the previously owners or vandalized, leading to large real declines in house quality between sales at points A and B, even if the time period between points A and B is short.

In the analysis that follows, we report results for two slight adjustments to the specification shown in equation 3. First, we include a series of dummy variables for how many times we have seen a given property previously transacted in the study period. In general, sellers make some home improvements at the time of a sale so that a house will show well. Thus, we include these additional sales number dummy variables in order to make sure that we do not systematically overstate the performance of homes that meet the ABCD structure simply because they sell at least four times during the study period.

Secondly, as shown in Table 2, flippers (especially experienced flippers) tend to purchase homes that are slightly older and smaller than the average homes that are sold in the market. Therefore, to ensure that we are comparing apples to apples, we report results for a second specification of equation 3 that interacts the three key flipper variables with de-measured measures of housing attributes, reporting the flipper coefficients at the mean attributes of the homes sold in the study period. This ensures that all comparisons of sources of returns are done for the same type of property, even though flippers with different levels of experience purchase properties that are somewhat heterogeneous.

Finally, it is worth stressing that while only flipped houses that sell at least four times and meet the ABCD structure will be helpful in identifying the three key flipper coefficients in equation 3, all of the counts presented in the paper are based on the full set of homes purchased by flippers. This is important because the set of homes that fit the ABCD structure will systematically result in a flipper purchase and sale closer to the middle of the study period (so that at least one sale can occur before and after the flipper's holding period).

## 5 The Sources of Flipper Returns - Baseline Results

We now provide estimates of the sources of flippers' returns using the above research design. Our baseline results are presented in Table 4 which presents estimates of equation 3 when flipper types are not controlled for using all years between 1992 and 2005, as well as conditioning on the flipped house transactions occurring during either the cold (1992-1998) or the hot periods (1999-2005). We exclude the end of the sample from these regressions because we need to follow the property for at least two years from the purchase date to estimate its return in our baseline definition of a flip. As mentioned above, for each sample period, results are presented for a basic specification and for one that interacts the key flipper variables with de-measured housing attributes to ensure that the estimates are reported for comparable houses.

Controlling for unobserved investment, the estimates reported in the first column of Table 4 imply that flippers purchase homes at a discount of about 5.8 percent (s.e. 0.3 percent)

	(1)	(2)	(3)	(4)	(5)	(6)
Flipper Buyer ( $b_{it}$ )	-0.058 (0.003)	-0.053 (0.003)	-0.129 (0.014)	-0.107 (0.013)	-0.035 (0.003)	-0.036 (0.003)
Flipper Seller ( $s_{it}$ )	0.054 (0.003)	0.054 (0.003)	0.087 (0.006)	0.063 (0.007)	0.045 (0.003)	0.048 (0.003)
Flipper Investment ( $a_{it}$ )	0.029 (0.004)	0.006 (0.004)	0.070 (0.014)	0.040 (0.013)	0.013 (0.004)	-0.008 (0.004)
First Sale	-0.132 (0.003)	-0.130 (0.003)	-0.141 (0.003)	-0.140 (0.003)	-0.144 (0.003)	-0.142 (0.003)
Second Sale	-0.075 (0.003)	-0.074 (0.003)	-0.081 (0.003)	-0.081 (0.003)	-0.082 (0.003)	-0.082 (0.003)
Third Sale	-0.042 (0.002)	-0.041 (0.002)	-0.047 (0.002)	-0.047 (0.002)	-0.047 (0.002)	-0.047 (0.002)
Fourth Sale	-0.020 (0.002)	-0.020 (0.002)	-0.023 (0.002)	-0.023 (0.002)	-0.023 (0.002)	-0.023 (0.002)
Interact House Characteristics?	No	Yes	No	Yes	No	Yes
Time Period	1992-2005	1992-2005	1992-1998	1992-1998	1999-2005	1999-2005
N	2,187,081	2,187,081	2,187,081	2,187,081	2,187,081	2,187,081
R <sup>2</sup>	0.947	0.948	0.947	0.947	0.947	0.947

Table 4: The table gives estimates of equation 3 for all flippers regardless of experience. Standard errors in parentheses. Interacting house characteristics indicates that the mean house characteristics for the sample are subtracted from individual house characteristics and these values are interacted with the flipper dummies. An indicator variable for 5 or more sales is omitted.

over the full sample period. That is, they purchase the house for approximately 6 percent less than its expected market price. Flippers also earn a premium of 5.4 percent (s.e. 0.3 percent) when they sell the property after controlling for potentially unobserved investment. When the mean-differenced value of house characteristics are interacted with the flipper dummies to account for potential differences in the types of homes purchased by flippers, the magnitude of these coefficients changes very little, as shown in the second column.

Specifications (3) and (4) restrict the sample period to the cold market period (1992-1998), which was characterized by lower transaction volume and declining or flat housing prices. In general, flippers purchase homes at a much steeper discount, 12.9 percent (s.e. 1.4 percent), and sell at a greater premium, 8.7 percent (s.e. 0.6 percent), during this period. This is consistent with the idea that flippers make their return by operating as middlemen during the cold market period, buying low and selling at a premium, relative to the average sales price in the market at the time.

Specifications (5) and (6) restrict the sample to the hot market period (1999-2005) in which prices were increasing rapidly and sales volume was much greater. In hot market conditions flippers have the potential to make returns by purchasing houses at times and in locations where expected market appreciation is high. Thus, as the parameter estimates in Table 4 show, flippers on average do not get a particularly low price, a discount of now only 3.5 percent (s.e. 0.3 percent), when buying or a particularly high price, a premium of only 4.5 percent (s.e. 0.3 percent), when selling during this period.

The coefficients on *Flipper Investment* reported in the first column suggest that flippers are not investing much more than 3 percent of a house's value. This number falls to less than 1 percent in column (2), which reports results at mean house characteristics. The coefficients related to the order of sale reported in the lower half of the table suggest, however, that these results may understate, to some extent the actual improvements that flippers make. These coefficients show a clear monotonic pattern of improvements, with all houses that sell multiple times typically selling at an increasing premium relative to market prices on later sales. Houses that sell four or five times, which flipped homes are more likely to be, typically generate a premium that is 10-15 percent higher than the expected market price. Thus, some of the investment that flippers make in the properties that they buy and re-sell quickly is being captured by the inclusion of these control variables. As investment does not make up a sizable portion of flipper returns and is not the focus of the paper, in the subsequent tables we suppress the estimates of coefficients corresponding to it for exposition sake.

We now investigate the differential sources of returns across flipper experience levels, using the same four categories defined above in Section 3.2. Table 5 presents parameter estimates for a set of specifications that correspond directly to those reported in Table 4, but that

allow the coefficients related to flipper discount, premium and investment to vary by flipper experience. The sale order dummy variables are included in the specifications reported in Table 5, but the parameter estimates (which are similar to those reported in Table 4) are not reported for ease of exposition. There is a clear heterogeneity in the sources of returns across flipper types. Looking across flipper types, it is clear that while all flippers buy relatively cheaply, more experienced flippers buy at a deeper discount relative to expected market prices. For the sample period as a whole, Flipper 4's get a discount at purchase of approximately 21 percent (s.e. 1.5 percent) and this discount is well over 30 percent in the cold market period. Steep discounts at the time of purchase are consistent with these experienced flippers operating as middlemen, buying cheaply and operating during any market conditions. Inexperienced flippers, on the other hand, generally do not buy at much of a discount, especially in hot market conditions. This, again, is consistent with the idea that they are generally seeking profit as speculators rather than middlemen.

	(1)	(2)	(3)	(4)	(5)	(6)
Flipper 1 Buyer	-0.035 (0.003)	-0.034 (0.003)	-0.062 (0.016)	-0.058 (0.015)	-0.020 (0.003)	-0.023 (0.003)
Flipper 2 Buyer	-0.075 (0.007)	-0.070 (0.007)	-0.175 (0.031)	-0.160 (0.031)	-0.050 (0.008)	-0.051 (0.008)
Flipper 3 Buyer	-0.123 (0.013)	-0.129 (0.012)	-0.188 (0.052)	-0.232 (0.060)	-0.090 (0.014)	-0.096 (0.014)
Flipper 4 Buyer	-0.210 (0.015)	-0.181 (0.018)	-0.330 (0.051)	-0.334 (0.071)	-0.153 (0.016)	-0.134 (0.019)
Flipper 1 Seller	0.049 (0.003)	0.051 (0.003)	0.061 (0.008)	0.053 (0.008)	0.045 (0.004)	0.047 (0.004)
Flipper 2 Seller	0.060 (0.007)	0.060 (0.008)	0.098 (0.016)	0.073 (0.021)	0.048 (0.008)	0.055 (0.008)
Flipper 3 Seller	0.072 (0.011)	0.050 (0.014)	0.137 (0.018)	0.098 (0.026)	0.046 (0.014)	0.034 (0.017)
Flipper 4 Seller	0.090 (0.010)	0.055 (0.014)	0.137 (0.013)	0.072 (0.026)	0.054 (0.013)	0.050 (0.016)
Interact House Characteristics?	No	Yes	No	Yes	No	Yes
Time Period	1992-2005	1992-2005	1992-1998	1992-1998	1999-2005	1999-2005
N	2,187,081	2,187,081	2,187,081	2,187,081	2,187,081	2,187,081
R <sup>2</sup>	0.948	0.948	0.947	0.947	0.947	0.947

Table 5: The table gives estimates of equation 3 when the coefficients associated with flipper activity are estimated separately by type. Standard errors in parentheses. Interacting house characteristics indicates that the mean house characteristics for the sample are subtracted from individual house characteristics and these values are interacted with the flipper dummies. Estimates of the investment coefficients, which also vary by flipper type, and the sale number dummy variables are suppressed for expositional sake.

Using the results from the estimates of the specifications reported in Table 5, we can report the source of a flipper's return for each flipper type: breaking this into the fraction

that stems from buying cheaply, selling high, and simply earning the market return during the holding period. These results are in Table 6. We include estimates of flipper rates of return based on time held, market growth, and the residuals. Again, it is important to emphasize, that these estimates of sources do not account for flippers’ transaction or holding costs, meaning actual profits are almost certainly smaller.

	Nominal Rate of Return	Buyer Discount	Seller Premium	Market Growth	Quarters Held	N
Flipper 1	0.234	-0.034	0.051	0.150	4.01	25,181
Flipper 2	0.294	-0.070	0.060	0.109	3.25	5,678
Flipper 3	0.374	-0.129	0.050	0.089	2.86	2,322
Flipper 4	0.531	-0.181	0.055	0.053	2.17	2,596

Table 6: The table shows the sources of returns by flipper type. The discounts, premiums, and market growth are calculated from specification (2) of Table 5 and quarters held is simply the mean number of quarters held. The nominal rate of return is generated by dividing the mean total return (premium - discount + market growth) by the mean years held.

Table 6 further highlights the distinction between flipper types and provides strong evidence that some flippers act as speculators while others operate as middlemen. First, there is a large disparity in time held. Flipper 4’s quickly re-sell their houses while Flipper 1’s hold them almost twice as long. Second, Flipper 1’s do not buy at an especially low price and, as a result, their (nominal) rate of return is primarily driven by overall market growth: 64 percent of their return stems from market growth. Flipper 4’s, on the other hand, earn most of their return by buying at prices below average market prices (purchasing cheaply generates 63 percent of their return) and quickly re-selling so that only 18 percent of their return stems from overall market growth. Taken together, the evidence on purchase activity, holding times, and sources of returns paints a very consistent picture: experienced flippers generally act as middlemen and inexperienced flippers as speculators in the Los Angeles housing market over our study period.

## 6 Robustness

In this section, we examine the robustness of the results presented above to a number of the assumptions that underlie our analysis. In so doing, we also address a number of additional questions regarding the behavior of flippers and foreshadow the analysis of the next section, which explores how middlemen and speculators target particular locations for their purchases.

## 6.1 Do Flippers Sell Winners and Hold Losers?

In the results presented in Section 5, we examined the sources of returns for houses that were re-sold in less than two years. Of course, the timing of the decision to re-sell the property is an endogenous choice made by the investor, likely influenced by the appreciation of the property and the cost of capital. By limiting the sample to only those homes that were re-sold in the first two years, we may be inadvertently focusing on a very selected sample of homes that performed very well in terms of market appreciation. As a simple check on the sensitivity of our results to the definition of flipped homes as those sold within two years, we consider the effect of adjusting this time period. In Table 7, the first specification is the baseline, which uses the estimates from specification (2) in Table 5. Specifications (2)-(4) in Table 7 vary the amount of time required from eighteen months to four years.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Flipper 1 Buyer	-0.034 (0.003)	-0.046 (0.003)	-0.031 (0.003)	-0.030 (0.003)	-0.007 (0.004)	-0.020 (0.005)	0.003 (0.007)
Flipper 2 Buyer	-0.070 (0.007)	-0.080 (0.008)	-0.065 (0.007)	-0.060 (0.007)	-0.044 (0.012)	-0.045 (0.012)	-0.012 (0.015)
Flipper 3 Buyer	-0.129 (0.012)	-0.143 (0.013)	-0.117 (0.011)	-0.111 (0.011)	-0.087 (0.018)	-0.106 (0.026)	-0.061 (0.031)
Flipper 4 Buyer	-0.181 (0.018)	-0.199 (0.018)	-0.173 (0.017)	-0.163 (0.016)	-0.165 (0.029)	-0.177 (0.035)	-0.172 (0.053)
Flipper 1 Seller	0.051 (0.003)	0.054 (0.004)	0.049 (0.003)	0.048 (0.003)	0.051 (0.007)	0.052 (0.004)	0.054 (0.007)
Flipper 2 Seller	0.060 (0.008)	0.063 (0.008)	0.058 (0.007)	0.056 (0.007)	0.083 (0.016)	0.063 (0.010)	0.082 (0.019)
Flipper 3 Seller	0.050 (0.014)	0.057 (0.015)	0.049 (0.013)	0.048 (0.013)	0.046 (0.031)	0.058 (0.017)	0.067 (0.039)
Flipper 4 Seller	0.055 (0.014)	0.054 (0.014)	0.056 (0.013)	0.054 (0.013)	0.037 (0.028)	0.086 (0.019)	0.059 (0.034)
Robustness Check	Baseline	Flip in < 1.5 Years	Flip in < 3 Years	Flip in < 4 Years	A to B < 3 Years	C to D < 3 Years	Specifications (5) and (6)
N	2,187,081	2,187,081	2,187,081	2,187,081	2,187,081	2,187,081	2,187,081

Table 7: The table presents a series of robustness checks. Standard errors in parentheses. Specification (1) is identical to specification (2) from Table 5. Specification (2) is similar to the baseline, but changes the required holding time from 2 years to 18 months. Specifications (3) and (4) increase the maximum holding time to 3 and 4 years respectively. Specification (5) requires that the time between transactions A and B is less than 3 years. Specification (6) requires that the time between transactions C and D is less than 3 years. Specification (7) requires the conditions in both (5) and (6). Estimates of the investment coefficients that vary by flipper type, which are included in each specification, are suppressed for exposition sake.

The results presented in columns (1)-(4) of Table 7 reveal that the conclusions drawn from the baseline results regarding the sources of returns - that more experienced flippers earn a large fraction of their return by buying at especially low prices, while less experienced flippers do not - are not very sensitive to the choice of threshold holding time. When the threshold is set to four years instead of two, for example, the estimated discount relative to expected market price that Flipper 4's get at purchase is 16.3 percent versus 18.1 percent, while the estimate for Flipper 1's remains very low, 3.0 percent versus 3.4 percent.

## 6.2 Are Results Driven by Flippers Buying Fixer-Uppers?

As we discussed in detail above, a broad challenge in examining the sources of flipper returns is the possibility that flippers invest significant amounts of money to improve properties, investment that is unobserved by the researcher. If, for example, flippers purchase fixer-uppers at what might appear to be below market prices and then bring them back up to standard market conditions, we might improperly infer that they were making substantial returns by buying at low prices relative to market.

Several aspects of our baseline analysis have been designed to minimize this concern. In particular, our focus on the ABCD structure for identifying the sources of flipper returns not only provides a way to estimate the amount of unobserved investment that flippers put into properties (versus typical home-sellers), but also naturally limits the identification of returns to properties that were transacted within a reasonably small period both before and after the flipper bought and sold the property.

Specifications (5)-(6) in Table 7 take the logic of this one step further, limiting the time between sales at point A and B, and C and D, respectively, to less than three years. Specification (7) combines these restrictions. By limiting the times between A and B and C and D, specifications (5)-(7) not only address the potential concern that flippers may buy homes which have been run down by their previous owners, but also that flippers invest in houses only to have their investment depreciate by period D.

The results presented in final three columns of Table 7 again strongly support the conclusions drawn from the baseline results regarding the different sources of returns depending on experience level. When the time between the transactions preceding and subsequent to the flippers holding of the property are both limited to three years, for example, the estimated discount relative to expected market price that Flipper 4's get at purchase is 17.2 percent versus 18.1 percent for the baseline case. In fact, the estimated discount at purchase for Flipper 1's falls all the way to zero, implying that these inexperienced flippers essentially purchase houses at expected market prices.

It is worth emphasizing that nothing in our analysis implies that flippers do not indeed

often purchase fixer-uppers that could be physically improved in a profitable way. Rather, our research design ensures that such properties do not contribute to the identification of the sources of flipper returns that stem from buying cheaply and selling at a premium.

### 6.3 Selective Survival - The Dynamic Pattern of Returns

Another potential concern with our baseline results is that our examination of the heterogeneity in flipper returns is not based on a time-invariant attribute of flippers, but instead on their experience. It is important to keep in mind that we are not interested in identifying the effects of flipper experience *per se*. Instead, as it turns out, conditioning on experience revealed striking differences in the patterns of purchases, holding times, and sources of returns for experienced versus inexperienced flippers that map neatly into the roles of middlemen and speculators, respectively. This does not imply, however, that some of the inexperienced flippers are middlemen just launching their careers or that some of the inexperienced speculators might not eventually become more experienced if they survive in the profession.

One way to examine the dynamics of experience and flipper type is to measure the source of returns over time within flipper type. In particular, instead of just examining the sources of returns for all houses flipped by Flipper 4's, for example, we consider separately the sources of returns for the first three flipped houses that they flipped, the 4th-6th houses, 7th-10th houses, and all houses after their first ten. These results are presented in Table 8.

The results reveal a consistent pattern of sources of returns for the more experienced flippers observed in the data. On their first three houses flipped in the data, Flipper 3's received a discount at purchase of 13.4 percent and premium at sale of 9.5 percent relative to expected market prices. For Flipper 4's these numbers were even higher: for their first three houses flipped in the data, they received a 25.4 percent discount when buying and a 17.3 percent premium when selling. The magnitude of these numbers reflects, of course, the fact that an experienced flipper's first three flipped homes were more likely to have occurred during the cold market period (1992-1998), during which flippers required larger margins on purchase and sales prices in a market with declining home prices. Taken as a whole, Table 8 supports the notion that the more experienced flippers observed in our data set have been acting in the economic role of middlemen throughout the sample period, while the ranks of inexperienced flippers are dominated by those pursuing a more speculative strategy in their limited careers in the market to date.<sup>18</sup>

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<sup>18</sup>The pattern of results shown in Table 8 is quantitatively similar when flippers are restricted to those observed making their first purchase in the data after 1993, which makes it very likely that the first three flips observed in the sample are indeed the flipper's actual first three experiences flipping homes.

Flip Number	1 to 3	4 to 6	7 to 10	11+
Buyer Coefficients				
Flipper 1	-0.035 (0.003)			
Flipper 2	-0.080 (0.011)	-0.072 (0.009)		
Flipper 3	-0.134 (0.034)	-0.123 (0.018)	-0.113 (0.020)	
Flipper 4	-0.254 (0.074)	-0.208 (0.035)	-0.173 (0.034)	-0.216 (0.019)
Seller Coefficients				
Flipper 1	0.049 (0.003)			
Flipper 2	0.046 (0.010)	0.073 (0.010)		
Flipper 3	0.095 (0.021)	0.063 (0.015)	0.072 (0.024)	
Flipper 4	0.173 (0.032)	0.102 (0.022)	0.086 (0.021)	0.069 (0.013)

Table 8: The table presents estimated flipper coefficients that vary with flipper type and the order in which the flipper purchased the property. Standard errors in parentheses. The rows correspond to the flipper type (total number of flips) and the columns correspond to the order of the flip in question. For example, Flipper 1’s only have coefficients for 1 to 3 because the maximum number of flips for this type is 3.

## 6.4 Neighborhood Targeting

For our baseline results, we estimated a single housing price index for the Los Angeles metropolitan market and used that to measure the rate of market appreciation while flippers held onto properties, as reported in Table 6. A concern with using a single aggregate price index for our analysis is that flippers might be able to identify and target submarkets or neighborhoods that appreciate faster than the metropolitan area as a whole. This might lead to an understatement of market appreciation and an overstatement of sale premium as sources of flipper returns.

To address this concern, we divide the Los Angeles metropolitan area into forty submarkets based on California state assembly voting district. We use voting districts because they are both large enough to have a reasonable number of flipper observations in each district and small enough to characterize a meaningful submarket. It is then straightforward to estimate an extended version of equation 3 that allows the coefficients on the time dummies to vary by submarket in order to estimate separate price indices for each submarket. The results of

this analysis are presented in Table 9 which has the same format as Table 6.

	Nominal Rate of Return	Buyer Discount	Seller Premium	Market Growth	Quarters Held	N
Flipper 1	0.240	-0.037	0.047	0.156	4.01	25,114
Flipper 2	0.310	-0.079	0.058	0.115	3.25	5,672
Flipper 3	0.407	-0.125	0.071	0.094	2.86	2,313
Flipper 4	0.640	-0.209	0.082	0.056	2.17	2,596

Table 9: This table shows the sources of returns by flipper type. This table has the same format as Table 6 but is based on a specification that estimates a separate price index for each of the 40 submarkets of the Los Angeles metro area defined by state assembly lower voting districts.

The results presented in Table 9 strengthen our qualitative conclusions for both experienced and inexperienced flippers, as inexperienced flippers target submarkets experiencing faster than average appreciation and experienced flippers actual target submarkets that are appreciating slower than average. Overall, the estimated total returns, as well as the source of returns, remain similar in Table 9 to the case where we treat the Los Angeles metropolitan area as one market.

## 7 Speculators and Bubbles

In this section we explore the relationship between speculator activity and local housing bubbles. For exposition sake, we group flippers into two categories based on experience. Experienced flippers, or middlemen, are those who engage in four or more flips over our sample (in the language above, these are Flipper 2-4's) and inexperienced flippers, or speculators, are those who flip two or three times during our sample (Flipper 1's). Given the findings above, this categorization divides flippers according to two very distinct strategies for earning returns.<sup>19</sup> The specific goal of this section is to document whether there is any evidence that these speculators contributed to Los Angeles' housing bubble.

We begin our analysis by documenting at the neighborhood-level whether speculator activity predicts local house price appreciation. We then turn to the question of whether these speculators are causing such appreciation or whether they are drawn into the market in anticipation of such appreciation, i.e. the issue of reverse causation.

<sup>19</sup>The qualitative results in this section are robust to altering the flip-thresholds on which the dichotomy is based.

## 7.1 Speculator Activity Predicts Local House Price Appreciation

In this subsection we relate speculator purchases to future price appreciation. To do so, we regress annual neighborhood-level price appreciation, where neighborhoods are defined by the California state assembly voting districts introduced above and price appreciation at the neighborhood-level is computed using the neighborhood-level price indices constructed in Section 6.4, on lagged quarterly purchases by speculators and middlemen, as well as lagged annual neighborhood-level price appreciation. The regressions also include neighborhood and quarter fixed effects. The results for differing lags appear in Table 10.<sup>20</sup>

It is well-known (e.g. Case and Shiller (1989)) that lagged price appreciation predicts future price appreciation in housing markets. This can be seen in the bottom part of Table 10 which establishes positive short-term persistence and long-term mean reversion in house price appreciation at the neighborhood level.<sup>21</sup> However, purchase activity of speculators also predicts future price appreciation. The first two columns show that a greater number of purchases by inexperienced, speculative flippers are associated with above average rates of price appreciation over the following one and two years, respectively, while the last three columns show that these short-term gains are followed by below average returns over the following three years. Middlemen, on the other hand, operate in areas where prices are not rising as quickly as the rest of the metropolitan area, and so their activity is not predictive of future prices. As discussed above, since middlemen earn their returns by finding “good deals” when purchasing and selling for high prices relative to the market, it is not surprising to find them operating in hot and cold neighborhoods just as they operate in hot and cold portions of the housing cycle.

## 7.2 How Well-Informed Are Speculators?

The evidence presented so far establishes that a substantial number of amateur speculators entered the market in the recent housing boom and that their entry into a submarket was associated with price bubbles over the next several years. In this subsection of the paper, we take up two final questions, both of which hinge critically on the quality of information with which speculators act. The first is whether speculator entry fuels local price bubbles or whether the positive correlation between their activity and local bubbles instead simply reflects their ability to predict and take advantage of short-term price spikes (due to their access to superior information). The second is whether speculators transmit valuable information to the market or instead act without any special knowledge about market fundamentals. The

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<sup>20</sup>We obtain similar results if lagged flipper holdings are used instead of purchases.

<sup>21</sup>To our knowledge, the fact that, even at the neighborhood-level, lagged appreciation strongly predicts future price appreciation is undocumented elsewhere in the literature.

	(1)	(2)	(3)	(4)	(5)
Quarterly Neighborhood-Level Purchases by:					
<i>Speculators</i>					
Lagged 1 Year	1.466 (0.170)				
Lagged 2 Years		1.513 (0.266)			
Lagged 3 Years			0.449 (0.262)		
Lagged 4 Years				-0.776 (0.222)	
Lagged 5 Years					-0.727 (0.279)
<i>Middlemen</i>					
Lagged 1 Year	0.377 (0.183)				
Lagged 2 Years		-0.308 (0.248)			
Lagged 3 Years			-0.498 (0.208)		
Lagged 4 Years				-0.391 (0.190)	
Lagged 5 Years					0.585 (0.320)
One Year Neighborhood-Level Appreciation:					
Lagged 1 Year	0.583 (0.068)				
Lagged 2 Years		0.023 (0.063)			
Lagged 3 Years			-0.335 (0.079)		
Lagged 4 Years				-0.480 (0.084)	
Lagged 5 Years					-0.327 (0.115)
Neighborhood Fixed Effects	Yes	Yes	Yes	Yes	Yes
Quarter Fixed Effects	Yes	Yes	Yes	Yes	Yes
N	2,820	2,660	2,500	2,340	2,180
R <sup>2</sup>	0.892	0.910	0.907	0.905	0.909

Table 10: Regressions of neighborhood yearly price appreciation on quarterly speculator and middlemen purchase activity and neighborhood-level yearly price appreciation. Standard errors in parentheses are clustered by neighborhood.

latter case offers essentially no scope for them to improve market efficiency and, therefore, serves as a key indicator regarding the economic implications of their activity in the market.

While some might take the inexperience of the speculators in the data as *prima facie* evidence that they are not especially well informed, we offer a more formal analysis of their behavior in this subsection.<sup>22</sup> In particular, we present evidence from the timing of purchases and sales by speculators as the Los Angeles market neared and went over its peak in 2006 that suggests that speculators failed to anticipate the market's peak in any way. That speculators could not anticipate the peak makes it difficult to rationalize the timing and location of their activity as being driven by superior information and instead makes it much more likely that the causation runs in the opposite direction – that their substantial presence in a market helped to fuel the run-up in housing prices.<sup>23</sup>

For the analysis in this subsection, we construct a sample of all homes purchased by speculators, regardless of whether they sold the homes within two years. If speculators had anticipated the downturn in housing, they should have curtailed their purchasing activity in advance of the market's peak. As Figure 5 shows, however, speculators did not reduce their buying activity ahead of the market's decline. During the housing boom speculator activity increased from well under 3 percent of all purchases at the start of 2002 to more than 4 percent by 2005. While the rate of speculator purchases declined slightly from these 2005 levels, at the market's peak in early 2006, they were still responsible for 4 percent of all purchases, well above their historical average. Given the time involved in both buying and selling properties, had they anticipated the market slowdown, they certainly should have curtailed their buying activity much sooner and more extensively by early 2006.

While Figure 5 suggests that speculators did not anticipate the market's peak, a confounding factor is that many of them might not have been putting much of their own money at risk. If banks were making mortgage loans without requiring these investors to contribute much of a downpayment, they may simply have been gambling with the bank's money and, consequently, had little to lose should it turn out that they bought too late in the boom. To investigate this possibility, we examined the average combined LTV for all mortgages held by speculators on the properties that they purchased in the boom. While the average LTV did rise for speculators in the boom (as it did for traditional home buyers), it remained below 80 percent at the peak, a rate that was below that of traditional homebuyers. Thus, speculators

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<sup>22</sup>Other researchers (e.g. Greenwood and Nagel (2009)) have found that inexperienced traders engage in the type of trend chasing behavior exhibited here. There is also a multitude of evidence of this phenomenon from lab and retail investor survey settings. See, for example, Smith, Suchanek, and Williams (1988), Haruvy, Lahav, and Noussair (2007) or Vissing-Jorgensen (2003).

<sup>23</sup>Our conclusion that speculators helped fuel the bubble is consistent with and complements the evidence presented in Chinco and Mayer (2012) who develop a research design that makes use of data from multiple MSAs to identify the impact of long-distance investors on metropolitan price bubbles.

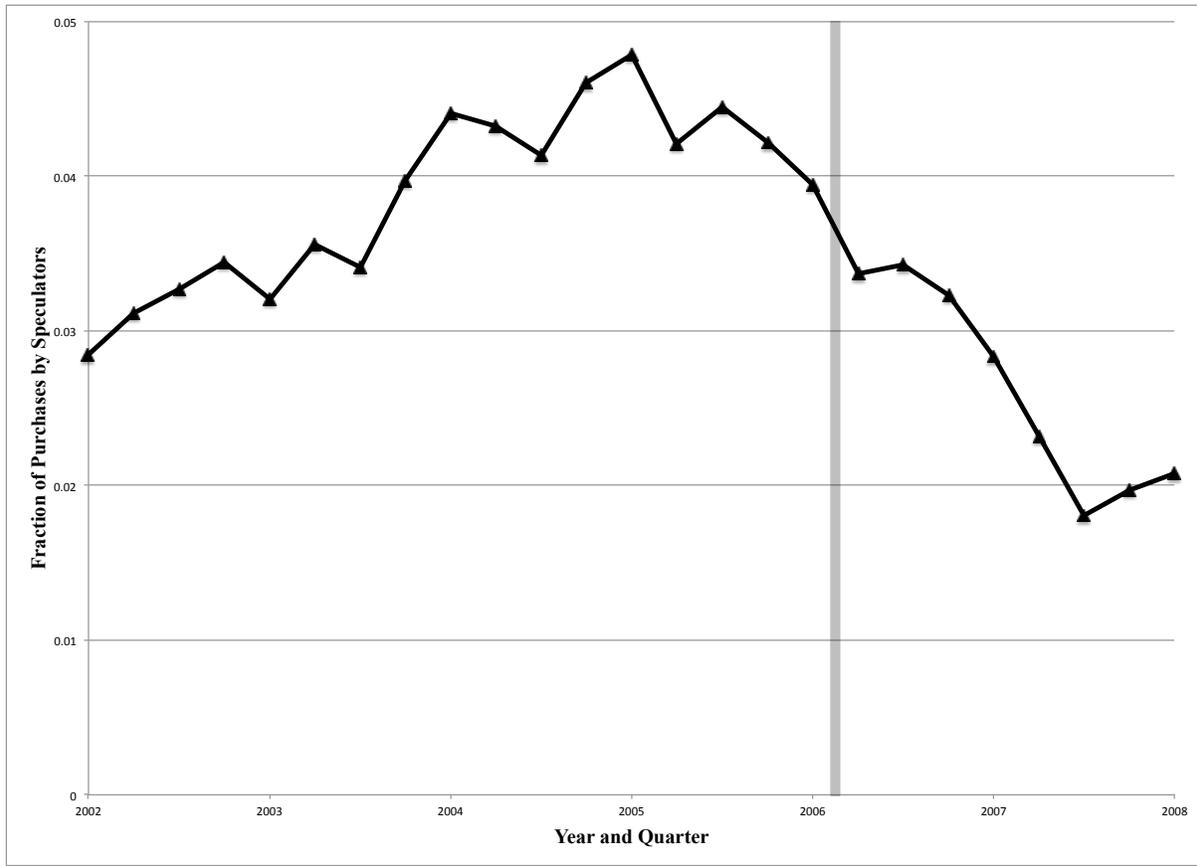


Figure 5: The figure displays the percent of total purchases made by speculators over time. The grey vertical band reflects the market’s peak.

were putting a significant amount of their own money at risk and certainly had a financial incentive to stop making new purchases ahead of the peak.

The dynamics of speculator selling activity provides even stronger evidence that they did not anticipate the market peak. Figure 6 shows the fraction of homes purchased by speculators in each quarter that were sold within one and two years from that quarter, respectively. Recall that the market peaked in the second quarter of 2006. Following the market peak, not only did prices began to decline rapidly, but transaction volume slowed considerably, making it difficult to unload any remaining inventory.

The solid line indicates that, of the homes that were purchased in any quarter prior to the second quarter of 2004, speculators typically sold about 65 percent within two years of purchase. However, starting with homes purchased in the second quarter of 2004, this percentage declined steadily, just the opposite of what well-informed agents should have been doing! If speculators had anticipated the market peak, we would have expected them to have sold a much greater percentage of the homes that they purchased in that quarter of 2004, for example, within two years in order to avoid holding inventory as the market peaked.

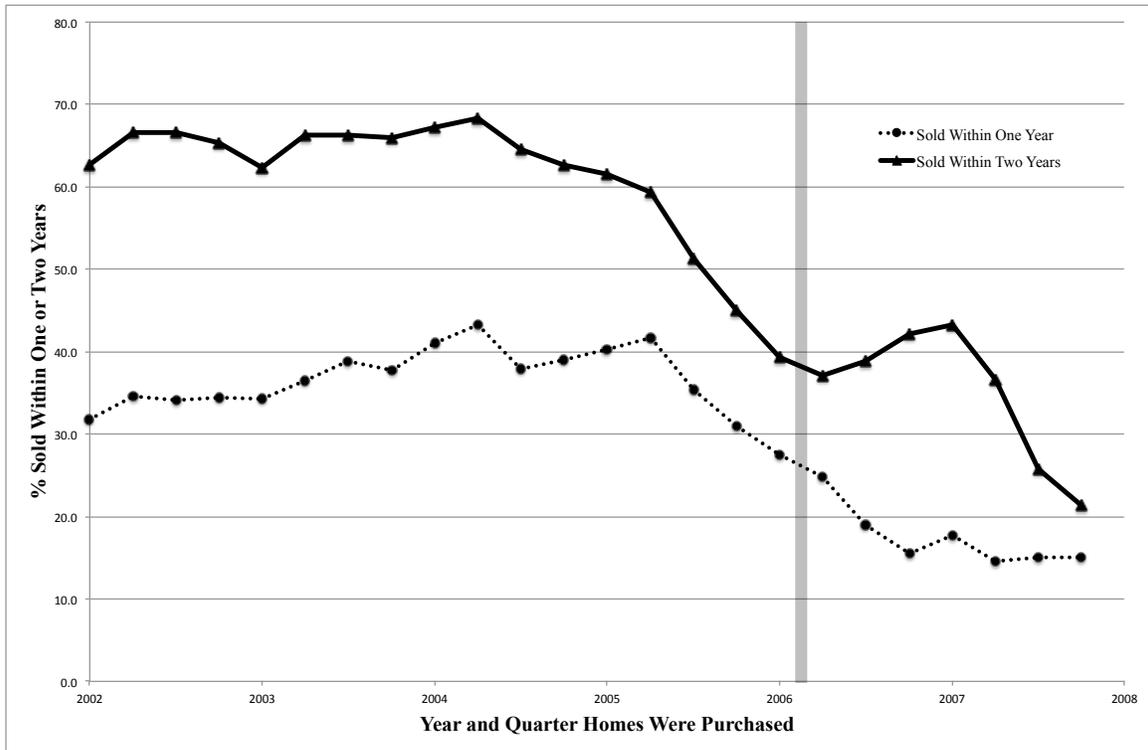


Figure 6: The figure displays the percent of homes bought in any quarter that were sold within one or two years after that quarter. The grey vertical band reflects the market's peak.

The dashed line in Figure 6 shows analogous result for the likelihood that speculators sold properties within a year of purchase. Again, if they had anticipated the peak, we would have expected speculators to have sold a much higher fraction of the homes that they purchased in early 2005 before prices began to fall. Instead, the propensity to sell within a year began to decline precipitously for homes purchased in the quarters beginning in 2005.

The evidence on selling activity is more compelling than that on purchase activity because speculators stood to lose even more of their own money by continuing to hold homes that they purchased in 2004 and 2005 past the market peak. Not only did they stand to lose the 20-plus percent that they put down on these properties at the time of purchase, but also all of the gains that they had accumulated through the substantial market appreciation in the final years of the boom. Simply put, these investors lost a tremendous amount of their own equity by failing to anticipate the market peak.

Taken together, the evidence presented here regarding the their activity near, at, and following the peak, paints a clear picture that speculators did not have any better information about Los Angeles housing price dynamics than traditional home buyers, consistent with the notion that many were novices participating in real estate speculation for only the first or second time.

The fact that speculators do not appear especially well-informed or sophisticated strongly suggests that the positive relationship between their purchase activity and local price bubbles, documented in Section 7.1, is not attributable to any special ability on their part to anticipate where and when short-term gains were available. Instead, it is much more likely that the causation runs the other way: that speculators helped to fuel local housing bubbles. By amplifying price volatility without transmitting any meaningful information to the market, the impact of this speculative activity is also very likely to have a negative effect on social welfare in the market. We know of no economic theory that implies that uninformed speculation might be welfare-enhancing. Instead, the presence of excess trading by underinformed agents (e.g., noise traders) often serves as a catalyst for excess market volatility in many theoretical models of speculation.

Finally, it is worth emphasizing that our tests for the quality of speculator information do not directly indicate whether speculators behaved rationally in the housing boom. Returns in a financial market during any historical period provide only a single ex post realization of the range of outcomes that might have been anticipated and, thus, it is generally difficult to use returns to gauge whether market participants behaved rationally from an ex ante perspective. Regardless of their rationality, knowing whether speculators had access to superior information provides the key to understanding their likely impact on the market and, thus, helps to inform our understanding of the role that played in the bubble of the 2000s.

## 8 Conclusion

Making use of a large transactions database and a novel research design, this paper provides the first comprehensive study of intermediaries (middlemen and speculators) in the housing market: identifying their activity, their sources of the returns and apparent strategy, the quality of their information with and the extent to which their activity is a potential driver of local price dynamics.

A main contribution of our analysis is a detailed characterization of the role that speculators played in Los Angeles' recent housing bubble. In particular, we document substantial entry by amateur speculators at the height of the boom, entry that was strongly associated with sharp short-term increases and intermediate-term declines in local housing prices. Their collective inexperience and complete inability to anticipate the market peak by either curtailing their purchases or selling their inventory suggests that these speculators were not acting with superior information, but were instead simply betting that the boom would continue for a while longer. The lack of any special informational advantage provides indirect evidence that their substantial purchases and holdings actually caused local housing bubbles rather

than reflected superior information about where such short-term gains were available.

Our analysis goes beyond a detailed re-telling of the role of speculation in the recent boom and bust. By examining the behavior of intermediaries over a 20-year period, we also identify real estate investors clearly operating in the role of middlemen. In this capacity, we document investors buying homes at prices well below market value and quickly re-selling after short holding periods at, or above, market value. These middlemen operate in all market conditions and, if anything, are more active during busts, when the liquidity they provide to the market is likely to be especially valuable.

In this way, our analysis suggests that the impact of real estate investors on the market – especially whether their activity increases or decreases social welfare – likely depends critically on the market cycle. In busts, middlemen almost certainly help to stabilize the market, effectively putting a floor on price declines and providing liquidity for many homeowners who may be desperate to sell quickly following economic shocks. In booms, rampant speculation may have a de-stabilizing role that significantly amplifies price volatility. Even well-informed speculators may have deleterious effects on the market if they use their informational advantage to fuel and ride the bubble as in DeLong, Shleifer, Summers, and Waldmann (1990). But if they are no better informed than traditional homeowners (if most indeed are traditional homeowners rather than real estate professionals), it is essentially impossible to rationalize their activity from the perspective of market efficiency. In fact, we know of no theoretical model in which uninformed speculation improves social welfare.

Taken together, our results suggest that substantial care should be taken in regulating the behavior of short-term investors in the real estate market. In busts, restricting investor activity may significantly harm the functioning of the market. The FHA's 2010 reversal of their 2006 restrictions on financing for homes that were quickly re-sold suggests that they may have come to this realization several years into the recent bust. In booms, however, substantial increases in investor activity, especially by amateur investors, may fuel speculative bubbles, which have important negative consequences for the real economy. While regulating investor behavior as a function of the market cycle may be difficult, other policy tools may be available in the future. For example, by tracking investor activity as in our paper and Haughwout, Lee, Tracy, and van der Klaauw (2011), it may be possible to generate real-time measures of speculative activity based on data from housing transactions and mortgages. Such measures might provide an indication that a speculative bubble was underway in a given market, providing the just the kind of warning that was not available during the bubble of the 2000s.

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