When are real estate flippers smarter than the crowd?

by

Siu Kei Wong[1], Kuang Kuang Deng[2], and Kwong Wing Chau[3]

[1] University of Hong Kong, Department of Real Estate and Construction, HKUrbanLab, Hong Kong, phone: (852) 2859 1193, e-mail: skwongb@hku.hk

[2] Corresponding author. Shanghai University of Finance and Economics, School of Public Economics and Administration, Shanghai, PRC, phone: (86) 021-3530 1127, e-mail: deng.kuangkuang@mail.sufe.edu.cn

[3] University of Hong Kong, Department of Real Estate and Construction, HKUrbanLab, Hong Kong, phone: (852) 2859 2128, e-mail: hrrbckw@hkucc.hku.hk

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Abstract

Real estate flippers earn higher returns than average traders in the market. By intensively searching for dumb buyers or sellers, they buy-low and sell-high to earn a monthly return that is 6.0% higher over the market returns. Their excess returns are dictated by the spread of investors' valuation. It is higher when prices are more dispersed and there are less comparable transactions. Due to flippers' smaller comparative advantage in search at resale than at purchase, the resale premium contributes less to the excess returns than the purchase discount. The time-varying rental income forgone negatively affects flippers' resale premium.

Keywords: trading strategy, search, real estate

JEL code: G14, D83, R30

Paper description: Flippers are a special type of real estate investors who buy and resell quickly. This paper asks how they earn higher returns than others. The answer is not just that they are smart but that certain market conditions in favor of search have to exist for them to make profits.

1. Introduction

Real estate flipping is a very short-term investment strategy that aims to buy-low and sell-high, often within a year or less. In most markets, flipping is not common due to high trading cost. This study provides an interesting case in Hong Kong where flipping – even only confined to those who buy and resell within three months – is active. About 60,000 such flips were found during 1992-2010, and their flipping return per month was 8.4%.[1] What gave flippers this high capital return? One reason is that flippers happen to enter and exit the market at the right time – they buy before the market price goes up and sell once the expected market appreciation is realized. But this is at best a partial explanation, as the monthly market return during their holding period only averaged 2.2%. What else did they do to get the remaining 6% excess return? Somehow flippers must have picked a seller who was willing to sell at below-market price (a purchase discount) and/or a buyer who was willing to buy at excess price (a resale premium). This represents the nearest form of arbitrage in a market where quality is heterogeneous and short sale is not possible.[2] Instead of describing these flippers as being smart or experienced (Bayer, Geissler, & Roberts, 2013), which can at best reiterate the importance of investor heterogeneity, we raise a further question: how to explain the temporal variation in the returns to flipping, in particular the relative size of the purchase discount and

[1] As will be elaborated in the Data section, in Hong Kong, the round-trip transaction cost of an average residential property in our flip sample was about 4.5%. Three months is considered too short for value-added improvements except some cosmetic repair.

[2] Real estate flipping is not arbitrage as defined for the securities market in a strict sense, as the excess return earned by flippers is not risk-free. Instead, they have to take the risk that the equilibrium market price may shift during the period between buy and sell.

resale premium?[3] Being smart is one thing, whether arbitrage opportunities are available is another. It is a combination of both that enables flippers to earn any excess returns. Hong Kong real estate transaction data, which tracks precisely when and for how much each flipper buys and resells her asset, is ideal for understanding the temporal variation in flipping returns.

For flippers to get a purchase discount or resale premium, those who trade with flippers must have suffered a loss. But who would like to be ripped off? In some cases, they could be motivated buyers or sellers who need a quick buy or sale due to such unforeseeable conditions as changes in jobs, health condition, or financial status (Springer, 1996). For them to trade quickly, they have no choice but to give concessions. More generally, they could be uninformed traders who act on incomplete price information (Kumar, 2009; Stigler, 1961). For real estate, quality is highly heterogeneous and transactions are highly decentralized. Buyers and sellers in the market may have a rough idea on what prices to offer or ask, but no one knows exactly, before a costly search, the highest bid price or the lowest ask price at any given time. Bargaining is so commonplace that similar properties may trade 'simultaneously' at different prices (Harding, Rosenthal, & Sirmans, 2003; Yavaş, 1992). For instance, Chinco and Mayer (2016) observe that non-local home buyers buy at a price higher than local ones. Limited price information held by each market participant therefore opens up arbitrage opportunities for flippers to earn excess returns by picking the underpriced offers and/or overpriced bids. While the emergency need for quick trades occurs idiosyncratically, the opportunities to trade with uninformed traders should vary systematically with the information environment, which is the

[3] The use of excess returns here focuses us on flippers who are arbitrageurs rather than pure speculators. This also mitigates the problem of sample selectivity – those who failed to earn a positive excess return may still flip if they can be compensated by a positive market return. As a result, both positive and negative excess returns are found in our flips sample.

subject of this study. Our underlying assumption is that some investors, known as price searchers, have lower search cost than others. They do more homework, know the market better, and bargain more effectively. Compared to other investors, they tend to specialize in flipping because hedging long-term real estate market risk is difficult, if not impossible.[4] Our main hypothesis is that flipping returns are higher when price information is more obscure in the market.

Two variables are developed to measure how informative a market is, namely *the number of comparable transactions* and *price dispersion* in the market. The former captures the amount of price information available for market participants to set their price; a larger number of comparable transactions should reduce arbitrage opportunities and hence suppress flipping returns. The latter captures the amount of disagreement in the prices of transacted properties. With greater disagreement, market participants learn less from past transactions. This increases arbitrage opportunities and hence improves flipping returns. Empirical analysis of the flips confirms the hypothesis: the flipping returns are negatively related to the number of comparable transactions and positively related to price dispersion. Property age has been used as a control for any effect from potential value-added improvements.

Not all flippers are price searchers. As mentioned in the beginning, some investors flip with an intention to time the market, known as speculators. Without knowing whether a flipper is a price searcher or speculator (or both), how valid is the empirical analysis? Pure speculators are less a concern because the market return component has been deducted from the total return in our measurement of excess return. More importantly, market timing differs from price

[4] A possible way for price searchers to hedge the price risk is to become real estate agents, who do not hold the property but earn a fee by matching buyers and sellers. In reality, some agents also flip houses.

searching in that the former only works in an up market. This means the two can be separated marginally: the information environment effect should be stronger in a stagnant or down market. Our empirical result supports this. We further conduct a counterfactual test based on 'slower' resales that took place at least a year after the initial purchase. These are unlikely to be made by price searchers. As expected, an analysis of their excess returns reveals that the number of comparable transactions and price dispersion no longer have the same effects as for the 'faster' flips.

What about the composition of the excess return to flipping, i.e. does it come more from purchase discount or resale premium? Based on our search cost argument, the former should be bigger because flippers face a holding cost – in terms of rental income forgone – after they buy and before they re-sell. Renting out the property would make it more difficult to sell, the last thing flippers want. A testable implication is that when a property is flipped, a higher market rent should reduce the resale premium but not the purchase discount. We introduce a new method to estimate the purchase discount and resale premium – since repeat sales are abundant, we back out the market price with other sales of the same property instead of hedonic pricing, which is vulnerable to omitted variable bias. Consistent with our expectation, the purchase discount is, on average, higher than the corresponding resale premium, and the latter is reduced when the market rent is high.

Our analysis of flipping extends the literature on incomplete information environment and investor performance, which documents that agents with informational advantages should outperform the market. For example, in the securitized real estate market, Hochberg and Mühlhofer (2017) show that real estate fund managers earn abnormal returns by successfully selecting the outperforming property sub-markets. In the direct real estate market, Levitt and Syverson (2008) cleverly find that real estate agents sell their own houses for a higher price than typical homeowners. Chinco and Mayer (2016) show that local real estate investors enjoy

a higher return than non-local buyers. The most relevant study is Bayer et al. (2013), who find that experienced flippers are able to purchase real estate at a discount. While this is also one of our findings, we differ in three major ways. First, Bayer et al.'s focus is the effect of flipping on real estate bubbles, whereas our focus is to examine what affects the return to flipping. Second, thanks to the low transaction cost in Hong Kong, we can observe flips within three months, as opposed to Bayer et al.'s use of two-year flips. This means we have a much better control for fix-up and market conditions in evaluating the excess return to flipping. Third, we go beyond investor types (e.g. investment experience), which can only explain cross-sectional variation in returns, and identify the arbitrage opportunities that predict changes in returns over time.[5] In this study, we provide a search cost explanation for the temporal variation in the returns to flipping. We test and confirm various search cost implications, including 1) the type of information environment that increases the return to flipping and 2) the holding cost that drives the resale premium down.

2. Development of Hypotheses

This section introduces a simple model to motivate our hypotheses. Consider an asset market where price information can only be obtained at a cost. Given the incomplete information about the true value of an asset in the market, different market participants have different valuations on the asset, which gives rise to a distribution of ask prices and a distribution of bid prices. Buyers search for listings with low ask prices; sellers wait for buyers with high bid prices. When the ask price of the seller is equal to or lower than the bid price of the buyer, the buyer

[5] Depken II, Hollans, and Swidler (2009) show that the average excess return earned by real estate flippers is time-variant and highly correlated with market conditions, though they did not explain why.

and the seller negotiate to determine a final transaction price that is between the bid and the ask. Our interest is not the search or bargaining process, which has been well covered in the literature (Knight, 2002; Wheaton, 1990; Yavaş, 1992; Yinger, 1981). Suffice to say, a transaction occurs only when a price is acceptable to both the seller and buyer. Even if market conditions do not change, different buyer-seller pairs could trade identical assets at different prices, a phenomenon known as price dispersion.

Suppose the (log) price at time *t* has a mean of $\hat{P}_t$. Some prices fall below $\hat{P}_t$ because the buyers have searched, or bargained, more effectively – they are able to identify sellers with low ask prices or weak bargaining power. Similarly, some prices are above $\hat{P}_t$ because the sellers have searched more effectively. The transacted price is therefore determined by the relative search effectiveness of the two parties. Search effectiveness has two components (Yavaş, 1992). One is the search intensity of a particular trader, which can be imagined as the number of searches made: Q_B for a buyer and Q_S for a seller. The other is search efficiency, which can be imagined as the extra expected benefit per search – a reduction in price for a buyer and an increase in price for a seller. This benefit is a function of the valuation spread of market participants, e.g. a dispersed distribution of bid prices among buyers should increase sellers' expected benefit per search. For simplicity, assume the extra expected benefit per search, V_t, is symmetric for both parties and independent of the number of searches. The log transacted price of trade *i* is:

$$P_{it} = \hat{P}_t + (Q_{i,S} - Q_{i,B})V_t \quad (1)$$

Equation (1) implies that the transaction price is higher (lower) than average if a seller searches more (less) intensively than a buyer. Search intensity is an inverse function of the search cost of a trader. Assuming that marginal search cost increases with search, a trader with lower average search cost should search more until the equilibrium point where V_t equals the cost of the last search. Consider a market where 1-*w* percent of traders are ordinary investors

(OI) and w percent are price searchers (PS). OI has higher search cost than PS, so $Q^{OI} < Q^{PS}$. When the buyer and seller are of the same type, the transacted price is $\widehat{P_t}$; when PS buys from OI, the transacted price goes below $\widehat{P_t}$ by $(Q^{PS} - Q^{OI})V_t$; when PS sells to OI, the transacted price exceeds $\widehat{P_t}$ by $(Q^{PS} - Q^{OI})V_t$. The expected market price is precisely $\widehat{P_t}$ as assumed in the beginning.

Suppose a trader bought at t-1 and then resells quickly at t. Assume the expected search benefit V_t remains the same over the two short periods of time. While the expected return for the whole market is $\hat{P}_{t+1} - \hat{P}_t$, the expected returns for OI and PS are different:

$$R_t^{OI} = \left(\hat{P}_t - \hat{P}_{t-1}\right) - 2wV_t(Q^{PS} - Q^{OI}) \quad (2a)$$

$$R_t^{PS} = \left(\hat{P}_t - \hat{P}_{t-1}\right) + 2(1-w)V_t(Q^{PS} - Q^{OI}) \quad (2b)$$

Obviously, PS is expected to earn an excess return, and OI, a below-market one. An important implication is that PS should specialize in short-term trading, especially flipping, in order to 1) build on their comparative advantage in search as captured by the second term in Equation (2b) and 2) minimize the risk of market price changes (the first term in Equation 2b). For ordinary investors, they better make longer-term investment unless they believe they can predict short-term market price movements.

Three hypotheses are developed from the simple model above. The first one is about V_t, the expected benefit per search. As mentioned before, this benefit is a function of the valuation spread of investors, a market feature that is exogenous to any single individual. When price information is more obscure in the market, the spread enlarges. The expected search benefit rises, further enhancing the search effectiveness of PS relative to OI. Therefore, other things being equal, the return to flipping increases when price information is more obscure in the market (**Hypothesis 1**). This hypothesis should hold more strongly in a down market, during

which speculators are less likely to flip.[6]

The return in Equation (2b) consists of two components, namely the market return (the first term) and the excess return (the second term). The excess return can be further decomposed into purchase discount and resale premium, given by Equations (3a) and (3b) respectively.

$$dis^{PS} = \hat{P}_t - P_t^{PS} = (1-w)(Q^{PS} - Q^{OI})V_t \quad (3a)$$

$$pre^{PS} = P_t^{PS} - \hat{P}_t = (1-w)(Q^{PS} - Q^{OI})V_t \quad (3b)$$

Equations (3a) and (3b) show that both of the purchase discount and resale premium are featured by the relative search intensity of flippers and ordinary investors, which is in turn determined by the comparative advantage in search of flippers. The purchase discount equals to the resale premium under the assumption that Q^{PS} is the same for purchase and resale. Here we relax this assumption and argue that flippers' comparative search advantage is larger when flippers buy than when they resale, i.e. $Q_B^{PS} - Q^{OI} > Q_S^{PS} - Q^{OI}$.

Flippers enjoy comparative advantages when they search properties to buy. The short holding periods usually do not allow them to live in the flipped property. Hence, they are more flexible in terms of the property attributes and more patient in search than ordinary home buyers. However, when flippers sell, their search is relatively more restricted. The heavy short sale constraint in the real estate market prevents flippers from earning a premium by selling-high if they do not hold a property with characteristics desired by the 'dumb' buyer in the first place. The lack of flexibility leads to higher search costs of selling than when the same flipper search to buy. A more important constraint of flippers when they sell is the opportunity costs of holding the property, namely the forgone rental income, as flippers' holding periods are usually too

[6] In a rising market, some OI may flip to earn a quick capital gain. Since they do not rely on arbitrage opportunities, their return is not affected by the amount of price information in the market, thereby limiting the predictive power of Hypothesis 1.

short for letting the property out. Additionally, as hedging is difficult in the real estate market, holding the property incurs market risk. These opportunity costs motivate flippers to seek a quick resale even at the costs of a lower resale premium (Turnbull & Zahirovic-Herbert, 2011). Nevertheless, compared to ordinary investors, flippers still do not need to worry about cases such as emergency financial needs for the down payment of the next residence as some owner-occupiers do. The flipped properties are usually not involved in foreclosure cases either. Taken together, the relative sizes of Q_S^{PS} and Q^{OI} is undetermined. But we can expect $Q_B^{PS} - Q^{OI} > Q_S^{PS} - Q^{OI}$. In other words, the purchase discount is higher than the resale premium for flippers (**Hypothesis 2**).

The third hypothesis follows from Hypothesis 2 and further explores the impacts of the temporal variation of search costs on Q^{PS}. As discussed, the forgone rental income is a major component of flippers' opportunity costs during the holding period, and hence the search costs for them to resell. We expect the market rental prices to be negatively associated with the resale premium but not with the purchase discount (**Hypothesis 3**).

3. Research Design

The empirical design starts with identifying real estate flips. Following previous empirical literature, we identify a pair of buy and resale transactions as a flip based on the holding period. Different from the typical design in the literature where a two-year holding period is used as the threshold, we focus on flips with short holding periods within three months. This is out of several considerations. Firstly, three months is too short for substantial renovations. Restricting holding period to three months controls the effects of fix-ups and depreciation. It singles out excess returns generated by flippers' intensive search from the quality changes of the property. Secondly, our preliminary observation shows that excess returns are most evident among flippers with a very short holding period. Figure 1 displays flippers' average cumulative excess

return over their holding periods as well as their average excess return per month. The solid line shows that, flippers reselling within three months earn cumulative excess returns of around 10%. The returns decrease sharply beyond three months. Thirdly, considering the high moving costs, three months is arguably too short for space consumption by the flippers themselves or for leasing out. Hence the (imputed) rental income in flippers' returns is negligible.

Insert Figure 1

We then estimate the excess returns of flippers. Equation (4) gives the flipping returns over the holding period, where P_{t1} and P_{t2} are the purchase price and the resale price, respectively. The flipping returns are then decomposed into a market return component and an excess return component. The market return component reflects the market conditions during the holding period of the flip. We estimate it based on a market price index. It is defined by Equation (5), where I_{t1} and I_{t2} are the price index values at the time of purchase (t1) and the time of resale (t2), respectively. The remaining part of the flipping returns is the excess return component, estimated by deducting the market return from the flipping return (Equation 6).

$$Flipping\ Return = \frac{P_{t2} - P_{t1}}{P_{t1}} \tag{4}$$

$$Market\ Return = \frac{I_{t2} - I_{t1}}{I_{t1}} \tag{5}$$

$$Excess\ Return = Flipping\ Return - Market\ Return \tag{6}$$

We develop two proxies of the valuation spread of investors, which indicate the variations in V_t, the expected benefit per search. The first one is *price dispersion* in the market which measures the degree of disagreement in transacted prices. With more dispersed transacted prices, market participants learn less from past transactions; their valuation would also be more dispersed. Price dispersion is estimated from a hedonic pricing model in the spirit of Yiu, Man, and Wong (2008). The difficulty in constructing a hedonic pricing model is in observing and

measuring many price relevant characteristics. Therefore, in order to control unquantifiable property attributes, in particular, location, only a few carefully selected estates that have been transacted since the beginning of the study period are used to estimate the price dispersion variable.[7] We regress the (log) transacted prices on property attributes including age, size, floor, the squared terms of the three, and estate dummies, with the district level price indices controlled. The price dispersion is then constructed in two steps: 1) to normalize the residuals from the hedonic regression using the dependent variable, and 2) to take the standard deviation of the normalized residuals for each month.

The price dispersion variable only captures the variations of valuation spread of investors over time. As to the cross-sectional variations in the valuation spread, an additional proxy is developed. Investors rely heavily on the transaction details of other comparable properties to evaluate the target property. More transactions of comparable properties enable ordinary investors to reduce mispricing of the target property, and hence decrease the valuation spread

[7] In the hedonic model used to estimate the price dispersion variable, only big estates that provides a considerable number of transactions over our study period are selected. Only estates that are sold out before the start of the study period and have no additional firsthand sales thereafter are selected. This avoids temporal changes in the sample used to estimate the hedonic model. The resulting sample consists of the four largest estates in Hong Kong, namely City One Shatin, Mei Foo Sun Chuen, Taikoo Shing and Whampo Garden, with 46,762 transactions in total during the study period. Transactions with the lowest and highest 0.2% of index-adjusted unit prices (altogether 235 transactions) are discarded. This is to eliminate the effects of abnormally low transacted prices, which could be due to property transferring from parents to children or between other acquaintances. Such cases largely magnify residual divided by transacted price.

in the market. For each flip, we compile *comps* as the number of transactions of comparable properties during the three months preceding the target flipping transaction. A three-month window is allowed because the information of a trade is usually referred to by other investors in the following several months due to the scarcity of trades in the real estate market. Comparable properties are selected by the following criteria: 1) we divide Hong Kong into 49 districts and require the comparable property to locate in the same district with the flipped property; 2) the size of the comparable property is not more than 10% larger or smaller than the flipped property; 3) the comparable property is not 10 years older or newer than the flipped property.

To test Hypothesis 1, we regress the excess returns per month on comps and price dispersion, and expect the excess returns to be negatively related to comps and positively related to price dispersion. As further tests, the relationships between the excess return and the valuation spread variables are further allowed to vary across different market conditions. We define *hot* to capture market conditions. It is a dummy variables equal to 1 if the market returns have been positive for three consecutive months, and 0 otherwise. It is expected that the interaction terms of hot and the two valuation spread variables to have opposite signs to the coefficients of their standalone terms.

The excess return is further decomposed into purchase discount and resale premium in order to test Hypothesis 2. Both of them are estimated using the repeat sales method. We firstly match the flip with the two transactions of the same housing unit before the flipping purchase and after the flipping sale, respectively. This matching process gives us two matched non-flip transaction price. To estimate the purchase discount of the flippers, the two matched non-flip prices are inflated/deflated to the time of the flipping purchase using a market price index. The mean value of the two adjusted prices are taken as the benchmark market value of the flipped property at the time of the flip purchase. The purchase discount is calculated as the difference

between the flipping buy and the benchmark price as a percentage of the purchase price of the flipper. A positive purchase discount indicates that the flipper buys at a lower price than the benchmark market value. To estimate the resale premium, we follow the same process, except that we adjust the matched non-flip prices to the time of the flip resale. A positive resale premium means that the flipper sells at a price higher than the benchmark value.

This repeat sales approach allows us to compute purchase discount and resale premium only for flipped properties that have been traded for at least four times (including the flip purchase and the flip resale) during the holding period, which compromises the sample size. But the sacrifice is necessary. The holding periods of the owners before and after the flippers can be very long, during which the property may depreciate substantially. By using two matched non-flip transactions that are distributed evenly before and after the flip, the omitted aging effects in the two benchmark prices cancel each other out when we take average. To confirmed Hypothesis 2, a paired t-test will be employed to estimate the significance of difference between the purchase discount and the resale premium.

One concern of our tests is the potential selection bias in the flip sample. If buyers on the market randomly encounter the chances to buy below the market, and such lucky buyers choose to flip while other buyers hold for longer, we may still be able to confirm Hypothesis 1 even if flippers do not search more intensively. The tests on Hypotheses 2 could help test whether this selection bias is a concern. If flippers simply buy underpriced properties out of luck but do not enjoy lower search cost, they should sell at around the market price and earn zero resale premium on average. A positive sale premium would imply that flippers are skilled and the observed above market returns are not merely due to sample selection bias.

As will be shown in the Data section, flippers earn over 75% of their excess returns by buying at a discount. Hence, a flipper would have a quite accurate estimation of her excess return at the time of purchase. On one hand, this further relieves the endogeneity concern that

only investors who found themselves earning a profit choose to flip while others hold longer and fall out of our flip sample. On the other hand, if as hypothesized, the valuation spread does affect the excess returns, the major effects should be at the time of purchase. Therefore, in the main regression, both *price dispersion* and *comps* are measured at the time when flippers buy. To further avoid endogeneity, both variables are estimated with only non-flip transactions.

Hypothesis 3 describes the effects of flippers' rental income forgone on their resale premium. When the market rental is higher, leaving the property vacant induces higher opportunity costs for flippers for holding the property. In this case, flippers would be more keen to sell the property quickly, even at the cost of lower resale premium. As the holding cost only incurs after flippers' purchase, market rent should not show the same effect on the purchase discount. To test the hypothesis, we use a market-wide rental index to measure the temporal variations in the forgone rental income, and regress the purchase discount and resale premium on it. The market rent variable is expected to have a negative coefficient in the resale premium equation but insignificant in the purchase discount model. Taken the two expected effects together, a higher market rental should also be associated with lower excess returns. Hence, we add market rent as an additional variable to the tests of Hypothesis 1 and expect it to be negative.

4. Data

We employ the data of the second-hand residential property market in Hong Kong to test the hypotheses. The transaction records are extracted from the Economic Property Research Centre database, which provides information on the time of transactions, transacted prices, names of buyers and sellers, and the detailed address and quality attributes of the transacted properties. The price index used to estimate the market returns is the HKU Repeat Sales Index Series[8]

[8] Refer to http://hkureis.versitech.hku.hk/ for the index values and the details about the

(Chau, Wong, & Yiu, 2005). The market rent variable is constructed from a monthly market-wide rental index compiled by the Rating and Valuation Department of Hong Kong.[9]

The Hong Kong housing market is selected as our laboratory for empirical tests mainly for its high liquidity. It provides us with a big sample size of 58,974 flips after the following sample construction procedure. This is considerably bigger than the major empirical studies on real estate flipping, which have sample sizes ranging from 14,000 to 37,000[10].

(1) By matching the exact addresses of the transacted properties, we firstly identify all the repeat sales pairs in the dataset. As mentioned, we employ a time-dependent definition of flips. A flip is defined as a pair of buy and resale transactions of the same housing unit with a time interval within three months.

(2) The study period is from January 1992 to December 2010. The period after 2010 is discarded considering a series of anti-speculation policies[11] implemented by the Hong Kong government in effective since the end of 2010. Since then, housing flips have been extremely inactive. The year 2011 recorded 84[12] cases of buy-resale within three

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construction of the index.

[9] Source: http://www.rvd.gov.hk/en/property_market_statistics/index.html

[10] See Depken II et al. (2009), Bayer et al. (2013) and Fu and Qian (2014).

[11] The Hong Kong government implemented the Special Stamp Duty (SSD) policy aiming at suppressing speculation. If a property was acquired between 20 November 2010 and 26 October 2012, the SSD chargeable is the 15%, 10% and 5% for properties held for 0 – 6 months, 6 – 12 months, and 12 – 24 months, respectively. The rates were increased to 20%, 15% and 10% since 27 October 2012.

(Source: http://www.ird.gov.hk/eng/faq/ssd.htm)

[12] Counted at the time when the flipper purchased the target property.

months, which is only 2.5% of the average annual flipping volume during the study period.

(3) Flips with the purchase and resale recorded in the same month are excluded. They may simply be recording errors rather than real transactions for two reasons. First, in Hong Kong, the transaction procedure usually takes more than a month. Second, the purchasing and reselling prices are mostly the same for these flips. Given the high transaction costs, it is irrational to do such transactions.

(4) Flips with excess returns (over holding period) higher than 200% or lower than -25% are considered as abnormal and discarded. The transacted prices of these transactions may be contaminated by property ownership transfer as bequests from parents, or transactions between related parties.

Insert Table 1

Summary statistics are provided in Table 1. On average, the flipped properties are about 17 years old and 500 square feet, which is older and smaller than the average of the total stock in Hong Kong (12.5 years old and 533 square feet). The observation is consistent with the literature on housing flips in that flippers prefer smaller and older properties with smaller lump sum payments. In Hong Kong, this may be due to the progressive transaction tax rates – transactions of expensive properties suffer from higher rates.

The average monthly flipping return of home flips is 8.4%, which yields a cumulative return over the holding period at 14.9%. The flipping return is not net of transaction costs. The transaction tax rate (the stamp duty) in Hong Kong ranges from HK$100 to 3.75% of the transaction price during the study period, the exact rate depending on the transaction value.[13]

[13] Information source: http://www.ird.gov.hk/eng/pdf/sd_pty_rates.pdf

For a property transacted at the mean price of the flip sample (HK$ 2.675 million), the rate is 1.5%. The commission fee charged by real estate agents in Hong Kong is 1%[14] of the transaction value, in general lower than other developed markets. The expense of legal services is around 1%. According to statistics released by Hong Kong Monetary Authority[15], during the study period, the total interest expenses of mortgage loans for a property bought entirely by mortgage were around 0.5%, 1% and 1.5% of the transacted price for 1 month, 2 months and 3 months holding periods respectively. Taken together, despite that the actual gain is lower than 14.9%, an average housing flip still generates a handsome profit. Considering a flip at the average transacted price of HK$ 2.65 million, a 15% return translates into HK$ 0.4 million (equivalently, US$50,000).

The standard deviation of the returns is high, making the 8.4% flipping return statistically insignificant. The insignificance seems to imply that that flippers earn positive excess returns just by coincidence. But this is not necessarily the case. In fact, the insignificance might be caused by the noises in excess returns introduced by another type of flippers, namely speculators. As Bayer et al. (2013) pointed out, some investors flip properties with the intention time the market. Despite their ability to forecast the market trend, speculators do not search more than others to select the underpriced properties. Their excess returns should be random with a non-positive mean. Since speculators may also be dumb buyers or sellers that trade with the price searchers, their average excess returns could even be negative. Nevertheless, whether there are a substantial number of price searchers earning positive excess returns is still of interest. Therefore, we still proceed to test our hypotheses. If the positive returns are earned

[14] http://www.globalpropertyguide.com/Asia/hong-kong/Buying-Guide

[15] http://www.hkma.gov.hk/eng/key-information/press-release-category/residential-mortgage-survey.shtml

entirely out of luck, our hypotheses would be rejected.

Table 1 shows that the average excess return per month is 6.0%, while the market return component only accounts for less than 30% of the flipping returns. This justifies our sample construction procedure in selecting the price searchers and largely excluding speculators. The monthly excess returns are 6% on average. For the flips with a holding period of three months or shorter, the average holding period is 2.05. The average monthly market return earned by an average investor (not flipper) during the study period is only 0.14%, which is much lower than the market returns of 2.2% earned by flippers. The big gap reflects the intensive flipping activities by speculators when the market is in uptrends.

Figure 2 plots the average excess returns per month of flippers and the Repeat Sales Index from 1992 to 2010. It shows that excess returns are highly time-varying, which further motivates us to explain the excess returns with time-varying factors, in addition to investors heterogeneity studied in previous research. The average excess return per month is higher during the market downtrend from late 1997 to early 2003, at around 10%, and lower in the two market booming periods when more attractive market returns are available. This observation further supports our argument that the flipping activities of speculators have introduced noises into the average excess returns eared by flippers.

Insert Figure 2

Price dispersion and *comps* are the key independent variables. They reflect the temporal and cross-sectional variations in the valuation spread that flippers can exploit. *Comps* covers a wide range from 0 to 934 transactions of comparable properties, while *price dispersion* shows less variation. *Experience* is the number of times a flipper has flipped properties during the study period. To construct *experience*, we count the number of flip records with the same 'seller' name in the database. On average, the flippers flip for 1.3 times over the study period.

5. Empirical findings

Columns (1) and (2) of Table 2 display the regression results of the tests for Hypothesis 1. The dependent variable is excess returns per month, which is the excess returns over holding period defined in Equation (6) divided by the holding period of the flipper. The variables of interest are comps and price dispersion. They are proxies of the degree of valuation spread of investors. The valuation spread is higher when comps is smaller and price dispersion is higher. Hypothesis 1 posits that the valuation spread increases the chance of flippers who search more intensively in identifying underpriced properties to buy or in overpricing properties at resale, both of which increases flippers' excess returns. As expected, the excess returns decrease with comps and increase with the price dispersion. The empirical evidence strongly supports Hypothesis 1.

Insert Table 2

Market returns have significantly negative coefficients. Flippers earn lower excess returns when the market is in an uptrend. We argue that this is due to the temporal changes of the mix of flippers under different market conditions. While price searchers are good at exploiting the valuation spread by intensive searching, not all flippers flip with the same purpose, despite our efforts in sample selection. As Bayer et al. (2013) suggest, speculators also flip. Instead of searching intensively for below-average listings or above-average offerings, speculators buy at market price with the expectation to reap the capital gain after the market goes up. During market booms, speculators are more active and account for a larger percentage of flippers. The non-positive excess returns of speculators lower the average excess returns earned by flippers in booming times. Another important implication from the time-varying mix of flippers is that the effects of valuation spread on the flipping excess returns should be stronger in cold market

conditions, when speculators are relatively less active. Columns (3) and (4) include interaction terms of Hot with the valuation spread variables. Consistently, the results show that the coefficients of comps and price dispersion are larger in bear markets.

Excess returns per month are also negatively related to holding period. This is consistent with our argument in hypothesis 2 that flippers enjoy their search advantage over ordinary investors mainly at the time of purchase. As the major component of excess returns is the purchase discount, which cannot be affected by the holding period, longer holding period dilutes excess returns per month. More details will be discussed when the empirical test for hypothesis 2 is introduced.

Bayer et al. (2013) show that more experienced flippers, who may have accrued skills of collecting and analyzing public information, are able to earn higher excess returns. We include *experience* in our regression as a control variable. *Experience* is the number of flips the flipper has conducted over the study period. Consistently, experience has positive coefficients across all specifications.

We also control the major property attributes in the regression, including size, age and floor. Table 2 shows that excess returns decrease with size and floor and increases with age, which implies that the excess returns are negatively related to property value. This could be driven by the progressive transaction tax rates (stamp duty) of real estate transactions in Hong Kong[16]. As the rates increase with the transaction value, flippers prefer transactions with low lump sum payments; and the most capable flippers, who earn higher excess returns, seek to flip properties with lowest lump sum payment to enjoy the lowest rates. This selection of properties by flippers results in the observed coefficients of the housing attributes.

At the same time, age serves an additional control purpose. Despite that we restrict the

[16] Source: http://www.ird.gov.hk/eng/pdf/sd_pty_rates.pdf

holding period of flippers to three months in order to minimize the quality change of the flipped properties during the holding period, this restriction does not exclude the possibility that flippers may do some quick cosmetic improvements on the property before resale. Older properties are more depreciated so that flippers of such properties are more likely to do cosmetic renovation. The positive coefficient of the age variable is also consistent with this effect.

To further support Hypothesis 1, we run a counterfactual test on 'slower' resales beyond a year and within two years, which are likely to be made by just ordinary investors instead of price searchers. About 100,000 resales with holding periods ranging from 12 month to 24 months took place during the study period. We repeat the tests of Hypothesis 1 with the 'slower' resales sample and present the findings in the Appendix. On average, the slower resales have an excess return over their holding period of only 0.3%. More importantly, the valuation spread in the market do not show any impact on the excess returns of the slower resales. The obscure market information environment only benefits price searchers who buy and resell quickly.

However, different from the effects of the valuation spread of investors, experience still show a significantly positive impact, despite that these slower resales only earns close to zero excess returns. This observation further differentiates our findings on real estate flips from Bayer et al. (2013). While they use experience as a key feature to identify flippers and to categorize distinct types of flippers, we find that experience helps not only flippers, but also investors with longer holding periods, to gain good bargains in buying and selling properties in relation to unexperienced investors.

To test Hypothesis 2, we firstly decompose the excess returns into to the purchase discount and the premium of sales. Summary statistics of the two components are given in the upper panel of Table 3. To compute the purchase discount and the resale premium, the flipped property has to be traded for at least four times during our study period. This approach

identifies 9,192 observations.[17] The purchase discount, with a mean of 7.3%, is the major component of flippers' returns. It is more than 60% higher than the market return component and accounts for more than 75% of the excess return component. On average, flippers sell at a smaller but positive premium of 2.2%. As discussed in Research Design, the positive premium implies that our observations are not merely attributed to sample selection bias. These findings are consistent with Depken II et al. (2009) and Bayer et al. (2013) that the major source of flippers' returns is the purchase discount.

Insert Table 3

Table 3 also presents the summary statistics of the holding period difference, estimated as the difference in the holding period of the previous owner that the flipper buys from and the holding period of the next owner that the flipper sells to. The slightly negative mean value of the holding period difference shows that the flip resales occurred closer to the subsequent transaction than the flip purchases did to the previous transaction, but only by half a month. The matched non-flip transactions are distributed almost evenly on the two sides of the flip. The omitted aging effects in the estimated purchase discount and resale premium are minimized.

The paired t-test is employed to estimate the significance of the difference between the purchase discount and the resale premium. The t-statistics, presented in the lower panel of Table 3, shows that the purchase discount is substantially higher than the resale premium among the flips with a holding period within three months. This confirms our argument that flippers are price searchers who take advantage of their lower search costs than ordinary investors. They enjoy a larger advantage when they search for underpriced properties to buy than when they

[17] Similar to the filters of the excess returns, observations with the purchase discount or the resale premium larger than 1 or smaller than -0.5 are discarded.

put their properties up for sale. Hypothesis 2 is supported.

Before moving on to the tests of Hypothesis 3, we regress the purchase discount and resale premium on the valuation spread variables as further tests on Hypothesis 1. The results are presented in Table 4. In both models, we control for the holding period difference to account for the potential effects of depreciation between the flip and the matched non-flip transactions. In the regression of resale premium, we also control the purchase discount as an independent variable, as flippers who have already earned a big discount at purchase may be willing to sell at a lower resale premium. We expect the valuation spread to have the same effects on the purchase discount and resale premium with those on the excess returns. The results are as expected.

Tables 5 shows the results of the tests on Hypothesis 3. Hypothesis 3 states that the forgone rental income during the holding period is a major component of the search costs of a flipper when she sells. Therefore, we expect the forgone rental income to be negatively associated with the resale premium. But we do not expect it to have the same relationship with the purchase discount as the forgone rental income has not been incurred yet when flippers buy. The market rental price index of residential properties in Hong Kong is used to indicate the time-series variations in the foregone rental income for flippers. Columns (5) and (6) show that, as expected, flippers' excess returns are negatively associated with the first difference of market rent.[18] Columns (1) through (4) further show that this effect is mainly due to the market rent's

[18] Pearson correlation tests show that the temporal variation of the level of market rent is highly correlated with the price dispersion (cor = -0.69), which causes multicollinearity in the regression and obscures the effects of market rent. Hence, the first difference the market rent index, which has much lower correlation with price dispersion (cor = -0.30), is included as the independent variable. If level of the market rent is used, the coefficient is also significant and

impact on the sale side. The purchase discount is indifferent to market rent.

As a robustness check, we conduct a sensitivity test on the threshold of holding period in defining flips. In the sensitivity tests, a flip is redefined as a pair of buy and resale within six months. We compile the six-month flip sample and present the summary statistics in Tables 6 and 8. The statistics support our earlier assertion about the mix of flippers. Speculators also flip, but they are less sensitive to holding period than price searchers. The market returns per month earned by six-month flippers is similar that earned by the three-month flippers. Extending the holding period yields much higher cumulative market returns. Tables 7, 9 and 10 repeat the regression analyses using the redefined flip sample. The results for the excess returns as well as the two components of the excess returns are highly consistent with our main regressions based on flips within three months. Our empirical findings are robust.

6. Conclusion

The valuation of an asset differs among market participants. This is particularly so in the real estate market where market participants rely on their incomplete information to evaluate property values. Those who have lower search costs search more intensively so they are able to buy low and sell high. This study identifies flippers in the real estate market as such price searchers. Using the transaction data of residential properties in Hong Kong, we show that real estate flippers constantly earn positive excess returns by exploiting the valuation spread among market participants. They identify and purchase underpriced properties, and then sell at a price slightly higher than market price. Flippers earn higher excess returns when the market prices are more dispersed and there are less comparable transactions. The ability of flippers in

negative in the standalone regressions, but turns positive in the pooled regressions in Columns (4) of Tables 2 and 5.

exploiting the valuation spread is dictated by the comparative advantage of flippers in search compared to ordinary investors. This comparative advantage is larger when flippers buy than when they resell due to the rental income forgone during flippers' holding period. So flippers' excess returns mainly come from the discount obtained at purchase. Despite that the resale premium is more moderate, it expands when the search cost is lower during their holding periods.

In addition to the academic contribution, our study also generates policy implications. The activities of flippers who are skilled at identifying underpriced properties or overpriced offerings match the temporarily unsynchronized buyers and sellers either in time or space and improve market efficiency by narrowing down the spreads of listing and offering prices. Consistent with the conclusion of Bayer et al. (2013), our findings also suggest that policies aiming at curtailing speculation by restricting flipping may wrongly eliminate efficiency enhancing flippers.

References

Bayer, Patrick J, Christopher Geissler, and James W Roberts. "Speculators and Middlemen: The Role of Intermediaries in the Housing Market." In *Economic Research Initiatives at Duke (ERID)*, 2013.

Chau, K. W., S. K. Wong, and C. Y. Yiu. "Real Estate Price Indices in Hong Kong." *Journal of Economic Literature* 13 (2005): 20.

Chinco, Alex, and Christopher Mayer. "Misinformed Speculators and Mispricing in the Housing Market." *Review of Financial Studies* 29, no. 2 (2016): 486-522.

Depken II, Craig A, Harris Hollans, and Steve Swidler. "An Empirical Analysis of Residential Property Flipping." *The Journal of Real Estate Finance and Economics* 39, no. 3 (2009): 248-63.

Fu, Yuming, and Wenlan Qian. "Speculators and Price Overreaction in the Housing Market." *Real Estate Economics* 42, no. 4 (2014): 977-1007.

Harding, John P, Stuart S Rosenthal, and CF Sirmans. "Estimating Bargaining Power in the Market for Existing Homes." *The Review of Economics and Statistics* 85, no. 1 (2003): 178-88.

Hochberg, Yael V., and Tobias Muhlhofer. "Market Timing and Investment Selection_Evidence from Real Estate Investors." *Journal of Financial & Quantitative Analysis* Forthcoming (2017).

Knight, John R. "Listing Price, Time on Market, and Ultimate Selling Price: Causes and Effecs of Listing Price Changes." *Real Estate Economics* 30, no. 2 (2002): 25.

Kumar, Alok. "Hard-to-Value Stocks, Behavioral Biases, and Informed Trading." *Journal of Financial & Quantitative Analysis* 44, no. 6 (2009): 1375-401.

Levitt, Steven D, and Chad Syverson. "Market Distortions When Agents Are Better Informed: The Value of Information in Real Estate Transactions." *The Review of Economics and*

Statistics 90, no. 4 (2008): 599-611.

Springer, Thomas M. "Single-Family Housing Transactions: Seller Motivations, Price, and Marketing Time." *The Journal of Real Estate Finance and Economics* 13, no. 3 (1996): 237-54.

Stigler, George J. "The Economics of Information." *The journal of political economy* (1961): 213-25.

Turnbull, Geoffrey K., and Velma Zahirovic-Herbert. "Why Do Vacant Houses Sell for Less: Holding Costs, Bargaining Power or Stigma?". *Real Estate Economics* 39, no. 1 (2011): 19-43.

Wheaton, William C. "Vacancy, Search, and Prices in a Housing Market Matching Model." *Journal of Political Economy* 98, no. 6 (1990): 23.

Yavaş, A. "A Simple Search and Bargaining Model of Real Estate Markets." *Real Estate Economics* 20, no. 4 (1992): 533-48.

Yinger, J. "A Search Model of Real Estate Broker Behavior." *The American Economic Review* (1981): 591-605.

Yiu, C. Y., K. F. Man, and S. K. Wong. "Trading Volume and Price Dispersion in Housing Markets." *Journal of Property Research* 25, no. 3 (2008): 203-19.

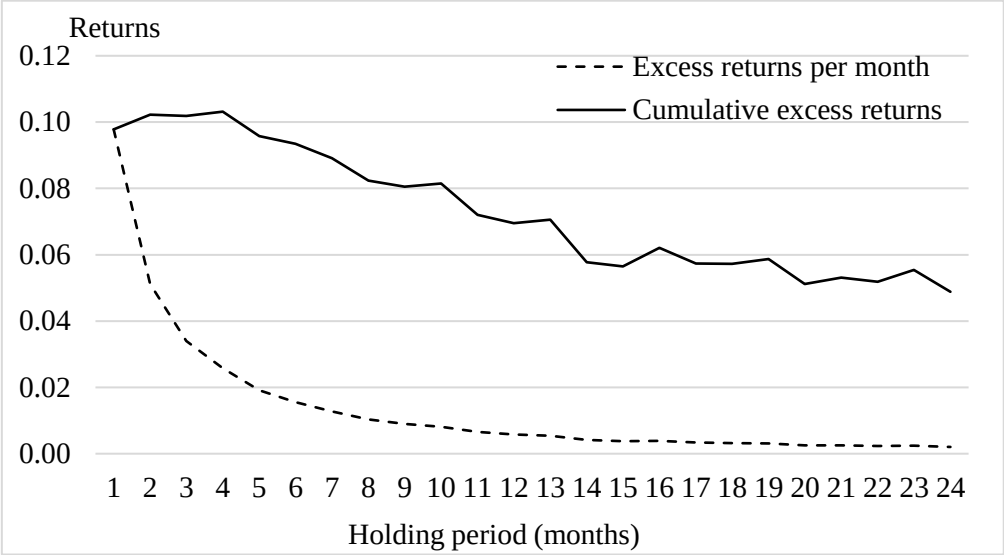

Figure 1 Flipping returns and holding period.

This figure presents the average excess returns earned by flippers with various holding periods, ranging from 1 month to 24 months. For each case of flip, the holding period is the number of months between the time when the flipper purchases a property and the time when she resells it. We calculate the cumulative excess return of each flip by subtracting the market return over the same period from the flipping return. The excess return per month is the cumulative excess return divided by the number of months in the holding period.

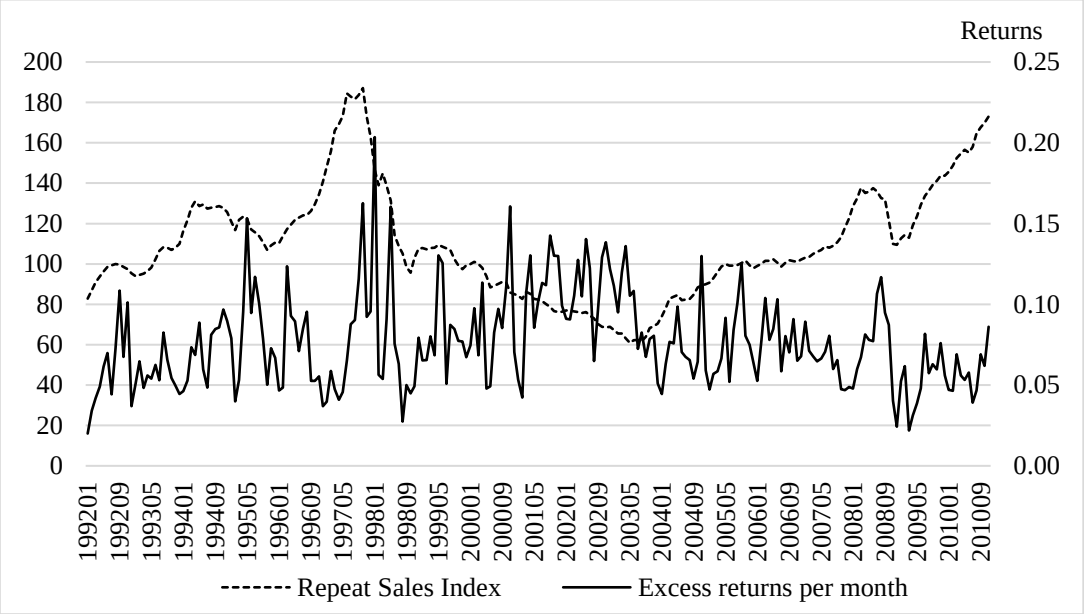

Figure 2 Excess returns of flipping and market returns

This figure presents the excess returns per month earned by flippers who buy and sell within three months over our study period from 1992 to 2010. The monthly excess returns is calculated by firstly subtracting the market return over the holding period of a flip from the cumulative flipping return of the flip, and then dividing it by the number of months in the holding period. We contrast flippers' monthly excess returns over time with the Repeat Sales Index, which captures the market conditions.

Table 1 Summary Statistics

Statistic	N	Mean	St. Dev.	Min	Max
Age	58,974	203.380	138.386	0	700
Size	58,974	500.827	271.783	72.000	4,260.000
Floor	58,974	12.779	9.497	1	85
Flipping returns (per month)	58,974	0.084	0.099	-0.275	2.000
Market returns (per month)	58,974	0.022	0.025	-0.130	0.076
Excess returns (per month)	58,974	0.060	0.099	-0.250	1.970
Purchase price	58,974	2.358	2.999	0.120	65.000
Resale price	58,974	2.662	3.374	0.170	71.800
Period	58,974	2.047	0.798	1	3
Experience	58,974	0.055	0.228	0	1
Price dispersion	58,974	0.254	0.118	0.113	0.739
Comps	58,974	78.122	101.593	0	934
Market rent	55,677	0.008	0.014	-0.084	0.086

Definitions of variables

Age	the age (months) of the flat that is flipped
Size	the size (square feet) of the flat that is flipped
Floor	the floor level of the flat that is flipped
Flipping returns (per month)	the difference between the resale price and the purchase price as a percentage of the purchase price divided by the holding period
Market returns (per month)	the returns of the market over the holding period calculated from the Repeat Sales Index divided by the holding period
Excess returns (per month)	the difference between the flipping returns and market returns divided by the holding period
Purchase price	the price at which the flipper purchases the property (*million HK$)*
Resale price	the price at which the flipper sells the property (*million HK$)*
Period	the holding period of the flipper measured in months
Experience	a dummy variable that equals 0 if the flipper took 1 or 2 repeat sales with a holding period within 3 months during the study period, and 1 if 3 or more.
Price dispersion	the market-wide degree of price dispersion calculated according to the method introduced in Research Design
Comps	the number of transactions of comparable properties within the three months before the flip
Market rent	the first difference of the monthly market rental index

Table 1 presents the summary statistics of the sample of flips with a holding period within 3 months. The data is extracted from the EPRC database that records all the transactions of

residential properties in Hong Kong. The sample covers the period from 1992 to 2010. We use the detailed address to match the transactions of the same residential units, and identify a pair of buy and resale transactions as a flip if the time interval between the two consecutive transactions of the same unit is within three months. We clean the sample by discarding flips with purchase and resale records in the same month, and flips with a cumulative excess return over 200% or below -75%. The screening results in 58,974 flips. This table shows the attributes of residential flats being flipped (*Age, Size, Floor*), the various return components earned by flippers (*flipping returns, market returns, and excess returns*), the transaction details of the flips (*Transaction prices, holding period*), and the two variables measuring the valuation distribution on the market (*Price dispersion, comps*). The two valuation distribution variables are measured at the time when the flipper buys.

Table 2 Determinants of monthly excess returns

	Dependent variable: *Excess returns (per month)*				
	(1)	(2)	(3)	(4)	(5)
Comps	-0.028***		-0.073***		-0.090***
	(0.004)		(0.009)		(0.010)
Price dispersion		0.047***		0.053***	0.055***
		(0.003)		(0.003)	(0.004)
Comps × Hot			0.049***		0.083***
			(0.009)		(0.010)
Price dispersion × Hot				-0.010***	-0.022***
				(0.003)	(0.003)
Market returns	-0.525***	-0.484***	-0.537***	-0.445***	-0.456***
	(0.016)	(0.016)	(0.017)	(0.017)	(0.017)
Period	-0.036***	-0.035***	-0.036***	-0.036***	-0.036***
	(0.0005)	(0.0005)	(0.0005)	(0.0005)	(0.0005)
Experience	0.009***	0.008***	0.009***	0.008***	0.008***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Size	-0.005***	-0.003**	-0.005***	-0.003**	-0.004***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Age	0.111***	0.117***	0.108***	0.115***	0.109***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Floor	-0.401***	-0.428***	-0.396***	-0.435***	-0.413***
	(0.042)	(0.042)	(0.042)	(0.042)	(0.042)
Constant	0.131***	0.114***	0.133***	0.115***	0.119***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Observations	58,974	58,974	57,821	57,821	57,821
Adjusted R^2	0.141	0.144	0.141	0.143	0.145
F Statistic	1,386.993***	1,412.682***	1,186.849***	1,210.879***	979.035***

Table 2 shows the regression results for testing Hypothesis 1. The dependent variable is flippers' excess returns per month. The key independent variables are *comps* and *price dispersion*. The degree of valuation spread is negatively associated with *comps* and positively associated with *market dispersion*. As predicted, the excess return is higher when comps is smaller and market dispersion is higher. These effects are stronger in cold market. Standard errors are presented in parentheses. Significance levels: * (p <0.10), ** (p <0.05), and *** (p <0.01).

Table 3 Flipping discount and premium

Statistic	N	Mean	St. Dev.	Min	Max
Purchase discount	9,192	0.073	0.158	-0.250	1.997
Resale premium	9,192	0.022	0.116	-0.250	0.613
Holding period difference	9,192	-0.524	67.398	-199	218
t-test on the difference of mean					
Difference		0.051			
t-statistic		19.443			

Table 3 presents the summary statistics of the purchase discount and the resale premium earned by the flippers with a holding period within three months. To calculate the discount, we (1) match the flip to the previous transaction and the next transaction of the same property, (2) adjust the transaction prices of the two matched transactions with a market index to the time of the flipping buy and sell respectively, (3) take the mean value of the prices of the two matched transactions as the benchmark, and (4) calculate the purchase discount/resale premium as the price difference between the flip buy/resale price and the benchmark as a percentage of the flipper's purchase/resale price. A positive value of the discount means the flipper obtains a price concession at purchase; a positive value of the resale premium means the flipper sells at higher than benchmark value. Holding period difference is the mean of number of months between the flip buy/resale and the two matched non-flip transactions. A negative mean value means that, on average, the flips took place half a month closer to the subsequent non-flip transaction than to the previous one. The lower panel of the table presents the result of a paired t-test on the difference between the purchase discount and resale premium.

Table 4 Determinants of purchase discount and resale premium

Dependent variable	*Purchase discount*		*Resale premium*	
	(1)	(2)	(3)	(4)
Comps	-0.235***		-0.018*	
	(0.019)		(0.010)	
Price dispersion		0.068***		0.121***
		(0.016)		(0.008)
Market returns	-1.241***	-1.340***	-0.943***	-0.558***
	(0.157)	(0.167)	(0.077)	(0.080)
Period	-0.007***	-0.005**	-0.005***	-0.004***
	(0.002)	(0.002)	(0.001)	(0.001)
Holding period	-0.356***	-0.387***	0.163***	0.181***
difference	(0.029)	(0.029)	(0.015)	(0.015)
Experience	0.018**	0.016*	0.021***	0.020***
	(0.008)	(0.008)	(0.004)	(0.004)
Size	-0.062***	-0.047***	0.018***	0.018***
	(0.008)	(0.008)	(0.004)	(0.004)
Age	0.101***	0.162***	0.077***	0.082***
	(0.018)	(0.017)	(0.009)	(0.009)
Floor	-0.621***	-0.748***	-0.579***	-0.602***
	(0.196)	(0.197)	(0.100)	(0.098)
Purchase discount			-0.515***	-0.518***
			(0.006)	(0.005)
Constant	0.149***	0.092***	0.066***	0.026***
	(0.009)	(0.009)	(0.004)	(0.005)
Observations	9,575	9,575	9,398	9,398
Adjusted R^2	0.094	0.081	0.514	0.525
F Statistic	125.416***	106.946***	1,103.162***	1,154.903***

Table 4 shows the regression results of *purchase discount* and *resale premium* on the two valuation spread variables. The dependent variables are estimated using the repeat sales method. The table shows that valuation spread of investors have similar effects on the purchase discount and resale premium to that on the excess returns. Standard errors are presented in parentheses. Significance levels: * (p <0.10), ** (p <0.05), and *** (p <0.01)

Table 5 Effects of holding costs

Dependent variable	*Excess returns*		*Purchase discount*		*Resale premium*	
	(1)	(2)	(3)	(4)	(5)	(6)
Market rent	-0.301***	-0.199***	-0.113	0.157	-0.640***	-0.413***
	(0.028)	(0.029)	(0.141)	(0.144)	(0.072)	(0.074)
Comps		-0.015***		-0.229***		0.008
		(0.004)		(0.019)		(0.010)
Price dispersion		0.045***		0.041***		0.111***
		(0.004)		(0.016)		(0.008)
Market returns	-0.482***	-0.425***	-1.546***	-1.173***	-0.644***	-0.394***
	(0.017)	(0.017)	(0.173)	(0.178)	(0.084)	(0.086)
Period	-0.036***	-0.036***	-0.006**	-0.007***	-0.005***	-0.005***
	(0.0005)	(0.0005)	(0.002)	(0.002)	(0.001)	(0.001)
Holding period difference			-0.398***	-0.349***	0.154***	0.173***
			(0.029)	(0.029)	(0.015)	(0.015)
Experience	0.009***	0.009***	0.016**	0.018**	0.021***	0.020***
	(0.002)	(0.002)	(0.008)	(0.008)	(0.004)	(0.004)
Size	-0.003**	-0.004***	-0.047***	-0.061***	0.018***	0.018***
	(0.001)	(0.002)	(0.008)	(0.008)	(0.004)	(0.004)
Age	0.117***	0.111***	0.163***	0.102***	0.084***	0.086***
	(0.003)	(0.003)	(0.017)	(0.018)	(0.009)	(0.009)
Floor	-0.418***	-0.433***	-0.754***	-0.621***	-0.578***	-0.598***
	(0.043)	(0.043)	(0.197)	(0.196)	(0.099)	(0.098)
Purchase discount					-0.517***	-0.519***
					(0.005)	(0.005)
Constant	0.130***	0.119***	0.113***	0.135***	0.066***	0.030***
	(0.002)	(0.002)	(0.008)	(0.010)	(0.004)	(0.005)
Observations	55,677	55,677	9,575	9,575	9,398	9,398
Adjusted R^2	0.142	0.145	0.080	0.095	0.517	0.526
F Statistic	1,318.865***	1,050.377***	104.425***	101.083***	1,120.391***	950.715***

Table 5 shows the effects of holding costs measured by market rent during the holding period on excess returns, purchase discount and resale premium. Columns (1), (3) and (5) show the regressions with only market rent and control variables; Columns (2), (4) and (6) include the two proxies of valuation spread of investors as additional independent variables. Standard errors are presented in parentheses. Significance levels: * (p <0.10), ** (p <0.05), and *** (p <0.01)

Table 6 Summary Statistics (period <= 6 months)

Statistic	N	Mean	St. Dev.	Min	Max
Age	102,150	203.993	137.153	0	719
Size	102,150	506.902	274.541	72.000	4,260.000
Floor	102,150	12.991	9.783	1	89
Flipping returns (per month)	102,150	0.064	0.083	-0.275	2.000
Market returns (per month)	102,150	0.020	0.023	-0.130	0.076
Excess returns (per month)	102,150	0.043	0.081	-0.250	1.970
Purchase price	102,150	2.424	3.064	0.113	65.000
Resale price	102,150	2.765	3.484	0.113	71.800
Period	102,150	3.245	1.613	1	6
Experience	102,150	0.074	0.261	0	1
Price dispersion	102,150	0.254	0.114	0.113	0.739
Comps	102,150	74.304	96.978	0	1,173
Market rent	97,117	0.008	0.015	-0.084	0.086

Table 7 presents the summary statistics of the sample of flips with a holding period within 6 months. The variables are defined in the same manner with those presented in Table 1.

Table 7 Determinants of monthly excess returns (period <= 6 months)

	Dependent variable: *Excess returns (per month)*				
	(1)	(2)	(3)	(4)	(5)
Comps	-0.025***		-0.064***		-0.075***
	(0.003)		(0.005)		(0.006)
Price dispersion		0.039***		0.043***	0.044***
		(0.002)		(0.002)	(0.002)
Comps × Hot			0.044***		0.070***
			(0.005)		(0.006)
Price dispersion × Hot				-0.006***	-0.016***
				(0.002)	(0.002)
Market returns	-0.462***	-0.431***	-0.477***	-0.407***	-0.420***
	(0.010)	(0.011)	(0.011)	(0.011)	(0.011)
Period	-0.017***	-0.017***	-0.017***	-0.017***	-0.017***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Experience	0.004***	0.004***	0.004***	0.004***	0.004***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Size	-0.002**	-0.001	-0.002***	-0.001	-0.002**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Age	0.084***	0.090***	0.083***	0.088***	0.083***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Floor	-0.303***	-0.326***	-0.298***	-0.332***	-0.315***
	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)
Constant	0.096***	0.082***	0.098***	0.082***	0.086***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Observations	102,150	102,150	100,536	100,536	100,536
Adjusted R^2	0.158	0.160	0.159	0.161	0.162
F Statistic	2,732.529***	2,776.775***	2,368.508***	2,405.111***	1,944.762***

Table 7 shows the sensitivity test of Hypotheses 1 with a sample of flips resold within six months. The variables are defined in the same manner with those presented in Table 2. Standard errors are presented in parentheses. Significance levels: * (p <0.10), ** (p <0.05), and *** (p <0.01)

Table 8 Flipping discount and premium (period <= 6 months)

Statistic	**N**	**Mean**	**St. Dev.**	**Min**	**Max**
Purchase discount	16,428	0.071	0.159	-0.250	1.997
Resale premium	16,428	0.021	0.116	-0.250	0.613
Holding period difference	16,428	-2.865	67.345	-199	218
t-test on the difference of mean					
Difference		0.050			
t-statistic		25.898			

Table 8 presents the summary statistics of the purchase discount and the resale premium earned by the flippers with a holding period within six months. The discount and the premium are computed through the same approach as that presented in Table 3. The lower panel of the table presents the results of a t-test on the difference in mean between the purchase discount and the resale premium.

Table 9 Determinants of purchase discount and resale premium (period <= 6 months)

Dependent variable	*Purchase discount*		*Resale premium*	
	(1)	(2)	(3)	(4)
Comps	-0.213***		-0.016**	
	(0.015)		(0.008)	
Price dispersion		0.073***		0.122***
		(0.012)		(0.007)
Market returns	-1.081***	-1.143***	-0.740***	-0.405***
	(0.120)	(0.125)	(0.061)	(0.063)
Period	-0.004***	-0.003***	-0.004***	-0.003***
	(0.001)	(0.001)	(0.0004)	(0.0004)
Holding period	-0.407***	-0.427***	0.154***	0.168***
difference	(0.021)	(0.022)	(0.012)	(0.011)
Experience	0.015***	0.014***	0.008***	0.008***
	(0.005)	(0.005)	(0.003)	(0.003)
Size	-0.062***	-0.050***	0.016***	0.016***
	(0.006)	(0.006)	(0.003)	(0.003)
Age	0.078***	0.126***	0.101***	0.106***
	(0.013)	(0.013)	(0.007)	(0.007)
Floor	-0.569***	-0.696***	-0.570***	-0.586***
	(0.145)	(0.146)	(0.077)	(0.076)
Purchase discount			-0.489***	-0.492***
			(0.004)	(0.004)
Constant	0.145***	0.093***	0.056***	0.017***
	(0.006)	(0.007)	(0.003)	(0.004)
Observations	17,117	17,117	16,738	16,738
Adjusted R^2	0.084	0.075	0.463	0.474
F Statistic	198.287***	175.318***	1,605.586***	1,676.298***

Table 9 shows the sensitivity test for the regression of *purchase discount* and *resale premium* on the two valuation spread variables with a sample of flips resold within six months. The variables are defined in the same manner with those presented in Table 4. Standard errors are presented in parentheses. Significance levels: * (p <0.10), ** (p <0.05), and *** (p <0.01)

Table 10 Effects of holding costs (period <= 6 months)

Dependent variable	*Excess returns*		*Purchase discount*		*Resale premium*	
	(1)	(2)	(3)	(4)	(5)	(6)
Market rent	-0.208***	-0.129***	-0.054	0.199*	-0.611***	-0.414***
	(0.017)	(0.017)	(0.106)	(0.108)	(0.058)	(0.059)
Comps		-0.014***		-0.206***		0.010
		(0.003)		(0.015)		(0.008)
Price dispersion		0.037***		0.052***		0.114***
		(0.002)		(0.012)		(0.007)
Market returns	-0.435***	-0.393***	-1.350***	-1.031***	-0.445***	-0.229***
	(0.011)	(0.011)	(0.132)	(0.134)	(0.067)	(0.068)
Period	-0.017***	-0.017***	-0.004***	-0.004***	-0.004***	-0.003***
	(0.0001)	(0.0001)	(0.001)	(0.001)	(0.0004)	(0.0004)
Holding period difference			-0.440***	-0.397***	0.142***	0.159***
			(0.022)	(0.022)	(0.012)	(0.011)
Experience	0.004***	0.004***	0.014***	0.014***	0.008***	0.008***
	(0.001)	(0.001)	(0.005)	(0.005)	(0.003)	(0.003)
Size	-0.001	-0.002**	-0.050***	-0.062***	0.016***	0.017***
	(0.001)	(0.001)	(0.006)	(0.006)	(0.003)	(0.003)
Age	0.089***	0.084***	0.127***	0.078***	0.108***	0.110***
	(0.002)	(0.002)	(0.013)	(0.013)	(0.007)	(0.007)
Floor	-0.317***	-0.330***	-0.703***	-0.568***	-0.572***	-0.587***
	(0.025)	(0.025)	(0.146)	(0.145)	(0.076)	(0.076)
Purchase discount					-0.490***	-0.492***
					(0.004)	(0.004)
Constant	0.095***	0.086***	0.114***	0.128***	0.057***	0.020***
	(0.001)	(0.001)	(0.006)	(0.007)	(0.003)	(0.004)
Observations	97,117	97,117	17,117	17,117	16,738	16,738
Adjusted R^2	0.159	0.162	0.073	0.085	0.467	0.475
F Statistic	2,624.469***	2,086.666***	170.262***	160.703***	1,628.100***	1,380.067***

Table 10 shows the sensitivity test of Hypothesis 3, which estimate the effects of *market rent* on flipping excess returns, purchase discount and resale premium with a sample of flips resold within six months. The variables are defined in the same manner with those presented in Table 5. Standard errors are presented in parentheses. Significance levels: * (p <0.10), ** (p <0.05), and *** (p <0.01)

Appendix

Table A1 Determinants of resale premium (12 months <= period <= 24 months)

	Dependent variable: *Excess returns (per month)*		
	(1)	(2)	(3)
Comps	0.0002		0.0002
	(0.0002)		(0.0002)
Price dispersion		-0.0003	-0.0002
		(0.0003)	(0.0003)
Market returns	-0.062***	-0.062***	-0.061***
	(0.003)	(0.003)	(0.003)
Period	-0.0003***	-0.0003***	-0.0003***
	(0.00001)	(0.00001)	(0.00001)
Experience	0.001***	0.001***	0.001***
	(0.0003)	(0.0003)	(0.0003)
Size	0.002***	0.002***	0.002***
	(0.0001)	(0.0001)	(0.0001)
Age	0.016***	0.016***	0.016***
	(0.0003)	(0.0003)	(0.0003)
Floor	-0.049***	-0.049***	-0.049***
	(0.003)	(0.003)	(0.003)
Constant	0.006***	0.006***	0.006***
	(0.0002)	(0.0002)	(0.0002)
Observations	98,342	98,342	98,342
Adjusted R^2	0.056	0.056	0.056
F Statistic	827.814***	827.776***	724.406***

Note: The tests in this table repeat the tests of Hypothesis 1 using a repeat sales sample with a holding period beyond one year and within two years. For these 'slower' resales, valuation spread of investors do not show any impact on the excess returns. Due to limited computing power, *comps* is defined as the trading volume of the districts where the flipped property is located in. Redefining *experience* as the number of times the seller conducted repeat sales within 24 months during the study period yields consistent results.