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Investment behaviour in the housing market*

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Abstract

Residential property flipping is defined as an investment strategy aiming to resell housing within a short timeframe. Investors flipping properties play different economic roles in housing markets. The main focus of this study is to investigate the welfare implications of flippers in the Dutch housing market and to advise policy measures accordingly. In this paper, a comparison is presented between flipped and non-flipped properties in the Netherlands between 1993 and 2019. Using data from the Dutch Land Registry Office, we employ a hedonic and repeat sales model to estimate the returns of flipped properties, the impact of increasing experience in flipping properties on returns and spatial and temporal dimensions of flipping. The results reveal that returns of flipping properties are 8.4% higher relative to market returns and increase with urban density up to 13.3% in the four largest municipalities. Furthermore, the returns of flipped properties increase with 7.4% if an individual flipped one property up to 12.5% if a person has flipped five or more properties relative to a person that has flipped no properties. Over time, the returns of flipped properties are positively related to overheating of the market, with highest returns measured in 2009 and 2018. Overall, we cannot exclude flippers acting as intermediaries, but flippers do show signs of speculative investment behaviour.

Keywords: house prices · housing market · investment behaviour · real estate · residential property flipping · short-term investors · speculators.

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1. Introduction

Property flipping is generally defined as an investment strategy aiming to resell housing within a short timeframe. Within this timeframe, this investment strategy relies on returns related to buying at a discount and selling at a premium.

The housing market is commonly characterised by its capital intensity, illiquidity and high transaction costs. Combined with mortgage loans that on average contribute 71% to total debt in the US (Haughwout et al., 2019), 91% in Great Britain (ONS, 2019) and 86% in the Netherlands (CBS, 2018), it is not inconceivable that participating in the housing market as a natural person is one's largest financial investment with great future consequences. Moreover, the housing market is seen as highly heterogeneous. Consequently, it is challenging to match housing with its final consumers and there are high levels of information asymmetry (de Wit & van der Klaauw, 2013; Depken et. al., 2011; Paraschiv & Chenavaz, 2011). This leads to a need for expertise for those participants with little experience and in absence of it a potential gap exist between the appraised value and the value at which the property is transacted in the benefit of the opposing partner with superior information

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(Leung & Tse, 2017). In addition, investors have proven to prefer higher-demand neighbourhoods in popular cities, leading to price run-ups in local housing markets which adds spatial housing-market polarisation (Aalbers et al., 2018; Hochstenbach & Arundel, 2019). Property flippers constitute one type of these investors. They play both positive and negative economic roles in the housing market. In this paper, the returns of flipped properties are compared with market returns. Relatedly, the economic role of flippers as intermediaries in real estate markets is assessed.

The emphasis of earlier research has been on the impact of increasing flip experience on returns and how returns of flipped properties behave over space and time. Furthermore, the economic roles of flippers as intermediaries between buyers and sellers in the housing market are analysed. Previous research has suggested superior returns relative to market returns and a significant contribution of flip-investors to the housing bubble in the US in 2007. The focus of Bayer et al. (2011) was mainly on the economic role of flippers in the U.S. housing bubble and their research identified the flipper both as a middlemen who contribute to the efficiency in the housing market and the flipper as a speculator who contributes to the volatility in the housing market. They found both a discount and a premium that is positively related to increasing flip experience. Furthermore, between 1992 and 1998 they found high discounts and premiums that decreased while the share of flippers increased when the market overheated during 1999 and 2005. The emphasis of Depken et al. (2009) was on comparing estimated returns of flipped properties to non-flipped properties. Equal to Bayer et al. (2011), they found both a discount and a premium compared to non-flipped properties that declines up to zero when the market collapsed in 2007. In addition, nominal profits were corrected for opportunity costs to derive economic profits and they also found a relation between the share of flipped properties and the price run-ups in the housing market.

In this paper a comparison is presented between flipped and non-flipped properties in the Netherlands between 1993 and 2019. We measure returns of flipped properties, the impact of increasing flip experience on returns and spatial and temporal dimensions of flipping. The main aim is to study the economic roles of flippers in the Dutch housing market.

This paper contributes to the understanding of the economic roles of intermediaries in the economy and the speculative behaviour of individual investors flipping properties by studying property transactions in the Dutch housing market (Bayer et al., 2011; Johri, & Leach, 2002; Li, 1998; Masters, 2007; Scheinkman & Xiong, 2003; Wright & Wong, 2014). In existing literature, a flipped property is defined as a repeat sale within two years (Bayer et al., 2011; Depken et al., 2009; Lee & Choi, 2011; Leung & Tse, 2017; Yilmaz, 2014). Given this timeframe, it can be questioned whether observed returns in existing literature relate to other influences than the investor's ability to identify properties with high potential to be flipped and whether individuals intentionally flip properties. Inferences drawn are thus increasingly biased if the holding period increases due to variables not controlled for. The observed return might not be related to the ability to find distressed sellers, but for example due to price run ups in local housing markets or positive externalities of redevelopment projects not foreseen by flippers. In addition, datasets in existing literature cover at maximum a total metropolitan area. The present paper differs in three ways. First, the institutional difference in transfer tax policy. Transfer tax rates on real estate differ across states in the US and countries in Europe. Transfer tax in the Netherlands changed from 6% to 2% in July 2011. Flipping in the Netherlands is clearly defined as a repeat sale within six months, because within this time-frame exemption from transfer tax is granted. Therefore, there is a heavy incentive for the investor to flip a property within six months[3]. This incentive is not present in existing literature related flips. The institutional setting further allows us to investigate the effect of a change in transfer tax from 6% to 2% in July 2011 on returns of flipped properties and the incentive to resell within six months. Secondly, the dataset contains unique subject-IDs for each natural person, allowing for an unbiased analysis of the impact of flip experience on returns. Thirdly, a nation-wide dataset is used that allows for a more extensive analysis of flipping over

3 The exemption of transfer tax if a property is resold within six months came into existence to prevent subsequent owners from paying transfer tax twice within six months leading to a decrease in market efficiency.

space and time compared to existing literature. We first study returns of flipping and whether this is related to a discount or premium. Subsequently, the impact of experience on returns is studied. The temporal dimension is studied using an index for flipped properties, non-flipped properties and both combined. In addition, three models are defined to study returns of flips in periods of booms and busts. The spatial dimension of flipping is analysed by comparing returns and the impact of flip experience on return in the four largest municipalities, forty largest municipalities and the whole of the Netherlands. This paper aims at providing insight in the behaviour of flip-investors in the Netherlands and recommend policy measures accordingly.

The results suggest that flip-investors buy at a large discount and sell at small discount compared to market prices. Returns are positively related to the level of experience in flipping properties, appreciate at a higher pace during boom and are highest in times of busts. Furthermore, returns increase with urban density. Coming full circle, flipping in the Dutch housing market shows clear signs of speculative investment behaviour.

The remainder of this paper is organised as follows. Section two elaborates on the theoretical background of flipping. Section three provides an in-depth analysis of the dataset including summary statistics and relevant spatial/temporal descriptive figures. The hedonic and repeat sales models are presented in section four. The results of these models are given and discussed in section five and six. Finally, the paper is concluded in section seven.

2. Theoretical Background

Flipping is defined as buying properties with the intent to resell quickly to make a profit based on indirect return (Depken et al., 2009; Bayer et al., 2011). In existing literature, the emphasis of research on flipping relates to the economic roles of flippers based on the origins of returns and level of flip experience (Bayer et al., 2011; Depken et al., 2009; Lee & Choi, 2011; Leung & Tse, 2017; Yilmaz, 2014). In addition, the influence of temporal and spatial dimensions of returns is studied. The influence of flippers on efficiency and indirectly on welfare depends on their origins of return. If flippers profit from a difference between transaction prices and fundamental values or optimistically believe that they can profit from indirect returns due to future price hikes, then flippers are welfare reducing. Flippers can, on the other hand, increase welfare by increasing efficiency in the market due to better matching between buyers and sellers and providing expertise to those who would not participate in the housing market otherwise (Bayer et al., 2011; Glaeser, 2013; Scheinkman & Xiong, 2003; Wright & Wong, 2014). However, welfare is only increased if the relatively higher returns made by flippers are offset by the aforementioned benefits (Li, 1998). The economic roles of flippers are assessed by studying the origins of returns.

Flipping as an investment strategy relies on indirect returns related to both buying at a discount and selling at a premium. A discount might be present due to a seller's cost of holding a property, the type of contract, the difference between the list and sales price and the period on the market (Glower et al., 1998). A sellers' holding cost includes the importance to relocate, consumption value of continuing living in the property and borrow costs. A flipper faces holding costs in the form of cost of capital. A discount thus occurs if a flippers' holding costs are lower relative to the sellers holding costs, because he is more patient in selling the property (Bayer et al., 2011). This is especially true for motivated sellers who, for example, are forced to sell the property due to a divorce or have to relocate due to a new job. Glower et al. (1998) confirms this statement, motivated participants in the housing market sell their property 30% sooner at a lower sales price relative to non-motivated sellers. On the contrary, non-motivated sellers accept only higher offers even if this results in a longer time to sell the property. Glower et al. (1998) therefore concluded that there is indeed heterogeneity among sellers, from which middlemen clearly benefit. Another reason for buying at a discount is the condition of the property, which is divested at a premium after renovation (Bayer et al., 2011; Depken et al., 2009). A premium might occur due to the level of information asymmetry in the housing market where more experienced flippers and inexperienced buyers meet. In this way, returns are generated by selling the property at a higher actual value compared to the fundamental value of the property (Wright & Wong, 2014). Further, flippers might aim at indirect return solely by speculating on expected price

appreciation in local housing market areas. Investing solely on the belief of future price appreciation is proven to be welfare reducing and adds to speculative bubbles across the economy (Glaeser, 2013; Scheinkman & Xiong, 2003). In the remainder of this section key findings and models to study the topic of flipping are discussed, followed by how this paper differs from earlier research.

Depken et al. (2009) compared flipped property prices with non-flipped property prices to find economic profit. They employed a hedonic model to estimate property prices by house and neighbourhood characteristics following the original contributions of Rosen (1974) and Goodman (1978). A buy- and sell-side dummy was included to estimate the effect on property prices if the property was divested within two years. In this way returns are linked to buying at a discount and/or selling at a premium. Using a dataset of all transactions in Las Vegas metropolitan area between 1994 and 2007, they found that the share of flips and height of returns is related to price-appreciation in the housing market with economic returns close to 20%. After the market collapsed in 2007, returns decreased to zero.

Bayer et al. (2011) linked literature about housing market dynamics and investment behaviour. They applied an adjusted novel repeat sales model first introduced by Bailey et al. (1963) and revised by Case and Shiller (1987). The model was extended with three dummies to find the effect of a sell-side or buy-side flip similarly to Depken et al. (2009) and a dummy to control for investments made in the property during the period of ownership. They used a dataset containing all transactions in the five largest counties of Los Angeles metropolitan area between 1988 and 2009. Their results focused on the economic roles of flippers as middlemen and speculators. Bayer et al. (2011) identified middlemen and speculators as two distinct types of flippers based on purchase activity, the source of their returns and the level of experience in flipping properties. Middlemen provide liquidity in the market and therefore improve efficiency. Speculators are perceptive to trend chasing behaviour and create distortions between prices and market fundamentals, increasing volatility of the housing market. They found that middlemen operate at all times and are not perceptive to the economic cycle. Their return mainly originated from buying at a discount relative to market prices and providing liquidity to the market for distressed owners. Speculators were especially active during periods of price appreciation and were not able to foresee a market collapse. In other words, there was no sign of an information asymmetry leading to the conclusion that speculative investors contributed to local house price bubbles. The welfare implications of flippers are thus dependent on the economic cycle. More specifically, they found a high premium and discount between 1992 and 1998 that decreased in periods of high market appreciation between 1999 and 2005. In addition, they found a positive relation between increasing returns and experience in flipping properties. The discount increased from 3.4%, if an individual flipped two to three properties, to 18.1% for those who flipped eleven or more properties, while the premium in selling properties was close to constant across all experience levels.

Lee & Choi (2011) studied the role of speculative behaviour of flippers in the boom and bust between 1995 and 2010. They applied two models. The repeat sales model is similar to the models applied by Bayer et al. (2011) and Yilmaz (2014) in a way that the repeat sales model, following the original contributions of Bailey et al. (1963) and Case and Shiller (1987), was expanded with variables to control for housing characteristics and a dummy to indicate whether the holding period of repeat sale is within two years. The second model is a Multivariate Adaptive Regression Splines (MARS) model following the contribution of Friedman (1991) to identify knot values to detect the timing of the impact of flippers. The dataset contained 247,880 repeat sales of single-family housing in Chicago Metropolitan Statistical Area. The results of the repeat sales model showed that flippers significantly contributed to price-run ups in the Chicago MSA housing market during 2004 and 2010. The MARS model identified multiple knot values leading to the conclusion that flippers influenced the housing market in different levels on different time periods, which supported their claim that flippers positively adds to appreciation in the housing markets in the boom and bust cycle. They also concluded that returns and investment risk are highest for flippers who resold their property within two years relative to a longer holding period and appreciated up

to 17.3% during the boom between 2000 and 2006, which is a clear sign of speculative behaviour.

Yilmaz (2014) focused on profits of flipped properties and whether this is related to a discount or a premium. Furthermore, it was identified whether returns differ between a suburban and downtown area. He employed a repeat sales model along the lines of Bayer et al. (2011) and Lee & Choi (2011) by adding housing characteristics and a buy- and sell-flip dummy to the repeat sales model. Using a dataset of 4,212 transactions between 1989 and 2011, he found that flipped properties are bought at a 20% discount and sold at a 10% premium. In addition, properties in the suburban area are bought at a discount just over 24% and sold at a premium of 8.8%. In the downtown area, the buy-flip dummy is insignificant, but flipped properties are sold at a 6.8% premium. His paper has important shortcomings, one might question whether a holding period of three years is the right time span to define a flip. Moreover, there are no robustness checks in place in which the interpretation of a flip is adjusted. Relatedly, the dataset contains observations between 1989 and 2011. It can be expected that profits differ in booms and busts within this period which should be confirmed by drawing samples of different time periods.

Leung and Tse (2017) studied the topic of flips by developing a model different from the earlier discussed literature on flips. The aim of their paper was to study the role of flippers as middlemen providing the necessary liquidity in an otherwise illiquid housing market, by creating a housing market search model closely related to the contributions of Arnot (1989) and Wheaton (1990). In this model, demand for housing is related to demand by both flippers and owner-occupiers. The results imply that the underlying cause of the existence of discounts and premiums relative to market prices must be the result of the existence of middlemen who survive not only on the basis of information asymmetry, but also on being able to provide liquidity to the housing market and acquire debt at lower financing costs. Further, in the presence of speculative traders, prices should reach a peak followed by a steep decline afterwards. Finally, a market with active momentum traders will result in transactions among momentum traders.

This paper is distinct from earlier research in three ways. First, the institutional setting differs. A flipped property in the Netherlands is clearly defined as a repeat sale within six months, which is not true for the US, leading to uncertainty whether the property is intentionally flipped or as a result of unobserved variables. Moreover, an increasing holding period might lead to returns being explained by other influences than the investor's ability to identify properties with high potential to be flipped. It might thus be questioned whether observed effects in existing literature can be attributed to investment behaviour rather than unobserved market developments. Second, the dataset contains unique subject-IDs for each natural person, allowing for an unbiased analysis of the impact of flip experience on returns. Third, the nation-wide dataset used in this paper allows for a more in-depth analysis of spatial and temporal dimensions of flipping.

The first hypothesis, based on earlier findings, is that flipped properties trade at a higher return compared to market returns which can be allocated to both a discount in the initial transaction and a premium in the second transaction. Secondly, flip experience is positively related to returns of flipped properties. Thirdly, returns of flips increase with price appreciation in the housing market and are highest during busts. Finally, we expect returns to increase with urban density.

3. Data

The dataset used in this study contains residential property transaction data provided by de Dutch Land Registry Office. Over time, the median sales price in the Netherlands develops as expected, with an overall increase except between 2008 and 2013 when the housing market experienced a great downfall due to the financial crisis (Appendix A). Geographically, on average, 11% is sold in the four largest municipalities Amsterdam, The Hague, Rotterdam and Utrecht. 31% is sold in the forty largest municipalities and 55% in the remaining municipalities (Figure 1).

The dataset includes each owner-occupied house transaction in the Netherlands from 1993 on with in total 4,693,115 records. For each record, the dataset provides the

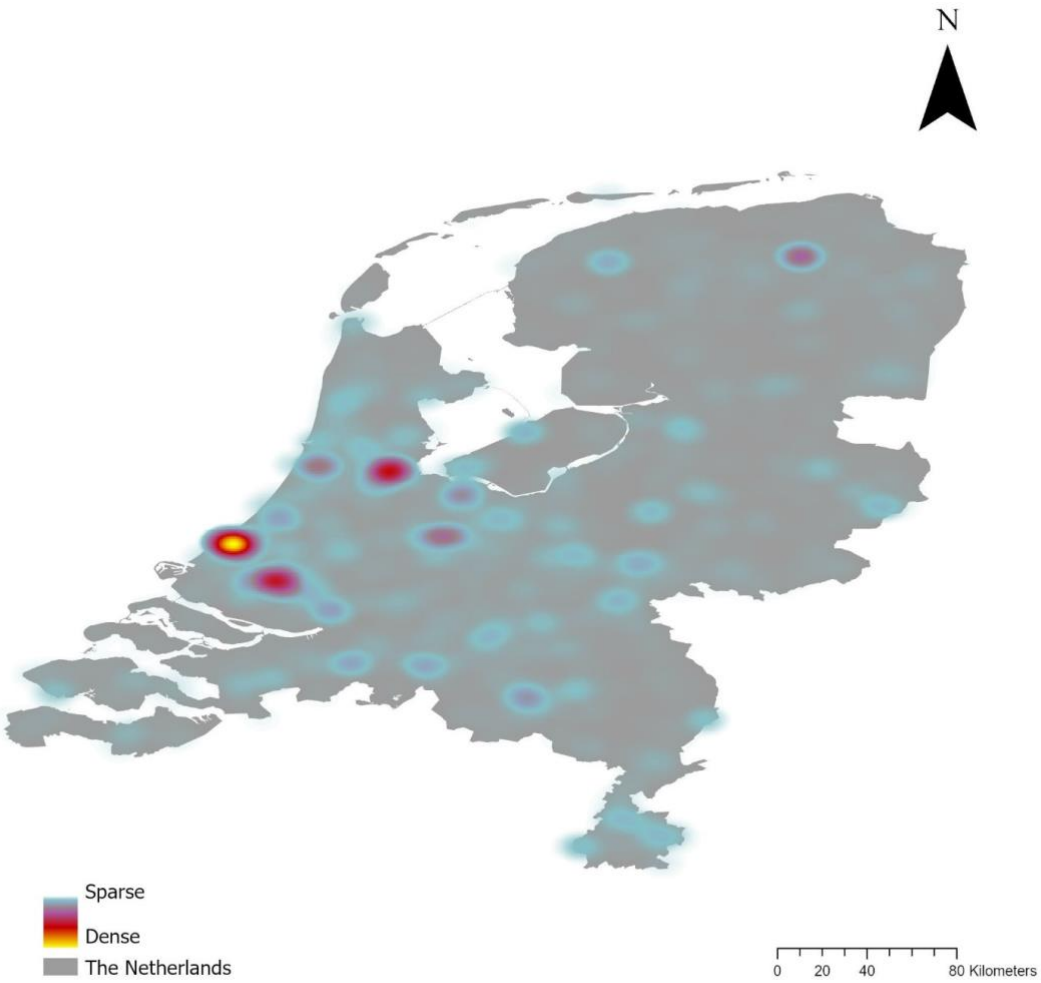

Figure 1 Point density analysis of the number of flips for the total study period.

exact transaction date, transaction price, address, XY-coordinates, subject-ID and multiple housing characteristics based on the BAG-register. The BAG-register contains characteristics of each address and building in the Netherlands recorded by each municipality. In addition, thirty-one housing market areas are added based on migration flows between municipalities with a minimum size of 100,000 households (Groenemeijer, 2019). A drawback of using the BAG-register is that it came into existence in 2009. Hence changes in size and footprint before that year are not observed. In other words, size and footprint of transactions before 2009 are as it was in 2009. Observations with unknown year of construction or size, sold within the same day or for less than one euro are dropped, leading to 60,632 deleted cases. A flipped property in the Netherlands is defined as a property resold within six months, because transfer tax exemption is granted within this time period. Clapp and Giacotto (1999) recommend removing flips from the dataset when applying a repeat sales model, because flips lead to an upward bias to the index values. Adding to it, Steele and Goy (1997) conclude that a decreasing holding period causes an increasing bias and therefore equally advise to delete these repeat sales. Jansen et al. (2008) removed for the aforementioned reasons all

Table 1
Number of months between sales, only repeat sales are included.

Months	Frequency	Percent	Cumulative Percent
0	15,487	0.8	0.8
1	6,000	0.3	1.1
2	7,295	0.4	1.5
3	7,592	0.4	1.9
4	7,082	0.4	2.3
5	10,261	0.5	2.9
6	12,250	0.7	3.5
7	2,861	0.2	3.7
8	3,932	0.2	3.9
9	4,920	0.3	4.2
10	5,468	0.3	4.5
11	6,316	0.3	4.8
12	7,264	0.4	5.2
13	7,577	0.4	5.6
14	8,046	0.4	6.0
15	8,697	0.5	6.5
16	9,164	0.5	7.0
17	9,806	0.5	7.5
18	10,173	0.5	8.0
19	10,983	0.6	8.6
20	11,330	0.6	9.2
21	11,733	0.6	9.9
22	12,293	0.7	10.5
23	12,799	0.7	11.2
24	13,807	0.7	11.9
24+	1,645,326	88.1	100
Total	1,868,462	100	

repeat sales that where divested within 12 months in the Netherlands between 1993 and 2006 and found that these repeat sales had a very high increase in value per month leading to a possible bias of the index. Flipped properties thus deviate from regular transaction and therefore cannot be seen as normal transactions. In total 1.43% or 65,967 transactions are sold within six months between 1993 and 2019. Table 1 provides an indication of the incentive to sell within this time period, because the number of transactions per month decline heavily after a period of ownership longer than six months. Spatially, the share of flipped properties relative to total transactions is highest in the four largest municipalities; Amsterdam, The Hague, Rotterdam and Utrecht, followed by the share of flips in the forty largest municipalities. Over time, the share of flips is again highest in the four largest municipalities. The forty largest municipalities deviate less than 0.5 percentage point relative to the whole of the Netherlands (Appendix B).

To study returns of flipped properties in the baseline model, two dummies are generated that indicate whether a flipper is involved in the buy- or sell-side of the transaction. The buy-side dummy (sell-side dummy) is 1 if the property is bought (sold) by a flipper and 0 otherwise. Using these dummies, we predict the return of a flipped property as the difference between the coefficients of both dummies and predict whether a property is bought at a discount and sold at a premium. Further, the experience per subject on the date of transaction is tracked by using unique subject-IDs variables. In this way, it is possible to study the relation between experience in flipping properties and returns made by flippers. Using these IDs, two sets of dummy variables are generated. One set of dummies to indicate the experience of a flipper in selling the property and second set of dummies to indicate the experience in buying the properties. The first dummy takes the value of 1 if the subject has no buy- or sell flip experience; the second dummy takes the value of 1 if the flipper has flipped 1 property; the third dummy takes the value of 1 if the flipper has flipped 2 to 4 properties and the fourth dummy takes the value of 1 if the flipper flipped 5 or more properties. Both sets of dummies are used in models 5

Table 2
Summary statistics for non-flipped and flipped properties.

	Non-Flipped properties			Flipped properties		
	N	**Mean**	**Std. Deviation**	**N**	**Mean**	**Std. Deviation**
Sales price	4,627,147	200,367	146,256.29	65,967	171,853	148,410.65
Size in SQM	4,472,182	122	92.51	59,723	120	176.77
Year of construction	4,472,182	1963	50.68	59,723	1953	57.60
Transaction year	4,627,147	2006	7.71	65,967	2004	7.15
Dummy Apartments	4,627,147	0.26	0.44	65,967	0.37	0.48
Dummy Row house	4,627,147	0.33	0.47	65,967	0.24	0.43
Dummy Corner house	4,627,147	0.13	0.34	65,967	0.10	0.29
Dummy semi-detached	4,627,147	0.11	0.31	65,967	0.09	0.29
Dummy detached	4,627,147	0.12	0.33	65,967	0.13	0.33
4 Largest cities dummy	4,591,690	0.86	0.34	65,028	0.79	0.41
40 largest cities	4,591,690	1.41	0.72	65,028	1.28	0.79
Buy-side flip dummy	4,627,147	0.01	0.11	65,967	0.07	0.25
Sell-side flip dummy	4,627,147	0.00	0.00	65,967	1.00	0.00
Transfer tax dummy	4,627,147	0.30	0.46	65,967	0.19	0.39
Valid N (listwise)	4,472,085			59,722		

and 7. To study temporal differences, three dummies are computed to indicate whether observations are transacted in periods of booms or busts between June 2001 and February 2009; March 2009 and February 2014 or March 2014 and June 2019. These dummies are used to draw three samples in models 6 to 8. To study spatial differences in returns of flipped properties, two dummies are incorporated to indicate whether a property is located in the four largest municipalities (Amsterdam, The Hague, Rotterdam and Utrecht) or in the forty largest municipalities in the Netherlands. These dummies are used to draw two samples in models 9 and 10 with only the four largest and subsequently the forty largest municipalities. This allows us to study differences in returns across the samples. To relax the assumption of a flip being a property transacted within six months, a set of dummies is created based on different holding periods to draw samples in models 14 to 17. The first dummy takes the value of 1 if the period of ownership is 12 months; the second dummy takes the value of 1 if the period of ownership is 24 months; the third dummy takes the value of 1 if the period of ownership is 36 months and the fourth dummy takes the value of 1 if the period of ownership is 48 months. Finally, a dummy that takes the value of 1 if transacted after July 2011 is computed to draw two samples in models 18 and 19 before and after July 2011. In this way, we can study the influence of the decline in transfer tax from 6% to 2% on returns of flipped properties.

The summary statistics of flipped and non-flipped properties are presented in Table 2. Comparing both samples reveal that on average the sales price of flipped properties is 16.6 percentage point lower. On average a flipped property is build ten years earlier and relatively more apartments are transacted in the sample of flipped properties compared to the sample of non-flipped properties. The differences in summary statistics suggest that investors flipping properties prefer apartments of a slightly higher age that are sold on average at a 16.6 percent point lower sales price.

4. Methods

To investigate the returns of flips, a hedonic model is used following the original contribution of Rosen (1974). The hedonic model allows to decompose the value of a property in individual property attributes and to correct for external effects. The baseline equation is defined as and closely related to Depken et al. (2009):

$$ln\, P_{it} = \alpha + \beta_1 W_{it} + \beta_2 X_t + \beta_3 Y_t + \beta_4 Z_{it} + \theta BF_{it} + \phi SF_{it} + \varepsilon_{it} \quad (1)$$

Where P_{it} is the transaction price for property i at transaction date t; W_{it} a vector for housing characteristics size, year of construction and house type for property i at transaction date t; X_t a vector of year dummies taking the value of 1 if sold at year t and 0 otherwise; Y_t a vector of 31

dummy variables for all housing market areas in the Netherlands taking the value of 1 if located in one of the housing market areas and 0 otherwise; and Z_{it} an interaction between X_t and Y_t; BF_{it} and SF_{it} are two dummies which are 1 if the transaction is part of a flip at the buy- or sell-side; ε_{it} is the error term. α, β_1, β_2, β_3, β_4, θ and ϕ are the parameters to be estimated. Note that we control for spatial and temporal effects as well as spatial effects that change over time by interacting both sets of dummies in Z_{it}. The dummy BF_{it} allows us to predict the effect on the transaction price if the property is bought by a flipper and is going to be sold within the next six months. The dummy SF_{it} allows us to predict the effect on transaction price if the property is sold by a flipper. BF_{it} and SF_{it} combined represent the total return of flipped properties. In this way, it is possible to determine whether the returns are related to buying at a discount and/or selling at a premium.

Applying the following model allows studying the relation between the returns of flipped properties and the experience in flipping properties of the investor. Four categories of experience are defined: investors who flipped no properties, flipped 1 property, flipped 2 to 4 properties and flipped 5 or more properties. The specification is defined as:

$$ln\, P_{it} = \alpha + \gamma_1 W_{it} + \gamma_2 X_t + \gamma_3 Y_t + \gamma_4 Z_{it} + \eta E_{it} + \lambda F_{it} + \varepsilon_{it} \quad (2)$$

Where P_{it} is the transaction price for property i at transaction date t and the right-hand side variables equal specification 1 except from; E_{it} and F_{it}. E_{it} is a vector for seven dummy variables that take the value of 1 depending on the experience of buying flipped properties, F_{it} is a vector for seven dummy variables that take the value of 1 depending on the experience of selling flipped properties. $\gamma_1, \gamma_2, \gamma_3, \gamma_4$, η and λ are the parameters to be estimated. E_{it} and F_{it} combined make it possible to predict the effect of experience on the returns of flipped properties and whether this is related to increasing discount in buying the property or an increasing premium in selling the property.

The hedonic models have shortcomings. First, the maintenance level is unobserved in the data. Therefore, the estimated returns are uncorrected for investments made in the property. Second, transaction price does not include additional fees such as brokerage fees. Both shortcomings imply that the estimated returns are biased upwards, because returns rely on profits and profits should be corrected for investments made in the property and additional fees. Third, the BAG-register came into existence in 2009. Hence changes in size and footprint before that year are not observed.

The hedonic models might thus be biased due to omitted variables. As a robustness check, a repeat sales model is computed following the contributions of Jansen et al. (2008). This model does not rely on the characteristics to estimate the transaction price. The repeat sales model follows the original contributions of Bailey et al. (1963) and Case and Shiller (1987) and is defined as:

$$P_{it} - P_{i\tau} = \sum_{t=1}^{T} G_t A_t + \varepsilon_{it} \quad (3)$$

With:

$$A_t = \begin{cases} -1, firstsale\ t \\ 1, resale\ \tau \\ 0, otherwise \end{cases} \quad (4)$$

Where $P_{it} - P_{i\tau}$ is the price change between transaction t and τ; G_t a prediction of the index numbers that fit the observed price change best; A_t a nT matrix that includes a set of dummy variables for every time period taking the value of -1 if observation i is first sold, 1 if resold and 0 otherwise; ε_{it} is the error term. An issue with this model is that each repeat sale equally impacts predictions, regardless the holding period. Case and Shiller (1987) argued that the variance increases linearly with the holding period. In other words, unobserved effects like changes in housing characteristics become increasingly important in explaining house prices as the holding period increases. To overcome this issue, the following equation is specified:

$$\varepsilon_t^2 = a + \sum_{t=1}^{T} \beta P_t + \mu_t^T \quad (5)$$

Where ε_t^2 is the squared error term; a twice the variance of the house specific random error, because both the initial sale

τ and resale at t are included in one observation; P_t is the increase in variance due to the increase in holding period i.e. the Gaussian Random Walk; μ_t^T is the error term i.e. the residuals that are not explained by P_t. β is the coefficient to be estimated. In contrast to specification 4, Abraham and Schauman (1991) argued that the increase in variance decreases when the holding period increases. To correct for this, the squared residuals are regressed against the holding period and squared holding period in the following specification:

$$E\left[d_i^2\right] = A(t-s) + B(t-s)^2 + 2C \qquad (6)$$

Where d_i^2 is the squared error term; $t-s$ is the holding period; $2C$ is twice the house-specific random error term; A is the estimated increase in variance related to the increase in holding period; B is the estimated squared increase in variance if the holding period increases. Finally, the repeat sales model is estimated using the square roots of the fitted values of specification 5 as weights. The specification deviates from the original contributions of Case and Shiller (1987), because F_{it} is included to estimate the effect of properties sold within six months on price change:

$$P_{it} - P_{i\tau} = C_t + H_{it} + N_{it} + \beta F_{it} + \varepsilon_{it} \qquad (7)$$

Where P_{it} is the log sales price of property i at period t; C_t the citywide level house prices at period t; H_{it} the Gaussian random walk t as explained in specification 6; N_{it} the house-specific random error that is linear, homoscedastic and uncorrelated; ε_{it} the error term.

To analyse how returns of flipped properties behave in different periods in the economic cycle, three indices are constructed based on the repeat sales model. First, three samples of flipped properties, non-flipped properties and both combined are drawn. Second, for each of the samples a repeat sales model is estimated. Third, three indices are computed based on the estimated coefficients of each repeat sales model by multiplying the exponent of the estimated coefficients per period i.e. $Index = exp(\beta) \times 100$. In this way, we analyse and compare the behaviour of each index over time.

The repeat sales model has two shortcomings. First, as no data on maintenance are present, we cannot assume constant quality over time, because investments might be made during the holding period. Second, properties might be bought and sold within the same month. By structuring matrix A_t as a dummy for each transaction year and month, the model does not observe the second sale if the property is sold in the same month. To overcome this issue. If the property is resold within the first half of a month, the first sale is moved one month before the month it was actually bought. If the property is resold in the second half of the same month, the resale is moved one month after it was actually sold. In this way, matrix A_t contains for all transactions sold within the same month a first (-1) and second transaction (1).

5. Estimation results

The baseline results are specified in Table 3. The main goal of this paper is to study differences in returns between flipped and non-flipped properties and elements influencing these differences to assess the economic roles of flippers in the housing market.

The key variables to study returns are the buy- and sell-flip dummies from Equation (1) and presented in models 1 to 4. Model 1 only includes the buy- and sell-flip dummy. Both dummies are negative and significantly different from zero. Model 2 expands the previous model with size, year of construction and house type to control for housing characteristics. In model 3 we control for spatial and temporal heterogeneity by including dummies for each housing market and year in the dataset. Finally, in model 4, both sets of location- and year-dummies are interacted to control for spatial changes over time. For the baseline model 4, the total adjusted R_2 is just over 70%. The coefficients of the buy- and sell-flip dummy infer that a flipped house is bought at a discount of 16.0% ($= \left(exp^{(-0.174)} - 1\right) \times 100$ and sold at a discount of 7.6% ($= \left(exp^{(-0.079)} - 1\right) \times 100$ compared to market returns. Combined, the coefficients suggest that the total return is 8.4% higher relative to market returns and related to buying at a steep discount. The

Table 3
Regression results for baseline specification.

LN Sale amount	(1)	(2)	(3)	(4)
Buy flip dummy	-0.303	-0.249	-0.174	-0.174
	(0.002)***	(0.002)***	(0.001)***	(0.001)***
Sell flip dummy	-0.190	-0.134	-0.078	-0.079
	(0.002)***	(0.002)***	(0.001)***	(0.001)***
LN size		0.654	0.698	0.699
		(0.001)***	(0.001)***	(0.001)***
Year of construction <1945		-0.140	-0.078	-0.078
		(0.001)***	(0.000)***	(0.000)***
Year of construction 1945 - 1980		-0.214	-0.107	-0.107
		(0.001)***	(0.000)***	(0.000)***
Row house		-0.037	0.030	0.032
		(0.001)***	(0.000)***	(0.000)***
Corner house		-0.009	0.078	0.081
		(0.001)***	(0.001)***	(0.001)***
Semi-detached		0.015	0.186	0.187
		(0.001)***	(0.001)***	(0.001)***
Detached		0.145	0.326	0.329
		(0.001)***	(0.001)***	(0.001)***
Intercept	12.019	9.058	9.114	9.029
	(0.000)***	(0.004)***	(0.003)***	(0.012)***
Location and time dummies	NO	NO	YES	YES
Interaction location and time dummies	NO	NO	NO	YES
Observations	4,693,114	4,531,905	4,531,807	4,531,807
R-squared	0.005	0.243	0.684	0.690

Dependent variable is ln(sale amount). Standard errors are in parentheses. The dummy year of construction >2000 is the reference category for the remaining year of construction dummies. The dummy apartment is the reference category for the remaining house type dummies. Location and time dummies represent one dummy for each of the 31 housing market areas and one dummy for each year between 1993-2019. Interaction location and time dummies represent an interaction between each housing market and year dummy.
*** p<0.01, ** p<0.05, * p<0.1.

discount might occur due to buying from distressed sellers who are prepared to sell below market value or unwary homeowners with little knowledge about the housing market, leading to a gap between the transaction price and market value (Depken et al., 2009; Bayer et al., 2011). To avoid transfer-tax, the property is then sold within six months, again at a discount, resulting in a total return of 8.4% higher relative to market returns. If the property is sold after six months, returns decrease 6% before July 2011 and 2% after July 2011 ceteris paribus.

The results are not in line with existing literature. Depken et al. (2009) found an annual nominal return of 60% related to both buying at a discount and selling at a premium at the height of the boom of the housing market. The magnitude of their annual nominal return increased between 1992-2007 when the market overheated and declined to zero in the economic downturn that followed. Bayer et al. (2011) found an overall higher return of 11.2% relative to market returns that increased to an average return of 21.6% between 1992-1998 and decreased to 8% between 1999-2005. Lee & Choi (2011) found that returns are highest for properties flipped within two years and increased most between 2000-2006 up to 17.3%. Yilmaz (2014) reported a total return of 13.1% relative to market returns in a suburban area and a premium of 6.6% in the downtown area.

Contradictions with existing literature are explained along the lines of four arguments. First, returns are influenced by the level of flip experience. Bayer et al. (2011) and Lee & Choi (2011) identify different types of flippers depending on the number of flipped properties. In section 6.1, we identify the influence of experience on flipped properties. Secondly, the dataset used by Bayer et al. (2011) covered all house transactions between 1998-2009 and the dataset of Depken et al. (2009) covered all house transactions between 1996-2007. Therefore, the housing boom up to 2007 is included, but not the financial crisis that followed. Total

average returns might therefore be higher relative to returns presented in this paper, which does cover both the overheating of the market and the downturn that followed. In section 6.2, we draw different samples of multiple time periods to identify the behaviour of returns in booms and busts in the economic cycle. Third, as previously mentioned, returns of flipped properties increase with urban density. Other literature covers high-density counties in Las Vegas, Los Angeles, Chicago and Atlanta while this paper covers the whole of the Netherlands. In section 6.3, models 9 to 13 are used to assess whether returns differ between the whole of the Netherlands, 40 largest municipalities and 4 largest municipalities. Fourth, the institutional setting differs. A flipped property in this paper is interpreted as a house that is resold within six months due to the exemption of transfer tax within this period. Previous literature interprets flips as a house that is divested within two years, because in the US no exemptions are granted if the property is sold within a number of months. As aforementioned, an increasing holding period might lead to an increasing influence of unobserved exogenous variables on return, which might be the case for results presented in other literature leading to higher returns relative to results presented in this paper. Lee & Choi (2011) found returns to be highest among flippers who resell within two years, concluding that these flippers took higher risk proving speculative behaviour. In section 6.4, we increase the holding period interpreted as a flip. Relatedly, in section 6.5, the incentive to sell within six months and returns before and after transfer tax changed from 6% to 2% in July 2011 are studied. Finally, Bayer et al. (2011) corrects for possible investments made during the holding period, which is impossible given the dataset in this paper. Therefore, returns presented in this paper are lower in reality if the owner did invest in the property.

6. Sensitivity analysis

6.1. Impact of experience on returns

Table 4 displays a hedonic model with the impact of experience on returns of flipped properties. It is hypothesised that returns increase with experience in flipping properties, which is proven by tracking each individual using unique subject IDs. In this way, the experience on the moment of buying or selling the property is traced. Model 5 presents six dummies that represent the change in return if the subject has experience in flipping one property, flipping two to four properties or flipping five or more properties. Returns on the buy-end side of the transaction increase from a discount of 12.0% if the subject bought one flipped property up to 31.9% if the subject bought five or more flipped properties relative to an individual who flipped no properties. Returns on the sell-end side of the transaction increase from a discount of 4.6% if the subject sold one flipped property up to 19.3% if the subject sold five or more flipped properties relative to an individual who flipped no properties. Combined, total returns increase from 7.4% if the subject has flipped one property to 12.1% if the subject flipped two to four properties and 12.5% if the subject has flipped five or more properties compared to an individual who flipped no properties. Based

Table 4
Regression results specified for the influence of experience levels on returns.

	(5)
LN Sale amount	Experience levels
Bought 1 flipped property	-0.128
	(0.002)***
Bought 2-4 flipped properties	-0.243
	(0.004)***
Bought >4 flipped properties	-0.384
	(0.004)***
Sold 1 flipped property	-0.047
	(0.002)***
Sold 2-4 flipped properties	-0.100
	(0.004)***
Sold >4 flipped properties	-0.215
	(0.004)***
Intercept	9.031
	(0.012)***
Control variables housing characteristics	YES
Location and time dummies	YES
Interaction location and time dummies	YES
Observations	4,531,807
Adj. R-Squared	0.691

Dependent variable is ln(sale amount). Individuals who bought or sold 0 flipped properties serve as the reference categories. Standard errors are in parentheses. Variables to control for housing characteristics are included. Experience is traced via unique subject-ID. Location and time dummies represent one dummy for each of the 31 housing market areas and one dummy for each year between 1993-2019. Interaction location and time dummies represent an interaction between each housing market and year dummy.
*** p<0.01, ** p<0.05, * p<0.1.

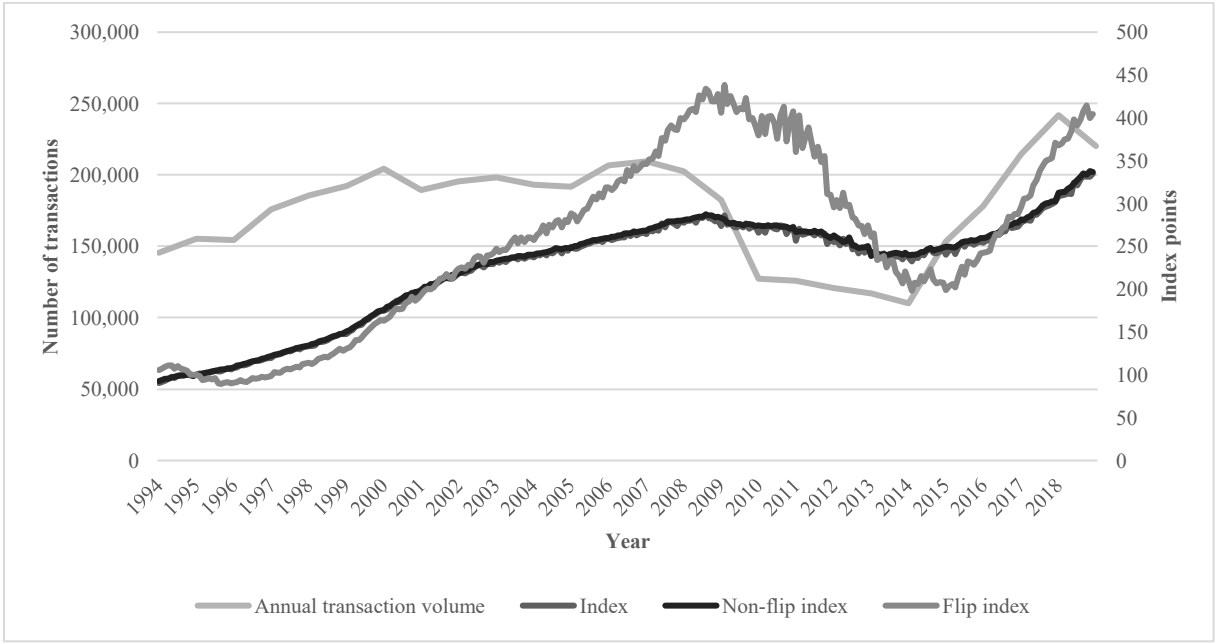

Figure 2 Transaction volume and price index between 1994-2018, base year 1995.

Table 5
Regression results specified for booms and bust periods.

	(6)	(7)	(8)
LN Sale amount	Jun-2001 – Feb-2009	Mar-2009 – Feb-2014	Mar-2014 – Jun-2019
Buy flip dummy	-0.163	-0.256	-0.186
	(0.002)***	(0.004)***	(0.003)***
Sell flip dummy	-0.072	-0.108	-0.063
	(0.002)***	(0.004)***	(0.003)***
Intercept	8.866	8.636	9.088
	(0.024)***	(0.023)***	(0.012)***
Control variables housing characteristics	YES	YES	YES
Location and time dummies	YES	YES	YES
Interaction location and time dummies	YES	YES	YES
Observations	1,477,966	584,445	1,060,000
Adj. R-squared	0.597	0.572	0.586

Dependent variable is ln(sale amount). Standard errors are in parentheses. Variables to control for housing characteristics are included. Location and time dummies represent one dummy for each of the 31 housing market areas and one dummy for each year between 1993-2019. Interaction location and time dummies represent an interaction between each housing market and year dummy.
*** p<0.01, ** p<0.05, * p<0.1.

on total returns, we conclude that subjects with increasing experience achieve higher returns.

The results are in line with Bayer et al. (2011), they reported increasing returns with experience with a rather stable premium and increasing discount.

6.2. Temporal dimensions of flipped properties

Figure 2 illustrates annual transaction volume and a price index between 1994-2018 for flipped, non-flipped and total transactions based on a repeat sales model. The baseline results rely on an overall estimation of returns covering all the transactions between 1994-2018. However, there might be temporal differences as reported by Depken et al. (2009) and Bayer et al. (2011). The flip index underperforms the total index between 1995-2002. After 2002, the flip index sharply increases as the market overheats up to the economic downturn after 2009. From this point on the flip index decreases until it underperforms the total index for three years up to 2016. After 2016, a relative sharp increase is observed in both the total and flip index.

Table 5 presents four hedonic models dividing the dataset in four time periods to capture the behaviour of returns in booms and busts. Based on the index of total transactions in Figure 2, there is a clear boom between 2001-

2009 and 2014-2019. A bust is observable between 2009-2014. The results imply an average return of 8.1% in the boom between 2001-2009; 12.4% in the bust between 2009-2014 and 10.9% in the boom of 2014-2019. One might expect returns to be relatively lower in times of economic decline, but the opposite is true for flipped properties. There is indeed a decline in returns of flipped properties even below market returns in the bust as observable in Figure 2, but on average in this period returns still outperform market returns at a higher rate compared to both booms. The underlying source of the increase in return is related to a higher discount that offsets the increase in the negative discount when the property is resold.

The results are in line with Depken et al. (2009), they found an increasing return when the market overheated that decreased up to zero in the economic downturn. However, it must be noted that the difference in market returns and flip returns is relatively highest during the bust as observed in Table 5. It is in contradiction with Bayer et al. (2011), because they reported higher returns between 1992-1998 compared to 1999-2005 and argued that flip-investors are able to buy at a steeper discount and sell at a higher premium when the market is not overheating. The same conclusion holds for the Netherlands based on Table 5, because during the bust returns of flipped properties are relatively highest. However, Figure 2 clearly shows that the flip-index declines below the total index in the same period. Leung & Tse (2017) conclude from their model that from a low-price, a new high-price steady state equilibrium is reached. If not, this is seen as an indication of speculative investment activity. The flip-index in Figure 2 clearly depicts a peak between June 2008 and February 2009 after which a steep downward trend is observed up to February 2014. This indicates, following the line of reasoning of Lueng & Tse (2017), speculative behaviour of flippers in the housing market. Lee & Choi (2011) found that house price appreciation is positively influenced if flippers enter into the housing market, with highest returns for flippers who divested the property within two years during overheating of the market between 2000-2006. This leads to the conclusion that short-term holders took higher risks and acted on the basis of speculation. In this paper, returns are highest after the bust, but appreciated heavily during the boom up to 2009 hence showing clear signs of speculative behaviour. It must be noted that 1.43% of total transactions in this dataset are flips, conceivably flippers react to market development instead of influencing booms and busts as concluded by Lee & Choi (2011).

Table 8
Total returns across different experience levels.

	Netherlands	**40 largest municipalities**	**4 largest municipalities**
Flipped 1 property	7.4%	9.3%	11.5%
Flipped 2-4 properties	12.1%	14.8%	17.0%
Flipped 5 or more properties	12.5%	13.2%	17.8%

6.3. Spatial dimensions of flipped properties

Table 6 displays the results of hedonic models 9 and 10 that restrict the sample to the forty largest municipalities and four largest municipalities (Amsterdam, The Hague, Rotterdam, Utrecht). The calculated returns in the baseline results rely on a model covering the total of the Netherlands. As a result, it is unintentionally assumed that returns are constant across the nation while Figure 1 shows a clear concentration of flips in the four largest municipalities. The buy flip dummy increases when the municipalities increase in size, while the sell flip dummy stays rather constant. Returns of flipped properties in the forty largest municipalities are 10.4%, 2 percentage point higher compared to the total housing market. Returns of flipped properties in the four largest municipalities are 13.3%, 4.9 percentage point higher compared to the total housing market.

One explanation for the increasing discount is the percentage of properties that are intentionally flipped by experienced investors in the forty and four largest municipalities is higher compared to the periphery. Experienced flippers are better able to find distressed sellers who sell at a higher discount. If so, the spread between experienced and inexperienced flippers should increase. Table 7 presents the hedonic results of experience levels across the forty largest municipalities and four largest cites (Amsterdam, The Hague, Rotterdam, Utrecht). The pattern of increasing return when we move from the Netherlands to the four largest municipalities is equal to the results of Table 6. Table 8 shows that the impact of experience on returns increases. The difference between subjects who flipped one

Table 6
Regression results specified for all cases, cases in the 40 largest municipalities and cases in the 4 largest municipalities.

	(1)	(9)	(10)
LN Sale amount	All cases	40 largest municipalities	4 largest municipalities
Buy flip dummy	-0.174	-0.192	-0.234
	(0.001)***	(0.002)***	(0.004)***
Sell flip dummy	-0.079	-0.073	-0.079
	(0.001)***	(0.002)***	(0.004)***
Intercept	9.029	8.750	8.381
	(0.012)***	(0.015)***	(0.010)***
Control variables housing characteristics	YES	YES	YES
Location and time dummies	YES	YES	YES
Interaction location and time dummies	YES	YES	YES
Observations	4,531,807	2,007,153	575,713
Adj. R-squared	0.690	0.705	0.731

Dependent variable is ln(sale amount). Standard errors are in parentheses. Location and time dummies represent one dummy for each of the 31 housing market areas and one dummy for each year between 1993-2019. Interaction location and time dummies represent an interaction between each housing market and year dummy.
*** p<0.01, ** p<0.05, * p<0.1.

Table 7
Regression results specified for the influence of experience levels on returns.

	(11)	(12)	(13)
LN Sale amount	Experience levels Netherlands	Experience levels forty largest municipalities	Experience levels four largest municipalities
Bought 1 flipped property	-0.128	-0.133	-0.165
	(0.002)***	(0.002)***	(0.004)***
Bought 2-4 flipped properties	-0.243	-0.264	-0.290
	(0.004)***	(0.005)***	(0.008)***
Bought >4 flipped properties	-0.384	-0.388	-0.428
	(0.004)***	(0.005)***	(0.008)***
Sold 1 flipped property	-0.047	-0.032	-0.038
	(0.002)***	(0.002)***	(0.005)***
Sold 2-4 flipped properties	-0.100	-0.088	-0.085
	(0.004)***	(0.005)***	(0.008)***
Sold >4 flipped properties	-0.215	-0.210	-0.186
	(0.004)***	(0.005)***	(0.007)***
Intercept	9.031	8.752	8.383
	(0.012)***	(0.015)***	(0.010)***
Control variables housing characteristics	YES	YES	YES
Location and time dummies	YES	YES	YES
Interaction location and time dummies	YES	YES	YES
Observations	4,531,807	2,007,153	575,713
Adj. R-Squared	0.691	0.705	0.732

Dependent variable is ln(sale amount). Individuals who bought or sold 0 flipped properties serve as the reference categories. Standard errors are in parentheses. Variables to control for housing characteristics are included. Experience is traced via unique subject-ID. Location and time dummies represent one dummy for each of the 31 housing market areas and one dummy for each year between 1993-2019. Interaction location and time dummies represent an interaction between each housing market and year dummy.
*** p<0.01, ** p<0.05, * p<0.1.

property and five or more properties increase from 5.1 percentage point in the total of the Netherlands to 6.4 percentage point in the four largest municipalities. Returns of subjects who flipped 1 property in the four largest municipalities is 4.1 percentage point higher compared to the total of Netherlands and increases to 5.0 percentage point for subjects who flipped two to four properties and 5.3 percentage point for subjects who flipped five or more properties. Flippers with equal experience thus achieve a higher return in the four largest municipalities relative to the whole of the Netherlands and the spread in return between inexperienced and experienced flippers increases. Another explanation for the higher discount in the four largest municipalities compared to the total of the

Netherlands might be that properties in denser areas need higher investments before they can be resold leading to a higher discount. We cannot control for maintenance and renovation, because these variables are not observed in the dataset. Finally, investors have proven to prefer higher-demand neighbourhoods in popular cities (Aalbers et al., 2018; Hochstenbach & Arundel, 2019).

The results are in line with Yilmaz (2014) who reported higher returns in a downtown district relative to a suburban district in Atlanta. Bayer et al. (2011) concluded that experienced flippers do not differentiate across submarkets in Los Angeles. On the contrary, inexperienced speculative flippers prefer those submarkets with relatively highest market appreciation. This is not in line with our results, because returns of experienced flippers are not constant across the Netherlands, forty largest municipalities and four largest municipalities.

6.4. Defining the right holding period

Table 8 presents the results of five hedonic models each with a different interpretation of the holding period of a flip. We continuously assumed a flip to be a property resold within six months. If so, one might expect that returns of flipped and non-flipped properties converge when the holding period of what is interpreted as a flip inclines. The holding period and buy- and sell-flip dummy are inversely related. The discount relative to non-flipped properties when the property is bought decreases from 16.0% down to 5.5%. The initial discount of 7.6% when the property is sold, declines and even turns into a premium of 1.9%. This leads to the conclusion that an owner pays close to average market prices when the owner holds the property for a longer time. However, the loss in return is partly offset by the sell-side of the transaction due to the decrease in discount and even a premium in selling the property. There is thus a shift in the origins of returns if the period of ownership interpreted as a flip is adjusted. Lee & Choi (2011) found standard deviations as a measure of investment risk and returns to be highest for flippers who divested the property within two years. Following the line of reasoning of Lee & Choi (2011), we can conclude that flippers show signs of speculative behaviour, because returns decrease if we increase the holding period interpreted as a flip.

6.5. Impact of changed transfer tax policy

Table 9 presents two hedonic models for the period before July 2011 and the period after July 2011. The percentage transfer tax changed from 6% to 2% in July 2011 leading to a decreased incentive to sell the property within six months. The decrease in transfer tax has a positive impact on the estimated buy flip dummy, which increases with 3.5% in the period after transfer tax changed. The sell flip dummy slightly decreases with 0.4%. An explanation might be that investors hold the property for a longer period if they are not content with the return if they flip the property. Initially with 6% transfer tax, these investors would not have taken the risk of holding the property for longer than six months and therefore lose the exemption of transfer tax. However, at a 2% transfer tax rate, the opportunity of achieving a higher return, despite losing the exemption, relative to flipping the property increases. In addition, Appendix C shows the period of ownership before and after July 2011. The number of flips relative to the total repeat sales in the dataset declines from 4.8% to 1.7%. Conversely, the number of flips in month six and seven decline with 84.4 percentage point before July 2011 and 45.1 percentage point after July 2011. Based on these descriptive statistics, one can conclude that the incentive to sell within six months is still observed in the dataset, but at a decreased magnitude.

6.6. Repeat sales analysis

Table 10 presents a repeat sales model for all repeat sales, the repeat sales in the forty largest municipalities and the repeat sales in the four largest municipalities. Not all house and location characteristics are observed in the dataset. A repeat sales analysis is performed as a robustness check. The main advantage of a repeat sales model compared to a hedonic model is that it relies on a repeat sale of the same property. Therefore, it does not rely

Table 8
Regression results specified for different periods of ownership.

LN Sale amount	(1) Period of ownership: 0-6 months	(11) Period of ownership: 0-12 months	(12) Period of ownership: 0-24 months	(13) Period of ownership: 0-36 months	(14) Period of ownership: 0-48 months
Buy flip dummy	-0.174	-0.157	-0.093	-0.067	-0.056
	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***
Sell flip dummy	-0.079	-0.051	-0.006	0.010	0.019
	(0.001)***	(0.001)***	(0.001)***	(0.001)***	(0.001)***
Intercept	9.029	9.033	9.039	9.040	9.039
	(0.012)***	(0.012)***	(0.012)***	(0.012)***	(0.012)***
Control variables housing characteristics	YES	YES	YES	YES	YES
Location and time dummies	YES	YES	YES	YES	YES
Interaction location and time dummies	YES	YES	YES	YES	YES
Observations	4,531,807	4,531,807	4,531,807	4,531,807	4,531,807
Adj. R-Squared	0.690	0.690	0.690	0.690	0.690

Dependent variable is ln(sale amount). Standard errors are in parentheses. Location and time dummies represent one dummy for each of the 31 housing market areas and one dummy for each year between 1993-2019. Interaction location and time dummies represent an interaction between each housing market and year dummy.
*** p<0.01, ** p<0.05, * p<0.1.

Table 9
Regression results specified for transactions before and after July 2011.

LN Sale amount	(15) Before transfer tax changed	(16) After transfer tax changed
Buy flip dummy	-0.163	-0.205
	(0.002)***	(0.003)***
Sell flip dummy	-0.077	-0.073
	(0.002)***	(0.003)***
Intercept	8.820	9.050
	(0.013)***	(0.011)***
Control variables housing characteristics	YES	YES
Location and time dummies	YES	YES
Interaction location and time dummies	YES	YES
Observations	3,181,665	1,350,142
Adj. R-Squared	0.687	0.586

Dependent variable is ln(sale amount). Standard errors are in parentheses. Location and time dummies represent one dummy for each of the 31 housing market areas and one dummy for each year between 1993-2019. Interaction location and time dummies represent an interaction between each housing market and year dummy.
*** p<0.01, ** p<0.05, * p<0.1.

Table 10
Regression results for the repeat sales model.

Ln(transaction price)	(17) All cases included	(18) 40 largest municipalities	(19) 4 largest municipalities
Flip dummy	0.076	0.091	0.103
	(0.000)***	(0.000)***	(0.001)***
Transaction month dummies	YES	YES	YES
Observations	1,840,410	886,170	277,342
R	0.738	0.732	0.691
R-squared	0.544	0.535	0.477

The dependent variable is the difference in ln(transaction price) between the initial and resale of the same property. Standard errors are in parenthesis. Month dummies represent one dummy for each of the 317 transaction months
*** p<0.01, ** p<0.05, * p<0.1

on individual property and location characteristics. The disadvantage is that the repeat sales model omits houses that are transacted only once leading to 1,840,410 observed repeat sales (van Duijn et al., 2016). In addition, it is impossible to compare estimations one on one, because the hedonic model relies on an arithmetic mean and the repeat sales model on a geometric mean.

The results point in the same direction compared to the hedonic model, with a return of 7.8% for all cases and increasing when we move to the forty largest municipalities (9.6%) and four largest municipalities (10.8%) relative to non-flipped houses. Therefore, the results in Table 10 are in line with the results in Table 3 and 6.

7. Conclusions

This paper studies the difference in returns between flipped and non-flipped properties. Specifically, the origins of returns are studied to uncover whether return is made by buying at a discount and/or selling at premium. We use a dataset of each house transaction performed by natural persons in the Netherlands between 1993 and 2019. Based on this dataset, multiple hedonic models are constructed in which housing characteristics are controlled for. Further, a dummy for each transaction year and housing market area is added to control for temporal and spatial differences. Most important are the buy- and sell flip dummy to uncover total return and its origin.

The first hypotheses is that flipped properties trade at a higher return compared to market returns, which is allocated to both a discount in the initial transaction and a premium in the second transaction. The results show that returns for properties sold within six months are related to buying at a steep discount and not selling at a premium. This is in line with the hypotheses that flipped properties trade at a higher return, but not that it is allocated to both a discount in the initial transaction and a premium in de second transaction. The second hypotheses is that flip experience is positively related to returns of flipped properties. Experience in flipping properties is indeed positively related to the discount acquired in buying the house. Also, a higher premium is acquired in selling the property relative to individuals with no flip experience, but this premium decreases when experience increases. The third hypotheses, that returns of flips increase with price appreciation in the housing market and are highest during busts, is confirmed. Over time, returns of flips relatively appreciate at a higher pace during boom and returns are highest in times of busts. However, within a bust, returns are rather constant for a while at the peak after which the index heavily decreases at a lower point than the total index between 2009 and 2014. Finally, we hypothesized that returns increase with urban, which is accepted. Returns of flippers with equal experience increase with urban density. Also, the spread across experience levels increases when we move from a model with all cases to a model with only the 40 largest municipalities and 4 largest municipalities. In addition to the hypotheses, we relaxed the assumption of a flip being a property sold within six months. When the period of ownership is increased to 12, 24, 36 and 48 months, the initial discount relative to non-flipped properties decreases. The discount when the property is sold changes to a premium when the period of ownership increases. As a result, the origin or return shift from buying at a discount to selling at a premium. Relatedly, the differences between returns before and after transfer tax changed in July 2011 are studied. The discount in buying the property increases with 3.7% and the discount in selling the property slightly declines with 0.1%. Overall, we conclude that flippers in the Netherlands show clear signs of speculative investment behaviour. However, in absence of information on improvements of the property during the period of ownership, we cannot exclude flippers acting as intermediaries. The exact economic roles of flippers are thus yet to be uncovered. Therefore, we advise against changing policy to prevent flippers to benefit from transfer tax exemption.

The total return of 8.4% observed in this paper, is not in line with returns found by Bayer et al. (2011), Depken et al. (2009), Lee & Choi (2011) and Yilmaz (2014). They found positive returns related to both a discount and premium. Also, the magnitude differs; Depken et al. (2009) found nominal returns up to 60%, Bayer et al. (2011) of 11.2%, Lee & Choi (2011) of 17.3% and Yilmaz (2014) of 13.1% in a suburban area and a premium of 6.6% in the downtown area. However, the estimated model for the four largest municipalities presents a total return of 13.4%, which is comparable to the returns of Yilmaz (2014) and Bayer et al. (2011).

We do recognise shortcomings. The returns are not corrected for investments made in the property and additional fees. In addition, changes property size before 2009 are not observed. However, the estimations in the repeat sales model points in the same direction compared to the baseline results. Additionally, Bayer et al. (2011) managed to correct for investments made in the property during the period of ownership which could not be corrected for in this paper. Returns might therefore be

overestimated. Finally, and of great importance, only natural persons are included in this dataset, but investors might operate from a different entity and not all transactions performed by natural persons are initiated from an investment perspective.

Future research is needed that overcomes the aforementioned shortcomings. This paper has discovered signs of speculative investment behaviour across flippers, but in absence of information on investments in the property, we cannot draw conclusions related to the exact economic roles of flippers. If the investments made in the property are known, it is possible to differentiate between flippers as speculators and middlemen to estimate the exact economic roles of flippers and advice policy measures accordingly.

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Appendix A. Median sales price

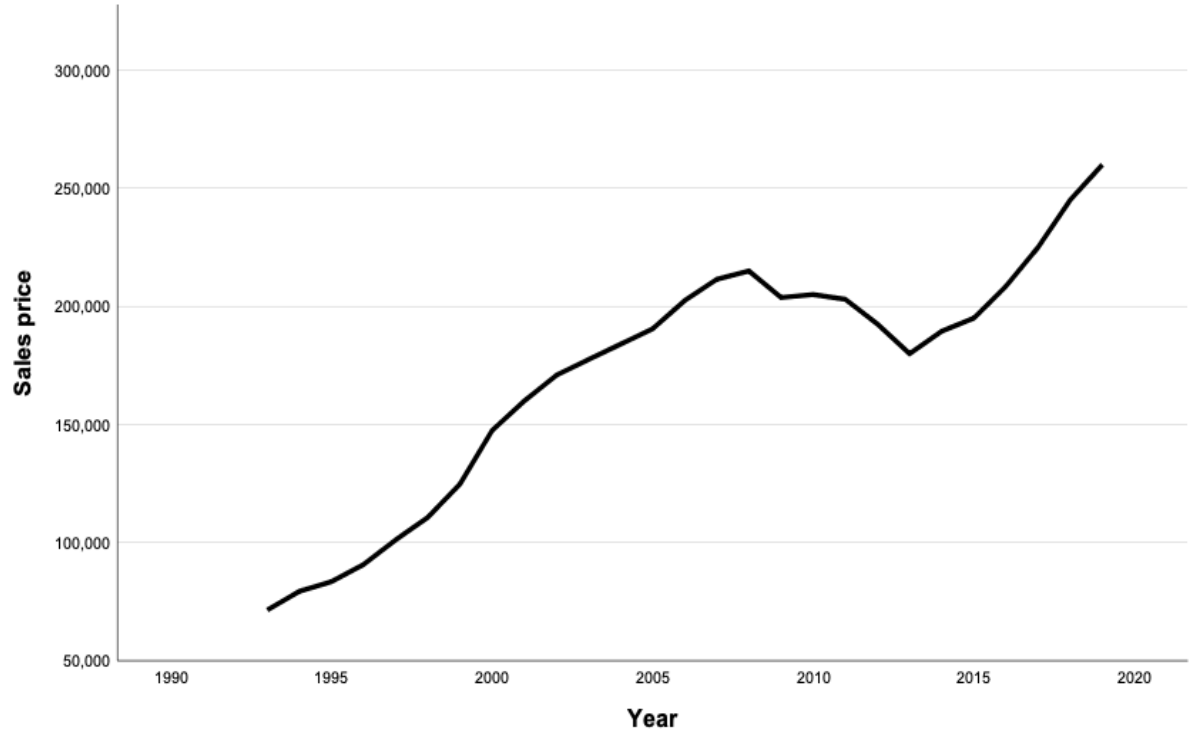

Figure A.1. Median sales price.

Appendix B. Annual percentage of flips relative to total transactions

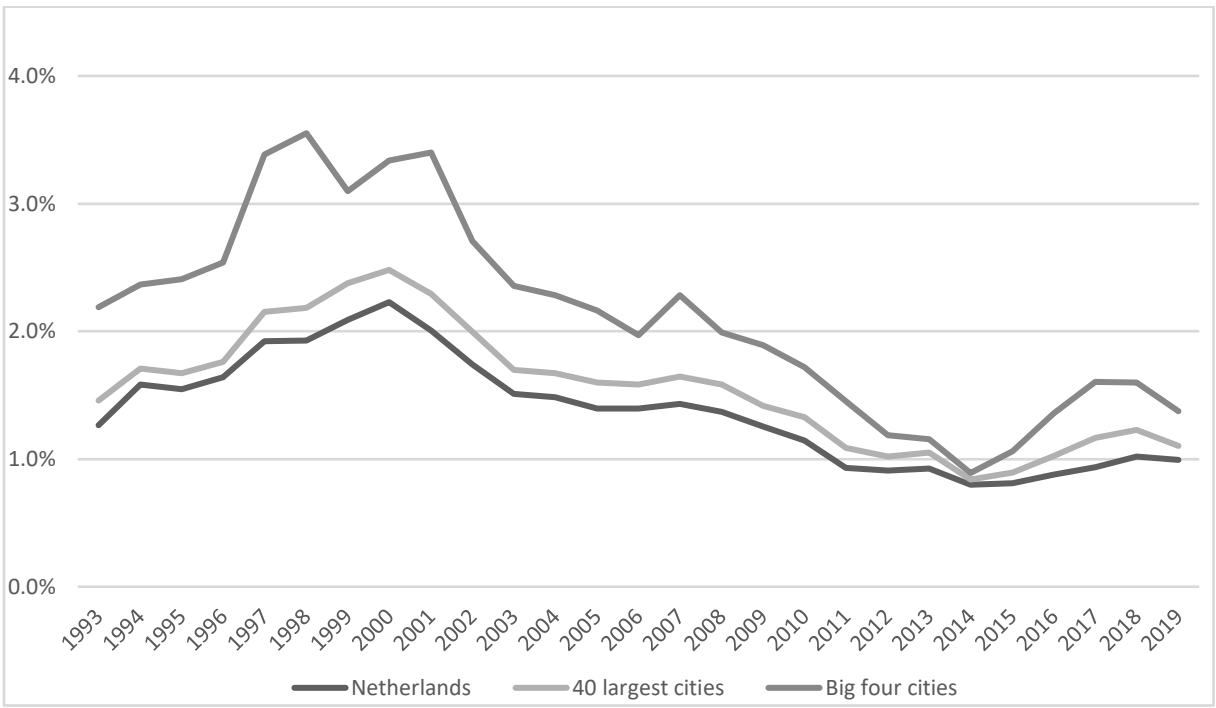

Figure B.1. Percentage flips relative to total annual transactions for the four largest municipalities (Amsterdam, The Hague, Rotterdam and Utrecht), forty largest municipalities and the Netherlands.

Appendix C Period of ownership

Table C.1. Period of ownership before and after July 2011.

Months	Frequency before 2011-07	Cumulative Percent	Frequency after 2011-07	Cumulative Percent
0	13,196	1.2	2,291	0.3
1	4,853	1.6	1,147	0.5
2	5,935	2.2	1,360	0.6
3	6,050	2.7	1,542	0.8
4	5,390	3.2	1,692	1.1
5	8,064	3.9	2,197	1.3
6	9,933	4.8	2,317	1.7
7	1,835	5.0	1,026	1.8
8	2,697	5.2	1,235	2.0
9	3,615	5.5	1,305	2.1
10	4,190	5.9	1,278	2.3
11	4,874	6.4	1,442	2.5
12	5,610	6.9	1,654	2.7
13	5,985	7.4	1,592	2.9
14	6,467	8.0	1,579	3.1
15	7,050	8.6	1,647	3.3
16	7,433	9.3	1,731	3.6
17	7,964	10.0	1,842	3.8
18	8,323	10.8	1,850	4.1
19	8,977	11.6	2,006	4.3
20	9,292	12.4	2,038	4.6
21	9,715	13.3	2,018	4.9
22	10,051	14.2	2,242	5.1
23	10,555	15.1	2,244	5.4
24	11,338	16.2	2,469	5.8
24+	930,918	100.0	714,408	100.0
Total	1,110,310		758,152	

Housing market areas are added based on migration flows between municipalities with a minimum size of 100.000 households.