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# The role of buy-side anchoring bias: Evidence from the real estate market☆

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ABSTRACT

We examine anchoring bias within the real estate market by evaluating evidence and a priori arguments on the effects of investor sentiment on willingness-to-pay among homebuyers. Based upon a unique dataset which provides the complete histories of transactions in the real estate market, our findings reveal that the anchoring phenomenon prevails regardless of homebuyer's gender. Homebuyers faced with higher systemic uncertainty and out-of-state housing transactions exhibit higher levels of anchoring; the heuristic thinking biased on investors' willingness-to-pay gives rise to the deviations from reasonable housing values.


## 1. Introduction

Given that 'anchoring heuristics' are extremely intuitive and rapid, when people decide to engage in various forms of investment, tasks that are normally seen as being very complex, such as the assessment of probabilities and the prediction of values, may, in practice, be reduced to much simpler judgmental operations. Nevertheless, as noted by Ferreira et al. (2008), among a wide variety of investment vehicles, engagement in real estate purchasing is probably the most significant financial decision anyone is likely to make in their lifetime.

Even without any consideration of the information asymmetry documented in several of the prior related studies,[1] or indeed the illiquidity and thinly-traded nature of residential housing markets, as argued in several other studies,[2] the valuation of a single real estate object is fundamentally challenging, largely as a result of its unique set of characteristics. Consequently, the heuristic thinking involved in such valuation leads to homebuyers being easily susceptible to anchoring bias.

As already noted, the purchase of the family home invariably represents a dominant proportion of the total wealth of a household.[3] Thus, although the effect of anchoring bias may also apply to other investment decisions made by investors, the effect is likely to be much more pronounced in real estate purchasing. That said, however, the sales price of a residential property is crucially reliant not only on its physical characteristics, but also the behavioral attributes of investors. Unfortunately, due to the lack of availability of comprehensive transaction level data, a thorough empirical understanding of such behavioral irregularities has yet to be achieved. We therefore attempt to fill the current gap in the extant literature by investigating the issue of investor

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[1] Examples include Garmaise and Moskowitz (2004); Firoozi et al. (2006) and Wong et al. (2012).
[2] See Kearl and Mishkin (1977); Lin and Vandell (2007) and Anglin and Wiebe (2013).
[3] This is particularly true for the young (see, for example, Flavin and Yamashita 2009).

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anchoring behavior through a comprehensive record of actual transactions obtained from a major dealer in the real estate market in Taiwan.

The prior related studies have tended to focus primarily on anchoring with regard to the listed prices or quoting strategies of sellers, with only a few studies having devoted any effort into unraveling the anchoring effect among buyers. From their examinations of the effects of buyer characteristics on real estate prices, Northcraft and Neale (1987) and Lambson et al. (2004) found that anchoring amongst homebuyers would directly affect the final selling price. Indeed, we suggest that ever since the initial discovery of the significant role played by anchoring in determining the reservation price of a buyer, homebuyers have undoubtedly made direct contributions to the upward distortions in sale prices.[4]

As an outcome which is contingent on the bargaining power between the buy and sell sides, the selling price can be a rather noisy proxy for teasing out the anchoring effects of homebuyers. We therefore carry out an alternative examination of the existence and influence of anchoring by focusing on the willingness to pay among homebuyers, which will arguably present straightforward evidence on the existence of anchoring in residential real estate purchasing decisions.

We aim to examine the above concepts by generalizing a new theoretical model, based upon the approach of Lambson et al. (2004), to highlight the relationship between anchoring bias and willingness to pay. Our model examines specific concerns, including search costs, uncertainty and informational asymmetry, as well as particular housing characteristics, under the assumption of a general, flexible two-parameter log-normal distribution of the underlying subjective housing price. As such, the mean parameter represents belief shifting (or anchoring) whilst the scaling factor represents the underlying uncertainty, with various empirical testable implications being deduced from the comparative statics analysis.

Our empirical identification of buy-side anchoring bias relies upon a unique hand-collected dataset providing detailed information on real estate buyers, including their gender, age and address. Given the detailed quotes from both sides and the deal price for each 2005-2010 transaction,[5] we can estimate the willingness to pay of such buyers through the price concessions.

In order to properly specify the reference point for the reservation price upon which the anchoring of buyers is based, in contrast to the experiment approach in the literature, our primary focus is to deliver insights using real transaction data. Lambson et al. (2004) point out that investors accustomed or anchored to real estate prices in their home state and this false bias could shorten their search cost. Our empirical approach involves constructing the buyer's current real estate price of land as the reference, which is achieved by merging the land values announced by the Department of Land Administration, Ministry of the Interior.

Using the modified hedonic model, originally proposed by Rosen (1974),[6] in conjunction with the Heckman (1979) two-stage adjustment for self-selection issues, we aim to disentangle the anchoring effect on the willingness to pay of buyers under some rigorous specifications. In addition to differentiating the anchoring effect from a variety of homebuyer characteristics, we also explore whether the strength of such anchoring bias may be dependent upon different housing regions and categories.

Our study contributes to the extant literature in several ways. Firstly, based upon the derived implications of the toy model, we find consistent empirical evidence of anchoring being a common phenomenon in the willingness to pay among buyers. To the best of our knowledge, our study may well be the first to contrast the magnitude of anchoring between genders, and indeed, it is interesting to find that although anchoring behavior is found to exist among both male and female homebuyers, the former appear to exhibit less anchoring bias than the latter.

In line with both Turnbull and Sirmans (1993) and Lambson et al. (2004), our empirical results further indicate that out-of-state buyers pay a premium which is specifically based upon anchoring bias attributable to increased information asymmetry. We also find a greater likelihood of homebuyers falling into anchoring traps during a period of financial crisis; this, in turn, implies that the higher the systemic uncertainty of the housing price, the greater the likelihood of homebuyers anchoring to their reference price.

Following a sequence of documented checks carried out among both controlled models with geographic factors, housing types, and an alternative dependent variable via price premium as well as an alternative reference price by the listing price, our arguments and findings are found to remain robust. In summary, our evidence indicates that buyers regularly pay an anchoring premium, essentially because of their upwardly-biased beliefs with regard to the price. These findings will undoubtedly further enhance our understanding of behavioral trading in real estate among individual investors.

The remainder of this paper is organized as follows. Our theoretical model is presented in Section 2, followed in Section 3 by the development of our hypotheses referring to the related literature. Our empirical model, variables and samples are described in Section 4, with Section 5 subsequently reporting the empirical results and Section 6 providing checks for the robustness of these results. Finally, the conclusions drawn from this study are presented in Section 7.

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[4] Northcraft and Neale (1987) demonstrated that the estimations of the value of a house, by both real estate agents and students, were largely dependent upon rough information on the list prices obtained from the questionnaire.

[5] The data set is collected and maintained by Taiwan Realty Co., one of the Taiwan's three largest real estate brokerages. The data project was suspended since the government implemented the mandatory Real-price Transaction and Registration system in 2012. Also due to the super-imposed luxury tax since 2011, we choose to restrict our sample period within 2005 to the end of 2010 to avoid these confounding policy effects in order to prevent speculators from manipulating real estate prices.

[6] Hedonic price model and repeat-sale approach are the two most common methods to characterize the price of real estates. One nice feature of the repeat-sale approach is that, by assuming fixed qualities of houses within short period and directly observing changes of house price in repeated turnovers, quality control is no longer a concern. However, it also require a large number of repeated transactions and the interval between two repeated sales be short; otherwise, the assumption may be invalid. Since we only have limited repeated sales within our sample period, we accordingly adopt the hedonic price method. Also, Hendershot and Thibodean (1990) found that the estimated house prices from the repeat-sale approach and hedonic price method are shown to be close.