# Behavioral Biases in the Housing Market

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**Abstract**

Behavioral economics has shed light on the complex and inefficient housing market caused by unconscious behavioral bias. This paper investigates heuristics and bias on both parties of housing transactions. Specifically, the existence and impact of the endowment effect are analyzed based on the sellers' perspective while status quo bias and anchoring effect are interpreted with respect to buyers. A simulation game of the housing market, a community housing market-related program and a professional analyzing app designed to offer a rational anchor are considered as solutions to the appearance of the endowment effect, status quo bias and anchoring effect during the decision-making process in the housing market.

## 1 Introduction

Behavioral Economics studies the effects of psychological, cognitive, emotional, cultural and social factors on the decisions of individuals and institutions and how those decisions vary from those implied by classical economic theory [TZ18]. In 1759, The Theory of Moral Sentiments written by Adam Smith laid out psychological principles of individual behaviour. In 1918, John Maurice Clark proposed the idea of behavioral economics [NAL05]. Since then, the idea of combining economics and psychology raised more and more attention and was applied to different areas such as the housing market.

Tversky and Kahneman point out that people often use heuristics when making decisions and these heuristics can lead to incorrect decisions [KT79]. Generally, sellers are subject to the endowment effect, which causes them to overvalue their properties and be averse to losses, with negative economic consequences. This has detrimental effects on the economy leading to fewer housing transactions happening in the housing market.

The majority of people consider buying a home to be their biggest and most significant financial transaction. Housing markets with infrequent sales have a bias toward the status quo that causes purchasers to favour the status quo alternative. Status quo bias reveals buyers' preference for the current state in

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the face of housing decisions, which causes decreased demand and sub-optimal decisions.

When negotiating with sellers, buyers usually anchor their estimated prices based on the market's asking price or seller's offering, which harms their positions in negotiations. Buyers are placed in a passive position during the process of negotiating home prices. It makes buyers easily manipulated by sellers, resulting in ineffective transactions and price premiums which may exacerbate the economic crisis or slow economic recovery from recession.

The paper is organized as follows. Section 2 provides the background and analysis of the housing market with respect to behavioral bias. Section 3 describes three common bias existing in the housing market, which affects either buyers or sellers. Section 4 provides the solutions for each bias during the decision-making process for the housing market.

## 2 Housing Market

The housing market is complex compared to other markets as a result of its heterogeneity. Each house is different, and housing markets contain many varying factors, where no two houses are identical (taking into account the interior and exterior of the property) [RW14]. Therefore, many economists such as Akerlof and Shiller claim that economic analysis should incorporate insights from behavioral economics [AS09]. Because of the structural components of the housing market, individuals are particularly vulnerable to the heuristics that behavioral economists have identified. Decision-making is prone to systematic biases as a result of the market's inherent complexity, high stakes and involvement, scale, subjective value, lack of feedback, and extreme ambiguity [SZ17]. As buying or selling a house is an infrequent but important transaction with such large financial consequences, consumers or sellers are usually inexperienced or financially unsophisticated, with limited information about the market. Infrequent purchases in housing markets facing the fact that all prices are negotiated individually make housing markets inefficient [RW14]. The stark contrast between the real estate market and the product market, where goods are homogeneous, adds to the pressure placed on consumers. In addition, different from real estate investment, transactions between buyers and sellers in residential housing markets involve strong emotional attachment and an intuitive basis that guides the decision choices.

The existence of behavioral biases that influence both parties' views of the property's value must be taken into account due to inexperienced sellers and buyers as well as intricate and inefficient housing marketplaces. Otherwise, the real estate industry will be turbulent due to internal and external factors at some time, leading to an economic crisis. Ackert et al. claim that a house price is based on future price expectations, therefore, many people partake in speculative housing transactions. It results in the fact that housing demand is partly driven by biased price expectations [AJ11]. For instance, Clark et al. suggests the 2008 financial crisis was exacerbated by speculative transac-

tions: the global housing market bubble was driven by emotion, rather than by sound investment decisions [GLCS09]. Therefore, it's essential to dive into behavioral biases which frequently interfered with individuals' decision-making when having housing transactions.

# 3 Behavioral Biases in the Housing Market

## 3.1 Endowment Effect

Housing markets exhibit a number of puzzling features, including a strong positive correlation between prices and sales volume and a negative correlation between prices and time on the market. Moreover, sales volume can fall 50 percent or more from peak to trough in a real estate cycle [GM01b]. It's reflected by the fact that houses sell quickly at prices close to and many times above the sellers' asking prices in a boom. In a bust, however, homes tend to sit on the market for long periods of time with asking prices well above expected selling prices, and many sellers eventually withdraw their properties without sales [GM01b]. This is because most sellers unavoidably experienced the endowment effect: the tendency for people to ascribe more value to items that they own compared to equivalent items that they do not own. Since most sellers have a long-standing emotional attachment to the property, the emotional value has subtly increased the selling price of the house. Thus, no matter how drastic the market changes, sellers always believe their properties are worth the higher price.

In the early 1970s, Richard Thaler found that Professor Richard was very reluctant to sell a bottle of his collection, even for a whopping 100 dollar, when a bottle was as high as 35 dollar. The large gap between 35 and 100 dollar is inconsistent with economic theory and the model of rational economic behaviour could not explain it as well [Kah11]. It reveals the reluctance of giving up a good or asset after consumption and connection caused by the endowment effect. Standard economic theory is based on the assumption that consumers are rational and aim to maximize their utility and it believes that the price of a product is determined by its hedonic characteristics and market equilibrium. Hence, for the same product, the price that the seller is willing to accept (WTA) equals the price that the seller is willing to pay (WTP). However, empirical results show that WTA is generally higher than WTP, sometimes as large as four times WTP for the same product [BG16]. The large gap between WTA and WTP demonstrates the endowment effect.

The most standard demonstration of the endowment effect is the mugs experiment. There are 44 students from the advanced law and economics classes participating in the mugs experiment. Half the students were randomly given mugs and became sellers while the others were buyers throughout three markets. A value for a token is assigned to each subject and it varies across subjects. Then, following the previous experiment, the experimenter conducts the second experiment which has the same participants as the first experiment. All subjects have the chance to examine a mug. Half of the subjects were assigned to

buyers and the rest are sellers throughout 4 markets. Buyers and sellers both write down the price they are willing to buy or sell. At the end of each market, the experimenter calculates the clearing price and the number of trades. After all the markets are finished, the experimenter randomly selects one market and all trades in that market are executed. The experimental result is listed in Figure 1. It clearly demonstrates that the median selling price is almost double the median buying price and only 20 percent of the predicted volume of trades occurs. According to neoclassical economics, about 50 percent of the potential transactions should have taken place. Sellers, however, placed a higher value on them than buyers [Kah11].

INDUCED-VALUE MARKETS

| Trial | Actual Trades | Expected Trades | Price | Expected Price |
|---|---|---|---|---|
| 1 | 12 | 11 | 3.75 | 3.75 |
| 2 | 11 | 11 | 4.75 | 4.75 |
| 3 | 10 | 11 | 4.25 | 4.25 |

CONSUMPTION GOODS MARKETS

| Trial | Trades | Price | Median Buyer Reservation Price | Median Seller Reservation Price |
|---|---|---|---|---|
| | Mugs (Expected Trades = 11) | | | |
| 4 | 4 | 4.25 | 2.75 | 5.25 |
| 5 | 1 | 4.75 | 2.25 | 5.25 |
| 6 | 2 | 4.50 | 2.25 | 5.25 |
| 7 | 2 | 4.25 | 2.25 | 5.25 |

Figure 1: Table of results in the mugs experiment

To further estimate whether individuals are reluctant to buy or sell, people were divided into three groups: sellers, buyers and choosers. Sellers were given a mug and stated their selling price while buyers stated their buying price for a mug. Choosers were asked to choose for each set of prices between receiving a certain amount of money or a mug. The median reservation prices were respectively 7.12 dollar for sellers, 2.87 dollar for buyers and 3.12 dollar for choosers. The large gap between sellers' estimated prices and buyers' and choosers' estimated prices reveals that the low volume of trade is mainly driven by sellers' reluctance to part with their endowment rather than buyers' reluctance to part with their cash. Apart from standard economic theory, this experiment illustrates that individuals tend to overvalue their properties instead of being rational [Kah11].

The endowment effect proven by the mug experiment could be translated to the housing market. Individuals have more attachment to their homes, due to the emotional connections, leading them unable to price their property rationally. A field experiment conducted in China found that WTA was greater than WTP. Sellers exhibited an endowment effect even though 68 percent of partici-

pants had previous experience in the market [BG16]. As demonstrated with the mug experiment, this results in a lower volume of trade, which threatens the economic principles and functioning of the market.

The Coase Theorem states that the allocation of resources to individuals who are free to bargain and transact at no cost should be independent of initial property rights. Resources should end up to their most effective use regardless of the starting point. However, if there exists an endowment effect, Coase Theorem does not hold. If the marginal rate of substitution between one good and another is affected by endowment, then the individual who is assigned the property right to a good will be more likely to retain it. Market decline, inefficient use of resources, and under-trading are the economic effects of defying the Coase Theorem [Kah11]. As a result, it's necessary to take efforts in preventing sellers from experiencing the endowment effect.

## 3.2 Status Quo Bias

The completeness assumption of rational choice theory ensures that decision-makers have well-defined preferences between any two possible alternatives. Together with utility maximization, it implies that a decision-maker always chooses the option which yields the highest utility subject to his or her budget constraint. Therefore, it's not surprising that standard economic theory has not devoted much attention to the process of decision-making. However, through the process of decision-making, problem recognition is identified as the key characteristic of each decision which rests upon recollection of information and the status quo [BM78]. Since the status quo enters the process of decision-making in the very delicate blueprint stage, it is not surprising that there are many reports showing the status quo led to significant deviations from the standards of behaviour predicted by normative models in the housing market [Kor97]. Status quo bias is an emotional bias: when faced with a choice among different options, people have a tendency to stick with the default. That is to say, in the housing market, people systematically favour maintaining a state of affairs that they perceive as being the status quo or choosing the property which has more attachment to them, rather than switching to a rational alternative state, all else being equal. The reason why buyers unconsciously stick to the status quo alternative is that the status quo effect is driven by the cognitive costs involved in thinking about the choice and switching [CRST08].

A series of controlled questionnaire experiments by William Samuelson and Richard Zeckhauser using undergraduate and graduate students as subjects illustrates the positive relationship between the status quo and individual preferences. The initial setting is that students are investors who are inheriting a large amount of money and now consider several portfolios to invest in: a moderate-risk company, a high-risk company, treasury bills, and municipal bonds. However, students were randomly divided into smaller groups, each of which received a different description of the financial state and the number of available choices. The different descriptions either revealed that one of the options represented the status quo position or that none of the options represented the status quo. For

instance, in Treatment A, subjects are told that the money is currently invested in treasury bills which is costless to change the investment, and given the four options which are a moderate-risk company, a high-risk company, treasury bills, and municipal bonds. Then, in Treatment B, the description stayed the same as Treatment A but with limited options: a high-risk company and treasury bills. The experiments conducted many treatments within two dimensions: the option selected as the status quo and the number of options offered. As experimenters hypothesized, they found that subjects generally preferred a given choice most often when it represented the status quo and least often when another choice represented the status quo, with preferences for the choice falling somewhere in between when none of the options given would preserve the status quo [Kah11]. This experiment not only proves that an option becomes much more popular once it is designated as the status quo but also reveals that the advantage of the status quo increases with the number of alternatives.

Experimenters have also observed the presence of status quo bias in the housing market. The study takes into account homeowners' predictions on the possibility of home price drops over the coming year in order to test for the existence of status quo bias in residential real estate. Homeowners are posed with three interconnected questions. Owners are first asked whether a decrease in the value of their primary residence or a decrease in the neighbourhood's average home price is more likely to occur. On a scale from 1 (homes in the neighbourhood are more likely to decline in value) to 9 (my home is more likely to drop in value), with 5 (both are equally as likely) being in the middle, increasing the status quo deviation aversion holds that homeowners would predict that other homes in the neighbourhood are more likely (a number slightly less than 5) to decline in value. This hypothesis is based on the argument that their home represents the center of their familiarity base or their status quo alternative. As the circle widens to include homes across the state and homes across the country, it would predict the reported values to get lower and lower because homeowners are presumably less familiar with other areas of the state and the country [MJSH08].

Figure 2 summarizes the results of three estimations with the pooled data that were performed in the examination of status quo bias. In Model I, experimenters only consider the proximity dummies; in Model II, they add the control variables; and in Model III, they consider the respondents' sociodemographic characteristics. Model I shows that the proximity dummies explain only about 2.8 percent of the total variance. Hence, proximity alone is a relatively weak explanation of the observed data, but this also reflects a large amount of noise one usually finds in survey data. Nevertheless, the F-test rejects the null hypothesis of all $\alpha$'s being simultaneously equal to zero at the 1 percent significance level. The regression intercept 0 is significantly smaller than zero. Therefore, there is a significant status quo bias at the neighbourhood level. Moreover, moving to the country level $\alpha 2$ significantly increases status quo bias, and the sample mean rises from -0.640 to -1.483 points [MJSH08]. In summary, results clearly confirm deviation aversion driven by the status quo effect, which reveals buyers' cognitions of the housing market are affected by the status quo effect.

**Table 2. Familiarity Bias: Pooled Sample OLS-Estimates**

| | | Coefficient | | |
|---|---|---|---|---|
| **Label** | **Variable** | **Model I** | **Model II** | **Model III** |
| Constant[a] | $\alpha_0$ | -0.640*** | -0.830*** | -0.421* |
| | | (0.185) | (0.262) | (0.222) |
| State[a] | $\alpha_1$ | -0.101 | 0.101 | -0.158 |
| | | (0.277) | (0.277) | (0.283) |
| Country[a] | $\alpha_2$ | -0.843*** | -0.843*** | -1.597*** |
| | | (0.298) | (0.297) | (0.355) |
| Termtime | $\beta_1$ | --- | -0.282 | --- |
| | | | (0.499) | |
| Night/Day | $\beta_2$ | --- | 0.212 | --- |
| | | | (0.258) | |
| Bull/Bear | $\beta_3$ | --- | 0.296 | --- |
| | | | (0.365) | |
| Female | $\gamma_1$ | --- | --- | -0.516** |
| | | | | (0.244) |
| Asia × Country | $\gamma_2$ | --- | --- | 1.706*** |
| | | | | (0.459) |
| $N$ | | 267 | 267 | 228[b] |
| $\overline{R}^2$ | | 0.028 | 0.023 | 0.096 |
| $F$-Test | | 4.78*** | 2.225* | 6.99*** |
| Breusch-Pagan-Test[c] | | 4.90* | 9.17 | 2.99 |

*Table notes*. Endogenous variable: familiarity bias Δ. *$p$≤0.10, **$p$≤0.05, ***$p$≤0.01 (tests are two-tailed if not otherwise stated). Standard errors are given in parentheses. Standard errors were computed using White's heteroscedasticity robust covariance matrix. [a]Test is one-tailed. [b]39 (13×3) observations with missing country classification data dropped. [c]Null hypothesis: homoscedasticity.

Figure 2: Table of results in the experiment of homeowners' predictions on housing price

In many circumstances, it seems that whether people have a preference for a good, a right, or anything else is often in the part of a function of whether their experience, their surroundings, or the government has allocated it to them in the first instance. In the housing market, most people in a housing transaction are inexperienced amateurs, with limited information about the market [SS06]. For most individuals, a house purchase is their largest and most important financial transaction throughout their lives. Infrequent purchase in housing markets with the fact that all prices are negotiated individually leads to the existence of status quo bias. The status quo bias indicates that individuals are inclined to familiarity. While facing risks and uncertainty, individuals will likely stay in their comfort zone gravitating towards a possibly risky decision with familiar features, such as location, amenities, property conditions and financial sectors, regarding the cognitive costs associated with analyzing alternative options [HCZ07]. Consequently, it breeds the benefit for housing sellers since status quo bias makes buyers blind from the potential benefits of additional information acquisition. Moreover, the anticipation of emotional burden and financial worries of the market turns to induce buyers to prefer the status quo [MJSH08]. For example, a prospective buyer may delay purchase fearing the pain of losing current features like proximity to amenities and neighbourhood atmosphere.

### 3.3 Anchoring Effect

The anchoring effect is a cognitive bias whereby an individual's decisions are influenced by a particular reference point or 'anchor'. Traditionally, pricing analysis considers the implicit price of property qualities, including but not limited to property attributes, neighbourhood characteristics, time, and locational effects in a competitive market [Ros74]. However, the analysis usually overlooks the effect of market participants, not until the emergence of behavioral economics in the 1990s [CL04]. As the efficient markets hypothesis believes, the "law of one price" in any type of market should hold. However, shreds of empirical evidence demonstrate that non-local property buyers usually pay a premium for comparable residential properties relative to their local counterparts, which contradicts the efficient markets hypothesis. Therefore, the sale prices of residential properties are not necessarily affected by objectively measured property attributes, but by attributes that sellers and buyers perceive as anchors [KSCY21].

In many situations, people make estimates by starting from an initial value that is adjusted to yield the final answer. The initial value, or starting point, may be suggested by the formulation of the problem, or it may be the result of a partial computation. In either case, adjustments are typically insufficient. That is, different starting points yield different estimates, which are biased toward the initial values. The gamble experiment by Tversky and Kahneman clearly illustrates the existence of the anchoring effect while making decisions. There are two gambles for subjects to bet on for two treatments [KT79]. In the first treatment, option A is drawing a red ball from a bag containing 50 percent red and 50 percent white balls, and option B is drawing a red ball 7 times in a

row, with replacement, from a bag containing 90 percent red and 10 percent white balls. In the second treatment, option A is drawing a red ball from a bag containing 50 percent red and 50 percent white balls while option B is drawing a red ball at least once out of 7 attempts, with replacement, from a bag containing 10 percent red and 90 percent white balls. Same as the prediction by experimenters, the result is a majority of subjects bet on option B for the first treatment and option A for the second treatment where option B in treatment 1 only has 48 percent to draw a red ball and option B in treatment 2 has 52 percent. The stated probability of the elementary event provides a natural starting point to the assessment of the probability of the situation. People subsequently compute estimates to a given context by the provided anchor, which causes people's determinations to be biased [KT79].

The anchoring effect exists through every financial transaction in the housing market as well. Valuations are skewed toward an initial starting estimate as a result of anchoring. It was first revealed in a real estate context by Northcraft and Neale, who describe that listing prices anchored the pricing decisions of students as well as real estate agents [NN87]. After more than a decade of research, demonstrations of anchoring by subjects cover a broad spectrum of experimental settings. Even negotiators who are trained as deal makers and provided with rich and accessible information are anchored in the negotiation process [Bla97]. Obviously, when individuals face unfamiliar markets, the bias is considerably more pronounced. The anchors that buyers use in order of significance are the uncompleted contract price of comparable property, the uncompleted contract price of the subject property, and the value opinions of other experts. Despite appearing contradictory, this order of significance is consistent with normative training and the widespread availability of information in contexts found in the real world [IH01]. Therefore, it places buyers in a passive position during the process of negotiating home prices. Because the buyer must rely on speculation to ascertain the seller's reservation point and the target point, the process of bargaining is fraught with risk. The reservation point is where the seller is indifferent about accepting or rejecting the offer while the target point is the seller's most preferred outcome. The real estate market is complex and dynamic where the fair market value (FMV) of the properties can't be objectively determined [NN87]. As a result, buyers will prefer the anchoring option unconsciously. The asking price acts as the anchor on which the entire negotiation is premised [GM01a]. An anchor that benefits one party during negotiations leads to better outcomes for that party. It is challenging for buyers to form independent objective evaluations of properties and attributes because sellers in the real estate market always show the anchor first. Inefficient adjustment creates distorted valuations. Due to the anchoring effect, buyers fail to negotiate optimal and advantageous offers, resulting in less beneficial transactions.

With respect to the housing market, the anchoring effect not only violates buyers' interest in decision-making for the property but also exacerbates the economic crisis or slows economic recovery from recession. Supported by the Monte Carlo experiments, it suggests that anchoring heuristics play a major role in the speculative bubble dynamics. More accurately, a large bubble should

be caused by a high anchoring level in the fundamental value assessment process. During speculative bubbles, fundamental traders do not take account of economic news and other fundamental data since they highly fall into the anchoring trap [Wil11]. Likewise, when facing the house price bubble, homeowners are unable to cope with selling their houses at a loss as a result of the previous reference prices. With low-interest rates and little government intervention, even if housing demand drops, homeowners often will not drop house prices because their perception based on anchoring to a reference point of previous perceived value, prevents them from lowering the price. Generally, the house price bubble will plateau at a level based on a previous value and remain there until either interest-rate movements or government intervention spark further demand. Therefore, it's necessary to prevent individuals from falling into the anchoring trap and to raise their awareness of the anchoring effect in the housing market.

# 4 Solution

## 4.1 Endowment Effect

Most pieces of evidence proving the existence of the endowment effect are from artificial lab settings and inexperienced subjects. For example, in the standard mug experiment, subjects do not trade mugs frequently. It leads to doubt about the relationship between experience and the endowment effect. Is endowment effect a stable bias in preferences or does it disappear as participants learn about the market? An experiment conducted by John List has responded to the question. In the setting of a sportscard show in Orlando, Florida, there are two goods to be traded: a) a Kansas City Royals game ticket stub for admission on the day when Cal Ripken Jr. broke the MLB record for consecutive games plates; b) a dated certificate commemorating the game when Nolan Ryan became the 21st player in MLB history to win 300 games. Participants of the sportscard show are divided into two groups — one acts as customers representing less experienced buyers and the other acts as dealers with more experienced. The experimenter asks participants whether they are interested in filling out a survey in exchange for a good as compensation. If participants agree, they will receive either Treatment 1 with Good A or Treatment 2 with Good B and then fills out the survey. The experimenter reveals the other good and asks the subjects whether they want to trade it after allowing him to inspect both goods, which means subjects have two options: keep the original good or trade the original good with the new good [Kah11].

Results presented in Figure 3 prove that there is an association between experience and the endowment effect. In the dealers' group, there are about 44 percent of trades happened for either trading Good A for Good B or Good B for Good A while in the non-deals group, only about 20 percent of trades happened for trading Good A with Good B and 25.6 percent trades for trading Good B with Good A. More obviously, while comparing consumers group internally,

| Variable | Percent traded | $p$-value for Fisher's exact test |
|---|---|---|
| Pooled sample (n = 148) | | |
| Good A for Good B | 32.8 | <0.001 |
| Good B for Good A | 34.6 | |
| Dealers (n = 74) | | |
| Good A for Good B | 45.7 | 0.194 |
| Good B for Good A | 43.6 | |
| Nondealers (n = 74) | | |
| Good A for Good B | 20.0 | <0.001 |
| Good B for Good A | 25.6 | |

| Variable | Percent traded | $p$-value for Fisher's exact test |
|---|---|---|
| Experienced nondealers (n = 30) | 46.7 | 0.32 |
| Inexperienced nondealers (n = 44) | 6.80 | <0.001 |

Figure 3: Table of results in the sportscard experiment

there is a huge difference of about 40 percent trades between inexperienced and experienced consumers. Results robust to a different institution to elicit values and can extend to a market in the lab that is not about sports memorabilia [Kah11].

Market knowledge is a confounding factor of the endowment effect. Greater awareness of the market can reduce the endowment effect. Willingness to pay (WTP) and willingness to accept (WTA) measures of value are quite different for inexperienced consumers, but that value differences erode with market experience. One potential shortcoming is that market experience is endogenous which consumes lots of time and needs a large amount of practice. Therefore, a simulation game of the housing market is needed to enrich sellers' experience in housing transactions. Users as house owners are asked to choose the type and characteristics of properties waiting to sell on the game. It's through a process similar to property-selling websites where users select or enter information about location, characteristics, purchase price, amenities and so on. Then, the game requires the selling price of the property users choose to sell and the game will also offer the market prices for different types of properties. Once users define their properties and list the selling price, the game starts. It goes day by day every 30 seconds with a maximum of 30 days in the game which is 15 minutes: as the waiting time for the house to be sold becomes longer and approaches 30 days more closely, it indicates the difficulty of selling the house in a real-world situation with the unreasonable selling price. Meanwhile, while waiting for the house to be sold, the game will also show some neighbourhoods with similar conditions being bought. As a result, the pressure coming from the nearby housing market and the unexpectedly long waiting time make users con-

scious of the existence of the endowment effect which causes them to overvalue their properties. After 15 minutes of the game, users will be aware of and pay attention to the opportunity cost of not being able to make the deal due to the endowment effect.

## 4.2 Status Quo Bias

The status quo bias has clear economic implications in the market. The demand for residential housing decreases as a result of a preference for the status quo. Even when utility for a buyer would be maximized elsewhere, the individual sticks to the current residence. This occurs because the status quo appears safer and due to avoidance of regret. Unwillingness to change to maximize utility reduces transactions and creates a barrier between buyers and sellers. To solve this barrier, it's suggested to use social conformity to prevent borderline buyers from sticking to the status quo. Thaler and Sunstein talk about conformity as a way to reduce energy use, environmental policy, and tax compliance [CRST08]. Buyers would benefit from replication in the real estate scenario. People are influenced to make decisions that go against the status quo bias by social and cultural conventions. An experiment found that people adjust their values to fit into society. For given options of economic recession, educational facilities, subversive activities, mental health, and crime and corruption, Participants were asked which option they consider the most important problem for their countries. Only 12 percent selected subversive activities when asked individually. However, in a group with a unanimous consensus, 48 percent of people followed suit [CRST08].

As a result, it's suggested to create an online housing market-related consulting program where people could share their experiences of moving from this community to substantially different neighbourhoods or environments and individuals who hesitate to determine whether buying a house are matched with similar experiences shared by former resident base on their demand. Those advisors for hesitant people could be paid based on the consulting hours or volunteer to help individuals from plumbing in station quo bias. The experiences shared by former residents exhibit the promising features of other environments, which are overlooked during the decision-making process due to the status quo bias. Moreover, if individuals are willing to meet or email former residents to further discuss their current worries, it's applicable to allow individuals to straightly immerse in the advantages that drive former residents' decisions during the conversation. By explicitly highlighting the beneficial values of alternative options and creating positive scenarios, the community program prompts buyers to compare the status quo to alternatives with a unique perspective. It induces buyers to compare options on the same scale, minimizing flawed intensity matching. The program is designed through the mechanism of conformity, which allows buyers to make rational decisions away from being affected by the status quo bias.

### 4.3 Anchoring Effect

Despite the increasing evidence about the importance of reference points for housing transactions, little agreement exists in the literature concerning the nature of reference points. The observed reluctance to sell in a decreasing housing market, as well as the wish to sell without reducing the price, suggests that, for some sellers, the reference price could be the initial buying price of the apartment [PC11]. The initial buying price of the property is a natural benchmark because it makes it possible to judge whether money was gained or lost in the transaction [MSB91]. This benchmark effect makes the initial buying price of the apartment a good candidate for the reference point [SS85]. However, as housing markets are in constant evolution, the seller's reference point for the apartment can evolve after the initial buying moment [GM01b]. Using experimental methods, Gneezy shows that a historical peak in the housing market also constitutes a potential candidate for the sellers' reference point [Gne02]. Other recent papers have suggested that the reference point is neither the initial price, nor the current market price, but an anticipation of the future price for the property [KR06]. Therefore, it suggests that the sellers could adapt their reference point, completely or partially, at a price of the initial price of the apartment or the other periods' market prices for the property.

The standard economic theory considers that buyer behaviour in the housing market should not be influenced by information manipulation from sellers. However, the housing market is characterized by asymmetric information because goods are heterogeneous and, therefore, difficult for outsiders to value [GM04]. Even if the seller and the buyer have access to the same information concerning the housing market, sellers also have private information about the apartment they want to sell. Such information asymmetry is likely to reinforce the impact of additional information on the buyer's reference point. As a result, it is difficult for buyers to distinguish where the price anchor is, which makes them easily manipulated by sellers.

One strategy to combat anchoring bias that is evidence-based information, which directly lets buyers be aware of the unreasonable anchor and make rational decisions away from the anchoring effect. Developing an app that can deeply analyze and integrate data related to the real estate market is the best solution. Inside the app, individuals are asked to enter their property needs, property location, property type and the property they own. The system will further search and obtain relevant data and information, such as the changes in house prices in the past five years, the real estate policies of relevant places, the prediction of future real estate prices, the average price of real estate in the most prosperous period, and so on. After a series of data searches, the app will be integrated into a report that clearly shows the relative data comparison and the advantages and disadvantages of each property. Professional data and analysis will allow buyers to change the original anchor to a more rational one or rebuild a new anchor. Then, when negotiating with homeowners, the huge difference between buyers' anchors and sellers' offers will prevent buyers from falling into the trap of the anchoring effect influenced by sellers so that it prompts buyers

to make an effective and rational housing decision.

# 5 Conclusion

The housing market involves infrequent financial transactions for individuals. During the decision-making process, buyers and sellers tend to unconsciously fall into the trap of behavioral bias. Those heuristics in buyers and sellers formulate inefficiencies in the housing market. This paper is focused on the endowment effects from sellers' perspective and explored status quo bias and anchoring effects for buyers. The endowment effect, which makes sellers overvalue their properties and fear losses, has detrimental effects on the economy. Buyers' preference for the status quo in the face of housing decisions is known as status quo bias, which results in lower demand and less-than-ideal choices. When exploring different property options, buyers are unconsciously anchored to the listing price, which results in transactions that negatively harm buyers during the negotiation process. Therefore, it's necessary to avoid those biases from affecting the transactions. Strategies provided are suggestions of following the market experience, a community housing market-related program and a professional analyzing app designed to offer a rational anchor. The video game of simulating housing transactions is encouraged since the evidence shows that enriched market experience could let individuals away from the endowment effect. Establishing an online consulting program related to the housing market is to induce buyers to compare options on the same scale, minimizing the interference from status quo options. In order not to let the anchoring effect put buyers in a passive and disadvantaged position, a professional analyzing app is designed to help buyers change their anchor or create a new anchor which is effective and rational.

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