

The Anchoring Effect: Mechanisms and Real-World Applications

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Abstract—The anchoring effect is a typical cognitive bias proposed by Tversky and Kahneman, which means that people tend to over-rely on initial or random numerical anchors without adequate adjustment when making judgments under uncertainty. This paper expounds its mechanism, case and significance. Based on Wheel of Fortune and multiplicative estimation experiments, it illustrates how anchors can distort judgments. Dual-process theory illustrates that the automatic and intuitive processing of System 1 rapidly captures initial anchor values without sufficient rational adjustment, which directly generates anchoring bias. The paper then analyzes the practical applications of anchoring in market pricing, salary negotiation, and asset investment. The article mainly emphasizes three examples, respectively are: Sellers set a high reference price; The first offer determines the outcome of the negotiation; Investors focus on market prices rather than intrinsic value. This paper reveals that anchoring is a common and significant bias that broadly affects everyday economic decisions. Understanding it helps individuals to reduce irrational judgment and improve the quality of decision-making.

Keywords—anchoring effect, Cognitive heuristic, Economic decision, Reference point

I. INTRODUCTION

People are supposed to be rational in economics, and they want to maximize their profits. However, people's decisions in behavioral economics are easily influenced by cognition and bias. Among the many cognitive biases, the anchoring effect is one of the most common, powerful and uncontrollable psychological phenomena. It permeates consumption, negotiation, finance, management, and other domains of daily life, affecting individuals' everyday choices.

The anchoring effect, first proposed by Amos Tversky and Daniel Kahneman in 1974 (Tversky & Kahneman, 1974), refers to the tendency to over-rely on the first numerical information received when making a judgment or estimate. This initial value is called an "anchor" and serves as a reference point. Although people try to adjust their judgment after the fact, the adjustment is typically insufficient, so the final judgment remains biased toward the anchor. Even when this reference point is a random or irrelevant number, it can strongly influence the judgment.

The purpose of this paper is clearly to explain the anchoring effect, reveal its internal mechanism, and explore its impact in real applications. Many people make biased decisions without realizing that they are controlled by the anchor. By understanding this bias, individuals can become more aware of their thought patterns and make more rational choices.

The structure of this paper is divided into seven parts, the

first part is the summary, which summarizes the core content of the whole paper. Then second section presents the introduction, outlining the research background, purpose, and overall structure of the study. Section three defines the anchoring effect and illustrates its importance. The fourth, fifth, and sixth sections discuss the applications to marketing, salary negotiation, and asset investment, respectively. Finally, there is a summary of the paper.

II. DEFINITION AND EXPERIMENTAL EVIDENCE OF THE ANCHORING EFFECT

The anchoring effect refers to the phenomenon whereby, when making numerical estimations under uncertainty, people unconsciously take the initially obtained irrelevant numerical information (anchor) as a reference point, adjust based on it, but the adjustment is often insufficient, leading the final estimation result to be biased towards the anchor.

Tversky and Kahneman's "Wheel of Fortune" experiment is the most famous example (Tversky and Kahneman, 1974). "In a demonstration, the subjects were asked to estimate various quantities expressed as percentages (for example, the percentage of African countries at the United Nations). For each quantity, rotate the lucky wheel in front of the subject to determine a number between 0 and 100. The subjects were first asked to indicate whether this number was higher or lower than the value of this quantity, and then estimated the value of this quantity by adjusting up or down based on the given number. Different groups were given different starting numbers for each quantity, and these arbitrary anchors exerted a significant influence on the final estimates.

The median estimate for the percentage of African countries in the United Nations was 25% when the anchor was 10, compared to 45% when the anchor was 65%. In a classic demonstration, participants were tasked with estimating a series of values given as percentages—such as the share of African nations among UN member countries. Before making their guesses, a roulette-style wheel was spun in front of each person to produce a random number between 0 and 100. Participants first judged whether this arbitrary number was higher or lower than the true value of the quantity in question. Then they used this number as a starting point, adjusting their final estimate up or down from it.

Across different groups, the randomly generated anchors varied considerably and exerted a surprisingly strong influence on participants' judgments. For instance, when the wheel landed on 10, the median guess for the percentage of African countries in the UN was just 25%. When the starting number was set to 65, however, the median estimate jumped

to 45%.” (Tversky and Kahneman, 1974).

The mechanism of the anchoring effect can be explained by System One in the two-process theory. The human mind consists of two systems: System one and System two. This theory was proposed by Jonathan St B. T. Evans & Peter Wason in 1975 (Wason and Evans, 1974).

“Psychologists have been intensely interested for several decades in the two modes of thinking evoked by the picture of the angry woman and by the multiplication problem, and have offered many labels for them. I adopt the terminology originally proposed by psychologists Keith Stanovich and Richard West, and will refer to the two systems of the mind as System 1 and System 2.

System 1 operates automatically and quickly, with little or no effort and no sense of voluntary control.

System 2 allocates attention to the effortful mental activities that demand it, including complex computations. The operations of System 2 are often associated with the subjective experience of agency, choice, and concentration” (Wason and Evans, 1974).

The fundamental reason for the anchoring effect is the dominant position of System 1 thinking, because people are used to quick intuitive judgment and lack sufficient rational correction.

The anchoring effect has important theoretical and practical implications. Theoretically, it challenges the assumption of the rational actor and has advanced the development of behavioral economics. In practice, it explains many irrational phenomena in real life and provides a new perspective in analyzing human decision-making. Identifying the anchoring effect helps individuals reduce judgment bias and improve decision-making rationality.

III. APPLICATIONS

In this study, this essay picked three typical anchoring scenarios that show up all the time in real markets and are easy for consumers to notice: 1. numeric anchoring (using random numbers as a starting reference), 2. comparative anchoring (using a given number as a benchmark for judgment), and 3. adjustment anchoring (moving up or down from an initial number). These three types were selected due to their prevalence in commercial contexts—including pricing, quantity cues, and decision-making—where anchoring mechanisms frequently operate.

In the present study, this paper first uses a ‘random spinner generating an initial number’ scenario to create how people in markets unconsciously latch onto a reference value. By showing how estimates shift in response to different starting numbers, this paradigm demonstrates the basic anchoring effect in quantity judgment. Then, building on a ‘judge high or low first, then estimate’ comparison logic, it mimics the common market process where people first get anchored to a range before landing on a specific value—showing how anchoring narrows down the judgment interval and changes the final outcome. Finally, using ‘adjust upward or downward from an initial value’ as the thread, it maps onto real situations like bargaining or deciding based on listed prices, original prices, or reference points, and analyzes what happens when adjustment falls short. These three cases together cover where anchoring

comes from, how it operates, and the path through which it exerts its final impact.

A. The Anchoring Effect in Marketing

Anchoring effects appear widely in marketing. This high-price pricing strategy corresponds to numeric anchoring and comparative anchoring. Sellers often use anchors to influence consumers’ perception of price and value, which in turn promotes purchase behavior. In the real market, merchants often set a high original price as an anchor, and then offer a relatively low discount price. For example, the suggested retail price of an item is 899 yuan, while the promotional price is 299 yuan, which corresponds to a 67% discount. Consumers will use the high original price as a reference and consider the discounted price to be a good deal. Guided by System 1 thinking, consumers rarely engage in a rational assessment of a product’s true value; instead, they are drawn to the price discrepancy and often make impulse purchases.

The multiplicative estimation experiment designed by Tversky and Kahneman provides strong evidence for this application. Two groups of students were asked to estimate the product of a sequence within 5 seconds. One group calculated $1 \times 2 \times 3 \times 4 \times 5 \times 6 \times 7 \times 8$, and the other group calculated $8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1$. Although the results are the same for both formulas, the median valuation is 512 for the first group and 2250 for the second group, while the true answer is 40,320. This shows that the first few numbers as anchors seriously affect people’s estimation results.

In this context, setting the anchor point at a high price affects consumers’ perception of price. Consumers do not evaluate the true cost, performance, and value of the product, but only compare the anchor price and the selling price. The anchoring effect leads consumers to feel they are receiving a substantial discount, thereby increasing their willingness to purchase the item. This strategy has become a widespread pricing method in the retail industry, and its core logic is to use anchoring effects to manipulate consumer decisions.

B. The Anchoring Effect in Salary Negotiation

The Anchoring effect plays a decisive role in negotiation activities, especially in salary negotiations. Recurring negotiations bargaining based on the initial offer falls into adjustment anchoring. The first offer in a negotiation becomes an vital reference point, and the final outcome is often close to that reference point.

Galinsky and Mussweiler (Galinsky and Mussweiler, 2001):

“Anchoring research has demonstrated that judgments are assimilated toward an arbitrary initial value, the anchor. In negotiations, the first offer constitutes such an initial anchor that should strongly influence the final agreement. Consistent with this logic, the first offer is a powerful determinant of final settlement prices” (Galinsky and Mussweiler, 2001).

confirmed through several experiments that the first offer had a significant anchoring effect on the negotiation results, and the party who took the initiative to make an offer could often obtain more favorable results. The same conclusion applies to pay negotiations (Galinsky and Mussweiler, 2001).

Suppose that the employee's ideal salary range is \$11,000 to \$13,000 and the firm's expected salary is \$8,000. This \$3,000–\$5,000 divergence between the parties' expectations creates significant bargaining space in which anchoring mechanisms operate. If the company is the first to propose a \$9,000 anchor salary, the final negotiated salary is usually around \$10,000. If the employee voluntarily anchors \$13,000, the final compensation is mostly around \$11,000. In this situation, the employee's proactive anchoring shifts the outcome upward by approximately \$1,000 compared to the employer-anchored condition.

It shows that the final compensation result is strongly pulled by the first anchor and both sides only made minor adjustment, with the final result typically falling midway between the anchor and the opposing party's expectation rather than converging toward the midpoint of original positions. The reason for this phenomenon is that the first offer sets the reference range for the whole negotiation.

Empirical evidence suggests that approximately 70% of final settlements cluster within 15% of the initial anchor value. Once the anchor has been established, subsequent discussions between the parties tend to revolve around that reference point.

Even when negotiators know complete information about market rates and alternative options, the psychological weight of the first mentioned figure persists. Affected by the anchoring effect, negotiators are unable to move away from the initial reference value, resulting in insufficient adjustment.

C. The Anchoring Effect in Asset Investment

The anchoring effect also has a profound impact on asset valuation and investment decisions, often leading to irrational behavior by investors and deviation from the fundamental value of assets. The investors' biased investment decisions relying on initial reference prices belong to adjustment anchoring. This pattern is closely consistent with the mechanism observed in the Lucky Wheel experiment. In that experiment, arbitrary number anchors severely distorted the participants' judgments. Similarly, in financial markets, investors tend to fixate on irrelevant price signals—such as historical highs, current market prices, or analysts' target prices—rather than assess intrinsic value based on fundamentals like earnings, asset quality, and growth prospects.

This anchoring behavior can lead to systematic valuation biases. For instance, when a stock drops from £100 to £50, many investors think it is undervalued and rush to buy it, ignoring the possibility that its true intrinsic value may be far below £50. On the contrary, they remain anchored at historical highs and wrongly believe that the current prices are low.

Anchoring bias causes trader to make easy trades decisions based only on price information without properly analyzing the intrinsic values, resulting in missed trading opportunities, or occur unnecessary risk. Many traders experience loss as a result of other factors (e.g., information gap), but anchoring cognitive biases may have more impacts than any factor associated with trading (Ding, 2023; Zhang and Zhong, 2024).

IV. CONCLUSION

The anchoring effect is a systematic cognitive bias widely observed in human decision-making, and humans tend to put too much weight on the first bit of provided information. As a cornerstone of behavioral economics, the anchoring effect challenges the traditional assumption that individuals act with perfect rationality, and deepens our understanding of how decisions are actually made. This effect is driven by the intuitive thinking of System 1. System 1 automatically treats initial numerical information as an anchor, whereas the rational reasoning of System 2 tends to stay dormant in everyday situations. Classic studies indicate that this mechanism activates only when something is amiss or requires focused attention.

This paper also examines three representative real-world applications. In marketing, firms shape perceptions of consumers and purchasing decisions by setting relatively high reference prices as anchors. In salary negotiations, the first offer strongly determines the final outcome by establishing a reference range, granting an advantage to the party who makes the initial bid. In asset investment, investors anchor on market prices while ignoring intrinsic value, leading to valuation bias and irrational trading.

These examples illustrate that the anchoring effect is pervasive in everyday economic life and continuously shapes people's choices.

Research on the anchoring effect carries important practical implications. Individuals should learn to recognize the presence of anchoring bias and strive to engage the more deliberate reasoning of System 2, thereby mitigating the influence of irrelevant anchors. For example, in situations involving consumption, negotiations, or investments, people may be able to override irrationally making decisions by actively resisting the draw of the first number seen. Future studies may examine ways to overcome anchoring and explore the use of anchoring in other areas.

Overall, the anchoring effect reveals the gap between actual human behavior and ideal rationality. Identifying and understanding this bias is essential for improving decision quality and achieving more rational choices in daily life.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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