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Overview and application of Endowment Effect, Anchoring and Hindsight Bias

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Abstract:

This paper systematically examines three core cognitive biases in behavioral economics: the endowment effect, anchoring effect, and hindsight bias, delving into their respective applications and impacts across diverse economic scenarios. Research indicates that the endowment effect causes individuals to assign higher value to possessions they already own, exerting a significant influence on investors' stock-holding behaviors and the formulation of environmental policies. The anchoring effect reveals the significant influence of initial information on judgments, manifesting prominently in areas such as real estate pricing, art auctions, and project management—even affecting the estimation behaviors of professional practitioners. Hindsight bias manifests as an overestimation of the predictability of outcomes after they become known, subsequently influencing entrepreneurs' reflections on failure, judgments of audit responsibility, and investors' ability to learn from market dynamics. This paper employs a literature review methodology to systematically synthesize existing empirical research. It not only provides a theoretical foundation for understanding irrational factors in economic decision-making but also offers robust empirical support for policymakers, facilitating the development of more effective market mechanisms and behavioral intervention strategies.

Keywords: endowment effect; anchoring; hindsight bias; economic decision-making; behavioral economics

1. Introduction

In the field of behavioral economics, significant progress has been made in research on the endowment effect, anchoring, and hindsight bias. The endowment effect illustrates that individuals tend to attribute greater value to items they already own — a phenomenon that manifests not only in market transactions but also significantly influences investors' stock-holding decisions, particularly in stock markets and environmental policy. The anchoring effect reveals the substantial influence of initial information on human judgment. Research indicates that this effect is prevalent in real estate pricing [1], art auctions

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[2], and project management [3]. Hindsight bias reflects the tendency for individuals to believe they could have foreseen outcomes after the fact, a phenomenon with profound implications for entrepreneurial decisions [4], audit assessments [5], and investment behavior [6].

While existing studies have examined these three cognitive biases from multiple perspectives, several gaps remain in the current body of research. First, current studies have not fully elucidated the interactive effects of these phenomena across different economic environments, particularly behavioral shifts that occur when individuals are simultaneously influenced by multiple biases. Furthermore, while the potential of policy interventions to mitigate these biases has been proposed, concrete approaches for reducing their impact on markets and individual decisions through institutional design still require further exploration.

This thesis employs a literature review methodology to systematically examine and discuss the application of the endowment effect, anchoring, and hindsight bias within economics. By synthesizing and analyzing existing research, the study aims to provide theoretical foundations for understanding how these psychological biases influence decision-making across diverse economic contexts. Furthermore, it offers empirical support for policymakers in the design of market systems and the application of behavioral economics principles.

2. Overview of Endowment Effect, Anchoring and Hindsight Bias

2.1 The Endowment Effect

The endowment effect refers to the tendency of individuals to assign higher value to an item after acquiring ownership of it than they would have prior to purchase, particularly in transactional contexts. When an item becomes personal "property," individuals typically place greater importance on it, even if its objective value remains unchanged. This phenomenon manifests as a disparity between the price individuals are willing to pay (WTP) and the price they are willing to accept (WTA), with WTA typically exceeding WTP [7]. The endowment effect has several applications in economics.

Firstly, empirical evidence indicates that market experience reduces the endowment effect [8]. As market experience increases, individual behavior gradually aligns with the predictions of neoclassical economics—that is, psychological valuations during transactions become less excessively influenced by ownership, leading to more rational trading behavior. The degree of this reduction depends on participants' transaction experience and the complexity of market mechanisms. In some markets, experienced traders can rationally adjust their price expectations to eliminate the endowment effect's influence, whereas for consumers lacking market experience, the endowment effect persists and may still continue to impact their transaction decisions. These findings hold significant implications for policymakers and market designers. Understanding the role of market experience in mitigating the endowment effect allows policymakers to design more effective market mechanisms. By increasing market experience or altering market structures, they can reduce behavioral biases and enhance the overall efficiency of markets. This also provides guidance for policy formulation that needs to reflect consumer preferences and market behavior. For instance, governments can help consumers reduce the impact of the endowment effect through educational initiatives and programs that build experience, thereby optimizing market resource allocation.

Furthermore, the endowment effect also exerts a profound influence on investors' stock-holding decisions [9]. Research on India's IPO lottery allocation process reveals that investors who receive shares in the IPO lottery—the "winners"—are more inclined to hold these shares than those who do not receive shares—the "losers." This trend remains pronounced one month, six months, and even 24 months following the IPO listing date. This indicates that the endowment effect not only influences investors' short-term decisions but also exerts a lasting influence on their long-term holding behavior. Moreover, despite the typically negative returns on IPO stocks, investors maintain their holdings even when facing losses. Winners hold a significantly higher proportion of their shares than losers, suggesting the endowment effect prompts them to assess the stock's value more positively and resist selling even under unfavorable market conditions. These discrepancies cannot be fully explained by traditional economic theories such as transaction costs or the wealth effect. Even among more experienced investor groups, the endowment effect significantly influences decision-making, indicating that psychological factors play a considerably greater role in investment choices than other considerations. Overall, these findings reveal that the investor behavior influenced by the endowment effect has significant implications, particularly when facing losses. Through this effect, investors often tend to continue holding stocks rather than selling, as predicted by standard economic theory. This provides a

new perspective for understanding behavior in IPO markets and other asset markets.

Additionally, a close connection exists between the endowment effect and discounting behavior, a mechanism of significant importance in the formulation of environmental policy [10]. Experiments reveal that when individuals possess ownership of an environmental asset—such as a forest or the conservation rights to a stretch of coastline—they adopt a more cautious approach to evaluating the future benefits of such assets. In other words, they are less inclined to calculate future gains using a high discount rate. This implies that once environmental rights are "conferred" upon individuals or groups, they place greater value on the future worth of those rights. This heightened emphasis on the future, also termed a "low discount rate," reflects how ownership fosters an emotional attachment that diminishes preference for immediate rewards, driving a stronger inclination to safeguard long-term benefits. In other words, after acquiring rights, individuals are more willing to bear costs for environmental sustainability than to quickly capitalize on on short-term gains. This insight informs policymakers that treating environmental resources solely as commodities in negotiations and interest coordination risks underestimating their non-market value to society as a whole. For instance, when communities are granted rights to manage wetlands or forests, they often develop a stronger motivation for stewardship and conservation. Therefore, policymakers can design systems that grant the public partial rights to environmental resources, thereby enhancing their commitment and investment in environmental protection. For instance, environmental policies can stimulate greater motivation for conservation by empowering communities to participate in governance and granting them usage rights. This approach not only fosters greater appreciation for resources but also reduces the discounting of future benefits, ultimately advancing sustainable development.

2.2 Anchoring

Anchoring is a psychological phenomenon in which individuals typically initiate their estimation process from an initial value, which then influences the final outcome. This initial value—the "anchor"—may be provided by the problem description or derived from partial calculations. Regardless of the anchor's relevance to the actual situation, adjustments are typically insufficient, causing final estimates to skew toward the initial value. This effect occurs not only in numerical estimation but also pervades multiple fields within economics. [11]

First of all, anchoring significantly influences real estate pricing strategies. Empirical studies reveal that listing properties at a higher price ultimately leads to higher transaction prices compared to various market reference prices. This conclusion holds true even after controlling for such variables as time on the market and property quality. Research indicates that even in the information-rich, high-stakes process of purchasing a home, the anchoring effect significantly influences buyer behavior. This suggests buyers do not evaluate properties purely rationally but are psychologically influenced by the initial listing price. This effect stems not from rushed judgments due to lack of time, tools, or comparative information, but from a deeply ingrained behavioral bias that is both widespread and persistent. Despite industry promotion of low-priced listings to trigger "buying frenzies" or "bidding wars," the study found no significant correlation between market 'heat' and the effectiveness of such low-priced listings. This suggests that "herd behavior" is not prevalent in actual residential markets. Furthermore, while most agents publicly advocate low-pricing strategies, their private judgments lean toward the notion that higher-priced listings yield better sale prices. This reveals a disconnect between public perception and practitioner behavior. In summary, moderately high listing prices benefit sellers in most scenarios. Therefore, sellers should rationally account for the anchoring effect when making listing decisions and remain vigilant against the actual losses incurred by low-price strategies.

Additionally, anchoring exerts a significant influence in art auctions. Research indicates that auction prices are influenced by historical prices, demonstrating that buyers indeed exhibit anchoring behavior during bidding. In other words, buyers' bids may be influenced by prior prices—whether actual hammer prices from previous auctions or pre-sale estimates—which act as anchors in the bidding process. The intensity of these anchoring effects varies across different art categories, with a more pronounced impact on Impressionist artworks. Furthermore, the anchoring effect appears more pronounced for re-auctioned artworks, particularly when pieces reappear on the auction market within a short timeframe (e.g., within three and a half years), at which point the influence of historical prices becomes more significant. This indicates that artworks re-auctioned within a short timeframe are more susceptible to historical price anchoring, while those with longer intervals exhibit weaker anchoring effects. Overall, the presence of anchoring effects among buyers, sellers, and auctioneers in art auctions underscores the influence of

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historical prices on current auction prices, providing empirical support for the application of behavioral economics within the art auction market.

Furthermore , anchoring has a significant influence in project management. During the initial planning phase, uncertainties and ambiguities stemming from insufficient information pose substantial challenges for estimation, making the results susceptible to various bias mechanisms. One such bias mechanism—the anchoring effect—occurs when project stakeholders (such as management or clients) propose suggestions or expectations without sufficient supporting information (e.g., "This module should be done in two weeks, right?"), which significantly influencing estimates. Anchoring not only creates "systematic estimation bias" but also persists in the absence of feedback, potentially transferring from one project to similar future projects. In the absence of external anchors, experiments reveal that participants become anchored to their initial estimates. While their task performance showed no significant variation, the magnitude of their first estimate profoundly influenced subsequent estimation rounds. This suggests that estimators implicitly reference past views as future benchmarks—a latent anchoring effect—even without explicit prompts. To mitigate the persistent impact of anchoring in real-world projects, project management teams can provide planners with clear feedback regarding the actual time spent on each task. Such feedback helps break the inertia of "self-anchoring" or historical anchoring. However, anchors can be beneficial in certain contexts. Providing a suitable, history-based "mild anchor" may actually improve estimation accuracy. This aligns with the principle of the "bias-variance tradeoff": moderate guidance may improve overall accuracy more effectively than a complete lack of direction. In summary, the anchoring effect is both present and persistent in project time estimation. This suggests the need to introduce systematic feedback mechanisms in practical management and to judiciously utilize historical data as a "beneficial anchor."

2.3 Hindsight Bias

Hindsight bias refers to the "knew-it-all-along" bias, wherein individuals alter their perception of an event's inevitability once they become aware of the event's outcome. It involves a projection of new knowledge into the past accompanied by a denial that the outcome information has influenced one's judgment. Thus, subjects who learn of an outcome in a hindsight experiment typically claim that they would have "known it all along" [12-13]. Hindsight bias not only influences individual decision-making but also generates systemic impacts across multiple economic domains.

Firstly, hindsight bias has an influence on entrepreneurial activities. Research indicates that after a startup fails, entrepreneurs often underestimate their initial expectations of success. This means that, in retrospect, entrepreneurs perceive the likelihood of their venture's success as having been lower than their initial projections. This indicates that when reflecting on failed experiences, entrepreneurs often exhibit a tendency toward "over-rationalization," attributing failure to external factors rather than internal shortcomings. Consequently, they may fail to learn essential lessons for future ventures, continuing to overestimate their chances of success. Moreover, hindsight bias not only affects the future decisions of failed entrepreneurs but may also lead them to persist in launching new ventures. Research reveals that even after experiencing negative outcomes, entrepreneurs continue to overestimate their chances of success in similar endeavors. The existence of this bias means entrepreneurs often fail to recognize their overly optimistic skew in entrepreneurial assessments. Furthermore, hindsight bias is present across all entrepreneurial activities, and is particularly evident among entrepreneurs lacking formal education. Those with higher levels of education exhibit lower hindsight bias, providing empirical evidence for the effectiveness of entrepreneurial education programs. In summary, hindsight bias distorts experiences and memories throughout the entrepreneurial journey, thereby influencing future business decisions. This finding holds significant implications for entrepreneurial education and practice, particularly in guiding entrepreneurs to recognize and overcome cognitive biases.

Moreover, hindsight bias also plays a significant role in auditing contexts. The fundamental contradiction within the auditing profession lies in the "systematic overestimation of the level of assurance auditors can provide." This expectation gap is specifically manifested in the public's belief that audits should "prevent all financial fraud," whereas in reality, audits only "provide reasonable but not absolute assurance." Hindsight bias offers an explanation for this contradiction. Fischhoff explains that "hindsight bias leads observers to believe an outcome was foreseeable when it was not." In auditing contexts, this manifests when juries overestimate auditors' ability to predict financial risks and apply more stringent standards to the performed audit procedures.. Research indicates that, the presentation of outcome information significantly influenced participants' evaluations of audit decisions, with unfavor-

able results leading to lower ratings and favorable ones eliciting higher ratings. This phenomenon suggests that hindsight bias played a dominant role in the evaluation process. The core of hindsight bias lies in people's tendency to perceive past events as foreseeable after knowing the final outcome, thereby skewing their assessments of decision-makers. This indicates that when reviewing events, participants often reconstruct the sequence of events starting from the outcome, making factors consistent with the result appear more significant. Overall, hindsight bias plays a significant role in audit evaluation scenarios, it may substantially influence auditors' liability determinations. Consequently, mitigating hindsight bias in judicial assessments is a critical future research topic.

In addition, hindsight bias significantly influences investors in financial markets. Hindsight bias can affect investors in two key ways. First, it can create false memories. After reviewing a company's financial reports, investors might declare, "I knew it would turn out this way," even though their initial expectations were entirely different. Second, it impedes learning capacity. If investors cannot accurately recall their original projections, they cannot properly gauge the impact of new information on the market, thus impairing their ability to make informed decisions. These detrimental effects of hindsight bias can pose a threat to the stability and efficiency of financial markets.. For instance, it can lead to an underestimation of market volatility. Rational investors adjust their future risk estimates for the future based on new data (such as extreme returns), which leads to increased volatility forecasts. Investors with hindsight bias, however, may dismiss such events as "inevitable," thereby underestimating volatility and contributing to mispricing—such as the undervaluation of call/put options in the options market. This also reduces trading profitability. Hindsight bias also distorts assessments of information asymmetry, such as "Did I know this earlier than others?" If investors overestimate their predictive abilities, it may lead to misguided trades and missed profit opportunities. In conclusion, research reveals limitations to market efficiency--Even experienced professionals cannot eliminate hindsight bias through market mechanisms. What's more, it suggests a cognitive mechanism: hindsight bias may stem from memory reconstruction processes and distorted perceptions of risk.

3. Conclusion

This paper systematically reviews the definitions and applications of the endowment effect, anchoring effect, and hindsight bias in economics, exploring their profound impact on economic decision-making. Research indicates that the endowment effect causes individuals to assign higher value to possessions they already own, thereby influencing investors' stock-holding behaviors and their long-term evaluations of environmental policies. The anchoring effect highlights the critical role of initial information in real estate pricing, art auctions, and project management, revealing irrational elements within markets. Hindsight bias induces individuals to mistakenly perceive outcomes as "foreseen" after the fact, affecting entrepreneurial reflections on failure, audit evaluations, and financial market decisions. Collectively, these three cognitive biases not only pose theoretical challenges to traditional economic assumptions but also profoundly influence market operations and policy formulation in practice. Future research may further explore the interactions among multiple biases and identify intervention pathways through institutional design to enhance decision rationality and market efficiency.

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