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Study on the Price Formation Mechanism of Art Auctions from the Perspective of Behavioral Economics: The Influence of Anchoring Effect and Endowment Effect

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Abstract: The art market is both unique and subjective. Particularly in art auctions, transaction prices not only reflect the value of the artwork but are also influenced by the psychological factors of the bidders. This paper systematically examines how the anchoring effect and endowment effect, as described in behavioral economics, contribute to high transaction prices in art auctions. The research focuses on traditional Chinese paintings, Impressionist works, and contemporary art, with data sourced from major art trading platforms such as Artron.net, Christie's, and Sotheby's. The results indicate that the anchoring effect significantly influences bidders' offers through prior auction prices or pre-sale estimates, with this effect being more pronounced when the time between auctions is short. The endowment effect reveals that bidders assign greater psychological value to their preferred artworks, making them willing to pay higher prices. Overall, these behavioral biases notably impact the market pricing of artworks, driving auction prices higher. This study integrates behavioral economics, art management, and statistical analysis to offer practical recommendations for auction houses to optimize bidding strategies, for buyers and sellers to make informed decisions, and for market regulators to develop effective policies.

Keywords: Art auction, Anchoring effect, Endowment effect.

1. Introduction

The art auction market has garnered increasing academic attention in recent years, particularly within the frameworks of behavioral economics and big data analysis. However, systematic research in this area remains underdeveloped compared to other more established financial markets. With the rapid advancement of big data and data mining, auction houses have increasingly adopted data analytics techniques to optimize auction strategies and price forecasting. Nevertheless, a clear research gap persists in integrating these techniques with psychological bias theories from behavioral economics.

Most current research on art auctions focuses on the macro level, examining market mechanisms, price formation, and investment returns, while relatively little attention has been paid to the specific behaviors of bidders and their psychological drivers during the auction process. In particular, key behavioral economics effects, such as the anchoring effect, endowment effect, have not been thoroughly analyzed in terms of their specific manifestations and interactions within the art auction context, despite being widely studied in other economic fields. Additionally, the impact of

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globalization on these behavioral effects across different market environments has not yet been sufficiently explored [1].

This paper seeks to address these research gaps by examining how the anchoring effect, endowment effect, and herd effect interact in art auctions, contributing to the formation of high transaction prices. To investigate these issues, this paper combines an extensive literature review with empirical analysis, identifying key findings and theoretical frameworks from existing studies.

This study not only offers new theoretical insights into the price formation mechanisms within the art market but also provides practical recommendations for auction houses to refine their strategies, for buyers and sellers to make more informed decisions, and for market regulators to develop effective policies. Moreover, as big data technology continues to evolve, this research offers valuable insights into future explorations that combine data analytics with behavioral economics.

2. Anchoring Effect

In auctions, anchoring effects significantly influence bidder behavior and the final sale price. Ku, et al. observed that the anchoring effect can lead bidders to overly rely on the starting price or the estimated price range set by the auction house, even when this price information does not accurately reflect the true market value of the auctioned item [2].

2.1. Influence of the Starting Bid

When an auction begins, the starting bid serves as the first publicly available price and acts as a psychological anchor for bidders. Bidders often assess the value of the auction item based on this initial price, even if it does not align with the true market value. Despite any inconsistency with the actual value, bidders tend to base their offers around the starting price. This effect is especially pronounced when the auction item has a high estimated value, ultimately leading to a higher final transaction price [3].

Tversky and Kahneman [4] demonstrated the significant influence of the anchoring effect in decision-making through a controlled experiment. Participants spun a manipulated "wheel of fortune" to receive a low (e.g., 10) or high (e.g., 65) number and were then asked to estimate how many countries in the United Nations are located in Africa. Although the numbers were irrelevant to the question, those given higher numbers provided higher estimates, while those with lower numbers gave lower estimates. This experiment illustrates how even arbitrary or irrelevant information can serve as an anchor, strongly shaping judgments and decision-making processes. The study underscores the pervasive nature of the anchoring effect, showing that people tend to rely heavily on the first piece of information they receive, even when it is unrelated to the task at hand.

2.2. The Influence of Bidding History

In art auctions, past sale prices significantly shape current auction outcomes. According to Beggs and Graddy, when an artwork achieves a higher-than-expected price in a previous auction, this price often acts as an "anchor" for subsequent auctions, prompting future bidders to offer higher amounts [5]. This anchoring effect causes bidders to adjust their strategies based on historical prices, even in competitive environments. Consequently, the final transaction price may approach or exceed the previous high price, particularly during intense bidding wars [6]. When past sales prices surpass market expectations, bidders often interpret these elevated prices as strong indicators of the artwork's value, thereby increasing their own valuations. This occurs regardless of whether current market conditions or the artwork's intrinsic value have changed. The historically high price continues to serve as a crucial reference point, influencing bidders' perceptions and behaviors in subsequent auctions.

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Conversely, if an artwork sold for a lower-than-expected price in a previous auction, this lower price acts as a "negative anchor," leading to reduced bids from future bidders and consequently lowering the current auction price. Thus, the anchoring effect can not only inflate an artwork's price but also lead to a price below its market value.

Beggs and Graddy [5] collected extensive data on art auctions from Christie's and Sotheby's in London, focusing on Impressionist, Modern, and Contemporary art. The dataset includes past sales prices, pre-auction estimates, final sales prices, and specific artwork characteristics (e.g., artist, size, creation date). Through regression analysis, the researchers examined the impact of past sales and pre-auction estimates on current prices. They first assessed whether artworks that sold at high prices previously continued to do so in subsequent auctions. They also analyzed how pre-auction estimates influenced bidding behavior, investigating whether high estimates led to higher bids and low estimates reduced final prices. The study further compared these effects across art markets to determine if the anchoring effect varied by market type.

The results indicate that anchoring effects are stronger in the Impressionist and Modern art markets, where a stable history of sales influences bidders to rely on past prices. For instance, Monet's works are often anchored by their previous auction results. In contrast, the Contemporary art market shows weaker anchoring effects due to price volatility and a lack of historical sales records, leading bidders to rely more on current market conditions and personal judgment.

The auction price of one of the Contemporary artists mentioned in the study fluctuated greatly from auction to auction, a phenomenon that suggests that bidders are more likely to rely on current information than on historical prices when making their bids. This is particularly common in the Contemporary art market, where the market price of a Contemporary work of art is often influenced by a number of factors, such as the artist's current reputation in the marketplace, the uniqueness of the work, and even the prevailing economic environment and market sentiment.

Compared to Impressionist or Modern artworks, Contemporary works often lack a long and stable market history, making it difficult for bidders to rely on past sales prices to guide their bidding. Instead, they tend to base their decisions on current market dynamics and their own subjective assessments of the artwork's value. For instance, if a Contemporary artist's work has garnered significant attention and achieved a high price in a recent auction, bidders may adjust their bids in subsequent auctions based on this recent performance, even if the work previously sold for a lower price.

In the article The Manifestation of the Anchoring Effect in the Chinese Art Market [7], the author similarly confirmed the impact of auction history on auction prices. To test the influence of past auction prices on current auction outcomes, the author collected 180,177 transaction records from Artron.net, covering 35 major auction houses between 2000 and 2019, featuring works by 229 modern and contemporary Chinese painters [7]. A log-linear regression model was constructed:

$$p_t = \mu\hat{p}_t + \lambda\left(p_{t-1} - \hat{p}_t\right) + \xi\left(p_{t-1} - \hat{p}_{t-1}\right) \quad (1)$$

By analyzing the model's results, the author found that when the time interval between two auctions is short, past auction prices (serving as external anchors) have a more significant effect on current auction prices. Specifically, when auctions occur less than a year apart, the impact of past prices on current bids is stronger. The coefficients λ and ξ are significantly positive, indicating that bidders rely heavily on past prices to set new bids and valuations, especially when the auctions are close in time. Conversely, when the time interval is longer, the influence of the anchoring effect weakens, and bidders are more likely to rely on other factors or new market information.

Understanding this cognitive bias is critical for auction houses, bidders, and sellers. Auction houses can apply the anchoring effect to optimize their auction strategies.

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3. Endowment Effect

In auctions, the anchoring effect and the endowment effect are distinct but interconnected cognitive biases that influence bidder behavior. The anchoring effect occurs when bidders, faced with uncertainty, rely on initial information like starting bids or previous sales prices as reference points for their bidding decisions [4]. This reliance on early prices elevates their psychological expectations and bidding levels.

The endowment effect becomes relevant when bids approach or surpass the anchor price. This bias refers to people placing higher value on items they own or temporarily perceive as theirs [8]. During an auction, once bidders place a bid, they develop a psychological sense of ownership, which increases their valuation of the item [9]. Together, the anchoring and endowment effects raise bids: anchors set initial prices, while a heightened sense of ownership drives further bidding, leading to higher final sale prices.

Carmon and Ariely's experiments [9] showed that even imagining ownership or "potentially owning" an item increases its perceived value, leading participants to bid higher. This analysis of cognitive biases offers a clearer understanding of how the anchoring and endowment effects combine to influence auction outcomes and push bidding beyond rational limits.

3.1. Imagined Ownership of Items

Carmon and Ariely randomized 88 participants into two groups: 45 in the experimental group and 43 in the control group. The experimental group was asked to imagine they already owned a ticket to a sporting event, envisioning details such as who they would go with and where they would sit. The control group did not perform any such imagery tasks. Participants were then asked to estimate how much they would pay for the ticket. The experimental group, who imagined ownership, valued the ticket at an average of $45, while the control group valued it at $30—a significant difference ($p< 0.01$). This suggests that simply imagining ownership can significantly increase perceived value [9].

3.2. Temporary Ownership

Wolf, Arkes, and Muhanna [10] aimed to explore whether temporarily being the highest bidder in online auctions induces an endowment effect, motivating participants to place higher bids in subsequent rounds. They invited volunteers to participate in a simulated online auction, randomly dividing them into an experimental group and a control group. The experimental group was allowed to interact with the auction items (e.g., coffee mugs) before the auction began, while the control group was not. In the experimental group, some participants briefly touched the item, while others held it for a longer period (e.g., 1-2 minutes) and were asked to imagine owning it and envision how they would use it.

After completing the item interaction, all participants entered a mock auction with a starting price of $5. At the end of each round, the highest bidder was informed that they were temporarily in the lead. Participants in the experimental group were asked to assess their sense of psychological ownership over the item, specifically whether they felt the item already belonged to them. The researchers also recorded the time participants spent as the highest bidder and their re-bidding behavior in subsequent rounds [10].

Experimental Results.

The results showed that those participants in the experimental group who had prolonged interactions with the item had significantly higher average bids than the control group ($p < 0.05$). In particular, those bidders who were temporarily ahead in the auction were more inclined to increase their bids in subsequent rounds. This suggests that the temporary ownership that bidders feel during an auction enhances their sense of attachment and value to the item, leading to higher bids [10].

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3.3. The Effect of Physical Contact

Prior to formal art auctions, auction houses hold exhibitions allowing bidders to closely inspect the items. Carmon and Ariely's research confirmed that physical contact with auction items enhances perceived ownership, leading to higher bids. In their experiment, 50 participants in the experimental group were allowed to touch and use a branded pen for up to 2 minutes, while the 50 participants in the control group could only view a picture of the item. In the subsequent mock auction, the experimental group's average bid was $12, compared to $6 for the control group, a significant difference ($p < 0.05$). These results suggest that physical contact significantly increases perceived ownership and willingness to pay [9].

The findings indicate that perceived ownership—whether through imagination, physical contact, or temporary lead in an auction—significantly increases item valuation and bids. This supports the "endowment effect" in behavioral economics, showing that psychological factors are crucial in economic decision-making, particularly in auctions.

4. Conclusion

This study examines how the anchoring, endowment, in behavioral economics influence high transaction prices in art auctions. The findings reveal that these psychological biases significantly impact bidders' decision-making, leading auction prices to deviate from the intrinsic value of artworks.

The anchoring effect drives bidders to offer higher bids, influenced by starting prices, auction history, or pre-sale estimates. The endowment effect shows that bidders assign greater value to items they perceive as theirs, resulting in higher bids. These insights offer valuable guidance for auction houses to optimize strategies and for buyers and sellers to make more rational decisions.

However, the study has limitations. Cultural differences in data samples may affect the generalizability of the results, and future research should examine these effects in different markets and cultural contexts. Moreover, the reliance on existing data and literature reviews suggests that future studies could use experiments and field surveys to further verify these effects' mechanisms and strengths.

Future research may focus on exploring these behavioral effects across various art markets (emerging vs. mature), under different bidding mechanisms (online vs. offline), and utilizing big data and AI technologies to predict bidder behavior. Such research could offer deeper insights into price formation in the art market and provide a scientific basis for decision-making and market regulation.

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