

# The Interplay of Scarcity Effect and Sunk Cost Fallacy in Consumer Irrational Behavior: A Study of the Guzi Economy

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**Abstract.** Guzi refers to peripheral products derived from IPs of 2D cultural content, which also known as ACGN (Anime, Comic, Game, Novel). By using ethnographic observation, this study addresses a gap in the literature by applying classical behavioral economic frameworks—specifically, the theories of scarcity and the sunk cost fallacy—to the emerging hedonic economy and guzi economy. Consequently, this study demonstrate an analysis on how do consumers' irrational behaviors and impulsive consumption in guzi economy be stimulated by the scarcity effect and the sunk cost fallacy. The results indicate that the business model of limited-edition merchandise systematically leverages scarcity effect to activate consumer characteristics, including the need for uniqueness, need for conformity, regret aversion and reactance. Besides, merchants strategically manipulate sunk cost perception through a high-connected approach: randomizing acquisition costs via blind boxes, inflating perceived value through artificial scarcity, obscuring financial outlays via digital payment systems, and ultimately outsourcing cost justification to consumers' emotional self-rationalization.

**Keywords:** Guzi economy, irrational behaviours, Scarcity effect, Sunk cost.

## 1. Introduction

The term "guzi" originates as a transliteration of the English word "Goods" and in contemporary discourse it designates peripheral products derived from intellectual properties (IPs) of 2D cultural content such as anime, games, and idols, including badges, cards, pendants, dolls, and figurines [1]. Building upon this foundation, "Guzi Economy" is determined as the consumer culture and economic form formed around ACGN (Anime, Comic, Game, Novel) cultural content IP, covering diverse business formats such as animation, comics, games, light novels, virtual idols, trendy toys, and offline entertainment [2]. In recent years, this phenomenon has achieved remarkable prevalence in China. According to the report from iiMedia Research, the scale of China's "Guzi Economy" reached 23.61 billion dollars in 2024, an increase of 40.63% compared with 2023, it is expected that by 2029, its market scale will exceed 41.9 billion dollars [1].

The sector's robust growth and future potential, however, cannot be attributed solely to consumer enthusiasm toward guzi and related IPs. Equally crucial are the market strategies employed by suppliers—such as limited-edition releases and the proliferation of blind-box sales—which actively cultivate speculative and, in many cases, irrational consumer behavior. This dynamic foregrounds the importance of analyzing the Guzi Economy not merely as an extension of cultural consumption, but also as a site where psychological, economic, and cultural mechanisms converge. Consequently, the study of such irrational consumption will exert influences on three aspects: consumers, academia, and cultural industries.

## 2. Theoretical background

The irrational behaviors of consumers are essentially impelled by product sunk cost and scarcity effect. Hence, this review will respectively introduce the previous study on the above-mentioned effects and the relationship between them and guzi economy.

## 2.1. Sunk cost

The sunk cost effect is manifested in a greater tendency to continue an endeavor once an investment in money, effort, or time has been made [3]. Thaler's (1980) influential account situates this phenomenon within the framework of prospect theory, which posits that individuals exhibit risk aversion when confronted with potential gains but tend toward risk-seeking behaviour when faced with potential losses [4]. However, prospect theory does not fully elucidate the psychological basis for the findings that sure losses are so aversive and sunk costs are so difficult to ignore [3]. One plausible explanation lies in the aversion to acknowledging waste: discontinuing an investment renders prior expenditures irrecoverable, thereby symbolizing wasted resources. In this sense, the unusual behavior is consistent with our own notion that sunk costs are difficult to write off because to do so would appear wasteful [3].

Within guzi economy, the sunk cost effect exerts a particularly notable influence on the consumption behavior associated with blind boxes. When consumers invest in blind boxes yet fail to obtain their desired item, the prior financial commitment activates the sunk cost effect. Consequently, a number of consumers engage in escalated, and often irrational, purchasing behavior until the favored outcome is achieved, and the joy derived from gain is more sensitive than the pain caused by loss, which is distinct from the loss aversion in prospect theory [4].

## 2.2. Scarcity effect

Scarcity refers to a basic economic problem, the gap between limited resources (time, money, labor, natural resources, etc.) and limitless wants [5]. Given this situation, individuals are precluded from possessing all desired entities, compelling them to engage in selective decision-making processes. Therefore, trade-off emerges as an intrinsic facet of decision-making, profoundly influencing people's perceptions and behaviors. This creates business opportunities: by creating a temporary product scarcity—either unintentionally or deliberately—a product provider can increase overall demand and stimulate customer enthusiasm over a specific period of time, leading to improved overall market performance [5]. It is crucial to emphasize that the effective realization of the scarcity effect necessitates an integration of predominant theoretical perspectives with pertinent consumer attributes, scarcity modalities, and product classifications.

Four principal theoretical frameworks underpin the scarcity effect, each associated with distinct consumer attributes. First, commodity theory [6]—perhaps the most frequently cited—posits that the perceived value of an item increases in proportion to its unavailability. This is closely tied to the consumer's pursuit of uniqueness [7], as individuals often seek products that symbolically differentiate them from others. Second, conformity theory [8] highlights the tendency of individuals to align attitudes and behaviors with group norms. Consumers with a heightened need for conformity assign greater value to products widely purchased by peers, thereby satisfying their desire for social assimilation [9]. Third, regret theory [10] suggests that consumers act to minimize anticipated regret. In contexts of scarcity, individuals may purchase goods not for their intrinsic utility but to avoid the psychological cost of missing a fleeting opportunity [5]. Finally, reactance theory [11] emphasizes that restrictions on behavioral freedom—in this case, product choice—heighten consumer motivation to obtain the constrained good [12].

Concerning the scarcity type, it can be divided into the demand-induced scarcity and the supply-induced one [13]. Specifically, the former arises from a sudden surge in consumer demand, where the supply of the commodity remains adequate or normal but is rapidly depleted. Conversely, the latter stems from sellers' proactive restriction of supply, artificially creating a shortage in quantity. Subsequently, this review will correspond these two scarcity categories with various constraints prevalent in guzi economy, including limited quantity, limited time, and on-site sales. Regarding the restriction in amount, it definitely belongs to the supply-induced scarcity. No matter how large the quantity demand is, merchants proactively set an extremely low quantity supply. However, productions restricted by limited time are influenced by a combination of two types of scarcity. Time itself is supply-constrained, because the merchants control the time length of availability.

Nevertheless, its scarcity effect is highly dependent on the concentrated outbreak of demand: if no one buys it, the limitation on time will be absolutely meaningless. Finally, selling exclusively in a particular place, spatial enhancement renders on-site sales into the extreme supply-induced scarcity. The production can only be obtained by being present at the scene (or through high-priced purchasing agents), which is the strongest physical supply constraint.

Not only do types of scarcity matter, that of product simultaneously play a significant role. A review of the product types and of the corresponding results indicates that product scarcity differs in terms of the concept of the underlying brand; for instance, conspicuous vs. non-conspicuous products, symbolic vs. functional products, and hedonic vs. utilitarian products [5]. Among these, hedonic shopping, in which the shopper aims to receive a joyful experience from the process [14], is closely related to guzi economy. Guzi economy is essentially a new form of consumer culture driven by emotions [1]. Its core lies in consumers realizing emotional value and identity through purchasing goods, so it is not only a commodity but also an emotional bond between consumers and virtual IPs [1]. Consequently, guzi is a component of the hedonic products. Guzi economy, by parity of reasoning, belongs to the hedonic shopping. The integration of demand-induced vs. supply-induced scarcity into the discussion shows that consumers who engage in hedonic shopping are more inclined to choose products that are scarce due to limited supply, proving the rationality of the various strategy with the same essence [15].

### 3. Methodology

The essay centers on three pivotal concepts: the guzi economy, the scarcity effect, and sunk cost, with distinct analytical pathways delineated for each category. Concerning the guzi economy—a burgeoning hedonic economic paradigm in China—the research corpus is primarily derived from scholarly articles indexed in the CNKI (China National Knowledge Infrastructure) database, ensuring a comprehensive examination grounded in domestic academic discourse. In contrast, insights pertaining to the scarcity effect and sunk cost—and their respective impacts on market dynamics and consumer behavior—are predominantly sourced from the extensive literature available on Google Scholar, thereby incorporating a broad spectrum of international perspectives.

Employing a rigorous qualitative analytical framework, this study elucidates that the business models underpinning limited-edition merchandise and blind boxes strategically exploit artificial scarcity and the sunk cost fallacy to stimulate consumers' emotional and psychological predispositions. Such strategic manipulation not only markedly diminishes the price elasticity of demand but also engenders impulsive purchasing behaviors, thereby exerting a profound influence on consumer decision-making processes and market outcomes.

### 4. Analysis

In this section, the analysis of irrational behaviors of consumers in guzi economy is manifested through two impacts, including the sunk cost and scarcity effect. Firstly, it is elaborated how does guzi economy exploit, enlarge and enhance the sunk cost effect, in order to stimulate the consumption. Secondly, analysis that business leverages scarcity to activate consumers' irrational psychological traits, thereby significantly reducing the price elasticity of demand is given.

#### 4.1. Sunk cost effect in Guzi economy

The sunk cost fallacy is one of the core engines driving guzi consumption, especially the behavior of blind boxes and gashapons. The term “blind box” originally refers to small collectible toy figures in sealed boxes that are dispensed via vending machines. This type of marketing has a long history worldwide, from Gashapon—vending machine-dispensed capsule toys in the 1960s—to bubble-gum packets, baseball cards, and the Pokémon card craze in the 1990s [16]. Regarding the utilization of blind box and gashapon in guzi economy, its purchase methods are divided into two types: offline

and online. The first one includes physical stores and flash mob events, which are organized for a particular IP in a limited period of time. While the second comprises an online gashapon system as well as live-stream shopping. Additionally, badges of distinct IPs almost replace the toy figures, and that of different characters in one IP sold bundled together. Hence, in order to get the badge of their favorite character, numerous unreasoning consumption conducts are inevitably produced. According to the comments on little red book, which is equivalent to Facebook abroad, millions of people spend dozens or even hundreds of dollars to draw blind boxes, solely to get items that originally cost a few dollars, more gravely, the vast majority of them failed to get the desired results. Moreover, comparing with offline shopping, online blind box mechanisms are more likely to trigger compulsive engagement and subsequently elicit stronger post-purchase regret.

The underlying cause stems from the guzi economy's strategic exploitation of the sunk cost fallacy, coupled with a systematic reinforcement of its psychological impact. This reinforcement is achieved through three primary avenues: emotional investment, business strategy, and payment methods. Firstly, as an extension to hedonic shopping, the objective of guzi economy is completely the same as that of hedonic shopping, i.e, not merely to purchase a particular product or service but to offer pleasure and satisfaction to consumers as well [16]. Consumers meet their material needs and achieve the transmission and recognition of emotional value by purchasing badges, figurines, or limited-edition cards of IP characters [1]. Essentially, this kind of consumption behavior is the possession of the symbolic meanings such as dreams, passion, and rebellion carried by virtual characters [1]. Consequently, in terms of the investment that has been made when purchasing blind box, an extra factor "emotion" should be added into the origins: money, time and effort. From the consumer perspective, individuals often rationalize their investment in blind boxes as a tangible expression of devotion and emotional connection to fictional characters. Thus, abandoning an undesired outcome necessitates not only acknowledging the waste of financial, temporal, and cognitive resources but also confronting the perceived loss of an emotional investment—a latter burden often deemed far more profound by consumers. Besides, hedonic shopping provides an incredibly powerful legitimate reason, making it easier to rationalize continued investment, weakening the guilt of "wasting money" and further indulging consumers in making decisions based on sunk costs.

Secondly, business strategy plays a significant exterior role as well. By combining the blind box with limited time, edition and location constraints, suppliers construct a nudge to facilitate consumers' purchasing desire: if consumers do not invest immediately, there will be no longer opportunities to engage in the investment. Therefore, the cost of abandonment surges up objectively, while that of expenditure drop off subjectively. In addition, due to the combination of limitation, the quantity supplied is much smaller than quantity demanded, leading to the shortage. Thus, the market has to increase the price to enter a new equilibrium point. However, under such situation, the escalation of sunk costs will subsequently exist, fueling a vicious cycle of irrational decision-making again. In summary, this business strategy is a cycling machine of sunk cost effect, that is, the rise of investment will plus that of price equal to deeper influence of sunk cost, which reversely lead to the previous change.

Finally, payment methods can reduce the pain of payment and accelerate expenditure by digital pay desensitization and small-amount but high-frequency payments. As for the first one, both offline and online shops support digital payment, including Wechat pay and Alipay pay. These mechanisms facilitate monetary expenditure in an abstract, digitized form, significantly weakening the perception of loss. Besides, the low entry cost of blind boxes—often priced at just a few dollars—significantly reduces consumer vigilance, effectively bypassing deliberate deliberation before purchasing. Nevertheless, compared to offline shopping, this desensitization exerts a more pronounced influence on online shopping. While in physical stores, consumers may still rely on tactile interaction with products and visual cues of accumulated purchases to regulate their spending, online transactions obscure the purchasing amount and impair consumers' rational decision-making processes.

## 4.2. Scarcity effect in Guzi economy

In guzi economy, scarcity effect is utilized and presented through constructing limitation system, including limited amount, time and region. By skillfully deploying such mechanisms, the majority of merchants have secured remarkable commercial success. For instance, the sales model of the merchandise for "Love and Deep Space" is a strong representative. Love and Deep Space is a 3D romantic interactive mobile game developed by Papergames. The title achieved over 5.4 million downloads within two weeks of its release and topped the App Store's overall best-selling chart on September 23, 2024. As for its strategy, all the guzi of Love and Deep Space is sold for a limited time, that is, products are only available during specific time periods announced by the official, such as a character's birthday week or specific festivals, which usually last about ten days. After the time period ends, the product links are taken down and can never be purchased again. By virtue of this model, Love and Deep Space has achieved a profound commercial success. For example, a new batch of guzi has gone on sale from October 11 to October 21. During the pre-sale period, the transaction volume exceeded 7 million dollars in seconds after the sale went live, and it achieved an outstanding result of over 28 million dollars in transactions on the first day.

The extraordinary sales performance can be attributed to the activation of scarcity effects across several consumers characteristics, including the need for uniqueness, need for conformity, regret aversion and reactance. First, with respect to the requirement for uniqueness, despite embedding themselves within communities of shared interest, individuals persistently engage in pursuit of distinction to cultivate a unique identity. purchasing limited-edition guzi that are challenging to obtain becomes an approach to show one's personality and status within the community. Possession of such items not only conveys individuality but also signals wealth, social connections, or profound emotional investment in the relevant IP. Displaying these acquisitions, particularly through online sharing, facilitates social recognition, accelerates follower accumulation, and enhances one's communicative leverage within fan communities.

Second, those consumers with a greater need for conformity value a product more when more people are buying it, which can be evidenced by the product's unavailability [11]. In guzi economy, if the limited-edition guzi of an IP is open for purchase, social media will push relevant posts to potential consumers. These community-driven posts manifest in several distinct forms: strategic discourses on acquisition methodologies, evaluative recommendations that generate shared enthusiasm, and the visual showcasing of guzi integrated into daily life, which collectively normalize and stimulate consumption. Under such situation, a pervasive perception of the guzi's popularity is artificially engineered, creating a compelling illusion of high demand while implying the anxiety of being excluded from the community and the disappearance of love to certain character if people do not consume. Therefore, in order to integrate into the group and prove the depth of love, they take the initiative to improve the paying willingness.

Third, regret aversion is the most powerful nudge to irrational consumption on limited-edition products, especially for guzi of limited time and region. These two strategies artificially construct a perception of irreversible scarcity, directly exploiting the fear of missing out (FOMO) to trigger impulsive purchasing behaviors. Additionally, due to the appearance of scarcity, the consumers' subsequently trade-off is between regrets of omission and regrets of commission [17]—namely, the future regret of not purchasing the limited-edition guzi versus the regret of wasting money after impulsive consumption. However, in the scenario of purchases of limited guzi, the weights and characteristics of these two types of regrets are highly asymmetric. As for the emotional expression on regrets of omission, it is vague and imaginative, with a strong sense of loss, while that on regrets of commission is quantifiable, realistic and accompanying guilt. Moreover, the decision weight on the previous is significantly overestimated for its high opportunity cost, while that on the latter one is oppositely underestimated. Thus, by amplifying the fear of "regretting not buying" while reducing the pain of "regretting spending money", consumers usually tend to purchase even though it is irrational and impulsive. Furthermore, the reflection on past personal regrets, and the longer term regrets of other choices, may make consumers more likely to "select indulgences"[18].

Finally, reactance reflects the need for behavior freedom, i.e., those consumers with a greater need for behavioral freedom value a product more if the product's availability is restricted [11]. In guzi economy, this can be interpreted as limited-edition products arousing a stronger desire for possession among consumers. However, this interpretation rarely plays a significant role in driving consumer behavior.

## 5. Discussion

According to the analysis, the result effectively satisfy the assumptions, i.e., guzi economy not only exploits but also reinforces the sunk cost fallacy, and the irrational behaviors of consumers are stimulated simultaneously by internal emotion and external scarcity effect. However, although most of the research theories and methods in this study are derived from previous scholars, there are still some differences in research objects and theoretical correlation.

With respect to study objects, most studies on scarcity and sunk costs focus on utilitarian fields. For instance, as for researches on scarcity, Barton, Zlatevska, and Oppewal also argued that material and shelf-based goods such as clothing and experiencing products have been well examined in the scarcity literature [19]. In addition, Shi, Li, and Chumnumpan stated in their review that the identified literature covered a variety of products such as food, beverages, clothing, music, consumer electronics, and automobiles [5]. Nonetheless, although they make passing references to hedonic consumption, the research remains briefly superficial and lacks depth. Therefore, this research focuses specifically on the hedonic economy, utilizing the guzi economy as a case study to substantiate prior scholarly conclusions and to elucidate the application of canonical theoretical frameworks within this distinct context. Regarding researches on sunk cost fallacy, previous studies have covered a wide range, including daily decision-making and business investment, etc. Moreover, although they have mentioned the crucial role of emotion, which contains risk aversion and self-justification [4], emotion in this research serves as a positive connection between commodity and consumers, supporting and supplementing the sunk cost fallacy.

Additionally, previous studies often analyze the scarcity effect or sunk cost as independent phenomena, but by using limited-edition blind boxes as a hub, innovation in theoretical connections has achieved. As a synthesis of sunk cost fallacy, scarcity effect and hedonic shopping, it reveals that the relationship among the three is not a simple superposition, but forms a closed cycle that facilitates consumption. Specifically, scarcity first triggers the fear of missing out (FOMO) and the desire for emotional attachments, leveraging the emotional economy to drive consumers to make their first purchase. When the first purchase fails to yield the desired item, the sunk cost fallacy comes into play, prompting them to continue making additional purchases through the psychology of loss aversion. The emotional economy then rationalizes irrational investments, providing a breeding ground and justifications for sunk costs. Since the goal of consumption is emotional satisfaction rather than practical functionality, consumers are more likely to interpret repeated irrational additional investments as "powering through for love." Eventually, the satisfaction of a few lucky ones who obtain their desired items and the "sunk cost stories" shared by the majority spread through social media, collectively reinforcing and strengthening the scarcity narrative and emotional value of these limited-edition blind boxes. This attracts more consumers to rush in during the next round of sales, thereby initiating a new and stronger cycle.

This research yields significant practical implications that extend beyond theoretical discourse, offering actionable insights for consumers and industry practitioners. As for the first one, the large majority of people feel regret after buying multiple identical guzi, purchasing limited-edition guzi at high prices, or drawing many blind boxes. So, through revealing underlying theories behind these unreasoning surfaces, such as the scarcity effect and the sunk cost, it may be helpful for buyers to identify marketing traps and establish a healthy consumption concept. Regarding the second aspect, publishing institutions can draw on the IP emotional empowerment logic and operation model of the guzi economy to accurately explore and strengthen the emotional resonance of products in the process

of IP development. Moreover, with the use of scarcity effect and sunk cost, it can realize the monetization of emotional value and promote the continuous enhancement of the value of publishing IP [1].

## 6. Conclusion

This paper presents a question that how do consumers' behaviors become irrational in guzi economy through economic strategies. By utilizing qualitative method and ethnographic observation, the comments on little red book have been generalized into typical phenomena, documenting people's feedback on impulsive consumption. Additionally, the research regards Love and Deep Space as an example, combining with the theories derived from the summary of preceding studies, subsequently drawing a conclusion. That is, the business model of limited-edition merchandise systematically leverages scarcity effect to activate consumer characteristics, including the need for uniqueness, need for conformity, regret aversion and reactance. Besides, merchants strategically manipulate sunk cost perception through a high-connected approach: randomizing acquisition costs via blind boxes, inflating perceived value through artificial scarcity, obscuring financial outlays via digital payment systems, and ultimately outsourcing cost justification to consumers' emotional self-rationalization.

This study addresses a significant gap in the literature by applying classical behavioral economic frameworks—specifically, the theories of scarcity and the sunk cost fallacy—to the emerging hedonic economy and guzi economy. While prior research has predominantly focused on utilitarian consumption contexts, such as financial investment, this investigation elucidates how these psychological mechanisms are not merely applied but are economically intensified and reinforced within emotion-driven consumption paradigms. Moreover, it is argued that in the hedonic economy, sunk costs are no longer the end of decision-making but a new starting point for continuous investment, because emotional investment of consumers provides a rationalization for sunk costs, significantly extending the decision-making cycles and payment limits.

Nevertheless, there exist several inevitable limitations. First of all, the research fails to conduct a rigorous investigation of a large sample, probably making errors difficult to control and result in poor stability of conclusions. Second, the findings and theoretical implications of this study are most salient and applicable to highly engaged, core consumers within the guzi economy. However, the decision-making processes of casual or peripheral participants may diverge significantly from the observed patterns, representing a boundary condition that warrants explicit acknowledgment and future investigation. Third, without using quantitative method, the unreasoning behaviors are not possible to be statistically supported and emphasized by calculating the price elasticity of demand. Finally, the findings exclusive focus on the Chinese market. Consequently, the findings and their theoretical implications may not be directly appropriate to other cultural contexts.

With regard to the future research avenue, it can be conducted with a larger and more variable sample, to make sure the reliability of the research. In addition, a critical avenue involves conducting a cross-cultural comparative study to examine how consumers from distinct cultural backgrounds, including collectivist societies like China, Japan, and South Korea versus individualistic societies like those in North America, respond to identical scarcity-driven marketing strategies. The influence of cultural variables—such as differing attitudes toward consumption, collectivism versus individualism, and varying regulatory environments—remains an open and critical question for future research.

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