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The impact of loss aversion on retailers' business operations in the commodity market

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Abstract. As the core concept of behavioural economics, loss aversion has a multi-dimensional impact on the business activities of sellers in the commodity market. Research shows that in the upstream part of the industrial chain, loss aversion will alter the decision-making logic of producers and sellers. Manufacturers may adopt conservative production strategies to avoid the risk of overcapacity, while sellers tend to reduce inventory orders to avoid unsalable losses. Both parties can adopt appropriate contract types according to risk preference in contract signing to reduce the loss of psychological utility caused by potential losses. In the downstream market, loss aversion has a profound impact on the interaction mode between sellers and consumers. Sellers actively disclose quality information through a user evaluation mechanism, and use positive evaluation to alleviate consumers' concern about "payment loss"; At the same time, the marketing strategy enhances or weakens consumers' loss aversion perception, so as to stimulate purchasing behaviour. This study systematically examines the path of loss aversion in production and marketing coordination and consumption decision-making, and provides a theoretical reference for retailers to optimise business strategies and improve market efficiency.

1 Introduction

As a core concept in prospect theory, loss aversion is characterised by people's stronger inclination to avoid losses than to pursue gains of equal magnitude. This psychological trait operates across both gain and loss scenarios: when confronted with gains and losses of the same amount, individuals experience a more intense psychological impact from losses and find it harder to tolerate their effects. Quantitative research indicates that the negative utility generated by a loss of a given size is approximately 2.5 times the positive utility derived from a gain of the same size [1]. Loss aversion is a deep-rooted psychological state, which widely exists in the depths of the human heart, and has a profound impact on individuals. The experiment found that even among children aged 5 to 10, the characteristics of loss aversion are obvious [2]. The findings indicate that an individual's thinking maturity and accumulated experience are not significantly correlated with their loss aversion. Some scholars even believe that loss aversion is an instinct that makes primates strive to protect themselves when facing potential risks to reduce the possibility of injury [2].

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Due to the existence of loss aversion, people's risk preferences are not consistent. When it comes to returns, people are risk-averse; they are more conservative and want to get returns. When it comes to losses, people are risk-seeking, inclined to take risks and avoid losses [1]. Research on loss aversion also encompasses details. For instance, some scholars have proposed that losses appear more prominent than gains in certain situations rather than all situations; other scholars have suggested that extremely large losses are given extra weight, while smaller losses often receive little attention [3].

This paper centres on loss aversion, a key concept in behavioural economics. Beginning with participants in the intermediate links of the commodity market, it analyses how loss aversion influences the behaviours of sellers and upstream producers in production, inventory management, and contract formulation. Subsequently, the paper extends its scope to the downstream market, examining the economic interactions between sellers and consumers driven by loss aversion. Ultimately, this paper aims to provide theoretical references for sellers to optimise their business strategies and enhance market efficiency.

2 Loss aversion of retailers and suppliers

In the supply chain, loss aversion exerts an influence on the production and inventory decisions of both suppliers and retailers. Divergences in their loss aversion levels can cause inventory levels to deviate from the optimal state, exacerbating inventory fluctuations and efficiency losses within the supply chain. When loss aversion is a factor, the decision-making behaviours of supply chain members are shaped by their risk preferences. Studies demonstrate that the degree of loss aversion among individual members notably alters the optimal decision-making path. Specifically, strong loss aversion traits can lead to systemic decision biases through risk transmission mechanisms, ultimately reshaping the equilibrium of the supply chain [4]. Scholars used a questionnaire to survey nearly 1000 enterprise managers, and found that most respondents paid more attention to the unknown probability of potential loss, rather than paying equal attention to potential profit and loss [5]. The loss avoidance attitude of supply chain members affects the optimal pricing and related decisions of the supply chain; the optimal order quantity is different under rational and irrational conditions [6].

2.1 Manufacture

As participants in the supply chain system, manufacturers’ psychological thresholds also influence the optimal decisions of market participants under the premises of risk aversion and loss aversion. When manufacturers face increased risks—specifically as their loss aversion coefficient rises—they grow concerned that bleak future sales prospects may lead to slow product turnover, resulting in excessive inventory backlogs. Such backlogs could trigger risks like capital stagnation or even capital chain fractures. Consequently, manufacturers become less tolerant of profit losses and tend to reduce production volumes to mitigate potential damage to their revenues from future sales shortfalls. Due to market complexity, loss-averse manufacturers act more cautiously. Therefore, manufacturers should conduct regular risk assessments, adopt rational risk analysis models, and perform quantitative evaluations and verifications to support decision-making, thereby avoiding issues such as overcapacity [4].

2.2 Inventory

The dealer's inventory problem is a classic example of the newsboy model, also referred to as the single-period inventory problem—a fundamental model in supply chain management research. As suggested by its name, the newsboy model is rooted in the scenario of a newsboy selling newspapers. Its core focus lies in determining the optimal number of newspapers the newsboy should order: this quantity must balance the need to avoid excessive unsold stock with meeting market demand, ultimately aiming to maximise the newsboy's profits, which constitutes the primary issue addressed by the model [4]. The loss-averse newsboy model can effectively solve the decision-making problem of optimal inventory and optimal order quantity under the condition of non-neutral risk, so it is often used in financial and production scenes in real life. Under the conditions of a complete market and asymmetric information, the evaluation of future prices by loss-averse retailers will be affected by a risk-averse attitude [7]. Compared with loss-neutral retailers, loss-averse retailers exhibit distinct ordering behaviours under different cost scenarios: when confronted with high excess costs, they tend to place fewer orders; conversely, in the face of high shortage costs, they are inclined to increase their order quantities [6]. Facing uncertain demand, the loss-averse newsvendor exhibits increased flexibility and complexity in inventory ordering decisions. Consequently, this loss-aversion-driven decision paradigm imposes more stringent operational requirements on all parties within the newsboy model framework.

2.3 Contracts for suppliers and retailers

Suppliers and retailers establish cooperative relationships through contracts, primarily choosing between revenue-sharing and transfer price mechanisms. The optimal contract selection and its specific terms are critically influenced by the retailer's financial condition, the retailer's level of loss aversion, and the supplier's loss aversion. Crucially, the retailer's economic status dictates contract preference: revenue-sharing contracts maximise supplier utility when the retailer is financially distressed; for moderately stable retailers, the choice hinges on the retailer's loss aversion—revenue-sharing is preferable if aversion is low; transfer pricing becomes more advantageous when the retailer's financial position is strong.

Furthermore, loss-averse suppliers inherently favour revenue-sharing contracts. Within this contract type, suppliers set lower wholesale prices and revenue shares for low-loss-aversion retailers, with increased supplier aversion further reducing both parameters; conversely, higher initial parameters are set for highly loss-averse retailers, but heightened supplier aversion then decreases them. Under transfer pricing, suppliers impose higher wholesale prices on low-loss-aversion retailers (increasing further with supplier aversion), while initially setting lower prices for high-loss-aversion retailers (which then increase with supplier aversion). Consequently, the offsetting effects of bilateral loss aversion on contract parameters provide a strategic foundation for optimising their determination [7].

3 Loss aversion of retailers and consumers

Although the human cognitive bias shown by loss aversion was only discovered by psychologists Daniel Kahneman and Amos Tversky in the 1970s, it did not affect the operators' use in earlier marketing activities. Marketing methods such as shopping vouchers and time-limited discounts were widespread in marketing activities before the loss aversion theory was discovered. With the discovery of loss aversion and the popularity of this theory, the use of loss aversion in marketing is becoming more and more popular, and more targeted, and the marketing effect is further enhanced [8]. In the commodity market, there are significant differences in the decision logic between retailers and consumers, and the core is reflected in the trade-off between price and value. Guided by profit maximisation, sellers' core strategy is to accelerate commodity circulation by setting competitive prices. This process needs to be based on a keen insight into market demand and competition patterns. In contrast, consumers' decisions focus more on the matching of price, quality and actual value. When paying a set price, they will give priority to whether the quality of goods meets the standard and whether the actual value is equal. This difference essentially reflects the distinction between their role positioning and target demands in market participation: retailers focus on the promotion of price strategy on commodity circulation efficiency and profit acquisition, while consumers pay more attention to the balance between price payment and commodity value return [2].

3.1 Information disclosure

Due to loss aversion—specifically, heightened sensitivity to the loss of "potential quality falling short of expectations"—consumers hesitate to purchase products with unknown quality. This psychological tendency drives enterprises to disclose quality information through methods like product trials and accumulated ratings, aiming to reduce consumer uncertainty and stimulate purchases. Quality evaluations, such as trial ratings, serve as key tools to mitigate loss aversion: ratings derived from genuine trials help consumers revise their perceptions of product quality (evident in updated expectations of quality and its variance), thereby narrowing the gap between actual and expected quality and reducing the negative utility caused by loss aversion. Conversely, loss aversion also influences enterprises’ choices of quality evaluation strategies. Given that consumers’ loss aversion affects their purchasing utility—with the negative utility from losses significantly outweighing the positive utility from equivalent gains—enterprises must adjust their trial scales and rating disclosure strategies based on consumers’ loss aversion characteristics [9]. Quality evaluation alleviates loss aversion by reducing information asymmetry, and loss aversion drives enterprises to optimise the disclosure strategy of quality evaluation. Both of them jointly affect consumers' purchase decisions and enterprise profits.

3.2 Marketing strategies

Operators can enhance or weaken the impact of loss aversion on consumers through certain price strategies, so as to achieve their marketing purposes. Although loss aversion is the internal psychological mechanism of consumers, its trigger or activation usually depends on external conditions, namely the existence of "loss", so enhancing loss aversion needs to strengthen consumers' sense of loss.

Consumers are most sensitive to price differences, so it is a common marketing strategy to use price differences to create a sense of loss. The time-limited discount launched by merchants can make some consumers feel a sense of loss due to the lack of low price benefits, and this sense of loss can become the driving force to promote consumer transactions. Such a price difference strategy can usually be combined with the conditions of limited sales, which further makes consumers think that failure to buy is a huge loss. When consumers have a sense of urgency and anxiety, they will make trading decisions that meet the expectations of operators.

The weakening of loss aversion can also be applied to marketing strategies. By changing the expression of price, operators can eliminate consumers' sense of loss to a certain extent, reduce the degree of loss aversion or inhibit the trigger of loss aversion [8]. The common pricing strategy of setting prices ending in 9 or multiple 9s leverages left-digit bias. This phenomenon causes consumers to form a preconceived price perception based primarily on the leftmost digit. Even when subsequently observing the full price, their cognitive adjustment remains insufficient, resulting in distorted price perception. Consequently, the perceived loss associated with consumption is reduced [10]. Another example is merchants decomposing a substantial lump-sum payment into minimal "per-day" or "per-use" fees, reinforced through targeted marketing emphasis. This approach constitutes a strategic attenuation of consumers' perceived loss magnitude.

4 Conclusion

This study systematically examines how loss aversion influences retailers’ business activities in commodity markets, uncovering its mechanisms and practical implications across different industrial chain links. The findings reveal that loss aversion, as a prevalent behavioural preference, not only reshapes interaction patterns between producers and sellers but also profoundly alters the decision logic of sellers and consumers, offering a new theoretical lens for understanding market behaviours.

In the upper reaches of the industrial chain, loss aversion drives producers and sellers to exhibit distinct risk-averse tendencies. Producers, aiming to avoid losses from overcapacity, tend to adopt conservative production plans, potentially reducing market supply elasticity; sellers, meanwhile, cut inventory orders to lower the risk of unsold goods, though this may lead to missed revenue due to stockouts. Contracting parties select agreement formats based on their heterogeneous risk preferences, thereby enhancing market efficiency. In the downstream consumer market, loss aversion motivates sellers to employ targeted strategies to optimise consumer behaviour. User review mechanisms, in essence, reduce consumers’ concerns about "payment losses" by enhancing quality information transparency; tactics like limited-time promotions stimulate immediate purchases by amplifying consumers’ loss perception of "missed opportunities," while methods such as minimising payment thresholds directly reduce their loss sensitivity. The effectiveness of these strategies confirms loss aversion’s core role in consumption decisions.

The theoretical contribution of this study lies in extending loss aversion theory beyond individual decision-making to industrial chain coordination and market interaction scenarios, enriching the application of behavioural economics in marketing. Practically, it provides clear strategic guidance for retailers: in supply chain management, balancing risk aversion and efficiency enhancement, and mitigating loss aversion’s negative effects via flexible contract designs; in consumer engagement, flexibly applying strategies to strengthen or weaken loss aversion based on product characteristics to optimise user experience and market performance. Future research could explore how loss aversion may evolve in its manifestations within digital contexts, broadening the study’s scope.

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