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The Impact of Gambling Behavior on Stock Returns under the Short-Selling Mechanism

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Abstract: This paper investigates the impact mechanism of gambling behavior on stock returns under the short-selling mechanism, using Chinese stocks eligible for short selling from March 31, 2010, to January 31, 2024, as the research sample. Furthermore, it examines the heterogeneity in the moderating effect of short-selling intensity on the relationship between gambling behavior and stock returns across different market conditions (bull and bear markets), firm sizes, and ownership types. The empirical results reveal a significant negative relationship between gambling behavior and stock returns. However, short-selling intensity positively moderates this negative relationship, implying that a higher degree of short-selling weakens the adverse impact of gambling behavior on stock performance. This positive moderating effect is more pronounced in firms with a higher proportion of institutional ownership, while a higher turnover rate weakens the moderating effect. The heterogeneity analysis further shows that the negative association between gambling behavior and stock returns is stronger in bull markets. Compared to large-cap and non-state-owned enterprises, the moderating effect of short-selling intensity is more pronounced in small-cap and state-owned enterprises.

Keywords: Gambling behavior; Short-selling mechanism; Institutional investor ownership; Turnover rate; Stock returns

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1. Introduction

Since 1990, China's stock market has experienced rapid expansion and development, accompanied by various irrational trading behaviors that have caused varying degrees of negative effects on the market. Among these, gambling behavior has had a particularly deep impact on stock pricing, and it has been especially significant for retail investors, making it a key transmission mechanism for systemic risk in the Chinese stock market. Scholars have found that gambling behavior in the stock market is similar to gambling behavior in general; investors tend to focus on purchasing low-priced stocks that offer potentially high returns, leading to increased stock price volatility [1]. Existing research also points to a negative correlation between gambling behavior and stock returns [2]. Su showed that stocks identified as "gambling stocks" often experience high returns initially, followed by

sharp declines [3]. Chen *et al.* pointed out that investors exhibit a preference for gambling and are willing to pay a premium for stocks with gambling attributes, resulting in short-term overvaluation, which adversely affects future returns [4].

The introduction of short-selling mechanisms can have a positive effect on the stock market. On one hand, short-selling can accelerate stock price adjustments, enabling prices to react more quickly to public information. This impact is particularly noticeable in markets with a high level of retail investor participation. During extreme price fluctuations, short-sellers typically engage in counteracting behavior to correct mispricing [5]. On the other hand, short-selling can reduce transaction costs and enhance market efficiency, which is crucial for investors to make rational trading decisions [6]. Therefore, the implementation of short-selling can, to a certain extent, improve the price discovery capability of China's stock market, correct price deviations caused by market speculation, and positively impact the market.

Existing studies have confirmed the negative relationship between gambling behavior and stock returns, and other scholars have also examined the positive impact of short-selling mechanisms on the market. In developed stock markets in Europe and the United States, many scholars have explored the impact of short-selling mechanisms on the relationship between gambling behavior and stock returns. Bergsma and Tayal pointed out that the positive effect of short-selling intensity on excess stock returns is most pronounced in gambling-type stocks [7]. However, the short-selling mechanism in China was introduced relatively late and differs from the mechanisms in Western markets, and research on the impact of short-selling on the relationship between gambling behavior and stock returns in China remains limited.

To enhance the framework for studying the impact of short-selling mechanisms on the relationship between gambling behavior and stock returns, this paper constructs an indicator of short-selling intensity and conducts a more detailed investigation into how short-selling influences the relationship between gambling behavior and stock returns. Furthermore, unlike developed markets, the Chinese stock market is characterized by a relatively low proportion of institutional investors and a higher turnover rate. This paper will further explore the moderating effects of institutional ownership and turnover rate on this relationship.

2. Literature review

"Gambling behavior" refers to the psychological or behavioral tendency of individuals to seek a large return with a relatively small investment, despite the extremely low probability of such large returns. Statman confirmed that purchasing stocks and buying lottery tickets are highly similar behaviors [8]. Both activities often lead to negative returns, yet investors continue to engage in them. Chen *et al.* argued that investors exhibit a preference for gambling, paying higher prices for stocks with gambling characteristics, which causes stock prices to be overvalued in the short term [4]. Johnathan *et al.* found that gambling behavior increases short-term market volatility, impacting stock returns, with this effect being more pronounced during periods of high market volatility [9].

Short-selling, as an important tool for information dissemination and price discovery, plays a positive role in enhancing market efficiency. Diamond and Verrecchia established a theoretical model in their empirical study, which showed that when short-selling restrictions exist, investors are unable to fully incorporate information into stock prices, thus reducing price discovery efficiency [10]. Fan and Gao found that short-selling accelerates the adjustment of stock prices to public information, thereby improving market efficiency, further proving the positive impact of short-selling mechanisms on market efficiency [5]. Additionally, during extreme price fluctuations, short-

sellers often exhibit opposite behavior, reducing downside risk and correcting mispricing to some extent. Bergsma and Tayal found that the effect of short-selling on excess returns is most pronounced in gambling-type stocks [7].

Existing research has confirmed the existence of gambling behavior and its negative correlation with stock returns, and has explored its mechanisms in detail. Regarding short-selling mechanisms, existing literature has examined their impact on pricing efficiency, information quality, and other factors, with some initial exploration of how short-selling influences the relationship between gambling behavior and stock returns. However, there are two primary deficiencies in the current research as listed:

(1) Most studies focus on mature markets in Europe and the U.S., with relatively few in-depth studies on emerging markets, such as China;

(2) There is a lack of research that constructs a short-selling intensity indicator based on China's stock market to study in detail how short-selling affects the relationship between gambling behavior and stock returns.

To address these gaps, this paper uses stocks with short selling eligibility in China's domestic market as samples, studying the impact of gambling behavior on returns under different levels of short-selling, and examines the moderating effects of institutional ownership and turnover rate.

3. Theoretical analysis and research hypotheses

When asset prices deviate from their intrinsic value, rational investors seize short-selling opportunities to hedge and generate profits. Their trading behavior can, to some extent, correct the short-term overvaluation of stock prices and adjust returns. The impact of short-selling on the relationship between gambling behavior and stock returns can be transmitted through investor sentiment, information disclosure quality, and equity pledge behavior.

From the perspective of investor sentiment, when short-selling is allowed, pessimistic investors can transmit negative information through short-selling, thereby curbing the overvaluation of stock prices driven by gambling behavior. As the scale of short-selling increases, more negative information is reflected in stock prices, leading to a more significant price correction, which in turn positively affects the actual returns. Short-selling can improve information disclosure quality, reduce speculative overreactions to favorable rumors, and limit irrational price increases, thereby positively adjusting long-term stock returns [11]. Additionally, in terms of equity pledging, when corporate shareholders pledge their shares, regardless of the purpose, short-sellers perceive this as a negative signal, using information extraction to suppress pledge activities [12]. The reduction in equity pledging can weaken the firm's tendency to cater to the market with actions such as high stock dividend payouts, thus reducing short-term gambling behavior and ultimately lowering the overvaluation of stock prices while enhancing average returns. Therefore, the first hypothesis (H1) is proposed, where the extent of short-selling can positively moderate the negative correlation between gambling behavior and stock returns.

Institutional investors play an important role in China's stock market. The higher the participation of institutional investors in stock trading, the more effectively information is transmitted to the market [13]. From the perspective of voluntary information disclosure and corporate innovation, institutional ownership is positively correlated with the quality of company information disclosure and corporate innovation, which enhances stock liquidity [14,15]. Increased liquidity, in turn, reduces transaction costs, and as transaction costs decrease, the number of short-selling activities may increase. This increase in short-selling helps reflect negative information in stock prices and suppresses the overvaluation of stocks caused by gambling behavior, ultimately having a positive impact on returns. Therefore, the second hypothesis (H2) is proposed: the higher the institutional ownership, the

stronger the positive moderation effect of short-selling on the negative correlation between gambling behavior and stock returns.

Turnover rate affects short-selling through liquidity and transaction cost pathways, thus influencing returns. Some scholars argue that a higher turnover rate indicates greater liquidity [16]. When turnover rate is positively correlated with liquidity, the increased liquidity facilitates short-selling [17]. Moreover, stronger liquidity means lower transaction costs, and reduced transaction costs can promote the increase of short-selling activities, enhancing the suppressive effect on the overvaluation of stocks due to gambling behavior, thereby benefiting returns. However, other scholars suggest that turnover rate is not always positively correlated with liquidity, especially in markets with high turnover rates, where liquidity may be negatively affected by price fluctuations, leading to lower liquidity [18]. When turnover rate is negatively correlated with liquidity, higher turnover rates may indicate worse liquidity, which could hinder short-selling activities, weakening the ability of short-selling to mitigate stock overvaluation driven by gambling behavior, thus negatively impacting returns. Therefore, two competing hypotheses are proposed:

H3a: The higher the turnover rate, the stronger the positive moderation effect of short-selling on the negative correlation between gambling behavior and stock returns.

H3b: The higher the turnover rate, the weaker the positive moderation effect of short-selling on the negative correlation between gambling behavior and stock returns.

4. Methods

4.1. Sample selection and data processing

The short selling business was officially launched in China on March 31, 2010. This study uses the individual stocks eligible for short selling as samples, with the data covering the period from March 31, 2010, to January 31, 2024. Financial stocks and ST stocks are excluded from the sample. Additionally, while the sample stocks are eligible for short selling, not every stock engages in short selling on every trading day. Therefore, stocks with significant missing data are excluded from the sample. With each expansion of the short selling eligible stock pool, the number of eligible stocks in the Shanghai and Shenzhen stock exchanges reached over 3,400 by December 31, 2023. The dependent variable, individual stock return, and control variables such as market capitalization, book-to-market ratio, profitability factor, investment factor, and momentum factor are sourced from the CSMAR database. Data on short-selling volume is obtained from the Wind database.

4.2. Variable selection and data description

The variables are listed as follows:

(1) Dependent variable: Individual Stock Return (R)

The individual stock return used in this study is the total return, which includes cash dividends reinvested.

(2) Independent variable : Gambling Behavior (MAX)

Note that Cui and Wang used the average of the maximum monthly return over the first three days of each month to construct the gambling behavior measure (MAX) [19]. Their results suggest that this method is most effective in identifying gambling behavior in the Chinese market. Therefore, referring to Cui and Wang, this study calculates MAX as the average of the maximum daily returns for the first three days of each month for each individual stock [19].

(3) Independent variable: Short-Selling Degree (RSI)

For the extent of short-selling, this study follows the approach of Bergsma and Tayal decides the short-selling volume by the total number of shares of the stock on a monthly basis [7]. Similarly, research in China, such as the study by Pan and Dong, measures short-selling by dividing the short-selling volume by the floating shares [20]. This study adopts the method of Bergsma and Tayal, measuring short-selling by dividing the short-selling volume by the total number of shares [7].

(4) Moderating variable: Institutional Investor Ownership Ratio (OWEnum)

Institutional investor ownership ratio (OWEnum) is included as a moderating variable. Since institutional ownership data is usually published quarterly by companies (e.g., shareholder announcements and annual reports), this study uses linear interpolation in Stata to convert quarterly data into monthly data.

(5) Moderating variable: Turnover Rate (Turnover)

The turnover rate is used to measure liquidity, based on the approach by Chordia *et al.* [16].

(6) Control variables (Control)

Considering that both firm size and the book-to-market ratio can impact stock returns, this study incorporates firm size (Lnsize), book-to-market ratio (BM), profitability factor (RMW), investment factor (CMA), and momentum factor (UMD) as control variables.

Table 1. Variable definitions

Type	Name	Definition	Shortform
Dependent variable	Return	Individual Stock Return Rate	R
Independent variable	Gambling Behavior	Measure of lottery-type stock intensity	MAX
Moderating variable	Short-Selling Degree	Monthly short-selling volume divided by total shares outstanding	RSI OWEnum Turnover
	Institutional Investor Ownership Ratio	data from CSMAR	OWEnum
	Turnover Rate	The frequency of stock trading within a given period	Turnover
Control variables	Profitability Factor	Measured by Return on Equity	RMW
	Investment Factor	Calculated using the sort-portfolio approach	CMA
	Momentum Factor	Constructed based on the momentum effect	UMD
	Firm Size	Natural logarithm of the firm's market capitalization	Lnsize
	Book-to-Market Ratio	Ratio of shareholder equity to the firm's market value	BM

4.3. Model

To investigate the impact of short-selling intensity on the relationship between gambling behavior and stock returns, a panel regression model is designed based on the theoretical analysis above. The model is constructed as follows in Eq.(1):

$$\begin{aligned} R_{i,t+1} = {} & \alpha_0 + \beta_1 * MAX_{i,t} + \beta_2 * MAX_{i,t} * RSI_{i,t} \\ & + \beta_3 * MAX_{i,t} * RSI_{i,t} * QWEnum_{i,t} \\ & + \beta_4 * MAX_{i,t} * RSI_{i,t} * Turnover_{i,t} + \beta_5 * RWM_{i,t} + \beta_6 * CMA_{i,t} \\ & + \beta_7 * UMD_{i,t} + \beta_8 * Lnsize_{i,t} + \beta_9 * BM_{i,t} ++ \varepsilon_{i,t} \end{aligned} \quad (1)$$

In this model, $R_{i,t+1}$ represents the stock's return in the following period, indicating its actual return. $MAX_{i,t}$ represents the gambling behavior of the stock in the current period, while $RSI_{i,t}$ denotes the short-selling intensity of the stock during the same period. $QWEnum_{i,t}$ refers to the proportion of institutional investors holding the stock, and $Turnover_{i,t}$ captures the turnover rate of the stock in the current period. The control variables include $RWM_{i,t}$ for the profitability factor, $CMA_{i,t}$ for the investment factor, $UMD_{i,t}$ for the momentum factor, and $Lnsuze_{i,t}$, the logarithm of the firm's size in the current period. Additionally, $B_{i,t}$ represents the book-to-market ratio of the firm in the current period, and $\varepsilon_{i,t}$ is the random error term.

4.4. Descriptive statistics and correlation analysis

4.4.1. Descriptive statistics

This study performs a descriptive statistical analysis on the explanatory variables, dependent variables, and control variables from March 1, 2010, to January 31, 2024. The specific statistical results are presented in **Table 2**. The monthly average return (*R*) of stocks eligible for short-selling in the full sample is 0.009, with a standard deviation of 0.136, a minimum value of -0.715, and a maximum value of 4.256. This indicates significant variation in the extreme returns of stocks eligible for short-selling, reflecting the occurrence of large price fluctuations in these stocks in the A-share market. Furthermore, the positive mean return for short-selling eligible stocks suggests that, on average, these stocks have generated positive returns since they became eligible for short-selling. The average value of the gambling behavior (*MAX*) is 0.128, with a standard deviation of 0.169. The maximum and minimum values are 19.825 and -0.335, respectively, highlighting a considerable variation in gambling behavior across stocks. The mean value of the short-selling intensity (*RSI*) is 0.001, indicating that the average short-selling proportion of stocks is 0.1%. This reflects the relatively lower maturity of China's short-selling market compared to Western markets. The average institutional investor ownership ratio (*OWEnum*) is 0.494, with a standard deviation of 0.239, a minimum value of 0, and a maximum value of 2.521. This suggests a substantial variation in the proportion of institutional ownership among firms. The turnover rate (*Turnover*) has an average value of 0.333, indicating that the average turnover rate for these stocks is 33.3%. The minimum turnover rate is 0.000, while the maximum is 7.217, suggesting diverse trading preferences among investors for these stocks.

Table 2. Descriptive statistics

Variables	Count	Mean	SD	Min	p50	Max
R	199509	0.009	0.136	-0.715	-0.003	4.256
MAX	199509	0.128	0.169	-0.335	0.104	19.825
RSI	199509	0.001	0.003	0.000	0.000	0.236
OWEnum	199509	0.494	0.239	0.000	0.517	2.521
Turnover	199509	0.333	0.371	0.000	0.212	7.217
RMW	199509	-0.002	0.027	-0.089	-0.005	0.092
CMA	199509	0.002	0.023	-0.049	0.003	0.063
UMD	199509	0.008	0.052	-0.199	0.010	0.175
Lnsize	199509	16.379	1.113	12.475	16.249	21.748
BM	199509	0.666	0.278	0.000	0.668	2.200

4.4.2. Correlation analysis

The results of the correlation analysis indicate the following (detailed results are provided in the Appendix A): The correlation coefficient between stock gambling behavior and stock returns is 0.198, which is statistically significant at the 1% level. The correlation coefficient between short-selling intensity and gambling behavior is 0.207, also significant at the 1% level, suggesting a positive relationship between the two. Furthermore, the proportion of institutional investor ownership is significantly correlated with both gambling behavior and short-selling intensity at the 1% level. The turnover rate is also significantly correlated with both gambling behavior and short-selling intensity, with significance at the 1% level. These results confirm the presence of correlation relationships among the variables studied.In addition, the VIF values for each variable are all below 10, indicating that there is no multicollinearity between the variables.

4.5. Results

The results presented in **Table 3** were derived from the regression of Eq.(1). Column (1) shows the relationship between the characteristics of gambling stocks and stock returns. From the results, it is evident that there exists a negative relationship between the intensity of gambling behavior in stocks and the actual stock returns. Column (2) includes the variable of short selling intensity. The interaction term between gambling behavior and short selling intensity has a coefficient of 0.592, which is statistically significant at the 1% level. This indicates that short selling intensity positively moderates the negative relationship between gambling behavior and stock returns. Therefore, Hypothesis (H1) is supported.

In Column (3), the model is augmented with the moderating variable of institutional investors' shareholding ratio. The interaction term among gambling behavior, short selling intensity, and institutional investors' shareholding ratio has a coefficient of 0.301, which is significant at the 10% level. This supports Hypothesis (H2). Finally, in Column (4), the model incorporates the moderating variable of turnover rate. The interaction term among gambling behavior, short selling intensity, and turnover rate has a coefficient of -8.889, which is significant at the 1% level. This suggests that as turnover rate increases, it weakens the positive moderating effect of short selling intensity on the negative relationship between gambling behavior and stock returns. Consequently, Hypothesis (H3b) is confirmed.

Table 3. Regression results of the impact of gambling behavior on stock returns under the short-selling mechanism

Variables	(1) R	(2) R	(3) R	(4) R
MAX	-0.018*** (-10.183)	-0.022*** (-10.116)	-0.017*** (-4.436)	-0.007* (-1.924)
RMW	-0.022 (-1.529)	-0.020 (-1.410)	-0.042*** (-2.894)	-0.026* (-1.802)
CMA	-0.593*** (-34.145)	-0.587*** (-33.798)	-0.579*** (-33.414)	-0.569*** (-32.921)
UMD	0.035*** (6.072)	0.036*** (6.170)	0.033*** (5.751)	0.029*** (5.084)
Lnize	-0.107*** (-113.977)	-0.106*** (-112.762)	-0.112*** (-116.904)	-0.105*** (-111.912)
BM	-0.261*** (-88.936)	-0.262*** (-89.087)	-0.262*** (-89.219)	-0.285*** (-96.297)

Table 3 (Continued)

Variables	(1) R	(2) R	(3) R	(4) R
RSI		-0.847*** (-7.954)	-1.081*** (-4.584)	-0.361* (-1.877)
MAXRSI		0.592*** (4.812)	0.410 (1.451)	0.482 (1.615)
MAX_OW			-0.009	
Enum			(-1.132)	
RSI_OWEnum			0.832**	
			(2.056)	
OWEnum			0.121*** (29.706)	
MAXRSIOWEnum			0.301* (1.761)	
MAX_Turnover				0.022*** (5.269)
RSI_Turnover				0.646*** (3.861)
Turnover				-0.056*** (-40.880)
MAXRSITurnover				-0.889*** (-3.029)
_cons	1.931*** (117.650)	1.921*** (116.722)	1.969*** (119.236)	1.930*** (117.921)
N	199509	199509	199509	199509
adj. R^2	0.082	0.083	0.087	0.094

Note: *p<0.1,**p<0.05,***p<0.01，t-statistics are reported in parentheses.

To verify the robustness of the research findings, this study conducted robustness tests by changing both the sample period and the dependent variable. The regression results were consistent with those of the main regression model (due to space constraints, details are available upon request). Specifically, to exclude the impact of large market fluctuations, we selected a sample period starting from 2015 to examine the effect of short selling and gambling behavior on stock returns following the market crash. In addition, following the methodology of Bergsma and Tayal, we incorporated the risk-free rate in the calculations and used excess returns to measure stock return [7]. The two robustness checks all yielded consistent results.

4.6. Heterogeneity analysis

4.6.1. Heterogeneity analysis based on bull and bear markets

Fan *et al.* argue that investor decision-making exhibits significant differences under varying market conditions [21]. This study, referencing the methodology of Pagan and Sossounov, divides the sample period into bull and bear markets, further investigating the impact of gambling behavior on stock returns under short-selling mechanisms in different market conditions [22]. The results from the heterogeneity analysis (**Table 4**) show that in a bull market,

there is a negative correlation between gambling behavior and stock returns, while in a bear market, there is a positive correlation. This finding does not align with our initial hypothesis.

One possible reason is that during a bear market, pessimistic sentiment prevails. Both rational and irrational investors tend to hold an excessively negative outlook on stock price movements, leading them to continuously sell off their stocks. Pessimistic investors expect stock prices to decline in the future, while speculative investors in the market may hold an optimistic view and buy stocks, thereby increasing the stock returns. The results also indicate that short selling negatively moderates the relationship between gambling behavior and stock returns during a bull market. which is contrary to expectations. A potential reason for this situation is that, although short sellers convey negative information through their trades, in a bull market, optimistic investors tend to attribute the early returns of the market to their own skills, resulting in irrationally optimistic behavior. Some irrational investors overly pursue high-risk, low-probability stock gains, and the negative information conveyed by short sellers actually caters to the gambling psychology of these investors, intensifying their speculative behavior and leading to an increase in speculation and price chasing.

Table 4. Differential impact of short-selling intensity on gambling behavior and stock returns: Analysis Based on bull and bear markets

Variables	(1) Bear	(2) Bear	(3) Bull	(4) Bull
MAX	0.372*** (20.863)	0.408*** (22.032)	-0.324*** (-11.082)	-0.283*** (-9.216)
RSI		-2.888 (-0.951)		-0.402 (-0.639)
MAXRSI		-12.773 (-1.161)		-6.369** (-2.571)
_cons	3.586*** （40.488）	3.552*** (40.147)	5.185*** (36.372)	5.044*** (35.234)
N	16135	16135	11171	11171
adj. R^2	0.185	0.189	0.200	0.206

4.6.2. Heterogeneity analysis based on market capitalization

Wang *et al.* investigated the differences in speculative characteristics between large-cap and small-cap stocks, finding that small-cap stocks exhibit stronger speculative attributes [23]. To examine whether the size of a company influences this behavior, this study uses market capitalization as an indicator, categorizing firms into large-cap and small-cap groups based on the median market capitalization. The study further explores whether the size of a company's market capitalization affects the degree of short selling and weakens the negative correlation between gambling behavior and stock returns. The regression analysis of the impact of different company sizes on short-selling levels and the relationship between gambling behavior and stock returns reveals that for small-cap firms, the relationship between gambling behavior and stock returns is more pronounced. Additionally, the degree of short-selling significantly positively influences the negative relationship between gambling behavior and stock returns. This finding suggests that investors are more inclined to pursue small-cap stocks, and the extent to which short selling positively moderates the negative relationship between gambling behavior and stock returns is more evident in small-cap stocks.

Table 5. Differential impact of short-selling intensity on gambling behavior and stock returns: Analysis based on market capitalization

Variables	(1) Small-cap	(2) Small-cap	(3) Large-cap	(4) Large-cap
MAX	-0.013*** (-5.467)	-0.017*** (-6.153)	-0.011*** (-3.781)	-0.010*** (-2.751)
RSI		-1.226*** (-5.780)		-0.365*** (-3.005)
MAXRSI		0.835*** (4.691)		0.013 (0.076)
_cons	3.003*** (94.659)	2.986*** (93.717)	2.076*** (82.372)	2.071*** (82.070)
N	99681	99681	99828	99828
adj. R^2	0.117	0.117	0.085	0.085

4.6.3. Heterogeneity analysis based on enterprise nature

Li *et al.* found that state-owned enterprises possess more resources and close ties with the government, while non-state-owned enterprises, in order to compensate for these deficiencies, are more likely to reduce their equity capital costs by improving the quality of their information disclosure [24]. As a result, NSOEs generally demonstrate higher quality in their information disclosure practices. This paper conducted a regression analysis to examine the differences in the impact of short-selling and gambling behavior on stock returns based on the nature of the enterprise. The results indicate a negative relationship between gambling behavior and stock returns. The absolute value of the MAX coefficient for non-state-owned enterprises is smaller than that for state-owned enterprises, suggesting that non-state-owned enterprises provide more complete information disclosure. As investors have access to more comprehensive corporate information, they are less likely to engage in excessive speculative behavior, which aligns with expectations. For both state-owned and non-state-owned enterprises, short selling significantly positively moderates the negative relationship between gambling behavior and stock returns. However, the moderating effect of short selling on this relationship is stronger in state-owned enterprises, indicating that the quality of information disclosure in state-owned enterprises is relatively incomplete. Thus, improvements in information disclosure quality have a more pronounced impact on gambling behavior and stock returns in state-owned enterprises.

Table 6. Differential impact of short-selling intensity on gambling behavior and stock returns: Analysis based on enterprise nature

Variables	(1) Non-state-owned	(2) Non-state-owned	(3) State-owned	(4) State-owned
MAX	-0.014*** (-6.879)	-0.017*** (-6.935)	-0.048*** (-10.320)	-0.052*** (-9.670)
RSI		-1.025*** (-5.874)		-0.690*** (-4.667)
MAXRSI		0.563*** (4.103)		0.823** (2.132)
_cons	2.092*** (95.376)	2.080*** (94.419)	1.728*** (69.764)	1.721*** (69.354)
N	115428	115428	84081	84081
adj. R^2	0.094	0.095	0.072	0.072

5. Conclusion

Since its establishment, the Chinese stock market has experienced rapid development and played an important role in the development of the real economy. However, many investors in the domestic stock market still engage in speculative behavior, often referred to as "gambling behavior." This type of behavior not only affects the returns of individual investors but also impacts the stability of the market. The introduction of the "short selling" system has provided investors with opportunities for short-selling arbitrage, which plays an important role in price discovery and market stability. Through empirical and theoretical analysis, the paper investigates the relationship between short-selling and gambling behavior, and how these factors affect stock returns, as well as the moderating role of institutional investors' shareholding ratio and turnover rate in it.

It was concluded that gambling behavior is negatively correlated with stock returns, and the degree of short-selling can significantly and positively moderate the negative correlation between gambling behavior and stock returns. A higher shareholding ratio of institutional investors enhances the positive moderating effect of short-selling on the negative correlation between gambling behavior and stock returns. In contrast, a higher turnover rate weakens this moderating effect. In bull markets, the negative correlation between gambling behavior and stock returns is stronger. Compared to large-cap stocks, small-cap stocks exhibit stronger speculative properties, and the degree of short-selling has a more pronounced moderating effect on the relationship between gambling behavior and stock returns in small-cap stocks. Whether the company is state-owned or non-state-owned, short selling significantly positively moderates the negative relationship between gambling behavior and stock returns, with a greater impact on state-owned enterprises.

Based on the conclusions of this study, the following recommendations are offered for both regulators and investors. For regulators, it is suggested to optimize the short-selling system by expanding the range of eligible securities for short-selling, encouraging institutional investors participation to alleviate supply shortages. A market-driven securities lending mechanism should be implemented, with fee reductions to enhance short-selling activity and improve market efficiency. Additionally, entry standards should be moderately relaxed to strengthen the role of short-selling in facilitating price discovery. Furthermore, the information disclosure system should be improved by strengthening disclosure requirements for listed companies, ensuring investors can access timely and accurate information. This will not only optimize the market's pricing function but also protect investors' rights and interests. Lastly, there should be an increase in the number of institutional investors and a restructuring of their composition. The diversification of institutional investors should be promoted, fostering high-quality institutions and introducing long-term value investment principles. In terms of structure, the focus should be on developing medium- and long-term institutional investors to address the current imbalance in the investor base.

For investors, retail investors should adopt a rational approach to market information, overcoming behaviors such as chasing trends or panic selling, and avoid frequent trading. When making investment decisions, multiple factors should be considered, and rationality should be maintained, avoiding decisions driven by emotions. Institutional investors, on the other hand, should refrain from following market trends blindly, instead focusing on enhancing their professionalism. While ensuring rational investment decisions, institutional investors should continue innovating their business models and pursue differentiated development strategies for long-term success.

Disclosure statement

The author declares no conflict of interest.

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