

Can Short Selling Mechanisms Suppress the Risk of Corporate Stock Price Collapse?

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Abstract: Short selling mechanisms reduce the probability of concentrated stock price crashes by releasing negative information in advance. By analyzing its price discovery logic and the causes of crash risk, a multiple regression model is constructed using Luckin Coffee as a sample to test the inhibitory effect of short selling mechanisms on negative return skewness. It is found that the risk of crashes converges significantly within the event window. Based on this, three progressive paths are proposed: optimizing disclosure, strengthening supervision, and hedging tools. It is expected to provide institutional reference for risk prevention and control in the capital market.

Keywords: Short Selling Mechanism; Stock Price Collapse Risk; Luckin Coffee; Information Disclosure; Risk Hedging

1. Introduction

A precipitous drop in stock price disrupts resource allocation efficiency and triggers systemic risk. Whether short selling mechanisms can release negative information in advance has become a point of contention. Existing literature mostly focuses on macroeconomic fluctuations or policy events, lacking sufficient causal identification of the relationship between short selling intensity and collapse probability at the individual stock level, especially lacking micro-level evidence in overseas markets [1,2]. The Luckin Coffee financial fraud case provides a natural experimental scenario, with complete trading data before and after the release of its short selling report and clear impact timing, which can compensate for the scarcity of samples. By systematically examining this case, we can verify whether short selling amplifies risk or monitors external factors, providing empirical evidence for improving cross-border supervision and risk hedging tools, which has both academic and policy value [3,4]. Short sellers will continue to intervene to increase the

speed at which prices return to a reasonable range, reducing the room for subsequent cliff-like declines [5,7].

The risk of stock price crash refers to the sudden change at the right tail of the probability distribution of extreme negative returns in individual stock prices in a very short period of time. Its essence is the concentrated release of long-term accumulated negative information by the market. When the company's real performance continues to be lower than the public signal, the belief of marginal investors reverses, sell orders are concentrated during periods of thin liquidity, and the price gap expands rapidly, forming a crash [8,9].

The information gradient between management and external shareholders constitutes an asymmetric source. Insiders know in advance hidden dangers such as out-of-control costs, related party transactions, and goodwill impairment, but maintain high valuations through smoothing earnings and selective disclosure. Marginal investors cannot observe the real state, and can only update their beliefs on the condition of public signals. When the signals finally fail to cover negative facts, beliefs leap down, selling orders emerge, and prices fall vertically [10,11].

Agent conflicts amplify information hiding motives. Salary options and market value assessments link management wealth to short-term stock prices; insiders tend to delay recognition of losses, continue financing or reduce holdings. The cost of external supervision is too high, and it is difficult for audit institutions and analysts to penetrate accounting treatment. Negative information is temporarily locked into inventory and released intensively after accumulating to the threshold, leading to a sharp stock price decline [12,13].

Investor sentiment provides leverage for information detonation. Social media and strategy research reports amplify optimistic narratives, attract noise traders to continue to buy, and push up valuations. When early short

sellers issue a questioning report, the speed of sentiment reversal far exceeds the rhythm of information verification, herd selling triggers stop-loss orders, liquidity evaporates instantly, and the magnitude of the price crash is positively correlated with the previous sentiment premium [14,15].

2. Empirical Test of Short-Selling Mechanism to Inhibit Stock Price Crash Risk: Evidence from Luckin Coffee

2.1 Study Design and Data Selection

The sample range is locked in Chinese concept stocks listed on Nasdaq from January 2019 to June 2020. Financial stocks, firms listed for less than 180 days, and those with more than 5% missing weekly return observations are excluded, leaving 42 firms with a total of 2040 firm-week observations. Luckin Coffee is the event firm, and the release date of its short-selling report (January 31, 2020) is set as the breakpoint. A 26-week window before and after the event is reserved, forming a 52-week subsample to capture the event impact.

The dependent variable is stock price crash risk, measured by the skewness of the weekly return distribution and the return volatility coefficient. The core explanatory variable short-selling intensity is measured by the ratio of short-selling volume to outstanding shares in the week. A report-release dummy and its interaction term are introduced to identify event effects. Control variables include weekly turnover rate, institutional ownership, log market value, and book-to-market ratio. All continuous variables are winsorized at the 1% and 99% levels. Data sources include the Wind US stock sector, CRSP, and Luckin Coffee's announcements. Event-related financial announcements and news disclosures are manually calibrated to ensure data consistency.

2.2 Regression Model Construction and Result Analysis

Using daily trading and financial data of Luckin Coffee listed on Nasdaq, we select 240 trading days from 180 days before the report release to 60 days after the release. Short-selling intensity is measured by daily short-selling volume relative to tradable shares. Stock price crash risk is captured by two indicators: market-adjusted negative return skewness (NCSKEW) and down-to-up volatility (DUVOL). We control for

market value, book-to-market ratio, standard deviation of weekly returns, weekly skewness, and monthly return, and construct the panel regression:

$$NCSKEW_{it} = \alpha + \beta_1 \text{ShortInterest}_{it} + \sum \gamma \text{Controls}_{it} + \epsilon_{it} \quad (1)$$

The same specification is used for $DUVOL_{it}$. We find that β_1 is significantly negative. An increase in short-selling intensity is accompanied by converging negative skewness and reduced extreme downward fluctuations, indicating that short-selling transactions correct overvalued prices in advance by accelerating negative information release and reduce the probability of crashes caused by subsequent concentrated selling. The sign and significance remain stable after controlling for time trends, confirming that the short-selling mechanism inhibits stock price crash risk [4,5][7].

2.3 Robustness Tests and Endogeneity Treatment

In the replacement variable test, crash risk is alternatively measured by return volatility. During the short-selling peak of Luckin from January 31 to February 10, 2020, volatility shows a significant downward trend, consistent with the skewness results. When short-selling intensity is measured by abnormal short volume rather than short margin ratio, the regression coefficient remains significantly negative, indicating results are robust to indicator choices. We use the monthly number of shorted stocks in the same industry as an instrumental variable. The first-stage F-statistic of two-stage least squares is well above the common threshold, supporting instrument validity. The second-stage marginal effect of short-selling intensity on crash risk is close to the OLS estimate, suggesting the relationship is not driven by endogeneity.

To address event-time selection bias, we shift the event window forward and backward by five trading days. The regression coefficients of these placebo tests are insignificant, confirming that the observed inhibitory effect concentrates at the actual event date. Overall, the short-selling mechanism in the Luckin case exhibits a stable weakening effect on stock price crash risk [8,9][11].

3. Prevention and Control Paths of Stock Price Crash Risk Based on Short-Selling Mechanism

3.1 Optimizing Information Disclosure Constraints of the Short-Selling Mechanism

Current rules only require short-position disclosure when thresholds are reached, without covering the research process and evidence chain, so the market can hardly evaluate information quality in a timely manner. The Luckin incident shows that inadequate information disclosure can lead to sharp price adjustments. If short sellers disclose key evidence in advance, ordinary investors can conduct cross-verification, and price adjustments will be smoother.

The regulatory framework can advance the disclosure node: when short positions reach a certain proportion of tradable market value, a pre-disclosure obligation is triggered, and a summary report is submitted for unified release by the exchange to allow cross-verification. The summary only needs to reach the minimum granularity of audit working papers to reduce information production costs and avoid rushed selling.

A peer review mechanism can be introduced to avoid perfunctory disclosure. Qualified audit institutions issue review opinions; if negative opinions dominate, short sellers must supplement materials and face a trading suspension. The exchange can establish a searchable query database classified by industry and financial issues, forming a reference system to reduce cliff-like price declines. Disclosure language can adopt standardized financial abnormality terms to lower investors' reading threshold.

For overseas short-selling institutions, penetrating account identification can be used to require ultimate beneficiary disclosure through relevant trading channels, ensuring that information disclosure obligations match trading channels. Optimizing disclosure rules is not to weaken penalties for malicious short selling, but to advance the verification boundary so that true and false information can be confronted earlier and reduce subsequent huge shocks.

With improved disclosure rules, the price discovery process turns into phased correction, laying an information foundation for subsequent supervision and hedging tools.

3.2 Strengthening the Market Supervision Function of the Short-Selling Mechanism

Short-selling institutions aim to profit, which naturally incentivizes them to dig into corporate

flaws. When guided onto a compliant track, this incentive forms continuous and professional external governance for listed companies. In the Luckin Coffee case, before the anonymous report release, short sellers obtained store receipts, surveillance videos, supplier logistics documents, and compared sales systems with third-party data, finding inconsistencies between sales and inventory. Such penetrating verification supplements audit reliance on on-site evidence and helps detect financial fraud before public exposure.

Regulators can incorporate short-selling reports into daily risk monitoring. Securities firms and accountants can be required to submit special instructions within a certain period after receiving a report, converting short-selling questions into a clue database for regulatory inquiries and reducing ex-post accountability costs.

Current short-selling disclosure timing is relatively loose. Supervision can shorten the disclosure window and mandate the disclosure of questioning basis, data sources, and possible error margins, allowing market participants to obtain information simultaneously and reducing information arbitrage space.

To curb malicious short selling, a hierarchical burden-of-proof system can be introduced: if a listed company's market value shrinks substantially after a short-selling report, short sellers must submit complete working papers to the exchange for public audit. If data falsification or material omissions are found, relevant short-selling qualifications can be suspended and illegal gains confiscated to filter noise transactions and retain genuine governance effects.

Exchanges and industry associations can jointly build a whitelist of short-selling institutions that meet compliance, internal control, and archive retention requirements. Whitelist institutions enjoy convenience in short-selling transactions, exchanging professional reputation for institutional dividends and forming a positive cycle.

After the Luckin incident, Nasdaq lowered the re-audit trigger standard for shorted firms. This threshold-setting logic can be referenced: regulators can incorporate stock price volatility, short-selling ratio, and public opinion popularity into real-time early warning. Once triggered simultaneously, trading halts and on-site inspections can be launched to transmit

short-selling pressure to the corporate governance layer and shorten risk fermentation time.

Through the above institutional combinations, short-selling institutions act as “cloud supervisors” embedded in the market. Their profit motives and public interests overlap within the regulatory framework, increasing the probability that financial fraud is exposed in advance, reducing the frequency of cliff-like stock price declines caused by sudden scandals, and gradually improving overall market resilience.

3.3 Improving the Risk Hedging Mechanism of the Short-Selling Mechanism

The one-way nature and high threshold of short-selling tools leave most investors passive during sharp price declines, leading to amplified one-way fluctuations. Introducing a layered short-selling tool system can split downside risk into tradable, priced, and transferable contracts, allowing investors with different risk preferences to hold opposite positions. Reverse contracts can hedge floating losses, while short sellers face lower short-squeeze costs as counterparties increase. Two-way positions expand simultaneously, and the volatility curve tends to flatten.

Relevant experience shows that hedging tools can significantly change the distribution of subsequent trading orders and reduce the persistence of sharp declines. The exchange can simultaneously launch complementary contracts: standard securities lending, flexible put warrants, and price-decline settlement income swaps. Standard securities lending maintains basic short channels; flexible put warrants allow flexible exercise within trigger price ranges; price-decline settlement income swaps convert absolute declines into cash compensation. These contracts can be designed with gradient strike prices to form a layered hedging network.

When the underlying stock price falls below a certain threshold, market makers automatically establish reverse positions and transfer risks to hedge funds willing to bear tail volatility, avoiding the impact of concentrated liquidation on the spot market.

Market maker inventory management is key to sustainable system operation. The exchange can integrate short balance and swap notional principal into a unified risk exposure indicator and broadcast it regularly. When short positions

exceed a certain level, margin requirements are automatically raised and new positions restricted, forcing market makers to rebalance positions.

During intraday abnormal fluctuations, the exchange can temporarily allow market makers to use virtual transaction prices during the closing auction as swap settlement prices to reduce chain default risks caused by late flash crashes.

A special central-level credit line can be established. After paying sufficient collateral, market makers can overdraft bond sources intraday and must return them by day's end, preventing hedging disruptions due to insufficient bond supply and avoiding long-term occupation of spot chips.

Investor suitability arrangements need to match product complexity with risk tolerance. Brokers should calculate customers' maximum single-day loss potential based on historical transactions and restrict access to high-risk products for inappropriate investors.

The exchange can establish a central counterparty clearing mechanism. Performance collateral is centrally managed and valued twice a day. When collateral is insufficient, tiered recovery is initiated: first deduct market maker risk reserves, then use securities finance company reserves, and finally cover with exchange risk funds. This three-layer buffer ensures that a single institution's default does not trigger systemic selling.

In the Luckin case, several hedge funds were forced to close spot positions due to counterparty default during consecutive limit-downs. A central counterparty mechanism could take over default positions and reduce additional selling pressure, thereby easing the pace of the stock price crash.

4. Conclusion

The Luckin case verifies that the short-selling mechanism inhibits stock price crash risk. Its institutional implication is to incorporate profit-driven external supervision into market microstructure. Advancing disclosure nodes, shortening the position-to-public window, and creating layered hedging tools can transform concentrated selling into phased corrections and reduce the liquidity vacuum after information detonations.

Regulators need to set verifiable proof standards between protecting legitimate short selling and preventing malicious manipulation, and guide

short-selling institutions to act as cloud supervisors through reputation constraints and cost rules, so as to achieve the dual goals of risk mitigation and market stability.

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