

How Capital Market Liberalization Influences Stock Price Crash Risk: The Intermediate Effect of Corporate Accounting Clarity

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Abstract: The introduction of the Shanghai-Hong Kong Stock Connect and Shenzhen-Hong Kong Stock Connect programs represents a pivotal juncture in the evolution of China's capital markets, signaling a significant move towards increased openness and integration. These initiatives have sparked considerable academic interest, underscoring their potential to transform the financial landscape. This research employs these programs as a quasi-natural experiment to investigate their profound impact on financial stability. Our analysis focuses on a comprehensive dataset encompassing A-share firms listed on both the Shanghai and Shenzhen Stock Exchanges over a thirteen-year period, from 2008 to 2021. Employing a robust difference-in-differences analytical approach, this study seeks to discern the effects of capital market liberalization on the incidence of stock price crashes. The empirical findings reveal a compelling association: greater openness in capital markets correlates significantly with a reduced risk of stock price crashes. This correlation is largely attributed to enhancements in corporate accounting transparency facilitated by these initiatives. Thus, these findings underscore the dual role of enhanced capital market openness in not only fostering stability in stock prices but also in mitigating market risks, safeguarding investor wealth, reducing systemic financial vulnerabilities, and fostering sustainable development across capital markets. This study contributes meaningfully to the existing literature on stock price crash risk by providing nuanced insights and actionable recommendations for policymakers and market participants alike, aiming to further bolster capital market openness and resilience.

Keywords: Shanghai-Hong Kong Stock Connect, capital market liberalization, stock price crash risk, financial transparency, systemic risk reduction.

1. Introduction

The openness of capital markets plays a crucial role in shaping the economic environment. Initiatives like the Shanghai-Hong Kong Stock Connect (launched in November 2014), the Shenzhen-Hong Kong Stock Connect (initiated in 2016), and the Shanghai-London Stock Connect (established in June 2019) have significantly liberalized China's capital markets, enabling substantial flows of international capital. The stock market, a cornerstone of financial systems, serves as a primary investment avenue for Chinese investors. Its stability and growth are critical, impacting investor

confidence, financial security, and the overall robustness of the national financial framework. However, the occurrence of stock price crashes presents considerable risks to market stability, potentially precipitating adverse cascading effects across other stocks. Therefore, comprehending the determinants of stock price crash risk and implementing effective measures are imperative for maintaining financial stability and safeguarding national economic security.

Amidst this evolving policy landscape, a fundamental query arises: How do initiatives designed to enhance capital market openness influence the risk of stock price crashes? Existing scholarship offers diverse perspectives on this issue. This study seeks to address this gap by conducting an in-depth investigation focusing on the Shanghai-Hong Kong and Shenzhen-Hong Kong Stock Connect programs, aiming to uncover underlying mechanisms. This research contributes to the literature by enhancing our understanding of factors influencing stock price crash risk, particularly through the impacts of macroeconomic policies and corporate accounting transparency. Moreover, it extends prior studies by expanding the analysis timeframe and incorporating companies listed via these stock connect initiatives.

This paper is structured into four sections: Section 1 provides a comprehensive literature review and theoretical hypotheses formulation; Section 2 outlines the research methodology; Section 3 presents and interprets empirical results; and Section 4 concludes with discussions on broader implications.

2. Literature Review and Theoretical Hypotheses

2.1. Literature Review

(1) Studies on Capital Market Openness:

Previous macroeconomic research extensively explores how capital market openness influences economic efficiency and market stability. The consensus suggests that such openness promotes domestic economic growth and integrates company-specific information into stock prices. It also enhances the predictive role of stock prices in corporate investment decisions, improves market efficiency, and enables prompt reflection of market information by foreign investors [1-3]. Furthermore, it tends to reduce stock price volatility and synchronicity [4], while stabilizing dividend payouts. However, it should be noted that in less developed local markets, initial capital market openness might exacerbate volatility. For example, the introduction of the Shanghai-Hong Kong Stock Connect reduced trading frequency and intensity, affecting the liquidity of listed stocks.

Micro-level studies focus on corporate governance, financial performance, and investor structure. They indicate that capital market openness mitigates earnings manipulation, reduces misconduct, enhances corporate governance standards, and improves investment efficiency through increased foreign investor participation. Additionally, it facilitates information transparency, lowers trading costs, enhances resource allocation efficiency, and stimulates R&D investments, thereby fostering corporate innovation.

(2) Studies on Stock Price Crash Risk:

In corporate finance theory, the potential for stock prices to experience sudden crashes often arises from conflicts between principals and agents in publicly traded companies. Managers frequently delay or obscure negative news to protect personal interests, while highlighting positive developments. Over time, accumulating unfavorable information becomes increasingly difficult to conceal, leading to abrupt and severe declines in stock values. Research into factors influencing the risk of stock price crashes commonly assesses a wide range of both internal and external variables.

Internally, several factors significantly influence the risk of stock price crashes within corporations [5]. These encompass managerial practices, the effectiveness of corporate governance structures, and the extent of transparency in information disclosure. Of particular concern is managerial behavior,

notably the deliberate concealment of negative information, which can profoundly heighten crash risk [6]. Robust internal information systems play a crucial role in mitigating asymmetries in information flow within the organization. Existing literature consistently highlights the critical role of enhanced corporate transparency in reducing the likelihood of stock price crashes, particularly through rigorous adherence to accounting standards and robust internal control frameworks [7].

External factors influencing stock price crashes include investor behavior and regulatory oversight. Research consistently demonstrates a direct link between investor sentiment and the frequency of stock price crashes. The influence of institutional investors on crash risk differs based on their categorization and investment strategies. Additionally, comprehensive analyst coverage and rigorous external audit oversight play pivotal roles in detecting and addressing corporate misconduct, thereby reducing the incidence of stock price crashes.

2.2. Theoretical Hypothesis

The effects of capital market liberalization on stock market stability are a subject of ongoing debate in academic circles. Much of the current research focuses narrowly on internal corporate governance mechanisms, often neglecting the pivotal role of external investors [8]. Moreover, there is a scarcity of literature that explores the dynamic interplay between these internal and external factors. While some scholars argue that liberalizing capital markets reduces stock price volatility and overall market risk, others posit that the influx of foreign capital may exacerbate market volatility due to various influencing factors. For instance, a study by Qin Yang Li and Nian Xing Xu [2] concentrated solely on companies listed under the Shanghai-Hong Kong Stock Connect, omitting analysis of the Shenzhen-Hong Kong Stock Connect. Their research, based on a sample size of 5,665 observations, may limit its applicability to broader contexts. To evaluate the influence of the Shanghai-Shenzhen-Hong Kong Stock Connect policy on the likelihood of stock price crashes within firms listed on both the Shanghai and Shenzhen exchanges, we formulate the following hypothesis:

H1: The liberalization of the capital market alleviates the risk of stock price crashes for the companies under consideration.

3. Research Design

3.1. Sample Selection and Data Sources

The research concentrates on firms that are publicly traded on the A-share markets of the Shanghai and Shenzhen Stock Exchanges, covering the timeframe from 2008 to 2021. To ensure uniformity in financial reporting and stock market outcomes in the context of revised accounting policies, data prior to January 1, 2007, were omitted. The initiation of the study in 2008 is deliberate, taking into account the delayed impact on the risk of stock price collapses. The sample was meticulously refined by excluding (1) ST (special treatment) companies, (2) financial institutions, and (3) companies delisted from the Shanghai and Shenzhen Stock Exchanges following their listing under the Shanghai-Shenzhen-Hong Kong Stock Connect. This refinement yielded a dataset comprising 21,789 observations. Data pertaining to the Shanghai-Shenzhen-Hong Kong Stock Connect and financial metrics of A-share listed companies were sourced from the comprehensive CSMAR database.

3.2. Variable Definitions

(1) Dependent Variable: Risk of Stock Price Crash

This research utilizes the Negative Conditional Skewness (NCSKEW) and Downside Volatility (DUVOL) as pivotal indicators to gauge the likelihood of stock price crashes, in accordance with recognized scholarly approaches. NCSKEW quantifies the degree of negative asymmetry in weekly

returns, factoring in the current market environment; elevated scores suggest a heightened susceptibility to stock price declines. DUVOL assesses the disparity in volatility between upward and downward stock price fluctuations; substantial values signify a greater propensity for stock price crashes.

(2) Independent Variable: Shanghai-Shenzhen-Hong Kong Stock Connect Variable

The principal independent variable is symbolized by a binary indicator, designated as $Treat \times Post$. In this context, the variable $Treat$ identifies whether a firm participates in the Shanghai-Shenzhen-Hong Kong Stock Connect program, indicated by $Treat = 1$ for inclusion and $Treat = 0$ for exclusion. The $Post$ variable functions as a dichotomous temporal marker, where $Post = 1$ signifies the year of observation following the introduction of the policy, and $Post = 0$ signifies the year prior to or without the policy's implementation.

(3) Control Variables

Expanding on the foundation laid by Nian Xing Xu and colleagues, this research integrates a variety of control variables that could potentially affect the risk of stock price crashes. The variables encompass company size ($Size$), debt ratio (Lev), the mean monthly rate of excess stock turnover ($Dturn$), return on assets (ROA), the designation as a state-owned enterprise (SOE), Tobin's Q ($TobinQ$), and the proportion of fixed assets ($Fixed$). The descriptions and the specific methods of measuring these indicators are provided in the subsequent section:

Table 1: Variable Definitions

Variable Name	Variable Symbol	Variable Definition
Negative Skewness of Weekly Returns	NCSKEW	This metric denotes the adjusted negative skewness of weekly returns, accounting for prevailing market conditions.
Volatility Difference	DUVOL	Represents the variation in volatility between periods characterized by rising and falling stock prices.
Dummy Variable	Treat post	The interaction term of "Treat" and "Post," employed as a categorical variable.
Firm Size	Size	Calculated as the natural logarithm of the total asset value of a firm.
Leverage Ratio	Lev	The ratio of a company's total liabilities to its total assets, as of the end of the fiscal year.
Average Monthly Excess Turnover Rate	Dturn	The disparity in the average monthly turnover rate between the current and the prior year.
Return on Assets	ROA	The net profit for the period, divided by the average total assets.
State-owned Enterprise	SOE	A binary indicator, with a value of 1 assigned to state-owned enterprises and 0 for non-state-owned entities.
Tobin's Q	TobinQ	Derived by aggregating the market value of freely tradable shares, the product of non-tradable shares and the net asset value per share, and the book value of liabilities, and then dividing by the total asset value.
Fixed Asset Ratio	Fixed	The proportion of net fixed assets in relation to the total asset base.

3.3. Model Specification

The Shanghai-Hong Kong Stock Connect was launched on the 17th of November, 2014, succeeded by the commencement of the Shenzhen-Hong Kong Stock Connect on the 5th of December, 2016. Leveraging these occurrences as quasi-natural experiments and referencing earlier scholarly works, the subsequent multi-period difference-in-differences model (1) is formulated:

$$NCSKEW_{i,t}(DUVOL_{i,t}) = \beta_0 + \beta_1 Treat \times Post + \beta_2 Control_{i,t} + \varepsilon_{i,t} \quad (1)$$

where $NCSKEW_{i,t}(DUVOL_{i,t})$ acts as a representative measure for the risk of stock price crashes, the dummy variable $Treat \times Post$ signifies the Shanghai-Hong Kong Stock Connect, $Control_{i,t}$ encompasses the control variables, and $\varepsilon_{i,t}$ represents the error term. Should the coefficient estimated by the difference-in-differences approach, β_1 , be significantly negative, it would suggest that the introduction of the Shanghai-Hong Kong Stock Connect policy—namely, the liberalization of the capital market—has the potential to reduce the risk of stock price crashes, thereby validating Hypothesis H1.

4. Empirical Results and Analysis

4.1. Descriptive Statistics

Table 2 presents the summary statistics for the key variables. The negative skewness of weekly stock returns, denoted as NCSKEW, exhibits a mean value of -0.292 with a standard deviation of 0.554, and it spans from a low of -2.758 to a high of 2.033. The measure of volatility disparity, known as DUVOL, has an average value of -0.204 and a standard deviation of 0.406, with values ranging from -1.836 to 1.479. These outcomes align with findings from previous research, highlighting considerable fluctuations in the risk of stock price crashes among different companies. The binary indicator for participation in the Shanghai-Shenzhen-Hong Kong Stock Connect, represented by $Treat \times Post$, has a mean of 0.239, which implies that approximately 23.9% of the companies in the sample are involved in the Stock Connect post its initiation. The remaining control variables fall within anticipated parameters.

Table 2: Descriptive Statistics

Variable	N	Mean	SD	Min	Max
NCSKEW Mdos	21789	-0.292	0.554	-2.758	2.030
DUVOL Mdos	21789	-0.204	0.406	-1.836	1.497
treat post	21789	0.239	0.427	0	1
Size	21789	22.27	1.393	15.58	28.64
Lev	21789	0.452	0.209	0.00800	1.522
Dturn	21789	-0.109	0.529	-25.59	4.447
ROA	21789	0.0380	0.0720	-1.130	0.816
SOE	21789	0.440	0.496	0	1
TobinQ	21789	2.125	3.161	0.641	259.1
FIXED	21789	0.225	0.171	0	0.971

4.2. Baseline Regression Results

Initially, model (1) scrutinizes the influence of the Shanghai-Shenzhen-Hong Kong Stock Connect policy on the risk of stock price collapses. The primary interest is centered on the coefficient associated with the $Treat \times Post$ variable. A coefficient that is statistically significant implies that the

implementation of the Shanghai-Shenzhen-Hong Kong Stock Connect policy, which signifies the liberalization of the capital market, exerts a notable effect on the risk of stock price crashes. The sign of the coefficient β_1 reveals the nature of this effect. The regression results are outlined in Table 3. In column (1), with the exclusion of control variables, the coefficient β_1 is -0.0283, which is statistically significant at the 1% level. This suggests that, irrespective of other variables, the execution of the Shanghai-Shenzhen-Hong Kong Stock Connect policy substantially reduces the risk of stock price crashes, as indicated by NCSKEW and DUVOL. In column (2), once control variables are included, the coefficient β_1 is -0.0278, maintaining its significance at the 1% level. This reaffirms the initial result and corroborates Hypothesis H1: The liberalization of the capital market alleviates the risk of stock price crashes for the companies under consideration.

Table 3: Shanghai-Shenzhen-Hong Kong Stock Connect and Stock Price Crash Risk

Variables	NCSKEW		DUVOL	
	(1) m1	(2) m2	(1) m1	(2) m2
treat_post	-0.0283*** (0.00920)	-0.0278*** (0.00979)	-0.0420*** (0.00671)	-0.0352*** (0.00714)
Control Variables		Control		Control
_cons	-0.285*** (0.00431)	-0.507*** (0.0790)	-0.194*** (0.00314)	-0.227*** (0.0576)
N	21789	21789	21789	21789
R ²	0.031	0.036	0.037	0.043

The standard deviations are presented in parentheses, with the following significance levels indicated by asterisks: * denotes p less than 0.1, ** signifies p less than 0.05, and *** indicates p less than 0.01.

4.3. Robustness Test

(1) Enhanced Stock Price Risk Metrics

The procedure for evaluating the risk of stock price crashes has been upgraded by implementing the total market capitalization average technique, which has supplanted the earlier market capitalization average technique. The indicators NCSKEW and DUVOL, calculated using this revised method, were incorporated into regression model (2), with the findings presented in Table 4. In the case of the NCSKEW indicator, the regression coefficient is -0.0246 in column (1), excluding control variables, and -0.0266 in column (2), including control variables. For the DUVOL indicator, the regression coefficient is -0.0382 in column (1) without control variables, and -0.0331 in column (2) with the inclusion of control variables. These coefficients are consistently statistically significant at the 1% level, substantiating the reliability of the conclusions drawn from previous research.

Table 4: Regression Results after Replacing Stock Price Crash Risk Indicators

Variable	NCSKEW		DUVOL	
	(1) m1	(2) m2	(1) m1	(2) m2
treat_post	-0.0246*** (0.00920)	- 0.0266*** (0.00979)	-0.0382*** (0.00670)	-0.0331*** (0.00713)
Control Variables		Control		Control

Table 4: (continued).

_cons	-0.292*** (0.00431)	-0.555*** (0.0790)	-0.200*** (0.00314)	-0.265*** (0.0575)
<i>N</i>	21789	21789	21789	21789
<i>R</i> ²	0.036	0.041	0.042	0.047

The standard deviations are presented in parentheses, with the following significance levels indicated by asterisks: * denotes *p* less than 0.1, ** signifies *p* less than 0.05, and *** indicates *p* less than 0.01.

(2) Exclusion of 2014 Shanghai and 2016 Shenzhen Stock Exchange Data

In line with the approach of Wang Zizhu and colleagues, this research omits data from Shanghai A-shares for the year 2014 and Shenzhen A-shares for 2016, which correspond to the respective rollout periods of the Shanghai-Hong Kong Stock Connect and the Shenzhen-Hong Kong Stock Connect. The subsequent regression analysis indicates that the coefficients for NCSKEW and DUVOL, when excluding control variables, are -0.0205 and -0.0365. Once control variables are factored in, these coefficients are revised to -0.0199 for NCSKEW and -0.0298 for DUVOL. Both of these coefficients maintain statistical significance at the 5% level for NCSKEW and at the 1% level for DUVOL, aligning with the results of prior scholarly work.

Table 5: Regression Results after Excluding 2014 Shanghai Stock Exchange Data and 2016 Shenzhen Stock Exchange Data

Variable	NCSKEW		DUVOL	
	(1) m1	(2) m2	(1) m1	(2) m2
treat_post	-0.0205** (0.00950)	-0.0199** (0.0101)	- 0.0365*** (0.00693)	- 0.0298*** (0.00735)
Control Variables		Control		Control
_cons	-0.284*** (0.00430)	-0.502*** (0.0794)	-0.193*** (0.00314)	-0.221*** (0.0579)
<i>N</i>	21368	21368	21368	21368
<i>R</i> ²	0.031	0.036	0.036	0.042

The standard deviations are presented in parentheses, with the following significance levels indicated by asterisks: * denotes *p* less than 0.1, ** signifies *p* less than 0.05, and *** indicates *p* less than 0.01.

5. Mechanism Analysis

5.1. Theoretical Analysis

Asymmetric information is a key factor in intensifying the susceptibility of stock prices to abrupt crashes. Publicly traded firms often possess informational advantages that impede investors' access to accurate and comprehensive corporate financial disclosures. In the absence of robust external oversight, corporate management may be incentivized to manipulate news releases and engage in insider trading, actions that can precipitate sharp declines in stock prices. The adoption of international disclosure standards within domestic capital markets post-market liberalization underscores the critical need for transparent corporate reporting. Overseas investors, facing greater information barriers and monitoring costs, typically favor companies that adhere to transparent accounting practices and exhibit strong corporate governance. To attract broader investor interest, listed companies are increasingly motivated to enhance the transparency of their financial disclosures.

With the advent of programs such as the Shanghai-Hong Kong Stock Connect, companies listed under this framework experience heightened scrutiny from analysts and market participants, indirectly bolstering external oversight mechanisms. The opening of capital markets encourages firms to proactively improve transparency in their financial reporting practices, thereby reducing information asymmetry between shareholders and management, as well as between companies and potential investors. Consequently, we propose the following hypothesis:

H2: The liberalization of capital markets reduces the risk of stock price collapses for companies in focus by promoting transparency in corporate financial reporting.

5.2. Research Design

To investigate the intermediary function of accounting information transparency, this research develops a comprehensive index called ‘Trans’ by averaging the percentile ranks of five pivotal metrics: earnings quality (DD), disclosure index (DSCORE), analyst coverage (ANALYST), precision of analyst earnings forecasts (ACCURACY), and engagement of Big Four auditing firms (BIG4). Should there be any missing data for a company listed, TRANS is determined by averaging the percentile ranks of the existing metrics. In accordance with the methodologies from prior studies [3], a mediation analysis is executed using the model (2) presented below:

$$MEDIATION_{i,t} = \alpha_0 + \alpha_1 Treat \times Post + \alpha_2 Control_{i,t} + \varepsilon_{i,t} \quad (2)$$

Here, $MEDIATION_{i,t}$ corresponds to the variable described earlier. A regression coefficient that is statistically significant suggests that the advent of the Shanghai-Hong Kong Stock Connect policy has an impact on the mediating factor of accounting information transparency. This analysis is constructed upon recognized theoretical frameworks regarding the influence of mediating factors on the risk of stock price crashes, offering insights into the manner in which capital market liberalization impacts these risks and validating the proposed hypothesis.

5.3. Empirical Results and Analysis

Model (2) is employed to explore the influence of the Shanghai-Hong Kong Stock Connect policy on the transparency of corporate accounting information. The primary focus is on the coefficient of $Treat \times Post$. A significant coefficient α_1 implies that the execution of the Shanghai-Hong Kong Stock Connect policy has a substantial effect on the transparency of corporate accounting information. The direction of this effect is suggested by whether the sign of the coefficient β_1 is positive (indicating an increase) or negative (indicating a decrease). The regression results are detailed in Table 6. The coefficient that links accounting information transparency with the Shanghai-Hong Kong Stock Connect dummy variable ($Treat \times Post$) is found to be 0.0384, which is statistically significant at the 1% level. This result indicates that the liberalization of capital markets is instrumental in strengthening the transparency of corporate accounting information. Improved transparency reduces information asymmetry, aids in the distribution of vital financial data, assists investors in making educated investment choices, and thus, reduces the probability of stock price collapses. These results lend empirical evidence to support Hypothesis H2.

Table 6: Path Analysis Study

	(1) TRANS
treat_post	0.0384*** (14.50)
Control Variables	Control

Table 6: (continued)

_cons	17760.9*** (31.33)
N	21789
r2	0.452

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

6. Conclusions and Implications

The Shanghai-Hong Kong Stock Connect and the Shenzhen-Hong Kong Stock Connect are landmark initiatives in China's ongoing campaign to liberalize its capital markets, which has garnered considerable academic attention. The adept management of the risk of stock price collapses is vital for nurturing a sophisticated capital market that preserves investor assets and reduces systemic financial hazards, a prerequisite for steady and vigorous market evolution. This research highlights that the liberalization of capital markets can significantly diminish the risk of stock price collapses for publicly listed companies by improving the transparency of corporate accounting practices. Drawing from our conclusions, several suggestions are put forward:

Firstly, it is advised to persist with the incremental opening of the capital market. This involves widening and deepening the scope of market accessibility, progressively relaxing capital quota constraints, and broadening pilot initiatives to encompass an expanded array of countries and regions. In tandem, vigilant observation of market trends stemming from policy interplays, coupled with the reinforcement of regulatory structures and the fortification of supervisory mechanisms over foreign investors and their transactions, is imperative.

Secondly, enhancing the transparency of accounting information within listed companies is critical. Measures should be taken to encourage firms to establish robust systems for disclosing accounting information, bolster internal reviews to ensure information integrity, and facilitate timely and accurate data releases. Standardizing regulations and systems governing corporate accounting disclosures, raising standards for audits and oversight, and imposing stricter penalties for corporate misconduct are recommended to incentivize voluntary disclosure. Emphasis should be placed on combating serious offenses like financial fraud to optimize the investment climate.

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