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Promoter Share Pledging and Downside Risk: Evidence from Indian Listed Firms

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Abstract

This study investigates the relationship between promoter share pledging and firm-level downside risk in Indian listed companies over the period 2009–2023. Using firm–year panel data from CMIE Prowess, the analysis examines both the incidence and intensity of promoter share pledging and their association with multiple measures of left-tail risk, including Conditional Value-at-Risk (CVaR), Value-at-Risk (VaR), maximum drawdown, minimum return, and crash-risk proxies (NCSKEW and DUVOL). The findings indicate that firms with pledged promoter shares exhibit significantly greater exposure to extreme negative return realizations compared to non-pledging firms. More importantly, the intensity of pledged shares is positively associated with incremental downside vulnerability, suggesting a dose–response relationship between collateral encumbrance and tail risk. These results remain robust after controlling for firm characteristics and year fixed effects. The evidence supports a collateral-amplification channel whereby equity-backed insider borrowing increases sensitivity to adverse price shocks. The study contributes to the governance and risk-management literature by linking promoter pledging to firm-level tail risk, highlighting its implications for investor protection and financial stability in ownership-concentrated emerging markets.

Keywords
Promoter share pledging; Downside risk; Conditional Value-at-Risk (CVaR); Crash risk; Corporate governance; Ownership concentration; Emerging markets; India.

1. Introduction
Promoter share pledging is where by the controlling shareholders pledge equity as collateral for loans and is a common hybrid financing mechanism in ownership-concentrated markets such as India. Pledging enables promoters to raise liquidity without diluting control, but it introduces a market-linked collateral risk because borrowing capacity depends on stock prices. Price declines can trigger margin calls or forced liquidation, potentially amplifying downside risk through governance instability and price spirals (Dou et al., 2019; Li et al., 2019; Chauhan et al., 2021).

Beyond traditional leverage, pledging creates a distinct collateral-constraint channel operating through equity volatility. Higher pledge exposure increases sensitivity to stock-price declines and may elevate crash and tail risk,

particularly in emerging markets with concentrated control (Wang and Chou, 2018; Dou et al., 2019; Li et al., 2019; Chauhan et al., 2021). Although India's regulatory framework has strengthened disclosure and broadened the definition of encumbrance, systematic evidence on pledging and structured downside risk remains limited.

Two gaps motivate this study. First, prior work largely frames pledging as a governance issue, with limited integration into operational downside-risk monitoring. Second, research often focuses on pledge incidence rather than pledge intensity, even though risk amplification is likely intensity-driven (Dou et al., 2019; Chauhan et al., 2021). This study addresses these gaps by combining long-horizon evidence on pledging patterns with a structured assessment of tail-loss and crash-risk metrics.

This study examines whether: Pledging firms exhibit higher downside risk than non-pledging firms. Does share pledge intensity magnifies tail losses and drawdowns (collateral amplification). If these relationships persist after controlling for firm fundamentals and time effects. The evidence can inform an operational risk-surveillance framework for emerging markets.

1.1 Objectives

The study aims to: 1: - Quantify downside-risk differences using multiple metrics (VaR, CVaR, drawdown, crash proxies) (Dou et al., 2019; Chauhan et al., 2021). 2: - Test whether higher pledge intensity produces a "dose–response" increase in tail risk (Dou et al., 2019; Li et al., 2019; Chauhan et al., 2021). 3: - Develop an operational monitoring framework linking pledge incidence, intensity, and firm characteristics. 4: - Provide actionable insights for governance and risk oversight in emerging markets (Wang and Chou, 2018; Chauhan et al., 2021).

2. Literature Review

This section reviews the literature on promoter share pledging, financing constraints, downside risk, and India's regulatory context. The discussion covers (i) agency and control theories, (ii) pledging as a financing mechanism, (iii) pledging and crash risk, (iv) measurement of tail risk, and (v) institutional developments in India.

Ownership concentration shapes firm risk and financing decisions (Shleifer and Vishny, 1997; La Porta et al., 1999). In promoter-driven systems such as India, share pledging allows controlling shareholders to access liquidity without diluting control. From an agency perspective (Jensen and Meckling, 1976), pledging alters incentives by making promoter payoffs more sensitive to stock prices. This convex payoff structure may induce risk-shifting behavior similar to the asset-substitution problem (Myers, 1977). At the same time, pledging introduces a collateral constraint channel: equity price declines reduce collateral value, potentially triggering margin calls and forced sales. Thus, pledging links market volatility to governance and control risk.

Recent evidence highlights pledging as a response to financing frictions. Dou, Masulis, and Zein (2019) document negative wealth effects associated with insider pledging, while Li, Liu, and Scott (2019) show increased fragility and lower firm value, particularly in weaker investor-protection environments. In the Indian context, Asija, Marisetty, and Rangan (2014) document that insiders who pledge their shares may engage in earnings manipulation, highlighting important governance concerns associated with pledging. Complementing this perspective, Behera and Mishra (2025) show that financing constraints significantly influence pledging decisions, indicating that firms facing tighter credit conditions are more likely to pledge shares and use pledging as a collateral-based substitute for external finance. Together, these findings suggest that share pledging reflects both agency conflicts and financing frictions.

Crash-risk measures such as NCSKEW and DUVOL capture asymmetric downside risk (Jin and Myers, 2006). Pledging may increase crash risk through delayed disclosure of bad news or forced liquidation during downturns. Dou et al. (2019) show adverse wealth consequences of insider pledging, and Chauhan, Mishra, and Spahr (2021) provide India-specific evidence linking pledging to higher firm risk. Importantly, prior studies suggest that pledge intensity—rather than mere incidence—drives risk outcomes. Higher pledge ratios increase sensitivity to volatility and collateral shortfalls, motivating a continuous intensity-based approach.

Traditional volatility measures may understate tail exposure. Risk-management literature emphasizes Value-at-Risk (VaR) and Conditional Value-at-Risk (CVaR) as measures of extreme losses. CVaR captures expected shortfall beyond the VaR threshold, providing a more comprehensive assessment of left-tail risk. Additional measures such as maximum drawdown, minimum return, and crash proxies (NCSKEW, DUVOL) capture extreme losses and return asymmetry (Jin and Myers, 2006). Integrating multiple tail-risk metrics allows a more complete assessment of collateral-induced vulnerability.

India's concentrated ownership structure and evolving disclosure norms make it a relevant setting. SEBI introduced mandatory pledge disclosure requirements in 2009 (SEBI, 2009), strengthened reporting standards in 2014 (SEBI, 2014), and expanded the definition of encumbrance with purpose-based disclosure in 2019 (SEBI, 2019). Parallelly, the Reserve Bank of India (RBI) tightened prudential norms on loans against shares (RBI, 2015; RBI, 2021). These reforms enhanced transparency and risk oversight, providing an important institutional backdrop for analysing pledging and downside risk. While existing studies link pledging to valuation and volatility, three gaps remain: (i) limited integration with comprehensive tail-risk measures, (ii) insufficient focus on pledge intensity as continuous exposure, and (iii) limited incorporation of financing-constraint mechanisms in emerging markets. By combining agency theory, financing-constraint evidence (Behera and Mishra, 2025), and tail-risk modeling within India's regulatory framework, this study offers a more integrated understanding of how promoter share pledging shapes downside vulnerability.

3. Methods

This section describes the research design, data sources, variable construction, and econometric specifications used to examine the relationship between promoter share pledging and downside risk. The empirical strategy is structured to (i) measure pledging at both the extensive and intensive margins, (ii) evaluate multiple complementary downside-risk proxies, and (iii) control for firm fundamentals and time effects to isolate the incremental effect of pledging.

3.1 Research Design

The study adopts a quantitative panel-data design using firm–year observations of Indian listed companies over the period 2009–2023. The panel structure enables examination of cross-sectional heterogeneity and temporal variation in pledging behavior and downside risk. The empirical approach proceeds in three stages: 1. Descriptive mapping of pledge incidence and intensity across years, industries, firm size quintiles, and life-cycle stages. 2. Univariate comparison tests between pledging and non-pledging firm–years. 3. Multivariate regressions estimating the association between pledging (incidence and intensity) and alternative downside-risk measures while controlling for firm characteristics and year fixed effects. This staged design allows both exploratory and causal-consistent interpretation within an observational framework.

3.2 Measurement of Share Pledging

Promoter share pledging is measured in two complementary ways: 1. Pledge Indicator (Binary): PLEDGE_DUMMY_it = 1 if promoter pledged shares > 0 in year t; 0 otherwise. 2. Pledge Intensity (Continuous): PLEDGE_INTENSITY_it = Promoter shares pledged / Total promoter shareholding. Pledge intensity captures the proportion of promoter holdings encumbered by collateral arrangements and represents the key exposure variable in "dose–response" tests.

3.3 Measurement of Downside Risk

To comprehensively capture downside exposure, the study employs multiple risk measures: **(i)** Value-at-Risk (VaR) is the 5th percentile of daily returns within a year. The 5% left-tail quantile of firm-specific return distribution within a year. **(ii)** Conditional Value-at-Risk (CVaR) is the expected loss conditional on returns falling below the VaR threshold. **(iii)** Maximum Drawdown (MDD) is the largest peak-to-trough decline in stock price during the year. **(iv)** Minimum Return (MINRET) is the lowest daily return within the year. **(v)** Crash-Risk Proxies like Negative Conditional Skewness (NCSKEW), and Down-to-Up Volatility (DUVOL). These measures follow established methodologies in crash-risk literature (Jin and Myers, 2006). Using multiple proxies ensures robustness and reduces reliance on any single downside metric.

3.4 Control Variables

To isolate the effect of pledging from correlated firm characteristics, the regressions include control variables like Firm Size (SIZE): Natural log of total assets, Firm Age (AGE): Log of years since incorporation, Leverage (LEV): Log of total debt to total assets, Profitability (ROA): Return on assets, Growth Opportunities (Q): Tobin's Q, Liquidity (CASH): Cash and equivalents scaled by total assets. These controls capture financial structure, performance, valuation, and liquidity conditions that may independently influence downside risk.

3.5 Econometric Specification

3.5.1 Baseline Model: Pledge Incidence

$$RISK_{it} = \alpha + \beta 1\ PLEDGE\_DUMMY_{it} + \gamma X_{it} + \delta_t + \varepsilon_{it}$$

where $RISK_{it}$ represents alternative downside-risk measures, X_{it} denotes control variables, δ_t represents year fixed effects.

3.5.2 Intensity Model (Pledgers Only)
$RISK\_it = \alpha + \beta 1\ PLEDGE\_INTENSITY\_it + \gamma X\_it + \delta\_t + \varepsilon\_it$

Standard errors are estimated using robust heteroskedasticity-consistent estimators. Year fixed effects control for macroeconomic shocks, regulatory changes, and market-wide volatility conditions.

3.6 Identification Considerations
The study adopts a reduced-form association framework. By including firm fundamentals and time fixed effects, the regressions mitigate omitted-variable bias arising from observable heterogeneity. The intensity specification further reduces cross-sectional selection bias by focusing only on firms that pledge shares. Although causality cannot be definitively established in an observational setting, the combination of controls, year effects, and intensity-based modelling strengthens inference regarding the incremental relationship between pledging exposure and downside risk.

The methodological framework contributes in three ways: 1. Integrating multiple downside-risk proxies within a unified regression structure. 2. Modelling pledge intensity as a continuous exposure variable. 3. Embedding the analysis within a panel framework that accounts for temporal variation and firm fundamentals. Together, this design enables systematic evaluation of whether promoter share pledging—especially at higher intensity—is associated with elevated downside vulnerability in Indian listed firms.

4. Data Collection
This study uses firm-level data obtained exclusively from the Centre for Monitoring Indian Economy (CMIE) Prowess database for the period 2009–2023. CMIE Prowess is a widely used corporate financial database in Indian corporate finance research and provides standardized firm-level accounting, ownership, and market data for listed Indian companies.
All variables used in this study including promoter shareholding patterns, pledged shares, financial statement variables, and stock price data are extracted from CMIE Prowess. CMIE Prowess compiles: Annual financial statements (balance sheet, profit and loss, and cash flow statements), Shareholding pattern disclosures, Promoter-level pledge information, Daily stock price and return data, corporate characteristics such as incorporation year and industry classification. The database ensures uniform variable definitions across firms and years, thereby enhancing comparability and internal consistency.

The sample covers the period 2009 to 2023, beginning with the post-2009 regulatory disclosure regime governing promoter share encumbrance under SEBI regulations. This period captures significant variation in promoter pledging behavior, regulatory refinements, and market cycles, including episodes of financial stress.

The initial sample consists of all listed Indian firms available in CMIE Prowess during the study period. The following screening criteria are applied: Firms must have available data on promoter shareholding and pledged shares. Firms must have complete annual financial statement data required to construct control variables. Firms must have sufficient daily stock return data within each fiscal year to compute downside risk measures. Firm–year observations with missing values in key independent or dependent variables are excluded from regression analysis. However, descriptive statistics may be reported using larger available subsamples. Financial sector firms are excluded where accounting structures differ substantially from non-financial firms, depending on model specification.

To ensure reliability and robustness: 1. Winsorization: Continuous financial variables are winsorized at the 1st and 99th percentiles to mitigate the influence of extreme outliers. 2. Return Data Alignment: Daily return data are aligned with fiscal years corresponding to accounting variables. 3. Missing Data Handling: Observations with incomplete pledge, financial, or return data are excluded from regression estimations. 4. Consistency Checks: Implausible pledge ratios (e.g., exceeding promoter holdings) and extreme financial ratios are reviewed and corrected or removed where necessary.

After applying screening and cleaning procedures, the final dataset consists of firm–year observations spanning 2009–2023. The panel includes both pledging and non-pledging firm–years, enabling extensive-margin analysis, as well as a subsample of pledging firm–years for intensity-based regressions. The resulting dataset provides a comprehensive representation of promoter share pledging behavior and firm-level downside risk exposure in India over a fourteen-year period.

5. Results and Discussion

This section presents the empirical findings on the relationship between promoter share pledging and firm-level downside risk. The discussion proceeds in five parts. First, we document descriptive patterns in pledging and downside risk. Second, we examine cross-sectional distributions across time, industries, firm size, and life-cycle stages. Third, we analyze univariate differences between pledging and non-pledging firms. Fourth, we present multivariate regression results for pledge incidence. Finally, we evaluate pledge intensity effects within the subsample of pledging firms.

5.1 Descriptive Statistics

The descriptive evidence indicates substantial cross-sectional variation in downside risk measures, including CVaR, VaR, maximum drawdown (MDD), minimum return, volatility (sigma), and crash-risk proxies (NCSKEW and DUVOL). The mean pledge dummy suggests that a non-trivial proportion of firm–year observations involve promoter share pledging. Among pledging observations, pledge intensity exhibits meaningful dispersion, with several firms displaying high encumbrance ratios. Financial control variables (size, leverage, profitability, growth opportunities, and liquidity) show distributions consistent with listed Indian firms. Overall, the descriptive statistics confirm that both pledging behavior and downside risk measures display sufficient variability to support multivariate analysis.

Table 1. Descriptive statistics

Variables	Obs	Mean	Std. Dev.	Min	Max	p1	p99	Skew.	Kurt.
Crash	3779	.187	.39	0	1	0	1	1.603	3.568
Volatility (sigma)	3779	.067	.047	.022	.309	.022	.309	2.94	13.359
Minimum Return (minret)	3779	-.163	.125	-.862	-.046	-.862	-.046	-3.334	16.719
VaR (var5)	3779	-.089	.039	-.237	-.029	-.237	-.029	-1.239	4.899
CVaR (cvar5)	3779	-.127	.075	-.481	-.041	-.481	-.041	-2.313	9.69
Max Drawdown (mdd)	3779	-.357	.179	-.918	-.087	-.918	-.087	-.851	3.381
NCSKEW (ncskew)	3779	-.079	1.151	-3.241	4.444	-3.241	4.444	1.116	6.881
DUVOL (duvol)	3779	-.112	.475	-1.116	1.567	-1.116	1.567	.931	4.736
Pledge dummy	61560	.141	.348	0	1	0	1	2.061	5.248
Pledge intensity	8690	.377	.318	.008	.997	.008	.997	.613	2.099
Firm_size	54148	6.762	2.209	2.688	10.675	2.688	10.675	-.023	2.156
Firm_age	57279	3.144	.724	.693	5.075	.693	4.595	-.977	4.542
Leverage	44830	-1.635	1.767	-5.747	1.745	-5.747	1.745	-.577	3.305
ROA	51199	.067	.082	-.102	.24	-.102	.24	.107	2.895
Tobins'Q	51238	1.595	2.249	.083	9.353	.083	9.353	2.471	8.335
Cash_holding	47777	.037	.054	.001	.206	.001	.206	2.059	6.366
Stock_return	19456	1.501	7.769	-12.73	24.043	-12.73	24.043	1.24	5.342
Nic 2 digit code	61560	36.245	18.127	10	89	10	81	.53	2.514

Notes: This table reports summary statistics for all variables used in the empirical analysis.

Table 1 presents descriptive statistics for downside risk measures, promoter share pledging variables, and firm characteristics. The downside-risk sample includes 3,779 firm-year observations. The crash indicator averages 0.187, indicating that approximately 18.7% of observations experience crash events. The mean 5% Value-at-Risk (var5) is −0.089 and the corresponding Conditional Value-at-Risk (cvar5) is −0.127, suggesting substantial left-

tail exposure. Maximum drawdown averages −0.357, reflecting significant peak-to-trough declines. Risk measures exhibit notable non-normality, particularly volatility and minimum returns, supporting the use of tail-risk metrics rather than variance-based measures alone.

Promoter share pledging occurs in 14.1% of the broader firm-year sample (N = 61,560), indicating that pledging is a meaningful financing practice. Among pledging observations (N = 8,690), average pledge intensity is 37.7% of promoter holdings, with substantial cross-sectional variation. Firm fundamentals are consistent with listed Indian firms: average profitability is 6.7%, Tobin's Q averages 1.60, and cash holdings average 3.7% of total assets. Return dispersion is high, reinforcing the relevance of downside risk analysis. Overall, Table 1 indicates economically material tail risk, meaningful variation in pledge intensity, and heterogeneous firm characteristics—justifying multivariate analysis controlling for firm and industry factors.

5.2 Distributional Patterns of Promoter Share Pledging

5.2.1 Year-Wise Trends

Year-wise patterns of promoter share pledging indicate substantial temporal variation aligned with market conditions and regulatory changes. Pledging activity persists across the entire sample period, with noticeable clustering of higher-intensity pledges during periods of financial stress, consistent with the financing-access channel. Importantly, extreme pledge ratios are not isolated events but recur across multiple years, suggesting that collateralized borrowing remains a sustained financing strategy rather than a temporary response. Detailed year-wise distributions are provided in Appendix-A.

5.2.2 Industry-Wise Distribution

Promoter share pledging is observed across a wide range of industries, indicating that it is not sector-specific. However, higher prevalence is evident in capital-intensive sectors such as electricity, construction, and manufacturing, supporting the view that financing needs and asset structures influence collateralized borrowing behavior. In contrast, service-oriented industries exhibit relatively lower pledging incidence. Detailed industry-wise distributions are reported in Appendix-B.

5.2.3 Market Capitalization Buckets

Pledging activity varies across firm size categories, with relatively higher prevalence among small and mid-cap firms compared to nano-cap and large-cap firms. This pattern suggests that firms with relatively limited access to conventional financing channels rely more on collateralized promoter borrowing. At the same time, the presence of pledging across all size groups indicates that it is not exclusively a small-firm phenomenon. Detailed results are presented in Appendix-C.

5.2.4 Life-Cycle Stages

Pledging activity varies across firm life-cycle stages, with relatively higher incidence observed in growth and decline phases compared to mature firms. This pattern suggests that liquidity pressures and financing constraints are important drivers of promoter pledging decisions. However, the presence of pledging across all stages indicates that it is a broad financing strategy rather than being confined to specific phases. Detailed results are reported in Appendix-D.

5.3 Summary Statistics by Pledging Status

Pledging firms display more adverse downside risk characteristics on average, including more negative tail measures and greater volatility. Financially, pledging firms tend to be smaller and exhibit lower profitability relative to non-pledging firms. These raw differences motivate formal univariate and multivariate testing.

Table 2. Summary statistics by pledging status

	pledge_dummy = 0			**pledge_dummy = 1**		
	N	Mean	SD	N	Mean	SD
Crash	2799	.176	0.381	980	.22	0.415
Volatility	2799	.066	0.046	980	.069	0.050
Minimum Return	2799	-.159	0.122	980	-.176	0.133
VaR	2799	-.087	0.038	980	-.094	0.041
CVaR	2799	-.124	0.073	980	-.135	0.080
Max Drawdown	2799	-.35	0.175	980	-.376	0.189

NCSKEW	2799	-.128	1.105	980	.064	1.264
DUVOL	2799	-.13	0.460	980	-.059	0.512
Firm_size	45572	6.445	2.155	8576	8.448	1.660
Firm_age	48590	3.112	0.741	8689	3.323	0.594
Leverage	37038	-1.637	1.797	7792	-1.626	1.614
ROA	42761	.069	0.082	8438	.056	0.082
Tobins'Q	42673	1.668	2.349	8565	1.235	1.620
Cash_holding	39530	.041	0.056	8247	.023	0.036
Stock_return	13344	1.95	8.362	6112	.519	6.169

Notes: This table compares descriptive statistics between pledging and non-pledging firm–years.

Table 2 compares pledging and non-pledging firm–years. Pledging firms exhibit higher crash incidence (0.220 vs. 0.176) and more severe tail risk, with more negative VaR, CVaR, and maximum drawdown values. Volatility and crash-risk asymmetry measures also indicate greater downside vulnerability among pledgers. In terms of firm characteristics, pledging firms are larger and slightly older but display lower profitability, lower cash holdings, and lower Tobin's Q. Leverage is broadly similar across groups. Overall, the evidence suggests that pledging firm–years face higher downside risk and weaker liquidity buffers, motivating multivariate analysis to isolate the incremental effect of pledging.

5.4 Pledging Intensity Among Pledgers

The mean pledge intensity suggests substantial encumbrance among pledgers, with a wide distribution ranging from minimal collateralization to near-total encumbrance of promoter holdings. This dispersion supports the use of a continuous intensity specification in regression analysis.

Table 3. Pledging Intensity and Firm Characteristics (Pledgers Only)

Variables	Obs	Mean	Std. Dev.	Min	Max	p1	p99	Skew.	Kurt.
Pledge_intensity	8690	.377	.318	.008	.997	.008	.997	.613	2.099
Firm_size	8576	8.448	1.66	2.688	10.675	4.078	10.675	-.473	2.803
Firm_age	8689	3.323	.594	.693	5.056	1.386	4.644	-.502	4.652
Leverage	7792	-1.626	1.614	-5.747	1.745	-5.747	1.745	-1.126	4.071
ROA	8438	.056	.082	-.102	.24	-.102	.24	.033	2.938
Tobins'Q	8565	1.235	1.62	.083	9.353	.083	9.353	3.333	15.039
Cash_holding	8247	.023	.036	.001	.206	.001	.206	3.073	13.591
Stock_return	6112	.519	6.169	-12.73	24.043	-12.73	24.043	1.445	7.956

Notes: This table C reports descriptive statistics restricted to pledging firm–years.

Table 3 presents descriptive statistics for pledge intensity among pledging firm–years. The average pledge intensity is 37.7%, with values ranging from near zero to almost full encumbrance, indicating substantial variation in collateral exposure. Pledging firms are generally large and mature, with meaningful dispersion in leverage, profitability, valuation, and liquidity. Cash holdings are relatively low on average, and returns exhibit high volatility. Overall, the wide variation in pledge intensity supports its use as a continuous measure in testing whether greater encumbrance increases downside risk.

5.5 Univariate Differences in Downside Risk

Table 4 reports univariate differences in downside risk between pledging and non-pledging firm–years. Pledging firms exhibit significantly more adverse tail outcomes, including more negative CVaR and VaR, deeper maximum drawdowns, and more negative minimum returns. Crash-risk measures (NCSKEW and DUVOL) also indicate greater downside asymmetry among pledgers. Volatility is slightly higher for pledging firms. Overall, the evidence suggests that promoter share pledging is associated with elevated tail risk and crash propensity, motivating multivariate analysis. The results indicate that pledging firms experience significantly more severe left-tail outcomes across multiple risk proxies, including CVaR, VaR, maximum drawdown, and minimum return. These findings suggest that promoter pledging is associated with heightened downside vulnerability at the descriptive level. However, univariate tests do not control for firm characteristics, necessitating multivariate regression analysis.

Table 4. Univariate Differences in Downside Risk by Pledging Status

Variable	Non-Pledge (N=2,799)	Pledge (N=980)	Mean Difference	t-statistic
CVaR	−0.124	−0.135	0.011***	4.037
VaR	−0.087	−0.094	0.006***	4.354
Max Drawdown	−0.350	−0.376	0.026***	3.855
NCSKEW	−0.128	0.064	−0.192***	−4.508
DUVOL	−0.130	−0.059	−0.071***	−4.062
Volatility	0.066	0.069	−0.003*	−1.850
Minimum Return	−0.159	−0.176	0.017***	3.755

Notes: This table reports two-sample t-tests comparing downside risk measures between pledging and non-pledging firms.

The table reports two-sample mean comparisons of downside risk between pledging and non-pledging firm–years. The results show that firms with pledged promoter shares face significantly more adverse downside outcomes. In particular, pledging firms exhibit more negative CVaR (−0.135 vs. −0.124) and VaR (−0.094 vs. −0.087), indicating deeper expected and threshold tail losses. They also experience larger maximum drawdowns (−0.376 vs. −0.350) and more negative minimum returns (−0.176 vs. −0.159), suggesting greater exposure to extreme negative price movements. Crash-risk proxies also differ sharply across the two groups. NCSKEW shifts from a negative mean for non-pledging firms (−0.128) to a positive mean for pledging firms (0.064), while DUVOL is significantly higher among pledgers. Together, these patterns indicate stronger downside asymmetry and greater crash-proneness in pledged firm–years. Volatility is also slightly higher for pledging firms, although the magnitude is smaller than that observed for the tail-loss measures. Overall, the univariate evidence suggests that promoter share pledging is associated with elevated downside vulnerability and crash risk. Since these comparisons do not account for differences in firm size, profitability, leverage, or liquidity, the next step is to estimate multivariate models to test whether the relationship persists after controlling for firm characteristics and year effects.

5.6 Multivariate Results: Pledge Incidence

Table 5 presents multivariate regressions linking promoter pledging to downside risk. The pledge dummy is significantly associated with more negative CVaR, VaR, maximum drawdown, and minimum returns, indicating more severe left-tail losses among pledging firms. Crash-risk asymmetry (NCSKEW) and volatility are also higher for pledgers in select specifications. Control variables behave largely as expected. Overall, the results show that promoter pledging is robustly associated with greater downside risk after accounting for firm characteristics and year effects. Across specifications, the pledge dummy is negatively and significantly associated with CVaR and VaR, indicating more severe extreme losses among pledging firms. Maximum drawdown and minimum return specifications yield consistent results. Crash-risk proxies also suggest increased asymmetry among pledging firms in certain models. These results persist after controlling for firm characteristics and year fixed effects. The evidence supports the collateral-amplification hypothesis: pledged promoter shares increase exposure to adverse market shocks.

Table 5. Share Pledging and Downside Risk

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
VARIABLES	**CVaR (cvar5)**	**VaR (var5)**	**Max Drawdown (mdd)**	**NCSKEW (ncskew)**	**DUVOL (duvol)**	**Volatility (sigma)**	**Min Return (minret)**
Pledge_dummy	-0.008***	-0.005***	-0.017**	0.086*	0.022	0.003*	-0.012**
	(0.003)	(0.002)	(0.008)	(0.050)	(0.020)	(0.002)	(0.005)
Firm_size	-0.001	0.000	-0.006**	0.012	0.010*	-0.000	-0.003**
	(0.001)	(0.000)	(0.002)	(0.014)	(0.006)	(0.000)	(0.001)
Firm_age	0.005**	0.004***	0.019***	-0.009	0.004	-0.004***	0.005
	(0.002)	(0.001)	(0.005)	(0.029)	(0.013)	(0.001)	(0.003)
Leverage	0.001	0.000	-0.000	-0.005	-0.001	-0.000	0.002
	(0.001)	(0.000)	(0.002)	(0.010)	(0.004)	(0.000)	(0.001)
ROA	0.068***	0.071***	0.356***	0.097	0.045	-0.040***	0.067**

	(0.016)	(0.009)	(0.044)	(0.274)	(0.115)	(0.010)	(0.027)
Tobins'Q	-0.000	0.000	0.002*	-0.000	0.003	-0.000	-0.002*
	(0.001)	(0.000)	(0.001)	(0.009)	(0.004)	(0.000)	(0.001)
Cash_holding	0.030	0.023*	0.097	0.167	0.086	-0.007	0.050
	(0.024)	(0.013)	(0.063)	(0.368)	(0.154)	(0.013)	(0.040)
Constant	-0.292***	-0.184***	-0.483***	1.879***	0.649***	0.162***	-0.361***
	(0.012)	(0.006)	(0.027)	(0.187)	(0.074)	(0.008)	(0.021)
Observations	2,612	2,612	2,612	2,612	2,612	2,612	2,612
R-squared	0.389	0.319	0.252	0.252	0.242	0.441	0.319
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports OLS estimates of the association between promoter share pledging and alternative measures of downside risk. The dependent variable in Column (1) is expected shortfall at the 5% level (CVaR; cvar5), Column (2) is 5% value-at-risk (var5), Column (3) is maximum drawdown (mdd), Column (4) is negative conditional skewness (ncskew), Column (5) is down-to-up volatility (duvol), Column (6) is return volatility (sigma), and Column (7) is the minimum return (minret). g_pledge_dummy equals 1 if promoter pledging is positive and 0 otherwise. All models include the same set of firm-level controls (size, age, leverage, profitability, Tobin's Q, and cash holdings) and year fixed effects. Robust standard errors are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

The table reports multivariate OLS estimates of the relationship between promoter share pledging and alternative downside risk measures after controlling for firm characteristics and year fixed effects. The results show that the pledge dummy is consistently associated with more adverse downside outcomes. In Columns (1) and (2), the coefficient on Pledge_dummy is negative and highly significant for both CVaR and VaR, indicating that firms with pledged promoter shares experience deeper left-tail losses than non-pledging firms. Similarly, Column (3) shows a negative and significant association with maximum drawdown, suggesting larger peak-to-trough declines for pledging firms during stress periods. Column (7) further indicates that pledging firms experience more negative minimum returns, reinforcing the evidence of heightened downside exposure. Among crash-risk measures, the coefficient on Pledge_dummy is positive and weakly significant for NCSKEW in Column (4), indicating greater return asymmetry and a higher tendency toward crash-prone return distributions. Although the effect on DUVOL is positive but statistically insignificant, the overall pattern remains consistent with the view that pledging is associated with higher downside vulnerability. Column (6) also shows that pledging firms exhibit slightly higher volatility, further supporting the collateral-amplification mechanism.

The control variables generally behave as expected. Larger firms tend to experience smaller drawdowns and less negative minimum returns, while older firms show somewhat higher tail-loss measures but lower volatility. Profitability is positively associated with some tail-risk measures and negatively related to volatility, suggesting that operating performance and market-based downside risk do not always move in the same direction. Overall, the results provide robust evidence that promoter share pledging is linked to greater downside risk even after accounting for firm fundamentals and time effects. This supports the argument that pledged promoter holdings amplify firms' exposure to adverse market shocks through collateral and margin-call channels.

5.7 Multivariate Results: Pledge Intensity

Table 6 examines pledge intensity among pledging firms. Higher intensity is significantly associated with more negative CVaR, VaR, and maximum drawdown, indicating deeper left-tail losses as encumbrance increases. Intensity also raises volatility, consistent with a margin-call amplification channel. Crash-asymmetry measures are largely unaffected. Overall, the results support a dose–response effect: greater pledge intensity materially worsens downside risk among pledging firms. The coefficient on pledge intensity is economically and statistically significant in multiple specifications. Higher encumbrance ratios are associated with more negative CVaR and VaR values and greater volatility. This dose–response relationship strengthens inference by demonstrating that downside exposure increases proportionally with collateral encumbrance.

Table 6. Pledge Intensity and Downside Risk

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
VARIABLES	**CVaR (cvar5)**	**VaR (var5)**	**Max Drawdown (mdd)**	**NCSKEW (ncskew)**	**DUVOL (duvol)**	**Volatility (sigma)**	**Min Return (minret)**
Pledge_intensity	-0.018**	-0.017***	-0.093***	-0.062	-0.034	0.019***	-0.022
	(0.008)	(0.005)	(0.023)	(0.138)	(0.055)	(0.004)	(0.015)
Firm_size	-0.001	-0.000	-0.007	0.026	0.026**	-0.001	-0.001
	(0.002)	(0.001)	(0.005)	(0.031)	(0.013)	(0.001)	(0.003)
Firm_age	0.006	0.004	0.013	-0.020	0.009	-0.003	0.007
	(0.004)	(0.002)	(0.010)	(0.056)	(0.024)	(0.002)	(0.006)
Leverage	0.001	-0.001	-0.002	-0.009	0.004	0.000	0.003
	(0.001)	(0.001)	(0.004)	(0.022)	(0.009)	(0.001)	(0.002)
ROA	0.046	0.048**	0.195**	0.784	0.326	-0.012	0.040
	(0.030)	(0.019)	(0.088)	(0.558)	(0.238)	(0.019)	(0.051)
Tobins'Q	0.001	0.001**	0.006*	-0.007	0.002	-0.002***	0.001
	(0.001)	(0.001)	(0.003)	(0.018)	(0.008)	(0.001)	(0.002)
Cash_holding	0.015	0.012	0.282	0.263	0.126	0.009	0.027
	(0.059)	(0.040)	(0.175)	(0.838)	(0.372)	(0.033)	(0.099)
Constant	-0.313***	-0.178***	-0.448***	2.260***	0.621***	0.169***	-0.415***
	(0.023)	(0.013)	(0.060)	(0.423)	(0.169)	(0.014)	(0.041)
Observations	666	666	666	666	666	666	666
R-squared	0.496	0.348	0.326	0.347	0.320	0.517	0.438
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: This table reports OLS regressions examining the relationship between pledge intensity and alternative measures of downside risk among pledging firm-years only. The dependent variables are: expected shortfall at the 5% level (cvar5), 5% value-at-risk (var5), maximum drawdown (mdd), negative conditional skewness (ncskew), down-to-up volatility (duvol), return volatility (sigma), and minimum return (minret). The key independent variable, pledge_intensity, measures the proportion of promoter shareholdings pledged. All models include firm-level controls (size, age, leverage, profitability, Tobin's Q, and cash holdings) and year fixed effects. Robust standard errors are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 6 examines the effect of pledge intensity on downside risk within the subsample of pledging firms. The results provide strong evidence of a dose–response relationship, whereby higher levels of promoter share encumbrance are associated with more severe downside outcomes. Across tail-risk measures, pledge intensity is negative and statistically significant. In Columns (1) and (2), the coefficient on Pledge_intensity is negative and significant for both CVaR and VaR, indicating that higher encumbrance leads to deeper left-tail losses. The effect is economically stronger in Column (3), where pledge intensity is associated with significantly larger maximum drawdowns, suggesting that firms with greater pledged shares experience more pronounced peak-to-trough declines during adverse market conditions. Although the coefficient on minimum return is negative, it is not statistically significant, indicating that intensity affects average tail exposure more consistently than extreme one-day losses. In contrast, crash-asymmetry measures (NCSKEW and DUVOL) are not significantly related to pledge intensity, suggesting that higher encumbrance primarily amplifies the magnitude of downside losses rather than altering return skewness. However, Column (6) shows a strong positive and significant association with volatility, supporting the margin-call amplification channel, where higher pledged exposure increases sensitivity to stock price fluctuations and potential collateral shortfalls.

Control variables exhibit largely consistent patterns. Profitability (ROA) is positively associated with VaR and drawdown measures, while Tobin's Q shows a mixed relationship—positively related to tail-risk measures but negatively associated with volatility—indicating valuation-related risk dynamics. Firm size and age do not show strong systematic effects across specifications. Overall, the findings reinforce that pledge intensity is a critical determinant of downside risk. Unlike the binary pledging indicator, intensity captures the extent of collateral exposure, demonstrating that higher encumbrance materially increases firms' vulnerability to adverse market

shocks. This provides strong support for the collateral-risk and margin-call mechanisms underlying promoter share pledging.

5.8 Discussion and Summary of Empirical Findings

The collective evidence suggests three key mechanisms, Collateral Amplification Channel: Equity price declines reduce collateral value, increasing forced-sale risk. **Risk-Shifting Incentives**: Convex payoff structures may alter managerial risk preferences. **Financing Constraint Channel**: Firms facing liquidity pressure may pledge shares, indirectly increasing market vulnerability. The intensity results are particularly important, as they indicate that not all pledging is equally risky; rather, risk escalates with the degree of collateralization.

The results consistently indicate that promoter share pledging is associated with higher downside risk. The magnitude of pledged shares amplifies tail vulnerability. The findings are robust across multiple downside risk measures and specifications. These findings underscore the governance and financial stability implications of promoter share pledging in ownership-concentrated emerging markets. Results remain qualitatively consistent across alternative downside risk proxies. The intensity specification further mitigates selection concerns by focusing exclusively on pledging firms. The stability of findings across CVaR, VaR, MDD, and crash-risk measures suggests that pledging affects multiple dimensions of downside exposure rather than a single volatility metric.

6. Conclusion

This study examines the relationship between promoter share pledging and firm-level downside risk in Indian listed firms from 2009–2023. Using panel data from CMIE Prowess and multiple tail-risk measures (CVaR, VaR, maximum drawdown, minimum return, and crash-risk proxies), we find that pledging firms face significantly greater exposure to extreme negative returns.

Importantly, higher pledge intensity is associated with incrementally worse downside risk, indicating a dose–response effect. This suggests that share pledging acts as a continuous risk amplifier rather than merely a binary governance feature. The findings extend the pledging literature by focusing on left-tail vulnerability and highlight a collateral-based risk channel linking equity prices to control stability. Overall, the results underscore the governance and financial stability implications of promoter pledging in ownership-concentrated emerging markets.

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APPENDICES

Appendix A. Year-wise incidence of promoter share pledging by pledge-intensity buckets (2009–2023).

%	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
0>100	576	592	629	620	625	612	633	649	664	684	708	683	648	643	614
0>1	27	32	35	32	30	25	27	31	35	37	33	30	47	65	66
1>100	549	560	594	588	595	587	606	618	629	647	675	653	601	578	548
100	4	8	9	9	13	18	29	33	35	32	32	26	28	24	26
1-99	545	552	585	579	582	569	577	585	594	615	643	627	573	554	522
0>25	283	304	329	291	292	273	273	275	271	295	297	283	296	324	321
25>50	150	129	135	139	141	126	140	140	148	146	157	132	122	120	114
50>75	84	82	92	104	97	112	97	96	110	112	111	126	100	76	69
75>100	59	77	73	86	95	101	123	138	135	131	143	142	130	123	110

Note: This table presents the year-wise incidence of promoter share pledging from 2009 to 2023, further categorized by pledge-intensity buckets.

Appendix B. Industry-wise distribution of pledging and non-pledging firm–year observations

NIC Section	Industry Code (NUM)	Broad Industry Name	Non-Pledging Firms (N, %)	Pledging Firms (N, %)	Total
B	2	Mining and quarrying	39 (65.00%)	21 (35.00%)	60
C	3	Manufacturing	25,438 (83.13%)	5,162 (16.87%)	30,600
D	4	Electricity, gas, steam and air conditioning supply	146 (51.23%)	139 (48.77%)	285

F	6	Construction	3,426 (77.69%)	984 (22.31%)	4,410
G	7	Wholesale and retail trade; repair of motor vehicles and motorcycles	13,066 (94.27%)	794 (5.73%)	13,860
H	8	Transportation and storage	1,072 (88.23%)	143 (11.77%)	1,215
I	9	Accommodation and Food service activities	870 (81.69%)	195 (18.31%)	1,065
J	10	Information and communication	4,200 (85.37%)	720 (14.63%)	4,920
M	13	Professional, scientific, and technical activities	1,371 (93.27%)	99 (6.73%)	1,470
N	14	Administrative and support service activities	2,244 (90.67%)	231 (9.33%)	2,475
O	15	Public administration and defence; compulsory social security	44 (97.78%)	1 (2.22%)	45
P	16	Education	339 (90.40%)	36 (9.60%)	375
Q	17	Human health and social work activities	745 (91.98%)	65 (8.02%)	810
R	18	Arts, entertainment, and recreation	119 (79.33%)	31 (20.67%)	150
S	19	Other service activities	134 (99.26%)	1 (0.74%)	135
Total			53,253 (86.07%)	8,622 (13.93%)	61,875

Notes: This table presents the industry-wise distribution of pledging and non-pledging firm–year observations.

Appendix C. Share pledging across market-capitalization buckets

Market-cap buckets	**Non-pledging (0)**	**Pledging (1)**	**Pledging (%)**	**Total**
1 (Nano-Cap)	20,347	3,885	16.03	24,232
2 (Micro-Cap)	5,838	2,101	26.46	7,939
3 (Small-Cap)	4,695	1,818	27.91	6,513
4 (Mid-Cap)	1,187	536	31.10	1,723
5 (Large-Cap)	773	314	28.88	1,087
Total	**32,840**	**8,654**		**41,494**

Notes: This table examines share pledging across market-capitalization categories.

Appendix D. Share pledging across firm life-cycle stages (Dickinson 2011) classification

Financial-constraint quintile	**Non-pledging (0)**	**Pledging (1)**	**Total**
1 (Introduction)	5,239	965	6,204
2 (Growth)	6,693	1,435	8,128
3 (Maturity)	14,468	3,552	18,020
4 (Decline)	4,251	891	5,142
5 (Shake out)	4,597	1,455	6,052
Total	**35,248**	**8,298**	**43,546**

Notes: This table categorizes pledging activity using the Dickinson cash-flow life-cycle classification.