



Market Underperformance and Convex Leverage Effects Following Convertible Bond Issuance: Evidence from China and India

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Research problem and relevance

⚠ Research problem

- Limited understanding of how convertible bond issuances affect stock returns in emerging markets, particularly in Asia
- Most existing research focuses on developed markets
- China and India represent unique institutional environments

How do market reactions to convertible bond announcements differ between emerging and developed markets?

📈 Research Relevance

Economic significance:

China and India are among the top 5 global economies by nominal GDP

Market growth:

Emerging markets increasingly access international capital markets

Practical impact:

Results inform corporate financing decisions, investment strategies, and regulatory policies

Academic contribution:

Fills literature gap on hybrid securities in emerging market contexts

Understanding these markets helps optimize financing strategies and investment decisions in the world's fastest-growing economies.



🎯 Main Research Goal

To demonstrate an analysis of the influence of convertible bonds issuance on the stock yield of Chinese and Indian companies and to determine key affecting factors.

1. Review academic literature on convertible bond offerings
2. Identify firm-level and market-level factors influencing abnormal returns
3. Develop testable hypotheses and examine combined factor impacts
4. Gather comprehensive data covering CB issuances over 2009-2023 period
5. Apply BHAR method and regression techniques
6. Analyze empirical findings and draw meaningful conclusions

Research Question

How do convertible bond issue affect stock returns in Chinese and Indian markets general and depending on the issuance conditions?



China and India market context



China

#2 Global Economy (By nominal GDP)

- Sustained **high GDP growth** rates over past decades
- Evolving regulatory framework for capital markets
- Increasing integration with global capital markets
- **Growing use of hybrid instruments** by Chinese companies
- Government oversight and market development policies (CSRC)



India

#5 Global Economy (By nominal GDP)

- One of the world's fastest-growing major economies
- Stable democratic institutions supporting market development
- English-speaking business environment facilitating international investment
- Strong IT and technology industry presence
- Attractive destination for international capital
- Developing market depth and liquidity characteristics



Literature review and research gap



Key Literature Findings

Research Gap

Limited Emerging Market Focus:

Most research concentrates on developed markets (US, Europe), with insufficient attention to emerging economies.

Asian Market Underrepresentation:

Despite China and India being major global economies, their convertible bond markets remain understudied.

Institutional Differences:

Emerging markets have unique regulatory frameworks, market structures, and investor behaviors not captured in existing literature.

Our contribution

First comprehensive study:

Systematic analysis of convertible bond effects in China and India markets.

Extended time period:

2009-2023 analysis capturing recent market developments and crisis periods.

Factor analysis:

Identification of specific factors affecting abnormal returns in emerging market contexts. Application of a quadratic leverage specification to capture non-linear market reactions, with estimation of turning points



Research hypotheses

Negative abnormal returns in emerging markets

(Wang and Xia, 2004; Guo, 2001; Wang et al., 2014; Abdul Rahim, 2012)

H1: Convertible bonds issuances by firms in China and India cause a negative abnormal returns both in the short-term event window around the announcement and over the long term.

Rationale:

Signaling theory suggests that convertible bond issuance may signal management's belief that stock is overvalued or company faces financial constraints.

Key Variables:

- Buy-and-Hold Abnormal Returns (BHAR)
- 12-month and 24-month periods
- Market benchmark comparison

Non-linear leverage interaction

(Salleh and Khaw, 2018; Myers & Majluf, 1984, Ammann et al., 2006)

H2: The relation of abnormal return and leverage is non-linear.

Rationale:

Very high or very low leverage may signal optimal capital structure adjustment, making convertible bonds attractive for leverage normalization.

Key Variables:

- Leverage ratio (debt-to-equity)
- Leverage squared term
- Days to conversion
- Control variables (size, industry, country)



Research hypotheses

Firm Characteristics Impact

Prokop et al. (2024), Fama and French (1992)

H3: Firms with higher leverage (D/E) and lower ROA experience more negative abnormal returns following convertible bond issuances

Rationale:

Poor financial performance combined with high leverage may signal financial distress, making convertible bond issuance appear as a last resort financing option.

Key Variables:

- Debt/EBITDA ratio
- Return on Assets (ROA)
- Interaction term (Debt/EBITDA $\times$ ROA)
- Size, industry, and country controls

Sequence Effect

Salleh et al. (2018), D'Mello et al. (2003), Eckbo (1986)

H4: Market reacts more negatively to the first issue of convertible bond than the subsequent issue of convertible debt.

Rationale:

“First issue more negative” view is rooted in adverse-selection logic: first-time issuers and infrequent users of convertible debt are thought to be riskier or more opaque, so investors react more negatively when these firms suddenly announce a convertible.

Key Variables:

- Repeat (Existing previous placement)
- Days to conversion



Research methodology



Buy-and-Hold abnormal return (BHAR)

$$BHAR_{i,t} = \prod_{1}^t (1 + r_{i,t}) - \prod_{1}^t (1 + m_{i,t})$$

BHAR Advantages:

- Captures compounding effects over time
- Reflects realistic investor holding periods
- Accounts for long-term market adjustments
- Suitable for measuring persistent effects



Cumulative abnormal returns

$$CAR_{i(t_1, t_2)} = \sum_{t=t_1}^{t_2} AR_{i,t}$$

CAR Advantages:

- Captures immediate market reaction to CB announcement (-10 to +10 days)
- Isolates event effect from general market volatility
- Directly comparable to prior convertible bond literature
- Complements long-term BHAR: short-term signal + long-term performance



Regression analysis

Multiple regression models:

Identify factors influencing the magnitude and direction of abnormal returns using various firm-level and market-level variables.

Analysis process:

- Data cleaning and outlier identification
- Descriptive statistics and correlation analysis
- Multicollinearity testing (VIF analysis)
- Model specification and hypothesis testing

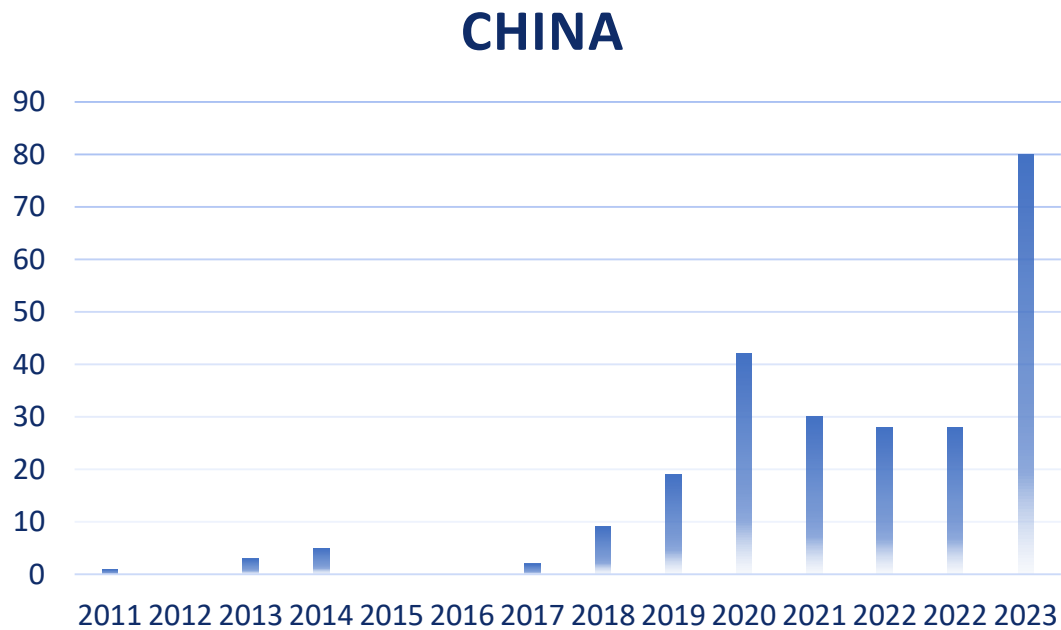
Control variables:

- Company size (market capitalization)
- Industry effects (IT, healthcare, industrial)
- Country effects (China vs. India)
- Time-varying factors (days to conversion)

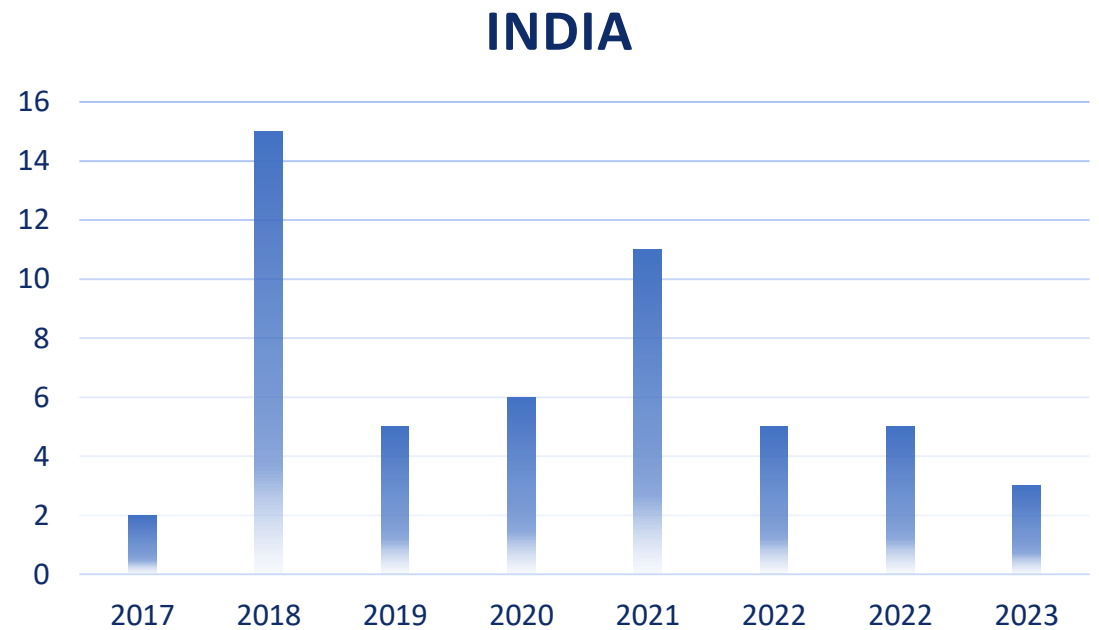


Distribution of placements in the Chinese and Indian markets by years

Distribution of placements in the Chinese market by
years



Distribution of placements in the Indian
market by years





The list of variables

Variable	Formula
Dependent variable	
CAR	$CAR_{i(t_1, t_2)} = \sum_{t=t_1}^{t_2} AR_{i,t}$ where CAR_t – abnormal return using the CAR method for period t; AR_t – abnormal return for each day within the event window: $AR_{i,t} = R_{i,t} - R_{m,t}$, where $R_{i,t}$ – the actual profitability of company i on day t; $R_{m,t}$ – market index return on day t.
BHAR	$BHAR_{i,t} = \prod_1^t (1 + r_{i,t}) - \prod_1^t (1 + m_{i,t})$ where $BHAR_t$ – abnormal return using the BHAR method for period t; $r_{i,t}$ – return of company i's stock in month t; $m_{i,t}$ – differ by country of stock: return of the market index for each country (for example: average of the SSE and SZSE indices for the Chinese market) in month t.



The list of variables

Variable	Formula	
Independent variables		Expected impact
DayToConv	Days to conversion	Positive
leverage	The debt-to-equity ratio (D/E), where D – Long-term liabilities of the company E – Shareholders' equity of the company	Negative
DebtEbitda	$(\text{Total Debt}_t + \text{Total Debt}_{t-1}) / 2 / \text{EBITDA}$	Negative
ROA	Return on Assets (ROA) = $\text{Net profit}_t / ((\text{Total assets}_t + \text{Total assets}_{t-1}) / 2)$	Positive
Repeat	Existing previous placement	Positive
Control variables		
Size	Log of total assets	
Country	The list of firms	
Sector	Industry affiliation of companies	



Data and Sample Description



Sample Overview

287

Total observations

235

Chinese issuances

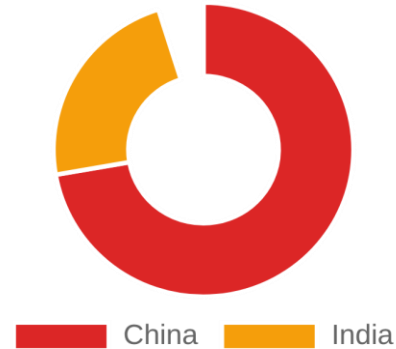
47

Indian issuances

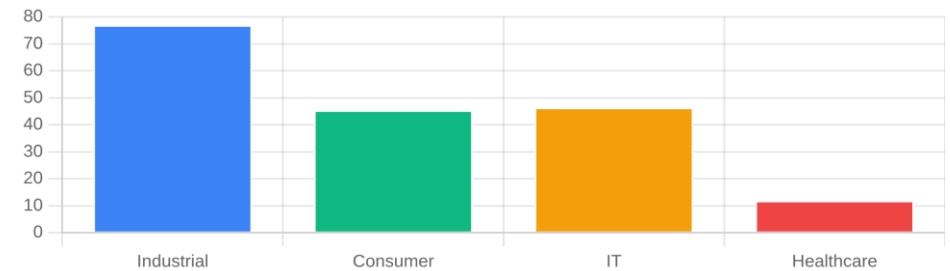
15

Years covered

Country distribution



Industry distribution



Study Period

2009 - 2023

Captures post-financial crisis market
dynamics and recent developments

Data Sources:

- Cbonds.ru - Convertible bond issuance data
- Wind Database - Chinese market data
- Bloomberg - Stock prices and financial data
- Company annual reports - Financial metrics

Sample selection criteria:

- Publicly traded companies only
- Convertible bonds issued 2009-2023
- Complete stock price data available
- Financial data accessibility
- Excluded: banks and financial institutions



Empirical results: China market

China market statistics

-2.3%

Mean CAR

8.4%

Std. Dev.

235

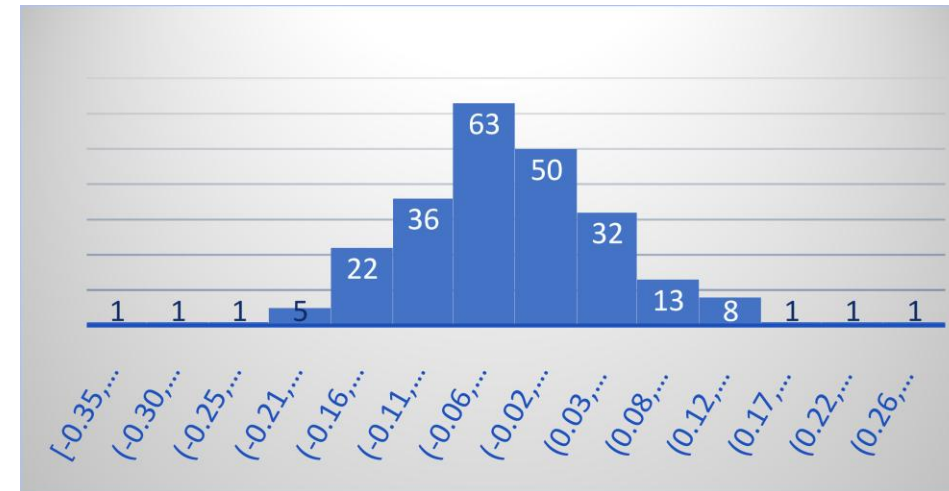
Sample Size

✓ Statistical Significance

Statistically significant negative abnormal returns ($p < 0.01$)

Conclusion: Chinese firms consistently underperform the market in the frame of 10 days near convertible bond issuance announcements.

Distribution of CAR





Empirical results: China market

China market statistics

-16.8%

Mean BHAR
(12 months)

219

Sample Size

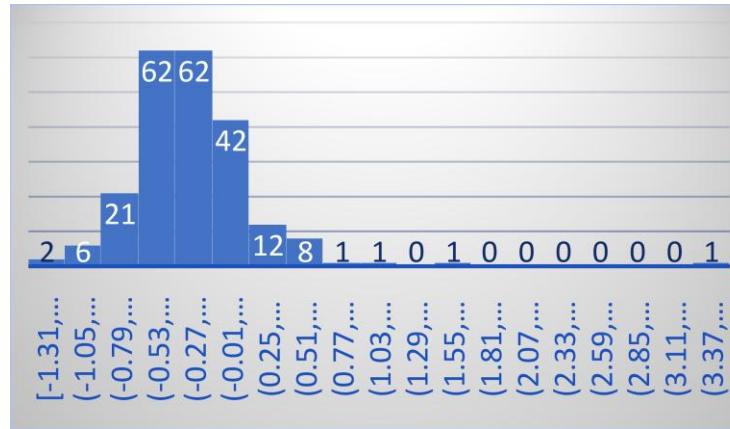
-30.3%

Mean BHAR
(24 months)

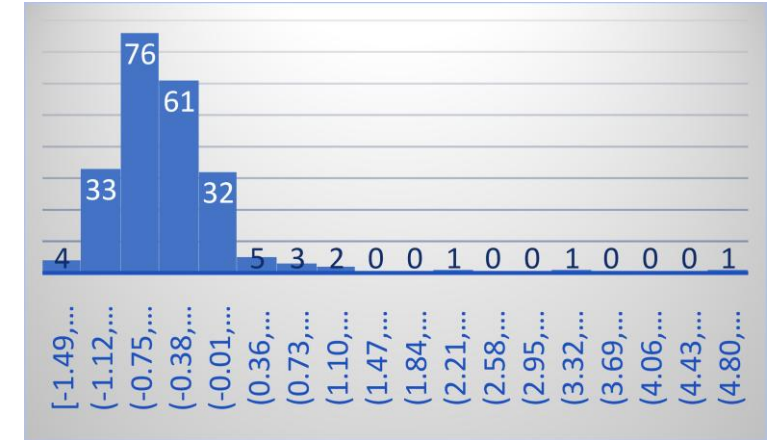
45.2%

Std. Dev. (12m)

Distribution of 12-Month BHAR



Distribution of 24-Month BHAR



Right-skewed distribution with majority of observations showing negative returns

✓ Statistical Significance

12-month BHAR:

Statistically significant negative abnormal returns ($p < 0.05$)

24-month BHAR:

Statistically significant negative abnormal returns ($p < 0.01$)

Conclusion:

Chinese firms consistently underperform the market following convertible bond issuance announcements.

Key Findings:

- Negative abnormal returns persist over both time horizons
- Effect becomes more pronounced over 24-month period
- High variability in returns across companies
- Results support signaling theory predictions



Empirical results: India market

India market statistics

-1.1%
Mean CAR

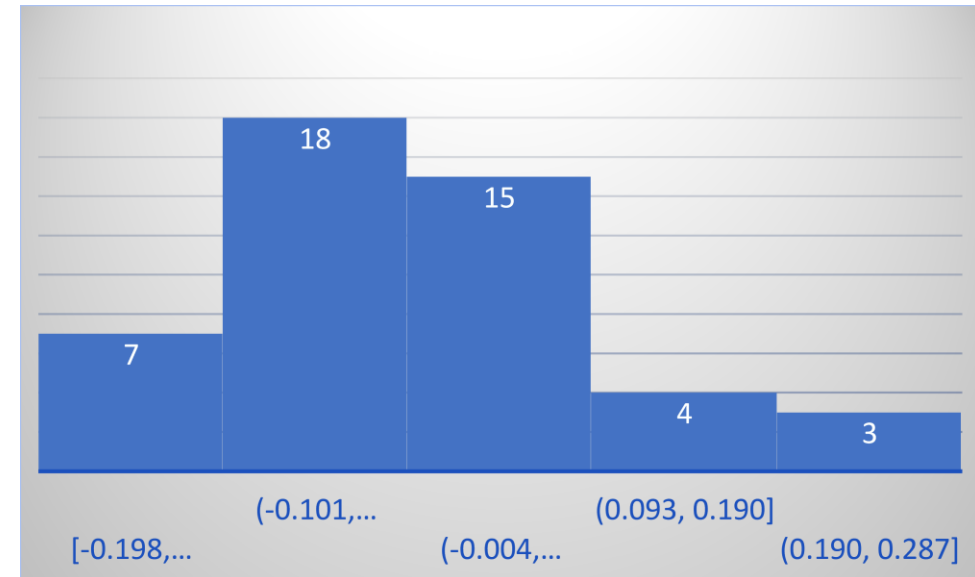
1%
Std. Dev.

47
Sample Size

✓ Statistical Significance

NOT statistically significant ($p > 0.05$)

Distribution of CAR





Empirical results: India market

India market statistics

-23.4%

Mean BHAR
(12 months)

47

Sample Size

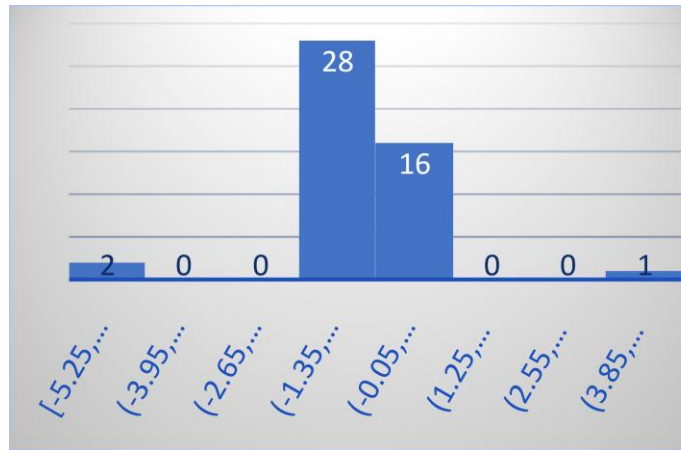
-17.3%

Mean BHAR
(24 months)

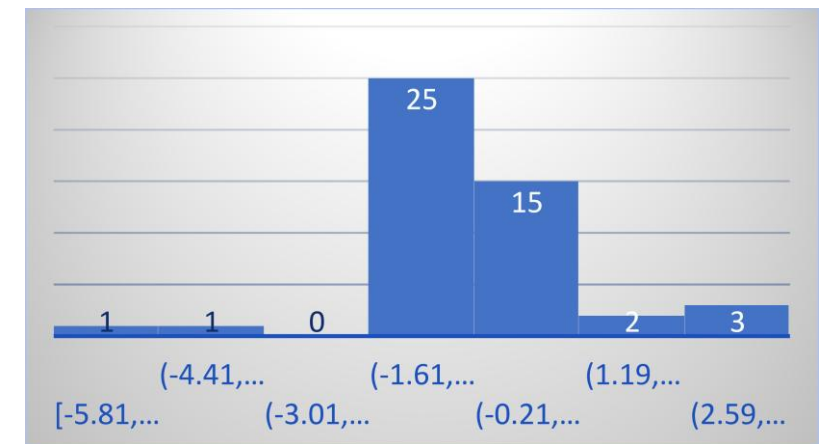
131.3%

Std. Dev. (12 m)

Distribution of 12-Month BHAR



Distribution of 24-Month BHAR



✓ Statistical Significance

12-month BHAR:

NOT statistically significant ($p > 0.05$)

24-month BHAR:

NOT statistically significant ($p > 0.05$)

Conclusion:

Despite negative mean returns, the effect is not statistically distinguishable from zero due to high variance.

Key Findings:

- High variability masks potential effects
- Smaller sample size reduces statistical power
- Different market characteristics from China
- Cannot reject null hypothesis of zero effect



Factors affecting abnormal returns

Leverage effects (H2)

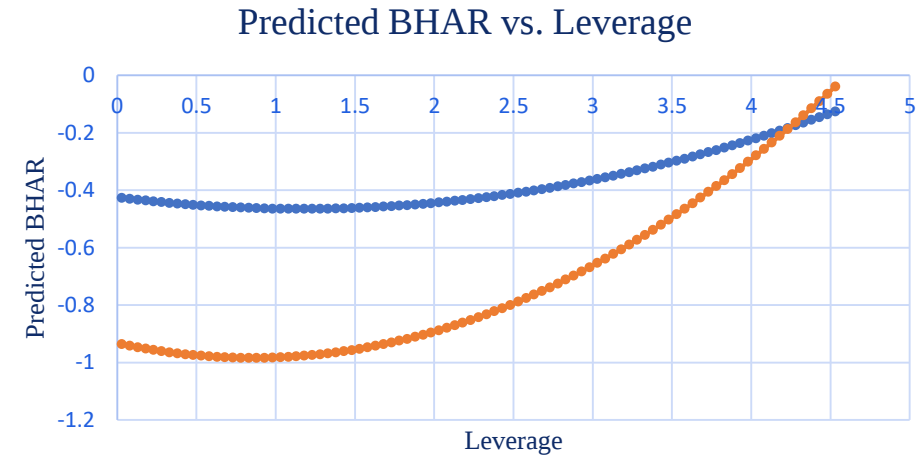
Non-linear leverage relationship

The relationship between leverage and abnormal returns follows a non-linear pattern, with extreme leverage levels potentially leading to positive abnormal returns.

H2: SUPPORTED

Non-linear relation between leverage and abnormal returns confirmed. Very high or very low leverage can signal optimal capital structure adjustment.

$$BHAR = \beta_0 + \beta_1(\text{leverage}) + \beta_2(\text{leverage}^2) + \text{controls} + u_i$$



$$\text{Leverage}_{12}^* = 1.17$$

$$\text{Leverage}_{24}^* = 0.86$$

	Model 1**	Model 2***
leverage	-0.07***	-0.12***
leverage2	0.03*	0.07***

Note: * – significant at 10% level, ** – significant at 5% level, *** – significant at 1% level



Factors affecting abnormal returns



Firm Characteristics (H3)



Financial health impact

Firms with higher leverage (Debt/EBITDA) and lower ROA experience more negative abnormal returns, especially over a 2-year period.

H3: SUPPORTED

$$BHAR = \beta_0 + \beta_1(Debt/EBITDA_i) \times \beta_2(ROA_i) + controls + ui$$

	Model 3**	Model 4***
DebtEbitda	-0.01*	-0.01**
ROA	0.74*	2.19***

Note: * – significant at 10% level, ** – significant at 5% level, *** – significant at 1% level



Sequence Impact (H4)

Market reacts more negatively to the first issue of convertible bond than the subsequent issue of convertible debt

H4: SUPPORTED

$$BHAR = \beta_0 + \beta_1(Repeat_i) \times \beta_2(DTC_i) + controls + ui$$

	Model 5*	Model 6*
Repeat	0.25**	0.40**
DayToConv	0.00*	0.00

Note: * – significant at 10% level, ** – significant at 5% level, *** – significant at 1% level

Key insights:

- Financial health is a critical determinant of market reaction
- Effects become more pronounced over longer time horizons
- Investors carefully study firm fundamentals when evaluating convertible bonds
- Signaling theory explains negative reactions for distressed firms



Key conclusions

Main findings

Regional differences

Convertible bond announcements have significantly different effects across emerging markets, with China showing consistent negative abnormal returns while India shows non-significant effects.

China market results

Statistically significant negative abnormal returns for both 12-month (-16.8%) and 24-month (-30.3%) periods, supporting signaling theory predictions.

India market results

Despite negative mean returns (-23.4% and -17.3%), high variance prevents statistical significance, suggesting different market dynamics.

Theoretical implications:

Results support signaling theory in China but suggest market efficiency varies across emerging economies.

Hypothesis testing results

H1: partially supported

Negative abnormal returns confirmed for China but not statistically significant for India

H2: supported

Non-linear leverage interaction confirmed; extreme leverage can lead to positive returns

H3: supported

Return on Assets (ROA) was found to have a positive effect on abnormal return

H4: supported

The market penalizes seasoned issuers significantly less

Key insights

Market efficiency varies

Emerging markets exhibit different levels of efficiency and information processing capabilities.

Firm fundamentals matter

Financial health is a critical determinant of market reaction to convertible bond announcements.

Long-term effects

Abnormal returns persist and often intensify over 24-month periods, suggesting lasting market adjustments.



Practical recommendations

Corporate Managers

⚠️ Anticipate market reactions

Prepare comprehensive communication strategies to explain the strategic rationale

🕒 Timing considerations

Avoid issuances during periods of poor financial performance

⚖️ Leverage optimization

Frame issuance as leverage normalization rather than distress financing

Investors

🌐 Regional awareness

Adjust investment strategies based on market-specific characteristics

📅 Long-term perspective

Factor in extended adjustment periods when making investment decisions

🛡️ Risk assessment

Distinguish between strategic and distress-driven issuances

Regulators

👁️ Market monitoring

Implement tailored oversight mechanisms for different market maturity levels

📄 Disclosure requirements

Require detailed explanations of strategic rationale and financial impact

🏗️ Market development

Balance innovation with investor protection measures

Overall recommendation

The varying effects of convertible bond announcements across China and India highlight the importance of understanding regional market characteristics, firm-specific factors, and institutional environments when making financing, investment, or regulatory decisions in emerging markets.

Thank you for your attention





Models

$$BHAR_{12i} = b_0 + b_1 leverage_i + b_2 leverage_i^2 + b_3 DayToConv_i + b_5 country_i + b_6 size_i + b_7 industry_i + u_i$$

$$BHAR_{12i} = b_0 + b_1 DebtEbitda_i * b_2 ROA_i + b_3 size_i + b_4 industry_i + b_5 country_i + u_i$$

$$BHAR_{12i} = b_0 + b_1 Repeat_i + b_2 DayToConv_i + b_3 size_i + b_4 industry_i + b_5 country_i + u_i$$

$$BHAR_{24i} = b_0 + b_1 leverage_i + b_2 leverage_i^2 + b_3 DayToConv_i + b_5 country_i + b_6 size_i + b_7 industry_i + u_i$$

$$BHAR_{24i} = b_0 + b_1 DebtEbitda_i * b_2 ROA_i + b_3 size_i + b_4 industry_i + b_5 country_i + u_i$$

$$BHAR_{24i} = b_0 + b_1 Repeat_i + b_2 DayToConv_i + b_3 size_i + b_4 industry_i + b_5 country_i + u_i$$



Models

Statistical models		
	Model 1 **	Model 2 ***
(Intercept)	0.06	-0.69
	(0.79)	(0.89)
leverage	-0.07***	-0.12***
	(0.03)	(0.03)
leverage2	0.03*	0.07***
	(0.02)	(0.02)
DayToConv	0.00*	0.00
	(0.00)	(0.00)
size	-0.02	-0.01
	(0.03)	(0.03)
industryhealthcare	0.02	0.17
	(0.12)	(0.14)
industryindustrial	0.05	0.28
	(0.15)	(0.18)
industryIT	0.11	0.17
	(0.10)	(0.11)
countryIndia	-0.10	0.03
	(0.18)	(0.19)
R ²	0.12	0.23
Adj. R ²	0.07	0.17
Num. obs.	251	251
RMSE	0.78	0.88

Note: * – significant at 10% level, ** – significant at 5% level, *** – significant at 1% level



Models

Statistical models		
	Model 3**	Model 4***
(Intercept)	0.39	0.23
	(0.66)	(0.69)
DebtEbitda	-0.01*	-0.01**
	(0.00)	(0.00)
ROA	0.74*	2.19***
	(0.45)	(0.61)
size	-0.02	-0.02
	(0.03)	(0.03)
industryhealthcare	-0.07	-0.12
	(0.12)	(0.14)
industryindustrial	0.08	0.19
	(0.12)	(0.12)
industryIT	0.01	-0.13
	(0.10)	(0.13)
countryIndia	0.10	0.29*
	(0.17)	(0.17)
DebtEbitda:ROA	0.06**	0.05*
	(0.03)	(0.03)
R ²	0.28	0.34
Adj. R ²	0.25	0.31
Num. obs.	251	251
RMSE	0.82	0.86

Note: * – significant at 10% level, ** – significant at 5% level, *** – significant at 1% level



Models

Statistical models		
	Model 5*	Model 6*
(Intercept)	-0.12	-1.30***
	(0.36)	(0.42)
Repeat	0.25**	0.40**
	(0.11)	(0.16)
DayToConv	0.00*	0.00
	(0.00)	(0.00)
size	-0.01	0.02
	(0.02)	(0.02)
industryhealthcare	-0.13	0.01
	(0.11)	(0.14)
industryindustrial	-0.00	0.20
	(0.11)	(0.13)
industryIT	-0.05	-0.07
	(0.08)	(0.11)
countryIndia	-0.05	0.07
	(0.18)	(0.20)
R2	0.05	0.09
Adj. R2	0.03	0.06
Num. obs.	251	251
RMSE	0.69	0.83

Note: * – significant at 10% level, ** – significant at 5% level, *** – significant at 1% level



Convertible bonds

Advantages for issuers

Lower interest rates:

Compared to straight debt due to conversion option value

Delayed dilution:

Equity dilution occurs only upon conversion

Flexible Financing:

Balances debt and equity characteristics

Investor appeal:

Attracts both debt and equity investors

Timing Flexibility:

Conversion at investor discretion

Advantages for investors

Dual Nature:

Debt-like safety, equity-like upside

Built-in conversion option (embedded optionality):

Investors are not forced to convert – they choose when (or if) to convert

Priority over equity in bankruptcy:

Holders of convertible bonds (as creditors) have a higher priority for repayment of funds than ordinary shareholders

Global Market Size: Over \$300 Billion

Used by major companies like Tesla for capital raising



Theoretical foundation of abnormal returns

Abnormal Returns

Isolates the effect of specific corporate events from market-wide influences.

Measures market reaction to convertible bond announcements

BHAR Method:

Accounts for compounding effects and long-term market adjustments

Signaling theory (Spence, 1973)

Convertible bond issuance may signal financial distress or growth opportunities

Negative Signaling:

- Management believes stock is overvalued
- Company faces financial constraints
- Uncertainty about future cash flows

Positive Signaling:

- Confidence in future stock price appreciation
- Optimal capital structure adjustment
- Growth investment opportunities

Market interpretation depends on firm characteristics and timing

Market efficiency

Efficient market hypothesis (Fama, 1970):

Stock prices reflect all available information instantaneously.

Semi-strong form: prices reflect all publicly available information

Implications for convertible bonds:

Immediate price adjustment to announcements

No predictable abnormal returns

Random walk behavior post-announcement

Emerging market context:

Lower institutional development

Information asymmetries

Potential market inefficiencies

China and India may exhibit different efficiency levels than developed markets



Literature review and research gap



Key Literature Findings: Emerging Markets

Authors	Setting/Sample	Method	Comments
Wang, B. et al. (2014)	China A-share market (50 listed firms)	Event study (CARs in various windows)	Significant negative announcement effects
Tian, K. and Lao, L.J. (2004)	China listed firms (23 CBs)	Event study (CARs around announcement)	Insignificant announcement effects. Mitigation of the negative effect by China's regulation.
Wang, H.Y. and Xia, Y.P. (2004)	China listed firms (2000-2003 CB issues)	Event study (quantitative CAR analysis)	Abnormal returns were significantly positive in the 6 days before the announcement and turned negative on most days post-announcement. Probably, information leakage took place.
Dong J. (2022)	China market CBs before/after COVID	Event study (CARs split pre-/post-pandemic)	Significant negative effect before the pandemic, but significantly positive effect for 2020-2022. Reduced information asymmetry post-2020 due to enhanced disclosure norms.
Liu and Wang (2005)	China listed firms (20 CBs 2001-2003)	Event study (CARs around announcement)	Significant positive abnormal returns. +0.64% abnormal return, no pre-issuance overvaluation.
Salleh et al. (2018)	Malaysia (200 CBs 2005-2015)	Event study (CARs with frequency/sequence effects)	Negative announcement returns, moderated by issuance frequency and sequence



Literature review and research gap



Key Literature Findings: Developed Markets

Authors	Setting/Sample	Method	Comments
Abdul Rahim, N., et al. (2012)	Global CB/warrant bonds (meta-analysis)	Meta-analysis of event studies	Significant negative abnormal returns Driven by high information asymmetry and retail investor overreaction.
Cheng, W., et al. (2005)	Japan CB issues	Event study (CARs around announcement)	Negative abnormal returns.
Duca et al. (2012)	U.S. CBs (1984-2008)	Event study (CARs) + arbitrage analysis	Increasingly negative CARs due to arbitrage.
Ammann, M. et al. (2006)	Germany/Switzerland (55 CBs)	Event study (CARs announcement/issuance)	-1.5% CAR on announcement day.
Eckbo et al. (2007)	Global security offerings	Literature review + meta-analysis	Moderately negative abnormal returns -1% to -2%. CBs may indicate that the firm is taking on risky projects, shifting risk from shareholders to bondholders.
Kim, J-H., et al. (2024)	Korea culture contents industry	Event study (CARs announcement day)	+1.6% positive CAR announcement day
De Jong et al. (2012)	Global CBs (multi-country)	Event study (CARs) + short-sale analysis	The average abnormal return is -0.55% Issue-date: -0.55% (full sample); -0.11% (constrained markets); -0.63% (non-constrained).
Kang, Kim, & Stulz (1999)	Japan equity/CB issues (1980-1988)	Long-run BHARs (3/5 years) vs benchmarks	Significant negative long-run returns despite positive/neutral announcements. 3-year BHAR: -33.69% (convertibles), 5-year: -51.77%
Prokop, J. et al. (2024)	Europe EU-28 (272 CBs 1990-2019)	Event study (CARs) + cross-sectional regressions	Market reacts primarily to the announcement rather than the actual issuance. No significant market reaction around the issuance date. The higher ROA, the less negative AR.