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Debt by Design: Exploring Market Forces Behind Leverage in Two Economies

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Abstract

This study investigates the determinants of capital structure by comparing firms listed on two prominent global stock indices: the S&P 500 (United States) and the NSE CNX 500 (India). Specifically, it examines how firm-specific factors such as liquidity, asset tangibility, and sustainability practices influence leverage decisions within differing economic and institutional contexts. Drawing on a comprehensive dataset of 3,575 firm-year observations from 406 S&P 500 companies and 4,180 observations from 419 NSE CNX 500 firms between 2011 and 2021, the analysis employs Two-Stage Least Squares (2SLS) regression, the Generalized Method of Moments (GMM), and a series of diagnostic tests addressing heteroskedasticity and model robustness. The empirical results indicate that liquidity, tangibility, and sustainability performance significantly affect firms' capital structure decisions. Moreover, growth opportunities and profitability also play key roles. Cross-country differences highlight the influence of macroeconomic conditions and financial system structures on leverage behavior. This research enriches the capital structure literature by offering a comparative, cross-national perspective and provides actionable insights for corporate managers, investors, and policymakers seeking to optimize capital structure in diverse financial environments.

Keywords:

Capital Structure; Leverage; Liquidity; Tangibility; Sustainability; Profitability; GMM; 2SLS.

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1- Introduction

Decisions on capital structure (Capstrt.), defined as the mix of debt and equity used by firms to finance their operations, are fundamental to corporate financial strategy. These decisions influence firm performance, risk management, and long-term sustainability, making Capstrt. a critical topic in financial decision-making. The foundational work of Modigliani and Miller [1] introduced the concept that, under perfect market conditions, Capstrt. choices do not affect firm value. Subsequent theories have expanded on this premise, including the trade-off theory [2], which balances the benefits of debt against bankruptcy risks, and the pecking order theory [3], which highlights the role of internal financing due to informational asymmetries. The market timing theory [4] further emphasizes how firms capitalize on market conditions by issuing equity when valuations are high and avoiding it during periods of undervaluation.

In the modern global economy, these frameworks face new challenges. Firms must navigate increasingly complex dynamics, including volatile market conditions, shifting economic landscapes, and the growing importance of sustainability practices. For instance, empirical studies highlight how market-specific factors shape financing strategies. Botta & Colombo [5] demonstrated that short-term leverage decisions are often influenced by market timing, while long-term strategies align more closely with trade-off principles. Similarly, Rani et al. [6] identified profitability, Tang, and

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Gr opportunities as key determinants of Capstrt. for firms in India, while Frank & Goyal [7] showed that Malaysian firms adjust their Capstrt. based on deviation costs. These findings emphasize the importance of both firm-specific and macroeconomic factors in shaping Capstrt. decisions.

Although many studies have explored Capstrt. decisions within individual economies, the literature has yet to fully explain how firm-specific and macroeconomic determinants interact across developed and emerging markets. Previous research has mainly concentrated on single-country analyses [7, 8], offering limited comparative insight into how financing behavior varies across institutional settings. Moreover, relatively few studies have incorporated sustainability dimensions or examined the effects of global uncertainty and crisis events on Lev decisions. This study aims to address these gaps by conducting a cross-market analysis of firms listed on the S&P 500 (United States) and the NSE CNX 500 (India), integrating both financial and non-financial variables to provide a broader understanding of Lev dynamics. In doing so, the paper contributes to existing literature by showing how economic maturity, institutional context, and sustainability commitments collectively shape corporate Capstrt. decisions.

Despite extensive theoretical and empirical research, gaps remain in understanding how firms optimize their Capstrt. in response to global economic shifts and sustainability imperatives. This challenge is particularly relevant when comparing developed markets, such as the S&P 500, with emerging markets, such as the NSE CNX 500. The scientific problem lies in identifying how firms can adapt their financing decisions to align with dynamic economic, and sustainability demands while maintaining competitiveness and resilience. Addressing this issue is crucial for advancing financial strategy in a rapidly changing global context. Addressing this issue is crucial for advancing financial strategy in a rapidly changing global context. To provide a clear roadmap for the reader, the structure of this paper is summarized below.

The remainder of this paper is structured as follows. Section 2 reviews the key theories and empirical studies on capital structure and its determinants. Section 3 outlines the data sources, variable definitions, and methodological approach adopted in this research. Section 4 presents and discusses empirical results for the S&P 500 and NSE CNX 500 firms. Finally, Section 5 concludes by summarizing the main findings, their implications, and avenues for future research.

2- Literature Review

2-1- Capital Structure and Theoretical Framework

Capstrt., the mix of debt and equity financing, has been extensively studied, with foundational theories such as Modigliani & Miller's [1] Capstrt. irrelevance theorem, the trade-off theory [2], the pecking order theory [3, 9], and the market timing theory [4]. These theories have been empirically tested across various contexts, revealing that factors like firm S, profitability, and Gr opportunities significantly influence financing decisions [10-12]. Numerous studies suggest a negative correlation between corporate performance and capital structuring choices, aligning with theoretical frameworks like trade-off, agency cost, and pecking order theory [12-17]. Numerous empirical studies, however, have demonstrated a negative link between a firm's Lev and its profitability, reinforcing the pecking order theory [9, 13-21]. Further, profitable corporations often have lower debt levels compared to their equity market value, despite having unused debt capacity [16-18, 22-24]. Recent studies have further explored these dynamics. For instance, one of the papers examined non-financial firms in the Gulf Cooperation Council (GCC) countries, finding that profitability, market-to-book ratio, firm S, earnings volatility, and Gr opportunities significantly influence Capstrt. decisions, partially supporting optimal Capstrt. Theories [17]. Similarly, another researcher highlighted that modern economic environments introduce new dimensions to Capstrt. decisions, with factors such as fluctuating interest rates, global economic cycles, and technological advancements demanding more dynamic and flexible financing strategies [18].

Additionally, a recently published article investigated the impact of a firm's foreign liability composition on its resilience during economic turmoil, identifying factors determining its foreign Capstrt. Their findings suggest that firms with a positive equity share in their foreign liabilities were less affected by the global financial crisis, highlighting the importance of (foreign) equity financing for firms' resilience to shocks and financial stability [19]. These recent studies underscore the evolving nature of Capstrt. determinants, emphasizing the need for firms to adapt their financing strategies in response to changing economic conditions and firm-specific characteristics. Institutional quality and governance play a decisive role in shaping firms' financing strategies. A study confirms that national governance strength significantly influences capital-structure decisions during economic crises, supporting the view that institutional stability moderates leverage behavior across markets [22].

2-2- Determinants of Capital Structure

2-2-1- Growth Opportunities (Gr)

The evaluation of Gr opportunities in firms involves the use of various metrics, such as the market-to-book ratio and research and development (R&D) expenditures. These metrics assess a firm's potential for expansion and innovation

[23-26]. Gr opportunities significantly impact a firm's Lev decisions. High-Gr firms often avoid debt due to revenue uncertainty and agency conflicts [12, 27]. Studies in ASEAN countries show varied results; for example, Indonesian firms align with the pecking order theory, while Thai firms exhibit trade-off behavior [28, 29].

2-2-2- Liquidity (Liq)

Liq, measured by the ratio of current assets to current liabilities, inversely affects Lev. Firms with higher Liq can finance operations internally, reducing the need for external debt. One of the research papers found that firms with greater Liq levels tend to have lower debt ratios, suggesting that liquid assets provide financial flexibility, diminishing reliance on external financing [26]. Further research provides additional evidence to support these conclusions. For example, a research paper observed notable impacts of corporate governance on the levels of debt and availability of cash among 2,425 non-financial companies in the Middle East and North Africa [27]. On the lending side, another study finds that corporate repayment capacity strongly depends on liquidity management and risk exposure, reinforcing the importance of market-driven credit constraints in shaping firms' leverage levels [28].

2-2-3- Non-Debt Tax Shields (NDtS)

NDtS such as depreciation and investment tax credits, can substitute for the tax benefits of debt, leading to lower Lev. Some studies suggested that firms with substantial NDtS are less incentivized to incur debt for tax [30-34]. A study provided empirical support, showing that Spanish firms with higher NDtS tend to have lower Lev ratios [20]. Recent research suggests that tax cuts could lead to an increase in corporate debt for both private and public companies. This could potentially reduce the influence of tax advantages on decisions related to Capstrt [21].

2-2-4- Profitability (ROE)

Multiple studies have conclusively demonstrated that a company's Capstrt. has a substantial influence on its performance. These studies utilize return on equity (ROE) as a metric to evaluate financial outcomes [25, 30, 35]. Profitability is a consistent determinant of Lev, with profitable firms often favoring internal financing [31, 32]. However, a research paper noted [32] that Lev positively affects ROE in the S&P 500 but negatively impacts firms in the NSE CNX 500.). Supporting evidence from emerging economies also shows that firm-level efficiency and liquidity directly affect financing choices. A recently published paper reports a strong inverse relationship between leverage and profitability, illustrating how internal performance dynamics shape capital-structure outcomes [33].

2-2-5- Firm Size (S)

Larger firms typically face fewer financial constraints, enabling them to secure debt financing with ease. This supports the trade-off theory [34]. Studies on the S&P 500 and NSE CNX 500 confirm this positive correlation between S and Lev [36].

2-2-6- Asset Tangibility (Tang)

Tangible assets serve as collateral, reducing borrowing costs and increasing Lev. Studies consistently report a positive relationship between Tang and Lev [37, 38].

2-2-7- World Uncertainty Index (WUI)

Global economic and political uncertainties, measured by the WUI, can influence corporate Lev decisions [34]. A study by found that increased global uncertainty leads firms to adopt conservative financing policies, reducing Lev to mitigate risk [37]. This behavior underscores the importance of macroeconomic factors in Capstrt. choices. A researcher found that economic policy uncertainty and firm characteristics significantly influence enterprises' decisions about debt financing [38].

Recent evidence strengthens this relationship. A recent study shows that firms facing higher policy uncertainty adjust Lev indirectly by holding more cash as a buffer, indicating that liquidity management mediates the effect of uncertainty on Capstrt [39]. One study provides European evidence that institutional and cultural factors moderate this relationship [40], while other highlights that sector-specific shocks, such as energy-price volatility, further reduce borrowing under uncertainty [41]. Another research paper suggests that oil-price shocks interact with ESG performance, showing that firms with stronger sustainability profiles adjust their debt levels more prudently in volatile conditions [42].

Collectively, these findings confirm that uncertainty - whether macroeconomic, institutional, or sectoral - dampens firms' willingness to leverage, while firm-level attributes such as liquidity strategy, governance context, and ESG commitment shape the extent of this response.

2-2-8- Commitment to Sustainable Development Goals (SDGs)

Firms engaged in ESG and SDG activities attract favorable financing terms, underscoring the growing influence of sustainability on Capstrt [43, 44]. Sustainability-oriented firms exhibit distinctive financing behavior that reflects long-term responsibility and stakeholder commitment. Recent evidence reinforces this link between ESG performance and Capstrt. behavior. Research finds that firms with higher ESG ratings face lower information asymmetry and prefer private bank debt over public bond issuance, maintaining lower Lev ratios and relying on more stable financing channels [45]. Further paper shows that stronger ESG disclosure is associated with lower Lev and reduced cost of capital, highlighting the role of sustainability in shaping Capstrt. Strategy [43]. A recent study provides supporting evidence from emerging markets, reporting that firms with higher ESG disclosure sustain lower Lev levels, confirming that transparency fosters conservative financial behavior [44]. Collectively, these findings show that firms committed to sustainability secure better financing conditions and display transparent financial structures aligned with long-term value creation.

The contrasting effects of sustainability variables (SDG commitments) between the two markets can be explained by differences in investor perception, market maturity, and policy enforcement. In the U.S. market, ESG and SDG adherence is often rewarded by investors who associate sustainability practices with long-term value creation, reduced information asymmetry, and lower default risk. Consequently, firms with stronger ESG engagement tend to enjoy lower financing costs and maintain conservative Lev levels. In contrast, in emerging markets such as India, sustainability disclosure is relatively recent and sometimes viewed as a compliance requirement rather than a strategic value driver. Limited investor awareness, weaker enforcement mechanisms, and lower market transparency can dilute the perceived financial benefits of sustainability engagement. As a result, Indian firms may use SDG-related initiatives to enhance reputation and attract capital rather than to reduce borrowing, leading to a positive association between SDG commitment and Lev. This divergence highlights that investor interpretation and institutional credibility play a central role in shaping how sustainability orientation influences Capstrt. decisions across different financial systems.

Similar results appear in other regions. Another recent paper finds that sustainability certification significantly influences debt–equity choices across OIC countries, indicating that the impact of ESG performance on Capstrt. extends beyond developed and emerging markets [46]. This supports the broader view that sustainability commitments shape firms' financing structures across diverse institutional contexts.

Differences in corporate governance frameworks between the United States and India fundamentally shape Capstrt. Beyond firm-level determinants. In the U.S., governance systems emphasize transparency, shareholder protection, and market-based monitoring. The presence of independent boards, active institutional investors, and robust disclosure regulations (e.g., SEC standards) reduces agency costs and information asymmetry. As a result, firms operate with greater financial discipline and can rely more on equity and hybrid instruments, maintaining moderate Lev levels consistent with trade-off and market-timing theories.

In contrast, India's governance landscape is characterized by concentrated ownership, family-controlled firms, and weaker enforcement of investor protection. Monitoring mechanisms are often relationship-based rather than market-driven, which increases lenders' risk perception and limits access to low-cost equity. Consequently, firms rely more heavily on debt financing, particularly bank loans, to sustain operations and growth. These systemic contrasts mean that governance quality acts as a macro-institutional moderator of Capstrt. choices: U.S. firms benefit from mature governance that rewards transparency and market efficiency, while Indian firms' Lev decisions are shaped by credit dependence, control retention motives, and institutional constraints. Thus, cross-country variation in governance not only explains observed differences in leverage ratios but also highlights how institutional strength and investor confidence interact to influence financing strategies across diverse economic contexts.

2-2-9- COVID-19

The COVID epidemic has significantly altered the financial structure of global businesses, affecting Lev ratios, debt financing decisions, and resulting in diverse changes across markets [47]. The pandemic, in other words, reshaped Lev globally, with firms in the U.S. reducing debt while Indian firms increased long-term Lev to address financial risks [47, 48]. The pandemic has shown that firms with excessive debt are more likely to face financial difficulties if their corporate social responsibility (CSR) performance is poor, as indicated by numerous studies [49].

Recent evidence reinforces these patterns. The authors highlight that COVID-19 amplified debt vulnerabilities and widened the leverage gap between large and small firms [47]. A working paper by IMF further note that declining revenues and heightened uncertainty prompted many firms to deleverage and rely on short-term, low-risk financing [50]. Evidence from emerging economies by another researcher confirms that Indian firms reduced Lev to preserve Liq and resilience during the pandemic [48]. Collectively, these findings indicate that the COVID crisis heightened sensitivity to

external shocks, leading corporations to favor liquidity conservation, lower Lev, and adaptive Capstrt. decisions that balance solvency and flexibility under prolonged uncertainty. Consistent with these mechanisms, firms tend to adopt less debt-heavy policies during crisis periods as part of prudent risk management [51].

2-2-10- Loss-Making Firms

Debt levels are positively correlated with the likelihood of operating losses, as financially distressed firms often rely on external funding [52]. Loss-making firms may face limited access to equity markets and therefore depend on debt financing despite higher default risks. Persistent losses weaken firms' capacity to service existing obligations, often leading to a deterioration in creditworthiness and financial flexibility. Consequently, the relationship between Lev and firm performance is complex while moderate debt may provide temporary liquidity support, excessive reliance on borrowing can intensify financial vulnerability and constrain long-term stability.

2-2-11- Research Hypothesis

We have formulated the following hypotheses to conduct a systematic analysis of the relationships between Lev and several factors, including Gr, Liq, NDts, profitability, company S, asset Tang, the WUI, the United Nations Sustainable Development Goals (UN-SDGs), the impact of COVID, and the presence of loss-making firms. The objective of these hypotheses is to examine the potential influence of each individual component, along with their relationships, on a company's Lev. The objective of this examination is to enhance comprehension regarding the intricate dynamics that regulate corporate financial systems.: To investigate the association amid Gr, Liq, NDts, Profitability, S, Tang, WUI, UN- SDG, Covid, Loss making firms and Lev, the following hypothesis developed:

Overall, the COVID-19 pandemic, together with global uncertainty and sustainability pressures, has reshaped firms' Capstrt. behavior, leading to more cautious borrowing, greater focus on Liq, and strategic adjustments in Lev. These findings emphasize that external shocks and firm-specific resilience significantly influence financing structures across markets. Extending this discussion, it is also important to consider how financial distress itself may interact with Capstrt. decisions.

H1: Financial factors have a significant impact on Lev.

H1a: Growth has a significant impact on Lev.

H1b: Liquidity has a significant impact on Lev.

H1c: Non-debt tax shield has a significant impact on Lev.

H1d: Profitability has a significant impact on Lev.

H1e: Size has a significant impact on Lev.

H1f: Tangibility has a significant impact on Lev.

H1g: World Uncertainty Index has a significant impact on Lev.

H1h: UN – SDG has a significant impact on Lev.

H1i: Covid has a significant impact on Lev.

H1j: Loss making firms have a significant impact on Lev.

H0: Financial factors have no significant impact on Lev.

H0a: Growth has no significant impact on Lev.

H0b: Liquidity has no significant impact on Lev.

H0c: Non-debt tax shield has no significant impact on Lev.

H0d: Profitability has no significant impact on Lev.

H0e: Size has no significant impact on Lev.

H0f: Tangibility has no significant impact on Lev.

H0g: World Uncertainty Index has no significant impact on Lev.

H0h: UN – SDG has no significant impact on Lev.

H0i: Covid has no significant impact on Lev.

H0j: Loss making firms have no significant impact on Lev.

3- Material and Methods

The study encompasses the time frame spanning from 2011 to 2021. The final sample for the S&P 500 consists of 3,575 firm-year observations from 406 enterprises, while the NSE CNX 500 includes 4,180 firm-year data from 419 firms. Table 1 presents an overview of the primary variables examined in the study, providing a comprehensive understanding of their operational definitions and the underlying reasoning for their inclusion. The primary focus of this study is the assessment of the central variable, "Leverage," in conjunction with a complete range of independent variables such as Gr, Liq, NDts, Profitability, and various others. Each of these variables contributes a distinct dimension to the analysis.

In order to investigate the interplay of these variables, the research utilizes a range of advanced statistical methodologies. Descriptive statistics serve as a fundamental basis for comprehending the features of the data, thereby establishing a framework for subsequent research utilizing regression approaches. The application of Two-Stage Least Squares (2SLS) Regression is employed to mitigate any endogeneity, while Heteroskedasticity and Stability Tests are utilized to assure the robustness of the analysis. Additionally, the Generalized Method of Moments (GMM) Regression is employed to capture the dynamic characteristics of the data.

4- Results

4-1- Research Model

To evaluate our hypothesis, the subsequent panel model was employed: This investigation utilized this model to elucidate the significance of the observed disparities among the chosen firms and to ascertain and analyze the impacts of the selected variables within the firms over the designated timeframe.

$$Levit = \beta 1 + \beta 2 Grit + \beta 3\ Liqit + \beta 4\ NDtsit + \beta 5\ ROEit + \beta 6 Sit + \beta 7\ Tangit + \beta 8\ WUIit + \beta 9\ SDGit + \beta 10\ Covidit + \beta 11\ Loss\ it + Fixed\ effects + \varepsilon_{it}$$

In this section, the variables classified as ‘dependent’ and ‘independent’ are delineated. The fixed effects are represented by the Year variable, while ε_{it} signifies the error term, which is incorporated into the model.

The research methodology flow chart is presented in Figure 1.

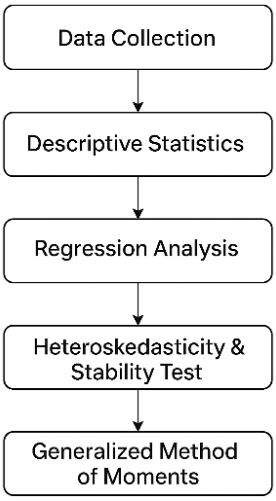

Figure 1. Research methodology flowchart

4-2- Sample & Empirical Results with Discussion

Refinitiv database has been used to collect the raw data. The study consists of two samples from the period of 2011-2021. Sample one consists of firms from the S&P500 index representing the USA market; after ignoring the firms with unavailable data, the final sample consists of 3575 firm-year observations from 406 firms. Sample two consists of firms from the NSE CNX500 index representing the Indian market; after ignoring the firms with unavailable data, the final sample consists of 4180 firm-year observations from 419 firms. The dependent variable is Lev, while the independent variables are Gr, Liq, Non-debt tax shield (NDts), Profitability (ROE), Size (S), Tangibility (Tang), World Uncertainty Index (WUI), UN – SDG, Covid and Loss-making firms, see explanation referred in Table 1.

Table 1. Explanation of variables

Type of variable	Variables	Explanation
Dependent variable	Leverage (Lev)	Total book value of total borrowings (sum of current liabilities and long-term debts) / total assets
Independent variables	Growth (Gr)	Percentage change in sales in the current year as compared to the previous year
	Liquidity (Liq)	Current assets / Current liabilities
	Non-debt tax shield (NDts)	(Depreciation + Amortization) / Total assets
	Profitability (ROE)	Return on equity = (Net profit after tax) / Total equity
	Size (S)	Log of total assets
	Tangibility (Tang)	Fixed assets / Total assets
	World Uncertainty Index (WUI)	World Uncertainty Index
	UN - SDG	Application of UN – SDG, since year 2016 is measured as 1 and before as 0.
	Covid	Covid period years 2020 and 2021 are measured a 1 and the others as 0.
	Loss making firms (Loss)	Firm years with income equal or less than zero are measured a 1 and the others as 0.

This study employs panel data to mitigate issues of collinearity and heterogeneity, thereby enhancing the reliability of the estimated results. To detect potential multicollinearity, pairwise correlation tests are conducted within the panel data framework. Consequently, this methodological approach ensures robust and valid findings. The study has conducted firstly a panel units root tests such as Levin et al. and Im et al. and Breitung t-stat. test to test the presence of unit roots and secondly boxplot analysis to check the data's symmetry, skew, variance, and outliers [53, 54].

The GMM approach is utilized in our empirical inquiry as a robust econometric instrument. GMM is known for its effectiveness in addressing potential endogeneity difficulties in panel data econometrics. GMM is highly proficient at estimating the dynamics of explanatory factors, particularly in cases where traditional approaches may produce biased outcomes due to the correlation between these variables and the error term, a phenomenon commonly referred to as endogeneity. Furthermore, we enhance the GMM by using the 2SLS technique, which provides a more detailed understanding of the proportions of endogenous and exogenous variables that may be attributed to the instruments. The utilization of this comprehensive methodology enables us to offer consistent and dependable estimations on the factors influencing Capstrt. and their effects on the Lev of firms. This augments the trustworthiness of our study findings within the realm of corporate finance.

In order to enhance the quality of our research through the application of the GMM method, our focus is directed towards a distinct set of significant features inside the panel data framework. Examining the potential endogeneity of explanatory factors and their dynamics is facilitated by this approach. The dependent variables in the model include Tobin's Q and Return on Assets (ROA), which serve as indices of corporate performance. Tobin's Q serves as a metric employed to assess the market valuation of firms by considering the expenses associated with asset replacement, whereas Return on Assets (ROA) gauges a company's profitability relative to its overall assets.

To account for various factors that may impact business performance, the research incorporates control variables such as firm S and age, financial Lev, and sales Gr. The determination of Firm S's operationalization involves the utilization of the natural logarithm of its total assets, which incorporates the influence of economies of scale and capital accessibility. The duration since a company's inception, often denoted as its age, can serve as an indication of the company's depth of expertise and resilience. Financial Lev denotes the extent to which a company depends on debt to support its total revenue. It is calculated by dividing total liabilities by shareholders' equity. The Sales Gr metric is computed as the percentage variation in total sales between consecutive years, serving as an indicator of the firm's sales Gr trajectory.

The study uses the GMM estimator as a methodological tool to minimize the sum product of the variables, which are weighted by a matrix A. By employing this methodology, it becomes possible to obtain parameter estimates that exhibit both consistency and efficiency. Furthermore, Sargan's test is utilized to validate the precision of our equipment, so ensuring the reliability of our model. The objective of this research is to provide a comprehensive understanding of the determinants that impact Capstrt. and its consequent implications on firm Lev in developing market economies, employing a rigorous econometric approach.

4-3- Descriptive Statistics

Table 2 presents the descriptive statistics, skewness, kurtosis, and the Jarque-Bera results for the S&P500 data set. As can be observed in Table 2, the standard deviation for all variables is moderate, indicating that the sample data closely aligns with its mean value. The skewness values provide a measure of the asymmetry of the series. It is noteworthy that S and SDG exhibit negative skewness values, indicating a longer left tail with lower values. Conversely, Lev, Gr, Liq,

NDts, ROE, Tang, WUI, Covid, and loss-making firms display positive skewness values, suggesting a longer right tail with higher values. Kurtosis, on the other hand, measures the peak or flatness of the distribution of the series. It has been observed that S, Covid, and WUI are mesokurtic, as these variables follow a normal distribution with a kurtosis of 3. In contrast, SDG is playkurtic, as its kurtosis value falls below 3. Additionally, Lev, Gr, Liq, NDts, ROE, Tang, and loss-making firms are leptokurtic, as their kurtosis values exceed 3. As for the Jarque-Bera test, it quantifies the disparity between the skewness and kurtosis of the series compared to the normal distribution. Given that the majority of variables have a Jarque-Bera probability below 0.05, it can be concluded that the data does not conform to a normal distribution.

Table 2. Descriptive Statistics (S&P500)

Variables	Lev	Gr	Liq	NDts	ROE	S	Tang	WUI	SDG	Covid	Loss
Mean	0.491280	0.092594	1.748592	0.033248	0.224393	23.48351	0.230843	1.018330	0.609231	0.210070	0.111888
Median	0.471143	0.059427	1.380974	0.029125	0.152282	23.50737	0.133782	0.858557	1.000000	0.000000	0.000000
Maximum	2.926832	11.42266	17.78686	0.314460	206.6190	27.30000	0.950528	2.154175	1.000000	1.000000	1.000000
Minimum	0.029446	-0.838831	0.135980	0.000000	-40.81667	18.69519	0.000694	0.388835	0.000000	0.000000	0.000000
Std. Dev.	0.197736	0.306214	1.307307	0.023417	4.229723	1.273469	0.225621	0.502971	0.487991	0.407415	0.315273
Skewness	1.096840	16.74837	3.423998	2.893537	33.13220	-0.067377	1.344358	1.026063	-0.447738	1.423466	2.462414
Kurtosis	10.13494	550.8741	23.08138	24.20465	1619.230	3.119802	3.815250	3.159419	1.200469	3.026254	7.063484
Jarque-Bera	8299.900	44879374	67054.64	71965.88	3.90E+08	4.842828	1175.851	631.0825	601.8197	1207.413	6072.412
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.088796	0.000000	0.000000	0.000000	0.000000	0.000000
Sum	1756.327	331.0239	6251.217	118.8626	802.2043	83953.55	825.2622	3640.528	2178.000	751.0000	400.0000
Sum Sq. Dev.	139.7411	335.1230	6108.151	1.959906	63940.85	5796.041	181.9342	904.1514	851.0954	593.2375	355.2448
Observations	3575	3575	3575	3575	3575	3575	3575	3575	3575	3575	3575

Table 3 illustrates the descriptive statistics, skewness, kurtosis, and the Jarque-Bera results for the NSE CNX500 dataset. As evidenced in Table 3, the standard deviation exhibits a moderate level for all the variables, suggesting that the sample data closely approximates its mean value. Considering skewness as a measure of the series' asymmetry, it is notable that S, Tang, and WUI exhibit zero skewness, indicating a symmetric distribution around their means. On the other hand, ROE and SDG display negative skewness values, implying a long-left tail with lower values. Conversely, Lev, Gr, Liq, NDts, Covid, and loss-making firms exhibit positive skewness values, indicating a long right tail with higher values. Kurtosis, which measures the peak or flatness of the series' distribution, reveals that S and Covid confirm a Mesokurtic distribution, characterized by a normal distribution with a kurtosis value of 3. In contrast, Tang, WUI, and SDG exhibit Platykurtic behavior, as their kurtosis values are below 3. Furthermore, Lev, Gr, Liq, NDts, ROE, and loss-making firms are classified as Leptokurtic, with kurtosis values exceeding 3. Jarque-Bera, which gauges the deviation of skewness and kurtosis from those of a normal distribution, indicates that the probability of Jarque-Bera for all variables is less than 0.05. This suggests that the data does not adhere to a normal distribution.

Table 3. Descriptive Statistics (NSE CNX500)

Variables	Lev	Gr	Liq	NDts	ROE	S	Tang	WUI	SDG	Covid	Loss
Mean	0.462356	0.177636	1.857376	0.031581	0.131234	24.48457	0.322120	0.555402	0.581818	0.199522	0.073923
Median	0.440000	0.110000	1.450000	0.030000	0.150000	24.33500	0.300000	0.492900	1.000000	0.000000	0.000000
Maximum	13.24000	70.65000	42.84000	0.320000	16.76000	30.21000	1.060000	0.917600	1.000000	1.000000	1.000000
Minimum	0.010000	-0.94	0.030000	0.000000	-52.38	19.44000	0.000000	0.244600	0.000000	0.000000	0.000000
Std. Dev.	0.357915	1.337899	1.649205	0.021871	1.093397	1.567694	0.206729	0.230475	0.493319	0.399689	0.261678
Skewness	18.72279	40.02662	7.564289	2.452316	-30.26856	0.471685	0.392659	0.091258	-0.331744	1.503743	3.256890
Kurtosis	596.0550	1935.819	126.0636	18.59025	1379.922	3.320244	2.294126	1.600704	1.110054	3.261243	11.60733
Jarque-Bera	61501102	6.52E+08	2677553.	46521.88	3.31E+08	172.8608	194.1928	346.8255	698.7762	1587.219	20293.12
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Sum	1932.650	742.5200	7763.830	132.0100	548.5600	102345.5	1346.460	2321.580	2432.000	834.0000	309.0000
Sum Sq. Dev.	535.3417	7480.295	11366.36	1.999047	4996.062	10270.58	178.5968	221.9827	1017.018	667.5990	286.1577
Observations	4180	4180	4180	4180	4180	4180	4180	4180	4180	4180	4180

The Pearson correlation between the independent and dependent variables exhibited in Table 4 (S&P 500) and Table 5 (NSE CNX500) is below 0.39, signifying a weak connection. In Table 4, Gr, Liq, NDts, and Tang demonstrate a negative correlation with Lev. This suggests that Gr, Liq, NDts, and Tang are inversely related to Lev, while ROE, S, WUI, SDG, Covid, and Loss-making firms display a positive correlation with Lev. Hence, ROE, S, WUI, SDG, Covid, and Loss-making firms exhibit a favorable association with Lev. According to Table 5, Liq, ROE, SDG, and Covid exhibit a negative correlation with Lev, indicating an unfavorable association. Conversely, Gr, NDts, S, Tang, WUI, and Loss-making firms demonstrate a positive correlation with Lev. Consequently, Gr, NDts, S, Tang, WUI, and Loss-making firms showcase a positive association with Lev. It is noteworthy that the S&P 500 and NSE CNX500 samples do not possess identical correlation associations.

Significant discoveries about the interconnectedness of major financial parameters may be observed through the examination of the correlation matrices presented in Tables 4 and 5 for the S&P 500 and NSE CNX 500 indexes, respectively. The examination of the link between variables such as Lev, Gr, Liq, profitability, and S in both indices reveals notable disparities in the magnitude and direction of correlations. The disparities between the two indices may suggest distinct financial frameworks, market forces, and regulatory systems. Acquiring understanding of these connections enables the recognition of potential variables that impact a company's success and offers essential data for investors, lawmakers, and business leaders as they negotiate the complex dynamics of the global financial landscape.

The comparative analysis between firms listed in the S&P 500 and NSE CNX 500 reveals important structural and institutional contrasts that shape Capstrt. outcomes beyond firm-level characteristics. Firms in the U.S. operate within a mature and highly liquid capital market, characterized by advanced financial instruments, lower information asymmetry, and stronger investor protection frameworks. These conditions facilitate easier access to equity financing and promote balanced debt–equity structures. In contrast, Indian firms face relatively higher borrowing costs, limited depth in bond markets, and stricter collateral requirements, which increase their dependence on bank-based debt financing. Regulatory frameworks, taxation policies, and disclosure standards further contribute to these differences. For instance, the U.S. system emphasizes market-based financing and shareholder value maximization, while the Indian market remains more relationship-driven, with banks playing a central role in corporate funding decisions. These institutional variations help explain the higher average Lev ratios observed among NSE CNX 500 firms and underscore the importance of considering market structure and governance quality when evaluating global Capstrt. dynamics. From a managerial perspective, understanding these structural contrasts enables firms to tailor financing strategies that align with the efficiency, risk, and cost profiles of their respective markets.

The results of the present study are compared with prior empirical findings to ensure consistency and contextual relevance. The observed positive influence of profitability and firm S. on Lev. aligns with the evidence reported by two researchers supporting the predictions of the trade-off and pecking order theories [7, 10]. Similarly, the negative association between uncertainty (WUI) and Lev corresponds with two studies, who also found that heightened uncertainty encourages conservative financing behavior [37, 40]. The findings on ESG and SDG commitments are consistent with three other research papers, confirming that sustainability-oriented firms maintain lower Lev levels [43, 44, 55]. In contrast, the results related to COVID-19 extend previous evidence by two studies, showing that pandemic-induced shocks heightened firms' preference for liquidity and reduced reliance on long-term debt [48, 50]. Collectively, these comparisons demonstrate that the present study's findings are largely in line with established literature, while also offering new perspectives on how uncertainty, sustainability, and crisis dynamics jointly influence Capstrt. across developed and emerging markets. Consistent with our findings, a recent published paper shows that firms' financial structures are critical to maintaining financial security in emerging markets, emphasizing that leverage decisions are shaped by broader governance and market condition [56].

Table 4. Correlation amongst the Variables (S&P500)

Variables	Lev	Gr	Liq	NDts	ROE	S	Tang	WUI	SDG	Covid	Loss
Lev	1										
Gr	-0.03	1									
Liq	-0.37	0.07	1								
NDts	-0.02	0.03	-0.12	1							
ROE	0.01	0.00	-0.01	-0.02	1						
S	0.05	-0.09	-0.28	0.12	0.02	1					
Tang	-0.05	-0.02	-0.16	0.48	-0.03	0.14	1				
WUI	0.00	-0.14	-0.01	0.01	0.00	0.02	0.02	1			
SDG	0.10	0.00	-0.05	0.04	0.01	0.15	-0.03	0.13	1		
Covid	0.05	0.02	-0.03	-0.01	0.04	0.13	0.01	-0.09	0.41	1	
Loss	0.31	-0.07	-0.03	0.16	-0.14	-0.01	0.12	0.04	0.04	0.044	1

Table 5. Correlation amongst the Variables (NSE CNX500)

Variables	Lev	Gr	Liq	NDts	ROE	S	Tang	WUI	SDG	Covid	Loss
Lev	1										
Gr	0.02	1									
Liq	-0.34	-0.03	1								
NDts	0.09	-0.01	-0.07	1							
ROE	-0.04	0.01	0.03	-0.05	1						
S	0.10	-0.02	-0.12	-0.06	-0.05	1					
Tang	0.09	0.02	-0.25	0.39	-0.03	0.12	1				
WUI	0.00	0.00	0.00	0.01	0.01	0.00	-0.01	1			
SDG	-0.05	-0.05	0.04	0.00	-0.02	0.15	-0.06	-0.01	1		
Covid	-0.01	-0.05	0.03	0.06	-0.04	0.13	-0.01	-0.22	0.42	1	
Loss	0.14	0.04	-0.10	0.12	-0.22	0.06	0.09	0.01	-0.03	0.04	1

The examination of the panel unit root test is carried out to assess the stationarity of the data, as indicated in Table 6. The panel unit root is observed in all cross-sections for both sample sets, as evidenced by the significant test statistic at the 1 percent significance level.

Table 6. Panel unit root test

Panel unit root test (S&P500)			Panel unit root test (NSE CNX500)		
Method	**Statistic**	**Prob.****	**Method**	**Statistic**	**Prob.****
Levin, Lin & Chu t*	-67.7037	0.0000	Levin, Lin & Chu t*	-64.3089	0.0000
Breitung t-stat	-36.6380	0.0000	Breitung t-stat	-44.1321	0.0000
Im, Pesaran and Shin W-stat	-99.5372	0.0000	Im, Pesaran and Shin W-stat	-95.4245	0.0000

The Capstrt. of blue-chip companies listed in the S&P 500 and NSE CNX500 demonstrate consistent patterns across various samples across time. However, significant differences and anomalies have been observed while analyzing yearly Lev boxplots. This highlights the significance of determining the variables that impact Lev assessments for these indices.

A comprehensive range of variables is considered, including various criteria such as fundamental financial indicators like Liq and Profitability, as well as more recent factors like the WUI and the impact of Covid.

The inequalities observed in Lev decisions can be ascribed to the significant economic conditions and market dynamics that are present in both the United States and India. Unlike the volatile economic conditions in India, the S&P 500 corporations function inside a more established and stable economic environment, hence impacting the CNX500 companies. The fluctuation in economic stability has consequences for businesses' ability to obtain capital, the cost of their debt, and their overall decisions regarding Lev.

Moreover, significant differences exist in the legislative frameworks and corporate governance standards of the two countries, resulting in distinct effects on Lev in terms of debt issuance and management. American companies benefit from a highly developed financial sector that offers a diverse array of financing alternatives. In contrast, Indian companies face more rigorous requirements that influence their decisions pertaining to Capstrt..

The COVID-19 pandemic has highlighted the importance of incorporating adaptation into financial strategy on a global scale. Both corporations listed in the indices have encountered significant challenges, with Liq and profitability being the key determinants impacting their Lev decisions. The economic uncertainty caused by the epidemic has led businesses to reevaluate their Capstrt.s, placing greater emphasis on financial flexibility rather than other factors.

4-4- Distribution of Lev (Box Plot Technique)

Figures 2 and 3 illustrate the distribution of Lev for both samples over the 2011–2021 period using Box plots. The Box-and-whisker plot visually represents the five-number summary (minimum, first quartile, median, third quartile, and maximum) through a central box with whiskers that extend to non-outlying values, providing a clear depiction of the data's spread and potential outliers. In Figure 2, for all the individual years examined, it can be inferred that the per year data distribution for Lev (S&P500) over the study period is symmetrical as the median is approximately centered between the quartiles and the whiskers are of similar length. Conversely, in Figure 3, it can be observed that the per year data distribution for Lev (NSE CNX500) over the study period, the distribution appears skewed, as indicated by the median’s asymmetric placement within the quartiles and the unequal whisker lengths

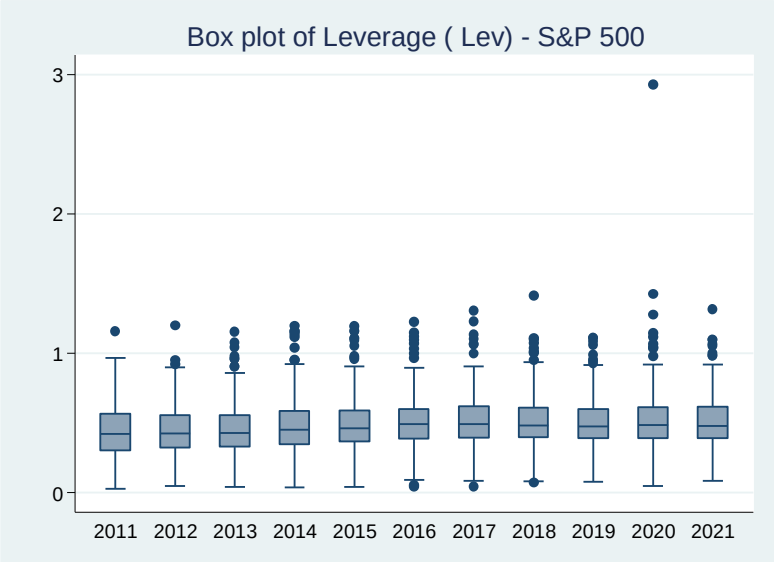

Figure 2. Box plot of Leverage (Lev) - (S&P500)

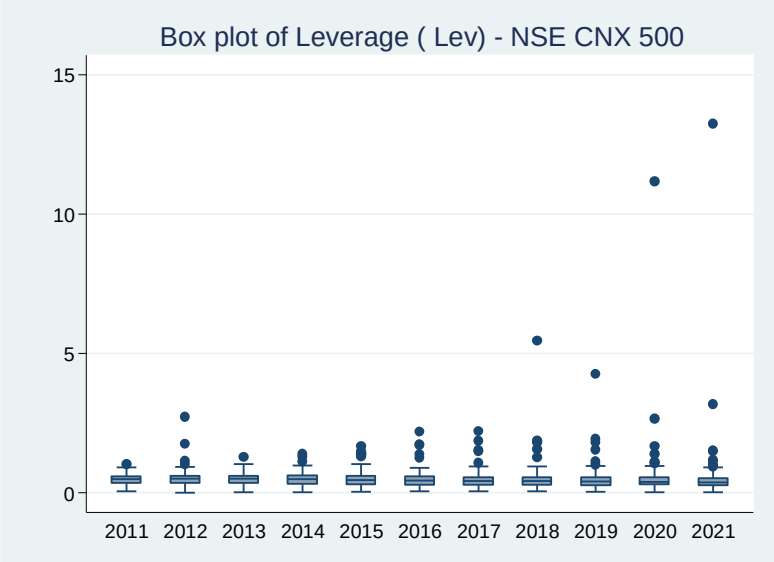

Figure 3. Box plot of Leverage (Lev) - (NSE CNX500)

4-5- Regression Results

Table 7 shows the estimated results of the 2SLS regression of Gr, Liq, NDts, ROE, S,Tang, WUI, SDG, Covid, and loss-making firms on Lev. It has been observed that for the sample of S&P500 , Liq, NDts, ROE, S,Tang, SDG ,and loss-making firms has a statistically significant relationship with Lev at $p<0.01$ indicating that Liq, NDts, ROE, S,Tang, SDG ,and loss-making firms have a significant impact on Lev, However Gr,WUI, and Covid have no impact on Lev.Incase of sample of NSE CNX500 , Liq, NDts,S, SDG ,and loss-making firms have a statistically significant relationship with Lev at $p<0.01$and Tang has a statistically significant relationship with Lev at $p<0.05$ indicating that Liq, NDts, S,Tang, SDG ,and loss-making firms have a significant impact on Lev, However Gr,ROE,WUI, and Covid have no impact on Lev.The overall model is sigificant as the Prob(F-statistic) < 5%. As the Durbin-Watson stat value is between 0 and 2, there is positive autocorrelation amongst the independent and dependent variable. A further examination known as the Breusch-Godfrey test has been performed to detect the presence of autocorrelation. The Breusch-Godfrey test specifically focuses on identifying autocorrelation within the errors that arise in a regression model. This test utilizes the residuals obtained from the regression analysis being considered, and a test statistic is subsequently derived from these residuals. The results of our analysis indicate the existence of serial correlation within our model, as evidenced by a probability of less than 0.05 for both the S&P 500 and the NSE CNX500 samples.

A critical analysis is necessary to acquire a better understanding of the implications and limitations of the data reported in Table 7. The results demonstrate a persistent negative effect of Liq and Tang on Lev in both S&P 500 and NSE CNX 500 businesses, suggesting a clear and direct relationship. There is a possibility that businesses with greater Liq or

tangible assets may have a decreased reliance on external funding. The deduction outlined above, albeit rational, has the potential to oversimplify the complex decision-making process that underlies Lev. While Liq and Tang have considerable importance, their impact on Lev is subject to various other factors such as market conditions, firm-specific risk profiles, and strategic priorities. However, these elements have not been extensively investigated in the present study.

The divergence in the impact of Gr, sustainable practices (as per the United Nations Sustainable Development Goals), and the presence of unsuccessful firms on Lev between the S&P 500 and NSE CNX 500 can be ascribed to unique market dynamics and regulatory regimes in the United States and Indian markets. However, it is crucial to recognize that solely ascribing the discrepancies to these factors may overlook the complex interplay among these variables within each market. Factors such as expectations of future market situations or the unique characteristics of the Gr, such as whether it is organic or acquisition-led, might alter the influence of Gr on Lev decisions. The impact of sustainable practices on Lev can be influenced by several aspects, such as current industry norms, stakeholder expectations, and the specific attributes of the implemented sustainability initiatives.

Moreover, while the presence of businesses that experience losses vary in its impact on Lev between the two indexes, a more detailed analysis is required to completely understand this discovery. The financial loss experienced by a corporation can be attributed to a range of issues, including strategic investments made for future expansion, operational inefficiencies, or a decrease in market demand. The regression analysis fails to consider the underlying factors contributing to the losses, which may potentially influence the influence of this status on Lev's decision-making process.

The elimination of GMM requires its elimination, while the preservation of GMM enables a favorable restatement of the assertion. Moreover, the technique, while robust, does possess certain limitations. One effective approach for addressing endogeneity is the utilization of 2SLS Regression. The cautious selection of instruments and the avoidance of any association with the erroneous term in the second stage regression are of utmost importance. Failure to meet the assumptions may result in estimations that nevertheless display bias. Moreover, it is crucial to recognize that the regression results are inherently limited by the dataset utilized. The connections between the factors under consideration and Lev may be influenced by unobserved variables and the dynamic nature of the business environment.

Table 7. Two-Stage Least Squares Regression results

Two-Stage Least Squares Regression results (S&P500)					Two-Stage Least Squares Regression results (NSE CNX500)				
Dependent Variable: lev					**Dependent Variable: lev**				
Method: Two-Stage Least Squares					**Method: Two-Stage Least Squares**				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**	**Variable**	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
Gr	0.006621	0.00951	0.696175	0.4864	**Gr**	0.0027	0.003865	0.698451	0.4849
Liq	-0.05988	0.002299	-26.04273	0.0000	**Liq**	-0.07022	0.003256	-21.56912	0.000
NDts	-0.502537	0.140688	-3.571994	0.0004	**NDts**	1.275103	0.260281	4.898947	0.000
ROE	0.002344	0.000683	3.43157	0.0006	**ROE**	-0.003312	0.004835	-0.684927	0.4934
S	-0.006922	0.002393	-2.893021	0.0038	**S**	0.015553	0.003414	4.555806	0.000
Tang	-0.094037	0.014595	-6.443028	0.00000	**Tang**	-0.070676	0.028218	-2.504639	0.0123
WUI	-0.007548	0.005861	-1.287777	0.1979	**WUI**	-0.005356	0.023067	-0.232205	0.8164
SDG	0.028395	0.006608	4.297162	0.00000	**SDG**	-0.030892	0.011708	-2.638591	0.0084
Covid	0.000208	0.007839	0.026598	0.9788	**Covid**	0.00211	0.014784	0.142714	0.8865
Loss	0.200301	0.009336	21.45485	0.00000	**Loss**	0.129598	0.020461	6.333834	0.000
Coefficient	0.763755	0.057051	13.38731	0.00000	Coefficient	0.205382	0.084881	2.419644	0.0156
R-squared	0.255954	Mean dependent var		0.49128	R-squared	0.13558	Mean dependent var		0.462356
Adjusted R-squared	0.253866	S.D. dependent var		0.19774	Adjusted R-squared	0.133507	S.D. dependent var		0.357915
S.E. of regression	0.170802	Sum squared resid		103.97390	S.E. of regression	0.333167	Sum squared resid		462.7598
F-statistic	122.6025	Durbin-Watson stat		0.58221	F-statistic	65.38893	Durbin-Watson stat		0.680639
Prob (F-statistic)	0.0000	Second-Stage SSR		103.97390	Prob(F-statistic)	0.00000	Second Stage SSR		462.7598
J-statistic	3564	Instrument rank		12	J-statistic	4169	Instrument rank		12
Prob (J-statistic)	0.0000				Prob(J-statistic)	0.00000			
Breusch-Godfrey Serial Correlation LM Test:					**Breusch-Godfrey Serial Correlation LM Test:**				
Obs*R-squared	1873.292	Prob. Chi-Square (2)		0.00000	Obs*R-squared	1836.469	Prob. Chi-Square (2)		0.00000

Table 8 provides an elucidation of the outcomes of the Heteroskedasticity & Stability Test for both the S&P500 and NSE CNX500 samples. The Breusch Pagan Test is employed in order to examine the presence of heteroskedasticity within a linear regression model, assuming that the error terms exhibit a normal distribution. It assesses whether the variance of the errors in a regression is contingent upon the values of the independent variables. Heteroskedasticity refers to scenarios where the variance of the residuals is dissimilar across a range of observed values. When conducting a regression analysis, heteroskedasticity results in an uneven dispersion of the residuals (also referred to as the error term). Given that the probability value for both samples is below 0.05, the data is considerably heteroscedastic. Ramsey's RESET test is a diagnostic procedure designed to assess whether the specified functional form of a regression model is appropriate. In essence, it evaluates whether the relationship between the dependent variable and the independent variables should be modeled linearly, or if a non-linear form would be more suitable. As the probability value for both samples are below 0.05, the dependent variable and the independent variables manifest themselves in a non-linear form.

Table 8. Heteroskedasticity & Stability Test results

Heteroskedasticity & Stability Test results (S&P500)			
Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	16.92703	Prob. F (10,3564)	0.0000
Obs*R-squared	162.0941	Prob. Chi-Square (10)	0.0000
Scaled explained SS	872.1026	Prob. Chi-Square (10)	0.0000
Stability test: Ramsey RESET Test			
	Value	**df**	**Probability**
t-statistic	5.620771	3563	0.0000
F-statistic	31.59307	(1, 3563)	0.0000
Difference in J-stats	3564.000	0	NA
Moment selection criteria			
SIC based:		3555.818	
HQIC-based:		3559.775	
Relevant MSC:		-22.20595	

Heteroskedasticity & Stability Test results (NSE CNX500)			
Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	4.071845	Prob. F (10,4169)	0.0000
Obs*R-squared	40.431	Prob. Chi-Square (10)	0.0000
Scaled explained SS	15110.44	Prob. Chi-Square (10)	0.0000
Stability test: Ramsey RESET Test			
	Value	**df**	**Probability**
t-statistic	17.58645	4168	0.0000
F-statistic	309.2833	(1, 4168)	0.0000
Difference in J-stats	4169.000	0	NA
Moment selection criteria			
SIC based:		4160.662	
HQIC-based:		4164.737	
Relevant MSC:		-6.456814	

Table 9. GMM MODEL (Generalized Method of Moments) Regression results

GMM MODEL (Generalized Method of Moments) Regression results (S&P500)				
Dependent Variable: lev				
Method: Generalized Method of Moments				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
Gr	0.000633	0.008799	0.071942	0.9427
Liq	-0.058393	0.00454	-12.86299	0.0000
NDts	-0.532472	0.293425	-1.814676	0.0697
ROE	0.001416	0.00099	1.430844	0.1526
S	0.001162	0.005273	0.220452	0.8255
Tang	-0.118173	0.030642	-3.856584	0.0001
WUI	-0.012805	0.003858	-3.319049	0.0009
SDG	0.027726	0.007779	3.564227	0.0004
Covid	-0.018566	0.008074	-2.299405	0.0215
Loss	0.094109	0.02319	4.058134	0.0001
Coefficient	0.581713	0.124619	4.667924	0.0000
R-squared	0.212688	Mean dependent var		0.49128
Adjusted R-squared	0.210479	S.D. dependent var		0.197736
S.E. of regression	0.175698	Sum squared resid		110.0199
Durbin-Watson stat	0.506242	J-statistic		133.9539
Instrument rank	12	Prob(J-statistic)		0.0000

GMM MODEL (Generalized Method of Moments) Regression results (NSE CNX500)				
Dependent Variable: lev				
Method: Generalized Method of Moments				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
Gr	0.003601	0.001584	2.272797	0.0231
Liq	-0.062213	0.015604	-3.987099	0.0001
NDts	-0.746364	0.475387	-1.570016	0.1165
ROE	-0.004998	0.003293	-1.518063	0.1291
S	0.01813	0.004999	3.627098	0.0003
Tang	-0.017791	0.044667	-0.398294	0.6904
WUI	0.005182	0.010572	0.490144	0.6241
SDG	-0.041451	0.008672	-4.779576	0.000
Covid	-0.024988	0.01094	-2.284192	0.0224
Loss	0.161702	0.021809	7.414605	0.000
Coefficient	0.165399	0.142882	1.157597	0.2471
R-squared	0.117732	Mean dependent var		0.462356
Adjusted R-squared	0.115616	S.D. dependent var		0.357915
S.E. of regression	0.336589	Sum squared resid		472.3149
Durbin-Watson stat	0.684497	J-statistic		2.450412
Instrument rank	12	Prob(J-statistic)		0.117494

A critical examination of Table 9, which presents the Generalized Method of Moments (GMM) regression results for firms listed in the S&P 500 and NSE CNX 500 indices, provides nuanced and context-rich insights into the determinants of leverage (Lev) across developed and emerging market environments. The GMM approach, by controlling for potential endogeneity, enhances the reliability of the estimated relationships and allows for a more accurate interpretation of the causal dynamics influencing capital structure decisions. For the S&P 500, the insignificant effect of Growth (Gr) on leverage ($p = 0.9427$) suggests that U.S. firms' financing decisions are not substantially influenced by short-term sales expansion or growth opportunities. This outcome aligns with the characteristics of mature capital markets, where firms often rely on retained earnings or equity issuance to fund expansion, thereby minimizing dependence on debt. The negative and highly significant coefficients for Liquidity (Liq) and Tangibility (Tang) reinforce traditional capital structure theories, indicating that firms with abundant internal resources or collateral assets are less inclined to borrow externally. This pattern supports both the pecking order theory, which posits that firms prioritize internal financing, and the trade-off theory, which emphasizes balancing debt-related tax advantages against bankruptcy risks. The negative and significant effect of the World Uncertainty Index (WUI) further implies that macroeconomic volatility and policy uncertainty induce firms to adopt more conservative capital structures. During uncertain periods, firms may restrain borrowing to safeguard liquidity, maintain financial flexibility, and mitigate exposure to systemic risks. The positive and statistically significant coefficient for Sustainable Development Goal (SDG) commitment, however, presents an intriguing contrast. It indicates that U.S. firms engaging in sustainability and ESG-aligned initiatives are rewarded with improved access to credit and lower financing costs. This finding suggests that investors and creditors in developed economies increasingly perceive sustainability practices as indicators of lower risk and long-term value creation. Additionally, the strong positive relationship between leverage and loss-making status in S&P 500 firms highlights a counterintuitive yet important dynamic: financially distressed firms may resort to additional borrowing as a short-term liquidity mechanism to cover operational deficits or restructure obligations. However, this behavior simultaneously increases financial vulnerability, underscoring the delicate balance between short-term solvency management and long-term stability.

Conversely, the NSE CNX 500 results reflect a distinctly different market behavior shaped by the institutional realities of an emerging economy. Here, Growth (Gr) shows a positive and significant relationship with leverage, suggesting that Indian firms rely more heavily on debt to fund expansion. This is likely due to limited equity market depth, constrained venture financing channels, and a more relationship-based banking system that encourages debt-driven growth. The negative and significant coefficient for Liquidity (Liq) is consistent with financial theory, confirming that firms with greater internal cash reserves prefer to reduce external borrowing to maintain autonomy and minimize financing costs. Firm Size (S) exhibits a strong positive association with leverage, indicating that larger Indian firms, endowed with better reputations and stronger collateral positions, enjoy privileged access to credit markets. This pattern supports the view that in emerging economies, firm reputation and scale act as informal substitutes for institutional credit quality and disclosure transparency. Interestingly, Tangibility (Tang) is not statistically significant in the Indian context, suggesting that asset-based lending is less prevalent or effective due to weaker enforcement of property rights, imperfect collateral valuation systems, and higher default risks in debt markets. In contrast to the U.S. findings, the negative and significant coefficient for SDG underscores that sustainability initiatives are not yet fully valued by Indian investors or creditors. This result may reflect lower ESG awareness, inconsistent sustainability disclosure standards, and the perception that environmental and social commitments impose additional compliance costs without immediate financial returns. This highlights a crucial policy implication: enhancing ESG reporting frameworks and investor literacy in emerging markets could bridge this perception gap and foster capital market rewards for sustainable practices. Furthermore, the negative coefficient for COVID-19 across both datasets indicates that the pandemic exerted a uniform deleveraging effect on firms globally. The widespread economic contraction and uncertainty led corporations to prioritize liquidity retention, reduce leverage exposure, and reassess risk tolerance. This trend reflects a global shift toward financial prudence and risk mitigation during crisis periods.

Finally, the persistent positive impact of loss-making status on leverage across both markets suggests that unprofitable firms continue to depend on debt financing due to constrained access to equity or limited internal funds. However, this dependency may exacerbate financial distress and raise systemic risks if not supported by robust restructuring mechanisms. In interpreting these results, it is also important to clarify several technical diagnostics used in the GMM model to assist non-specialist readers. For instance, the "instrument rank" refers to the number of valid instrumental variables included in the model. These instruments are used to correct for endogeneity by replacing endogenous regressors with variables that are correlated with them but uncorrelated with the error term. A sufficiently high instrument rank is necessary to ensure identification, though too many instruments can lead to overfitting. Additionally, the "Sargan's test" (often referred to via the J-statistic) is a post-estimation diagnostic that tests the overall validity of the instruments. A low p-value (e.g., < 0.05) suggests that the instruments may be invalid (i.e., correlated with the error term), while a higher p-value supports their appropriateness. These tests are central to confirming the robustness of GMM estimations, and brief explanatory notes like these can enhance accessibility for readers less familiar with advanced econometric diagnostics.

In summary, these GMM regression results reveal that leverage determinants are deeply context-dependent. While liquidity and financial distress exert consistent effects across markets, variables such as growth, firm size, and sustainability orientation demonstrate divergent behaviors influenced by institutional maturity, regulatory quality, and investor perception. The findings confirm that capital structure decisions cannot be generalized across economies; instead, they emerge from an interaction of firm-level attributes, macroeconomic conditions, and governance environments. Future research could enhance this analysis by integrating qualitative dimensions such as managerial decision-making behavior, investor sentiment, and corporate governance mechanisms to provide a more holistic understanding of leverage dynamics in diverse financial systems.

5- Conclusions

This study examined the determinants of Capstrt. by comparing firms listed in the S&P 500 (United States) and NSE CNX 500 (India) over the period 2011–2021. Using GMM and 2SLS regression models, the results revealed that profitability, firm S, and Tang have a significant positive influence on Lev, whereas Liq, NDts, and sustainability commitments (ESG/SDG) negatively affect it. Additionally, macro-level variables such as the World Uncertainty Index (WUI) and COVID-19 crisis exhibited a negative association with Lev, suggesting that external shocks and crisis conditions prompt firms to reduce debt exposure and prioritize liquidity preservation. These findings align with the trade-off and pecking order theories while extending them by integrating uncertainty, sustainability, and crisis effects into the Capstrt. framework.

The results contribute to the Capstrt. literature by offering comparative evidence from both developed and emerging markets, emphasizing how institutional contexts shape financing strategies. For policymakers, the findings highlight the need to strengthen financial stability frameworks and enhance access to sustainable financing instruments during uncertain periods. Corporate managers are encouraged to maintain an optimal balance between equity and debt while embedding sustainability principles into financing decisions. Investors can use these insights to better assess firm resilience and creditworthiness, particularly under conditions of uncertainty. Overall, this research advances understanding of Capstrt. dynamics by combining traditional theories with contemporary factors—providing a holistic framework that captures the evolving nature of corporate financing decisions in a globally integrated and risk-sensitive environment.

While the present study focuses primarily on quantitative determinants of Capstrt., incorporating qualitative variables could further enrich the model and deepen interpretation. Factors such as managerial risk aversion, organizational culture, and societal attitudes toward debt influence how financing choices are perceived and implemented but are difficult to capture through financial ratios alone. For instance, managerial conservatism or family-control preferences may lead firms to avoid external borrowing even when market conditions are favorable. Similarly, cultural norms regarding indebtedness and risk tolerance can shape firms' optimal Lev decisions differently across developed and emerging economies. Integrating such behavioral and cultural dimensions through survey-based or mixed-method approaches would provide a more holistic understanding of how managerial judgment and social context interact with traditional financial determinants. Future research could therefore combine firm-level quantitative analysis with qualitative insights to explore how perceptions, norms, and leadership orientations moderate Capstrt. decisions.

6- Declarations

6-1- Author Contributions

Conceptualization, H.H., S.D., and N.T.; methodology, H.H., S.D., and N.T.; software, S.D.; validation, N.T. and S.D.; formal analysis, H.H. and S.D.; investigation, N.T. and S.D.; resources, S.D.; data curation, H.H. and S.D.; writing—original draft preparation, H.H., N.T., and S.D.; writing—review and editing, H.H. and N.T.; visualization, S.D.; supervision, H.H.; project administration, H.H. All authors have read and agreed to the published version of the manuscript.

6-2- Data Availability Statement

The data presented in this study are available in the article.

6-3- Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

6-4- Institutional Review Board Statement

Not applicable.

6-5- Informed Consent Statement

Not applicable.

6-6- Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this manuscript. In addition, the ethical issues, including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, and redundancies have been completely observed by the authors.

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