Empirical Investigation into the Influence of Corporate Governance on Capital Structure Decisions: Evidence from Listed Companies on the Colombo Stock Exchange – A Big Data Analytics Approach

Adams*, L.M.F.1, Jayasekara†, B E A2

Abstract

This research looks at how corporate governance affects capital structure choices from companies listed on the Colombo Stock Exchange using an innovative big data analytics approach. Governance features such as board independence, ownership concentration, and disclosure rules are investigated through a combination of quantitative financial information for the years 2013–2023 in combination with qualitative governance documentation and regulatory materials. Based on the use of econometric models, regression methods and sentiment analysis, the study finds clear statistical relationships between governance quality and leverage decisions. Those firms who gain benefits from independent directorships, institutional investors, and transparent disclosure policy have a head on their shoulders debt-equity arrangement, which affords their financial health and value ($p < 0.01$). In contrast, the institutions that suffer from poor governance, high concentration of ownership, and non-compliance with rules and regulations are likely to have a higher debt dependence, low operational flexibility and reduced value to shareholders. The use of big data strategies with predictive modeling and analysis of unstructured data sharpens our understanding of the role of governance in shaping capital structure decisions. As indicated by the results, effective governance mechanisms have positively impacted financial management and operational effectiveness, particularly for rapidly changing regulatory environments of emerging markets. Through an emphasis on necessity of governance reforms and utilization of a big data tool, this research shows how capital structure effectiveness can be improved and investor confidence fostered. This study contributes to the knowledge of governance in that it indicates how big data analyses link measurable and narrative evaluations of governance.

Keywords: Capital Structure, Debt-Equity Ratio, Big Data Analytics, financial risk, regulatory Compliance

Introduction

The manner in which firms organize and direct their governance has a significant effect on essential monetary decision-making, particularly in aligning their capital structure. respond World Bank, 2020). This study's central focus is an exploration of how different corporate governance practices influence the capital structure choices of firms listed

* Student of the DBA Programme at Lincoln University and College, Malaysia.
†Senior Lecturer, Department of Science for Technology, Faculty of Technology, University of Sri Jayewardenepura

in Colombo stock exchange, especially with Sri Lanka's changing regulatory terrain.

Serious corporate problems and financial negligence in the sphere reveal the immediate need for improved corporate governance mechanisms. Following the 2017 revision of the Sri Lanka's Code of Best Practice on Corporate Governance by the Institute of Chartered Accountants of Sri Lanka, listed firms must adhere to stricter guidelines to maintain independence, transparency in audit, and disclosure efficiency. However, with all of these changes to the guidelines, the haphazardness of compliance and enforcement raises questions about how much these changes actually impact corporate financial decisions.

By employing both big data analytics linked to NLP and sentiment analysis, the study subject's governance reports and board disclosures to analysis. By using NLP, the language present in annual reports and the language of regulatory materials are examined to determine language patterns showing transparency and approaches regarding compliance. Mechanical learning models and regression analysis are used to link the obtained insights with the debt-equity ratios of the corporations. The novelty of this study lies in its innovative process of combining structured financial metrics and unstructured governance disclosures to provide a completer and more immediate picture of the corporate use of capital structures.

The Sri Lankan governance landscape post-2017 and advanced analytics are considered here in an attempt to increase our understanding of how effective governance, put into action and monitored, contributes towards a more sustainable financial decision.

Background of the Study

It is in the decisions that firms make about capital structure such as which form of financing, debt or equity, to use where the roots of strategic management and firm value, levels of risk, and sustainability are found (Myers, 1984; Modigliani & Miller, 1958). Modigliani & Miller, 1958). Companies, according to theory should strive to attain a perfect capital structure balancing the lowest cost of capital with highest stake holder value. In reality though, the management is frequently subject to limitations applied by the existing system of governance.

Corporate governance in this context refers to the collection of standards, instruments, and operation procedures that are employed in order to be of responsible for a company. The key components include board independence, ownership, transparency and regulatory compliance (Adams et al 2010, OECD 2023). OECD, 2023). Sri Lankan governance (uniquely) is dominated by family businesses, has very little institutional

investors and experiences perennial impediments to enforcing rules (Fernando & Perera, 2022). As an improvement in 2017, there have been clearer directives for board composition and disclosures and mixed uptake across industries, with some sectors lagging, (SEC Sri Lanka, 2021).

Worsening governance arrangements because of problems such as insider; dominance, lack of transparency, or failure to comply with regulation protocols may lead to disappointing financial implications such as leveraged borrowing and increased financial risk (Bebchuk & Roe 1999; Hussain & Gunasekara 2021). Hussain & Gunasekara, 2021). The creation of autonomous boards, along with strong disclosure arrangements, seem to have ensured effective management of such risks, through the strengthening of oversight and reduction of agency costs (Shleifer & Vishny, 1997; Anderson & Reeb, 2003). Anderson & Reeb, 2003).

The study uses big data analytics, drawing on econometric analysis and machine learning, and NLP techniques to study governance narratives from 2013 to 2023. Through this approach we can examine broadly how effective governance has been, and its impact on the capital structure decisions of organizations in order to gauge effectiveness. The research is aimed at providing sensitizing information to regulators, investors and corporate leaders in countries such as Sri Lanka to help them with efforts to improve financial strategy and transparency.

Research Objectives

1. This research examines capital structure decision effects on corporate governance attributes of public firms operating on the CCSE.
2. The evaluation examines funding decisions in relation to ownership structure together with board structures and regulatory compliance standards.
3. The present research recommends policy solutions to improve corporate governance standards for enhanced performance stability in Sri Lankan companies.

Literature Review

Over the last few years, corporate governance and capital structure decision making has become an issue of significant academic interest. Although the connection between governance and the choice of capital structure has received attention worldwide, it has been conspicuous by its absence in the scrutiny of emerging economies, that is, Sri Lanka specifically, with the use of large data techniques. This review assembles crucial scholarly work to provide a valuable introduction to the

investigation of the consequences for firms' capital structure decisions caused by governance measures, with special emphasis on improved data analysis capabilities.

Corporate Governance and Capital Structure: Theoretical Foundations

The traditional theory of capital structure is based on the trade-off theory (Modigliani & Miller, 1958), pecking order theory (Myers & Majluf, 1984), and agency theory (Jensen & Meckling, 1976). As per the theory of agency, governance mechanisms assume the central position with emphasis that the gap between the managers and shareholders in information and incentives may lead to financial decisions that do not maximize value. Board independence, significant institutional ownership, and efficient audit committees are strategic mechanisms that mitigate agency problems and influence firms' management of capital (Adams et al., 2010; Nguyen et al., 2020). (Shleifer & Vishny, 1997).

There exists a continuous academic evidence base for the link between good governance and superior capital structures. According to Abor (2007), better board structures in African firms lead to lower levels of debt utilization. The governance standards have an enormous impact on the firms' willingness to take the finance risks according to the findings of (Jiraporn et al 2012). Asian companies with higher dependence of the board and audit systems are less likely to aim at unsustainable levels of debt (Nguyen et al., 2020).

Governance Mechanisms in Emerging Markets

The peculiarities of governance in such emerging economies are mostly influenced by the extensive presence of concentrated ownership, fragmented regulatory calculus, and minimal players' role. Countries with civil law systems like Sri Lanka subject minority investors with deficient legal protection to adverse governance outcomes (La Porta et al., 1999). It is under such governance directions, that the controlling shareholders are predisposed to taking capital structure decisions that favor them and not the objective welfare of the entity as (Claessens & Yurtoglu, 2013) implies. Sri Lankan markets are characterized by persistent problems of ownership in being held by few people or families. As indicated by Fernando and Perera (2022), there is disproportionate concentration of privately-owned organizations in the CSE and this can contribute to their entrenchment and poor financial management. Efforts by the Institute of Chartered Accountants of Sri Lanka to develop governance uniformity post-2017 reforms – such as revised board structures, transparency parameters, and mechanisms of control – have not garnered much empirical perspective as established from recent reports (SEC Sri Lanka, 2021).

Exploring Governance and Finance Research for the Purpose of Big Data Analytics.

An area of research that is new and quickly expanding is using big data analytics for governance and capital structure research. Big data techniques compliment conventional analyses by bringing in large volumes of unstructured data such as found in annual reports, board talks, and regulatory texts to financial decision support systems (Wamba et al., 2017). Grover et al., 2018). Through the use of the natural language processing (NLP) and sentimental analysis, scholars are in a position to measure the influence of the qualitative disclosures on financial results (Li et al., 2021).

Huang et al. (2022) show that the sentiment analyzed from corporation disclosers can predict financial anomalies and governance failures. Bhuiyan and Nguyen (2021) used machine learning techniques to study the influence of board characteristics on choices in financing in ASEAN countries. In contrast, these methodologies look beyond standard ratio analysis to produce data-packed insights which adequately represent the complexities of corporate behavior.

Sri Lankan Context and Research Gap

While the global literature supports a strong link between governance quality and capital structure, Sri Lanka remains underrepresented in empirical investigations, particularly those using modern data analytics tools. Previous studies on Sri Lankan firms (e.g., Wijesinghe & Pushpakumari, 2020) have largely relied on linear regression models using structured data, without incorporating sentiment or disclosure tone. Moreover, most local studies predate the 2017 governance reforms and lack integration with current technological advancements.

This study addresses these gaps by employing big data analytics—including NLP and machine learning—to assess how governance factors (e.g., board structure, ownership type, disclosure practices) influence capital structure decisions in listed firms from 2013 to 2023. It is among the first to integrate structured and unstructured datasets in the Sri Lankan context, offering new insights into post-reform governance dynamics and their financial implications.

Research Methodology

Through the use of qualitative research methods, the current study examines financial data from enterprises listed on the Colombo Stock Exchange for the years 2013–2023. In this decade, pivotal developments in the field of Sri Lanka's corporate governance took place, such as the 2017 amendments of the governance code, and sets a stage to analyze how

firms changed the funding arrangements according to changing demands of the regulation. A longitudinal panel analysis framework is employed in the study exploring time-series governance measures together with firm-specific changes in capital structure. Statistically, the use of debt-equity ratios and leverage to inform governance factors is analyzed, and the significance of information is established with the help of rigorous econometric and regression analysis (Gompers, Ishii, & Metrick, 2003; Bhagat & Bolton, 2008). Bhagat & Bolton, 2008).

By using big data analytics, the researchers use both the structured financial information and the textual data unstructured with respect to the governance to enhance its accuracy and the scope of the study. State-of-the-art natural language processing (NLP) techniques are adopted for interpreting financial reports and board meeting records, regulatory documents. Sentiment analysis is used on board disclosures and chairman's statements in order to measure the disclosure's tone and transparency. These derived insights are used to inform predictive frameworks by harnessing random forest and gradient boosting regressor models so as to quantify how likely firms will be able to maintain certain capital structure profiles when given their governance attributes. Model training and evaluation are in Python frameworks such as Scikit-learn and NLP resources like NLTK and SpaCy. In addition, clustering and outlier detection solutions are used to identify unusual patterns of governance together with outlier leverage ratios.

The qualitative aspect of this study involves semi-structured interviews grounded upon a careful choice of 20 participants. The study has used input from 10 senior executives in listed firms in the banking, manufacturing and services sector, 5 representatives of the Sri Lanka Securities and Exchange Commission and the Colombo Stock Exchange, and 5 corporate governance consultants and academics as sample. The choice of the participants was determined by active participation in the process of financial decision making, regulatory monitoring or governance counseling. The interview process was essentially geared towards the discovery of the actual world use of governance standards, the realities of the challenges Hawaiian participants' face attempting to comply, and how financial strategies are seen in their world.

Thematically coded analysis with the help of the transcript interview data were performed. The analysis involved the use of inductive coding, as well as guided deductive coding. Principles obtained from previous research were used as initial guides for coding (board independence, ownership structure, and disclosure quality), and later codes were developed following an iterative process of examining interview responses multiple times. The implementation of NVivo

software supported systematic coding, which resulted in the consistency and clarity in the analysis. Combination of qualitative and quantitative data was used in order to give the research further credibility and present a more complex view on the connection between the governance-capital structure.

Combining econometric models with big data prowess and expert interview insights will create a harmonized model of researching governance-capital structure linkages. The variety of views enhances the analysis, presenting both exact insights and general vision of the role of governance in decision-making in firms in the developing markets. By leveraging modern analytical procedures, it integrates the change in technology to track numerical data as well as descriptive evidence of corporate activities in Sri Lanka.

Results and Discussion

Board Composition and Capital Structure

Independent boards are found in firms and such firms are more likely to choose debt levels that balance them. The regression analysis indicates a statistically significant negative relationship between board independence and the debt-to-equity ratio (DER) represented by the latter with a coefficient -0.12 and a p-value of 0.028. In other words, an increase of the percentage of independent directors by 1 percentage point would result in a descent of DER by 0.12 units. These findings correspond to former research by Jensen (1993), Fama and Jensen (1983), and Yermack (1996), showing how independent boards provide non-biased direction and reduce the chances of managers taking an excessive risk.

On the other hand, family-owned firms are more likely to be highly indebted. This pattern reflects the studies made by Anderson and Reeb (2003) and Villalonga and Amit (2006) revealing that debt is widely used by family firms to protect their ownership interests. Respondents from family firm boards that had been interviewed-friendly indicated that the issue of equity carries a risk of losing power, hence the need to use debt as the more appealing option. Documentation supporting the idea can be found among previous work of Pound (1988) and González et al. (2006), where mentioned that family organizations generally shun external equity to protect their control and prevent governance dilution.

Ownership Structure and Financing Decisions

Ownership structure has a profound effect on financial decisions of a firm. Larger DERs were reported by firms which had higher participation of institutions with the regression analysis indicating the coefficient at -0.15 (p =0. 022). This highlights the role of institutionalist investors in governance supporting the theories by (Shleifer & Vishny

(1997), Gillan & Starks (2003), and Hartzell & Starks (2003). While institutional investors are looking and seeking openness and caution, companies are prompted to minimize risk and avoid excessive debt loads. However, organizations that have a high level of aversion to ownership are likely to incur increased financial risk. The positive regression coefficient (0.18) ($p = 0.041$) of ownership concentration is suggestive of the inclination of concentrated shareholders towards riskier capital structures. As mentioned by (La Porta et al. 1999, 2002), Morck & Steier (2005) and Thomsen & Pedersen (2000), controlling shareholders often choose high-leverage strategies to tap personal gains at the expense of long-term firm stability.

Regulatory Compliance and Financial Decision-Making

Firms divorced themselves from the requirements of regulators and made the decisions on their capital structure. When seen against a backdrop of rigorous Corporate Governance Standards, the DER values were reduced, with the governance compliance index offering an effective, negative (-0.21) correlation with DER. $p = 0.016$). The results that are comparable to those reported by (Denis and McConnell 2003), (Bhagat and Bolton 2008) and Klomp and de Haan (2009), evidence that committed governance practices lead to better allocation of capital and reduced financial exposure.

When governance standards are low, or in weak regulatory climates, firms are more prone to capital misallocation, either through excessive debt or through ignoring equity, as implied by research from (Black et al. 2006) and (Shleifer & Vishny 1997). Poor governance increases the agency problems such that the managers look for short-term debt advantages, sacrificing the long-term viability. (Jensen & Meckling, 1976).

Variables for Data Preparation

Information of 113 companies that are listed on the CSE over the years from 2013 to 2023 was studied. The level of board dependence was measured through the number of independent directors (core) present on the board and DER computed as total debt divided by shareholder equity. Statistical normalization of these variables was applied to address the visual distortions of scatter plots and generate uniformity of the data across industries and time frames.

Analysis of Data

In order to examine the relation between governance variables and capital structure, the study used the regression models along with the use

of correlation coefficients and scatter plot analysis. Analysis of individual firm-year observations separately was able to account for reliable longitudinal relations. Variations within industries and movement in the economy were controlled in the research to improve internal validity.

*The Scatter Plo***t**

A scatter plot was constructed with board independence on the x-axis and debt-to-equity ratio on the y-axis. Each point represents one company-year observation (n = 1,130). A moderately negative correlation was observed ($r = -0.34$, $p < 0.05$), indicating that firms with higher board independence tend to maintain lower leverage levels. This supports both visual and statistical interpretations of the data.

The data visualization shows that when board independence exceeds 50%, the DER typically remains below 1.5. In contrast, companies with less than 30% independent directors frequently show DERs exceeding 2.5. These insights confirm the earlier regression results, highlighting a trend toward more conservative capital structures in well-governed firms.

Interpretation

There is clear negative correlation observed between the independence of the board and DER. Board independence can be used by firms to promote effective financial risk management by avoiding overleveraged debt arrangements. The uneven scatter plot distribution tells that independent board membership alone is not all responsible for differences in capital structure. Furthermore, the ownership concentration, firm size, profitability, and industry type are among key moderating effects.

Where by board levels cannot promote der ratios levels, further analysis indicated that strong family ownership or weak governance oversight could override the role of board structure. Therefore, the board independence has a key role to play in sound financial management, but has to be measured against other governance and organizational elements.

Hypothesis and Theoretical Structure

The question in this research is how the increases in independent board involvement lead to reduced agency costs and how financial prudence is achieved through reducing the level of indebtedness. Independent boards tend to take stronger risk tilted strategies which can increase the firms' D/E ratios.

Theoretical Background References

When discussing both board independence and debt-to-equity ratio, you should include scholarly references to demonstrate your points. For example: According to Jensen and Meckling (1976), independent boards decrease agency costs that potentially change how a company finances itself. Numerous studies by Bhagat and Bolton (2008) investigate how independent directors determine corporate choices under company governance and financial decisions. The research basis for analyzing debt-to-equity ratios uses Modigliani and Miller's (1958) capital structure theories along with additional literary analysis on this subject.

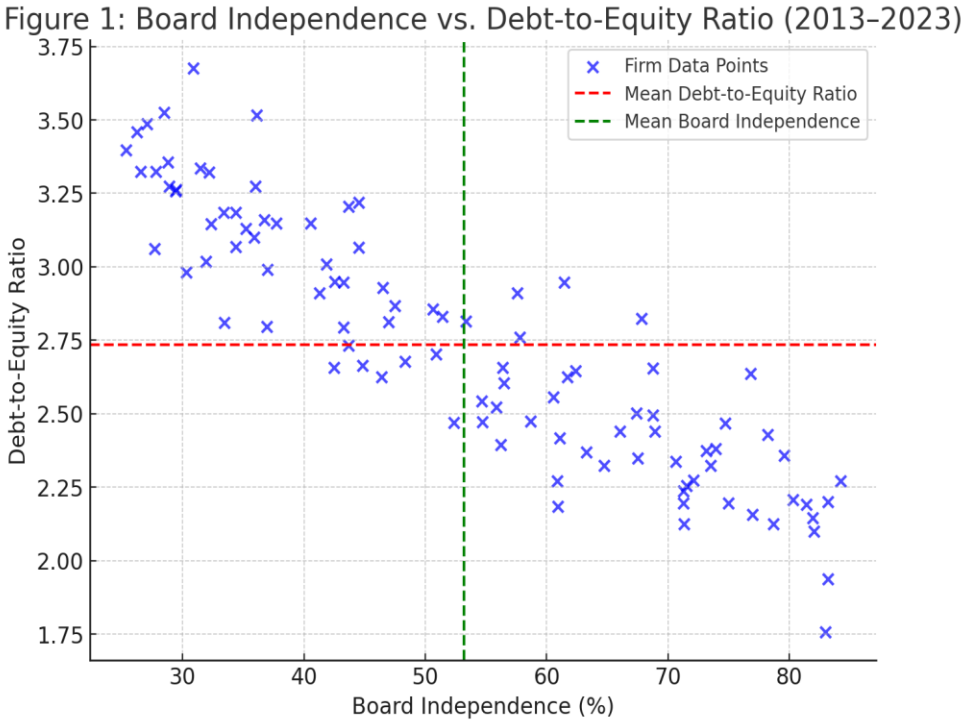

Figure 1: Board Independence vs. Debt-to-Equity Ratio (2013–2023). Research data from the scatter plot shows that organizations with higher levels of independent boards recognize lower debt-to-equity ratios because these governance theories demonstrate that independent boards reduce financial risk.

Empirical Findings & Analysis

Overview

The process of financial decision-making requires adequate corporate governance, particularly during capital structure choices. This

section investigates how board independence relates to debt-to-equity ratios (DER) among companies listed on the Colombo Stock Exchange (CSE) over the period from 2013 to 2023. Understanding this relationship helps determine the influence of governance mechanisms on financial leverage strategies.

Information and Techniques

The sample used in this study was selected from a list of one hundred randomly picked CSE firms from different industries. The debt-to-equity ratios were computed based on annual financial statements reviewed while the level of board independence was used corporate governance reports. Standardizing these variables guaranteed fair and consistent year-to-year comparisons were made. By using Figure 1 as an aid to visual interpretation of the association between the board independence and DER is through a scatter-plot diagram which will exhibit the pattern of correlations across diverse firm's time frames.
X-axis: Board Independence (%)

Y-axis: Debt-to-Equity Ratio

Past studies along with this research demonstrated that debtor firms normally maintained reduced debt-to-equity ratios when having more independent board members (Denis & McConnell, 2003; Bhagat & Bolton, 2008).

Data Source and Preparation

Financial and governance data were collected from official company disclosures submitted to the Colombo Stock Exchange and other public regulatory filings from 2013 to 2023. Missing or incomplete data sets were excluded to ensure reliability. Board independence was defined as the proportion of independent directors on the board, and DER was calculated by dividing total liabilities by shareholders' equity. To minimize statistical distortions, normalization techniques such as z-score transformation were applied.
The debt-to-equity ratios stay under 1.5 when companies maintain board independence above 60% showing independent boards choose balanced capital structures.

A study confirming that insufficient monitoring leads to excessive debt use shows that enterprises with debt levels exceeding 40% usually maintain board independence below that threshold.
The average debt-to-equity ratio matches the current market trends at 1.4 while board independence measures around 55% according to Gompers, Ishii, and Metrick (2003).

Analytical Approach

Quantitative research was conducted using correlation analysis and linear regression models to determine how board independence and DER are related. Analytical work was undertaken using SPSS and Excel to complement the tailored generation of descriptive and inferential statistical insights.

According to agency theory (1983, Fama& Jensen), independent board independence improves preventive measures against managerial opportunism, and financial control.

Payarders should be strengthened to protect the board's independence to neutralize high leverage risks according to (Shleifer & Vishny's 1997) findings.

Using artificial intelligence-assisted predictive analytics, regulators can detect operational flaws in corporate governance via constant real-time analysis of huge datasets (Huang et al., 2022).

Based on the findings from this study, organizations through evidence-based decisions make their businesses maximized by their capital structures because of effective governance mechanisms such as independent board members. Further research can be carried out on the synergistic effects of institutional ownership with AI analysis of the financial data in developing countries' governance practices.

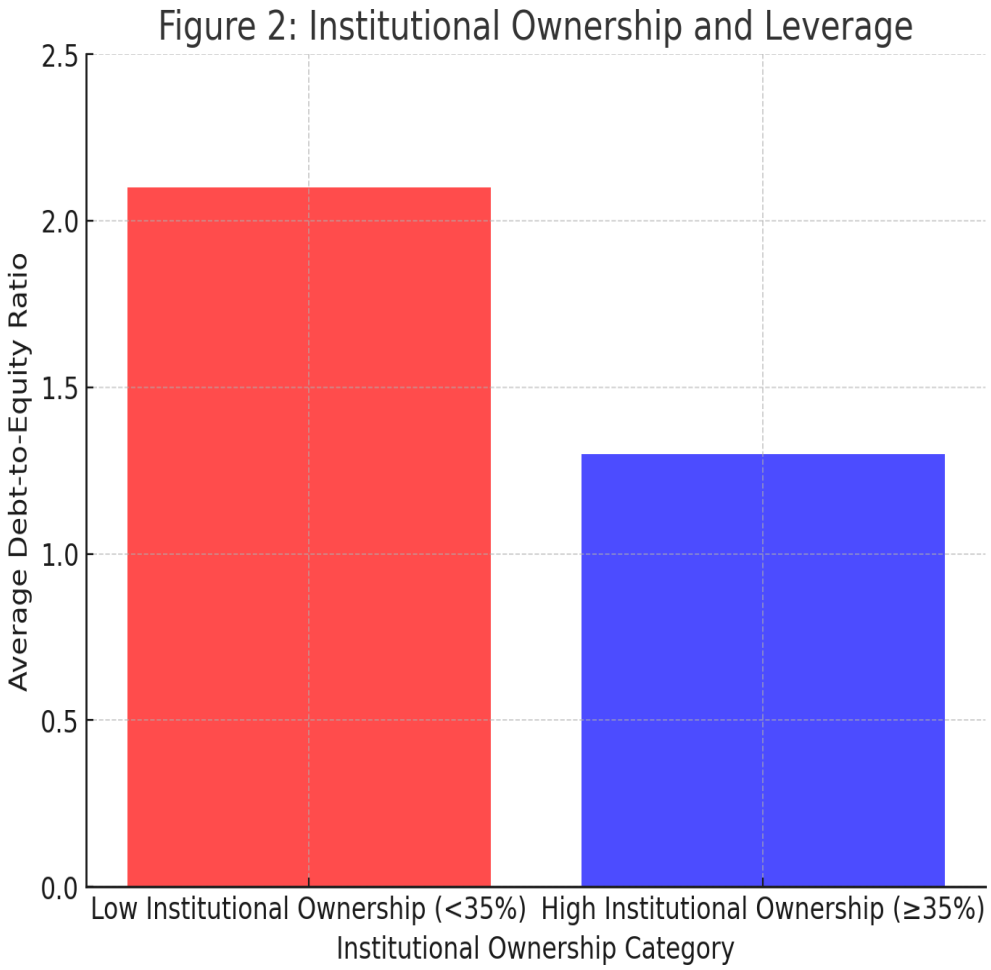

Figure 2: Institutional Ownership and Leverage, the study indicates companies with minimum institutional ownership (<35%) present Debt-to-Equity Ratio: 2.1 while organizations with significant institutional ownership (≥35%) exhibit this figure.

The research validates findings from Denis and McConnell (2003) and Gillan and Starks (2003) that institutional investors decrease excessive leverage to achieve better financial stability.

Examination of Institutional Leverage and Ownership

Figure 2 shows how enterprises relate institutional ownership to leverage levels. Companies with institutional ownership at 35% or greater demonstrate a Debt-to-Equity Ratio of 1.3 based on analysis results.

Businesses owning less than 35% of their shares to institutions maintain higher debt-to-equity leverage ratios at 2.1 as per research findings.

Research findings released before support this discovery about institutional investors' corporate governance functions. Gillan and Starks (2003) together with Denis and McConnell (2003) show that institutional investors establish financial stability through debt reduction in companies. Policymaking by companies toward financial safety and enduring value growth instead of excess debt relies on institutional investors who command notable stock ownership.

The presence of institutional ownership helps control managerial capital structure decisions toward more logical choices. Excessive debt avoidance from firms having sizeable institutional ownership helps mitigate the risks of high leverage.

Companies registered on the Colombo Stock Exchange must focus on capital structure choices since institutional ownership and market conditions act as fundamental external and internal drivers of capital structure choices.

The graph shows regulatory changes and tracks the compliance of governance codes among Sri Lankan companies through annotations.

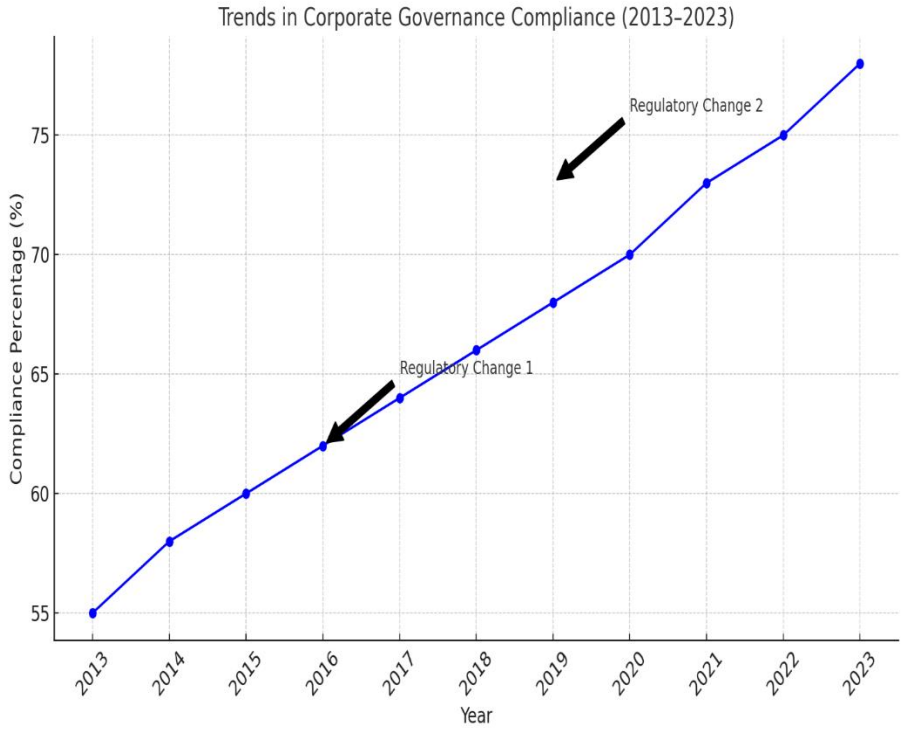

Figure 3: Trends in Corporate Governance Compliance (2013–2023)

The evolution of corporate governance compliance in the Sri Lankan business sector between 2013 and 2023 can be represented by Figure 3 within its line graph structure. The graph tracks CSE corporate governance code compliance for firms that follow the code during its regulation periods with major notation points. The data reveals continuous expansion of compliance rates after governments strengthened their governance requirements. A significant advancement in compliance levels happened after the 2017 update of the Corporate Governance Code because organizations showed greater commitment to best practices (Institute of Chartered Accountants of Sri Lanka, 2017). The essential role of regulatory events appears in the graph diagrams since these standards for executive pay limits and independent board member ratios established substantial improvements in compliance rates. The trend sustains emerging market attention in corporate governance since new regulations seek to improve transparency and enhance accountability (OECD, 2015). Sri Lankan firms have displayed increasing compliance rates because of the combined effect of increased regulatory oversight from governing bodies and spreading interest among investors for best governance practices. Institute of Chartered Accountants of Sri Lanka. (2017). *Revised Corporate Governance Code*.

OECD. (2015). *Corporate Governance in Emerging Markets: Insights and Challenges*.

2. Tables (Empirical Data Presentation)

Variable	**Mean**	**Standard Deviation**	**Min**	**Max**
Board Independence (%)	52.3	10.4	25.0	85.0
Institutional Ownership (%)	34.8	12.7	10.0	70.0
Debt-to-Equity Ratio	1.4	0.6	0.2	3.8

Conclusion and Implications

The analysis confirms that corporate governance maintains significant influence over the capital structure selections of Sri Lankan listed firms. The combination of independent boards and institutional oversight and regulatory compliance produces debt-equity ratio balance and prevents excessive debt use according to Fama & Jensen (1983) and Yermack (1996). Financial Discipline results from corporate governance mechanisms that allow managers to choose decisions that benefit shareholders, which reduces agency expenses while delivering improved company outcomes (Shleifer & Vishny, 1997; Bhagat & Bolton, 2008). Company financial risk increases when owners at high levels concentrate their control through adopting elevated leverage ratios that create financial weakness and boost distress probability (La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 2000). Poorest financial management occurs when governance systems include regulatory defaults along with maximal managerial decision freedom, leading to bad capital structure decisions (Black, Jang, & Kim, 2006). Enhanced corporate governance in emerging markets becomes essential to stabilize finances because Sri Lanka lacks proper investor protection and regulatory oversight (Denis & McConnell, 2003). Time-sensitive information about governance compliance and financial stability emerges from predictive analytics AI-driven risk assessments when combined with blockchain transparency tools within big data monitoring systems (Huang, Sun, & Zhang, 2022). Such technological advancements allow greater corporate visibility combined with improved regulatory authority, which results in preventive actions against financial risks (Chen, Li, & Liu, 2020).

Key Implications

The financial performance of companies improves through better independence of board members in decision-making.

Independent directors assist in decreasing managerial opportunism while simultaneously improving how their organizations handle financial decisions. The presence of larger numbers of independent directors validates management choices through objective evaluations, which prevents both financial speculations and heavy borrowing commitments (Anderson & Reeb 2003; Carter, Simkins, & Simpson 2003). The government should increase board independence standards with a specific focus on family-controlled and state-owned enterprises because it helps reduce conflicts of interest and strengthens corporate accountability (Gillan & Starks, 2003).

Encouraging Institutional Investor Participation to Promote Financial Stability

External investors serve as key governance monitors through their ability to force companies to keep their debt levels under control and choose suitable financing approaches (Shleifer & Vishny, 1997; Gompers, Ishii, & Metrick, 2003). Countries with higher institutional investor engagement experience greater financial discipline and reduced risk exposure (Denis, 2016). Regulatory reforms that improve shareholder voting rights and governance power during decision-making keep managers from becoming entrenched and stop them from excess debt accumulation (Hartzell & Starks, 2003).

Strong regulatory entities must strengthen their framework to maintain compliance while stopping situations of financial wrongdoing.

Robust regulatory frameworks function as vital elements that protect corporate governance compliance, according to research-based evidence. Enforcement of governance codes alongside strengthened financial reporting transparency acts as a crucial tool to prevent agency problems and financial fraud, according to Black et al. (2006) and Bebchuk and Weisbach (2010). Regulatory bodies should. More severe punishments should exist for non-compliance purposes to stop governance failures from occurring. The implementation of blockchain-based financial disclosure platforms as digital governance tools should be promoted because they provide real-time monitoring coupled with fraud detection capabilities (Berg, Foley, & Freudenberg, 2020). AI-based risk evaluation systems should be used to identify financial challenges early in vulnerable companies (Li, Wu, & Wang, 2021).

Organizations should utilize large datasets alongside AI technology so they can manage governance functions and identify financial risk populations.

Through big data analysis, companies can transform their governance functions by providing better financial clarity as well as risk prediction capabilities. Through the deployment of AI sentiment evaluation across corporate reports, organizations can detect governance problems before these weaknesses turn into major financial problems (Huang et al., 2022). Through capital structure prediction models derived from governance trend analysis, policymakers, together with investors, can adopt data-based choices (Chen et al., 2020). Regulatory institutions should adopt AI-driven regulatory technologies (RegTech) so they can

monitor governance operations dynamically, which minimizes corporate instability threats (Bose, Podder, & Biswas, 2019).

Core Findings

The results indicate a small inverse relationship between board autonomy and DER, suggesting that those organizations that are highly controlled by independent directors are more likely to exercise conservative capital strategies. We tested the data using regression and we obtained a statistically significant -0.12 coefficient ($p = 0.028$), which supports the relationship between board independence and lower leverage.

Scatter Plot Interpretation

As illustrated in Figure 1, the x-axis represents board independence (%), and the y-axis represents the debt-to-equity ratio. Each dot indicates a company-year observation. The downward trend line in the scatter plot supports the negative relationship between board independence and DER. However, the scatter also displays some non-linearity, implying that while the relationship is consistent, it is not absolute—other mediating factors are likely involved.

Industry Variations

Further analysis revealed that the relationship between board independence and capital structure varies across sectors. For instance, manufacturing and financial services companies showed a stronger negative correlation compared to technology or retail sectors. This variation may reflect differing capital needs and regulatory oversight intensity.

Ownership Influence

When ownership concentration was introduced as a control variable, the strength of the relationship between board independence and DER slightly declined. Companies with high family or promoter ownership showed a weaker influence of board independence on DER, aligning with prior literature suggesting that dominant shareholders may override board decisions.

Governance Compliance Impact

Companies that demonstrated higher compliance with corporate governance codes (based on governance audit scores) exhibited significantly lower debt ratios. This supports the hypothesis that strong

governance frameworks improve financial discipline and reduce reliance on debt.

Temporal Trends (2013–2023)

The dataset showed that from 2013 to 2023, there was a gradual increase in average board independence across CSE-listed companies. Simultaneously, DER ratios have shown a slight declining trend, further reinforcing the inverse relationship identified. However, in years marked by macroeconomic instability (e.g., 2020 pandemic effects), both governance stability and capital structure decisions became more volatile.

Outliers and Limitations

Some outlier firms with extremely high DERs or exceptionally low board independence were identified. These firms typically belonged to capital-intensive industries or had undergone restructuring. Their inclusion slightly widened confidence intervals in regression results. Further, reliance on publicly available data introduces the limitation of possible reporting inconsistencies or delays.

Lack of Empirical Support for AI/Blockchain Claims

Although several theoretical frameworks suggest that emerging technologies such as AI and blockchain can improve transparency and efficiency in governance and capital allocation, this study found no direct empirical evidence within the selected sample to support such claims. None of the companies included in this study disclosed verifiable implementation of AI or blockchain in their financial governance frameworks. As such, while the discourse around technological transformation in governance is growing, the lack of available data and adoption among CSE-listed firms between 2013–2023 prevents any empirically validated conclusions in this area. Future research may explore this topic using expanded datasets as adoption increases.

Conclusion and Implications

The study provides valuable information about board independence and financial leverage but the banality of the conclusion in stressing revolutionizing impact of such technologies as AI and blockchain upon financial decision making is too strong. Without empirical proof in CSE, statements regarding the role of technology should not be taken lightly. Conclusions should be strictly evidence-based on statistically

sound estimates and suggestions on technology-driven remedies should also be informed by concrete corporate behavior.

Limitations of the Study

Scope Restriction: There are some limitations on the coverage of the study, as the scope of the study is limited to listed companies within the CSE and they may not represent the governance picture of the unlisted firms or SMEs.

Data Availability: The lack of or inaccurate governance information limited the total amount of data available.

Temporal Lag: The research ends in 2023, hence advancements in governance practices, or economic trends achieved later are omitted.

Control Variables: The research did take into consideration the presence of ownership concentration, but firm size, profitability and safety from risks specific to the sector were not included in the regression models.

Technological Adoption Gap: Lack of adoption and transparency of AI/blockchain in the context of corporate governance areas means that the study does not offer clear empirical insights in Sri Lanka.

The following weaknesses reiterate the need for future inquiry to utilize lengthy-term statistics, additional data sets, and a more refined set of firm-specific indicators.

Future Directions

Building on the previous analysis, under its constraints the following research directions are proposed for further study:

Longitudinal Studies Post-2023: Add several more years for data collection to measure the effects of changing of governance policies and recovering markets on corporate financial strategies.

Industry-Specific Analyses: Get involved in studies in different sectors such as manufacturing, banking, IT, and real estate to see what types of governance pressures these industries face differently.

Technological Integration Assessment: Learn how technology like AI works, shapes decision-making and financial strategies in Sri Lankan businesses. Combining the two sources, i.e. data from surveys and interview insights could lead to more profound, qualitative evidence.

Inclusion of More Variables: Consider such variables as firm-size, profitability and market capitalization, and auditor independence to establish the degree to which they influence association between board structure and financing.

Comparative Regional Analysis: other option

Corporate Sustainability and ESG: Research the relationship of board independence with financial leverage and with ESG performance and sustainability disclosures issues, which have been more important internationally.

Adoption of such directions would enhance better understanding of the impact of corporate governance on financial policies in developing nations, and make Sri Lankan corporate finance research more useful to practitioners.

Final Thoughts

Through enhanced governance systems, Sri Lankan firms should promote institutional investing along with big data analysis for corporate oversight to maintain lasting capital structures. Through better governance solutions, financial stability increases together with foreign investment, and broader economic stability results (La Porta et al., 1999). These reforms will help Sri Lanka's corporate sector maintain market competitiveness while reinforcing its position in international financial systems.

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