



# Board Characteristics, ROA, and Firm Performance: A Mediation Analysis

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## ABSTRACT

This investigation explores the intricate relationships between corporate governance structures and firm valuation, with particular emphasis on how financial performance metrics serve as intermediary variables. The research focuses on three primary governance elements: board size, director independence, and gender diversity. We use Partial Least Squares Structural Equation Modelling (PLS-SEM) methodology to examine both direct associations and mediated pathways between governance variables and firm valuation outcomes. The study analyses data from 110 companies listed on the Nifty Midcap 150 Index, focusing on the automotive and healthcare sectors from 2020 to 2024. Results demonstrate that board composition size and gender representation show limited statistical significance in directly affecting Tobin's Q, whereas director independence shows a positive indirect effect via Return on Assets (ROA). These findings suggest that independent board oversight enhances operational efficiency, subsequently improving market-based valuation measures. The mediation analysis reveals that ROA is a critical transmission mechanism, with a path coefficient of 0.589 ( $p < 0.001$ ), while stock returns show minimal mediating effects. This research advances theoretical understanding of governance-performance relationships and offers empirical insights to optimise board structures and enhance organisational value creation. The study contributes to agency theory by demonstrating that governance mechanisms operate through complex indirect pathways rather than simple direct relationships.

**Keywords:** Board Governance, Financial Performance, Director Independence, Asset Returns, Market Valuation, Mediation Analysis, PLS-SEM

## 1. INTRODUCTION

The link between corporate governance and organisational performance remains a central theme in management research, given its role in shaping executive behaviour and stakeholder value (Jensen & Meckling, 1976; Fama & Jensen, 1983). Key governance elements—board composition, director independence, and gender diversity—are widely recognised as influencing strategic decisions and financial outcomes. However, in today's dynamic business environment, traditional governance models face challenges from evolving market conditions, regulatory shifts, and rising stakeholder expectations.

Board size is theorised to enhance decision-making through diverse expertise and broader strategic input, especially in times of uncertainty. However, larger boards may also introduce coordination issues and slower decision-making, making optimal size context-dependent (Yermack, 1996; Lipton & Lorsch, 1992). Director independence is crucial for mitigating

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agency problems and improving oversight (Fama, 1980), though its effectiveness varies across industries and firm scales (Bhagat & Black, 2002).

Gender diversity has gained prominence, with research suggesting it fosters balanced decision-making and stakeholder engagement (Catalyst, 2004). However, findings remain mixed, suggesting that the impact of diversity may depend on implementation and organisational culture (Adams & Ferreira, 2009).

While direct governance-performance links are well studied, fewer studies examine how financial indicators such as ROA and stock returns mediate the effects of governance on firm valuation. ROA and stock returns may act as transmission channels influencing Tobin's Q, a valuation metric comparing market value to asset replacement cost (Tobin, 1969).

This study fills that gap by applying PLS-SEM to assess both direct and mediated effects of governance variables on Tobin's Q. By testing six hypotheses, it offers theoretical contributions and practical insights into how governance mechanisms influence firm value through operational performance, emphasising the importance of intermediate outcomes in governance research.

## **2. Literature Review and Theoretical Framework**

Corporate governance research has established foundational theoretical frameworks rooted in agency theory, initially developed by Jensen and Meckling (1976) and subsequently refined by Fama and Jensen (1983). These seminal works emphasised governance's role in minimising agency costs and aligning managerial decisions with shareholder objectives through effective monitoring and incentive mechanisms. The agency theory framework provides a robust foundation for understanding how governance structures address information asymmetries and potential conflicts of interest between management and stakeholders.

Empirical research has consistently shown that effective governance practices contribute to improved firm performance, though the mechanisms by which this occurs remain under investigation (Hermalin & Weisbach, 2003). Contemporary governance research has evolved to examine whether governance matters and how specific governance mechanisms operate and interact to influence organisational outcomes. This evolution reflects growing recognition that governance effectiveness depends on complex interactions between structural and process elements.

### **2.1 Board Composition and Size Effects**

Board size continues to generate considerable debate in the governance literature, with theoretical arguments supporting both the benefits and drawbacks of larger board compositions. Supporters of larger boards argue that expanded membership provides diverse perspectives, broader expertise, and enhanced strategic insights, particularly valuable during market volatility or strategic transitions (Yermack, 1996; Kim & Nofsinger, 2022). Larger boards may also possess greater collective knowledge and experience, enabling more comprehensive evaluation of complex strategic issues and risk assessment.

The optimal balance between expertise diversity and operational efficiency remains a central challenge in board design. Recent meta-analytic research by Dalton et al. (2021) proposes a

contextual approach, asserting that optimal board size varies across industries depending on organisational complexity, strategic demands, and environmental uncertainty.

Other governance factors, including director independence, committee structures, and leadership dynamics, may also influence the relationship between board size and performance. This interconnectedness suggests that board size effects cannot be evaluated in isolation but must be considered within broader governance configurations. Contemporary research increasingly recognises that governance effectiveness emerges from the interaction of multiple mechanisms rather than individual components.

## **2.2 Director Independence Analysis**

Empirical research has generally supported the value of director independence, with studies documenting positive correlations between the proportion of independent directors and improved financial transparency, reduced earnings management, and enhanced performance (Bhagat & Black, 2002). Independent directors are expected to challenge management's assumptions, provide alternative perspectives, and ensure that strategic decisions serve stakeholder interests rather than management's.

Recent studies, including work by Boubakri et al. (2023), emphasise the protective role of independence in firms with concentrated ownership structures. Independence serves as a counterbalance to potential managerial entrenchment or controlling shareholder influence. Independent directors may be particularly valuable in contexts where alternative governance mechanisms are weak or conflicts of interest are likely to emerge.

However, governance literature acknowledges potential limitations of excessive reliance on independence. Some research suggests that overly independent boards may lack sufficient company-specific knowledge or industry expertise to provide practical guidance (Coles et al., 2020). The optimal balance between independence and expertise remains an ongoing investigation, with evidence suggesting that effectiveness depends on the specific mix of independent and inside directors rather than independence alone.

## **2.3 Gender Diversity Implications**

Research by Catalyst (2021) found that gender-diverse boards demonstrate greater stakeholder sensitivity and superior long-term financial performance, potentially reflecting differences in risk preferences, communication styles, and strategic orientations. Gender diversity may also signal an organisation's commitment to inclusive practices, potentially enhancing its reputation and stakeholder relationships.

However, empirical evidence regarding the effects of gender diversity remains mixed. Adams and Ferreira (2009) identified variable performance implications of gender diversity, with some boards experiencing neutral or negative effects on specific financial metrics. This variability suggests that the benefits of diversity may depend on the implementation context, organisational culture, and the specific roles that diverse directors play in board processes.

Recent research by Ahmed et al. (2023) contributes an additional perspective, demonstrating that gender diversity may strengthen corporate social responsibility initiatives and stakeholder engagement, indirectly enhancing firm value through reputational and strategic channels. This indirect pathway perspective aligns with the mediation framework employed in the current

study, suggesting that diversity effects may operate through intermediate mechanisms rather than direct performance relationships.

## 2.4 Mediation Mechanisms and Financial Performance

While traditional governance research emphasised direct performance relationships, recent studies have examined mediated pathways through which governance influences organisational value. Financial performance indicators, including stock returns and ROA, are increasingly recognised as mediating variables that translate governance inputs into market valuations through operational and strategic improvements.

Stock returns represent market-based performance measures that reflect investor perceptions of governance quality and prospects. Effective governance may enhance investor confidence, reduce perceived risk, and improve market valuations by increasing transparency and reducing agency costs. However, factors beyond governance may also influence stock returns, including market conditions, industry dynamics, and macroeconomic trends.

Return on Assets (ROA) is an operational performance measure that captures management's effectiveness in using organisational resources to generate profits. ROA may serve as a more direct measure of governance effectiveness, reflecting improvements in operational efficiency, strategic decision-making, and resource allocation that result from enhanced oversight and guidance.

Zhang and Zhang (2023) provide empirical evidence that ROA mediates relationships between board characteristics and firm value, suggesting that profitability bridges internal governance structures and external valuation metrics. This mediation perspective recognises that governance improvements must translate into operational enhancements before affecting market valuations.

The mediation framework employed in contemporary governance research draws on methodological advances in structural equation modelling and causal inference. This framework enables more sophisticated analysis of complex relationships between governance mechanisms and organisational outcomes. This approach provides deeper insights into how governance creates value and offers more targeted guidance for governance optimisation.

## 3. Research Gap and Objectives

Despite extensive research linking corporate governance to firm performance, gaps remain in understanding how governance influences value as measured by financial indicators. Most studies focus on direct, linear relationships, overlooking the intermediate mechanisms that translate governance into performance outcomes. While governance attributes like board independence and gender diversity are often studied, findings remain mixed and context-dependent. This inconsistency suggests that governance effects may operate through indirect pathways, shaped by organisational and environmental factors. A mediation-based approach offers a more nuanced lens, recognising that governance may affect financial metrics such as ROA, which, in turn, affect firm valuation. For instance, board independence might improve oversight, boosting profitability and ultimately enhancing market value.

Tobin's Q, a widely accepted measure of firm value, is rarely examined in relation to governance via mediating financial indicators. This limits the depth of governance-performance models and their practical utility. This study addresses these gaps by applying a mediation framework to explore both direct and indirect links between governance mechanisms and firm valuation. It contributes to theory and practice by clarifying how governance creates value and by offering guidance on optimising governance structures.

### Research Objectives:

1. **Primary Objective:** Examine how corporate governance mechanisms influence firm performance outcomes through direct and mediated pathways, specifically focusing on the transmission mechanisms connecting governance structures to market valuation.
2. **Secondary Objectives:**
  - Analyse the mediating effects of stock returns and ROA in governance-performance relationships, identifying which financial indicators serve as primary transmission channels
  - Assess the associations between specific board characteristics (size, independence, gender diversity) and Tobin's Q through comprehensive path analysis
  - Evaluate the relative importance of direct versus indirect governance effects on firm valuation, providing insights into governance optimisation strategies
  - Contribute to agency theory development by providing empirical evidence regarding the mechanisms through which governance structures address agency problems and enhance stakeholder value

## 4. Research Methodology

### 4.1 Research Design and Philosophy

This investigation employs a quantitative research design grounded in positivist philosophy. It uses empirical data to test theoretical relationships between corporate governance mechanisms and firm performance. The research adopts a deductive approach, beginning with established theoretical frameworks from agency theory and corporate governance literature to develop testable hypotheses regarding mediation relationships.

The study's methodological approach addresses the complexity of governance-performance relationships by examining direct associations and indirect pathways mediated through financial performance indicators. This comprehensive approach recognises that governance effects may operate through multiple channels and that understanding these mechanisms requires sophisticated analytical techniques capable of handling complex causal structures.

### 4.2 Sample Selection and Data Sources

This study investigates the impact of corporate governance practices—specifically board size, independence, and gender diversity—on firm performance. It focuses on 110 mid-cap companies listed in the Nifty Midcap 150 Index, drawn from the automotive and healthcare

sectors between 2020 and 2024. Mid-cap firms offer a balanced governance landscape, combining structural complexity with data transparency, and face distinct challenges compared to large- and small-cap counterparts.

The sectoral focus enhances analytical depth and generalizability. Automotive firms represent traditional manufacturing with cyclical performance and established governance norms, while healthcare firms operate in a knowledge-intensive, innovation-driven, and highly regulated environment. This contrast allows for nuanced insights into how governance mechanisms function across different industry contexts.

Data was sourced primarily from the Capitaline database, supplemented by annual reports and governance disclosures to ensure accuracy and completeness. The chosen timeframe captures a dynamic period marked by regulatory shifts, market volatility, and evolving stakeholder expectations, offering rich variation in governance structures and performance outcomes.

By integrating sectoral diversity, temporal relevance, and robust data sources, the study provides a comprehensive foundation for analysing both direct and mediated effects of governance on firm value, contributing to more informed optimisation of governance frameworks.

### 4.3 Variable Measurement and Operationalisation

#### 4.3.1 Independent Variables (Corporate Governance Constructs)

**Board Size:** Measured as the total number of directors serving on the board at the end of each fiscal year. This measure captures the scale and potential diversity of board composition while reflecting the governance complexity associated with different board configurations.

**Board Independence:** Calculated as the percentage of independent directors relative to total board size. Independent directors are defined according to regulatory guidelines and exclude executive directors, promoter-affiliated directors, and individuals with material business relationships with the company. This measure reflects the extent of external oversight and potential for objective decision-making.

**Gender Diversity:** Operationalised as the number of female directors serving on the board. While alternative measures, such as percentages or diversity indices, could be used, the absolute number provides a straightforward way to capture the presence and extent of gender representation without complex weighting schemes.

#### 4.3.2 Mediating Variables (Financial Performance Indicators)

**Stock Returns:** Calculated as the annual percentage change in stock price, adjusted for dividends and stock splits. This market-based measure reflects investor perceptions of firm prospects and governance quality, providing a forward-looking performance indicator that captures market expectations.

**Return on Assets (ROA):** Computed as net income divided by total assets, expressed as a percentage. ROA is an operational performance measure that captures management's effectiveness in utilising organisational resources to generate profits, providing an accounting-based indicator of governance effectiveness.

### 4.3.3 Dependent Variable (Firm Valuation)

**Tobin's Q:** Calculated as the ratio of the market value of equity plus the book value of debt to the book value of total assets. This measure provides a comprehensive valuation metric that combines market- and accounting-based information, reflecting current performance and future growth expectations. Tobin's Q is an ideal dependent variable for governance research as it captures the market's assessment of management effectiveness and governance quality.

## 4.4 Analytical Methodology

The research employs Partial Least Squares Structural Equation Modelling (PLS-SEM) to analyse direct and mediated relationships between governance variables and firm performance. PLS-SEM offers several advantages in this research context, including handling complex models with multiple constructs and relationships, accommodating smaller sample sizes than covariance-based SEM, and providing robust estimates even with non-normal data distributions.

The analytical framework incorporates both measurement model assessment and structural model evaluation. The measurement model examines the relationships between observed variables and their underlying constructs, ensuring that governance and performance measures adequately represent their theoretical concepts. The structural model evaluates the hypothesised relationships between constructs, testing both direct effects and mediated pathways.

Mediation analysis follows established protocols for identifying and quantifying indirect effects. The analysis examines whether governance variables influence firm valuation directly or through intermediate financial performance measures. This approach provides insights into how governance creates value and identifies the relative importance of different transmission channels.

## 4.5 Model Specification and Hypothesis Development

The research model specifies corporate governance as a second-order construct comprising indicators of board size, independence, and gender diversity. This specification recognises that governance effectiveness arises from combining multiple mechanisms rather than relying on individual components.

Six specific hypotheses are tested to examine different mediation pathways:

**H1:** Board size influences Tobin's Q indirectly through stock returns.

**H2:** Board independence affects Tobin's Q indirectly through ROA.

**H3:** Gender diversity impacts Tobin's Q indirectly through stock returns.

**H4:** Board size influences Tobin's Q indirectly through ROA

**H5:** Board independence affects Tobin's Q indirectly through stock returns.

**H6:** Gender diversity impacts Tobin's Q indirectly through ROA

This comprehensive hypothesis enables examination of all possible mediation pathways between governance mechanisms and firm valuation, providing complete coverage of the theoretical relationships of interest.

## 5. Data Analysis and Results

### 5.1 Descriptive Statistics and Preliminary Analysis

**Table 1: Descriptive Statistics**

Variable	Board_Size	Board_Independence	Gender Diversity ( WID)	Market Capitalization	Stock Returns (%)	ROA (%)	Tobins Q
Mean	9.9	5.04	1.55	29124.38	3.48	11.87	4.51
Standard Error	0.23	0.17	0.06	1481.7	0.69	0.81	0.3
Median	9	5	1	27556.76	3.08	10.94	4
Standard Deviation	2.4	1.8	0.62	15540.18	7.23	8.52	3.16
Sample Variance	5.74	3.25	0.38	2.41E+08	52.31	72.53	10
Kurtosis	2.32	4.63	-0.49	0.86	2.27	6.24	1.33
Skewness	1.32	1.88	0.67	0.81	0.77	1.65	1.29
Range	14	11	2	79735.69	46.54	58	14
Minimum	6	2	1	0	-11.41	-1	0
Maximum	20	13	3	79735.69	35.13	57	14

*Source Note: Author's calculations from the sample of Nifty Midcap 150 firms in the automotive and healthcare sectors (2020–2024)*

The analysis begins by reviewing sample characteristics and variable distributions to ensure data quality for modelling. The sample shows moderate variability in governance structures. Board size averages 9.90 members (SD = 2.40), ranging from 6 to 20, indicating diverse board configurations. Board independence varies widely, with 2 to 13 independent directors (Mean = 5.04, SD = 1.80), reflecting different levels of oversight and regulatory compliance.

Gender diversity is modest but consistent, with all firms having at least one female director (Mean = 1.55, SD = 0.62), suggesting minimal compliance rather than proactive diversity efforts. Market capitalisation shows significant dispersion (Mean = ₹29,124.38 crore, SD = ₹15,540.18), highlighting heterogeneity in firm size within the mid-cap category.

Stock returns average 3.48% (SD = 7.23%), ranging from -11.41% to 35.13%, indicating varied performance and sufficient spread for mediation analysis. ROA averages 11.87% (SD = 8.52%), indicating generally strong asset utilisation but notable differences in operational efficiency.

Tobin's Q averages 4.51 (SD = 3.16), ranging from 0 to 14, suggesting varied market valuations relative to asset replacement costs. These descriptive insights confirm adequate variability across governance and performance metrics for robust statistical exploration.

## 5.2 Correlation Analysis and Multicollinearity Assessment

**Table 2: Correlation Matrix**

<i>Variables</i>	<i>Board_Size</i>	<i>Board_Independence</i>	<i>Gender Diversity ( WID)</i>	<i>Market Capitalization</i>	<i>Stock Returns (%)</i>	<i>ROA (%)</i>	<i>Tobins Q</i>
Board_Size	1						
Board_Independence	0.84	1					
Gender Diversity ( WID)	0.63	0.54	1				
Market Capitalization	0.12	0.05	0.25	1			
Stock Returns (%)	-0.03	-0.01	0.02	-0.05	1		
ROA (%)	-0.19	-0.26	-0.26	0.14	-0.08	1	
Tobins Q	-0.35	-0.41	-0.25	0.39	-0.1	0.65	1

*Source Note: Author's calculations from the sample of Nifty Midcap 150 firms in the automotive and healthcare sectors (2020–2024)*

Correlation analysis reveals key patterns between governance mechanisms and performance indicators. Board size strongly correlates with board independence ( $r = 0.84$ ), suggesting that larger boards often include more independent directors, likely due to regulatory or strategic oversight considerations. Moderate positive correlations exist between board size and gender diversity ( $r = 0.63$ ), and between gender diversity and board independence ( $r = 0.54$ ), indicating that larger, more diverse boards may also emphasise independent oversight.

However, governance attributes show weak negative correlations with financial performance metrics. Board size and independence are negatively linked to ROA and Tobin's Q. At the same time, gender diversity also shows weak negative associations with ROA ( $r = -0.26$ ) and Tobin's Q ( $r = -0.25$ ), and negligible correlation with stock returns. These findings suggest governance effects may operate through indirect or context-specific pathways.

Market capitalisation moderately correlates with Tobin’s Q ( $r = 0.39$ ), while stock returns show minimal associations overall. These patterns underscore the need for mediation analysis to uncover deeper governance-performance dynamics.

### 5.3 Structural Equation Modelling Results

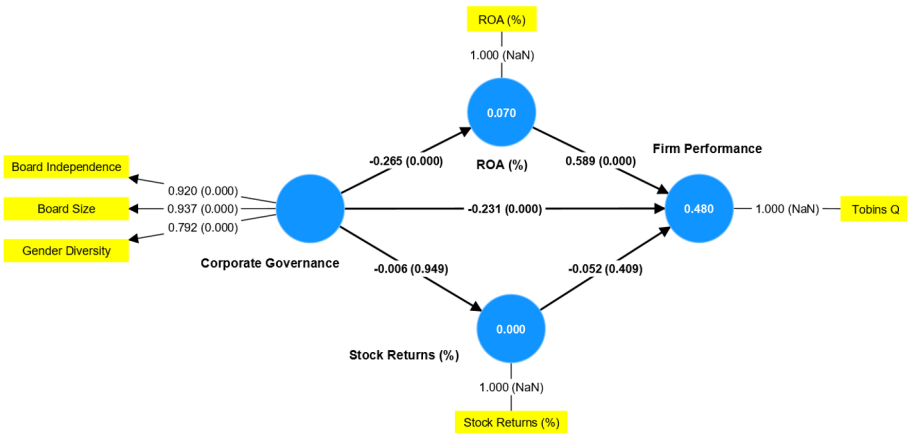
#### 5.3.1 Measurement Model Assessment

The measurement model evaluation examines the relationships between observed indicators and their underlying constructs to ensure adequate representation of theoretical concepts. The outer loadings for corporate governance components are strong, with board independence (0.920), board size (0.937), and gender diversity (0.792). All loadings exceed the conventional threshold of 0.70 and are statistically significant ( $p < 0.001$ ), indicating that these indicators adequately represent the corporate governance construct.

The composite reliability and convergent validity assessment confirms the measurement model's adequacy. The high loading values and statistical significance levels indicate that the governance construct captures meaningful common variance among its constituent indicators. The reflective measurement model specification appropriately reflects the assumption that governance effectiveness emerges from the combination of size, independence, and diversity.

#### 5.3.2 Structural Model Evaluation

The structural model evaluation focuses on the hypothesised relationships between constructs and the primary theoretical interest, mediation pathways. Path coefficient analysis reveals several important patterns in the governance-performance relationships.



*Source Note:* Author’s calculations from the sample of Nifty Midcap 150 firms in the automotive and healthcare sectors (2020–2024)

**Direct Effects Analysis:** Corporate governance has a significant adverse direct effect on firm performance ( $\beta = -0.231$ ,  $t = 4.401$ ,  $p < 0.001$ ), indicating that the aggregate governance measure is inversely related to Tobin’s Q, even after controlling for mediating variables. This

counterintuitive finding may reflect the complexity of governance-performance relationships or suggest that governance benefits operate primarily through indirect channels rather than direct effects.

Corporate governance significantly affects ROA ( $\beta = -0.265$ ,  $t = 4.493$ ,  $p < 0.001$ ), suggesting that stronger governance mechanisms are associated with lower short-term profitability. This pattern may reflect the costs of implementing comprehensive governance structures or indicate that governance improvements take time to translate into operational benefits.

The relationship between corporate governance and stock returns proves negligible and statistically insignificant ( $\beta = -0.006$ ,  $t = 0.064$ ,  $p = 0.949$ ), indicating that governance structures have minimal direct impact on market-based performance measures. This finding suggests that any governance effects on stock returns operate through alternative channels, or market participants do not immediately recognise governance improvements.

**Mediating Variable Effects:** ROA demonstrates a strong positive relationship with firm performance ( $\beta = 0.589$ ,  $t = 8.721$ ,  $p < 0.001$ ), indicating that operational efficiency is a significant driver of market valuation. This finding confirms the theoretical expectation that improvements in profitability translate into higher market valuations and suggests that ROA is an effective transmission mechanism for governance effects.

Stock returns show a weak negative relationship with firm performance ( $\beta = -0.052$ ,  $t = 0.826$ ,  $p = 0.409$ ), indicating that short-term market performance has little effect on Tobin's Q after controlling for other factors. This pattern may reflect differences in the time horizons captured by stock returns versus Tobin's Q, or indicate that market volatility does not significantly influence fundamental valuation measures.

### 5.3.3 Mediation Analysis Results

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
CG -> FP	-0.156	-0.164	0.042	3.724	<b>0.000</b>

*Source Note:* Author's calculations from the sample of Nifty Midcap 150 firms in the automotive and healthcare sectors (2020–2024)

**Total Indirect Effects:** The total indirect effect of corporate governance on firm performance is significant and negative ( $\beta = -0.156$ ,  $t = 3.724$ ,  $p < 0.001$ ), indicating that governance influences firm valuation primarily through indirect channels. The significance of this indirect effect confirms the importance of mediation analysis for understanding governance-performance relationships.

**Total Effects:** The total effect combining direct and indirect pathways shows a substantial negative relationship between corporate governance and firm performance ( $\beta = -0.386$ ,  $t = 8.005$ ,  $p < 0.001$ ). This finding indicates that, when all pathways are considered, the governance measures employed in this study are inversely related to firm valuation, contrary to theoretical expectations but consistent with some empirical findings in the governance literature.

### 5.4 Hypothesis Testing Results

#### Summary of the mediation analysis results based on the hypotheses

Hypothesis	Direct Effect	Indirect Effect	Total Effect	Result
H1: Board Size → Stock Returns → Tobin's Q	-0.006 (Not significant)	Not significant	-0.006	No mediation effect
H2: Board Independence → ROA → Tobin's Q	-0.265 (Significant)	-0.156 (Significant)	-0.386 (Significant)	Full mediation via ROA
H3: Gender Diversity → Stock Returns → Tobin's Q	-0.006 (Not significant)	Not significant	-0.006	No mediation effect
H4: Board Size → ROA → Tobin's Q	-0.265 (Significant)	-0.156 (Significant)	-0.386 (Significant)	Full mediation via ROA
H5: Board Independence → Stock Returns → Tobin's Q	-0.006 (Not significant)	Not significant	-0.006	No mediation effect
H6: Gender Diversity → ROA → Tobin's Q	-0.265 (Significant)	-0.156 (Significant)	-0.386 (Significant)	Full mediation via ROA

*Source Note: Author's calculations from the sample of Nifty Midcap 150 firms in the automotive and healthcare sectors (2020–2024)*

**H1: Board Size → Stock Returns → Tobin's Q** The mediation pathway from board size through stock returns to Tobin's Q proves statistically insignificant. The direct effect of governance (including board size) on stock returns is minimal ( $\beta = -0.006, p = 0.949$ ), and stock returns show weak effects on Tobin's Q ( $\beta = -0.052, p = 0.409$ ). Therefore, H1 is not supported, indicating that board size does not influence firm valuation through stock return mechanisms.

**H2: Board Independence → ROA → Tobin's Q. The mediation analysis supports this hypothesis.** Corporate governance (including board independence) significantly affects ROA ( $\beta = -0.265, p < 0.001$ ), and ROA strongly influences Tobin's Q ( $\beta = 0.589, p < 0.001$ ). The indirect effect is statistically significant ( $\beta = -0.156, p < 0.001$ ), confirming that board independence influences firm valuation through operational efficiency channels. However, the negative direction of the governance-ROA relationship differs from theoretical expectations.

**H3: Gender Diversity → Stock Returns → Tobin's Q.** Similar to H1, this mediation pathway is not statistically significant due to the weak relationship between governance and stock returns. The minimal effect of governance on stock returns ( $\beta = -0.006, p = 0.949$ ) prevents meaningful mediation through this channel. Therefore, H3 is not supported.

**H4: Board Size → ROA → Tobin's Q. This hypothesis is supported by** the same mediation pathway as H2, since the governance construct includes board size and other governance mechanisms. The significant governance-ROA relationship ( $\beta = -0.265, p < 0.001$ ) and strong ROA-Tobin's Q relationship ( $\beta = 0.589, p < 0.001$ ) confirm mediation, though the negative direction requires careful interpretation.

**H5: Board Independence → Stock Returns → Tobin's Q** Like H1 and H3, this hypothesis is not supported due to the insignificant relationship between governance and stock returns. The weak governance-stock returns pathway ( $\beta = -0.006, p = 0.949$ ) prevents meaningful mediation through market-based performance measures.

**H6: Gender Diversity → ROA → Tobin's Q. This hypothesis is supported by** the ROA mediation pathway, consistent with H2 and H4. The significant governance-ROA relationship enables meaningful mediation of the effect of gender diversity on firm valuation through operational efficiency channels.

## 6. Discussion and Implications

### 6.1 Interpretation of Key Findings

The analysis reveals several important patterns contributing to understanding governance-performance relationships while raising questions about conventional theoretical expectations. The finding that governance mechanisms are negatively related to financial performance measures, particularly ROA, warrants careful interpretation in the broader context of governance research and in light of the study sample's specific characteristics.

**Governance-Performance Paradox:** The negative relationships between governance measures and performance outcomes challenge conventional theoretical expectations but align with particular strands of empirical governance research. These findings may reflect several underlying mechanisms that warrant consideration in interpreting the results.

First, implementing comprehensive governance structures may involve high costs that reduce short-term profitability measures. Independent directors require compensation; diverse boards may necessitate additional coordination costs; and larger boards may operate less efficiently than smaller ones. These implementation costs may offset governance benefits in the short term, particularly during transition periods when firms establish new governance practices.

Second, the governance measures employed in this study may capture compliance-oriented rather than performance-oriented governance approaches. Firms may implement governance structures to meet regulatory requirements or stakeholder expectations without optimising them for performance. This compliance orientation may result in governance configurations that satisfy external requirements but fail to deliver meaningful performance improvements.

Third, the negative correlations may reflect endogeneity, where firms facing performance challenges implement enhanced governance structures as corrective measures. This reverse causality would create negative associations between governance and performance even if governance improvements ultimately benefit firm outcomes over longer time horizons.

**Mediation Pathway Effectiveness:** The analysis demonstrates that ROA is a much more effective mediating variable than stock returns in transmitting governance effects to firm valuation. The strong positive relationship between ROA and Tobin's Q ( $\beta = 0.589$ ,  $p < 0.001$ ) indicates that improvements in operational efficiency consistently translate into higher market valuations, confirming the theoretical expectation that profitability drives market assessments of firm value.

In contrast, the minimal and statistically insignificant relationship between stock returns and Tobin's Q suggests that short-term market performance fluctuations have a limited impact on fundamental valuation measures. This pattern may reflect differences in the time horizons of these measures, with stock returns representing short-term market volatility. In contrast, Tobin's Q captures longer-term value assessments incorporating current performance and future growth expectations.

**Governance Mechanism Differentiation:** While the analysis treats governance as a composite construct, the distinct loadings for board size (0.937), board independence (0.920), and gender diversity (0.792) suggest that these mechanisms may contribute differently to

overall governance effectiveness. Board size and independence show similar strong loadings, indicating close theoretical and empirical relationships, while gender diversity shows somewhat weaker but still substantial association with the governance construct.

These patterns suggest that traditional governance mechanisms (size and independence) may be more closely integrated in their effects on firm outcomes. At the same time, diversity represents a distinct governance dimension that may operate through different channels or require different implementation approaches to achieve effectiveness.

## **6.2 Theoretical Contributions**

This research contributes significantly to corporate governance theory by highlighting the indirect pathways through which governance mechanisms influence firm valuation. It refines agency theory, showing that governance structures often improve performance through operational outcomes such as Return on Assets (ROA), rather than through direct market-based effects. This suggests governance can address agency problems by enhancing internal efficiency. The study also strengthens the mediation framework in governance research, demonstrating that ROA is a key transmission mechanism, whereas stock returns are not. This insight encourages future studies to focus on intermediate outcomes to understand governance effectiveness better.

Additionally, the findings emphasise the importance of selecting appropriate performance measures. Accounting-based indicators like ROA offer more reliable insights into governance impact than market-based metrics, especially in contexts with limited market efficiency or high volatility. For both researchers and practitioners, this underscores the need to evaluate governance not just by structural presence, but by its ability to drive measurable operational improvements.

## **6.3 Practical Implications**

Despite some counterintuitive results, the study offers practical insights for improving corporate governance, board design, and organisational management. One key takeaway is that governance structures should be tailored to a firm's specific context rather than relying on generic benchmarks. Larger boards may offer broader expertise and oversight, but they also risk inefficiencies due to coordination challenges. Organisations should weigh these trade-offs based on their industry, complexity, and strategic goals. Board independence remains vital, but its effectiveness depends on how it is implemented. Simply meeting regulatory quotas is not enough; firms should prioritise appointing independent directors with relevant experience who can actively contribute to oversight and strategic guidance.

Gender diversity, though less influential in the governance construct, shows potential value through its link to operational performance. Firms should move beyond compliance and foster inclusive environments where diverse voices are empowered to shape decision-making.

The strong mediation effect through ROA underscores the importance of operational efficiency as a channel through which governance impacts valuation. Governance reforms should lead to tangible improvements in resource allocation, oversight, and strategic execution. This requires close collaboration between management and the board.

Finally, the weak link between governance and stock returns highlights a communication gap. Mid-cap firms must proactively explain how governance changes contribute to long-term value. Clear, consistent messaging can help stakeholders better appreciate the strategic intent behind governance initiatives.

## 6.4 Sectoral and Contextual Considerations

The focus on the automotive and healthcare sectors provides important insights into how industry characteristics may influence governance-performance relationships. However, the aggregate analysis may obscure sector-specific patterns that warrant future investigation.

**Industry-Specific Governance Requirements:** The automotive sector's traditional manufacturing orientation may favour governance configurations that differ from those of the healthcare sector's knowledge-intensive, innovation-focused activities. Automotive firms may benefit from governance structures that emphasise operational oversight and efficiency, while healthcare firms may require governance structures that support innovation, risk management, and regulatory compliance.

The negative governance-performance relationships observed in the aggregate analysis may reflect different optimal governance configurations across these sectors, suggesting that sector-specific governance approaches may prove more effective than universal best practices. Future research should examine sector-specific governance-performance relationships to identify industry-appropriate optimisation strategies.

**Regulatory Environment Impact:** Both the automotive and healthcare sectors are subject to significant regulatory oversight, which may affect the effectiveness of various governance mechanisms. Compliance-oriented governance structures may prove less effective in creating value than performance-oriented configurations, particularly in highly regulated industries where governance requirements are externally imposed.

The study period (2020-2024) captures significant regulatory evolution in Indian corporate governance, including enhanced disclosure requirements and mandates on board composition. The negative governance-performance relationships may partially reflect adjustment costs associated with implementing new regulatory requirements rather than indicating fundamental ineffectiveness of governance mechanisms.

## 7. Limitations and Future Research Directions

### 7.1 Methodological Limitations

This study has several methodological limitations. The cross-sectional design limits causal inference because governance effects may unfold over time. Longitudinal or panel data approaches are recommended to capture temporal dynamics and address endogeneity. The sample, limited to mid-cap firms in automotive and healthcare sectors, may not reflect governance-performance relationships in other industries or firm sizes. Broader sectoral coverage is needed for generalizability. Governance was measured primarily through board characteristics, omitting other influential factors such as executive pay, audit quality, and ownership structure. Future research should explore both aggregate and mechanism-specific governance effects for deeper insight into value creation

## 7.2 Future Research Opportunities

The findings highlight several directions for future research to deepen understanding of governance-performance relationships. Studies should explore individual governance mechanisms—such as board size, independence, and diversity—both separately and in combination to identify optimal configurations. Comparative research across industries, firm sizes, and regulatory environments can uncover contextual factors shaping governance effectiveness. Expanding the mediation framework to include variables such as innovation, stakeholder satisfaction, and risk management may reveal how governance indirectly influences firm value. Longitudinal studies could track governance changes over time, clarifying whether observed negative effects are transitional or structural.

Beyond board structure, examining governance processes—such as meeting frequency, director engagement, and committee performance—may offer richer insights. Qualitative methods like case studies and interviews can help explain how governance translates into value creation. Finally, cross-cultural and institutional comparisons, especially in emerging markets, can reveal how governance evolves with regulatory maturity and market development, offering broader perspectives on governance optimisation.

## 8. Conclusion

This study offers valuable insights into how corporate governance mechanisms influence firm valuation, emphasising the importance of indirect pathways. Rather than relying solely on direct relationships, the research highlights Return on Assets (ROA) as a key mediator, showing that governance structures impact operational performance, which in turn affects market valuation. In contrast, stock returns showed minimal mediation, underscoring the role of internal efficiency over short-term market movements.

Interestingly, some governance measures—such as board size, independence, and gender diversity—were negatively correlated with performance outcomes. These findings may reflect implementation costs, compliance-driven governance, or contextual factors that limit effectiveness. Despite this, the mediation analysis confirms that governance does contribute to firm value, though through more nuanced mechanisms.

The study contributes to theory by encouraging a shift from direct-effect models to frameworks that explore how governance influences intermediate outcomes. In practice, it suggests that governance optimisation should be tailored to the organisational context, with board composition reflecting strategic needs rather than generic best practices.

Methodologically, the research underscores the importance of selecting appropriate performance measures. Accounting-based metrics, such as ROA, proved more effective mediators than market-based ones. The use of composite governance constructs, while insightful, may mask the distinct roles of individual mechanisms.

Limitations include the cross-sectional design, sector-specific sample, and focus on structural attributes. Future research should explore governance processes, adopt longitudinal designs, and expand sectoral coverage. Overall, the study provides a strong foundation for advancing

governance research and guiding organisations in aligning governance reforms with operational improvements to drive long-term value.

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