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Does audit committee composition influence firm performance? Evidence from the top NSE-listed non-financial companies of India

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Abstract

Purpose – This study aims to examine the influence of Audit Committee (AC) composition on Firm Performance (FP) by measuring AC composition (ACC) with a composite score based on the varying effect of each composition-characteristic.

Design/methodology/approach – Partial Least Squares- Structural Equation Modeling (PLS-SEM) technique is used to weigh ACC characteristics. Based on 133 companies and covering five years from 2016 to 2020, the study analyses data after controlling endogeneity through the Gaussian Copula approach.

Findings – We find a significant positive influence of ACC on Firm Performance. Among the ACC characteristics, the absence of executive directors has the highest positive weight on ACC to influence FP, followed by AC size and Gender diversity. AC independence and members' accounting and financial expertise have no significant weight on its composition.

Practical implications – Apart from the theoretical contribution, the study reveals that each ACC characteristic has a varying effect on AC effectiveness to influence the FP that needs to be considered by regulators while framing regulations on ACC and by BOD while constituting AC for a company.

Originality/value – The study claims originality by being pioneering to reveal that AC composition, with a synergy of its disparate characteristics, positively impacts FP. It highlights that the absence of executive directors and gender diversity in AC (characteristics overlooked by the extant literature) significantly and positively influence FP. Methodologically, it introduces the use of the PLS-SEM algorithm to weigh the characteristics in governance studies. Further, these findings remain relevant amid recent Indian legal reforms, offering contemporary insights for policy consideration.

Keywords Audit committee, Gender diversity, Non-executive directors, PLS-SEM, SmartPLS4, Gaussian copula

Paper type Research paper

1. Introduction

Corporate Governance (CG) is a system of structuring and directing a company through which corporate value creation is managed to minimize externalizing its costs onto society at large. When CG operates effectively, the three key players – the executives, the board of directors, and the shareholders – provide, through a system of checks and balances a system for a transparent and accountable system for promoting objectively determined goals and benchmarks (Monks and Minow, 2011). The Board of Directors (BOD) is the central pillar of the CG system, which provides this direction and control. BODs constitute committees to improve their efficiency and effectiveness in some specific areas where more focused,

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specialized, or technical discussions are required. These committees, often referred to as the sub-committees of the BOD, undertake specialized tasks and studies in their respective areas to assist the board in enhancing its effectiveness. An effective CG can enhance the managerial capacity of the corporates by playing a significant role in overseeing and monitoring the management. This oversight role is fulfilled by the Audit Committee (AC), a vital sub-committee of the BOD. To assist the board in playing its oversight and monitoring role, the AC examines, evaluates, and surveils the organization's accounting and financial system, verifies the external auditor's independence, and checks the internal control system.

In the extant literature, AC appears to be the most researched committee of the BOD (Al-Jalahma, 2022; Dakhlallh *et al.*, 2020; Puni and Anlesinya, 2020) due to its widened scope and increasing importance, particularly in the wake of a series of mega frauds like Enron in 2001, WorldCom in 2002, Satyam in 2009, and Toshiba in 2015. The corporate scandals in the past two decades have shattered corporate trustworthiness, and upholding trustworthiness in such a trust-deficit situation poses a new challenge for the ACs to embrace a proactive oversight role with enhanced duties and responsibilities. Accordingly, an effective AC needs to ensure that a company produces relevant, adequate, and credible information for the investors. Although the effectiveness of AC relies on its composition, authority, resources, and diligence (Ika and Ghazali, 2012), the composition aspect is primary and pivotal. The elements of AC composition (ACC) include size, members' expertise, independence, gender diversity, and inclusion of executive director(s).

Despite extensive research on the individual ACC characteristics and their impact on FP (Al-Okaily and Naueihed, 2020; Altin, 2024; Al Farooque *et al.*, 2020; Umar *et al.*, 2024), the literature provides a fragmented view of AC effectiveness. Most of the literature (Bazhair, 2022; Al Farooque *et al.*, 2020; Kallamu and Saat, 2015; Umar *et al.*, 2024) considered a few of the AC composition characteristics wherein a partial view of AC effectiveness is linked with FP. Hardly there is any study that focuses on the composition component of AC effectiveness. Hence, those studies fail to provide a comprehensive view of AC effectiveness. A few studies (Al-ahdal and Hashim, 2022; Gupta and Mahakud, 2021; Singhania and Panda, 2023) have attempted to present a holistic view by considering AC characteristics as an index. However, due to the simple sum of the characteristics in the index, these studies fail to capture the disparate effects of each AC characteristic. Further, the absence of executive directors, one of AC's most important composition characteristics to determine its effectiveness, has been ignored by the extant literature due to the regulatory differences among nations. Notably, India permits one-third of AC directors to be in executive positions, whereas a few Asian countries, such as Malaysia and Singapore, prohibit executive directors in the AC. Conversely, other Asian nations like Japan and Jordan allow up to 49% of AC members to be executives, while Thailand goes further, permitting up to two-thirds of AC directors to hold executive roles. Although the literature has considered the gender diversity of the board and its impact on FP, the literature on the impact of gender diversity of AC on FP is scanty, as only two studies could be traced to date on this relationship (Chijoke-Mgbame *et al.*, 2020; Maji and Saha, 2021). Additionally, the methodological shortcomings in these studies (use of FGLS, which underestimates variability up to 50%, and Pooled OLS without any test for endogeneity) raise questions about the accuracy of their results. While the regulations of other nations are significantly different from Indian regulations, the Indian studies (Bansal and Sharma, 2019; Gupta and Mahakud, 2021) have become obsolete due to pre-reform corporate data and the change in AC regulations by the Securities and Exchange Board of India (SEBI)'s Listing Obligations and Disclosure Requirements (LODR) regulations (2015).

The current study assumes differentiation from the studies in the existing literature by overcoming the above-mentioned shortcomings. To overcome these limitations, the study has focused on a single component of AC, i.e. AC composition, and considered all the characteristics in the said component to capture the comprehensive view of the AC

composition's impact on FP. Further, the study has weighed the composition-related characteristics based on their disparate impact on the construct, AC composition, for influencing FP. To weigh the characteristics in such a manner, the study employed the PLS-SEM algorithm, which weighs the indicators (AC characteristics) based on multiple regression between the indicators and the construct (AC composition). Hence, the AC composition as a construct provides a holistic view of the component. The study also considers all the AC characteristics related to AC composition relevant to the Indian context, including the absence of executive directors and gender diversity. Additionally, the SEBI's LODR regulations 2015 are considered, thereby revalidating the obsolete Indian studies.

The relationship between the ACC and FP, although has a great significance globally, assumes greater significance in the Indian context because India ranked third on the incidence of fraud as per the Global Fraud Report 2015/16 (Kroll, 2015), and its regulations are fast changing. E.g. The Companies Act (2013) required the majority of members to be independent and financially literate, while the new regulations by the SEBI's LODR (2015) require two-thirds of the members to be independent and all members to be financially literate, with at least one member having accounting or related financial management expertise.

The motivation for this research lies in the above-mentioned significance and research Gaps. The results of our study show that ACC significantly influences FP, and to be more specific, AC size, gender diversity, and absence of executive directors in AC tend to increase AC effectiveness in this relationship. Two characteristics, namely AC's expertise and independence, are found to have no significant influence on AC effectiveness. This unique finding implies the possibility that the executive members may show dominance in AC, due to which the independent directors play a recessive role or are suppressed from exerting their expertise and power. With these findings, the study provides practical implications as it informs the policymakers and corporate managers to consider the contributing composition characteristics while constituting AC.

The study claims novelty in several ways. First, it is a pioneering study, to our belief, to show that the AC composition, as an aggregate of the weights of its characteristics, has a significant positive impact on FP. Second, the study is the first to show that the absence of executive directors in AC is the highest contributor among all the AC composition-related characteristics that positively impact FP. It also has policy implications as it suggests the regulators to align the Indian regulations with those of Malaysia by removing the option of executive directors in AC. Third, the study also pioneers to investigate and highlight the positive impact of AC's gender diversity on FP. Fourth, since the weights of AC characteristics are based on their regression on AC composition, which as a construct impacts the FP, this method of weighing using the PLS-SEM algorithm considers the synergies of the disparate effect of each AC characteristic. Hence, it also provides a methodological advancement to governance-related studies. Fifth, considering the latest Indian legal reforms, the study withstands the test for contemporary validation.

The rest of the paper is structured as follows: Section 2 presents the background, literature review, and hypotheses formulation, Section 3 explains the methodology, Section 4 presents the results, Section 5 discusses these results, and Section 6 concludes the paper.

2. Background, literature review, and hypotheses development

2.1 Institutional setting and regulatory framework

In India, the institutional framework for ACC is governed by The Companies Act (2013) and SEBI's Listing Obligations and Disclosure Requirements Regulations (2015). These regulations require the AC to have at least three directors, with two-thirds being independent, to ensure independence from management. All members must be financially

literate, and at least one must have accounting or related financial management expertise. These rules enhance the AC's effectiveness in overseeing financial reporting and internal controls, promoting transparency, and protecting shareholder interests, thereby supporting robust corporate governance and improving financial performance in Indian firms.

Compared to other Asian nations, India's AC regulations are unique. Malaysia mandates all AC members to be non-executive directors, with the majority independent, and allows up to 10% shareholding for independence, while India's limit is stricter at 2%. Jordan also requires all AC members to be non-executive, with the majority independent, but does not specify a shareholding limit. Unlike these countries, India permits executive directors on the AC. These differences underscore the tailored approach of India's AC regulations to address its specific corporate governance challenges.

2.2 Theoretical framework

The Relationship between ACC and FP can be theoretically linked with the help of Agency theory. Agency theory is based on the conflicts between the shareholders (owners) and the company managers because of the information asymmetry between them and their varying interests (Jensen and Meckling, 1976). An appositely composed AC ensures robust oversight and governance, increasing financial reporting transparency and accountability (Saleh and Mansour, 2024). This oversight helps detect fraud and prevent malpractice, ensuring that management decisions are aligned with shareholder interests. As a result, accurate financial reporting and reliable internal controls are maintained, reducing agency costs and enhancing investor confidence. Hence, a well-composed AC is crucial for improving the FP by ensuring that the company operates in a way that maximizes shareholder value.

2.3 AC composition (ACC) and FP

ACC primarily refers to the requirements and qualifications necessary for an individual to become an AC member (Ika and Ghazali, 2012). The rationale behind these requirements is to ensure that the AC can make decisions in the best interest of stakeholders. ACC is regarded as a critical determinant of AC effectiveness (Singhania and Panda, 2024). Consequently, these requirements have been periodically updated to improve the effectiveness of the AC. E.g. the previous Indian regulation (Companies Act 2013) required a majority of independent directors on the AC. This requirement has been strengthened under the current regulatory provision (SEBI's LODR 2015), which mandates a minimum of two-thirds independent directors.

An effective AC ensures transparent management decisions, reliable financial reports, robust internal controls, and enhanced trustworthiness, all of which contribute to improved FP. Previous studies on AC effectiveness have found a positive impact on FP (Gupta and Mahakud, 2021; Singhania and Panda, 2023).

Accordingly, we hypothesize:

H1. ACC positively impacts FP.

Based on the AC regulations and existing literature, we have identified five ACC characteristics, i.e. AC size, independence, absence of executive directors, member expertise, and gender diversity. The impact of each ACC characteristic on FP is considered a separate (or derivative) hypothesis under the main hypothesis for a deeper exploration of the results.

An AC should have adequate members to perform its job on time that too with complete focus. A larger AC benefits from a diverse pool of knowledge and expertise, enhancing reliable monitoring (Bazhair, 2022). Most empirical literature depicts a positive relationship between AC size and FP (Altin, 2024; Bazhair, 2022). Independent directors, because of their unbiasedness, ensure the quality and transparency of the financial reporting process and

have more opportunities to improve the information that the management might withhold for their personal or professional benefit. Consequently, independent directors in AC positively impact the market perception, leading to enhanced FP (Altin, 2024; Umar *et al.*, 2024).

Members with expertise in accounting and finance increase AC's effectiveness (Ika and Ghazali, 2012) and reduce the probability of financial restatements (Agrawal and Chadha, 2005). These expert members can assess and improve the quality of financial statements, enhancing transparency and thereby improving FP. Empirically, while some studies (Alzeban, 2020; Dakhlallh *et al.*, 2020) found a positive association between AC expertise and FP, a few others (Alqatamin, 2018; Kallamu and Saat, 2015) reported an insignificant relationship.

Non-executive directorships (NEDs) in the AC monitor executive directors' actions and bring external expertise to the company. However, the presence of executive directors in the AC can hinder this monitoring role with their operational knowledge supremacy and domination, rendering the purpose of AC inefficacious. An AC constituted solely of NEDs is likely to improve AC effectiveness and, thereby, FP. However, the empirical literature on this relationship is silent. Female executives, with their distinct qualities like passivity, emotion, modesty, affection, and expressiveness, enhance stakeholder welfare and organizational growth, leading to better FP. Numerous studies on the relationship between board gender diversity and FP (Ahmed *et al.*, 2024; Brahma *et al.*, 2020) predominantly establish a positive relationship. By extension, the logic is equally valid for all sub-committees of the board, including the AC.

Accordingly, the following derivative hypotheses are formulated:

H1.1. AC size positively impacts FP

H1.2. AC independence positively impacts FP

H1.3. AC expertise positively impacts FP

H1.4. Constitution of AC solely with NEDs positively impacts FP

H1.5. Gender diversity of AC positively influences FP.

3. Methodology

3.1 Sample selection

For this study, six industries- IT, Drugs and Pharmaceuticals, Chemicals, Metal and Metal Products, Consumer Goods, and Food and Agro-based- were randomly selected in equal ratios from the two broad categories of the OECD STI scoreboard (1999). This categorization was purposively chosen due to the diverse operational characteristics, regulatory environments, and market dynamics inherent in different business landscapes across each category. Such diversity is crucial, as it significantly impacts financial performance metrics, thereby providing a comprehensive understanding of the influence of audit committee composition across varied industry contexts. There are 534 NSE-listed companies in these six industries with a total market capitalization of - 3,874,370.0876 crores (i.e. $ 514.194 Billion) as of 31st March 2020, which constitute our sampling frame. From this frame, all the 151 companies listed as the top 500 companies based on market capitalization were selected as samples to avoid the unavailability of data. However, to ensure consistent data availability over the study period, 18 companies were further dropped. Thus, the final sample comprises 133 companies (as shown in Table 1), representing 94.63% of the total frame's market capitalization. The data relating to all variables considered in the study were collected for five years, from 2016 to 2020, from the Prowess database, the company's Annual reports, and websites. SmartPLS4, developed by Ringle *et al.* (2022), was used to analyze the data.

3.2 Variables and measurement

We have used two parameters to measure our dependent variable FP: Return on Asset (ROA) as an Accounting-based measure and Market Capitalization (MAC) as a market-based measure.

ROA has been widely used to measure FP (Muttakin *et al.*, 2015; Singhania and Panda, 2022). On the other hand, market capitalization refers to the actual market value of the firm, which does not include any accounting aspects, eluding any chance of manipulation (Bansal and Sharma, 2019).

Five ACC characteristics are identified to measure the ACC as the independent variable in the model. Each of these characteristics is weighted depending on its disparate influence on the ACC using the formative measurement model of the PLS-SEM algorithm. The ACC characteristics are considered binary variables and accordingly measured on a nominal scale: the presence (denoted as 1) or absence (denoted by 0).

The study uses three control variables that include firm-specific characteristics like firm size (measured as the natural log of total assets), asset turnover (ratio of net sales to total assets), and leverage (ratio of total debt to equity). Initially, other control variables like board size and independence were considered but later dropped due to the reduction in the model fit. Table 2 is incorporated to exhibit all the variables above and their measurement.

3.3 Research model

We have used the Partial Least Squares-Structural Equation Modeling (PLS-SEM) to analyze and establish the linkages between independent, dependent, and control variables. Structural Equation Modeling (SEM) is a statistical technique for measuring and analyzing relationships between observed and latent variables. More robust than traditional

Table 1. Sample selection and observations for the study

Total companies listed in the national stock exchange (NSE) belonging to the six chosen industries (sampling frame)	534
Companies from these industries that are listed among the top 500	151
Companies dropped due to data unavailability	18
Final sample companies used in the study	133
Number of years (study period from 2016 to 2020)	5 years
Total number of observations for the study (133 companies × 5 years)	665

Source(s): Authors' computation

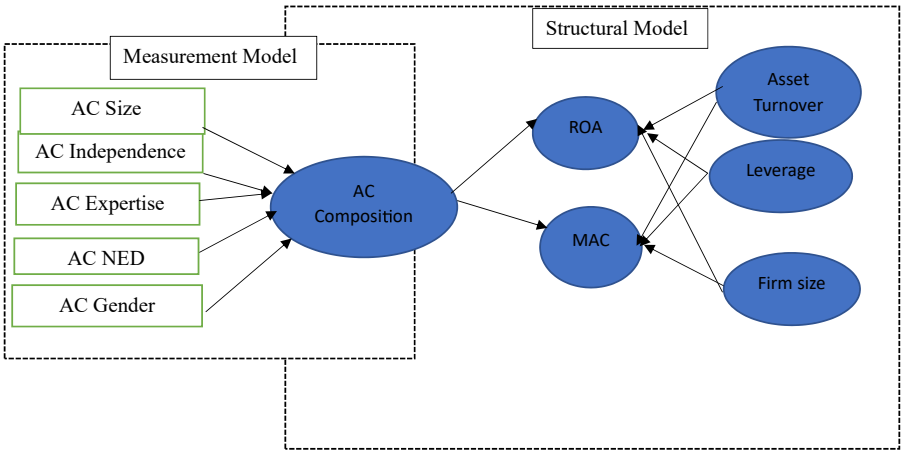
Table 2. Variables and their measurement

Variables	Measurement
Dependent variables	
Return on assets (ROA)	Earnings before interest and Taxes (EBIT)/Total Assets
Market capitalization (MAC)	Natural log of market capitalization
Independent variables	*1 if true, otherwise 0*
Non-executive directorship	All the AC members are non-executive directors
Independence	At least two-thirds of AC members are independent
Expertise	At least one member is an accounting or related financial management expert
Size	The number of AC members is more than three
Gender diversity	At least one female director is present in the AC
Control variables	
Firm-size	Natural log of total assets
Asset turnover	Net sales/total assets
Leverage	Debt/equity

Source(s): Authors' computation

regression techniques, SEM examines linear causal relationships among variables while concurrently accounting for measurement error. PLS-SEM is a component-based estimation approach that fits a composite model (instead of a common factor model) by maximizing the amount of explained variance.

In the research model shown in Figure 1, the ACC characteristics are linked to ACC in a formative measurement model. In contrast, ACC and control variables are linked to the FP measures in the structural model. The regression equation in Table 3 shows this research model. These equations depict the relationships between the latent and observed variables in the formative measurement model and the relationships between the latent and dependent variables in the structural model.



Source(s): Authors' configuration

Figure 1.
PLS-SEM used for analysis

Formative measurement model:

$$\text{AC Composition} = \lambda 1 \times \text{AC size} + \lambda 2 \times \text{AC independence} + \lambda 3 \times \text{AC expertise} + \lambda 4 \times \text{AC NED} + \lambda 5 \times \text{AC gender} + \epsilon$$

Where:

AC Composition is the latent variable representing Audit Committee Composition

AC size, AC independence, AC expertise, AC NED, and AC gender are the formative indicators

$\lambda 1, \lambda 2, \lambda 3, \lambda 4, \lambda 5$, are the weights of each indicator on the latent variable

ϵ represents the error term

Structural model:

$$\text{ROA} = \beta 1 \times \text{AC Composition} + \beta 2 \times \text{Asset Turnover} + \beta 3 \times \text{Leverage} + \beta 4 \times \text{Leverage} + \zeta \text{MAC} = \gamma 1 \times \text{AC Composition} + \gamma 2 \times \text{Asset Turnover} + \gamma 3 \times \text{Leverage} + \gamma 4 \times \text{Firm Size} + \eta$$

Where:

ROA and MAC are dependent variables representing Return on Assets and Market Capitalization, respectively

AC Composition is the independent latent variable representing Audit Committee Composition

Asset Turnover, Leverage, and Firm Size are control variables

$\beta 1$, and $\gamma 1$ are the path coefficients between AC Composition and ROA and MAC, respectively

$\beta 2$, and $\gamma 2$ are the path coefficients between Asset Turnover and ROA and MAC, respectively

$\beta 3$, and $\gamma 3$ are the path coefficients between Leverage and ROA and MAC, respectively

$\beta 4$, and $\gamma 4$ are the path coefficients between Firm Size and ROA and MAC, respectively

ζ, and η represents the error terms for ROA and MAC, respectively

Source(s): Authors' computation

Table 3.
Regression equations

4. Results

4.1 Descriptive statistics

The descriptive statistics in Table 4 present the observed variables along with their mean, standard deviation, and minimum and maximum values. The Table shows that our sample companies earn an average of 21.2% return on their assets (falling in the range of 122% to −96.4%) with a wide variation among companies (coefficient of variation = 81.13%). Market capitalization varies widely and is in line with the firm's size. The asset turnover ratio is also widely dispersed from the mean, indicating variations in the utilization of assets, with some very efficient firms having a max value of 7.943. Most firms don't have any debt, while some firms are highly leveraged. Among AC variables, 78.8% of the firms have fulfilled the minimum criteria of two-thirds independent members, 85% of the firms have at least one financial expert, 45% of the firms have a gender-diverse AC, 70% of firms have more than three members in AC, and 66.9% of the ACs have no executive directors.

4.2 Pearson correlation matrix

A Pearson correlation matrix examines the significance of the associations between variables. Results in Table 5 show that AC gender, size, and NED have a significant positive association with ROA, while only NED is positively associated with MAC. Among the control variables, asset turnover has a strong positive association with ROA, whereas firm size and leverage show a negative correlation with ROA. Conversely, firm size has a significant positive association with MAC, leverage has a negative association, and asset turnover shows no significant association with MAC. Significant correlations between the independent or control variables may indicate multicollinearity. Therefore, multicollinearity is tested during the measurement and structural model evaluations.

4.3 Model fit

The Normed Fit Index (NFI) by Bentler and Bonett (1980) checks the model fit using the Chi-square value, where an NFI value above 0.9 is considered a good fit. Further, the Standardized Root Mean Square Residual (SRMR) is used, and a value of less than 0.10 is considered a good fit. Table 6 shows the results of the model fit test for all parameters required to judge whether the model is a good fit. The saturated model considers the correlation between all the constructs, and the estimated model considers the model structure based on total effects. The results indicate that the model is a good fit, with NFI above 0.9 and SRMR less than 0.10.

Variable	Mean	Std. dev.	Min	Max
ROA	0.212	0.172	−0.964	1.22
MAC	3.952	0.597	2.552	5.875
Firm Size	3.483	0.612	1.988	5.112
Asset turnover	1.342	0.999	0.032	7.943
Leverage	0.398	0.822	0	11.43
AC independence	0.788	0.409	0	1
AC expertise	0.85	0.358	0	1
AC gender	0.453	0.498	0	1
AC size	0.702	0.458	0	1
AC NED	0.669	0.471	0	1

Source(s): Authors' computation

Table 4.
Descriptive statistics

Table 5. Pearson correlation matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) ROA	1.000									
(2) MAC	0.212***	1.000								
(3) Firm size	−0.281***	0.682***	1.000							
(4) Asset turnover	0.422***	0.037	−0.281***	1.000						
(5) Leverage	−0250***	−0.183***	0.160***	0.015	1.000					
(6) AC independence	0.053	0.006	0.003	−0.062	−0.064*	1.000				
(7) AC expertise	−0.004	0.046	0.012	−0.015	−0.019	−0.012	1.000			
(8) AC gender	0.131***	0.054	−0.045	0.004	−0.086**	−0.016	0.044	1.000		
(9) AC size	0.085**	0.008	−0.035	−0.022	−0.010	0.322***	0.048	0.129***	1.000	
(10) AC NED	0.072*	0.183***	0.127***	0.020	−0.024	0.229***	−0.036	0.112***	−0.164***	1.000

Note(s): ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$
Source(s): Authors' computation

4.4 Endogeneity test

The endogeneity test was performed using the Gaussian Copula approach. The results in Table 7 reveal no endogeneity between the independent and dependent variables. However, all three control variables are observed to have endogeneity with ROA, and one of them, namely, Firm size, confronts the endogeneity issue with MAC. As Becker *et al.* (2022) suggested, the Gaussian Copula terms are included in the relationship to control endogeneity.

4.5 Formative measurement model evaluation

As suggested by Hair *et al.* (2021), convergent validity, indicators collinearity, and the significance of indicators' weights were tested for the validity and reliability of the formative measurement model. In the case of the formative measurement model, convergent validity requires redundancy analysis using the same construct's reflective model (Hair *et al.*, 2021) with a correlation coefficient of 0.70 or above. The result of the redundancy analysis, as shown in Table 8, demonstrates the observed redundancy analysis coefficient at 0.997. Further, we used the Variance Inflation Factor (VIF) to test the indicator collinearity, where a value of less than five is generally considered an indication of no collinearity in the extant literature (Al Farooque *et al.*, 2020; Gupta and Mahakud, 2021). The results for all the five AC-composition characteristics show the VIF value within the acceptable limits, suggesting no collinearity. Although the significance of the indicators' weight is required to be tested,

Table 6.
Goodness of fit test

Fit tests	Saturated model	Estimated model
NFI	0.976	0.932
Chi-Square	31.980	90.202
SRMR	0.028	0.039

Source(s): Authors' computation

Table 7.
Endogeneity test using Gaussian copula

	ROA		MAC	
Gaussian copula terms	*t*-stats	*p*-value	*t*-stats	*p*-value
AC composition	0.388	0.699	0.415	0.678
Leverage	7.719	0.000***	0.704	0.482
Asset turnover	4.339	0.000***	1.900	0.130
Firm size	3.664	0.000***	2.143	0.033**

Note(s): ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$
Source(s): Authors' computation

Table 8.
Assessment of formative measurement model

AC characteristics	Indicator weights	*p*-value of weights	VIF
AC independence	*−0.166*	*0.391*	1.243
AC expertise	*0.148*	*0.499*	1.005
AC gender	*0.356*	*0.089**	1.051
AC size	*0.386*	*0.022***	1.238
AC NED	*0.887*	*0.000****	1.163
Redundancy Analysis (coef.)	*0.997*		

Note(s): ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$
Source(s): Authors' computation

removing indicators should be avoided in the formative model to capture the entire domain of the latent variable (Hair *et al.*, 2021). Therefore, we retain all the indicators to capture the entire domain of ACC.

The results in Table 8 show that AC NED has the highest weight and significance ($\beta = 0.887$, p-value< 0.01), followed by AC Size ($\beta = 0.386$, p-value< 0.05) and AC gender ($\beta = 0.356$, p-value< 0.1). However, AC expertise ($\beta = 0.148$, p-value> 0.1) and AC independence ($\beta = -0.166$, p-value> 0.1) are found to have insignificant contributions to AC effectiveness.

4.6 Structural model evaluation

The structural model requires the testing for multicollinearity, coefficient of determination (R^2), and significance of path coefficients. The bootstrapping results in Table 9 show that the model is free from multicollinearity and has a significant R^2 value at a 1% level. As a construct measured with the disparate weights of five AC characteristics, AC Composition has a significant positive impact on FP ($\beta = 0.222$, p-value< 0.01 [ROA]; $\beta = 0.119$, p-value< 0.05 [MAC]). Among the control variables, firm size has a significant positive impact on both performance measures ($\beta = 0.572$, p-value< 0.01 [ROA]; $\beta = 0.616$, p-value< 0.01 [MAC]). Asset turnover is significant to only the market value of the firm ($\beta = 0.007$, p-value> 0.1 [ROA]; $\beta = 0.127$, p-value< 0.01 [MAC]). Leverage is positively related to the ROA ($\beta = 0.109$, p-value< 0.01) but has a negative impact on the firm's market value ($\beta = -0.205$, p-value< 0.01).

4.7 Robustness test

Recent studies (Hair *et al.*, 2021; Sarstedt *et al.*, 2020) have suggested performing robustness tests for structural models to address non-linearity, endogeneity, and unobserved heterogeneity. While the endogeneity issue was previously addressed, tests for non-linearity and unobserved heterogeneity were also conducted (see Appendix). The results were insignificant, indicating that the structural model is robust.

5. Discussion

AC composition has a significant positive impact on FP, leading to the acceptance of hypothesis H1. It implies that the AC's composition enhances its effectiveness through its diligent oversight of the financial reporting process, diversity of resources, and management

Variables	ROA			MAC		
	Coef.	p-values	VIF	Coef.	p-values	VIF
AC composition	0.222	0.008***	1.013	0.119	0.026**	1.037
Asset turnover	0.007	0.951	1.092	0.127	0.000***	1.295
Firm size	0.572	0.000***	1.130	0.616	0.000***	1.161
Leverage	0.109	0.009***	1.032	−0.205	0.000***	1.106
Gaussian copula (Leverage)	−0.561	0.000***	–	–	–	–
Gaussian copula (Asset Turnover)	0.447	0.000***	–	–	–	–
Gaussian copula (Firmsize)	−0.669	0.000***	–	0.254	0.041**	–
R-square	0.438	0.000***		0.727	0.000***	

Note(s): ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$
Source(s): Authors' computation

Table 9.
Path coefficients

monitoring, enhancing a firm's financial performance. This result is in line with the recent study by Gupta and Mahakud (2021), which concludes that there is a positive association between AC effectiveness and FP in Indian banking companies.

This positive impact of AC composition on FP can be attributed to the various AC composition characteristics. Among these characteristics, the AC constituted solely by NEDs has the highest contribution, thus supporting our hypothesis H1.4. This result signifies that the executive directors in AC deteriorated the AC's effectiveness, which falls in line with the agency theory as the presence of executive director(s) dissipates the AC's oversight and monitoring role. Further, the executive directors may join hands with the CEO to protect their investment as they know more about the firm's internal affairs. Given this reason, even a single executive director in AC may negatively affect the ability of the independent directors on the committee. This argument is further supported by the result of AC independence, which has a negative but insignificant weight contributing to the ACC. Thus, we reject our hypothesis H1.2. Another possible explanation could be that the board might appoint inexperienced and unworthy independent directors to fulfill the regulatory provisions with a 'ticking the box' attitude. Further, our result is in congruence with the results of the previous studies (Al Farooque *et al.*, 2020; Zhou *et al.*, 2018), which found a similar insignificant impact of AC independence on FP.

AC size has a significant contribution to the ACC-FP relationship. Hence, we failed to reject our hypothesis H1.1. This result is supported by previous studies by Alqatamin (2018), Altin (2024), and Dakhlallh *et al.* (2020). However, it contradicts the outcome of other studies by Al Farooque *et al.* (2020) and Salehi *et al.* (2018). To infer AC size, our finding indicates that ACs with four or more directors can be more effective than those with the minimum requirement of three or even fewer. This result is also in line with the resource dependence theory, which suggests a greater number of directors for higher firm resources.

AC expertise has no significant weight in influencing FP, thus rejecting our hypothesis H1.3. This result, though surprising, is in line with the results of earlier studies (Alqatamin, 2018; Kallamu and Saat, 2015). This could be either due to the appointment of expert members just to fulfill the mandatory requirement of the regulation without giving them adequate authority or due to a lack of interest and diligence to discharge the assigned responsibility (i.e. token representation). Further, the weight of AC gender diversity is significant in influencing FP at a 10% level. Hence, we fail to reject our hypothesis H1.5. While congruent with the result of a recent study by Chijoke-Mgbame *et al.* (2020), this result is also in line with the legitimacy theory, as a firm can attain legitimacy by giving women equal rights and opportunities through appointment to various corporate committees. According to Gul *et al.* (2011), a firm with a weak governance structure can ameliorate its condition by having a gender-diverse board.

6. Conclusion

The present study extends the extant literature on corporate governance, particularly the ACC in India, by providing the first empirical evidence on the influence of ACC on FP by considering the weighted aggregate of membership characteristics, particularly after the vital changes in AC regulations by SEBI's LODR 2015. For this purpose, we identified five ACC characteristics, i.e. AC size, gender diversity, absence of executive directors, AC independence, and members' expertise. Our results from the formative measurement model of the PLS-SEM show that the first three characteristics have a significant weight on ACC in influencing the FP. However, the study fails to ferret out any significant impact on the latter two characteristics' weights on ACC to influence FP. Further, the

structural model of the PLS-SEM shows that the ACC, as a composite construct measured by the disparate weights of the composition characteristics, significantly influences both the measures of FP. To infer, our results indicate that a gender-diverse and large-sized AC brings extensive and diverse resources to the firm, which are instrumental in improving FP. Further, the study discovers that, in the absence of executive member(s), AC can work independently to increase the effectiveness of its oversight and management monitoring role, which will consequently lead to better FP by reducing agency conflict and increasing legitimacy.

This study is unique in several ways. While attempting to overcome the limitations of the extant literature, the study is not only pioneering to show that the AC composition, considered as a construct with the synergy effect of its disparate characteristics, has a significant positive impact on FP but also is one of the pioneers to consider characteristics like the absence of executive directors and gender diversity of AC as essential characteristics of AC composition. The weighing of the characteristics based on their impact on AC composition in the AC composition and FP relationship through multiple regression between AC characteristics and composition by using PLS-SEM is another uniqueness of the study that attempts to show the accurate and holistic picture of the AC composition as a construct. The study also remains relevant amid recent Indian legal reforms, offering contemporary insights for policy consideration.

The study has several managerial implications. The policymakers, corporate managers, and other stakeholders will consider our findings useful as they provide empirical evidence on the disparate impact of each characteristic of ACC on FP, which is vital in deciding and regulating ACC. The results suggest that AC should be of considerable strength with gender diversity but without any executive director to improve its effectiveness and, consequently, the firm's performance. Currently, the Indian regulation regarding executive directorships and gender diversity in AC is silent. Regarding independence, the current regulation (SEBI's LODR, 2015) requires at least 2/3rd members to be Independent. Suppose the regulators move a step further and make it mandatory to constitute the AC with all the members as either Independent, like in the US, or non-executive, like in Singapore. In that case, the problem of dis-synergy due to the presence of executive director(s) can be resolved. The regulators should also consider the gender diversity of the AC in the manner it is mandated for BODs in many countries, as it increases the AC's resources to impact FP positively. Regarding AC size, BODs, and other executives can increase the AC size to at least four (against the regulatory minimum of three), as more directors mean more resources and efficient monitoring, leading to better performance. Although spelled out in the Indian context, the aforesaid practical implications are very much contemporary in other developing economies with similar governance settings.

The present study is not free from limitations. The study considers a timeframe covering only five years, from 2015–16 to 2019–20, due to changes in the regulations in 2015 and the COVID-19 pandemic that disrupted the Indian market severely in 2020. Hence, future studies may consider a longer period and compare the pre- and post-COVID impact on the relationship between ACC and FP. Further, AC effectiveness does not depend only on its composition. A well-constituted AC is likely ineffective if it works without authority or diligence (DeZoort *et al.*, 2002). Future research may consider other parameters of AC effectiveness like authority, meeting frequency, or members' attendance in the model to see their relationship with FP. Additionally, future studies may split the sample based on companies' profitability, firm size, audited by Big4 versus non-big4 auditors, and exploring the influence of ACC on future FP for a nuanced understanding of the relationship between ACC and FP.

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Appendix
Robustness test

Non-linearity test

Sarstedt *et al.* (2020) recommend testing for non-linearity in PLS-SEM by incorporating a quadratic term. A significant quadratic term indicates non-linearity, which should be interpreted by examining the regression coefficient and Cohen's (1977) f^2 effect size (Henseler *et al.*, 2012). Only when both are significant does the quadratic effect hold implications, with effect sizes of 0.02, 0.15, and 0.35 classified as small, medium, and large, respectively. A quadratic effect holds implications only when both the quadratic term and the effect size are significant. Effect sizes of 0.02, 0.15, and 0.35 are classified as small, medium, and large, respectively (Cohen, 1977; Namirad *et al.*, 2023). Results in Table A1 reveal quadratic relationships of firm size, asset turnover, and leverage with ROA, as well as firm size with MAC. However, all these quadratic relationships have small effect sizes (($f^2 < 0.15$), indicating minimal implications.

Table A1.
Non-linearity tests for structural model

QE terms	ROA		MAC	
Endogenous variables	Coef.	*t*-stats	Coef.	*t*-stats
AC composition	0.047	1.599	0.008	0.324
Asset turnover	$-0.103\ f^2 = 0.052$	4.231***	−0.021	1.418
Firm size	$0.015\ f^2 = 0.043$	1.191***	$-0.045\ f^2 = 0.014$	2.435**
Leverage	$0.050\ f^2 = 0.102$	3.168***	0.009	0.582

Note(s): ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$
Source(s): Authors' computation

Unobserved heterogeneity

To identify the unobserved heterogeneity in PLS-SEM, we followed the procedure of Sarstedt *et al.* (2017) and performed FIMIX-PLS analysis with one to eight segments, ensuring a minimum observation size of about 85 per segment (Sarstedt *et al.*, 2020). Our findings (see Table A2) show that Akaike's Information Criterion with factor 3 (AIC3) favors an eight-segment solution, while AIC4 favors a seven-segment solution. However, Consistent AIC (CAIC) and Bayesian Information Criteria (BIC) lean towards a four-segment solution. Further, the Minimum Description Length with factor 5 (MDL5) points to a one-segment solution.

Given the conflicting results from these segmentation criteria, we conclude that unobserved heterogeneity is not significant. Thus, the structural model remains robust.

Table A2. Fit indices for the one- to four-segment solutions

Criteria	Number of segments 1	2	3	4	5	6	7	8
AIC3 (modified AIC with factor 3)	2924.2	2628.8	2395.4	2276.1	2249.2	2204.3	2163.9	*2163.8*
CAIC (consistent AIC)	2969.2	2723.1	2539.4	*2469.6*	2492.2	2496.8	2505.8	2567.1
AIC4 (modified AIC with factor 4)	2934.2	2649.6	2427.4	2319.1	2303.2	2269.4	*2239.9*	2262.6
BIC (Bayesian information criterion)	2959.2	2702.1	2507.4	*2426.6*	2438.2	2431.8	2429.8	2480.1
MDL5 (minimum description length with factor 5)	*3219.2*	3248.1	3339.4	3544.6	3842.2	4121.8	4405.8	4742.1

Source(s): Authors' computation

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