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Audit Committee Characteristics and Firm Performance: Evidence from India

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Abstract. This study examines the impact of audit committee (AC) characteristics on firm performance (FP) in 133 NSE-listed Indian companies over five years. Data from annual reports, Capitaline, Prowess, and NSE websites are analysed using panel-corrected standard error regression. Results show that non-executive directors, AC charter, AC size, multiple directorships, and meeting attendance positively affect ROA and market capitalization. Gender diversity influences ROA, while expertise affects market capitalization, but AC independence negatively impacts market capitalization. The collective effect of all 11 AC characteristics significantly enhances FP. This research provides a comprehensive analysis, with three characteristics not previously studied.

Keywords: audit committee, firm performance, ROA, market capitalization, PCSE, India

JEL Classification: M41

1. Introduction

Worldwide failure of Corporate Governance (CG) and accounting frauds have wiped out many firms from the global market such as Enron and WorldCom from the US and Satyam from India in the first decade of this century. The recent bank fraud in 2022 by ABG Shipyard for 224.82 billion Indian rupees (2.67 billion USD) has shattered the trustworthiness of CG in a firm. The monitoring of the management and the oversight of the reporting process provided by the Board of Directors (BOD), particularly by the Audit Committee, is in question. An Audit Committee (AC) is a sub-committee of the BOD and a vital component of the CG mechanism, which is responsible for the appointment of external auditors, oversight of the financial reporting process, management's surveillance, and the internal control system of the company. The power of the AC to question the

management, oversee the reporting process, and detect fraud depends upon the effectiveness of the committee.

Corporate fraud occurred even after the formation of AC, where the committee failed to discharge its responsibilities properly (Kallamu and Saat, 2015). The effectiveness of AC depends on its characteristics (Akhtaruddin and Haron, 2010; Dhaliwal et al., 2010; Gupta and Mahakud, 2021; Li et al., 2012). Therefore, the regulatory bodies kept changing the characteristics of AC to improve its effectiveness: e.g. the Security and Exchange Board of India's (SEBI) Listing Obligations and Disclosure Requirements (LODR) regulations (2015) changed many characteristics of the Indian Companies Act 2013: e.g. the requirement of independent members in AC were changed from majority to two-thirds of the members, and the presence of at least one financial or accounting expert was added.

While the initial literature emphasized AC characteristics and their effectiveness, recent literature has started focusing on AC's impact on the firm's value and financial performance (FP).

There is a plethora of research on the relationship between CG and FP (Arora and Bodhanwala, 2018; Arora and Sharma, 2016; Bhagat and Bolton, 2008, 2019; Hermuningsih et al., 2020; Sarpong-Danquah et al., 2018). A keyword search of the Scopus index revealed more than six thousand papers on CG and FP. However, the keyword search discloses that the studies on the effect of AC's characteristics on FP are minimal, with around four hundred articles. This is probably because AC is a relatively new concept in comparison to CG. Most papers consider only a partial view of AC effectiveness and treat AC as part of the overall CG construct, where AC effectiveness loses prominence (Leung et al., 2014). Some studies have looked into either a single (Chaudhry et al., 2020; Chijoke-Mgbame et al., 2020; Maji and Saha, 2021) or several characteristics (Fariha et al., 2022; Farooque et al., 2020) of the AC. As a result, some of the AC characteristics remained unobserved. Still other studies considering more AC characteristics have taken the aggregate effect through an index and not their individual effects (Al-ahdal et al., 2020; Haldar and Raithatha, 2017). A country-wise bibliometric analysis of the Scopus index further reveals that most studies have taken place in the US, with 79 papers, followed by Malaysia with 58 papers. India has only 17 research papers on AC and FP. These papers include studies on the overall CG structure, single AC characteristics, or a few characteristics, as well as analyses using an index. The motivation for this paper arises from a research gap in the existing literature – there is a lack of detailed analysis of all identifiable AC characteristics and their impact on FP.

The present study investigates the influence of Audit Committee (AC) characteristics on 133 NSE-listed Indian firms from six different industries for a period of five years from 2016 to 2020. We have used 11 AC characteristics and analysed their individual and aggregate impact on the accounting-based and market-based measures of FP after the regulatory changes made by SEBI's LODR regulations

(2015). We have employed Panel-Corrected Standard Error (PCSE) regression technique to analyse data after identifying heteroskedasticity, autocorrelation, and cross-sectional dependence.

The results indicate that six AC characteristics significantly affect the accounting-based measure of FP, while seven AC characteristics significantly influence the market-based measure of FP. While the extant literature supports these results, this study's uniqueness lies in using three new AC characteristics that were not examined individually in the previous research. Among the three characteristics, the composition of AC by 100% non-executive directors (NEDs) and the presence of AC charter are found to have a significant positive impact on both measures of FP. At the same time, the representation of AC members at board meetings is found not to affect FP.

This study makes several significant contributions to the emerging literature on AC. Firstly, it provides a comprehensive explanation of AC effectiveness by examining eleven specific AC characteristics and their impact on FP, both individually and collectively, offering a holistic perspective on this relationship. Secondly, the study introduces three new AC characteristics into the discourse: the inclusion of non-executive directors on the AC, the presence of an AC charter, and the representation of AC members in board meetings. Our findings reveal that while the non-executive directorship of AC and the presence of an AC charter significantly enhance FP, these factors have been largely overlooked in previous research. Thirdly, in the Indian context, this study addresses the impact of the Securities and Exchange Board of India's (SEBI) Listing Obligations and Disclosure Requirements (LODR) of 2015, which brought about crucial regulatory changes that have a consequential impact on AC effectiveness, rendering prior studies outdated. Despite an extensive search, no literature was found that considers the effect of individual AC characteristics on FP following these regulatory changes. Therefore, this study is the first to analyse both the individual and aggregate effects of AC characteristics on FP, incorporating the most current regulations.

The rest of the paper is designed as follows: Section 2 presents the literature review and hypothesis development; Section 3 deals with the research methodology; Section 4 presents the results and discussion; Section 5 concludes the paper.

2. Literature Review and Hypotheses Development

ACs are responsible for the oversight and quality of the financial reporting process. It is a primary operating committee of the company's Board of Directors (BOD), which ensures that the financial reports of these corporations are accurate (Buchalter and Yokomoto, 2003). Expectations from ACs skyrocketed in the early

2000s, as many corporate scandals like Enron and WorldCom were divulged, and the Sarbanes Oxley Act (SOX) emerged in 2002 (Beasley et al., 2009). The SOX Act (2002) defines AC as "(A) a committee (or equivalent body) established by and amongst the Board of Directors of an issuer to oversee the accounting and financial reporting processes of the issuer and audits of the financial statements of the issuer; and (B) if no such committee exists with respect to an issuer, the entire Board of Directors of the issuer".

The history of AC dates back to 1939 when the New York Stock Exchange endorsed the concept of AC, and the recommendations and regulations regarding its roles and characteristics started flowing in an evolutionary process. This change in the characteristics of AC was effectuated to improve its effectiveness and regain investors' trust and confidence in the corporation. Accordingly, it is expected that a company with an effective AC and investors' confidence will perform better than its counterparts. In this paper, we identified 11 AC characteristics that are expected to influence the effectiveness of AC and, in turn, the overall FP. The characteristics and expected influence on FP are discussed below to form the premise for formulating our hypotheses.

2.1. Non-executive AC Directors

A non-executive director (NED) is not an employee of the company and is not involved in the company's day-to-day operations. They monitor the activities of the executive directors and the performance of various sub-committees (Mura, 2007) and control the opportunistic and favouritism attitude of the directors (Khan et al., 2021). NEDs bring an independent view to the decision-making process while mentoring and supporting the executive directors.

There are no stringent regulations and legal requirements for the appointment of NEDs in AC. Therefore, under the stewardship theory, it is assumed that the companies will appoint well-qualified, capable, and experienced NEDs who will act in the best interest of the stakeholders. Further, a NED can be a nominee director appointed by organizations who vest interest in the company such as financial institutions or investors. It is more likely that NEDs will perform their duty to oversee and monitor executive management effectively. In both cases, the inclusion of NEDs is likely to improve AC's effectiveness, leading to a positive effect on FP.

Despite our extensive search in the extant literature, we could not find any earlier research to establish the empirical relationship between NEDs in AC and FP. Therefore, in the light of the aforementioned theoretical argument, we hypothesize that:

H1: AC comprising non-executive directors positively influences FP.

2.2. Independent AC Directors

An independent AC member is likely to execute their responsibility by remaining outside the dominance of the executive managers. Hence, the AC with such member(s) can take an independent view of the financial reporting process, leading to higher audit quality (Kallamu and Saat, 2015). An AC with an independent director is free from any undue influence and remains unbiased; therefore, it reduces the agency problem between the executives and the shareholders (Alqatamin, 2018). An independent AC director improves the quality of auditing and overseeing the executive management, which implies a better monitoring function of the board and an improved financial reporting and disclosures (Farooque et al., 2020). This increases the company's legitimacy and market value, which, in turn, increases FP.

Earlier empirical studies on the relationship between AC independence and FP have reported inconclusive results. While some researchers report a positive relationship (Alqatamin, 2018; Dakhlallh et al., 2020; Hamdan et al., 2013), Barka and Legendre (2017) found a negative relationship. In the Indian context, Bansal and Sharma (2016) find that independent AC does not influence ROA, while it positively influences ROE and negatively influences Tobin's Q.

Based on the above theoretical discussion and empirical outcomes of the earlier research, we hypothesize that:

H2: AC independence positively influences FP.

2.3. The AC Member's Expertise

Expert AC members are better equipped to understand the auditor's judgment and communicate effectively with the internal and external auditors (Abbott et al., 2003; DeZoort et al., 2002). When skilled in accounting and finance or having professional sophistication in financial management, an AC member exhibits a higher capability to detect and prevent financial misstatements (Raghunandan et al., 2001). Not only will expert AC members be in a better position to understand the technical aspects of financial reporting and auditing, but they can also serve better in the event of disputes between external auditors and managers (Hsu et al., 2019). Further, an expert AC member improves the quality of financial reporting and increases the company's legitimacy. This increases the stakeholders' confidence and the inflow of funds into the company, thus increasing its firm value.

The extant literature provides arguments that the presence of experts in AC reduces internal control problems (Zhang et al., 2007), avoids accounting mistakes, reduces regulators' attention towards the company (Kallamu and Saat, 2015), and improves the quality of financial reporting (Abbott et al., 2004). However, the empirical studies relating to the AC member's expertise and FP show mixed results.

While Hamdan et al. (2013) and Dakhlallh et al. (2020) found a significant positive effect of AC expertise on FP, Bendigeri (2021) found a negative effect between the two variables. Interestingly, Alqatamin (2018) and Kallamu and Saat (2015) found an insignificant effect of AC expertise on FP. Given this inconclusive result, we hypothesize in the light of the aforementioned theoretical arguments that:

H3: The expertise of AC members is positively related to FP.

2.4. AC Gender Diversity

Adams and Ferreira (2009) argue, based on agency theory, that women's inquisitive nature makes them more effective monitors of managerial actions than men, thereby helping to reduce agency problems. Women, compared to men, exhibit different leadership styles, skills, knowledge, competencies, and possess feminist personality traits such as being helpful, sympathetic, sensitive, tender, nurturing, and expressive. According to the resource-based view, these traits enable companies to better leverage essential resources (Maji and Saha, 2021). Recognizing the benefits of these psychological traits and feminist management styles, countries like Germany, Norway, Spain, France, Iceland, Italy, Belgium, Finland, and Kenya have recently implemented legislative quotas requiring that 30 to 40 percent of board of directors (BOD) positions be held by women (Brahma et al., 2020).

Over the past decade, researchers have increasingly focused on the impact of female board members on FP. Empirical evidence, with a few exceptions, generally shows a positive relationship between gender diversity and firm performance. Researchers like Brahma et al. (2020), Duppati et al. (2020), Julizaerma and Sori (2012), and Liu et al. (2014) have found that gender diversity on boards significantly enhances firm financial performance. However, Adams and Ferreira (2009) and Matsa and Miller (2013) offer a contrasting view, suggesting that mandatory gender diversity may lead to over-monitoring in well-governed firms or the appointment of inexperienced female board members, resulting in a negative impact on performance.

Empirical studies specifically examining gender diversity in audit committees (AC) are rare. Our extensive search identified only two studies (Alqatamin, 2018; Chijoke-Mgbame et al., 2020), both of which found that gender-diverse ACs have a positive effect on financial performance. Accordingly, we hypothesize that:

H4: Gender diversity in AC positively influences FP.

2.5. AC Charter

An AC charter informs its stakeholders about the roles and responsibilities of the AC and provides authority and direction to AC directors (Böhm et al., 2016). The Blue Ribbon Committee (BRC) (1999) recommends that every listed firm adopt a formal written charter approved by the BOD that specifies AC's

responsibilities. According to the US Securities and Exchange Commission (SEC, 1999), the disclosure of the AC charter will strengthen investors' confidence, as the shareholders can assess the roles and responsibilities of the AC. This will bring in role clarity, enhance role consciousness and role commitment, and consequently improve the effectiveness of the AC. According to Ika and Ghazali (2012), AC responsibilities should be registered in an AC charter, guiding the committee and acting as its power source. All these will culminate in boosting stakeholders' confidence and, in turn, improving FP.

Despite the theoretical linkage between AC effectiveness and FP and the recommendation of regulatory bodies, the variable AC charter has slipped the empirical researcher's attention, who thus omitted the analysis of its impact on FP. An earlier study that considered AC charter used it in an AC index where the impact of AC charter is not determined independently (Al-ahdal et al., 2020). Hence, based on the above theoretical linkages, we hypothesize that:

H5: AC charter or its proxy statements positively influence FP.

2.6. AC Size

The size of AC is a crucial indicator associated with its effectiveness. A larger AC typically has more resources and authority, enabling it to fulfil its responsibilities more effectively (Mangena and Pike, 2005). The diverse knowledge and expertise of a large-sized AC help carry out more reliable and efficient management monitoring (Hamdan et al., 2013). Since all AC members are also directors of the board, a larger AC implies greater representation on the Board of Directors (BOD), which can increase the likelihood that the board will adopt the AC's performance-enhancing recommendations. Further, the division of labour or the expertise of a larger AC brings a specialized focus on its different tasks. However, a larger AC may have a detrimental effect on its effectiveness due to diffusion of responsibility and process loss (Bédard and Gendron, 2010), which might reduce FP.

The empirical studies that examined the relationship between AC size and FP show a mixed result. While Alqatamin (2018), Dakhlallh et al. (2020), and Hamdan et al. (2013) found a significant positive effect of AC size, Al Farooque et al. (2020), Wibawaningsih and Surbakti (2020), and Zhou et al. (2018) found no significant effect of AC size on FP. Based on the mixed theoretical arguments and empirical evidence, we claim a positive effect of AC size on FP.

H6: Larger AC size positively impacts FP.

2.7. Multiple Directorships by AC

The resource-dependency theory posits that directors holding multiple directorships are instrumental in bringing strategic knowledge and other intellectual

resources. According to Kiel and Nicholson (2006), multiple directorships can add value to the firm in three ways: firstly, by acting as a collaborative mechanism to extract resources or support from the external stakeholders vital to corporate performance (Zahra and Pearce, 1989); secondly, by acting as a channel of communication for information to and from the external environment; and, thirdly, by enhancing the organizational legitimacy (Zahra and Pearce, 1989). E.g. a director with multiple directorships may inform a cheaper loan source due to his earlier network or introduce a value-adding governance policy in a replicative mode. On the other hand, in line with the busyness hypothesis (Ferris et al., 2003), such members reduce AC efficiency due to several counter-productive factors that include the possibility of distraction, overloading of information, over-commitments, tendency to undermine management counsels, and over-workload causing paucity of time to carry out duties.

The extant literature on multiple directorships shows contradicting results based on resource dependency theory and the busyness hypothesis. Sarkar and Sarkar (2009) studied 500 companies listed on the Bombay Stock Exchange (BSE) and found a positive impact of multiple directorships on FP. Contrary to the above, a study by Jackling and Johl (2009) on BSE-listed companies and Limbasiya and Shukla (2019) on the Nifty Index found a negative impact of multiple directorships on FP. Further, a study by Saleh et al. (2020) on the Palestine Security Exchange (PSE) finds that multiple directorships of AC do not significantly influence FP. Based on the above, we hypothesize the following:

H7: Multiple directorships of AC members do not influence FP.

2.8. AC Meeting Frequency

The frequency of AC meetings indicates the members' degree of rigour, meticulous involvement, and diligence in discharging their roles and responsibilities. The high frequency of AC meetings widens the scope and opportunities of the members to prepare, ask questions, and pursue answers when dealing with management, internal auditors, external auditors, and other relevant constituents (DeZoort et al., 2002). All else remaining equal, ACs that meet frequently are more likely to achieve their goals on time (Buallay, 2018), as this increases the reliability of the process of financial accounting, which leads to better performance (Abbott et al., 2004). BRC (1999) recommends that the ACs meet more frequently for better communication of the AC members with the external and internal auditors. A frequently meeting AC improves the quality of financial statements (Beasley et al., 2009), enhances the monitoring process (Jackling and Johl, 2009), and motivates the company's managers to perform better – all these culminate in an improvement in FP.

The empirical studies found in the extant literature on AC meetings provide mixed results. Al Farooque et al. (2020) found a positive relationship between AC

meeting frequency and FP, which is in line with the above theoretical argument. However, Alqatamin (2018) found no significant effect of meeting frequency on FP. Contrary to the above, Rahman et al. (2019) found a negative impact of AC meeting frequency on FP. This adverse effect could be because, along with the marginal costs incurred for more meetings, the directors meet more frequently just to comply with the regulatory requirements. Based on the above contradicting empirical outcomes, we hypothesize no relationship between them.

H8: The frequency of AC meetings remains independent of FP.

2.9. Attendance of AC Meetings and Board Meetings by AC Directors

AC directors are expected to attend AC meetings to monitor and supervise the firm or make strategic decisions. If a director fails to attend the meetings, it would mean that he/she is unwilling or unable to fulfil their duties (H. I. Chou et al., 2013). Attendance of directors in meetings shows their individual interest, involvement, and commitment towards the firm (Min and Chizema, 2018). The frequency of meetings is valueless and, at times, defeats the purpose if directors do not attend them. Therefore, the degree of diligence of an AC depends on the attendance of the members. Further, the representation of the AC members in the BOD enhances the probability of getting their recommendations accepted.

The empirical studies on this characteristic are very scarce. While examining the empirical validity of the above theoretical argument, Chou and Buchdadi (2017) and Salim et al. (2016) find a positive association between attendance of AC meetings and FP. When we find no empirical research on the representation of AC members on board meetings and its effect on FP, based on our arguments, the following hypotheses are formulated:

H9: Attendance of AC meetings positively influences FP.

H10: Attendance of AC directors in board meetings is positively related to FP.

2.10. AC Director's Shareholding

In line with agency theory, directors having considerable shareholdings are likely to be more motivated to monitor the management and the reporting process (Shivdasani, 1993). This improves the monitoring and oversight responsibility of the AC, which in turn improves FP. According to Mangena and Pike (2005), shareholding by AC directors could affect their incentive to monitor the financial reporting process. Further, based on their empirical research outcomes, Lin et al. (2014) assert that the director's shareholding is linked with increased board attendance, which has an instrumental effect on a firm's accounting performance.

On the contrary, the director's shareholding compromises their independence and negatively affects FP. Carcello and Neal (2003) argue that AC directors with

higher shareholding may join hands with management to protect their investment. This affects the quality of the monitoring and oversight process. A study by Pant and Pattanayak (2007) finds an inverted U-shaped relationship between shareholding and FP. When the ownership is low, it pushes up FP, but a further increase in shareholding (when substantial) negatively affects the performance and ends up pulling down the FP curve. Based on the above argument, the following hypothesis is formulated:

H11: The AC director's shareholding negatively affects FP.

2.11. AC Effectiveness Index

AC effectiveness is an abstract construct. To concretize the construct, DeZoort et al. (2002) assert, "An effective AC has qualified members with the authority and resources to protect stakeholder interests by ensuring reliable financial reporting, internal controls, and risk management through its diligent oversight efforts." The extant literature on AC affirms that AC effectiveness is primarily a function of its characteristics (Akhtaruddin and Haron, 2010; Bédard and Gendron, 2010; Dhaliwal et al., 2010; Li et al., 2012; Singhania and Panda, 2022, 2024). We have developed an AC effectiveness index by considering all AC characteristics that are likely to have a positive relationship with FP. Hence, we hypothesize that:

H12: AC effectiveness index is positively related to FP.

3. Research Methodology

3.1. Sample Selection

For our study sample, we chose six industries: IT, drugs and pharmaceuticals, chemical, consumer goods, food and agro-based, and metal and metal product industry. The first three industries were chosen because of their high growth and performance and the last three because they are the traditional industries where the highest population is employed. Under the National Stock Exchange of India (NSE), 534 companies belong to these six industries, and it constitutes our population of the study with a total market capitalization of 387,437.00876 billion rupees (5,142.856 billion USD). Our sampling frame is the top 500 NSE-listed companies based on market capitalization as on 31 March 2020. In this context, there are 24 IT companies, 32 drugs and pharmaceutical companies, 28 chemical companies, 23 consumer goods companies, 25 food and agro-based companies, and 19 metal and metal product companies. Out of these 151 companies, 18 were omitted due to a lack of required information. Therefore, our final sample consists of 133 companies for five years from 2016 to 2020, constituting 665 observations. The

total market capitalization of these 133 companies is 366,667.5791 billion rupees (4,867.1617 billion USD), representing around 94.63% of the total population. The data were collected from the Capitaline database, the Prowess database (CMIE), annual reports, and websites. Stata 16 is used to analyse the models.

3.2. Variables and Measurement

3.2.1. Dependent Variables

The dependent variable for our study is firm performance (FP). We have measured FP by two alternative parameters, viz. Return on Assets (ROA) and Market Capitalization [natural log of market capitalization (LMCap)]. ROA is a profitability ratio that measures how well a company generates profits from its total assets. It is the most accepted accounting-based measure of FP (Alqatamin, 2018; Kallamu and Saat, 2015). On the other hand, Market Capitalization is the total market value of all the company's outstanding shares. It refers to the company's value as determined by the stock market. Market Capitalization has been used in its natural logarithm form in previous studies as a market-based measure of FP (Bhat et al., 2018; Madaleno and Vieira, 2020).

3.2.2. Independent Variables

Eleven AC characteristics discussed above are the independent variables of the study. These characteristics are measured using a nominal scale and are presented in a tabular form along with their abbreviations and measurements in *Table 1*.

Table 1. *Measures of independent variables*

Variables	Abbreviation	Measurement
AC Independence	AC_ind	If 2/3rd of the members are independent, then 1, otherwise 0.
AC Expertise	AC_expert	A score of 1 is assigned if at least one member is an accounting expert, otherwise 0.
AC Non-executive Members	AC_ned	If all the AC directors are non-executive members, then 1, otherwise 0.
AC Charter	AC_charter	If the company discloses AC charter or its proxy statements explaining AC roles and responsibilities in detail, then 1, otherwise 0.
AC Size	AC_size	If the number of AC members is more than 3, then 1, otherwise 0.
Multiple Directorship	AC_multiDir	If the average multiple directorships of AC members are between 0 to 4, then 0, otherwise 1.

Variables	Abbreviation	Measurement
Gender Diversity	AC_gender	If AC has at least one female director, then 1, otherwise 0.
AC Meetings	AC_meet	If AC meets less than five times a year, then 0, otherwise 1.
AC Meeting Attendance	AC_M_attend	If the attendance in AC meetings is 90% or more, then 1, otherwise 0
Board Meeting Attendance by AC	AC_BM_ attend	If AC directors' attendance in board meetings is 90% or more, then 1, otherwise 0.
Shareholding	AC_share	If AC shareholding is less than 2%, then 0, otherwise 1.
AC Effectiveness Index	ACEI	Sum of all the scores obtained from the eleven AC characteristics.

Source: author's own compilation

3.2.3. Control Variables

The control variables for our study are the BOD index (measured as the sum of the scores of board size, the ratio of independent directors, and the frequency of board meetings) and firm-specific characteristics such as firm size, asset turnover, and leverage. The variables, along with their abbreviations and measurements, are presented in *Table 2*.

Table 2. *Measures of control variables*

Variables	Abbreviation	Measurement
Board Size	B_size	If B_size ≤ 5, Score = 0.50; if B_size = 6 or 7, Score = 0.65, if B_size = 8 or 9, Score = 0.80, if B_size = 10 or 11, Score = 1.00, if B_size = 12 or 13, Score = 0.95, if B_size ≥ 14, Score = 0.90 (Arora and Bodhanwala, 2018; Mishra et al., 2021; Varshney et al., 2015).
The Ratio of Independent Board Directors	B_ind	It is calculated by dividing the total number of outside directors by the total board size (Arora and Bodhanwala, 2018; Mishra et al., 2021; Varshney et al., 2015).
Frequency of Board Meetings	B_meet	A dummy variable equals "1" if a company has held more than four meetings in a financial year and "0" otherwise (Arora and Bodhanwala, 2018; Varshney et al., 2015).
BOD Index	BODindx	B_size + B_ind + B_meet
Firm Size	Firmsize	Natural logarithm of total assets.
Asset Turnover	Asset_tnvr	The ratio of net sales by total assets.
Leverage	Leverage	Ratio to total debt to equity.

Source: author's own compilation

3.3. Research Models

We performed the panel-corrected standard error (PCSE) regression technique to analyse the relationships proposed in the research hypotheses. The four models are as follows.

Model 1: $ROA = \beta_0 + \beta_1$ AC_ned $+ \beta_2$ AC_ind $+ \beta_3$ AC_expert $+ \beta_4$ AC_gender $+ \beta_5$ AC_charter $+ \beta_6$ AC_size $+ \beta_7$ AC_multiDir $+ \beta_8$ AC_meet $+ \beta_9$ AC_M_attend $+ \beta_{10}$ AC_BM_attend $+ \beta_{11}$ AC_share $+ \beta_{12}$ BODindx $+ \beta_{13}$ Firmsize $+ \beta_{14}$ Asset_tnvr $+ \beta_{15}$ Leverage $+ \varepsilon_i$

Model 2: $ROA = \beta_0 + \beta_1$ ACEI $+ \beta_2$ BODindx $+ \beta_3$ Firmsize $+ \beta_4$ Asset_tnvr $+ \beta_5$ Leverage $+ \varepsilon_i$

Model 3: $LMCap = \beta_0 + \beta_1$ AC_ned $+ \beta_2$ AC_ind $+ \beta_3$ AC_expert $+ \beta_4$ AC_gender $+ \beta_5$ AC_charter $+ \beta_6$ AC_size $+ \beta_7$ AC_multiDir $+ \beta_8$ AC_meet $+ \beta_9$ AC_M_attend $+ \beta_{10}$ AC_BM_attend $+ \beta_{11}$ AC_share $+ \beta_{12}$ BODindx $+ \beta_{13}$ Firmsize $+ \beta_{14}$ Asset_tnvr $+ \beta_{15}$ Leverage $+ \varepsilon_i$

Model 4: $LMCap = \beta_0 + \beta_1$ ACEI $+ \beta_2$ BODindx $+ \beta_3$ Firmsize $+ \beta_4$ Asset_tnvr $+ \beta_5$ Leverage $+ \varepsilon_i$

4. Results and Discussion

Table 3 reports the descriptive statistics of our variables for a sample of 665 firm-year observations. The mean value of ROA is 0.212, with a minimum of -0.964 and a maximum of 1.22. This indicates that the profitability of Indian firms is very low. The mean value and standard deviation (std. dev.) of LMCap are 3.952 and 0.597 respectively, with a minimum of 2.552 and a maximum of 5.875. This indicates a wide variation in the market capitalization of the companies, which is following the firm size of the sample companies with a mean of 3.483 and std. dev. of 0.612. The mean and std. dev. of Asset Turnover ratio is 1.342 and .999 respectively, with a minimum of 0.032 and a maximum of 7.943. This shows that while some companies are very efficient with their assets in generating revenue, others are very inefficient, and there is a wide gap in the efficiency of the companies. The mean and std. dev. of Leverage is 0.398 and 0.822 respectively, with a minimum of 0 and a maximum of 11.43, indicating that while some companies prefer no leverage, others have very high leverage. The mean score of ACEI is 6.538, with a minimum of 2 and a maximum of 10. The std. dev. of ACEI is 1.754, indicating considerable variations in the effectiveness of the AC.

Table 3. *Descriptive statistics (665 observations)*

Variable	Mean	Std. Dev.	Min.	Max.
ROA	0.21	0.17	-0.96	1.22
LMCap	3.95	0.60	2.55	5.87
AC_ned	0.67	0.47	0	1
AC_ind	0.79	0.41	0	1
AC_expert	0.85	0.36	0	1
AC_gender	0.45	0.50	0	1
AC_charter	0.73	0.45	0	1
AC_size	0.70	0.46	0	1
AC_multiDir	0.38	0.49	0	1
AC_meet	0.53	0.50	0	1
AC_M_attend	0.67	0.47	0	1
AC_BM_attend	0.62	0.48	0	1
AC_share	0.15	0.36	0	1
BODindx	2.17	0.45	0.9	2.8
Firmsize	3.48	0.61	1.98	5.11
Asset_tnvr	1.34	0.99	0.032	7.94
Leverage	0.40	0.82	0	11.43
ACEI	6.54	1.75	2	10

Source: Singhania and Panda (2022)

Before running the regression, we tested for multicollinearity, heteroskedasticity, autocorrelation, and cross-sectional dependence. The variance inflation factor (VIF) shows no issue for multicollinearity in our samples. However, the Breusch–Pagan (1979) and white (1980) tests show that all four models suffer from heteroskedasticity. Further, the Durbin and Watson (1950) and Wooldridge (2002) tests confirm first-order autocorrelation in all the models. The Pesaran (2021) test reveals that, while there is no cross-sectional dependence for model 1 and model 2, the test confirms the presence of cross-sectional dependence in model 3 and model 4.

The presence of heteroskedasticity, autocorrelation, and cross-sectional dependence makes econometric analysis difficult. Beck and Katz (1995) suggested using the PCSE regression model for such cases. Chen et al. (2005) found that PCSE is an efficient technique for testing hypotheses. The extant literature on FP has extensively used the PCSE model in the presence of heteroskedasticity, autocorrelation, and cross-sectional dependence (Canarella and Gasparyan, 2008; Islam et al., 2021; Minh Ha et al., 2022; Nguyen and Nguyen, 2020; H. U. Rahman et al., 2021; Singhania and Panda, 2023).

Table 4 presents the results of regression analysis for models 1 and 3. The result shows that NEDs in AC positively influence both ROA (z = 2.92, p < 0.01) and LMCap (z = 5.74, p < 0.01) at a 1% significance level. This supports our hypothesis *H1*. AC independence is not associated with ROA; as it negatively affects market capitalization (z = -3.69, p < 0.01), we reject our hypothesis *H2*. This may be because the market perceives that the independent director has limited firm-specific knowledge compared to an executive director. Further, the BOD may appoint unworthy or less proficient directors with a ticking-the-box attitude to fulfil the regulatory requirement of two-thirds independent directors. This result is consistent with the previous studies (Bansal and Sharma, 2016; Farooque et al., 2020; Zhou et al., 2018), which found no relationship of AC independence with ROA and a negative relationship with market capitalization.

Table 4. *PCSE regression for model 1 and model 3*

	ROA		**Market Capitalization**	
Variables	Coef.	P > |z|	Coef.	P > |z|
AC_ned	.020	0.003***	.092	0.000***
AC_ind	.001	0.863	-.067	0.000***
AC_expert	.003	0.829	.056	0.001***
AC_gender	.022	0.002***	.021	0.156
AC_charter	.047	0.000***	.221	0.000***
AC_size	.036	0.000***	.086	0.002***
AC_multiDir	.015	0.079*	.093	0.000***
AC_meet	-.010	0.389	-.021	0.357
AC_M_attend	.020	0.010***	.048	0.097*
AC_BM_attend	.010	0.297	.039	0.180
AC_share	-.019	0.122	.004	0.886
BODindx	.003	0.706	.011	0.730
Firmsize	-.046	0.000***	.751	0.000***
Asset_tnvr	.067	0.000***	.166	0.000***
Leverage	-.041	0.034**	-.211	0.000***
_cons	.184	0.000***	.798	0.000***
R-squared		0.310		0.672
Wald chi2		971.75		6727.98

Source: author's own computation

Notes: *** p < 0.01, ** p < 0.05, * p < 0.1.

The expertise of AC members is insignificant to ROA and is consistent with Alqatamin (2018) and Kallamu and Saat (2015). However, it positively influences the company's market capitalization (z = 3.20, p < 0.01) at a 1% significance level.

Hence, we reject hypothesis *H3* with ROA as a measure of FP and accept the hypothesis with LMCap as a measure of FP. The result is in tune with Dakhlallh et al. (2020), who found a positive association between AC expertise and Tobin's Q. This is because, although the companies may appoint experts in AC just to meet the regulatory requirements, without giving proper authority to the expert, the investors perceive that the expert member will improve AC's technical knowledge and monitoring ability.

Gender diversity in AC positively influences ROA ($z = 3.07$, $p < 0.01$) at a 1% significance level but is insignificant to LMCap. Hence, we fail to reject our hypothesis *H4* while considering ROA, but we reject the said hypothesis while considering LMCap as a measure of FP. This result is consistent with Alqatamin (2018) and Chijoke-Mgbame et al. (2020), who found a positive association between gender diversity and ROA. This indicates that female members in AC are related to higher FP compared to ACs with no female members. However, the insignificant effect of gender diversity on market capitalization signifies that the market perceives no difference in performance due to the gender of AC's members.

The presence of AC charter or its proxy statement is positively associated with both ROA ($z = 4.03$, $p < 0.01$) and LMCap ($z = 9.95$, $p < 0.01$) at a 1% level of significance. Hence, we fail to reject our hypothesis *H5*. The size of AC has a positive relationship with both ROA ($z = 5.45$, $p < 0.01$) and LMCap ($z = 3.08$, $p < 0.01$) at a 1% level of significance. Hence, we fail to reject our hypothesis *H6*. This result is consistent with the previous works of Alqatamin (2018), Dakhlallh et al. (2020), and Hamdan et al. (2013).

The results further manifest that multiple directorships by AC members are positively associated with ROA ($z = 1.76$, $p < 0.10$) at a 10% and with LMCap ($z = 3.77$, $p < 0.01$) at a 1% significance level respectively. So, we accept our hypothesis *H7*. This result aligns with the resource dependency theory and is supported by Sarkar and Sarkar (2009), but it contradicts Jackling and Johl (2009).

The results further display that the frequency of AC meetings has a negative but insignificant effect on both ROA and LMCap. Hence, we fail to reject our hypothesis *H8*. This result is congruent with Alqatamin (2018), who failed to find any relationship between the frequency of AC meetings and FP.

Attendance in AC meetings is seen to have a positive effect on both ROA ($z = 2.57$, $p \leq 0.01$) at 1% and LMCap ($z = 1.66$, $p \leq 0.10$) at 10% significance level respectively. Hence, we accept our hypothesis *H9*. This result is consistent with the previous study of Chou and Buchdadi (2017) and Salim et al. (2016). On the other hand, attendance of board meetings by AC directors has no significant effect on FP, due to which we reject our hypothesis *H10*. Further, shareholding by AC is found to have no significant effect on both measures of FP. Hence, we reject our hypothesis *H11*.

Table 5. *PCSE regression for model 2 and model 4*

	ROA		Market Capitalization	
Variables	Coef.	P>|z|	Coef.	P>|z|
ACEI	.018	0.000***	.056	0.000***
BODindx	-.006	0.545	.004	0.860
Firmsize	-.045	0.000***	.761	0.000***
Asset_tnvr	.067	0.000***	.164	0.000***
Leverage	-.044	0.027**	-.216	0.000***
_cons	.193	0.000***	.788	0.000***
R-squared		0.292		0.647
Wald chi2		453.42		3688.20

Source: author's own computation

Notes: *** p < 0.01, ** p < 0.05, * p < 0.1.

Table 5 presents the PCSE regression results for the AC effectiveness index, which is a sum of all the characteristics of AC. The result indicates that ACEI is highly significant to both ROA ($z = 6.02$, $p \leq 0.01$) and LMCap ($z = 5.47$, $p \leq 0.01$) at a 1% level of significance. Hence, we accept our hypothesis *H12*. It signifies that the characteristics of AC enhance its effectiveness, which in turn improves FP. This result is congruent with the previous studies of Al-ahdal et al. (2020) and Gupta and Mahakud (2021), who analysed the effect of the AC index on FP and found a positive association.

Among control variables, the BOD index has no significant effect on FP. Among firm-specific characteristics, Firm Size is negatively significant to ROA while positively affecting the LMCap. Asset Turnover is positively associated with both ROA and LMCap, and Leverage is negatively associated with both ROA and LMCap at a 1% level of significance.

5. Conclusions

The extant literature on FP focuses on Corporate Governance (CG) and BODs, where the individual effects of the characteristics of a vital sub-committee of BOD, such as the AC, is overlooked. Though a few researchers have established a relationship between AC attributes and FP, they have either taken a few characteristics or considered them in an index, due to which the individual effects of the attributes remain concealed. The methodological soundness in most of the earlier studies, barring a few, was found low owing to either small sample size or period coverage. In order to address the shortcomings, we have considered 11 AC characteristics to analyse their individual and collective effect on accounting and market-based measures of FP.

The findings of this research reveal that six AC characteristics, i.e. AC gender, AC charter, AC size, multiple directorships of AC members, attendance of AC meetings, and presence of NEDs, significantly influence the accounting-based measure (ROA) of FP, while seven AC characteristics, i.e. AC independence, AC expertise, AC charter, AC size, multiple directorships of AC members, attendance of AC meetings, and presence of NEDs, significantly influence the market-based measure of FP. The aggregative effect of 11 AC characteristics captured through ACEI has a significant positive effect on both measures of FP.

This study contributes to the emerging literature on AC in multiple ways. Firstly, it comprehensively explains AC effectiveness by considering 11 AC characteristics and examining their effect on FP individually and collectively, thus providing a holistic approach to the relationship. Secondly, it considers three new AC characteristics: the constitution of AC with non-executive directors, the presence of the AC charter, and the representation of AC members in board meetings. While we found that the non-executive directorship of AC and the presence of AC charter significantly improve FP, these characteristics remained ignored in previous research. Thirdly, in the Indian context, SEBI's LODR (2015) has made crucial changes in the regulations, which have a consequential impact on AC effectiveness, making previous studies obsolete. Despite our extensive search, we could not find any literature considering the effect of individual AC characteristics on FP after the above-mentioned regulatory changes. Hence, our study is the first to consider the individual and aggregate effect of AC characteristics on FP considering up-to-date regulations.

This paper has several managerial and policy implications. While offering a comprehensive conceptual framework to understand AC characteristics influencing its effectiveness and, in turn, FP, the study reveals empirical results beneficial to regulators, management (BOD), and investors. The regulators can benefit from our results by revisiting AC regulations to mandate the requirement of AC charter and non-executive directors of AC, implementing quotas for gender-diverse AC, and reducing the requirement of AC independence. It will assist the managers in taking appropriate measures in increasing AC size and motivating AC directors to attend more meetings. Further, investors can gain from our findings to assess AC effectiveness in value-adding attributes and make investment decisions accordingly.

This study has some limitations. Firstly, the study period is limited from 2015 to the year 2020. This is because of the regulatory changes in AC characteristics by SEBI's LODR (2015) and market instability due to the COVID-19 pandemic. Secondly, the generalizability of the findings is limited to Indian companies. Thirdly, since the study is based in India, where corporate culture is relatively uniform and ownership structures are predominantly family-owned, these characteristics are not controlled. Therefore, future research may consider a more extensive study period and consider the pre-COVID and post-COVID comparison of

the effectiveness of the AC. Further, a cross-country comparison of the influence of AC characteristics on FP can be carried out in order to understand this relationship in different CG settings, cultures, and ownership structures.

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