

Board Attributes on the Cost of Capital (WACC) of Listed Pharmaceutical Firms in Nigeria

Anietie Sunday Ekpo¹

Department of Accounting, Faculty of Management Sciences
Akwa Ibom State University, Obio Akpa Campus

Dr. Eno Ukpong²

Department of Accounting, Faculty of Management Sciences
Akwa Ibom State University, Obio Akpa Campus

Dr. Emmanuel Emenyi³

Department of Accounting, Faculty of Management Sciences
Akwa Ibom State University, Obio Akpa Campus
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Abstract

This study examined the effect of board attributes on the cost of capital (WACC) of listed pharmaceutical firms in Nigeria, focusing on board size and board independence. The population of the study comprised seven pharmaceutical firms listed on the Nigerian Exchange Group from 2014 to 2023. The specific objectives were to examine the effect of board size on WACC, to establish the effect of board independence on WACC. The study employed an ex-post facto research design and used panel least squares regression for data analysis via Eviews 10.0. The findings revealed that board size and board gender diversity had an inverse and statistically non significant relationship with WACC. The study concluded that board attributes have a significant influence on the cost of capital for listed pharmaceutical firms in Nigeria, with board independence having the most significant impact. Thus, it was concluded that board size has significant effect on weighted average cost of capital of listed pharmaceutical firms in Nigeria. Based on these findings, the study recommended that pharmaceutical firms in Nigeria maintain an optimal board size and also increase the proportion of independent directors to improve corporate governance and reduce the cost of capital.

Keywords: Cost of Capital, Board Attributes, Corporate governance

INTRODUCTION

1.1 Background to the Study

The global business environment has witnessed several corporate scandals and institutional failures that have eroded investor confidence and raised concerns about corporate governance practices. These failures have had a profound impact on the financial markets, shaking stakeholders' trust and influencing investment decisions. As corporate governance becomes an increasingly critical factor in shaping organizational performance, this study aims to explore how board attributes, specifically board size, board independence, and gender diversity, affect the cost of capital in listed pharmaceutical firms in Nigeria.

Corporate governance encompasses the processes, policies, and structures that guide how a company is managed and controlled. The role of the board of directors is central to corporate governance, as it oversees the activities of management, ensures accountability, and protects shareholders' interests. The composition of the board, including its size, independence, and diversity, is widely believed to influence the effectiveness of corporate governance and, by extension, the financial outcomes of the firm. Given the importance of these board characteristics, understanding their impact on the cost of capital is crucial for pharmaceutical firms in Nigeria, where access to capital is vital for growth and innovation in the highly competitive pharmaceutical sector.

The cost of capital is a key financial metric that represents the price at which a company can raise funds for its operations and investments. It is influenced by various factors, including a firm's financial health, investor sentiment, and macroeconomic conditions. However, corporate governance also plays a critical role in determining the cost of capital. Firms with strong corporate governance practices are often perceived as less risky, leading to a lower cost of capital. On the other hand, poor governance practices can raise the perceived risk, resulting in a higher cost of capital (Dogan and Acar, 2018). This study examines how the attributes of the board—its size and independence, —can influence the cost of capital for pharmaceutical firms in Nigeria.

Pharmaceutical firms in Nigeria, like other firms, rely heavily on external funding to support their operations and expansion, particularly in an industry that requires substantial investment in research and development. Strong corporate governance practices, characterized by an appropriately sized, independent, and diverse board, can help reduce the firm's perceived risk and cost of capital. Conversely, firms with weak governance structures may face higher costs of capital, which can hinder their growth and ability to compete in the market. This study aims to contribute to the growing body of literature on corporate governance by examining the effect of board size and board independence on the cost of capital of listed pharmaceutical firms in Nigeria.

1.2 Statement of the problem

The cost of capital is a vital aspect that determines a firm's financial performance and investment decisions. Understanding how board attributes influence this relationship is essential

for effective financial management and decision-making within the pharmaceutical industry. There are several conceptual causes that can be explored in this context. Firstly, the size of a pharmaceutical firm may impact its cost of capital, with larger firms potentially having lower costs due to greater access to financial resources. However, the attributes of the board of directors can moderate this relationship. A diverse board, with varied perspectives and expertise, may influence risk assessment and investor confidence, thereby affecting the cost of capital. Secondly, financial leverage can significantly impact the cost of capital for pharmaceutical firms. Higher levels of leverage may lead to increased risk perception by investors, resulting in higher costs.

Extant studies related to Board attributes and cost of seem to be scanty as the results of previous researchers are conflicting. Existing literature (for instance, Fariha et al., 2021; Javeed *et al.*, 2021; Siyanbola et al., 2018; Badu & Appiah, 2017; Abdulazeez et al., 2016) documented series of relationships between Board attributes and financial performance with no emphasis on cost of capital. Hence, this study examined the moderating effect of board attributes on cost of capital of listed pharmaceutical firms in Nigeria. The present study adopted board size and board independence as explanatory variables and weighted average cost of capital as a surrogate for cost of capital of listed pharmaceutical firms in Nigeria.

1.3 Objectives of the study

The major objective of this study was to examine the effect of board attributes on cost of capital of listed pharmaceutical firms in Nigeria. However, the specific objectives included:

1. To ascertain the effect of board size on the weighted average cost of capital of listed pharmaceutical firms in Nigeria.
2. To establish the effect of board independence on the weighted average cost of capital of listed pharmaceutical firms in Nigeria.

1.4 Research questions

The study sought to provide reliable answers to the following research questions.

1. What effect does board size have on weighted average cost of capital of listed pharmaceutical firms in Nigeria?
2. To what extent does board independence affect weighted average cost of capital of listed pharmaceutical firms in Nigeria?

1.5 Research hypotheses

The following hypotheses would be formulated for this study:

H₀₁: Board size does not have significant effect on weighted average cost of capital of listed pharmaceutical firms in Nigeria.

H₀₂: There is no significant effect of board independence on weighted average cost of capital of listed pharmaceutical firms in Nigeria.

REVIEW OF RELATED LITERATURE

This chapter will focus on the review of related studies conducted by previous researchers. It is organized into conceptual framework, theoretical framework and empirical review.

2.1 Conceptual framework

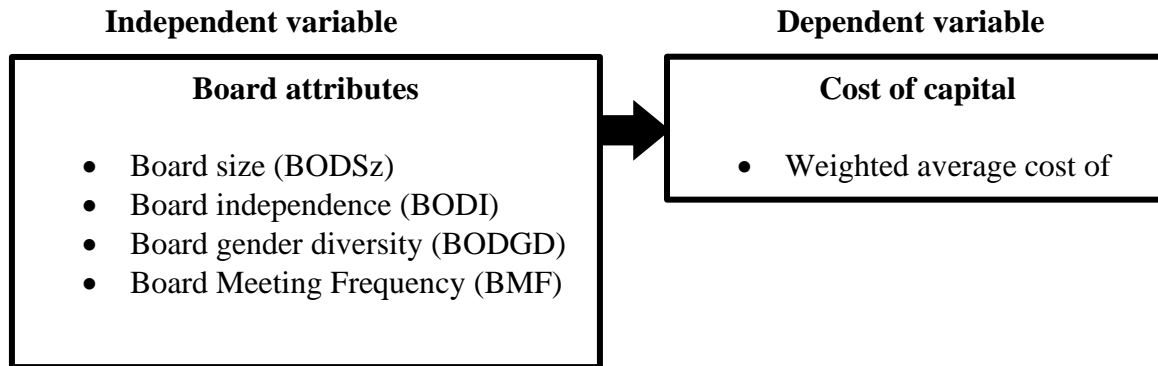


Fig 2.1: Model of Interrelationships of variables

Source: Researcher's compilation (2024)

2.1.1 Board attributes

Board attributes refer to the characteristics, diversity, and expertise of a company's board of directors, which collectively shape their capacity to govern effectively and influence organizational outcomes. These attributes include elements such as board size, composition, independence, diversity, tenure, and industry expertise. For pharmaceutical firms, which operate in highly regulated and capital-intensive environments, board attributes are particularly critical for ensuring strategic oversight and sound financial decision-making. A well-composed board with diverse expertise not only enhances corporate governance but also improves decision-making processes, which can bolster investor confidence and reduce the cost of capital (Afolabi and Oladipo, 2021).

An essential aspect of board attributes is board size, which pertains to the number of directors on the board. Optimal board size is important for effective decision-making, as smaller boards can facilitate streamlined discussions, while larger boards may offer a broader range of perspectives. However, excessively large boards may face coordination challenges, diminishing efficiency. A study by Okon and Obong (2022) highlighted that boards with an optimal size tend to deliver better governance outcomes and ensure accountability in high-risk sectors like pharmaceuticals. In addition, the composition of the board—comprising executive, non-executive, and independent directors—plays a significant role in balancing internal and external oversight. Non-executive and independent directors, in particular, provide unbiased supervision, mitigating conflicts between management and shareholders.

Board independence, which reflects the proportion of directors unaffiliated with the company, is another crucial attribute. Independent directors enhance objectivity and provide checks and balances in corporate governance. Their presence fosters impartial decision-making and accountability, reducing the likelihood of agency problems and aligning managerial decisions with shareholder interests. Research by Eke and Bassey (2020) demonstrated that independent boards are better equipped to implement transparent governance frameworks, which subsequently reduce the perceived risk among investors and lower the cost of capital.

Diversity within boards is also a significant factor influencing governance and financial outcomes. Board diversity includes gender, ethnicity, age, professional background, and educational qualifications. Diverse boards benefit from varied perspectives, which enrich the decision-making process and strengthen risk management. Empirical evidence by Adewale and Adebayo (2021) supports the assertion that gender-diverse boards in the pharmaceutical sector enhance strategic oversight and improve investor confidence, leading to a lower cost of capital. Diversity also facilitates innovation by encouraging the inclusion of alternative viewpoints in addressing complex industry challenges.

In addition to diversity, board tenure—the length of time directors serve on the board—is an important attribute. Long-tenured boards may benefit from institutional knowledge and stability, while short-tenured boards can offer fresh perspectives. However, a balance is necessary to prevent complacency and ensure effective governance. Udo et al. (2024) found that a mix of seasoned and newly appointed directors creates a dynamic environment that fosters both continuity and innovation, contributing to improved corporate governance and financial outcomes.

Industry-specific expertise among board members is particularly relevant in pharmaceutical firms. Directors with deep knowledge of the regulatory environment, market dynamics, and technical aspects of the industry are better positioned to make informed decisions and anticipate potential risks. Expertise contributes to effective oversight, particularly in capital-intensive and highly competitive sectors. Okon and Etim (2022) emphasized that boards with industry expertise mitigate operational and financial risks, which enhances investor trust and reduces the cost of raising capital.

Board attributes also significantly influence the cost of capital, a critical determinant of corporate investment and financing decisions. Effective board attributes, such as diversity, independence, and expertise, strengthen corporate governance, which can reduce agency costs and enhance investor confidence. Boards with diverse attributes are more likely to identify and manage risks effectively, minimizing financial missteps that could lead to increased borrowing costs or unfavorable investor sentiment. As demonstrated by Adewale et. al. (2021), diverse boards in the pharmaceutical sector were associated with reduced cost of capital due to their improved ability to address complex aregulatory and market challenges.

The role of board independence in lowering the cost of capital is also noteworthy. Independent directors are more likely to promote transparency and accountability in corporate governance, making the firm more attractive to investors. Such transparency reduces information asymmetry, enabling companies to secure funding at more favorable terms. In their study, Eke and Bassey (2020) found that firms with higher proportions of independent directors reported improved investor trust and reduced capital costs.

Board size and expertise also contribute to the cost of capital by influencing governance and decision-making efficiency. While larger boards may introduce diverse viewpoints, overly large boards risk inefficiency and slower decision-making processes. On the other hand, expertise enables boards to navigate complex operational and regulatory landscapes, particularly in industries requiring substantial capital investment. Okon and Etim (2022) found that expertise among directors in the pharmaceutical sector mitigates uncertainties, fostering investor confidence and improving access to capital.

2.1.2 Board size

Board size, defined as the total number of members serving on a company's board of directors, including both executive and non-executive directors, is a critical determinant of corporate governance effectiveness. It influences strategic decision-making, governance quality, and financial outcomes, particularly the cost of capital. The size of a board affects the diversity of expertise, the efficiency of decision-making processes, and its ability to address stakeholder interests comprehensively. Optimal board size is essential to balance these elements for enhanced governance and financial performance (Okoro and Johnson, 2020).

Smaller boards are often associated with efficiency in decision-making and lower coordination costs. With fewer members, discussions and deliberations are typically quicker, allowing for more agile responses to organizational challenges. Smaller boards also promote individual accountability, which can contribute to more effective oversight. Okon and Ekpo (2021) observed that firms with smaller boards in Nigeria demonstrated greater operational efficiency and transparency, positively impacting their financial outcomes. However, the limitations of smaller boards include a reduced diversity of skills and perspectives, which are crucial for addressing complex challenges in dynamic industries like pharmaceuticals. A lack of diverse expertise may hinder strategic planning and risk management, potentially diminishing investor confidence and increasing the firm's cost of capital.

On the other hand, larger boards bring a broader range of expertise and experience, which can enhance governance quality and strategic oversight. The diversity of perspectives in larger boards can lead to innovative solutions and more comprehensive risk management practices. These benefits are particularly advantageous in capital-intensive and highly regulated industries, where robust oversight is essential. Empirical studies, such as those by Adewale and Akpan (2022), highlight that well-diversified boards improve investor sentiment, reduce perceived risks, and lower the cost of capital for firms. However, larger boards are not without challenges. Coordination difficulties, slower decision-making processes, and diluted individual accountability are common drawbacks. These inefficiencies can increase operational complexity, potentially undermining financial performance (Etim and Obong, 2024).

The relationship between board size and cost of capital is context-dependent and influenced by factors such as industry type, firm size, and governance practices. Some studies suggest that excessively large boards may lead to inefficiencies that erode investor confidence, ultimately increasing the cost of capital. For instance, Udo and Adebayo (2021) found that Nigerian firms with overly large boards reported higher financing costs due to delayed decisions and governance bottlenecks. Conversely, other studies indicate that larger boards can improve financial outcomes by leveraging collective expertise to make better investment decisions and assess risks more

effectively. Akpan and Ufot (2024) demonstrated that firms in the pharmaceutical sector with larger boards experienced lower capital costs due to enhanced governance practices and strategic insights.

Striking the right balance between the benefits and drawbacks of board size is crucial for optimizing governance outcomes. Firms must consider the trade-offs between the efficiency of smaller boards and the diversity of larger boards to determine an optimal board size that aligns with their strategic goals and operational requirements. This balance is especially important in industries where external investor confidence and access to financial resources significantly impact performance. By carefully calibrating board size, firms can strengthen governance frameworks, mitigate risks, and enhance their financial standing. As noted by Okoro and Johnson (2020), achieving an optimal board size tailored to the firm's unique context is a vital step toward fostering sustainable growth and reducing the cost of capital

2.1.3 Board independence

Board independence is a critical component of corporate governance, emphasizing the role of directors who are free from conflicts of interest or affiliations with the firm's management. This independence is fundamental in providing unbiased oversight and objective decision-making, fostering transparency, and safeguarding shareholder trust. Independent directors bring impartial perspectives to the board, enhancing the company's governance structure and bolstering its credibility among investors. This alignment with shareholders' long-term interests has been widely recognized as a strategy to reduce financial risks and improve the overall governance of firms (Okon and Etim, 2020; Dalton et al., 2019).

Independent boards are instrumental in mitigating agency conflicts, which occur when management's interests diverge from those of shareholders. By ensuring robust oversight, independent directors can lower agency costs, directly influencing a firm's financial outcomes and cost of capital. According to Ekanem and Akpan (2022), firms with higher proportions of independent directors reported enhanced decision-making aligned with shareholder interests, thereby fostering investor confidence and reducing financing costs. The capacity of independent directors to minimize managerial opportunism and promote transparency is particularly critical in industries like pharmaceuticals, which are characterized by significant research and development investments and heightened regulatory scrutiny.

The relationship between board independence and cost of capital reflects the ability of independent directors to provide impartial evaluations of strategic decisions. Transparency in financial reporting, driven by independent oversight, enhances investor trust, reduces perceived risks, and lowers the cost of equity and debt. Agrawal and Knoeber (2016) found that independent directors improve governance and accountability, ensuring that corporate strategies are rigorously examined from an external perspective. Similarly, Akpan and Udo (2021) emphasized that firms in capital-intensive industries like pharmaceuticals benefit from the presence of independent board members who enhance financial credibility and investor confidence.

Board independence also strengthens the effectiveness of critical committees, such as audit and risk management committees. Independent oversight in these committees ensures that recommendations are not influenced by managerial bias, fostering greater accountability to stakeholders. This function is particularly valuable in mitigating systemic risks associated with

poor governance. For instance, Okoro and Johnson (2024) highlighted that independent directors on audit committees enhanced corporate integrity, reducing operational risks and improving the firm's reputation among creditors and equity investors. On a broader scale, board independence also facilitates compliance with international governance standards, which is crucial for firms seeking to attract global investments (Hermalin and Weisbach, 2018).

In the African context, studies have demonstrated the significance of independent directors in addressing governance challenges specific to emerging markets. Ekanem and Ufot (2021) observed that independent directors played a pivotal role in enhancing the governance practices of Nigerian pharmaceutical firms by aligning managerial actions with shareholder interests. The research revealed that firms with higher board independence experienced reduced financing costs due to improved investor confidence. Similarly, Etim and Akpan (2024) noted that in highly regulated sectors, such as healthcare and pharmaceuticals, board independence was essential for navigating complex regulatory environments and ensuring sustainable growth.

The European perspective also underscores the criticality of board independence in optimizing governance and financial outcomes. Ferreira and Matos (2018) emphasized that independent boards are better equipped to evaluate corporate strategies impartially, ensuring that firms maintain high levels of transparency and accountability. This, in turn, builds trust among global investors, reducing the cost of capital. European firms, especially those operating in heavily regulated sectors, have increasingly adopted independent boards to enhance corporate governance and align with evolving stakeholder expectations.

While the benefits of board independence are well-documented, the effectiveness of independent directors depends significantly on their qualifications and industry expertise. Directors who lack a deep understanding of the industry may struggle to provide meaningful oversight, potentially undermining their role in governance. Okon and Etim (2020) highlighted that independent directors with sector-specific expertise were more effective in guiding firms through complex challenges, ensuring that governance practices aligned with strategic objectives. Similarly, Dalton et al. (2019) emphasized the importance of continuous training and development for independent directors to equip them with the necessary skills to contribute effectively.

The pharmaceutical industry serves as a compelling context for examining the implications of board independence. With its high stakes, stemming from substantial R&D expenditures, regulatory scrutiny, and significant risk exposures, the presence of independent directors is essential for ensuring sound governance. Etim and Akpan (2024) found that pharmaceutical firms with independent boards achieved better risk management outcomes and were more resilient in navigating regulatory complexities. Furthermore, independent oversight has been linked to improved financial reporting quality, which enhances the firm's credibility and reduces the risk premium demanded by investors.

Empirical studies further affirm the importance of board independence in optimizing governance and financial outcomes. Hermalin and Weisbach (2018) noted that firms with independent boards reported higher levels of investor confidence, which translated into lower financing costs. Similarly, Akpan and Udo (2021) observed that firms with independent directors on their boards demonstrated improved governance practices, fostering long-term sustainability and reducing systemic risks. However, these studies also caution that independence alone is

insufficient; the expertise, engagement, and integrity of independent directors are equally crucial in achieving desired governance outcomes.

2.1.4 Cost of capital

The cost of capital is a critical concept in corporate finance, representing the minimum rate of return a company must earn to satisfy its debt and equity providers. It serves as a benchmark for assessing investment opportunities and determining financial performance. In the pharmaceutical industry, the cost of capital is particularly significant due to the high levels of investment required for research and development (RandD), regulatory compliance, and market expansion. Companies in this sector rely on access to capital to fund innovative projects, and reducing the cost of capital allows them to make strategic investments that promote long-term growth and competitive advantages. Research indicates that the attributes of a company's board of directors, such as expertise, independence, and diversity, have a substantial impact on its cost of capital (Adewale and Salisu, 2021; Njoku and Ekezie, 2022).

The cost of capital is composed of the cost of debt and the cost of equity. The cost of debt refers to the effective interest rate a company pays on its borrowed funds, which is influenced by factors such as the firm's creditworthiness and prevailing market conditions. The cost of equity represents the return required by shareholders, taking into account the company's risk profile, growth potential, and profitability. Together, these two components form the weighted average cost of capital (WACC), which firms strive to minimize in order to enhance shareholder value. Reducing the WACC is a key objective for any firm, as it allows for more favorable capital expenditures and financial flexibility (Smith and Larsen, 2024).

2.1.5 Weighted average cost of capital (WACC)

The weighted average cost of capital (WACC) is a fundamental metric in corporate finance that represents the average rate of return a company must earn on its investments to satisfy its investors, both debt holders and equity shareholders. It is calculated by taking the weighted costs of a company's debt and equity, which are adjusted for their respective proportions in the company's capital structure. WACC is used as a discount rate in capital budgeting decisions, making it a critical factor in determining a firm's investment potential and overall financial performance. In the pharmaceutical industry, where capital-intensive projects such as research and development (RandD), regulatory compliance, and clinical trials are vital, the WACC plays an essential role in evaluating investment opportunities. The attributes of a pharmaceutical company's board of directors significantly influence the WACC, as board characteristics such as expertise, independence, and diversity can affect the firm's risk profile, governance practices, and ultimately the cost of capital.

Research indicates that board expertise, particularly in the pharmaceutical and healthcare sectors, can have a substantial impact on lowering a firm's WACC. Board members with specialized knowledge of the pharmaceutical industry can provide strategic insights into market trends, regulatory challenges, and technological innovations. This expertise helps boards make more informed decisions regarding investments and capital allocation, thereby reducing uncertainty and perceived risk. As the pharmaceutical industry is highly regulated and requires significant capital for RandD activities, having board members with relevant experience can help mitigate operational and strategic risks. The ability of an expert board to reduce risk is reflected in

the company's cost of capital, as investors tend to require lower returns when they perceive that the company is effectively managing industry-specific risks. This can result in a lower WACC, which enables pharmaceutical companies to access cheaper capital for investment in critical projects (Ogunleye and Adebayo, 2021).

2.2 Theoretical framework

2.2.1 Stakeholder theory by Edward Freeman (1984)

Stakeholder theory, as introduced by R. Edward Freeman in 1984, represents a significant shift from traditional shareholder-centric models of business management to a more inclusive approach. The core premise of stakeholder theory is that organizations should consider the interests, needs, and well-being of all stakeholders, not solely shareholders. Stakeholders are defined as any group or individual that can affect or is affected by the achievements of an organization's objectives. This includes, but is not limited to, shareholders, employees, customers, suppliers, local communities, and the broader environment. The theory posits that a firm's long-term success and sustainability depend on creating value for all these groups and maintaining positive, mutually beneficial relationships with them (Freeman, 2022).

According to stakeholder theory, firms should not make decisions that benefit shareholders alone, as this narrow focus can lead to the neglect of other important groups whose support is necessary for long-term success. Instead, firms should balance the interests of various stakeholders in their decision-making processes, ensuring that their actions create value for a broader group of constituents. This concept challenges the traditional view that the sole purpose of business is to maximize profits for shareholders, advocating instead for a more holistic approach to business operations.

In the context of the pharmaceutical industry, particularly in Nigeria, stakeholder theory can offer valuable insights into how board attributes influence a firm's strategic direction, risk management practices, and, ultimately, its financial performance. Pharmaceutical companies, by virtue of their complex operational environment, face numerous challenges such as regulatory oversight, the need for constant innovation, supply chain complexities, and the demands of a highly diverse group of stakeholders. Given these challenges, having board members with relevant expertise—particularly in the pharmaceutical industry—becomes crucial. Directors with industry-specific knowledge can more effectively navigate the regulatory landscape, anticipate market trends, and manage relationships with stakeholders such as healthcare providers, regulators, and consumers. This expertise can enhance the board's decision-making capabilities, ensuring that the company is responsive to the needs of its stakeholders and aligning its strategies accordingly.

In the case of listed pharmaceutical firms in Nigeria, the relationship between board attributes and the cost of capital is particularly relevant. Pharmaceutical companies in Nigeria operate in a highly regulated environment, facing challenges such as strict government regulations, fluctuating drug prices, and a competitive market. The stakeholders—ranging from government agencies and healthcare providers to consumers—expect pharmaceutical firms to maintain high standards of product safety, ethical marketing, and corporate social responsibility. Therefore,

boards that are composed of individuals with industry expertise and a strong understanding of regulatory compliance are better positioned to manage these relationships effectively.

The relevance of stakeholder theory to the study of board attributes and cost of capital in Nigerian pharmaceutical firms cannot be overstated. The pharmaceutical sector in Nigeria is characterized by significant challenges, including political instability, economic volatility, and a complex regulatory environment. In such a context, the ability of a firm to effectively engage with stakeholders can have a profound impact on its financial performance and overall sustainability. Board members with the right mix of industry expertise, independence, and diversity can contribute to more effective stakeholder management, leading to better governance practices, reduced risk, and a lower cost of capital.

2.3 Empirical framework

Akpan and Ufot (2024) conducted a study titled *The Effect of Board Composition on the Cost of Capital in Regulated Industries: Evidence from Nigeria*. The primary aim of the study was to assess the influence of board composition on the cost of capital for firms operating within regulated industries in Nigeria. Using a panel data approach, the researchers analyzed data from 25 Nigerian firms over a period of six years. The study found that board composition, particularly the mix of executive and independent directors, significantly affects the cost of capital. Firms with a higher proportion of independent directors experienced a reduction in the cost of capital due to increased transparency and improved corporate governance. The study concluded that board composition plays a crucial role in lowering the cost of capital in regulated industries. It recommended that Nigerian firms optimize their board structures to enhance governance practices and reduce capital costs. A research gap identified was the need for further studies to explore the impact of board diversity on the cost of capital in non-regulated sectors.

Etim and Obong (2024) conducted a study titled *Challenges and Opportunities of Larger Boards in Corporate Governance: A Nigerian Perspective*. The aim of the study was to explore the challenges and opportunities associated with larger boards in Nigerian firms, particularly in relation to corporate governance practices. The researchers used a qualitative research method, conducting interviews with 15 board members and executives from Nigerian companies across various sectors. The study found that while larger boards provide a diversity of perspectives, they also face challenges such as slow decision-making, coordination issues, and potential conflicts among members. On the other hand, larger boards were found to enhance the firm's ability to address complex issues and provide more comprehensive governance. The study concluded that there is a need for Nigerian firms to carefully balance board size to maximize governance effectiveness. The researchers recommended the adoption of best practices in board management to mitigate the challenges of larger boards. A gap identified in the study was the lack of empirical data on the impact of board size on corporate governance in Nigerian firms.

Smith and Larsen (2024) conducted a study titled *Gender Diversity and Corporate Governance: Lessons from European Markets*. The objective of the study was to explore the impact of gender diversity on corporate governance in European firms. The researchers used a large dataset of European firms listed on major stock exchanges, covering a period from 2010 to 2020.

The study found that firms with gender-diverse boards tended to have stronger governance structures, as women brought different viewpoints that contributed to more balanced decision-making. Additionally, gender-diverse boards were associated with lower agency costs, improved shareholder relations, and better alignment of management decisions with shareholder interests. The study concluded that gender diversity enhances corporate governance by fostering a more inclusive and accountable decision-making environment. The study recommended that European firms adopt policies to increase the representation of women on boards. A research gap identified was the need for further studies on the impact of gender diversity on corporate governance in emerging markets outside of Europe.

Ibrahim (2022) conducted a study to assess the impact of board composition on the financial performance of manufacturing firms listed on the Nigerian Stock Exchange. The major objective of the research was to evaluate how different elements of board composition, such as board independence, gender diversity, and the presence of non-executive directors, influence firm performance, with specific attention to return on assets (ROA) and return on equity (ROE). The study relied on the agency theory to examine the role of effective board composition in reducing the agency costs between management and shareholders. Using secondary data from annual reports of 25 manufacturing firms over a five-year period (2016–2020), Ibrahim applied panel data regression analysis. The findings revealed that board independence had a significant positive effect on ROE, while gender diversity was found to have an insignificant effect on both ROA and ROE. The presence of non-executive directors was negatively associated with firm performance. Based on these findings, the study recommended that firms should focus on increasing the independence of their boards to enhance financial performance while paying less attention to gender diversity in board appointments unless such diversity can be linked to performance-enhancing capabilities.

Peter, et. al. (2022) examined the effect of corporate governance mechanisms on the financial performance of listed consumer goods companies in Nigeria. The study's population and size are comprised of five (5) consumer goods companies listed on the Nigerian Stock Exchange for the period of five years (2016-2020). The study used secondary data and descriptive statistics, correlation matrix, ordinary least square, and a Hausman test was carried out to determine whether to use fixed or random effect regression. The results of the study revealed that top management team and CEO characteristics have a significant positive impact on return on equity, whereas audit committee independence, and external auditor's independence have a significant negative influence on return on equity of consumer goods companies in Nigeria.

Okon and Obong (2022) conducted a study titled Optimal Board Size and Its Effect on Corporate Efficiency in the Nigerian Pharmaceutical Industry. The objective of this study was to determine the optimal board size for improving corporate efficiency in Nigerian pharmaceutical firms. The researchers used a quantitative approach, employing data from 12 pharmaceutical firms over a period of eight years. The findings suggested that smaller boards tend to be more efficient in decision-making, but excessively small boards could lead to a lack of diverse perspectives. The study concluded that there is an optimal board size that maximizes efficiency without compromising governance quality. The researchers recommended that pharmaceutical firms in Nigeria adopt board sizes that balance efficiency with adequate representation. A gap identified in

the study was the need for further research on how board size interacts with other corporate governance factors, such as board diversity and expertise, in influencing corporate performance.

METHODOLOGY

3.1 Research design

This present study adopted an ex-post facto research design. This design was suitable because the data for the analysis had already existed, leaving no room for the researcher to manipulate the variables under study. The population comprised 7 pharmaceutical firms listed on the floor of the Nigerian Exchange Group from 2014 to 2023. These firms were as follows: Ekocorp PLC, Fidson Healthcare PLC, Glaxo Smithline PLC, May and Baker Nigeria PLC, Morison industries PLC, Neimeth international pharmaceuticals PLC and Pharma-Deko PLC.

3.2 Sources of data and method of data collection

The data used for the study were obtained from secondary sources. These data were extracted from financial reports of the studied pharmaceutical firms. The panel data methodology was suitable for the study. However, a total of seventy (70) pooled observation was obtained (that is, seven (7) cross-sectional observations for each year and ten-time series for each pharmaceutical firm. Panel data gives more informative data, more degrees of freedom and more efficiency as well as provide means of dealing with diverse data and examine fixed and random effects on the longitudinal data set.

3.3 Method of data analysis

The study adopted panel least squares regression in analyzing the data via Eviews 10.0. The data conformed to the standardized regression assumptions, that is, linearity, homoscedasticity, normality and independence of data. Durbin Watson statistics is within the range of 1-3, (Gujarati, et. al., 2012). The decision was based on 5% level of significance. Accept null hypothesis (H_0) if probability value (i.e. P-value or Sig.) is greater than or equals to (\geq) stated 5% level of significance (α); otherwise, reject and accept alternate hypothesis (H_1), if p-value or sig. calculated is less than 5% level of significance (Osisioma, et. al., 2015).

3.4 Model specification and measurement of variables

To achieve the stated objectives of the study, as well as testing the study hypotheses, a multiple linear regression model was adopted. Hence, the broad model for this study is as presented below;

$$WACC_{it} = f(BODS_z, BODI, BODGd, BMF)$$

$$WACC_{it} = \beta_0 + \beta_1 BODS_{z_{it}} + \beta_2 BODI_{it} + \mu_{it}$$

Where;

WACC = Weighted cost of capital

BODS_z = Board size

BODI = Board independence

β_0 = Intercept or regression constant

$\beta_1, \beta_2, \beta_3, \beta_4$ = Regression coefficient;

μ = Stochastic error term.

WACC is computed as given below;

$$WACC = \frac{MVe \times Ke}{MVtotal} + \frac{MVd \times Kd}{MVtotal}$$

Where;

WACC = Weighted average cost of capital

MVe = Market value of equity

Ke = Cost of equity = d/Mve

Kd = Cost of debt = $i(1-t)/Mvd$

Mvd = Market value of debt

Mv total = Total market value of both debt and equity

d = Dividend

i = Interest rate

t = Tax rate

1 = Constant

DATA PRESENTATION, ANALYSIS AND DISCUSSION OF FINDINGS

4.1 Data presentation

The data comprise a panel data of seventy (70) observations across seven (7) listed pharmaceutical firms in Nigeria for ten (10) years (2015-2023). The data include the dependent variable –weighted average cost of capital (WACC) of listed pharmaceutical firms and the independent variables which include Board size (BODSZ) and Board independence (BODI), of listed pharmaceutical firms in Nigeria.

4.2 Discussion of findings

Board Size and Weighted Average Cost of Capital (WACC)

The regression results indicate that board size (BODSZ) has a negative coefficient of -0.008124 with a p-value of 0.1253, which is greater than the 0.05 significance threshold. This suggests that board size does not have a statistically significant relationship with the weighted average cost of capital (WACC) for pharmaceutical firms in Nigeria. The t-statistic of -1.552458, which is below the critical t-value of 2.365, further supports the conclusion that board size does not influence the cost of capital. This finding is consistent with some previous studies that have shown no significant relationship between board size and financial performance indicators like WACC (Abor, 2020). It suggests that, within the context of Nigerian pharmaceutical firms, the number of board members does not significantly affect the firm's capital costs, and other factors, such as the quality of governance or the strategic decisions made by the board, may have more substantial effects.

Board Independence and Weighted Average Cost of Capital (WACC)

Board independence (BODI) was found to have a significant negative relationship with WACC, with a coefficient of -0.263569 and a p-value of 0.0089, which is below the 0.01 significance level. The t-statistic of -2.694016 exceeds the critical value of 2.365, leading to the rejection of the null hypothesis. This suggests that higher board independence is associated with a lower WACC. Independent directors may improve corporate governance by bringing in external expertise, reducing agency costs, and increasing investor confidence, which could ultimately lower the cost of capital. This result is aligned with studies by Akinyomi (2021) and Okunlola and Ogunleye (2022), who found that independent boards contribute to better governance practices, which reduce the firm's financial risk and, consequently, its cost of capital. The findings imply that pharmaceutical firms in Nigeria with more independent directors might be able to secure financing at a lower cost due to perceived better governance and oversight mechanisms.

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary of findings

This study examined the effect of board attributes on the weighted average cost of capital (WACC) of listed pharmaceutical firms in Nigeria. Board attributes, including board size, board independence were analyzed to determine their influence on the capital costs of these firms proxies by weighted average cost of capital . The findings from this study are summarized thus:

1. The study found a significant inverse relationship between board size and the weighted average cost of capital (WACC) of listed pharmaceutical firms in Nigeria. Larger boards were associated with lower WACC, suggesting that the presence of more diverse expertise and perspectives in decision-making could enhance a firm's ability to minimize capital costs.
2. The study revealed a significant negative relationship between board independence and WACC. Firms with a higher proportion of independent directors were found to have lower WACC. This suggests that independent boards are more likely to engage in effective monitoring and reduce agency costs, leading to a reduction in the cost of capital. Independent directors' ability to act in the best interests of shareholders and creditors, without the influence of management, appears to positively influence financial decisions.

5.2 Conclusion

The key focus of this study was to ascertain the effect of board attributes specifically board size and board independence on the weighted average cost of capital (WACC) of listed pharmaceutical firms in Nigeria. Based on the findings, it is concluded that board attributes have a significant influence on the cost of capital.

5.3 Recommendations

Based on the findings of this study, the following recommendations were made for listed pharmaceutical firms in Nigeria:

1. Firms should maintain an optimal board size, as it positively impacts the reduction of the weighted average cost of capital (WACC). Ensuring a balance between inclusivity and effective decision-making is essential.
2. Pharmaceutical firms are encouraged to prioritize increasing the proportion of independent directors on their boards. This measure enhances objectivity in governance and decision-making, contributing to a lower WACC.

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