BOARD OF DIRECTORS' CHARACTERISTICS THAT INFLUENCE RISK ADOPTION AND ITS EFFECT ON FINANCIAL AND NON-FINANCIAL PERFORMANCE IN INTERNATIONAL COMPANIES.

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Trabajo de grado presentado como requisito parcial para optar por el título de Magíster en Finanzas

Director de Trabajo de grado: Victor Alberto Peña Vargas

Doctor en Ciencias Económicas

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2024

Santiago de Cali, 11 de julio de 2024

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Por medio de la presente estamos entregando a usted el Trabajo de Grado cuyo título es "Board of Director´s Characteristics that Influence Risk Adoption and its Effect on Financial and non-Financial Performance in International Companies".

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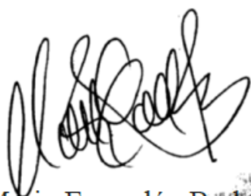

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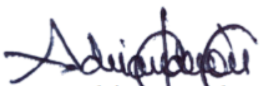

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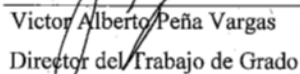

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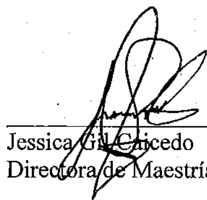

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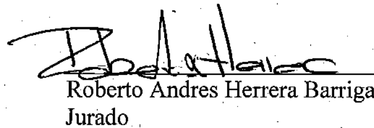

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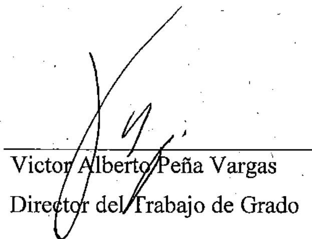

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DEDICATORIA

A Dios por abrirme los caminos a esta linda experiencia, poner a las personas correctas y necesarias justo en el momento indicado, darme la sabiduría y el discernimiento para recibir sus bendiciones y en consecuencia hacer su voluntad.

A mi hermosa madre que sé que desde el cielo continúa intercediendo por mí, y que seguramente asi como sufre cada momento difícil por el que atravieso, celebra conmigo con dulzura cada éxito alcanzado y reto superado.

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A mi linda esposa Sandra Angarita, por su apoyo incondicional, su compañía, por ser ese pilar fundamental en nuestra familia, por todo su amor y la gran fortaleza de su ser. Por ser el aliento incluso en los momentos más difíciles.

Finalmente agradecer a todos mis compañeros y docentes por los aprendizajes, apoyo y momentos especiales, asi por compartir sus conocimientos y un poco de si.

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A mi esposo, cómplice permanente y apoyo incondicional en este proceso profesional que hoy culmina.

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Mil y Mil gracias….

Luz Adriana Calderón C.

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Abstract

A latent interest of firms is the search for a balance between performance in financial and non-financial objectives, the latter related to the human and social impact of the Company's activity. A fundamental part of achieving these types of objectives is the decisions made by the board of directors. This entity has become vital to achieving the firm's strategic goals. In this way, this research aims to analyze the moderating effect of the board of directors' characteristics and its impact on the relationship between the firm's operational risks and its impact on financial and non-financial performance. A structural equation model is used to achieve this objective, with a survey of 450 exporting firms. Among the main results is that firms with a board of

directors as a strategic resource tend to have better conditions for making strategic decisions than those without. The moderation effect of boards of directors is stronger than those firms that only establish strategic guidelines for the execution of their activities without the intermediation of a board of directors.

Keywords: Operational risk, board of directors' characteristics, financial and non-financial performance, structural equation model.

General Objective:

Objective of this research is to analyze the impact of the board of directors on the relationship between operational risk and the non-financial and financial performance of the firm.

Specific Objective

- To analyze the effects of Operational risk on financial performance and non-financial performance.
- To study the moderation role of The board of directors' characteristics on the relationship between Operational risk and financial performance.
- To study the moderation role of The board of directors' characteristics on the relationship between Operational risk and non-financial performance

Introduction

The SEC (Securities and Exchange Commission) final rule mandates public companies to disclose comprehensive climate-related information, including risk oversight strategies and greenhouse gas emissions, by TCFD recommendations. This highlights a significant shift in corporate governance, emphasizing the significance of climate considerations. Concurrently, it underscores the essential role of a robust board of directors within firms (Ahlberg et al., 2023). By aligning with TCFD guidance, the SEC aims to enhance transparency, comparability, and reliability in disclosures, aiding investors in assessing climate-related risks (Moss, 2024).

The rule emphasizes companies prioritizing climate risk management and underscores the vital role of boards in overseeing such strategies, fostering accountability and transparency in decision-making (Ali et al., 2023). Emissions disclosure facilitates environmental impact evaluation, aligning investments with sustainability goals, while the involvement of boards ensures strategic alignment with long-term objectives (Al-Begali & Phua, 2023). Identifying oversight parties within the board structure promotes accountability and proactive risk management, emphasizing the indispensable function of boards in steering firms toward sustainable practices. Overall, the rule signifies a shift towards greater transparency, accountability, and sustainability, empowering investors and enhancing corporate resilience in the face of climate change, underscoring the critical role of boards in navigating complex environmental challenges. (NACD Staff, 2024).

In recent years, the European Commission has received a notable surge in attention towards exploring alternatives for transitioning to a sustainable economy, as Ferrarini et al. (2023) emphasized. The imperative drives this heightened interest to align with the objectives outlined in the Paris Agreement and the Sustainable Development Goals. To this end, the legislative body has embarked on developing reforms to foster financing plans conducive to sustainable development. A crucial avenue for firms to channel their efforts towards sustainability initiatives lies in establishing robust corporate governance structures, facilitating

the alignment of resources and capabilities towards objectives contributing to firm sustainability (Alodat et al., 2023; Ain al., 2022).

As underscored by Xiang et al. (2022), the board of directors serves as a cornerstone in the management and performance of companies within the contemporary business landscape. The board of directors is at the heart of corporate governance, a critical body overseeing strategic and financial decisions. The board's composition, encompassing aspects such as diversity, experience, independence, and competence, has increased significance within academic discourse and practical business realms (Ain al., 2022).

Acknowledging the critical role of market conditions and sustainability strategies in shaping firms' risk profiles, it becomes imperative to comprehend how boards of directors can facilitate efforts in resource management and policy formulation, as articulated by Le & Nguyen (2023). Key elements such as board composition and alignment with strategic objectives are instrumental in enhancing investment decisions, fostering stakeholder trust, and ensuring adherence to financial metrics (Al-Sayani & Al-Matari, 2023).

This study endeavors to enrich the scholarly understanding of board dynamics and offers practical insights into leveraging effective board structures and strategic alignment to drive impactful policies and robust monitoring mechanisms. As emphasized by Pinheiro et al. (2023), this research aims to illuminate the pathway toward cultivating a corporate culture steeped in sustainability and social responsibility. By offering actionable insights transcending theoretical constructs, this study empowers organizations to navigate the evolving business landscape with a steadfast focus on long-term resilience and ethical practices, as elucidated by Cambrea et al. (2023).

After reviewing the literature in the field of characteristics of the board directors and especially its relationship with the study of both financial and non-financial performance, it

was possible to find areas of study such as the following: cultural studies (Escandon-Barbosa et al ., 2023), institutionalism (Parente-Laverde et al., 2023; Naveed et al., 2022; Yun & Hu, 2022) family firms (Kerai et al., 2023; Vazquez et al., 2020), Export performance (Aksoy et al., 2023; Lavery et al., 2023; Brunet al., 2022; Carbonero et al., 2021; Hao et al., 2021; Areneke & Tunyi, 2021; Loof & Viklund-Ros, 2020; Lukason & Vissak, 2020; Bauweraerts et al., 2019), diversity (Zaitul & Ilona, 2021; Idris & Saridakis, 2020).

Given the diverse findings across the surveyed research, numerous enduring voids emerge within the literature. Primarily, these gaps manifest without a cohesive narrative bridging disparate developmental domains (Alshabibi, 2021). Furthermore, discerning recurrent themes and collective perspectives regarding the explored subjects still need to be discovered. Moreover, methodological disparities and theoretical domains among the inquiries necessitate a theoretical framework to uphold the studies' rigor and applicability. Lastly, a more substantial discourse on the context and pragmatic implications, fostering a detailed comprehension of non-financial board directors' performance, could catalyze future research aligning with practitioners' perspectives (Alves, 2023a; Amin & Cumming, 2023).

In the domain of board of directors inquiry, addressing the novelty and complexity of this subject entails delving into scrutinizing the factors within board structures shaping sustainability-related decision-making processes and plumbing the depths of potential corporate hazards (Khandelwal et al., 2023). Expanding beyond the purview of decision-making influences, comprehensive apprehension of the myriad challenges profoundly impacting a firm's overall efficacy becomes imperative (Al-Begali & Phua, 2023). Such an approach augments the existing knowledge repository, offering a broader vantage encompassing both positive influences and plausible pitfalls within the complex landscape of board directorship (Amin & Cumming, 2023; Alves, 2023b).

Moreover, fundamental challenges intertwine with geopolitical uncertainties amid the contemporary backdrop of board directors. However, this inquiry is a singular facet of a broader challenge, embracing significant upheavals, macroeconomic jolts, and climatic fluctuations (Areneke et al., 2022). While boards profess adeptness in tackling local challenges, an overarching sentiment of ill-preparedness looms concerning broader-scale forces deemed excessively nebulous to grasp entirely (McKinsey & Company, 2023). In response to this paradigmatic shift, boards must swiftly acclimate, necessitating a more nuanced approach to comprehending, surveilling, and alleviating geopolitical risks on their global scope.

Considering the firm's environment and the evolutionary trajectory of knowledge concerning board directors and non-financial performance, two salient gaps crystallize within the literature. The first pertains to the imperative to probe the environmental risk levels within commercial environments where its ramifications on firm performance are discerned (Diab et al., 2023). The second gap revolves around the sway exerted by the board of directors on the firm's non-financial outcomes. This difficulty stems from the imperative to scrutinize beyond the board's composition, examining its influence on decisions vis-à-vis internal facets such as performance-associated risks and the firm's societal impact (Le & Nguyen, 2023; Pinheiro et al., 2023).

A significant element to underscore is that the directorate's panel can notably sway financial decision-making and, consequently, the fiscal efficacy of an enterprise (Al-Sayani et al., 2023). Nevertheless, notwithstanding the mounting scrutiny this subject is garnering, gaps persist in our grasp of how these precise variables impact the non-financial performance of the corporation (Amin & Cumming, 2023). In this way, the objective of this research is to analyze the impact of the board of directors on the relationship between operational risk and the non-financial and financial performance of the firm.

This manuscript is organized as follows: In the initial segment, the literature is examined in the domain of the board of directors, non-financial and financial performance, and operational risk. In the subsequent segment, the technique employed for data manipulation is expounded. The ensuing segment delineates the outcomes of the analysis conducted. In the ensuing segment, the deductions of the exploration are presented. In the ultimate segment of the dossier, the principal contributions, the constraints of the study, and forthcoming avenues of exploration are elucidated.

Theoretical Framework

An essential aspect of understanding the numerous studies on the board of directors lies in highlighting the significance of investment decision-making, fostering trust among stakeholders, meeting financial metrics, and ensuring financial performance. However, despite these crucial aspects, there needs to be more clarity in the narrative, revealing critical gaps in the literature that hinder a comprehensive understanding of the subject under study.

One significant gap lies in the lack of a cohesive narrative that integrates the developmental areas focused on by these studies, including financial performance. This absence of connection limits the synthesis of diverse findings, impeding the emergence of a unified understanding. Additionally, these studies have notable methodological and theoretical differences, posing challenges in their applicability and rigor in future research endeavors. The absence of a solid theoretical framework exacerbates this condition, leaving the studies susceptible to criticism, particularly in academic rigor. Without robust theoretical foundations, the practical implications and contextual discussions restrain future research directions.

Research efforts should strive to contribute to both theoretical and practical dimensions, enhancing knowledge development impact. Addressing these challenges will facilitate progress in understanding the board of directors' characteristics, particularly concerning financial and non-financial performance. This advancement will promote coherence and provide more robust foundations for future research aligned with practitioners' perspectives.

Board of Directors principles

From an organizational perspective, the board of directors is regarded as the entity responsible for navigating potential constraints arising in the environment that may impede a company's effectiveness (Miller-Millesen, 2003; Pfeffer & Salancik, 2015). The resource dependence theory places a strong emphasis on context and aids in understanding how companies respond to market conditions. Consequently, the board of directors must address the pressures stemming from environmental uncertainty, particularly highlighting the factors influencing decision-making, especially in resource allocation (Schmid & Roedder, 2021).

In this context, the behavior of the board of directors is directly influenced by two factors: the resources available in the environment, crucial for the firm's success, and the institutional regulatory framework. Derived from the resource dependence theory, it becomes possible to explain the board's behavior based on the pressures exerted by environmental resources. Consequently, companies strive to adapt and overcome existing limitations (Middleton, 1987).

However, the Company's environment is also shaped by institutional regulations governing its behavior. According to scholars such as Alshabibi (2021), the external environment directly impacts the behavior of the board of directors. Other studies have shown that the role of the board of directors varies depending on different institutional setups, including economic conditions, legal systems, and power structures (Sakawa, 2021).

Viewed through the lens of institutional theory, the behavior of the board of directors is seen as a response to the regulatory pressures present in the environment. This perspective suggests that environmental considerations lead to adopting behaviors and structures sanctioned within the institutional framework (Bin Idrees et al., 2024). Consequently, organizational theory highlights how organizations respond to environmental conditions, with internal pressures compelling firms to structure themselves to respond more effectively to environmental dynamics (Joseph et al., 2023).

By examining how external pressures, resources, and institutional contexts shape the board's behavior, we gain insight into how board directors make strategic decisions, allocate resources, and respond to regulatory pressures. This understanding elucidates how the board's actions influence a firm's financial and non-financial performance within a dynamic environment. Therefore, the study of board behavior, particularly concerning risk perception and its impact on financial performance, contributes to understanding how behavior can shape responses to external pressures, resource utilization, and adaptation to institutional contexts.

Perceives risk and financial and non-financial performance

The relationship between perceived risk, non-financial performance, and the role of the board of directors is a critical aspect of effective corporate governance and strategic decision-making within a firm (Chen et al., 2021). Perceived risk, encompassing factors such as reputational concerns, regulatory compliance, and ethical considerations, is pivotal in shaping a company's non-financial performance (Taghavi Moghaddam et al., 2018). The board of directors, as the governing body responsible for oversight and strategic direction, is

instrumental in navigating and mitigating these risks to ensure the long-term sustainability and success of the organization (Fernández-Temprano & Tejerina-Gaite, 2020).

When perceived risks are not adequately managed, they can have profound implications for a firm's financial and non-financial performance. Reputational damage arising from ethical lapses or non-compliance with regulations can erode stakeholder trust and impact brand value. As stewards of the Company's reputation, the board of directors must actively engage in risk oversight, setting the tone for a risk-aware culture that permeates the organization (Aversano et al., 2023; García-Ramos & Díaz, 2021).

The board's role becomes even more critical in industries where financial performance metrics, such as revenue growth, profitability, and shareholder return, are paramount (Mer et al., 2021). These metrics are often directly tied to a company's perceived ethical and social responsibility, and failure to address them can result in negative perceptions among investors, customers, and the wider community. Boards prioritizing financial considerations contribute to a holistic approach to risk management, aligning the Company's operations with societal expectations and sustainable practices.

Risk perception and non-financial performance

The interaction amidst perceived risk, non-financial performance, and the impact of the board of directors on corporate performance presents a dynamic scenario. This dynamism aligns with the established narrative, furnishing theoretical propositions substantiating the interconnectedness of assorted risks and their direct impact on non-financial performance.

Consequently, five distinct risk categories are introduced—monetary, emotional, temporal, communal, and operational—and assert that each directly and positively influences

non-financial performance. This preceding condition accentuates the importance of perceived risk, encompassing reputational apprehensions, regulatory compliance, and ethical considerations, in shaping a company's non-financial performance. The contention that financial, emotional, temporal, communal, and operational risk all contribute positively to non-financial performance reinforces the notion that effective risk management, particularly under the board directors' purview, is crucial for the organization's long-term viability and success.

References to research by Chen et al. (2021), Taghavi Moghaddam et al. (2018), Fernández-Temprano & Tejerina-Gaite (2020), Aversano et al. (2023), García-Ramos & Díaz (2021), and Mer & Virdi (2021) furnish the foundational elements for research in the board of directors domain, connecting the theoretical framework to empirical evidence and bolstering the argument that board of directors play a role in navigating and mitigating these risk for effective corporate governance and strategic deliberation. The proposed hypothesis is grounded in literature, contributing to a structured framework for comprehending various direct and positive risks that influence non-financial and financial performance within the broader spectrum of corporate governance.

According to academics such as Escandon-Barbosa and Salas-Paramo (2022), the perception of risk is linked to procuring a product or service, conceptualized in a multidimensional manner. Thus, this conceptual type is posited to be associated with an individual's perception of a phenomenon, which may vary according to behavioral patterns manifest in a specific country (McLeay et al., 2021). These risks encompass financial, communal, temporal, emotional, and operational facets.

Regarding non-financial performance, some evidence demonstrates how companies tailor their measurement systems to attain goals and objectives, facilitating performance enhancement (Sim & Koh, 2001). Although results manifest superior performance, issues

related to external performance concerning service quality may arise (Huang et al., 2017). This emphasis on non-financial performance can highlight superior performance primarily induced by its long-term orientation, customer-centric approach, and concentration on value generation.

Financial risk is linked with the potential for unfavorable outcomes for the firm concerning the execution of actions aimed at fulfilling its objectives. Most financial decisions will prioritize the financial gains spurred by escalating product prices. However, over time, this may stifle innovation processes within the firm (Sun & Lei, 2021). Considering financial risk, particularly in profit reduction, is a critical aspect of decision-making to achieve objectives more aligned with social impact and preserve the firm's stellar image (Hamrouni et al., 2019). While it has been studied previously in the literature, empirical work in the field is necessary to comprehend better its interaction and dependency on other factors for the specific scenario of non-financial performance.

On the other hand, the relationship between time risk and a firm's non-financial performance is a critical factor that underscores the dynamic challenges and opportunities businesses face in today's fast-paced and ever-changing environment (Kittur & Chatterjee, 2023). Time risk, referring to the uncertainties and potential disruptions associated with the timely execution of strategies, product development, and operational processes, can significantly impact a company's ability to meet non-financial performance targets and adapt to evolving market demands (Cobben et al., 2023).

Time risk is associated with the time used to achieve objectives (Escandon-Barbosa et al., 2021). Over time, an evaluation of the viability of the actions that allow achieving the objectives and the attributes they entail can be carried out. For scholars such as Forsythe et al. (2006), these aspects related to time are also related to the characteristics of the context in which it operates, and that can influence decisions regarding the firm's strategies in terms of

the achievement of objectives that are beyond what is profitable solely and exclusively, and that will be mediated by the social and cultural context in which it operates (Ali et al., 2023).

The correlation between performance uncertainty and a corporation's fiscal outcomes constitutes an integral facet of the contemporary management strategy of businesses (Hajmohammad et al., 2023). Performance uncertainty, encompassing variables like operational efficacy, technological disruptions, and vulnerabilities in the supply chain, directly affects a firm's ability to accomplish its financial targets and honor its obligations (Ganeshkumar et al., 2023). The consequences of performance uncertainty on fiscal outcomes are essential, impacting various aspects of a company's activities, reputation, and stakeholder interactions.

Performance uncertainty is entwined with the requirement for readily accessible and timely data to comprehend the scope of activities in financial realms. Studies in the domain have suggested that this is also reliant on cultural elements at the national level, revealing the spectrum of principles and convictions influencing decision-making within the Company. Thus, the perception of performance uncertainty will be associated with the array of internal adjustments within the Company, enabling it to provide exceptional financial offerings (Amirtha et al., 2021). Performance uncertainty arises as decision-making processes demand sufficient and prompt information regarding potential discrepancies in the Company's financial impact procedures. According to the above, the following hypotheses are proposed:

H1. Operational risk has a direct influence on financial performance.

H2. Operational risk has a direct influence on non-financial performance.

Corporate Performance Perspective from the board of directors

A board of directors is essential to corporate governance and financial decisions within organizations (Sun & Lei, 2021). Although the importance of this component is growing, there is still a requirement for a thorough comprehension of how the board's composition affects the financial performance of firms (Schmid & Roedder, 2021). This is a significant problem in the realm of finance and corporate management. The difficulty lies in the absence of clear understanding regarding the influence of board diversity (including gender, experience, and background), director independence, and competency on financial decision-making and the development of shareholder value (Taghavi Moghaddam et al., 2018). The absence of comprehension hampers firms' capacity to make well-informed and efficient choices, affecting their competitiveness and long-term viability in an ever more intricate and interconnected business environment that include resources necessary to reach objectives like human capital and diverse corporate strategies (Xiang et al., 2022).

Boustanifar et al. (2022) delve into the influence of human capital on boards of directors, particularly in the context of internationalization risk. Their findings highlight that leaders with a higher risk appetite are more likely to steer their companies towards greater internationalization, a crucial insight for understanding leadership decisions. It was also considered the assumption that the internationalization risk of companies will be higher if managers have greater power and lower risk in companies with a certain degree of experience in internationalization. But internationalization process required characteristics like social capital. Scholars as Tasheva and Nielsen's (2022) show that research on social capital offers practical implications for multinational companies. Their study on the Global Dynamic

Managerial Capability (GDMC) and its three components provides a tangible framework for understanding the organization of assets, leading to enhanced firm performance, a key concern for businesses.

Askarzadeh et al.'s (2022) study on the composition and independence of boards of directors underscores the pivotal role of diversity, particularly the inclusion of women, in shaping companies' strategic behavior. Their research, based on a comprehensive sample, reveals that higher female leadership participation on acquiring companies' boards is linked to lower levels of ownership in foreign acquisitions, a finding that underscores the potential impact of inclusivity on business decisions. In the case of leadership related with independence of board directors, a number of disciplines have sought to understand how the humility as a personal characteristic influence's leaders, as well as the teams and organizations they lead.

Studies shows that leader humility have developed mainly in isolation, with little synergy between fields. This previous idea has generated a split between micro and macro researchers, indicating that humility is defined as a mutable behavioral state and a stable leader trait, respectively Chandler et al. (2023). The author researched leader humility at multiple organizational levels to facilitate linkages across disciplines and theory. He combined that research with an analysis of 212 studies, identifying 99 population estimates for the relationships between leader humility and numerous individuals, team, and organizational variables. Humble leadership was most strongly associated with follower satisfaction with the leader and leaders' participative decision-making. It was also evident that humble leadership is not associated with the leader's job or organizational performance but is significantly related to the performance of co-workers and teams.

The origins of corporate governance may be connected to the development of agency theory. Agency theory posits the existence of two distinct relationships: the principal-agent

connection, which primarily pertains to the owner of the firm and the board of directors. Agency theory aims to comprehend the various connections within a company resulting from the potential conflicts between capital owners and firm executives (Salido Hernandez et al., 2018).

In numerous instances, the problem emerges due to a need for more congruence between agents and the principal's interests. Agency theory examines the managerial decisions made by a firm's managers that align with the investor's objectives and try to maximize the firm's utilization without being influenced by the managers' ambitions. Hence, the theoretical examination of the board of directors' effect allows for a comprehensive comprehension of its significance and the necessity to juxtapose it with empirical data to ascertain the elements that impact decision-making inside the organization (Sakawa et al., 2021).

From the point of view of finance, investors can influence corporate governance using their voting rights and the potential to sell their shares (Pinheiro et al., 2023). Hence, implementing corporate governance enables the seamless incorporation of information systems, mitigating information asymmetry and promoting enhanced investment outcomes (Sahoo et al., 2023). Establishing a board of directors highlights the significance of investments in innovation that companies might undertake and reduces the disparity in wages that workers receive (Owusu et al., 2023).

On the other hand, it is essential to note that innovation processes within companies have several forms. The innovation process is also connected to the cultural environment in which a company operates (Nguyen et al., 2020). As a result, institutions are formed according to the operational context, which can either facilitate or limit the active participation of the board of directors. The moderating effect of the board of directors on the link between financial

risk and financial performance is a crucial element of corporate governance that impacts a firm's ability to withstand challenges and adapt strategically (Nguyen et al., 2024).

As a vital governance body, the board of directors has a significant responsibility in overseeing and influencing this relationship to guarantee the best possible performance of the firm (Pramono et al., 2023). In industries and economic environments where financial risk might bring uncertainties affecting the business's financial components, the board's moderation function has significant significance (Mohy-ud-Din, 2023). In periods of economic recession or instability in the financial market, organizations may encounter increased financial risk that, if left unattended, might adversely affect their capacity to allocate resources toward sustainability, innovation, and corporate social responsibility, which are integral aspects of financial performance.

Hence, the board of directors is pivotal in determining a company's strategic trajectory, and its choices significantly impact financial performance and the management of performance risks (McKinsey & Company, 2023). Proactive boards actively supervise and manage risks, establishing a culture inside the firm that is conscious of and mindful of potential risks. Sem

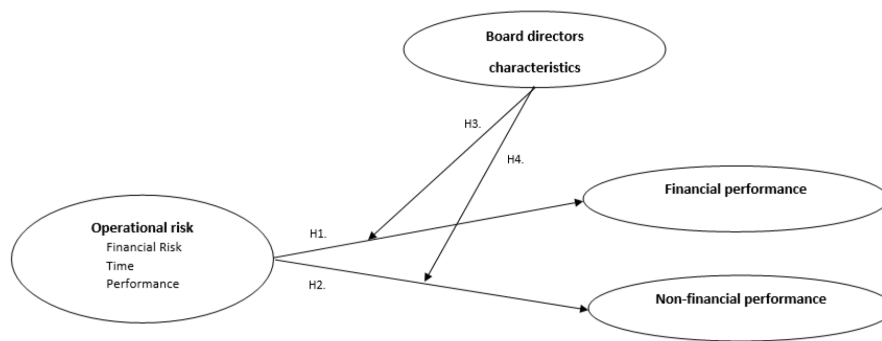
(Mansour et al., 2023). Based on these methodologies, the present study proposes the following hypothesis, in which the board of directors has a moderating role in the various relationships:

H3. The board of directors' characteristics moderate the relationship between Operational risk and financial performance.

H4. The board of directors' characteristics moderate the relationship between operational risk and non-financial performance.

According to the previous hypotheses, the conceptual model in the figure 1 is proposed:

Figure 1. Conceptual model



Methodology

Our research was conducted over five months, from August to December 2023, and included 480 Colombian exporting companies from different agriculture, manufacturing, technology, and services industries. This study aimed to acquire comprehensive knowledge regarding the complex nature of financial and non-financial operations in these critical sectors, concentrating on the difficulties faced by companies in different regions of Colombia, specifically Bogota, Medellin, Barranquilla, and Cali.

By employing robust selection techniques, the survey effectively included participants from different companies and industries, consequently increasing the comprehensiveness of insights related to export dynamics. The sample balance represented large corporations, small and medium-sized enterprises (SMEs), and microenterprises, with 8, 35, and 427 companies,

respectively. This approach not only focused on the precision of the survey methodology but also allowed an examination of business dynamics within different groups.

The sampling process considers geographic diversity vital because firms were selected from significant Colombian cities that were recognized for their significant business concentration. In addition, the survey methodology placed significant emphasis on the concepts of transparency and confidentiality. Respondents were explicitly informed on the essential elements of honesty and data protection.

The survey questionnaire had extensive pilot testing to ensure clarity and applicability. Procedures were designed to allow continuing involvement and support during face-to-face conversations. The study rigorously followed ethical norms, including obtaining informed consent and maintaining data confidentiality. After collecting the data, a Structural Equation Model (SEM) was used to examine the connections within the study. Structural Equation Modeling (SEM), known for its versatility and adaptability, facilitated the concurrent analysis of several variables and their interrelationships. The model specifically examined how the board of directors influences the connection between perceived risks and firm performance, including financial and non-financial aspects.

This study utilized Structural Equation Modeling (SEM) to determine how the board of directors influences the connection between perceived risks and firm performance, considering financial and non-financial aspects. The Structural Equation Modeling (SEM) methodology allows for the simultaneous examination of numerous variables, thus allowing for an in-depth investigation into the relationship and impact of these elements within the specific context of Colombian exporting firms.

Constructing the model involved defining the connections between the fundamental ideas (such as perceived risks and board effectiveness) and their associated observable

measures (such as survey responses and financial metrics). By integrating latent variables, structural equation modeling (SEM) facilitates the exploration of latent constructs that might not be readily measurable, consequently offering a more complete comprehension of the studied phenomena.

In addition, structural equation modeling (SEM) permits researchers to incorporate measurement errors, enhancing the precision of model estimation. By including measurement models, Structural Equation Modeling (SEM) differentiates the variability caused by measurement error from that caused by the underlying constructs. This ensures that the observed relationships are not simply influenced by measurement imprecision.

The present work employed a rigorous model evaluation using multiple fit indices, such as the chi-square goodness-of-fit, Comparative Fit Index (CFI), Root Mean Square Error of Approximation (RMSEA), and other relevant measures, to conduct the structural equation modeling (SEM) analysis. The fit indices evaluate the degree of consistency between the hypothesized model and the observed data, providing valuable insights into the reliability and applicability of the model.

Variables

1. *Operational risk* is an independent construct with three components:

a. *The Financial Risk* Scale is a significant instrument extensively researched to evaluate the dynamic financial environments associated with emerging technologies. Based on the critical research conducted by Stone and Gronhaug (1993), this scale thoroughly examines the possible economic risks in comparison to the optimistic opportunities presented by innovative technology initiatives. It describes three essential aspects: initial financial obstacles,

the possibility of excessive expenses, and the problematic combination of pricing strategies that may affect investment returns. This is supported by a strong Cronbach's alpha coefficient of 0.87, which confirms its usefulness in assessing the financial risk profiles associated with technological initiatives.

b. *The Time Risk Scale* is significant in technological development. It serves as an indicator to examine the temporal difficulties associated with incorporating technology. Expanding on the fundamental ideas of Stone and Gronhaug (1993), this scale thoroughly examines the time aspects related to the acceptance and incorporation of new technology. The degree of its attention includes the problematic challenges of learning curves, the time required to adopt something, the detailed usage dynamics, and the rate at which it expands. The scale's reliability is demonstrated by its high Cronbach's alpha coefficient of 0.89, indicating its effectiveness in addressing the temporal difficulties associated with technological advancements.

c. *The Performance Risk Scale* shows the various risks associated with technical performance. Based on the essential notions of Stone and Gronhaug (1993), this scale analyzes the elaborate network of risks connected to performance that affect technology projects. The scope of this subject includes two crucial areas: the fundamental performance hazards associated with technology and the dynamics related to user satisfaction with symbiotic products. The scale demonstrates vital dependability, as evidenced by Cronbach's alpha coefficient of 0.86, which confirms its effectiveness in assessing the performance risks associated with technical initiatives.

2. *Financial performance*: The assessment of financial performance includes a substantial selection of metrics based on numerous academic publications, with a particular emphasis on critical indicators such as the growth of market share, the return on sales, the return on

resources, and the total profitability. The increase in market share is indicative of the organization's competitive capabilities and tactics for expanding its market presence, whereas the return on sales serves as an indicator of operational efficiency and the efficacy of pricing strategies. The metric of return on resources offers valuable insights into the management of investment and the utilization of assets. At the same time, profitability provides a comprehensive perspective on the financial condition and achievements of the Company. By including a wide range of financial measurements, companies can completely understand their financial performance environment.

3. *non-financial performance* measures include a wide range of 13 factors, which are influenced by the framework proposed by Hoque and James (2000) and align with the ideas described by Kaplan and Norton (1996). The metrics are categorized into three perspectives: client orientation, internal processes, and knowledge acquisition and improvement. When evaluating the customer focus, the participants were given five indicators to evaluate their organization's dependence on non-financial metrics. These indicators included market share, customer satisfaction surveys, punctuality in delivery, responsiveness to customer inquiries, and the cost of warranty repairs. The internal operations approach included four essential elements, highlighting variables such as optimizing material and labor efficiency, implementing reengineering and process optimization activities, introducing novel products, and establishing permanent relationships with suppliers. The study explored four more aspects within the learning and development domain. These aspects included evaluating the organization's dedication to staff training and development, establishing a positive workplace culture, monitoring employee satisfaction, and prioritizing employee well-being and safety. The participants provided scores on a five-point scale, ranging from minimal to significant utilization, to evaluate the level of integration of these measures into their organization's

performance evaluation processes. This provided valuable insights into incorporating non-financial metrics within organizational performance frameworks.

4. *Board directors characteristics*: In order to develop a global measure of board directors' diversity, it is necessary to standardize each specific board characteristic, such as Nonfamily Representation on the Board (the presence of nonfamily members serving on the board of directors), Women's Representation on the Board (the inclusion of women directors relative to the total composition of the board), Board Age Diversity (The age distribution among board members is indicative of the diversity and dispersion of age groups), Board International Experience (evaluates the degree to which board members have previous professional expertise in global environments), and Intensity of Board Activities (the frequency and depth of formal meetings held by the entire board over a specified period), by this scale. Normalization assigns equal weights to each measure and then converts the original values of every characteristic onto a scale of 1 to 7. This guarantees that the interpretation and comparability of the data are consistent. After normalization, the values associated with each feature would be combined, considering their corresponding weights, to obtain the global measure.

Results

Table 1 provides a compilation of the variables used in our study and their corresponding definitions and evaluation methods. This table describes the fundamental elements necessary for our study, allowing an overview of the definitions being examined.

Table 1 shows an overview of the constructs we are examining in our database. The table includes necessary statistical measures, including the mean and standard deviation values, which offer insights into the distribution of responses among the five dimensions identified in

our research. The average score for each construct is 5.82, demonstrating a significant range of responses with a standard deviation of 1.15. The wide range of responses highlights the information obtained from our questionnaire. In addition, the correlation matrix, an essential part of our approach, provides a comprehensive understanding of the complex connections among these constructs, creating the basis for their establishment into an efficient structural equation model.

Table 1. Mean, standard deviation correlation matrix, AVE, and SCR

Constructs	Mean	S. D.	1	2	3	4	5	6	AVE	SCR
1. non-financial	*4.81*	*1.01*	*1.0000*						0.67	0.81
2. Time R.	*5.36*	*1.34*	*0.183*	1.0000					0.73	0.86
3. Financial	*5.67*	*1.46*	*0.031*	*0.167*	*1.0000*				*0.72*	*0.85*
4.Financial R.	*5.01*	*0.85*	*0.157*	*0.041*	*0.145*	*1.00*			*0.68*	*0.83*
5.Performance R.	*5.91*	*0.64*	*0.156*	*0.015*	*0.145*	*0.015*	*1.00*		*0.64*	*0.78*

Additionally, the relationships realized between constructs eliminate questions about heteroscedasticity, increasing our dataset's reliability. The validity and reliability of our data are further supported by confirmation using Confirmatory Factor Analysis (CFA), as evidenced by the Composite Reliability Index (CFI) exceeding the criterion of 0.7 set by Bagozzi and Yi (1988). Furthermore, it is essential to mention that the Average Extracted Variance (AVE) for each construct above exceeded the limit of 0.5, as indicated by Fornell and Larcker (1981), consequently validating the distinctiveness of the constructs. Our measures are highly valid, as evidenced by increasing Cronbach's alpha (α) values that consistently exceed 0.84.

The multigroup model's modification, with an RMSEA of 0.005, CFI of 0.91, and TLI of 0.90, enhances the model's validity and robustness. The findings presented in this study enhance our comprehension of the relationship among operational risk, board characteristics,

and organizational success. These findings confirm our dataset's validity and reliability and support the accuracy of our selected measurement and analysis methods. The results of our Structural Equation Modeling (SEM) analysis are shown in Table 2, focusing on moderation effects and hypothesis testing.

The analysis of the model relationship examines the hypotheses and provides valuable insights into the interaction of operational risk, board characteristics, and organizational performance. To begin with, the findings support Hypothesis 1, suggesting that operational risk directly impacts non-financial performance. The coefficient of 0.52, accompanied by a t-value of 4.11 (p-value of 0.000), highlights operational risk's significant influence on factors beyond financial indicators. This implies that proficient management of operational risk is of great significance for ensuring financial stability and enhancing overall operational efficiency and effectiveness.

Furthermore, the findings provide empirical evidence supporting Hypothesis 2, which proposes a favorable and direct correlation between operational risk and financial performance. The results indicate a positive relationship between operational risk and financial outcomes, as evidenced by a coefficient of 0.41 and a statistically significant t-value of 3.18 (p-value of 0.000). This suggests that firms have the potential to strategically utilize operational risk to enhance their financial performance. However, it also emphasizes the significance of efficiently managing these risks to mitigate negative financial consequences.

Table 2. Hypothesis

Model Relationship (Hypothesis)	Standard Coefficient	t- value (p-value)
H1. Operational risk has a direct influence on non-financial performance.	0.52	4.11 (0.000)
H2. Operational risk has a direct and positive influence on financial performance.	0.41	3.18 (0.000)
H3. The board of directors' characteristics moderate the relationship between operational risk and non-financial performance.	0.36	3.61 (0.000)
H4. The board of directors' characteristics moderate the relationship between operational risk and financial performance.	0.35	3.13(0.000)
Adjustment of the Multigroup Model RMSEA: 0.005; CFI: 0.91; TLI: 0.90		

Moreover, this study's findings support the moderating effects of board features on the associations between operational risk and performance. Hypothesis 3 posits that board characteristics influence the association between operational risk and non-financial performance. This hypothesis is supported by a coefficient of 0.36 and a statistically significant t-value of 3.61 (p-value of 0.000). Similarly, Hypothesis 4, positing a moderating influence on the association between operational risk and financial performance, is substantiated by a coefficient of 0.35 and a statistically significant t-value of 3.13 (p 0.000). The results of this study emphasize the significant influence of board governance on the relationship between operational risk and organizational outcomes, encompassing financial and non-financial performance indicators.

Moderation Effect Analysis

The results of the analysis provide additional support for Hypotheses 3 and 4. Hypothesis 3 suggests that the elements of the board of directors play an essential part in moderating the relationship between operational risk and non-financial performance, considering board characteristics at both low and high levels. Organizations with inadequate diversity, knowledge, and involvement on their boards will need help managing operational risks, which can significantly affect non-financial performance measures. In contrast, boards that possess a significant degree of diversity, knowledge, and participation have the potential to perform exceptionally well in recognizing, evaluating, and reducing operational risks, thereby having a beneficial impact on non-financial performance indicators (see Figure 2.

When the board has limited diversity and competence, it may need the essential skills and views for successful risk management methods. This may lead to a responsive approach in dealing with operational risks, resulting in less-than-ideal non-financial performance results.

With adequate technological competence and industry-specific knowledge, the board may be able to predict and address emerging risks related to technological breakthroughs. This might impede the organization's capacity to innovate and adjust to evolving market dynamics.

In contrast, when the board has a high level of board characteristics, such as diversity, experience, and proactive participation, it is more capable of efficiently managing operational risks and using them to improve non-financial performance indicators. An inclusive board comprising individuals with a wide array of expertise and viewpoints can offer novel ideas and creative resolutions, thus enhancing the organization's ability to address operational obstacles effectively. Furthermore, boards that actively participate in risk supervision and decision-making procedures can cultivate a culture of being conscious of and resilient to risks inside the business, enhancing non-financial performance indicators such as customer happiness, process efficiency, and innovation.

Similarly, according to H4 (see Figure 3), the board of directors' attributes have a moderating effect on the connection between operational risk and financial success, regardless of whether the board characteristics are low or high. Organizations lacking diversity, knowledge, and involvement on their boards may need help efficiently handling operational risks, which can result in adverse financial consequences. On the other hand, boards with significant diversity, experience, and participation are anticipated to reduce the adverse financial consequences of operational risks and take advantage of chances for financial profit.

Figure 2. Moderation effect (a)

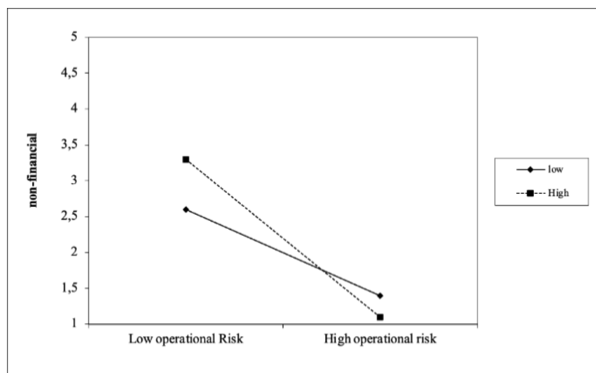
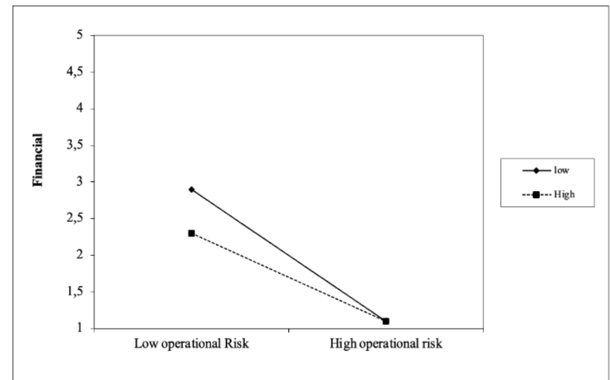


Figure 3. Moderation effect (b)



Conclusions

The present study explores the relationships among operational risk, board characteristics, and organizational performance, significantly contributing to understanding the factors influencing corporate governance and strategic decision-making procedures. Using empirical analysis and theoretical foundations, we have examined the direct influence of operational risk on both financial and non-financial performance and the moderating effect of board features. The results of our study emphasize the crucial significance of skilled operational risk management and efficient board governance in guaranteeing the continued viability and success of firms in the problematic current business environment.

This highlights the considerable influence of operational risk on variables beyond financial metrics, underscoring the imperative for organizations to prioritize the reduction of operational risk to improve overall operational efficiency and effectiveness. Moreover, the results of our study also indicate a positive association between operational risk and financial performance, implying that organizations can strategically use operational risk to improve their financial results while effectively mitigating any adverse financial effects.

Furthermore, our research offers empirical evidence to support the notion that board characteristics mediate the relationships between operational risk and performance. The statistically significant coefficients and t-values provide evidence supporting the hypotheses that suggest the impact of board characteristics on both non-financial and financial performance outcomes. This highlights the critical role of board governance in shaping the connection between operational risk and organizational outcomes. The results highlight the significance of having a diverse, experienced, independent, and competent board to effectively manage and reduce operational risks, ensuring companies' long-term sustainability and prosperity.

Our study makes a theoretical contribution to the present literature by emphasizing the essential importance of corporate governance, including the structure and role of the board of directors, in effectively addressing intricate environmental issues and promoting sustainable practices. This study highlights the significance of aligning governance structures with strategic objectives to manage operational risks and achieve organizational performance excellence successfully, drawing upon theoretical frameworks proposed by Xiang et al. (2022) and other scholars. Our study makes a valuable contribution to the existing body of literature by addressing long-standing gaps and presenting a well-organized framework for future research. This research enhances our understanding of contemporary businesses' complex relationship between risk, governance, and performance.

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