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Original Article

Decoding Leadership Bias in the Digital Era: A Systematic Literature Review of CEO Overconfidence, Risk-Taking, and Firm Value in Digital Banking

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Abstract: *This study presents a Systematic Literature Review (SLR) examining the relationship between CEO overconfidence, risk-taking behavior, and firm value in digital banking. Drawing from 25 peer-reviewed journal articles published between 1984 and 2025, the review synthesizes insights from Upper Echelons Theory, behavioral finance, and corporate governance. The review uses PRISMA guidelines and thematic coding via NVivo to identify four dominant clusters: CEO psychological traits, risk-taking mechanisms, moderating governance variables, and valuation metrics. The findings suggest that CEO overconfidence is a critical driver of strategic risk-taking, and it can have either a positive or negative impact on firm value, depending on moderating factors such as age, gender, board independence, and digital maturity. These effects are especially pronounced in digital banking, where rapid technological adoption, data-driven decision-making, and an evolving regulatory framework exist. The study identifies research gaps related to geographic bias, methodological limitations, and insufficient integration of emerging themes such as AI governance and platform-based value. The review concludes with actionable implications for boards, investors, and regulators, including the need for behavioral assessments in CEO selection, risk-adjusted performance metrics, and early-warning systems grounded in executive psychology.*

Keywords: *Behavioral Finance, CEO Characteristics, CEO Overconfidence, Digital Banking, Firm Value, Risk-Taking, Systematic Review, Upper Echelons Theory.*

I. INTRODUCTION

The emergence of digital banking constitutes a pivotal transformation within the global financial services sector. Conventional banking practices have been profoundly disrupted as institutions increasingly integrate digital platforms to deliver services that are more customized, efficient, and scalable. This shift is particularly pronounced in emerging economies, where digital banking fosters financial inclusion, drives economic participation, and reshapes consumer financial behaviors (Deloitte Insights, 2022; PricewaterhouseCoopers, 2021). Nevertheless, the potential of digital innovation is accompanied by considerable challenges, including unstable credit risks, heightened exposure to cybersecurity threats, and evolving regulatory ambiguities, all of which necessitate robust governance mechanisms and vigilant executive oversight (Nie & Yen, 2024).

Within this dynamic landscape, executive leadership behaviour is crucial to an institution's success or failure. In particular, the cognitive and behavioral characteristics of Chief Executive Officers (CEOs) have drawn growing interest from scholars and practitioners. Among these traits, CEO overconfidence - typically defined as an executive's tendency to overestimate their ability to influence future outcomes - has emerged as a significant behavioural factor influencing corporate strategy (Malmendier & Tate, 2005; Barber & Odean, 2001). Overconfident CEOs are often more inclined to pursue bold, high-risk strategic initiatives, which can lead to disruptive innovation but also increase the likelihood of misallocating resources, engaging in value-destructive investments, and underestimating potential risks (Ben-David et al., 2013; Roll, 1986). As PricewaterhouseCoopers (2021) highlights, digital banking CEOs face intensified pressure to deliver rapid innovation while simultaneously managing elevated expectations from investors and digitally native consumers - a dual challenge that makes behavioral insights more relevant than ever.

The challenges are particularly obvious in digital banks, which typically operate with minimal physical infrastructure, heavy dependence on technological systems, and frequently pursue ambitious customer acquisition strategies (Deloitte Insights, 2022; PricewaterhouseCoopers, 2021). Such institutions are especially susceptible to leadership-induced risk-taking because of their exposure to rapid technological change, governance frameworks that mirror start-up cultures, and the relative absence of

well-established regulatory benchmarks (Tang & Chang, 2024; Nie & Yen, 2024). Overconfident chief executives may amplify these vulnerabilities through decisions such as accelerated credit growth, technology-driven lending practices that lack robust credit assessments, or overly ambitious merger and acquisition initiatives - all of which have the potential to compromise financial stability and erode long-term firm value (Ben-David et al., 2013; Roll, 1986; Malmendier & Tate, 2005).

Recent evidence further highlights that demographic attributes of CEOs - such as age and gender - can significantly shape the relationship between overconfidence and organizational outcomes. Younger executives, who are often more technologically adept and oriented toward rapid growth, may tend to discount strategic risks (Tang et al., 2020; Yim, 2013). In contrast, female executives tend to exhibit greater risk aversion, prioritizing sustainability considerations and broader stakeholder inclusivity (Palvia et al., 2014; Faccio et al., 2016). These patterns highlight the importance of considering demographic factors when evaluating executive decision-making in digital banking (Hambrick & Mason, 1984).

Despite advances in behavioral finance and corporate governance research, consolidated knowledge regarding the impact of CEO overconfidence on firm value remains limited, particularly within the distinctive operational dynamics of digital banking (Hirshleifer et al., 2012). This knowledge gap is more pronounced in emerging economies, where institutional maturity, regulatory supervision, and financial infrastructure often trail those of developed markets (Gabrielsson & Huse, 2004; Morck et al., 1988).

This review seeks to bridge this gap by systematically synthesizing findings from leading peer-reviewed studies. Specifically, it explores how CEO overconfidence influences risk-taking and how these behaviors subsequently shape firm value in digital banking institutions. Moreover, it assesses the moderating influence of CEO demographic characteristics, thereby advancing an integrative framework that links behavioral finance, corporate governance, and organizational performance (Hambrick & Mason, 1984; Barber & Odean, 2001).

By offering a theoretically grounded synthesis, the article contributes to the strategic management literature with implications for board-level governance, executive recruitment, and policy formulation in the digital banking domain. It also establishes a foundation for future empirical inquiries aimed at quantifying and mitigating the risks associated with executive psychological biases in technology-driven financial systems.

II. METHODOLOGY

This research adopts the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework to enhance methodological rigor, transparency, and replicability (Moher et al., 2009). The review protocol was structured to map and evaluate the existing body of literature on CEO overconfidence, with a particular focus on its influence on firm value in the digital banking sector.

A) Data Sources and Search Strategy

A structured search was conducted across Scopus, Web of Science, and ScienceDirect. The search terms used were combinations of keywords, including: "CEO overconfidence," "executive bias," "risk-taking," "digital bank," "firm value," "corporate governance," and "behavioral finance."

Boolean operators and filters were employed as follows:
Title/Abstract/Keyword = ("CEO overconfidence" OR "executive confidence") AND ("risk-taking" OR "strategic risk") AND ("firm value" OR "performance") AND ("digital bank" OR "fintech")

B) Inclusion and exclusion criteria

Clearly defined inclusion and exclusion criteria were used to ensure this systematic literature review's methodological rigor, transparency, and relevance. These standards were guided by established review frameworks such as the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines (Moher et al., 2009), which are widely recognized for promoting replicable and unbiased review processes. The inclusion criteria prioritized peer-reviewed journal articles that aligned with the research objectives concerning CEO behavior, risk-taking, and firm value within financial institutions. To ensure relevance, especially given the rapid evolution of digital banking models and leadership dynamics, the review included studies published between 1984 and 2025.

In addition, the scope was confined to literature within banking and financial services, prioritizing studies at the intersection of corporate finance, digitalization, and executive decision-making under regulatory constraints. This thematic focus was essential for ensuring cohesion and for isolating the specific dynamics of CEO overconfidence, risk-taking, and value creation within financial institutions (Ben-David et al., 2013; Faccio et al., 2016).

Correspondingly, exclusion criteria were used to preserve analytical precision. Non-peer-reviewed sources, including conference papers, working papers, book chapters, and trade publications, were excluded due to their variable methodological

standards and less rigorous vetting processes, which could otherwise compromise the reliability of insights (Gabrielsson & Huse, 2004). Publications in languages other than English were also omitted to avoid translation inconsistencies and conceptual distortions. Finally, studies that did not explicitly engage with corporate finance, CEO behavior, or executive-level decision-making in the financial sector were excluded, as they lay outside the conceptual scope of this review (Hambrick & Mason, 1984; Barber & Odean, 2001).

C) Screening and Selection

The initial search returned 421 records. After removing duplicates and screening abstracts, 125 articles were retained for full-text review. Ultimately, 25 articles met all inclusion criteria and were included in the final synthesis.

D) Article categorization

As part of the analytical process, each selected article was systematically classified into one of four thematic clusters based on its central research focus. This thematic categorization enabled a more structured synthesis of findings and facilitated the identification of conceptual overlaps and research gaps within the literature, in line with best practices for systematic literature reviews (Moher et al., 2009; Gabrielsson & Huse, 2004).

Cluster 1 reveals studies investigating the psychological traits of CEOs, particularly how these traits influence strategic and operational decision-making within organizations. Central to this cluster is CEO overconfidence, a cognitive bias wherein executives overestimate their ability to influence outcomes and control risk. Foundational studies, such as those by Malmendier and Tate (2005) and Barber and Odean (2001), demonstrate how overconfidence manifests in investment decisions, earnings forecasts, and expansion strategies. Recent work by Tang and Chang (2024) further contextualizes these behavioral traits within the high-velocity environment of financial institutions.

Cluster 2 includes literature focusing on risk-taking behavior within financial institutions. Articles in this category assess how CEOs' cognitive traits—especially overconfidence— affect the firm's propensity to undertake high-risk financial strategies, including credit expansion, investment in untested technologies, and mergers or acquisitions. Research by Ben-David et al. (2013) and Roll (1986) provides empirical evidence linking CEO overconfidence to value-destructive risk-taking in volatile market environments. In digital banking, such behaviors are particularly consequential due to the speed of decision-making and the technological complexity involved (Deloitte Insights, 2022).

Cluster 3 focuses on corporate governance and demographic moderators that shape how CEO traits affect firm outcomes. Studies in this cluster examine the moderating roles of age, gender, tenure, education, industry experience, and governance variables, including board independence, ownership concentration, and compensation structure. For example, Faccio et al. (2016) and Palvia et al. (2014) found that female CEOs and independent governance structures are associated with more conservative financial policies. Meanwhile, Custódio et al. (2013) highlight the influence of educational and industry backgrounds on managerial behavior and capital structure.

Cluster 4 addresses the measurement and determinants of firm value. This includes traditional financial metrics - such as Return on Assets (ROA), Return on Equity (ROE), and Tobin's Q - as well as emerging indicators relevant to digital banking, such as user engagement, Non-Performing Loan (NPL) ratios, and platform scalability (Morck et al., 1988; PricewaterhouseCoopers, 2021). These newer metrics are increasingly important in evaluating the performance and sustainability of digitally native financial institutions.

By categorizing the literature into four distinct thematic clusters, this review develops a structured narrative that captures the interconnections among CEO behavioral characteristics, strategic risk-taking, governance practices, and firm performance. Such an organization offers a comprehensive analytical framework for examining the influence of leadership behavior on organizational outcomes in digital banking, particularly within the context of rapidly transforming and dynamic financial environments.

The figure below illustrates the PRISMA-based article selection flow:

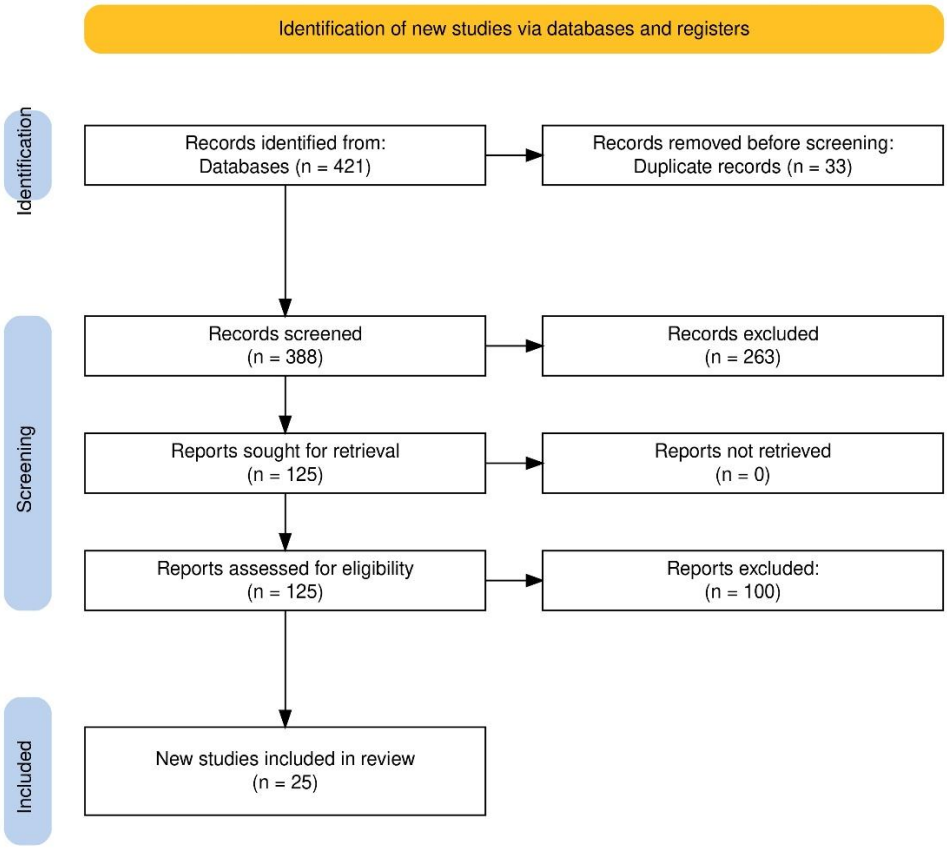

Fig. 1: PRISMA flow diagram of article selection

Source: *Reviewed and structured by adopting PRISMA (Moher et al., 2009)*

E) Data Extraction and Synthesis Approach

We extracted bibliographic information, research methodologies, theoretical frameworks, geographic foci, and significant findings from each study. The synthesis followed a narrative integration approach and thematic coding to identify cross-study patterns.

F) Reliability and quality assessment

Quality appraisal was also conducted using a modified Critical Appraisal Skills Programme (CASP) checklist (Singh, 2018). Each study was evaluated based on relevance, methodological rigor, theoretical contribution, and citation impact. Only studies scoring above 70% were retained in the synthesis.

G) Tools used

A combination of software tools was employed throughout the data collection, coding, and analysis stages to support the systematic review process and ensure methodological rigor. Zotero was the primary reference management tool, enabling efficient organization, citation tracking, and seamless integration of bibliographic data. This facilitated the systematic documentation of all sources and ensured consistency in citation formatting across the review.

For qualitative data analysis and thematic synthesis, NVivo was used to conduct structured coding of the selected articles. This tool identified and categorized recurring themes, concepts, and patterns within the literature, particularly about CEO traits, risk-taking behavior, governance variables, and firm value. NVivo's functionality proved essential in maintaining analytical depth and coherence across the four thematic clusters.

Additionally, Microsoft Excel was used to assist in cluster tracking and fundamental bibliometric analysis. The software enabled the classification of articles into thematic categories, facilitated the cross-tabulation of variables such as publication year, region, and methodological approach, and provided visualisation of data trends across the reviewed studies. These tools enhanced the transparency, reproducibility, and analytical clarity of the systematic literature review.

III. THEORETICAL FRAMEWORK

This review is based on two principal theoretical constructs: Upper Echelons Theory (UET) and Behavioral Finance. These frameworks help explain how CEOs' individual traits and cognitive biases influence their strategic decisions, particularly in high-stakes environments such as digital banking.

A) Upper Echelons Theory (UET)

First proposed by Hambrick and Mason (1984), UET reveals that an organization's outcomes - such as strategic choices and financial performance - are primarily shaped by its top executives' experiences, values, and personalities. Later elaborations by Cannella et al. (2009) further emphasized the role of top management teams in shaping strategic intent and long-term organizational direction. UET theory argues that because decision-makers interpret situations through their cognitive lenses, demographic and psychological attributes (e.g., age, education, tenure) become proxies for understanding corporate behavior.

In digital banking, UET provides a compelling framework for examining how CEO overconfidence may lead to disproportionate risk-taking and potentially destabilise firm value. The fast-paced, tech-driven environment of digital banks escalates the effects of such cognitive filters.

B) Behavioral Finance

Behavioral finance extends this analysis by focusing on psychological biases in financial decision-making. Overconfidence bias, in particular, refers to the tendency of individuals, such as CEOs, to overestimate their ability to predict outcomes or control events (Barber & Odean, 2001). This can lead to overly optimistic projections, excessive investment, and underappreciation of risk.

This theory is particularly relevant for digital banks, where strategic decisions frequently involve emerging technologies, untested markets, and rapidly evolving regulatory environments. Overconfident CEOs may commit to large-scale lending expansions or technology acquisitions without fully considering downside risks or implementing adequate mitigations.

C) Integration Of UET and Behavioral Finance

This study adopts an integrated framework combining Upper Echelons Theory (UET) and Behavioral Finance to provide a robust theoretical foundation for this systematic review. Together, these two perspectives offer a holistic lens for analyzing the role of CEO traits - particularly overconfidence - in shaping strategic decisions and firm outcomes in digital banking environments.

Upper Echelons Theory (Hambrick & Mason, 1984) reveals that organizational outcomes are partially predicted by the observable characteristics of top executives, such as their age, gender, tenure, and educational background. These variables serve as proxies for underlying cognitive frameworks and value systems, influencing how leaders perceive strategic choices and respond to external stimuli. UET provides the structural basis for identifying which CEO traits are relevant and how they interact with institutional and market-level contingencies.

Conversely, behavioral finance (Barber & Odean, 2001; Ben-David et al., 2013) introduces insights into how cognitive biases - such as overconfidence - distort decision-making processes. Unlike traditional economic theories that assume executive economic rationality, behavioral finance emphasizes that subjective heuristics and biased risk perceptions frequently influence managerial decisions. Within this framework, CEO overconfidence is a cognitive bias that leads executives to overestimate their knowledge, control over outcomes, or ability to mitigate risk (Malmendier & Tate, 2005; Roll, 1986).

The integration of behavioral finance, Upper Echelons Theory (UET), and corporate governance perspectives enables the construction of a multi-layered explanatory model for understanding CEO decision-making in digital banking. Within this framework, CEO overconfidence emerges as a cognitive bias characterized by an inflated self-assessment of judgment and capability, influencing capital allocation, innovation strategies, and credit-related decisions. Demographic characteristics, such as age, gender, and tenure, further moderate the manifestation of this bias. Consistent with UET, younger CEOs are generally associated with higher levels of risk tolerance, while female CEOs have been linked to more cautious financial strategies, highlighting how individual attributes condition the behavioral expression of overconfidence (Tang et al., 2020; Faccio et al., 2016; Palvia et al., 2014).

Risk-taking behavior functions as a critical mediating mechanism, transforming cognitive biases into strategic choices such as entering new markets, launching unsecured lending initiatives, or pursuing rapid digital expansion (Deloitte Insights, 2022; Tang & Chang, 2024). These behaviors ultimately shape firm-level outcomes, with firm value positioned as the dependent variable within the model. Empirical evidence demonstrates that while CEO overconfidence may initially generate short-term gains, the absence of effective governance mechanisms can result in long-term value erosion (Ben-David et al., 2013; Morck et al., 1988). Thus, the framework underscores the dual role of CEO traits—both direct and indirect—in influencing organizational

performance, while also emphasizing the importance of governance structures in moderating the risks associated with executive bias.

Combining UET's emphasis on who leaders are with behavioral finance's focus on how they think and act, the conceptual framework, as illustrated in Figure 2, reflects a nuanced understanding of leadership bias and its impact on digital banking performance. This integration aligns with broader strategic leadership frameworks that highlight how digital transformation demands a shift in executive mindset, cross-functional coordination, and new decision-making logics driven by customer centricity and data analytics (Verhoef et al., 2021). It also provides a flexible structure for future empirical testing, particularly in the underexplored contexts of emerging markets and technology-intensive financial sectors.

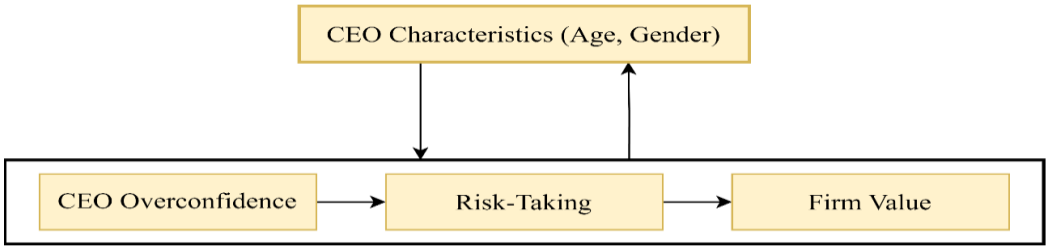

Fig. 2: Integrated conceptual framework

Source: Reviewed and synthesized from Hambrick & Mason (1984), Barber & Odean (2001), Ben-David et al.(2013), Malmendier & Tate (2005), Morck et al. (1988)

This integrated model provides the analytical foundation for evaluating the selected studies and developing a cohesive narrative about executive bias, decision-making, and performance in digital banks.

Table 1: Summary of key literature on CEO Overconfidence, risk-taking, and firm value

Author	Findings	Journal
Barber & Odean (2001)	Men are more overconfident in their financial decisions than women, which influences risk-taking and firm behaviour.	Quarterly Journal of Economics
Ben-David et al. (2013)	Overconfident executives often underestimate volatility and risk, which can impact their investment and financing decisions.	Quarterly Journal of Economics
Faccio et al. (2016)	Female CEOs take less risk, resulting in greater capital allocation efficiency.	Journal of Corporate Finance
Florackis et al. (2020)	CEO ownership aligns risk-taking with firm value, particularly in innovation-driven environments.	European Journal of Operational Research
Hirshleifer et al. (2012)	Overconfident CEOs lead firms to invest more in innovation; outcomes vary based on governance structures.	Journal of Finance
Malmendier & Tate (2005)	Overconfident CEOs tend to overinvest using internal funds, avoiding external financing, with implications for value creation.	Journal of Finance
Morck et al. (1988)	Managerial ownership affects firm valuation; there is a potential for value destruction when ownership concentration misaligns with shareholder interests.	Journal of Financial Economics
Palvia et al. (2014)	Banks led by female CEOs exhibit lower default risk and better capital buffers.	Journal of Financial Services Research
Tang & Chang (2024)	CEO overconfidence in digital banks is associated with aggressive lending and higher NPLs.	Asia Pacific Journal of Management

IV. CEO OVERCONFIDENCE: DEFINITIONS AND CONSEQUENCES

CEO overconfidence is widely recognized as a cognitive bias whereby executives overrate their capacity to shape future outcomes and manage uncertain environments. Originating from the behavioral finance tradition, this psychological trait exerts a significant influence on strategic choices and capital allocation. Malmendier and Tate (2005) provided important empirical evidence showing that overconfident leaders tend to persistently overinvest, particularly in internal initiatives with questionable returns, reflecting an exaggerated belief in their managerial capabilities. Earlier, Roll (1986) articulated the “hubris hypothesis,” arguing that such executives are more inclined to engage in value-destroying mergers and acquisitions under the assumption that they can generate unique synergies that others overlook.

The implications of this behavioral tendency are salient in dynamic industries such as digital banking, where decision-making occurs under conditions of high uncertainty and rapid change. In these settings, overconfident CEOs may misjudge market signals or underestimate volatility, resulting in patterns of overinvestment, delayed divestitures, or aggressive scaling efforts without sufficient infrastructure or risk management safeguards (Ben-David et al., 2013; Hirshleifer et al., 2012). While overconfidence can drive bold innovation and market expansion, it simultaneously raises the likelihood of strategic missteps, thereby creating both opportunities and vulnerabilities for firms operating in digital banking ecosystems characterized by constant regulatory shifts, technological disruptions, and evolving customer expectations (PricewaterhouseCoopers, 2021; Deloitte Insights, 2022).

A) Defining CEO Overconfidence

Scholars have developed several methodological approaches to capture and quantify CEO overconfidence, each providing unique insights into how this cognitive bias influences executive decision-making. One of the most prominent measures is option-based, which infers overconfidence from a CEO's tendency to retain in-the-money stock options beyond rational exercise points. Such behavior reflects an exaggerated belief in the firm's prospects, as first documented in the influential work of Malmendier and Tate (2005). Another widely adopted proxy is earnings forecast optimism, where overconfidence is identified through the consistent overestimation of future earnings or growth. This persistent optimism, despite contrary market signals, represents a distorted perception of firm performance, often embedded in strategic planning and corporate communication. Empirical studies, including Hirshleifer et al. (2012), reveal that firms led by overconfident CEOs tend to release overly favorable guidance that frequently fails to materialize, generating valuation volatility and misalignment with investor expectations.

Investment behavior provides an additional view for identifying overconfidence. Executives exhibiting this bias often allocate resources aggressively, even under unfavorable macroeconomic conditions. Malmendier and Tate (2005) demonstrated that overconfident CEOs persistently pursue capital expenditures and acquisitions with negative Net Present Value (NPV) projections, convinced that their managerial capabilities can overturn adverse conditions. Such risk miscalibration is especially problematic during downturns, where prudent firms typically retrench. Complementing these quantitative proxies, qualitative approaches such as media portrayal and textual analysis offer further insights. By employing text mining and linguistic pattern recognition, researchers have identified overly optimistic language and self-attribution tendencies in CEO interviews, earnings calls, and public statements. Hirshleifer et al. (2012) have linked these communication patterns to heightened risk-taking in innovation-driven firms. Collectively, these proxies - ranging from financial behavior to discourse analysis - form a robust toolkit for operationalizing CEO overconfidence in empirical studies of corporate finance and behavioral strategy.

Within digital banking ecosystems, these manifestations become particularly salient. Overconfident executives often drive premature product launches, undertake fintech acquisitions with inadequate due diligence, and expedite loan disbursements to high-risk borrower segments. Such actions highlight how psychological biases, when amplified by fast-paced and high-growth environments, shape strategic trajectories, capital allocation efficiency, and ultimately, firm value.

B) Empirical Evidence and Outcomes

A substantial body of empirical research has consistently highlighted the link between CEO overconfidence and critical dimensions of corporate decision-making. One of the most extensively documented domains is investment behavior. Overconfident executives frequently pursue large-scale, high-risk projects, often underpinned by an inflated assessment of their managerial capabilities. Malmendier and Tate (2005), for example, demonstrated that such leaders tend to allocate resources excessively to internal projects, even when these projects present negative net present values (NPVs). This pattern reflects a misalignment between their subjective perceptions of value creation and objective economic outcomes.

Beyond investment choices, overconfidence also exerts a notable influence on financing policies. Overconfident CEOs often display a marked preference for internal funding sources, such as retained earnings, while avoiding external financing. This reluctance stems from a conviction that capital markets undervalue the firm's intrinsic worth, thereby rendering equity or debt issuance unnecessarily dilutive. Ben-David et al. (2013) provided empirical evidence of this tendency, linking managerial miscalibration to a lower likelihood of raising funds through external capital markets.

The effects of overconfidence extend further into Mergers And Acquisitions (M&A). Executives exhibiting this bias are more likely to pursue acquisitions, often without a strong economic justification. Roll's (1986) "hubris hypothesis" originally proposed that such decisions are often value-destructive, driven more by managerial ego than by shareholder interests. Subsequent studies, including Tang and Chang (2024), have reinforced this perspective, showing that overconfident CEOs are statistically more likely to engage in acquisitions that result in weaker post-merger performance. Taken together, these findings illustrate the pervasive impact of CEO overconfidence across strategic domains, underscoring its potential to shape, and at times undermine, long-term corporate outcomes.

C) Relevance In Digital Banking

Digital banks operate in inherently dynamic, high-velocity environments where strategic choices must be executed with both agility and precision. The accelerated pace of operations creates opportunities for exceptional value creation but also heightens the risk of rapid value erosion. López-Figueroa et al. (2025) emphasize that leadership in digital contexts now extends far beyond conventional financial oversight, encompassing digital vision, technological adaptability, and the capacity to manage innovation ecosystems. Their systematic review demonstrates that digital leadership increasingly involves navigating challenges such as data governance and technological disruption—domains in which leadership biases and cognitive traits directly influence strategic outcomes. Within such rapidly evolving ecosystems, CEO overconfidence can exert amplified effects, particularly when institutional checks or robust risk assessment mechanisms fail to constrain executive decisions (Tang & Chang, 2024; Hirshleifer et al., 2012).

One of the most visible areas where overconfidence manifests is in the adoption of technology. Overconfident leaders often pursue cutting-edge innovations, such as artificial intelligence or blockchain-based platforms, based on overly optimistic expectations of competitive advantage (Malmendier & Tate, 2005; Barber & Odean, 2001). While such initiatives can position firms as innovation leaders, they also carry elevated risks of regulatory complications, cybersecurity vulnerabilities, or implementation setbacks, especially under weak governance structures (Faccio et al., 2016; Deloitte Insights, 2022). Credit practices represent another critical domain of concern.

Overconfident executives, eager to accelerate user growth and capture market share, may relax credit standards, underestimating borrower default probabilities or overestimating the effectiveness of digital risk models (Ben-David et al., 2013; Palvia et al., 2014). This behavior increases exposure to Non-Performing Loans (NPLs), undermining both asset quality and long-term financial stability (Nie & Yen, 2024). Furthermore, strategic misalignment often arises when firms pursue aggressive expansion without adequate investment in supporting infrastructure or customer service. Executives may emphasize growth indicators such as app downloads or customer acquisition while underinvesting in operational systems, ultimately eroding customer trust, weakening reputation, and reducing operational efficiency (PricewaterhouseCoopers, 2021; Hambrick & Mason, 1984).

An illustrative case is evident in the Indonesian digital banking sector, where rapid customer acquisition has been driven by PayLater services. Although such strategies have fueled short-term growth, they have also coincided with rising NPL ratios, underscoring the financial and reputational vulnerabilities associated with unchecked executive optimism. This example highlights the amplified risks of overconfidence in digital banking, where leadership decisions unfold within highly volatile and innovation-driven ecosystems.

D) Moderators and Boundary Conditions

While CEO overconfidence is generally associated with a greater propensity for risk-taking, its ultimate effect on firm value is highly context-dependent and shaped by various moderating variables. Notably, the age of the CEO plays a significant role in how overconfidence influences strategic decisions. Empirical research has shown that younger CEOs exhibit stronger overconfidence traits and are more inclined to experiment with novel strategies, particularly in digital transformation (Tang et al., 2020; Yim, 2013). This youthful bias toward innovation and disruption, while potentially value-enhancing, may also amplify exposure to strategic and operational risks if not properly governed.

Gender is another important moderating factor. Studies have consistently found that female CEOs tend to exhibit more conservative and measured decision-making styles than their male counterparts. This behavioral tendency enables them to neutralize or mitigate the adverse effects of executive overconfidence, especially in high-stakes environments like digital banking (Palvia et al., 2014; Faccio et al., 2016). As such, gender diversity in executive leadership may serve as a stabilizing force, promoting prudent risk management and long-term sustainability.

Furthermore, corporate governance mechanisms - such as independent boards, risk oversight committees, and performance-based compensation systems - can moderate the relationship between overconfidence and firm value by providing formal checks and balances on executive behavior. These mechanisms are essential in ensuring that overconfident strategic choices are subject to scrutiny and aligned with shareholder interests (Gabrielsson & Huse, 2004; Florackis et al., 2020). In sum, the interaction between CEO traits and institutional governance structures determines whether overconfidence will translate into strategic agility or result in value-destructive outcomes.

E) Implications for Stakeholders

An in-depth understanding of CEO overconfidence carries significant implications for various stakeholders, particularly boards of directors, investors, and financial regulators. This psychological trait influences strategic direction and affects organizational resilience and long-term value creation. As such, the ability to recognize and respond to manifestations of

overconfidence in top executives is increasingly viewed as a core component of effective corporate governance and risk oversight.

For board directors, insights into CEO overconfidence can play a pivotal role in executive recruitment and leadership development. By incorporating behavioral assessments into selection processes, boards can better evaluate a candidate's risk orientation and decision-making style, ensuring a more balanced and strategically aligned executive profile (Hambrick & Mason, 1984; Cannella et al., 2009). Tailored training programs can also be developed to help executives recognize and manage cognitive biases, particularly in high-stakes digital environments.

For investors, overconfidence has significant implications for the design of incentive structures. Equity-based compensation, while often used to align managerial interests with those of shareholders, can inadvertently exacerbate risk-taking behaviors among overconfident CEOs who already possess an inflated sense of control over firm outcomes (Florackis et al., 2020; Ben-David et al., 2013). As a result, investors should consider balancing equity incentives with mechanisms that reward long-term performance and prudent risk management.

From a regulatory perspective, monitoring CEO overconfidence can contribute to the development of early-warning systems that flag decision-making anomalies, which may indicate heightened financial or strategic risk. Tools such as behavioral analytics, sentiment analysis from public disclosures, and board-level evaluations can be preventive measures to identify when overconfident behavior threatens to undermine institutional soundness (Hirshleifer et al., 2012; Roll, 1986). Regulators, particularly in emerging markets, must remain vigilant in overseeing the intersection of executive psychology and systemic financial stability, especially as digital banking models continue to evolve with limited historical precedent (PricewaterhouseCoopers, 2021; Deloitte Insights, 2022).

Figure 3 depicts that CEO overconfidence is not solely a behavioral quirk but a material factor with direct implications for governance practices, capital markets, and regulatory oversight. Addressing this bias through informed policy and organizational frameworks is essential for promoting sustainable performance and safeguarding institutional integrity in the digital financial ecosystem.

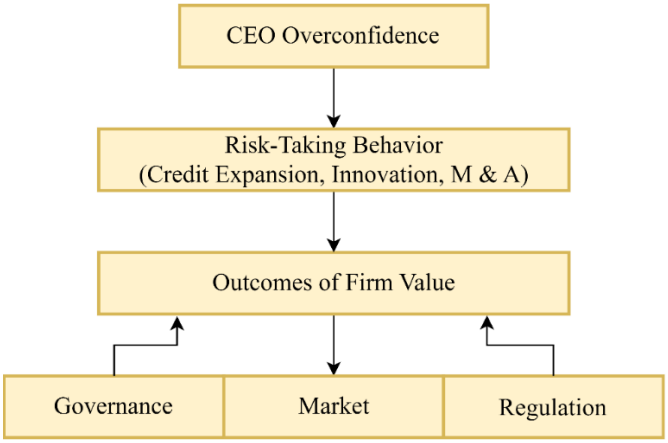

Fig. 3: CEO Overconfidence—Mechanisms and consequences in digital banking

Source: *Reviewed and synthesized from Malmendier & Tate (2005), Hambrick & Mason (1984), Cannella et al. (2009), Florackis et al. (2020), Ben-David et al. (2013), Hirshleifer et al. (2012), Roll (1986), PricewaterhouseCoopers (2021), Deloitte Insights (2022)*

V. RISK-TAKING AS A MEDIATING MECHANISM

Risk-taking in corporate decision-making refers to the willingness of firms to undertake actions that involve significant uncertainty, where outcomes can range from considerable gains to substantial losses. In digital banking, risk-taking is particularly salient due to the sector's rapid technological innovation and competitive pressures. Strategic behaviors that characterize risk-taking in this setting include extending credit to underbanked or thin-file customer segments, adopting emerging financial technologies such as artificial intelligence (AI) for credit scoring, and forming non-traditional partnerships with fintech companies to expand market reach (Tang & Chang, 2024; Ben-David et al., 2013).

These decisions often reflect a leadership-driven appetite for growth and disruption, especially under the influence of overconfident CEOs who perceive themselves as better equipped to navigate risk-laden environments (Malmendier & Tate, 2005; Barber & Odean, 2001). While such risk-taking can lead to competitive advantages and innovation-led value creation, it also

exposes firms to potential volatility and operational vulnerabilities if not adequately governed. This dual-edged nature of strategic risk underscores the importance of incorporating behavioral considerations and robust oversight mechanisms into the risk governance frameworks of digital banks (Florackis et al., 2020; Deloitte Insights, 2022).

A) Risk-Taking as a Bridge Between Overconfidence and Performance

Prior studies highlight risk-taking as a critical behavioral mechanism through which CEO overconfidence translates into organizational outcomes. Rooted in the principles of behavioral finance, this mediating relationship highlights how cognitive distortions - particularly overestimation of personal efficacy and underappreciation of downside risk - can disrupt rational decision-making processes at the executive level (Barber & Odean, 2001; Malmendier & Tate, 2005). Overconfident CEOs tend to believe they are better equipped than others to navigate uncertainty, often resulting in aggressive strategies that stretch the organization's risk tolerance.

In digital banking, these tendencies become obvious due to the sector's fast-paced innovation cycles, untested business models, and relatively limited regulatory precedent (Deloitte Insights, 2022; PricewaterhouseCoopers, 2021). Overconfident CEOs in digital banks are more likely to launch unsecured lending platforms with lax credit approval mechanisms, driven by a desire to rapidly capture market share. Additionally, they may adopt nascent technologies such as AI-driven credit scoring or blockchain-based transaction systems without thorough validation or adequate risk controls (Tang & Chang, 2024). Another frequent manifestation is the acceleration of loan disbursement cycles without sufficient due diligence, a strategy to boost short-term growth metrics.

While these high-risk, high-reward approaches may temporarily enhance firm performance - through increased customer acquisition, market visibility, or investor excitement - they often result in long-term volatility and deterioration in asset quality, particularly when underlying credit risks materialize. This pattern reinforces the importance of treating risk-taking as a financial construct and a behavioral extension of executive psychology, requiring integrated governance oversight and risk-adjusted performance evaluation frameworks (Florackis et al., 2020; Ben-David et al., 2013).

B) Empirical Evidence of Risk-Taking Outcomes

Empirical studies demonstrate that risk-taking can act as a catalyst for enhancing firm value when pursued within a strategically aligned and well-governed framework. Yet, the impact of such behavior is heavily dependent on the surrounding governance structures and prevailing market conditions. Florackis et al. (2020) identified a positive relationship between CEO equity incentives and corporate risk-taking, particularly in innovation-driven industries. Their findings highlight how compensation systems that are tied to equity performance can motivate executives to embrace riskier strategies in pursuit of both personal and organizational gains.

The significance of incentive structures is particularly evident in financial institutions. Bolton et al. (2010) observed that equity-based compensation schemes play a critical role in shaping executive behavior, with the potential to materially influence firms' overall risk profiles. These results underscore the importance of designing compensation mechanisms that encourage innovation and growth while incorporating safeguards to limit excessive risk exposure. In a similar vein, Galasso and Simcoe (2011) demonstrated that Executive Stock Options (ESOs) frequently encourage managers to undertake high-risk, high-reward innovation projects, with lasting consequences for firm value. Collectively, these studies suggest that risk-taking is not inherently detrimental; rather, its outcomes depend on the conditions under which it is incentivized and managed.

At the same time, not all governance mechanisms support risk-taking. Imhof and Seavey (2014) found that stringent disclosure requirements can inadvertently discourage executives from pursuing bold strategies. When managers become overly focused on meeting short-term reporting targets, they may adopt conservative investment approaches, leading to underinvestment and missed opportunities for long-term growth.

In the context of digital banking—particularly in emerging economies like Indonesia—the balance between innovation and prudence is especially delicate. Several digital banks in the country have faced regulatory scrutiny due to the rapid expansion of their credit portfolios, often attributed to executive overconfidence and weak risk governance (PricewaterhouseCoopers, 2021; Deloitte Insights, 2022). This experience highlights the importance of incentive and oversight systems that promote technological innovation and market expansion while maintaining robust safeguards against systemic financial risks.

C) Categories of Risk in Digital Banking

In digital banking, risk-taking behavior encompasses a broad spectrum of interrelated risk dimensions, each of which can affect firm performance and stakeholder trust. These risks are often higher when strategic decisions are influenced by overconfident CEOs, particularly in the absence of robust governance and control mechanisms.

Credit risk is one of the most immediate challenges, especially for digital banks that target underbanked, MSME or thin-file borrowers - segments that typically lack formal credit histories. Overconfident executives may aggressively expand unsecured lending portfolios, underestimating default probabilities and over-relying on algorithmic credit scoring models (Tang & Chang, 2024; Ben-David et al., 2013). This behavior increases the likelihood of non-performing loans (NPLs) and weakens asset quality.

Operational risk is another significant concern arising from digital banks' heavy reliance on third-party application programming interfaces (APIs), cloud infrastructure, and automated decision-making systems. While such technologies offer scale and efficiency, they also introduce vulnerabilities related to system downtime, integration errors, and cybersecurity threats—risks that overconfident executives may underestimate due to overreliance on technological infallibility (Deloitte Insights, 2022; PricewaterhouseCoopers, 2021).

Strategic risk also looms, particularly when digital banks merge with fintech startups or diversify into adjacent markets such as e-wallets and digital insurance. While these moves can expand service offerings and enhance user stickiness, they also carry significant risks associated with integration and execution. Overconfident CEOs may initiate such strategies without adequate market testing or resource planning, resulting in a misalignment between strategic goals and operational capacity (Roll, 1986; Malmendier & Tate, 2005).

Lastly, reputational risk is increasingly salient in the digital age, where customer service failures, data breaches, or harmful social media exposure can rapidly erode trust and damage brand equity. In environments where overconfident executives deprioritize reputational safeguards in favor of rapid scaling, the firm becomes more vulnerable to public backlash and regulatory penalties (Palvia et al., 2014; Hirshleifer et al., 2012).

Taken together, these four risk categories—credit, operational, strategic, and reputational—are not only interdependent but also magnified by the psychological biases of executive leadership. This highlights the need for digital banks to implement comprehensive risk management systems that proactively address behavioral risks at the organization's top.

D) Conditional Effects and Moderating Factors

The consequences of risk-taking in digital banking are far from uniform. They are significantly influenced by a set of moderating conditions that shape the extent to which such behavior affects firm value and financial stability. These moderators—ranging from governance structures to external market forces—determine whether risk-taking leads to innovation-driven growth or results in value erosion and systemic vulnerabilities.

First, corporate governance mechanisms play a crucial role in mitigating the impact of executive risk appetite. Structures such as board oversight, dedicated risk committees, and enhanced transparency practices can effectively counter overconfident or impulsive CEO behavior. By providing formal checks and strategic guidance, these mechanisms help ensure that risk-taking is aligned with the firm's long-term objectives and stakeholder expectations (Gabrielsson & Huse, 2004; Florackis et al., 2020). For instance, independent boards and well-designed compensation structures have been shown to temper excessive confidence in top management and promote more prudent decision-making (Faccio et al., 2016).

Second, the market environment—specifically, whether the firm is operating in a bullish or bearish cycle—has a considerable impact on the outcomes of risk-taking. Aggressive strategies may generate short-term gains through rapid expansion and investor enthusiasm in buoyant market conditions. However, in downward or volatile markets, the same strategies can lead to heightened losses, increased volatility, and erosion of stakeholder confidence. Nie and Yen (2024) found that market sentiment and macroeconomic trends significantly mediate the relationship between CEO behavior and merger performance, illustrating the sensitivity of strategic outcomes to broader economic contexts.

Lastly, the regulatory framework imposed by central banks and financial authorities is another decisive factor. In the case of digital banks, where business models often outpace regulatory development, regulators such as the Otoritas Jasa Keuangan (OJK) in Indonesia are essential in defining the risk boundaries for digital lending activities. Regulatory clarity regarding capital adequacy, data security, lending limits, and consumer protection can constrain or enable executive decisions, influencing how risk-taking manifests across institutions (PricewaterhouseCoopers, 2021; Deloitte Insights, 2022).

In summary, risk-taking in digital banking is influenced by internal leadership traits and the interplay among governance, market dynamics, and regulatory oversight. Understanding these moderating variables is essential for designing resilient organizational strategies and effective policy interventions.

E) Strategic Implications and Risk Governance

Given the high-stakes and fast-evolving nature of digital financial innovation, boards of directors and investors must reconceptualize CEO-led risk-taking as a threat and a strategic lever that must be proactively monitored and managed. In digital

banking environments, where technological disruption, regulatory flux, and volatile consumer preferences converge, risk-taking can serve as a source of competitive advantage - provided it is managed through structured oversight mechanisms and performance-aligned evaluation tools (Tang & Chang, 2024; Cannella et al., 2009).

One critical recommendation is the integration of risk-adjusted performance metrics into CEO evaluation frameworks. Traditional performance indicators such as Return On Equity (ROE) or market capitalization may overlook the underlying risk exposure that drives short-term gains. By contrast, risk-adjusted metrics - such as Economic Value Added (EVA) or Sharpe ratios - offer a more holistic view of executive performance, mainly when overconfidence influences corporate strategy (Ben-David et al., 2013; Florackis et al., 2020).

Furthermore, boards should mandate scenario planning and stress testing in executive decision-making processes. These tools allow leadership teams to model potential outcomes under adverse conditions and test the resilience of high-risk strategies before implementation. This is particularly relevant for digital banks engaging in rapid credit expansion or investing in nascent technologies such as Artificial Intelligence (AI) or blockchain (Deloitte Insights, 2022; Malmendier & Tate, 2005). Such mechanisms also help mitigate the cognitive biases often associated with CEO overconfidence by grounding strategic discussions in empirical data and probabilistic reasoning.

Lastly, deploying balanced scorecards can enhance alignment between CEO incentives and sustainable risk outcomes. By combining financial, customer, internal process, and learning and growth perspectives, balanced scorecards offer a multidimensional framework for evaluating performance and discouraging excessive risk-taking driven by short-term shareholder pressures (Faccio et al., 2016; Gabrielsson & Huse, 2004). These systems can be further tailored to reflect specific risk tolerance levels and strategic objectives, particularly in emerging market digital banks facing complex regulatory and operational challenges.

In sum, boards and investors must adopt a more nuanced, tools-based approach to managing CEO-led risk-taking that fosters innovation while preserving organizational resilience and stakeholder trust.

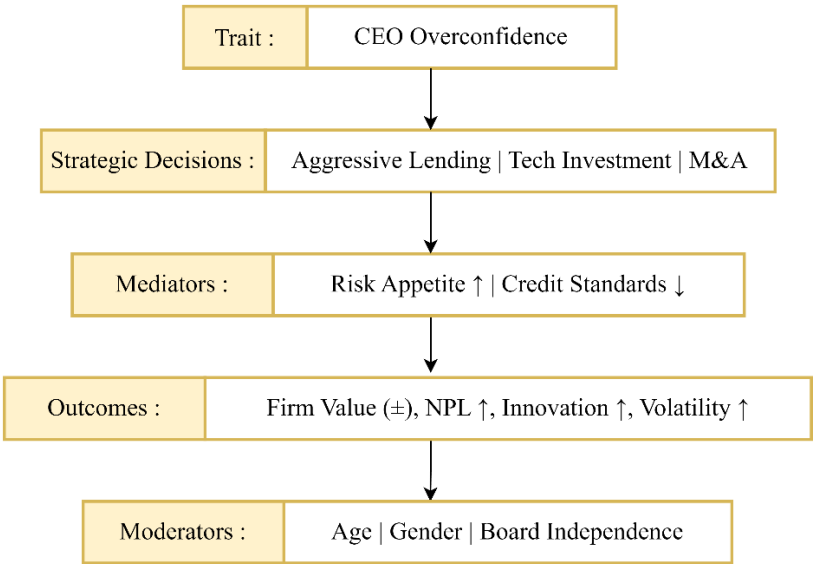

Fig. 4: Pathways of CEO Overconfidence through risk-taking to firm value

Source: *Reviewed and synthesized from Malmendier & Tate (2005), Hambrick & Mason (1984), Cannella et al. (2009), Florackis et al. (2020), Ben-David et al. (2013), Hirshleifer et al. (2012), Roll (1986), Tang & Chang (2024), PricewaterhouseCoopers (2021), Deloitte Insights (2022)*

VI. CEO CHARACTERISTICS AS MODERATORS

Figure 4 shows that CEO characteristics - such as age, gender, tenure, education, and industry background - function as important moderating variables in the relationship between CEO overconfidence, risk-taking behavior, and firm value. These demographic and experiential traits, often examined through the lens of Upper Echelons Theory (Hambrick & Mason, 1984), serve as proxies for deeper cognitive orientations, strategic preferences, and behavioral tendencies. As such, they help contextualize how overconfidence is expressed in executive decision-making and to what extent it influences organizational outcomes.

Empirical evidence suggests that younger CEOs are generally more inclined to take risks, particularly in innovation-intensive industries like digital banking. This age-related risk propensity often coincides with higher levels of overconfidence, potentially leading to bolder, less restrained strategic moves (Tang et al., 2020; Yim, 2013). In contrast, female CEOs exhibit more cautious and stakeholder-oriented leadership styles, which may neutralize or moderate the negative consequences of overconfident decision-making (Palvia et al., 2014; Faccio et al., 2016).

Other factors, such as educational background and industry experience, further influence the manifestation of overconfidence. For example, CEOs with engineering or finance training are often more data-driven and structured in their decision-making. At the same time, those with entrepreneurial or technology-oriented backgrounds may display greater intuitive bias and faster decision cycles (Custódio et al., 2013). Similarly, CEO tenure can reinforce overconfidence due to entrenchment or moderate it through accumulated organizational understanding and learning (Cannella et al., 2009).

CEO demographic and professional characteristics shape how cognitive biases like overconfidence affect strategic behavior and firm value. These insights emphasize the importance of considering individual-level heterogeneity in leadership evaluations and governance frameworks.

A) Theoretical Justification for Moderation

The Upper Echelons Theory, initially proposed by Hambrick and Mason (1984), reveals that the demographic characteristics of top executives partially predict organizational outcomes. These traits are observable proxies for deeper cognitive orientations, value systems, and decision-making frameworks. According to this theory, age, gender, education, and professional background do not merely reflect surface-level diversity but significantly influence how executives interpret strategic challenges and opportunities.

For instance, younger CEOs are typically more growth-oriented and less risk-averse, engaging more readily in high-velocity innovation strategies and aggressive scaling, especially in digital banking environments (Tang et al., 2020; Yim, 2013). In contrast, female CEOs have been found to exhibit more conservative, stakeholder-focused decision-making styles, emphasizing long-term sustainability, cautious capital allocation, and greater attention to reputational risk (Palvia et al., 2014; Faccio et al., 2016).

These demographic traits play a pivotal role in shaping how CEO overconfidence is expressed and operationalized in strategic behavior, influencing the magnitude and direction of risk-taking and its subsequent impact on firm value. Thus, the Upper Echelons Theory provides a robust theoretical foundation for understanding the moderating influence of CEO characteristics in behavioral corporate finance and digital banking governance.

B) CEO Age and Risk Behavior

Empirical research consistently demonstrates that younger CEOs tend to exhibit higher levels of risk-taking, particularly in sectors characterized by rapid innovation and technological disruption, such as digital banking. This generational effect is attributed to increased openness to new ideas, comfort with emerging technologies, and a stronger orientation toward growth and expansion. For instance, Tang et al. (2020) found that younger CEOs are significantly more likely to adopt new technologies and engage in aggressive mergers and acquisitions, viewing such strategies as mechanisms for achieving competitive differentiation in fast-paced markets.

Similarly, Yim (2013) observed a negative correlation between CEO age and conservative financial policies, noting that younger executives are less inclined to maintain ample cash reserves or issue regular dividend payouts. These tendencies reflect a broader strategic posture that favors reinvestment and expansion over caution and liquidity preservation.

In digital banking, where adaptability, customer-centric innovation, and speed-to-market are essential, younger CEOs often interpret high-risk environments as strategic opportunities rather than threats. This mindset can enable bold innovations and first-mover advantages, particularly in digital lending, AI-powered credit scoring, and fintech integration. However, such behavior also comes with increased exposure to systemic and operational risks, particularly in emerging markets where regulatory frameworks and institutional safeguards may be underdeveloped or inconsistently enforced (Deloitte Insights, 2022; PricewaterhouseCoopers, 2021). As such, while the dynamism of younger CEOs may catalyze growth, it must be combined with governance mechanisms that ensure risk-taking aligns with sustainable long-term value creation.

C) CEO Gender and Risk Aversion

Gender is a critical moderating factor in the CEO overconfidence and risk-taking relationship. A growing body of literature underscores that female CEOs generally adopt more cautious and risk-averse decision-making styles than their male counterparts. This conservatism is particularly evident in financial policy and strategic risk tolerance. For instance, Palvia et al. (2014) found that banks led by female CEOs exhibited lower default risks and maintained more substantial capital buffers,

suggesting a more prudent approach to balance sheet management. Similarly, Faccio et al. (2016) concluded that female executives are associated with lower corporate leverage and greater earnings stability, highlighting their tendency to prioritize long-term financial resilience over expansion.

In the context of digital banking, where innovation races and competition often incentivize risk-taking, female CEOs may counterbalance the excesses of overconfidence. Their leadership may result in more rigorous due diligence, stricter credit policies, and better alignment with sustainability objectives—outcomes that contribute to institutional robustness in the face of technological and regulatory uncertainties.

D) Educational Background and Experience

Beyond age and gender, CEO educational attainment and professional experience further moderate the expression of overconfidence and the propensity for risk-taking. Educational background serves as a proxy for decision-making style and strategic orientation. Custódio et al. (2013) found that CEOs with degrees in engineering or finance tend to engage in structured, analytical, and data-driven decision-making. This group is likelier to rely on quantitative assessments and formal models when evaluating strategic risks, promoting systematic approaches to complex problems.

In contrast, CEOs with entrepreneurial or non-traditional backgrounds often favor intuitive, high-velocity decision-making styles, which may amplify the expression of overconfidence in fast-moving digital banking environments. These CEOs are typically more comfortable with uncertainty and may be quicker to pursue disruptive innovation or rapid scaling initiatives.

For digital banks operating at the convergence of finance and technology, the disciplinary orientation of the CEO plays a crucial role in shaping organizational risk posture. A CEO with a background in software engineering, for example, may be more inclined to invest aggressively in AI or big data infrastructure, potentially underestimating the regulatory, reputational, or cybersecurity risks associated with such investments (Deloitte Insights, 2022; PricewaterhouseCoopers, 2021). As such, a nuanced understanding of CEO experience is essential in evaluating firm-level strategic behavior and resilience.

E) Interaction Effects and Governance Implications

Figure 5 shows that the interaction between CEO characteristics and overconfidence is complex, multi-directional, and context-dependent. For instance, a young, male, overconfident CEO may drive rapid growth and aggressive innovation, exposing the firm to heightened volatility, regulatory risks, and potential governance failures. Conversely, a female, experienced CEO may bring institutional stability, greater stakeholder alignment, and robust risk mitigation practices, albeit at the cost of slower innovation adoption or market responsiveness.

Moreover, CEO tenure can modulate both extremes. Longer-serving CEOs often develop deeper organizational understanding and greater alignment with institutional risk appetite, which can moderate impulsive behavior and enhance risk calibration over time (Cannella et al., 2009).

These interaction effects have direct implications for corporate governance and board design. As Gabrielsson & Huse (2004) argued, governance effectiveness is influenced by formal structures and behavioral and contextual factors. Boards should, therefore, not limit their oversight to the presence of overconfidence alone but should assess how executive traits—such as age, gender, tenure, and education—may shape their behavioral expression in decision-making and firm strategy.

To this end, succession planning and leadership development frameworks must incorporate psychological and demographic profiling to ensure alignment between CEO characteristics and the organization's strategic demands. Such practices will support more deliberate CEO selection, reduce governance blind spots, and better position firms to navigate the evolving challenges of the digital banking landscape.

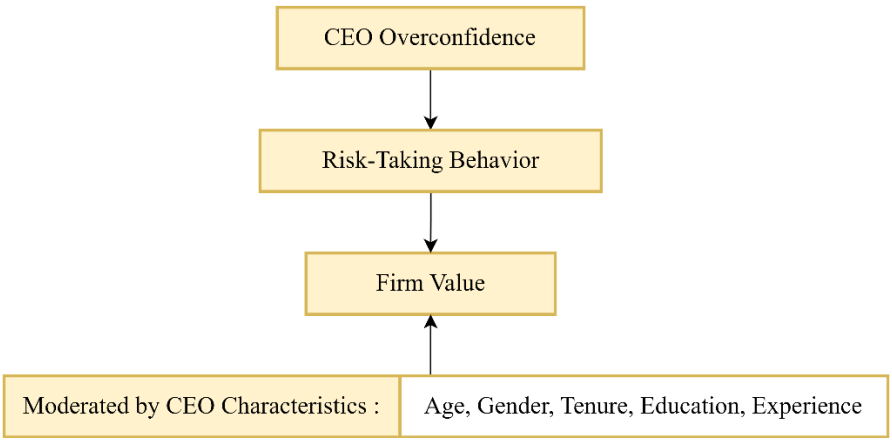

Fig. 5: The moderating role of CEO characteristics in the overconfidence-risk-firm value nexus

Source: *Reviewed and synthesized from Malmendier & Tate (2005), Hambrick & Mason (1984), Cannella et al. (2009), Florackis et al. (2020), Ben-David et al. (2013), Hirshleifer et al. (2012), Roll (1986), PricewaterhouseCoopers (2021), Deloitte Insights (2022), Gabrielsson & Huse (2004), Morck et al. (1988)*

VII. FIRM VALUE IN THE DIGITAL BANKING CONTEXT

Firm value is a fundamental indicator of a company's strategic effectiveness, capital allocation decisions, and stakeholder confidence. It reflects how well an organization translates its resources and capabilities into sustainable financial performance and long-term competitiveness. In traditional financial institutions, firm value is typically assessed using conventional financial metrics such as Return On Assets (ROA), Return On Equity (ROE), and Tobin's Q - each capturing distinct profitability and market valuation dimensions. For instance, Tobin's Q, which compares the market value of a firm to the replacement cost of its assets, is widely used to infer investor expectations and growth potential (Morck et al., 1988).

However, these conventional indicators alone are insufficient in capturing the unique value drivers of digital banks, which operate under markedly different business models and strategic imperatives. In digital banking, firm value must also account for intangible assets and performance dimensions such as technological innovation, user engagement, digital infrastructure, and platform scalability (Deloitte Insights, 2022). Additionally, customer retention metrics, active user base growth, and data-driven service personalization are increasingly relevant, given their influence on recurring revenue and long-term competitive advantage.

Therefore, while traditional financial metrics remain important, they must be augmented with non-financial indicators to provide a more comprehensive evaluation of firm value in digital financial services. This expanded measurement approach is especially pertinent for stakeholders seeking to assess digital banks' strategic success and resilience amid ongoing innovation and regulatory transformation (PricewaterhouseCoopers, 2021).

A) Defining and Measuring Firm Value

Firm value is a multidimensional construct that reflects a company's financial health, strategic positioning, and market perception. In academic and practitioner literature, it is typically assessed through market-based and accounting-based performance indicators, offering unique insights into how well a firm generates returns, utilizes resources, and sustains competitive advantage.

One of the most widely cited market-based indicators is Tobin’s Q, which is calculated as the ratio of a firm’s market value to the replacement cost of its assets. A Tobin’s Q greater than one suggests that the market values the firm more than the cost of its assets, indicating strong growth expectations and investor confidence. Conversely, a value below one may signal inefficiencies or undervaluation. Morck et al. (1988) emphasized that managerial ownership can significantly influence firm valuation, reinforcing the link between executive incentives and perceived firm performance. This is particularly relevant in digital banking, where intangible factors such as leadership style, technological innovation, and growth potential are considered. Often shapes investor sentiment.

Regarding accounting-based indicators, Return on Equity (ROE) and Return on Assets (ROA) remain foundational. ROE captures the profitability generated from shareholders' equity, while ROA assesses how efficiently a firm utilizes its assets to generate earnings. Both metrics are important for comparing performance across firms and are frequently used in empirical studies to evaluate the financial outcomes of executive decision-making, including the effects of overconfidence or risk-taking behaviors (Ben-David et al., 2013; Malmendier & Tate, 2005).

For publicly listed digital banks, additional metrics such as market capitalization and stock price volatility serve as real-time reflections of market valuation and risk exposure. These indicators are critical in high-growth, tech-driven banking environments, where investor perceptions can fluctuate rapidly based on earnings announcements, user growth reports, or regulatory developments (Nie & Yen, 2024).

Moreover, the evolution of the digital banking business model has necessitated using non-traditional performance metrics. Key among these are user base growth, active user retention, and Net Promoter Scores (NPS) - which collectively gauge customer engagement, satisfaction, and loyalty. These metrics are vital in assessing a firm's platform scalability and network effects, both critical drivers of firm value in digital ecosystems (Deloitte Insights, 2022; PricewaterhouseCoopers, 2021). Non-performing loan (NPL) ratios have emerged as a key financial risk metric, particularly as digital banks expand their credit portfolios through unsecured lending and Buy-Now-Pay-Later (BNPL) services. High NPL ratios may indicate deteriorating asset quality, poor credit screening, or overly aggressive growth strategies, negatively affecting firm value (Tang & Chang, 2024).

In summary, evaluating firm value in digital banking requires a blended approach, integrating traditional financial ratios with modern, technology-centric indicators. This comprehensive view allows researchers, investors, and regulators to assess digital banking institutions' short-term performance and long-term sustainability more accurately.

B) Firm Value and Strategic Risk

A substantial body of empirical research underscores that strategic risk-taking - particularly when driven by CEO characteristics such as overconfidence - can significantly impact firm value positively and negatively. These effects are often contingent on market conditions, the robustness of governance structures, and the success of innovation initiatives. For example, Ben-David et al. (2013) demonstrated that overconfident CEOs pursue aggressive growth strategies, including rapid market expansion, ambitious M&A activities, and substantial investment in unproven technologies. While such strategies may initially inflate firm valuation by signaling strong growth potential, they often erode long-term sustainability due to insufficient risk controls, resource misallocation, or underestimating downside scenarios.

Moreover, excessive strategic risk-taking can result in adverse financial and reputational outcomes, including elevated non-performing loan (NPL) ratios, increased capital adequacy requirements, and damage to institutional credibility in the eyes of regulators and stakeholders. These outcomes are particularly problematic in digital banking, where high-velocity decision-making and lean governance structures may fail to adequately contain the risks associated with CEO-driven strategic experimentation (Tang & Chang, 2024; Roll, 1986).

C) Digital Banks: Unique Value Drivers and Risks

Digital banks possess unique structural characteristics and strategic models that differentiate them from traditional banks in creating, sustaining, and signaling firm value. According to Deloitte Insights (2022) and PricewaterhouseCoopers (2021), several critical features define the digital banking value proposition.

First, customer-centric technology plays a foundational role in driving value. Digital banks often leverage intuitive user interfaces, real-time personalization, and data-driven lending algorithms to enhance customer experience. These technologies improve retention and lower acquisition costs, strengthening valuation metrics tied to user engagement.

Second, network effects are central to scaling value. As digital banks grow their user base, they unlock exponential gains through increased data flow, improved risk modeling, and enhanced cross-selling opportunities. Platforms that successfully scale can enjoy outsized valuation multiples due to their high scalability and low marginal costs.

However, this value creation is accompanied by significant risk dimensions, particularly data security and digital trust. A single cybersecurity breach or operational failure can result in sharp declines in market valuation despite strong earnings, as stakeholders place immense value on the safety and integrity of digital platforms (Hirshleifer et al., 2012).

Lastly, regulatory compliance has emerged as a critical determinant of firm valuation, particularly in the digital banking sector, where technological advancement frequently outpaces regulatory adaptation. Firm value is increasingly sensitive to shifts in the fintech regulatory landscape, including requirements for licensing, consumer protection, data privacy, and Anti-Money Laundering (AML) compliance. As digital banks expand their offerings and customer base, any failure to meet these regulatory expectations can lead to license suspensions, monetary sanctions, or operational restrictions—all of which can severely undermine investor confidence and disrupt business continuity (Deloitte Insights, 2022; PricewaterhouseCoopers, 2021).

A relevant illustration is Indonesia's digital banking ecosystem, where the market has rewarded several institutions for launching innovative digital products and forging strategic alliances with fintech or e-commerce platforms. It has seen its market valuations increase following the rollout of app-based services and embedded finance models. However, this momentum has

sometimes been reversed due to rising Non-Performing Loan (NPL) ratios, which signal weaknesses in credit underwriting and risk governance. Such developments highlight the dual-edged nature of rapid innovation, where growth without adequate risk oversight can erode value and provoke regulatory scrutiny (Tang & Chang, 2024; Ben-David et al., 2013).

These examples underscore the importance of digital banks maintaining robust internal controls and regulatory alignment as integral components of value-creation strategies in fintech-intensive environments.

D) The Role of CEO Leadership in Value Creation

The influence of CEOs on firm value is profoundly mediated through their strategic choices in capital allocation, technology adoption, and cultural leadership. In digital banking, where firms operate in a complex intersection of finance and technology, CEOs with strong digital literacy are often better positioned to align product offerings with rapidly evolving customer expectations and regulatory norms (Custódio et al., 2013; Cannella et al., 2009).

Their ability to comprehend technological architecture and data analytics enables more informed and responsive decision-making. Conversely, overconfident CEOs may systematically undervalue risk mitigation investments, such as cybersecurity infrastructure, regulatory compliance systems, or credit underwriting enhancements. This mismatch between perceived and actual firm value can lead to inflated market expectations, followed by reputational damage when those expectations are not met (Ben-David et al., 2013; Roll, 1986).

Furthermore, CEOs' communication style and market-facing behavior significantly shape perceived firm value, as markets often respond not only to financial fundamentals but also to leadership narratives and symbolic actions. Studies such as Hirshleifer et al. (2012) show that public language reflecting CEO overconfidence can temporarily boost investor sentiment but may also lead to higher volatility if unsupported by performance consistency.

E) Stakeholder implications

Understanding the determinants of firm value in digital banking has critical implications for various stakeholders, including investors, regulators, and corporate boards.

Investors require transparent insights into how CEO traits—such as overconfidence, age, gender, or education—impact firm performance under volatile market conditions. Recognizing the behavioral drivers behind strategic decisions allows for more accurate forecasting of financial outcomes and risk exposures (Faccio et al., 2016; Palvia et al., 2014).

Regulators must ensure that innovation-driven growth does not compromise systemic financial stability. As the digital banking sector grows in scale and complexity, regulators such as the Otoritas Jasa Keuangan (OJK) must develop frameworks that incorporate behavioral risk assessments and CEO conduct into their supervisory toolkits (PricewaterhouseCoopers, 2021; Deloitte Insights, 2022).

For board directors, the task is to define and monitor value-focused key performance indicators (KPIs) that align CEO incentives with sustainable growth. This includes incorporating risk-adjusted performance metrics, scenario planning, and ESG-aligned governance standards into executive compensation and appraisal systems (Florackis et al., 2020; Gabrielsson & Huse, 2004).

Figure 6 shows that a nuanced understanding of how executive behavior influences firm value is essential for designing governance and oversight structures that support innovation while safeguarding long-term institutional resilience.

Fig. 6: Components and drivers of firm value in digital banking

Source: *Reviewed and synthesized from Malmendier & Tate (2005), Hambrick & Mason (1984), Cannella et al. (2009), Florackis et al. (2020), Ben-David et al. (2013), Hirshleifer et al. (2012), Roll (1986), Tang & Chang (2024), PricewaterhouseCoopers (2021), Deloitte Insights (2022), Morck et al. (1988).*

VIII. RESEARCH GAPS AND FUTURE DIRECTIONS

Although studies at the intersection of CEO behavioral characteristics, corporate finance, and digital banking have grown considerably, significant gaps remain that hinder both theoretical consolidation and practical application. These shortcomings are especially evident in rapidly evolving digital financial ecosystems and within the context of emerging markets. To address these limitations, this section identifies critical areas requiring deeper investigation and advances potential research directions aimed at strengthening the field's methodological rigor, contextual relevance, and conceptual sophistication.

A) Geographic Limitations and Contextual Bias

Much of the literature on CEO overconfidence, risk-taking, and firm value originates from studies in North America and Europe, where institutional environments are more mature and regulatory regimes more established (Ben-David et al., 2013; Malmendier & Tate, 2005). This geographic concentration creates a contextual bias that limits the generalizability of findings to emerging economies, such as those in Southeast Asia, Latin America, or sub-Saharan Africa, where regulatory frameworks, cultural values, and governance standards differ markedly. For instance, in Indonesia's digital banking landscape, digital banks operate within a nascent fintech ecosystem subject to evolving regulatory oversight from the OJK (Deloitte Insights, 2022; PricewaterhouseCoopers, 2021).

Future research should prioritize comparative cross-country designs that assess how national fintech ecosystems and governance structures moderate the relationship between CEO traits and firm outcomes. Such studies could reveal whether behavioral tendencies like overconfidence manifest differently across cultural or institutional contexts (Gabrielsson & Huse, 2004).

B) Limited Longitudinal Analysis

Many existing studies employ cross-sectional research designs, capturing a snapshot of CEO traits and firm performance at a single point in time (Florackis et al., 2020). However, overconfidence and risk-taking behaviors are dynamic, often evolving as CEOs gain tenure, adapt to market cycles, or respond to digital transformation pressures.

Longitudinal studies are needed to understand these behavioral trajectories more deeply. These studies track CEO career paths and firm value fluctuations across various economic environments, including pre- and post-pandemic performance and phases of technological disruption. Longitudinal insights can reveal whether overconfident CEOs learn from past mistakes or whether entrenchment exacerbates risky behaviors over time (Cannella et al., 2009).

C) Underexplored Moderators Beyond Age and Gender

While CEO age and gender are commonly analyzed as moderating variables (Palvia et al., 2014; Faccio et al., 2016), other potentially influential dimensions remain under-researched. These include educational background (Custódio et al., 2013), cultural heritage, cognitive diversity within executive teams, and political affiliations or networks.

Future studies should employ multivariate frameworks to explore how these additional traits interact with overconfidence, shaping firm strategies and risk exposure. For example, the role of CEO political connections in regulatory arbitrage or the impact of disciplinary orientation (e.g., tech vs. finance) on digital investment decisions in fintech environments are promising avenues for further exploration.

D) Over-Reliance on Traditional Performance Metrics

Most empirical research on CEO behavior and firm value continues to rely on traditional financial metrics such as Return On Assets (ROA), Return On Equity (ROE), and Tobin's Q (Morck et al., 1988). While these indicators remain important, they are often insufficient in capturing value dynamics in digital banking, where intangible drivers such as user engagement, platform scalability, and digital trust are equally consequential (Deloitte Insights, 2022).

Future research should develop and validate composite performance indices incorporating non-financial indicators—including Net Promoter Scores (NPS), user retention rates, API reliability, and cybersecurity posture—alongside traditional accounting and market-based measures (PricewaterhouseCoopers, 2021).

E) Lack of Methodological Diversity

The prevailing methodological paradigm in this field is quantitative and regression-based, with a predominant focus on archival data (Tang & Chang, 2024). While this approach offers generalizability, it lacks the depth and nuance required to understand cognitive and psychological phenomena in executive decision-making.

Future research would benefit from incorporating qualitative, experimental, and mixed-methods approaches, including semi-structured CEO interviews, behavioral experiments, and textual analysis of earnings calls and public speeches to identify overconfidence indicators (Hirshleifer et al., 2012). These methods can triangulate findings and enrich behavioral models with real-world executive narratives.

F) Fragmented Theoretical Integration

Much of the current literature adopts a single-theory perspective, drawing primarily on Upper Echelons Theory (Hambrick & Mason, 1984) or behavioral finance (Barber & Odean, 2001), often without synthesizing complementary frameworks. This fragmented approach limits the explanatory power of behavioral models in complex digital finance environments.

There is a compelling need for hybrid theoretical models that integrate Upper Echelons Theory, Agency Theory, and Stakeholder Theory to account for multiple dimensions of CEO influence, including incentives, cognitive limitations, and multi-stakeholder engagement. Such integrated models could better explain why overconfidence persists and how governance systems can moderate its effects on firm value (Gabrielsson & Huse, 2004; Faccio et al., 2016).

G) Emerging Technologies and Algorithmic Decision-Making

The advent of AI-driven decision support systems and automated lending platforms introduces a new research frontier regarding the interaction between CEO traits and algorithmic governance. In digital banks, strategic decisions are increasingly shaped by machine learning models and predictive analytics, raising questions about the diminishing—or potentially augmenting—role of human leadership.

Future research should explore how digitally literate CEOs interact with, override, or complement algorithmic outputs in credit underwriting, fraud detection, and portfolio management. Studies might also investigate whether overconfident CEOs are more likely to ignore algorithmic recommendations or manipulate digital tools to support risky decisions (Florackis et al., 2020; Ben-David et al., 2013).

In summary, addressing these research gaps will require geographically diverse samples, longitudinal designs, multidimensional moderator analysis, innovative performance metrics, methodological pluralism, theoretical synthesis, and attention to emerging digital technologies. Doing so will expand academic understanding and enhance the real-world relevance of research on CEO behavior and firm value in digital banking.

1. Geographic expansion (Emerging markets)
2. Longitudinal CEO behavior tracking
3. Broader moderator variables (e.g., education, culture)
4. Digital banking-specific firm value metrics
5. Methodological innovation (qualitative, experimental)
6. Theoretical integration (UET + behavioral finance + agency)
7. Digital-AI leadership interfaces

Fig. 7: Priority areas for future research

IX. CONCLUSION

This systematic literature review has examined the multidimensional relationship between CEO overconfidence, risk-taking behavior, and firm value, specifically emphasizing the rapidly evolving digital banking sector. Drawing on over a decade of empirical and theoretical contributions, the review integrates insights from behavioral finance (Barber & Odean, 2001; Ben-David et al., 2013), strategic leadership theory (Cannella et al., 2009), and corporate governance scholarship (Gabrielsson & Huse, 2004; Florackis et al., 2020). Anchored in Upper Echelons Theory (Hambrick & Mason, 1984) and complemented by

perspectives from Agency Theory (Morck et al., 1988) and Stakeholder Theory (Faccio et al., 2016), the review highlights how CEO psychological and demographic characteristics fundamentally influence organizational decisions and financial outcomes.

The findings confirm that CEO overconfidence is a critical driver of strategic risk-taking, often functioning as a mediator between executive bias and firm value. This behavioral tendency may produce value-enhancing innovation or value-destructive volatility, depending on contingent factors such as governance strength, regulatory oversight, and the firm's digital maturity (Tang & Chang, 2024; Deloitte Insights, 2022). Additionally, CEO attributes - especially age, gender, and educational background - act as important moderators, shaping how overconfidence manifests in areas such as investment behavior, risk tolerance, and innovation strategies (Yim, 2013; Palvia et al., 2014; Custódio et al., 2013).

These dynamics are even more important in the context of digital banking. The high pace of technological disruption, competitive intensity, and regulatory complexity places extraordinary demands on executive decision-making. Leadership traits must be evaluated in isolation and in relation to contextual variables such as digital capabilities, stakeholder expectations, and regulatory frameworks (PricewaterhouseCoopers, 2021). This aligns with emerging evidence that executive cognition and external institutional forces can amplify or constrain firm value trajectories (Faccio et al., 2016; Roll, 1986).

The review also highlights critical research gaps that warrant further exploration, including the geographical concentration of existing studies in North America and Europe, which leaves emerging markets such as Southeast Asia underrepresented (Nie & Yen, 2024). Additionally, the field lacks longitudinal studies necessary to trace how CEO behavior evolves over strategic cycles (Cannella et al., 2009). Methodologically, there remains an over-reliance on regression-based designs, with limited application of qualitative, experimental, or mixed-method approaches that could yield richer insights into executive psychology (Hirshleifer et al., 2012). Moreover, the interaction between human leadership and algorithmic decision-making remains a nascent but crucial area for future inquiry, especially given the rise of AI-supported governance systems in digital finance (Deloitte Insights, 2022).

From a practical perspective, this review offers several important implications for key stakeholders in digital financial ecosystems. For boards of directors, incorporating behavioral and demographic considerations into CEO recruitment, succession planning, and performance evaluation can help ensure stronger alignment between leadership traits, firm risk appetite, and innovation objectives (Gabrielsson & Huse, 2004). For investors, traditional reliance on financial indicators alone is insufficient; integrating leadership psychology and strategic behavior into valuation frameworks becomes particularly vital in innovation-driven markets (Ben-David et al., 2013). Regulators, meanwhile, should acknowledge the behavioral dimensions of executive decision-making when shaping oversight mechanisms for digital banks, particularly with respect to risk governance, fintech licensing, and systemic stability (PricewaterhouseCoopers, 2021; Faccio et al., 2016).

Ultimately, decoding leadership biases—most notably, CEO overconfidence—extends beyond academic inquiry and represents a practical necessity for understanding how digital banks innovate, compete, and sustain themselves in volatile market environments. As the intersection of leadership behavior, technological transformation, and financial governance grows increasingly prominent, future research must adopt an interdisciplinary, context-sensitive, and integrative perspective. Such an approach will better equip scholars, practitioners, and policymakers to foster digital banking institutions that are not only innovative but also resilient, transparent, and strategically aligned with long-term value creation.

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