

# Understanding the Innovative Banking System through Strategic Role of the Board of Diversity in the Adoption of FinTech Services: From the Context of Industry 4.0

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## Abstract

The banking sector is more revolutionized than ever, with advanced technologies driving a rapid change in the financial industry. This study aims to explore and understand how digital technologies, mainly Industry 4.0, influence the perception of the board of governance to adopt FinTech services in Saudi Arabia. Theoretically, this study integrated and employed a resource-based view and institutional theory. A qualitative research technique was applied to gain different insights from diverse respondents from the banking industries. A purposive sampling method was adopted, and semi-structured interviews were conducted, taking a sample of 17 respondents. Thus, NVivo software was used to analyze data. Findings from the present study indicate that boards with structured, inclusive decision-making frameworks capitalize more effectively on diverse perspectives, ensuring responsible and adaptable FinTech strategies within the Industry 4.0 context. The novelty of this study contributes to the resource-based view and institutional theory by positioning board diversity as a critical asset for competitive advantage in the digital era. Practical implications suggest that organizations prioritize targeted board diversity, particularly in technology and compliance, to navigate Industry 4.0 challenges while maintaining customer trust and operational resilience.

**Keywords:** Innovative Banking System, Strategic Role, Board Of Diversity, Fintech Services, Industry 4.0

## Introduction

The convergence of the modern banking system with Industry 4.0 (IR4) is revolutionizing the global economic landscape (Pinheiro et al., 2019), practically after the introduction of Financial Technology (FinTech) (Koesworo et al., 2019; Muhammad et al., 2022). As industries across sectors embrace digital transformation, adopting FinTech services has become imperative for maintaining competitiveness and driving innovation. IR4, characterized by the integration of artificial intelligence (AI), Blockchain (BC), Big Data Analytics (BDA), and the Internet of Things (IoT), is reshaping the traditional banking system

into the modern banking system (Xu et al., 2024). A well-known innovation in the modern banking system is FinTech, supported by IR4 advanced technologies that enhance financial services and offer innovative solutions for payments, lending, insurance, and investment (Muhammad et al., 2022). The synergy between these two technological forces has the potential to unlock unprecedented opportunities for businesses and individuals alike. Previously, Alwi et al. (2022) highlighted that FinTech services are the reality of modern banking systems protected and implemented by IR4 advanced technologies. To counter the escalating threat of cyberattacks, FinTech companies are employing cutting-edge IR4 technologies such as AI, IoT, BDA, and BC to ensure the robust protection of consumers' sensitive financial and personal information (Irfan et al., 2024). However, successfully adopting FinTech services within an IR4 context requires careful strategic planning and effective execution. As the highest level of corporate oversight, board governance plays a crucial role in steering organizations toward digital transformation and ensuring the responsible and ethical use of FinTech (Ferilli et al., 2024).

The rising popularity of the FinTech services, Statista (2023), reported that FinTech companies worldwide generated \$79.38 billion in 2023, which is forecast to increase further by exceeding \$141.8 billion in 2028, up from only \$2.51 billion in 2019. Notably, due to the lack of advanced technological resources and strategic leadership support, several developing countries, mainly Saudi Arabia, struggle to adopt FinTech services (Abubotain & Chamakiotis, 2021). In this view, Al-Matari et al (2022), suggested that the governances of banking, particularly board-level decision-making, play an essential role in strategizing and implementing FinTech services. Board diversity—across dimensions such as gender, age, and cultural background—has emerged as a critical factor influencing how banks assess, adopt, and integrate FinTech solutions to remain competitive in an IR4-driven environment (Ghafoor et al., 2022). Prior empirical studies discussed that board diversity is widely considered beneficial for enhancing decision-making quality, as it allows for various perspectives that collectively address complex banking system issues. For instance, Xu et al. (2024) pointed out that in the context of FinTech services adoption, diversity is theorized to facilitate more balanced decision-making, where the potential benefits of technology are weighed against regulatory, ethical, and operational risks. Yet, while the theoretical advantages of board diversity are well-documented, empirical evidence on how diverse boards specifically influence FinTech services adoption strategies remains limited. Existing empirical studies have focused mainly on the relationship between board diversity and financial performance or general corporate governance outcomes (Paniagua et al., 2018). However, there is a notable gap in understanding how board diversity specifically impacts FinTech adoption decisions within the rapidly changing landscape of IR4. Practically, financial institutions face significant challenges in integrating FinTech solutions, which require both an innovative outlook and a strict adherence to regulatory standards. Hence, diverse boards are uniquely positioned to navigate this complex environment; members with different expertise—such as technology, finance, legal, and customer relations—can provide a holistic view of the potential opportunities and pitfalls associated with FinTech adoption (Muhammad et al., 2022). Additionally, demographic diversity, including gender, age, and cultural differences, contributes to a broader understanding of customer needs and market trends, essential for customer-centric innovation in FinTech services (Ghafoor et al., 2022).

This study addresses the above theoretical and practical gaps by exploring how board diversity influences strategic decision-making, risk management, and customer alignment in FinTech adoption within the context of IR4 in Saudi Arabia. This study utilized a qualitative research design based on semi-structured interviews with various banks and/or financial institutions' board members. Specifically, this paper addresses the following research question.

RQ1. How does board diversity influence the strategic decision-making processes related to FinTech adoption within Industry 4.0?

RQ2. Which dimensions of diversity (e.g., gender, age, and culture) most significantly impact the board's ability to balance innovation with regulatory compliance and risk management in FinTech adoption?

RQ3. What role does board diversity play in aligning FinTech innovations with customer-centric goals and market demands in an increasingly digitalized financial sector?

These questions provide a comprehensive yet focused framework for examining the critical aspects of board diversity and FinTech adoption in the era of IR4.

The contributions of this study are threefold. First, it provides empirical evidence that extends the Resource-Based View (RBV) and institutional theory by positioning board diversity as an invaluable strategic asset that enhances the organization's adaptability and competitive advantage in FinTech adoption. Second, the study highlights practical approaches for leveraging diverse perspectives in decision-making, including structured frameworks that allow boards to integrate varying viewpoints efficiently in the context of IR4. Finally, it offers actionable insights for financial institutions seeking to enhance customer alignment through a board composition that reflects demographic diversity, enabling a better understanding of customer needs and market responsiveness.

This paper is organized as follows. Following the introduction, the literature review section is presented in Section 2. The methodology section describes the qualitative research design, data collection process, and thematic analysis used to develop critical findings, as demonstrated in section 3. In the section 3, the study's themes and sub-themes are presented. The discussion section interprets overall findings considering existing theoretical frameworks, addressing both the strengths and challenges of board diversity in FinTech adoption and conclusions in Sections 4 and 5.

## **Literature Review**

### *Industry 4.0 and the Transformation of Financial Services*

Initially, the concept of IR4 began in Germany, where the concept was introduced as part of a national initiative to modernize manufacturing firms (Pinheiro et al., 2019). The concept was first discussed publicly in 2011 at the Hannover Fair, one of the world's largest trade fairs for industrial technology. The concept of IR4 was further defined and elaborated by academics and industry experts, most notably by Professor Klaus Schwab, founder and executive chairman of the World Economic Forum (Pinheiro et al., 2019). Later, the critical advancement of IR4, such as AI, BC, BDA, and IoT, have been utilized to enable modern banking systems to adopt transformation strategies of FinTech services that align with rapidly changing market demands (Go et al., 2020; Muhammad et al., 2022). Accordingly, Muhammad et al. (2022) mentioned that the intersection of FinTech within IR4 advanced technologies is reshaping

financial services, driving efficiencies, innovation, and customer-centricity in ways previously unattainable. Similarly, Alwi et al. (2022) highlighted that the IR4 advanced technologies are instrumental in transforming how financial institutions operate and interact with customers. For instance, Ryman-Tubb et al. (2018) discussed that AI-driven algorithms enhance credit scoring, fraud detection, and personalized customer service decision-making processes. A study by Majumder et al. (2023) suggests that AI-driven credit assessments offer greater accuracy and efficiency, reducing operational costs and lending risks. In addition, BC advanced technology has similarly revolutionized the financial sector by enabling decentralized, secure, and transparent transactions (Alshareef & Tunio, 2022). According to Javaid et al. (2022), BC technology eliminates the need for intermediaries in financial transactions, reducing costs and increasing processing speed, especially in cross-border payments.

However, BDA further allows financial institutions to understand customer behavior in real-time, enabling them to deliver personalized products and enhance engagement with FinTech services (Awotunde et al., 2021). Research by Go et al. (2020) highlights that BDA technology has the potential to reveal insights into spending patterns, customer preferences, and risk profiles, thereby facilitating more targeted service offerings and fostering customer loyalty. IoT advanced technologies, while still an emerging concept in modern financing systems, enhance accessibility by enabling mobile and contactless payments, making financial services more convenient and inclusive (Soni et al., 2022). Despite these advancements, IR4 advanced technologies also pose strategic challenges, such as the need for advanced cybersecurity measures, regulatory compliance, and significant investment in infrastructure upgrades (Koesworo et al., 2019). Therefore, effective decision-making in adopting these technologies requires a board with diverse expertise to evaluate both the technological benefits and associated risks. This background lays the foundation for exploring the role of board diversity in shaping technology adoption strategies in the context of IR4.

### **Theoretical Background**

Prior studies suggested several theoretical frameworks to explain the strategic influence of board diversity in adopting FinTech services within the IR4 context by employing the RBV and institutional theory.

First, RBV posits that unique resources and capabilities, such as intellectual capital, provide organizations with a competitive advantage (Barney, 1991). Diverse boards represent a form of intellectual capital, bringing a range of knowledge and experience that can guide complex decision-making processes, such as those required for FinTech services adoption. A board with diverse expertise in advanced financial technology and compliance is a strategic resource (Hodge & Piccolo, 2005), enhancing the organization's ability to comprehensively evaluate risks and opportunities (Nahar & Jahan, 2021). In the context of IR4, RBV suggests that board diversity contributes directly to financial institutions' competitive positioning by enabling more significant and agile responses to technological changes (Putra et al., 2021). In the present study, RBV theory suggests that a financial institutions unique and valuable resources, such as diverse board members' expertise and insights, can create a competitive advantage in adopting FinTech innovations within IR4.

Second, institutional theory focuses on organizations seeking legitimacy by aligning with regulatory, social, and industry expectations (DiMaggio & Powell, 1983). In the context of

FinTech services, where regulatory compliance and cybersecurity are crucial, boards with diverse members, including those with compliance, legal, and ethical expertise, help ensure that FinTech adoption strategies adhere to industry norms and regulatory standards (Ferilli et al., 20224; Xu et al., 2024). Further, the institutional theory posits that boards with strong compliance expertise can better navigate the complex regulatory environment associated with IR4, thereby safeguarding the organization's reputation and legitimacy (Shaikh & Amin, 2024).

In summary, while theoretical frameworks like RBV and institutional theory support board diversity as a strategic asset, empirical evidence linking these theories to FinTech adoption in highly regulated environments of IR4 is sparse. Further research examines how board diversity impacts FinTech adoption within IR4 outcomes, particularly in customer satisfaction, regulatory compliance, and competitive positioning. To bridge these theoretical gaps, the present study integrated and employed RBV and institutional theory to explore the role of board diversity in adopting FinTech services in the context of IR4 in Saudi Arabia. Therefore, the theoretical model presenting influence of board diversity on FinTech adoption within IR4 is presented in Figure 1.

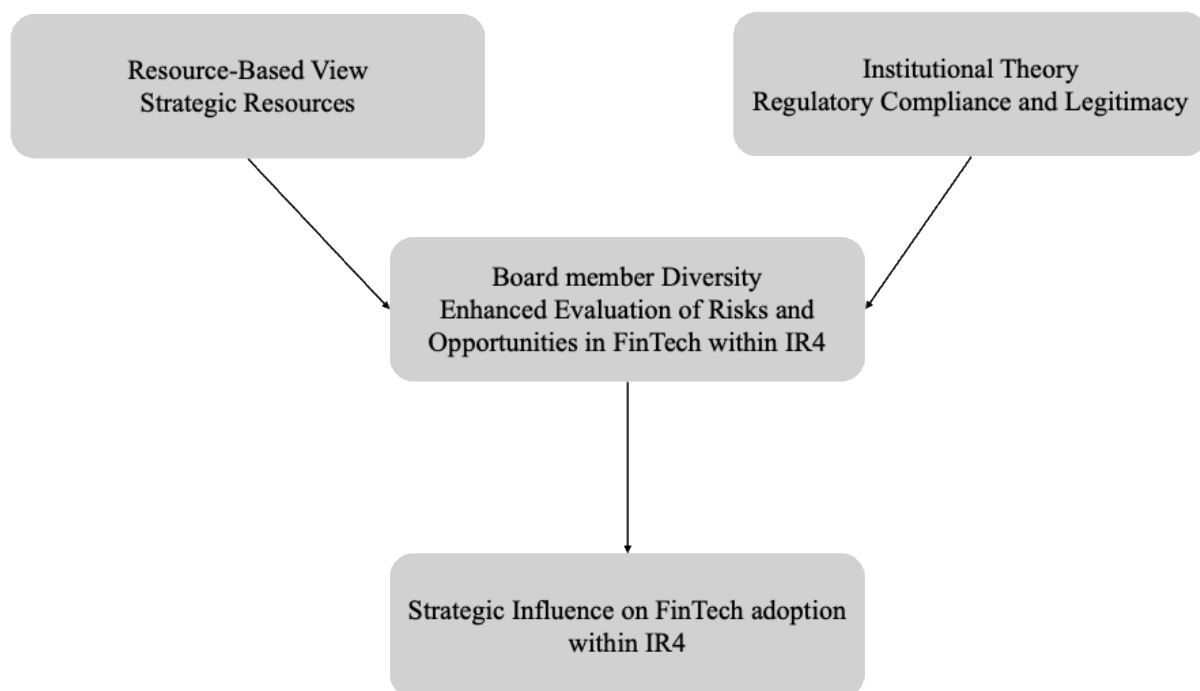


Figure 1. Theoretical Model: Influence of Board Diversity on FinTech Adoption

## Method

### *Research Design*

This study employed an exploratory qualitative design, utilizing semi-structured interviews with 17 board members from various sectors, including financial institutions, technology firms, and related organizations involved in FinTech adoption within IR4. Each participant held a strategic role in influencing technology adoption decisions within their institutions. The semi-structured interview format provided flexibility, allowing participants to discuss their experiences freely while enabling the researcher to probe for clarity and detail, yielding rich, context-specific insights (Adams, 2015). An interpretive perspective guided the research, emphasizing the subjective, socially constructed nature of participants' perceptions

acknowledging the influence of social and environmental factors (Sampat et al., 2024). This approach was chosen due to a lack of empirical studies in Saudi Arabia, allowing the research to engage FinTech managers as critical informants with relevant insights (Abed & Alkadi, 2024). A quantitative analysis was deemed unsuitable given the limited number of industry founders. The qualitative approach facilitated a deeper understanding of FinTech experts' experiences, perspectives, and the impact of these systems on daily operations, aligning with previous studies examining similar themes (Sampat et al., 2024). This research design enabled an in-depth narrative on the subject matter, capturing the complex realities of FinTech adoption within IR4 advanced technologies.

#### *Sample and Participant Recruitment*

To engage with FinTech experts in Saudi Arabia and explore their awareness and understanding of the adoption of FinTech services within the IR4 advanced technology context, we contacted potential participants and invited them to participate in interviews. This method was selected to gain exhaustive insights because in-depth interviews allow for a comprehensive exploration of complex concepts. Utilizing a list of board members from various sectors, including financial institutions, technology firms, and related organizations involved in FinTech adoption within IR4. Thus, this study adopted a purposive sampling approach, supplemented by snowball sampling, to identify knowledgeable participants. The targeted respondents knew about the FinTech services and the role of IR4 advanced technologies professionals whose expertise made them well-suited for this study (Muhammad et al., 2022).

However, the recruitment criteria included: (a) active involvement within the Saudi Arabian FinTech startup ecosystem as a board member, (b) a minimum of five years of experience in FinTech startups, and (c) experience as a decision-maker or implementer of FinTech technologies. This study initially contacted all board members from the listed FinTech companies in Saudi Arabia via email, receiving responses from 21 board members.

The final sample consisted of 17 board members who agreed to participate and were available for interviews following a pilot study with six participants. These board members represented diverse roles, organizations, and experiences within the FinTech sector, supporting a well-rounded perspective. The sample size aligns with past studies that found between 20 and 50 participants sufficient for reliable responses and conclusions (Sampat et al., 2024). Detailed information about the project and a consent form were emailed to each board member. Upon receiving their signed consent forms, we commenced the interviews. The sample was predominantly male (58.82%, n=11) with substantial experience having over five years in the industry.

#### *Data Collection*

To obtain the objectives of this study, qualitative data was gathered through semi-structured interviews with a standardized protocol approved by the institutional review board, which consists of sampling board members from FinTech companies from various cities in Saudi Arabia. This approach enabled in-depth data collection, allowing for qualitative analysis and encouraging an open, ongoing dialogue with participants (Carter & Henderson, 2005). The interviews were conducted via Zoom meetings and face-to-face from February to March 2024. Interviews were recorded after participants provided informed consent, assuring



anonymity and confidentiality and ensuring no information would be shared with third parties. All other ethical considerations were also observed. Interview durations ranged from 46 to 72 minutes, averaging 56 minutes. A professional transcribed the recordings; the transcripts were saved as PDF files for further analysis.

### **Data Analysis**

In the present study, a thematic analysis was employed to identify and interpret recurring themes in the interview data, allowing for a structured exploration of patterns in participants' narratives. This analysis followed Braun and Clarke's six-step process and included multiple stages to ensure reliable and meaningful findings (Braun & Clarke, 2006).

- (a) Familiarization with Data: The research team began by thoroughly reading each transcript to gain a broad understanding, note initial impressions, and identify key ideas and keywords that would guide the coding.
- (b) Initial Coding: Open coding was applied to each transcript, where labels such as "risk management," "customer alignment," and "innovation speed" were assigned to segments of text, capturing distinct concepts expressed by participants.
- (c) Theme Development: Codes were then grouped into broader themes aligning with the research questions.
- (d) Sub-Theme Identification: Sub-themes were developed within each central theme to provide deeper insights.
- (e) Refinement and Interpretation: Themes and sub-themes were reviewed and refined through peer debriefing and validation by selected participants to ensure they accurately represented the data.
- (f) Finalization and Member Checks: The themes were organized into three main themes addressing the research objectives, with participants given the option to review the transcripts. While three participants declined, the others agreed with the transcriptions as accurate representations of their viewpoints.

This process resulted in a detailed thematic map, with the final output presented in Table 3 containing the three main themes, sub-themes, and relevant examples to support each theme.

Table 3

*Key Themes and Practical Recommendations*

RQs	Themes	Sub-themes
RQ1. How does board diversity influence the strategic decision-making processes related to FinTech adoption within Industry 4.0?	Influence of Diversity on Strategic Decision-Making	<ul style="list-style-type: none"> <li>• Contribution of Varied Expertise</li> <li>• Generational Perspectives on Technology Adoption</li> <li>• Role of Cognitive and Cultural Diversity</li> </ul>
	Decision-Making Dynamics and Conflict Resolution	<ul style="list-style-type: none"> <li>• Managing Divergent Perspectives</li> <li>• Inclusive Decision-Making Processes</li> </ul>
	Impact on Innovation and Agility	<ul style="list-style-type: none"> <li>• Encouraging Innovative Thinking</li> <li>• Risk-Taking vs. Risk-Aversion Balance</li> </ul>
RQ2. Which dimensions of diversity (e.g., gender, professional expertise, generational) most significantly impact the board's ability to balance innovation with regulatory compliance and risk management in FinTech adoption?	Diversity Dimensions and Their Impact	<ul style="list-style-type: none"> <li>• Professional Expertise and Risk Assessment</li> <li>• Gender Diversity and Decision-Making Styles</li> <li>• Generational Diversity and Innovation Tolerance</li> </ul>
	Balancing Innovation with Risk and Compliance	<ul style="list-style-type: none"> <li>• Regulatory Knowledge and Compliance Assurance</li> <li>• Strategic Risk Management in Technological Adoption</li> </ul>
	Collaboration Across Diverse Perspectives	<ul style="list-style-type: none"> <li>• Integrating Diverse Risk Tolerances</li> <li>• Building Consensus for Balanced Strategies</li> </ul>
Question 3: What role does board diversity play in aligning FinTech innovations with customer-centric goals and market demands in an increasingly digitalized financial sector?	Customer-Centric Focus Through Demographic Diversity	<ul style="list-style-type: none"> <li>• Gender and Cultural Insights in Customer Alignment</li> <li>• Market Sensitivity and Cultural Intelligence</li> </ul>
	Enhancing Responsiveness through Diversity	<ul style="list-style-type: none"> <li>• Leveraging Big Data and Analytics for Customer Insights</li> <li>• Personalization and Customer Engagement Strategies</li> </ul>
	Innovation Alignment with Customer-Centric Goals	<ul style="list-style-type: none"> <li>• Aligning Technological Solutions with Customer Value</li> <li>• Continuous Improvement through Customer Feedback</li> </ul>



## Findings

The thematic analysis of the qualitative data revealed the role of board diversity in adopting FinTech services within the context of IR4 in Saudi Arabia, summarizing three research questions and nine themes.

### Findings from RQ1

#### *Theme 1: Influence of Diversity on Strategic Decision-Making*

The present study found that board diversity—spanning expertise, generational viewpoints, and cultural backgrounds—significantly enhances strategic decision-making in FinTech adoption within the IR4 advanced technology landscape. Expertise diversity allows boards to evaluate FinTech initiatives from critical perspectives, including technology, finance, compliance, and customer impact. Technical experts generally advocate for rapid adoption to optimize operational efficiencies, while financial and compliance-oriented members prioritize ROI and risk management. This range of expertise supports balanced strategies that encourage innovation while maintaining regulatory and economic prudence. Additionally, the present study revealed that generational diversity adds value, with younger members often driving for swift technology adoption to maintain a competitive edge. In contrast, more experienced members emphasize caution, drawing from past lessons to promote sustainable growth. This generational balance ensures that innovation does not compromise thorough risk assessment, creating a steady path for adopting new technologies. However, the study further notes that cognitive and cultural diversity, though valuable in providing global insights, can sometimes prolong discussions due to varying priorities. Such diversity underscores the need for structured decision-making frameworks to facilitate efficient, collaborative decision-making.

#### *Theme 2: Decision-Making Dynamics and Conflict Resolution*

The present qualitative study demonstrated that board diversity brings varying perspectives that often result in conflicting viewpoints, particularly around the risks and benefits of FinTech adoption. Boards that used formal discussion protocols, like consensus-building exercises, could better unify diverse opinions into cohesive strategies. Furthermore, inclusive decision-making processes emerged as essential for leveraging the full spectrum of board insights. Participants highlighted that their board's "inclusive approach" encourages all members to share their viewpoints, ensuring no valuable insights are missed. Thereby, board members appreciated having "space to voice their concerns or ideas," contributing to well-rounded decisions. These practices of open dialogue and equal participation fostered a collaborative environment, leading to stronger cohesion and alignment on strategic goals. Boards reported that such inclusive processes were particularly effective in navigating the complex implications of FinTech, ensuring well-informed, multifaceted decisions.

#### *Theme 3: Impact on Innovation and Agility*

On theme 3, the present study illustrated that the diverse boards are more open to experimentation and innovation, a crucial approach in the fast-paced, dynamic environment of IR4. This openness fosters a culture of creativity and adaptability, enabling boards to respond swiftly to FinTech's evolving demands. This diversity promotes a supportive environment for piloting new programs and testing FinTech solutions within manageable risk levels. Boards with varied perspectives reported that this mix of backgrounds leads to more creative problem-solving and greater agility in navigating technological disruptions.

Significantly, this innovative mindset extends beyond adopting new technologies to how boards perceive and manage associated risks. However, the present study pointed out that in terms of risk tolerance, diversity helps boards achieve a balance between risk-taking and caution. Members with finance or compliance backgrounds often advocate for a careful, phased approach, with one stating, "It's my role to encourage a careful rollout." Conversely, technology-focused members favor calculated risks to maintain competitiveness, with one commenting, "Calculated risks are necessary for staying competitive." Overall, such a balance of practices enables boards to design FinTech strategies that are innovative and prudent, integrating high-risk and high-reward perspectives. This balanced approach supports sustainable, agile decision-making, allowing organizations to pursue innovation responsibly while ensuring stability, aligning with IR4 requirements for agility and resilience.

## **Findings from RQ2**

### *Theme 1: Diversity Dimensions and Their Impact*

The interviews highlight the importance of professional expertise diversity in enhancing practical risk assessment for FinTech adoption within the context of IR4. Board members with backgrounds in compliance, cybersecurity, and finance bring specialized knowledge on regulatory and operational risks associated with FinTech. For example, a board member from a compliance background emphasized that "Understanding regulatory frameworks is essential for FinTech adoption," ensuring that innovation aligns with regulatory standards. Similarly, a cybersecurity expert noted the importance of focusing on security implications, as FinTech often involves sensitive data. This range of expertise strengthens the board's capacity to assess risks comprehensively, ensuring that strategic decisions meet regulatory and security requirements while fostering innovation.

In addition, the present study indicates that gender diversity emerged as a critical dimension, particularly in promoting collaborative, inclusive decision-making styles. Female board members frequently highlighted the importance of discussing innovative aspects and the safety and sustainability of new technologies for customers. Thus, one female participant emphasized, "We discuss not only what's innovative but also what's safe and sustainable for our users." Another participant remarked on how the presence of women on the board introduces more open dialogue, facilitating thorough risk assessment. This collaborative approach helps boards balance regulatory compliance with innovation, enhancing customer trust and protecting organizational reputation.

### *Theme 2: Balancing Innovation with Risk and Compliance*

Findings from the present study demonstrated that the board members with regulatory knowledge play a critical role in ensuring that FinTech adoption aligns with legal standards, particularly in highly regulated sectors like finance. Members with legal and compliance expertise act as "guardians" of regulatory compliance, consistently reminding the board to balance FinTech innovation with legal requirements. Furthermore, board members emphasized that innovation doesn't come at the cost of regulatory violations, underscoring the need to avoid penalties and protect the organization's reputation. This expertise helps boards navigate compliance pitfalls, allowing FinTech adoption to remain innovative and legally sound.

Therefore, the interviewee added that risk management, supported by diverse professional expertise, also plays a crucial role in adopting FinTech responsibly. Members with cybersecurity and operational risk backgrounds bring heightened awareness of immediate and long-term threats associated with FinTech. One risk manager highlighted the importance of addressing “both cyber and operational risks,” ensuring that even innovative technologies do not create security vulnerabilities. Another board member added that risk management expertise enables the board to “anticipate potential failures and plan for them in advance,” fostering a proactive approach to risk. In essence, the presence of regulatory and risk management experts ensures that boards adopt FinTech with a strategic balance of innovation and caution. This well-rounded approach to risk management is essential in IR4, where rapid technological advancements can introduce unforeseen risks. By leveraging diverse expertise, boards can capitalize on growth opportunities while maintaining legal and operational safeguards, enabling responsible, sustainable FinTech adoption.

### *Theme 3: Collaboration Across Diverse Perspectives*

The interviews indicate that integrating diverse risk tolerances within boards results in a balanced approach to FinTech adoption. Board members with technology backgrounds are generally more inclined to take risks, advocating for swift adoption to stay competitive. One tech-focused member said, “We risk falling behind if we don’t take calculated risks.” In contrast, members from compliance or finance backgrounds tend to adopt more cautious stances, with one finance-oriented participant noting, “Risky ventures need to be approached with caution to protect shareholder value.” Such diversity in risk tolerance allows boards to consider high-risk, high-reward strategies and conservative approaches, crafting a nuanced strategy aligned with the organization’s risk capacity. By balancing these perspectives, boards avoid leaning too heavily towards one level of risk tolerance, supporting responsible innovation. Additionally, a collaborative and inclusive decision-making process enhances boards’ ability to reach consensus on balanced strategies for FinTech adoption. Participants underscored the importance of open discussions, where board members can share their viewpoints. One participant noted, “Everyone has a chance to voice their views, even if it means longer discussions.” This consensus-building approach integrates diverse viewpoints, resulting in strategies that balance innovation, regulatory compliance, and risk management. Such collaborative practices foster unity among board members, creating a shared vision for FinTech adoption. This collective approach ensures that strategies reflect the board’s diverse strengths, supporting sustainable growth and effective risk management in the rapidly evolving FinTech landscape.

## **Findings from RQ3**

### *Theme 1: Customer-Centric Focus Through Demographic Diversity*

The present study identified that the gender and cultural diversity on boards significantly enhance alignment between FinTech strategies and diverse customer needs. Female board members often bring a customer-centered approach, emphasizing user experience and satisfaction, particularly for underserved demographics. Hence, cultural diversity further enriches the board’s understanding of diverse markets, enabling a more adaptive approach to FinTech adoption. Cultural awareness helps boards advocate for solutions adaptable to various cultural contexts, thus broadening the organization’s market reach. Additionally, the interviewee added that the culturally diverse boards show heightened sensitivity to shifting market trends, allowing organizations to respond quickly to evolving customer preferences.

Board members with varied backgrounds bring awareness of global trends, strengthening the organization's capacity to anticipate and address customer demands across different regions. This cultural intelligence aligns FinTech innovations with local and international needs, ensuring competitiveness in a rapidly evolving digital landscape. Such insights from diverse board members enable organizations to stay ahead of market changes, effectively tailoring FinTech offerings to meet regional and international customer expectations.

### *Theme 2: Enhancing Market Responsiveness through Diversity*

In this second theme, the present study illustrated that the board members with expertise in technology and data analytics strongly support data-driven approaches to understanding and predicting customer behavior, utilizing big data to enhance customer alignment. Leveraging customer data provides valuable insights into preferences and trends, enabling boards to make informed decisions that keep FinTech solutions relevant. A board member with a background in data analytics noted, "Data helps us understand what customers want and predict future trends, so our FinTech solutions are always relevant." These insights guide boards in prioritizing innovations that address real customer needs, boosting responsiveness and satisfaction. Furthermore, the present study suggests that the diverse boards are more inclined to emphasize personalization and customer engagement in FinTech offerings, recognizing that tailored solutions foster stronger customer connections. This emphasis on personalization aligns FinTech innovations with customer-centric goals, addressing individual needs and enhancing customer loyalty. By crafting engagement strategies from diverse perspectives, boards ensure that FinTech products attract customers and build long-term relationships, which is essential for success in the competitive digital financial landscape.

### *Theme 3: Innovation Alignment with Customer-Centric Goals*

In this last theme, the present study demonstrated that board diversity plays a crucial role in ensuring that FinTech solutions are designed to deliver genuine value for customers rather than adopting technology for its own sake. Diverse boards bring various perspectives on customer value, emphasizing the importance of aligning technological adoption with specific user needs. The value-driven approach ensures that FinTech solutions are relevant, meaningful, and focused on customer-centric innovation. Furthermore, diverse boards prioritize customer feedback as a tool for continuous improvement. Boards foster adaptability and responsiveness by integrating customer insights into their innovation processes. In this view, the present study added that such an iterative approach, supported by diverse boards, ensures that FinTech offerings evolve alongside customer expectations, maintaining satisfaction and a competitive edge. By championing a customer-centered strategy, diverse boards enable FinTech innovations that resonate with users and build long-term loyalty in a competitive digital landscape.

## **Discussion**

The thematic analysis findings of this study provide a nuanced view of how board diversity influences FinTech adoption within the context of IR4, revealing that diversity serves as both a strategic asset and a source of complexity in the board decision-making process. Through interviews with 17 board members, this research highlighted how diversity—across gender and culture—enriches board perspectives, enabling more robust decision-making processes, enhanced risk management, and greater alignment with customer needs. This discussion synthesizes the implications of these findings and explores both the strengths and challenges

that diversity brings to FinTech adoption while considering the theoretical underpinnings of the study.

### **Theoretical Implications**

First, the findings from the present study strengthen the RBV by positioning board diversity as a unique and valuable resource that enhances organizational adaptability and competitive advantage. Traditionally, RBV emphasizes that worthwhile, rare, inimitable, and non-substitutable resources provide sustained competitive advantages (Putra et al., 2021). In this study, the diverse backgrounds of board members—spanning technology, finance, compliance, and customer relations—emerge as strategic assets that enrich decision-making capabilities. Sanad & Al Lawati (2023) outlined that board diversity enables organizations to assess FinTech initiatives from multiple perspectives, facilitating a comprehensive evaluation of risks, opportunities, and customer needs. Accordingly, Wan et al. (2011) discussed that the theoretical extension here is that board diversity serves as a form of intellectual capital, fostering a well-rounded approach to technological adoption. Thus, such insight suggests that future applications of RBV should consider not only tangible assets but also diverse human capital at the governance level as a critical factor for achieving competitive advantage in technologically driven industries (Barney, 1991). By framing diversity as a strategic asset, this study contributes to a deeper understanding of how diversity within organizational leadership affects long-term resilience and growth (Hodge & Piccolo, 2005).

Third, in the present study, institutional theory posits that organizations seek legitimacy by adhering to regulatory, normative, and cultural expectations within their environments. The present study outlines the importance of compliance and legal expertise on boards in managing FinTech adoption within regulatory constraints Gimpel et al. (2018), aligning the organization's innovations with societal expectations for data security and consumer protection. Similarly, Ghafoor et al. (2022) pointed out that the compliance-focused board members acted as institutional stewards, ensuring that FinTech strategies adhered to regulatory mandates and ethical standards, which is crucial in an industry as regulated as finance. However, the findings from the present study suggest an extension of institutional theory, emphasizing that diverse boards are more adept at balancing innovation with regulatory requirements, which is essential in adopting disruptive technologies responsibly. This has theoretical implications for understanding how institutional pressures shape organizational compliance and innovation strategies within regulated environments. By demonstrating that boards with compliance expertise support responsible innovation, this study extends Institutional Theory to encompass diverse governance as a mechanism for sustainable technological advancement.

### **Practical Implications**

First, a critical practical insight from this study is the importance of structured, inclusive decision-making frameworks that accommodate diverse viewpoints. For instance, diversity in the boardroom enriches discussions but can also lead to extended deliberations when members hold conflicting perspectives. To capitalize on diversity without compromising efficiency, boards should implement frameworks that allow for structured debates, consensus-building, and equal participation. Practical steps for financial institutions include investing in training sessions on consensus-building and providing tools that foster transparent, inclusive discussions. Financial institutions could also establish rules for rotating

leadership roles within the board, ensuring that all perspectives, particularly those from underrepresented voices, are heard (Sanad & Al Lawati, 2023). These frameworks streamline decision-making and enhance the board's ability to synthesize diverse insights into cohesive strategies, supporting agile yet responsible FinTech adoption.

Second, findings from the present study highlight the value of having a mix of expertise and backgrounds on the board, particularly in areas relevant to FinTech, such as technology, compliance, risk management, and customer relations. Financial institutions can leverage these insights by prioritizing diversity in board recruitment seeking candidates with varied skills and experiences that align with strategic goals. For instance, boards can include members with backgrounds in cybersecurity to address data privacy concerns or customer-focused backgrounds to enhance customer-centric innovation in FinTech (Gimpel et al., 2018). Prior studies suggest that the boards should evaluate their current composition and identify expertise gaps crucial for effective FinTech adoption and IR4 readiness. For instance, using a competency-based approach in board recruitment and promoting a culture of inclusivity can help ensure that boards have the skills needed to make informed, balanced decisions (Alessio & Vasilakis, 2024). Such targeted recruitment strategies align with the RBV by positioning diversity as an invaluable resource that supports organizational resilience and strategic adaptability (Ferilli et al., 2024).

Third, the findings indicate that gender and cultural diversity on boards enhance the organization's alignment with customer needs, as diverse members bring unique insights into customer behavior and preferences. This implies that organizations should focus on creating customer-centric FinTech strategies that leverage data-driven insights (Choi, 2021). Boards with a strong representation of customer-oriented and technology-savvy members can advocate for analytics-based decision-making processes that continuously monitor and adapt to customer trends (Gitonga et al., 2021). In addition, Firmansyah et al. (2022) suggest that the boards should prioritize investment in data analytics tools that provide real-time insights into customer behavior, allowing them to accurately make decisions that reflect customer needs. Another study by Gimpel et al. (2018) illustrated that financial institutions should also foster a customer-feedback culture, where insights from customer interactions inform strategic FinTech decisions. This approach enhances responsiveness, supporting the development of customer-centric solutions that drive loyalty and engagement.

## **Conclusion**

This study's theoretical and practical implications emphasize that board diversity serves as a strategic asset in FinTech adoption within IR4, enhancing resilience, customer alignment, and regulatory compliance. By integrating diverse perspectives, boards can foster innovation responsibly, balancing agility with oversight. These findings reinforce the need for organizations to cultivate diversity and inclusivity within their governance structures, adopting frameworks that leverage diversity as a resource. Organizations can position themselves for success in the evolving digital landscape through structured decision-making processes, targeted recruitment, and cross-generational knowledge sharing.



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