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Nexus between Corporate Governance and FinTech Disclosure: A Comparative Study between Conventional and Islamic Banks

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Abstract

Purpose: This study investigates the impact of corporate governance on FinTech disclosure levels in Jordanian conventional and Islamic banks. It aims to determine whether governance mechanisms affect disclosure practices in the FinTech sector, exploring the interplay between governance and transparency in financial innovations.

Methodology: The research methodology entails a thorough analysis of data from all 15 Jordanian conventional and Islamic banks listed on the Amman Stock Exchange, covering the period from 2015 to 2022. This study employs manual content analysis using a custom FinTech Disclosure Index (FDI) and quantitative analysis with a two-way clustered error regression model.

Findings: The findings show that corporate governance mechanisms, particularly board size, board meetings, and 'Big4' audit firms, are crucial in enhancing FinTech disclosure across conventional and Islamic banks. However, Islamic banks consistently show higher disclosure levels than their conventional counterparts, attributed to their distinct governance structures that

emphasize ethical governance and transparency. These results indicate an awareness among decision-makers about the importance of business model transformation towards FinTech.

Originality: This study pioneers the introduction of FDI, utilizing it for a novel comparative analysis of FinTech disclosure levels between Islamic and conventional banks. By exploring how various governance structures influence FinTech disclosure, this research provides fresh insights into the interplay between corporate governance and financial technologies in the banking sector.

Keywords: FinTech Disclosure Index (FDI), FinTech, Islamic Banks, Business Model Transformation, Corporate Governance.

1. Introduction

Financial technology (FinTech) has revolutionized the landscape of financial services by adopting advanced technologies such as mobile banking, digital payments, and automated lending. FinTech and Industry 4.0's association shows a new era of efficiency, automation, and inclusivity in financial practices, breaking down geographical barriers (Frost et al., 2019; Frame and White, 2004). The COVID-19 pandemic has significantly accelerated the digital transformation, highlighting the essential role of FinTech in enhancing accessibility to financial services and driving economic growth (World Bank, 2021).

As global dynamics shift, particularly following the 2008 financial crisis, FinTech has not only reduced operational costs and enhanced service efficiency but also disrupted traditional business models, urging legacy financial institutions to rethink their strategies (Chen et al., 2023; Financial Stability Board, 2017). This disruption extends into regulatory domains, demanding adaptations that accommodate innovative technologies while addressing the emerging risks to the financial system (Elia et al., 2023; Ruhland and Wiese, 2022). Technologies such as artificial intelligence and blockchain are transforming banking operations and customer interactions (Acar and Çıtak, 2019), which necessitates a deeper exploration into their governance implications, particularly in regions with unique banking frameworks like Jordan.

Jordan's digital transformation, led by government initiatives and the Central Bank of Jordan, aims to establish the country as a leader in digital finance within the MENA region. Both conventional and Islamic banks in Jordan are adopting FinTech to improve service delivery and operational efficiency. While the core governance directives may be uniform across both types, Islamic banks must ensure their FinTech integrations comply with Shariah principles, which include interest (riba) and the ethical dimensions of financial transactions.

This requirement adds complexity to how technology is adopted and disclosed. For example, Islamic banks conduct additional due diligence to ensure their financial technologies do not facilitate non-compliant products or services. The regulatory environment in Jordan thus provides a unique context to study how these uniform governance structures are adapted by conventional and Islamic banks to meet their specific operational and ethical mandates, allowing for a better understanding of how governance frameworks handle diverse technological integrations and voluntary disclosures in terms of transparency and compliance.

The literature shows that while many studies have focused on the operational integration of FinTech and its impact on bank performance and risk management (Lee et al., 2021; Zhao et al., 2023), the dynamics of how governance structures influence the transparency and disclosure of FinTech initiatives within these banks are less understood. Particularly, existing research tends to concentrate on the implementation and operational impact of FinTech, often overlooking how governance factors such as board structure, regulatory compliance, and ethical governance practices affect the level and quality of FinTech disclosures (Bashayreh and Abu Wadi, 2021).

Furthermore, while the influence of FinTech on banking performance has been extensively studied in various regional contexts—from Asia to the Middle East—the specific comparative analysis of how these technologies are disclosed under different governance regimes in Islamic versus conventional banks remains scant. This is particularly relevant in Jordan, where the parallel operation of these banking systems within a single regulatory environment provides a unique opportunity to explore these dynamics.

This research gap is significant because understanding the nexus between corporate governance and FinTech disclosure is crucial for several reasons. First, it helps regulatory bodies and financial institutions assess and enhance their governance structures to better accommodate the rapidly evolving landscape of digital finance. Second, it provides insights for investors and

clients, enabling them to compare the transparency and accountability practices of different banks, which can influence the bank's performance and profitability.

A relevant study by Kharrat et al. (2024) highlights the construction of a FinTech Index to measure FinTech development in the MENA region and its impact on bank performance, but it does not address how corporate governance affects FinTech disclosure practices. Additionally, Ding et al. (2023) explore the exaggeration effect of FinTech disclosures on productivity in Chinese enterprises, finding significant productivity promotion from FinTech exaggeration, especially in early life stages and large firms. However, this study also does not focus on the role of corporate governance in FinTech disclosure.

Our study addresses this gap by focusing on the impact of corporate governance on FinTech disclosure levels in Jordanian conventional and Islamic banks. It employs a novel FinTech Disclosure Index (FDI) to quantitatively assess these disclosures, thereby providing fresh insights between corporate governance and financial technologies within these distinct banking frameworks. This approach not only contributes to filling the identified research gap but also enhances the understanding of the strategic implications of governance in the digital transformation of the banking sector. In this context, we present the following research questions:

RQ1: Does the corporate governance structure affect the level of FinTech disclosure?

RQ2: Does the level of FinTech disclosure vary between conventional and Islamic banks? These questions aim to deepen our understanding of the role of governance in shaping the transparency and effectiveness of FinTech applications in the banking sector.

We empirically investigate the influence of corporate governance structure on the level of FinTech disclosure in conventional and Islamic banks. Further, we examine the level of FinTech disclosure between these banks. Our study is based on a sample of Islamic and conventional banks from the MENA region, specifically Jordan, over the period 2015-2022. This study sheds light on the nexus between corporate governance structure and the level of FinTech disclosure in both Islamic and conventional banks, contributing to the literature and offering a better understanding of the interdependencies between corporate governance and FinTech disclosure levels.

The findings are expected to have significant implications for policymakers, practitioners, and researchers interested in the evolving dynamics of FinTech, corporate governance, and sustainability in the financial industry. This research highlights how stronger governance frameworks can enhance FinTech disclosure practices, guiding banks to restructure their

governance models to improve transparency and technological integration. Additionally, it provides essential insights for policymakers to develop regulations that encourage robust governance practices and support FinTech adoption, ensuring the financial sector remains innovative while maintaining stability.

The remainder of the paper is structured as follows: Section 2 is a detailed literature review, Section 3 is an outline of the research design and methodology, Section 4 is data analysis and findings, and Section 5 is a conclusion.

2. Theoretical framework, literature review, and hypotheses development

2.1 Theoretical Framework and Literature Review

The FinTech sector represents a significant shift in the financial services industry by leveraging advanced technologies to offer services to traditionally underserved populations. This sector includes digital solutions like mobile banking, digital payments, and digital lending, which promote broader financial inclusion (Frost et al., 2019). The convergence of these technologies in both Industry 4.0 and FinTech highlights a broader trend toward digitalization, emphasizing efficiency, automation, and inclusive financial practices.

Research indicates that FinTech reduces costs, enhances efficiency, improves informational asymmetry, and mitigates disintermediation by minimizing the role of traditional intermediaries (Chen et al., 2023). These advancements extend to regulatory and supervisory frameworks, adapting to the evolving needs of financial intermediaries and consumers while addressing the associated stability risks of financial systems (Cheng and Qu, 2020; Deng et al., 2021). Elia et al. (2023) analyzed 377 articles from 2014 to 2021, exploring how FinTech influences various stakeholders, including regulatory bodies and banks. They conclude that the key drivers for partnerships in the FinTech industry are financial returns, reputation, and credibility, while incumbents prioritize customer satisfaction and innovative business models (Ruhland and Wiese, 2022).

In Indonesia, Frederica et al. (2021) analyze the collaboration between banks and FinTech companies, focusing on regulatory impacts and their implications for banking performance. Bashayreh and Abu Wadi (2021) also find a positive association between the adoption of FinTech services and bank performance in Jordanian commercial banks.

Empirical studies highlight the significant role of FinTech in enhancing banking services and performance globally. For instance, Gai et al. (2018) underscore how FinTech improves the

quality of financial services through advanced information technologies. Bakar and Nordin (2020) examine the impact of FinTech investments on bank performance in Malaysia, Singapore, and Thailand, providing insights into investment strategies in technological advancements. In Jordan, research underscores the importance of FinTech in enhancing banks' financial performance and shaping user loyalty through personal innovativeness and financial literacy, as highlighted by Alkhwaldi et al. (2022) and Kayed et al. (2024).

Recent studies (Alkaraan et al., 2022; Hussainey et al., 2022) indicate that disclosures about advanced technology adoption positively correlate with corporate governance structures and financial performance. Boards of directors play a crucial role in reducing interest divergence, thereby mitigating agency problems. The quality of the governance structure is critical for stakeholders as it influences FinTech disclosures (Najaf et al., 2021). Effective FinTech disclosures reduce information asymmetry and address agency problems, which is crucial for standard setters, regulatory bodies, and other stakeholders.

Disclosing technological advancements and new services offers significant benefits to companies. It meets to the increasing demand for advanced digital banking among customers, satisfies shareholders' desire to maximize benefits, and attracts investors looking for innovative and promising companies. Enhanced transparency about new developments can thus attract customers, please shareholders, and draw new investments.

Despite these benefits, existing literature has not fully explored how corporate governance structures influence FinTech disclosures in different types of banking institutions, such as conventional versus Islamic banks. This study aims to address this gap by examining these dynamics within the context of Jordanian banks.

The theoretical foundation of this study is based on agency theory and stakeholder theory. Agency theory, articulated by Jensen and Meckling (1976), addresses conflicts of interest between shareholders and managers. It highlights reducing information asymmetry and aligning interests through effective governance mechanisms. Stakeholder theory, proposed by Freeman (1984), expands the focus to include all stakeholders affected by a company's actions. It highlights the importance of transparency and accountability in corporate governance to build trust and ensure sustainable growth.

By combining these theoretical perspectives, this study seeks to provide a thorough understanding of how corporate governance structures impact FinTech disclosures in Jordanian banks, both conventional and Islamic.

2.2 Corporate governance and FinTech disclosures

Research across various domains highlights the profound impact that transparency and governance have on disclosure practices within the financial sector. Prior studies, such as those by Hassanien & Hussainey (2015), Hassanein et al. (2019), and Albitar et al. (2020), firmly establish the link between transparent disclosure practices and improved financial outcomes. These studies demonstrate that clear and comprehensive disclosures significantly strengthen a company's reputation and foster investor trust, especially critical in sectors like banking where financial stability is crucial.

Further empirical support is provided by Ding et al. (2023), who investigate how exaggerated FinTech disclosures impact the productivity of enterprises, suggesting that strategic management of disclosures can positively affect operational outcomes. Kharrat et al. (2024) extend this line of inquiry by developing a FinTech Index to measure the effects of financial technology on the performance of Islamic and conventional banks in the MENA region, finding that FinTech initiatives significantly boost bank efficiency, profitability, and stability.

Additionally, research by Mazumder and Hossain (2023) indicates that board composition—specifically board independence and gender diversity—profoundly influences cybersecurity disclosure practices. This suggests that diverse and independent boards are more likely to engage in thorough FinTech disclosure practices. Similarly, Shehadeh et al. (2024a) analyze how the COVID-19 pandemic and governance structures have enhanced the disclosure of Industry 4.0 technologies in Jordanian commercial banks during times of crisis.

The literature also indicates that corporate governance mechanisms play a significant role in influencing disclosure levels in financial institutions. Xiao and Zhao (2012) highlight that government ownership in banks can impact their capacity for financial innovation, which is crucial for FinTech development. Similarly, Wang and Cao (2022) demonstrate that board composition and director characteristics, such as independence, meeting attendance, and educational background, significantly influence the extent of FinTech development in Taiwan's banking industry. Sannino et al. (2020) discuss how CEO characteristics, particularly those related to FinTech innovation, affect the implementation of long-term strategic models in financial

technology firms. Al-Matari et al. (2022) examine the relationship between FinTech, board characteristics, and corporate performance in Saudi Arabia's financial sector, finding no moderating effect of FinTech on the association between board characteristics and financial performance, although gender diversity was not considered. Conversely, Arena et al. (2022) show that gender-diverse boards can improve the operational effectiveness of banks when offering FinTech solutions. Sanad and Al Lawati (2023) further support this by demonstrating that board gender diversity enhances firm performance, especially when moderated by the adoption of FinTech, emphasizing the importance of inclusive governance in leveraging technological advancements.

Furthermore, Hussainey et al. (2022) delve into the role of corporate governance in narrative reporting on Industry 4.0 technologies among UK non-financial firms, showing that higher governance quality correlates with more detailed reporting on corporate transformation toward Industry 4.0. This underscores the crucial role of good governance in facilitating strategic disclosures essential for business model transformation.

However, the above-mentioned studies did not examine the influence of corporate governance on FinTech disclosure through a comparative study between conventional and Islamic banks. Considering agency and stakeholder theories, corporate governance structures not only mitigate internal conflicts and align the interests of management with those of shareholders but also meet the broader expectations of all stakeholders, including customers and regulators.

Given these insights and identified gaps, we propose the following hypothesis:

H1: FinTech disclosure levels are likely to be influenced by corporate governance mechanisms in Islamic and conventional banks.

2.3 FinTech Disclosure Practices in Islamic and Conventional Banks

FinTech has significantly transformed the financial industry by improving transparency, efficiency, and accessibility. As both Islamic and conventional banks integrate FinTech solutions, they aim to enhance their financial operations, though their approaches and resulting impacts differ significantly. Exploring these variations in FinTech disclosure practices provides valuable insights into the deployment and reporting of these technologies across different banking systems.

Research by Wen et al. (2023) highlights that FinTech reduces real earnings management by enhancing the quality of financial reporting. This improvement is attributed to better

information production, increased external monitoring, and improved credit accessibility, all of which collectively reduce the incentive for earnings manipulation, thereby bolstering the trustworthiness of financial disclosures for external investors.

In the context of Islamic banks, technologies like blockchain are crucial for managing high transaction costs and improving profit-sharing agreements. Abojeib and Habib (2021) specifically examined blockchain's role in facilitating charitable activities, such as Zakat collection and Waqf management, enhancing their effectiveness significantly.

However, Islamic banks face unique challenges in adopting FinTech, as detailed by Hassan et al. (2022) and Haridan et al. (2023). These challenges include compliance with Islamic principles, operational efficiency, customer retention, transparency, and accountability. Similarly, Yuspin et al. (2023) and Rabbani. (2022) compared governance codes in Sharia-based FinTech with traditional systems, uncovering both challenges and opportunities within Islamic FinTech frameworks.

Susilowati et al. (2022) analyzed governance disclosures on Indonesian and Malaysian FinTech company websites, finding that disclosure practices were influenced by country-specific contexts and the type of FinTech services offered.

Nobanee and Ellili (2016) discovered that conventional banks tend to disclose more about corporate sustainability than Islamic banks. This higher level of disclosure positively correlates with the performance of conventional banks but does not significantly impact Islamic banks. This theme of variable disclosure practices is further supported by Mazumder and Sobhan (2021), who introduced a dummy variable ("ISLAM") to account for potential differences in corporate sustainability disclosure due to the banks' Islamic-Shariah orientation.

Lui et al. (2021) found that Malaysian Islamic banks report higher levels of total corporate social responsibility disclosures (CSRD) than their conventional counterparts. This reflects the internalization of Islamic accountability principles, which emphasize CSR alongside financial disclosures.

Hasan et al. (2023) studied the impact of risk disclosures on the credit ratings of commercial banks in Bangladesh, showing a more substantial positive effect in Islamic banks, suggesting that such disclosures are particularly influential in these institutions.

Lastly, Masud et al. (2024) observed that Islamic financial firms in Bangladesh are less transparent about corporate corruption compared to conventional firms, highlighting a difference in transparency and accountability practices between the two types of institutions.

These findings lead us to propose the following hypothesis:

H2: There is a positive relationship between bank type (Islamic versus conventional) and levels of FinTech disclosure.

3. Research Design

3.1 Sample and Data Collection

The sample for this research includes all 15 commercial banks in Jordan that have published their annual reports from 2015 to 2022, totaling 119 bank-year observations. No bank was excluded, ensuring an extensive view of the industry's practices. Data was primarily sourced from the narrative sections of the annual reports, including management discussions and sections on technological innovations. These sections are increasingly valued for their qualitative disclosure, as demonstrated by studies like Hussainey et al. (2022). In contrast to the commonly used computer-based content analysis methods, such as those by Fisher et al. (2020) and Karim et al. (2021), this research employs manual content analysis to uncover deeper thematic trends in FinTech-related reporting, a method also supported by recent studies such as Shehadeh et al. (2024a) and Shehadeh et al. (2024b).

3.2 FinTech Disclosure Index (FDI)

Our assessments of disclosure quantity depend on a customized manual content analysis approach, as an alternative to the automated natural language processing models commonly used in contemporary accounting research. This method was selected based on the belief that manual analysis provides a more accurate evaluation of corporate disclosures, particularly given the complexities of financial technology as observed in the annual reports of Jordanian banks. This belief is supported by the study conducted by Shehadeh et al. (2024b), which employed manual content analysis to develop the Digital Transformation Disclosure Index, demonstrating the method's ability to capture detailed and specific disclosures and validating its superiority in handling complex and intricate information in the field of financial technology.

Our approach follows the precedent set by thorough Industry 4.0 analyses, such as those by Alkaraan et al. (2022) and Hussainey et al. (2022), particularly the manual content analysis method applied by Shehadeh et al. (2024b).

The process began with compiling an initial list of specific FinTech-related terms from academic literature and industry reports, including reports from renowned institutions such as (McKinsey & Company, 2023, 2022), (PwC, 2019), (Boston Consulting Group & QED Investors, 2023) and (Deloitte, 2020). This list was then expanded to include synonyms and related terms, ensuring an extensive vocabulary that covers the essence of financial technology discussions within the sector.

A manual count of each term's frequency within the annual reports was conducted, creating a temporal narrative of FinTech discourse. This detailed process resulted in the formation of the FinTech Disclosure Index (FDI), which systematically evaluates the occurrence and comprehensiveness of FinTech disclosures in the banks' annual reports by counting the frequency of selected terms. These terms cover a wide range of FinTech innovations, including digital payment systems, mobile banking, cybersecurity, blockchain technology, and other essential areas of modern banking. Appendix 1 includes a complete list of the key terms searched, which were selected to reflect the technological innovations and their applications in the banking sector.

3.3 Scoring Banks' Annual Reports

Banks' reports were systematically scored using the FinTech Disclosure Index (FDI) within a manual content analysis framework. Each bank's annual report was manually searched for the frequency of FinTech terms included in the FDI, leading to the calculation of an annual FinTech Score. These scores were aggregated to discern trends in FinTech disclosure throughout the study period. The search function (Ctrl+F) was used to identify and count the key terms in each report. This data, along with governance-related information such as board size, meeting frequency, and auditor qualifications, were recorded in an Excel file, supporting comparative and evolutionary analyses of FinTech narratives.

3.4 Regression Model

We employ a two-way clustered error regression model with robust standard errors to ensure the robustness of our analysis. To select the most suitable model, we conducted a Hausman test. The test yielded a chi-square statistic of 42.19 with a p-value less than 0.0001, leading us to reject the null hypothesis. This suggests a systematic difference in coefficients between the fixed

effect and random models. Therefore, the Hausman test indicates that the Fixed Effects model is the preferred choice for our data.

However, recognizing that some of our variables are dummy variables, we were aware of the potential introduction of spurious group-level shocks and correlations in errors. Such a scenario could lead to inaccurate inferences about the estimated coefficients, as noted by Hoechle (2007) and Petersen (2009). To address these concerns, we opted for a two-way clustered error regression model. This model is compatible with the fixed effects model and offers additional advantages. It allows us to account for potential measurement errors by considering variations in data accuracy across different banks and years. Furthermore, it enables us to accommodate sample heterogeneity by recognizing and controlling for diverse characteristics within the dataset.

In line with the methodology proposed by Petersen (2009), our model upholds potential measurement errors or misspecifications that could inadvertently introduce spurious group-level shocks and correlations in errors. To further enhance the robustness of our analysis, we introduced banks and year dummies into our regression models. This approach serves a dual purpose: it accounts for potential measurement errors and accommodates sample heterogeneity. Finally, to examine the presence of multicollinearity among the investigated independent variables, we employed a Spearman correlations matrix and conducted Variance Inflation Factor (VIF) tests.

To examine the impact of corporate governance on FinTech disclosure, we consider of several corporate governance mechanisms. We limit our analysis to some governance mechanisms due to data availability. We considered board size as Hussainey et al (2022) provided evidence that the number of directors on corporate boards positively affects levels of disclosure related to Industry 4.0 in the narrative sections of the annual reports. We considered the quality of external auditors as prior research shows its positive impact on corporate narrative reporting (e.g. Al Lawati et al, 2021; Abdelhak et al, 2023). We also considered board meeting frequency as a measure of board diligence and effectiveness (Vafeas, 1999). We anticipate that boards with more frequent meetings could be engaged more with business transformation models towards FinTech and they are more likely to signal their digital strategies through voluntarily reporting FinTech-related information in their annual report narratives. We considered gender diversity as a potential driver for FinTech disclosure as prior research shows that female directors have a positive impact on corporate narrative reporting (e.g., Ahmed, 2024; Katmon et al, 2019; Rahman et al, 2024). Finally, we consider nationality diversity in our analysis as Muttakin et al (2015) provide empirical

evidence on the position impact of foreign directors on corporate narrative reporting in developing countries.

Following prior research, we control for several firm characteristics variables such as corporate profitability (Wang and Hussainey, 2013); dividends (Wang and Hussainey, 2013); firm growth rate (Hussainey and Walker, 2009), and firm size (Wang and Hussainey, 2013; Hussainey et al, 2022; Rahman et al, 2024).

We used the following models to test the first research hypothesis. Each model presents different combinations of corporate governance variables. In model 1, we considered board size and the quality of external auditors as potential governance mechanisms that drive FinTech disclosure. In model 2, we considered board size, the quality of external auditors and the number of board meetings, while in Model 3, we added the number of foreign directors to independent variables included in model 2. Model 4 focuses on four independent governance variables: board size, the quality of external auditors, the number of board meetings and gender diversity, while Model 5 considers five governance attributes: board size, the quality of external auditors, the number of board meetings, foreign directors and gender diversity.

Model (1): $FinTech_{it} = \alpha + \beta_1 BS_{it} + \beta_2\, Big4_{it} + \beta_3 \mathrm{ROI}_{it} + \beta_4 \mathrm{DivdPerSh}_{it} + \beta_5 \mathrm{MtoBR}_{it} + \beta_6 \mathrm{Firmsize}_{it} + e_{it}$ (1)

Model (2): $FinTech_{it} = \alpha + \beta_1 BS_{it} + \beta_2\, Big4_{it} + \beta_3 NumrBdMeets_{it} + \beta_4 \mathrm{ROI}_{it} + \beta_5 \mathrm{DivdPerSh}_{it} + \beta_6 \mathrm{MtoBR}_{it} + \beta_7 \mathrm{Firmsize}_{it} + e_{it}$ (2)

Model (3): $FinTech_{it} = \alpha + \beta_1 BS_{it} + \beta_2\, Big4_{it} + \beta_3 NumrBdMeets_{it} + \beta_4 Foreign_{it} + \beta_5 \mathrm{ROI}_{it} + \beta_6 \mathrm{DivdPerSh}_{it} + \beta_7 \mathrm{MtoBR}_{it} + \beta_8 \mathrm{Firmsize}_{it} + e_{it}$ (3)

Model (4): $FinTech_{it} = \alpha + \beta_1 BS_{it} + \beta_2\, Big4_{it} + \beta_3 NumrBdMeets_{it} + \beta_4 Gender_{it} + \beta_5 \mathrm{ROI}_{it} + \beta_6 \mathrm{DivdPerSh}_{it} + \beta_7 \mathrm{MtoBR}_{it} + \beta_8 \mathrm{Firmsize}_{it} + e_{it}$ (4)

Model (5): $FinTech_{it} = \alpha + \beta_1 BS_{it} + \beta_2\, Big4_{it} + \beta_3 NumrBdMeets_{it} + \beta_4 Foreign_{it} + \beta_5 Gender_{it} + \beta_6 \mathrm{ROI}_{it} + \beta_7 \mathrm{DivdPerSh}_{it} + \beta_8 \mathrm{MtoBR}_{it} + \beta_9 \mathrm{Firmsize}_{it} + e_{it}$ (5)

Where: FinTech is our FinTech Disclosure Index, measured using the content analysis method. BS is board size, Big 4 is the quality of external auditing firm, NumrBdMeets is the number of board meetings in a year, Foreign is the number of foreign directors on the board, and Gender is the number of female directors on the board. ROI is our profitability measure (return on

investment), and DivdPerSh is dividends per share. MtoBR is the market-to-book ratio. Firmsize is the firm size measured by the log of total assets.

4. Results and Discussion

4.1 Descriptive Analysis

Table (1) shows the descriptive analysis. The mean value of FinTech disclosure is 17.613 with a standard deviation of 15.345. The minimum value is 0 and the maximum value is 80. The mean value of FinTech disclosure indicates that, on average, banks in the sample have a moderate level of FinTech disclosure. The standard deviation of 15.345 indicates that there is a significant amount of variation in the level of FinTech disclosure among banks in the sample, suggesting that some banks have very high levels of FinTech disclosure, while others have very low levels. The mean value of return on investment is 1 with a standard deviation of .444. The minimum value is -.161 and the maximum value is 1.816. This suggests that banks in Jordan have a positive return on investment on average, with a relatively low level of variability in returns. The range of returns varies from negative to positive values, indicating that some firms have negative returns while others have positive returns. Dividends per share mean is .107 with a standard deviation of .091, indicating that the sample firms pay out relatively low dividends per share on average. The mean value of market to book ratio is .882 which means that banks in Jordan are valued at less than their book value on average. Finally, the mean value of Total Assets is approximately $4,509,000,000 with a standard deviation of approximately $6,123,000,000, revealing that the sample firms have a large amount of assets on average. However, the high standard deviation suggests that there is significant variation in asset size among the banks in the sample.

Insert Table 1 about here

Table 2 findings suggest that there is significant evidence of strong collinearity within the analyzed models. It shows that there is a positive correlation between FinTech disclosure and board size indicating that firms with larger boards tend to have higher levels of FinTech disclosure. There is also a positive correlation between FinTech disclosure and the number of board meetings, suggesting that firms with more board meetings tend to have higher levels of FinTech disclosure. In addition, there is a positive correlation between return on investment and dividends per share indicating that firms with higher returns on investment tend to pay out higher dividends per share.

Insert Table 2 about here

Figure (1) offers a more insightful perspective on the correlation among variables, presenting a scatter plot matrix. This matrix visually illustrates the correlations between various pairs of variables. The matrix comprises a grid of scatter plots, where each plot reveals the connection between two specific variables.

Insert Figure 1 about here

Figure (2) helps us better understand how FinTech disclosure correlates with different characteristics of other banks over time. However, it falls short of offering a complete interpretation of the complex interplay among these variables. The scatter plots imply the potential existence of a positive correlation between select financial metrics and other variables. However, deriving precise insights regarding the robustness and directionality of these relationships proves challenging to precisely determine the strength and direction of these relationships.

Insert Figure 2 about here

4.2 Corporate Governance and FinTech Disclosure

Table 3 presents the regression results analyzing the effect of corporate governance on FinTech disclosure. Each model incorporates different combinations of corporate governance variables. A key finding is that board size consistently shows a positive and statistically significant relationship with FinTech disclosure, with coefficients ranging from 1.756 to 2.299. This suggests that as the board size increases, the level of FinTech disclosure tends to rise. Similarly, the inclusion of "Big4" audit firms consistently demonstrates a significant positive impact on FinTech disclosure across all models, emphasizing the importance of audit quality. Therefore, H1 is accepted. Firm size also emerges as a robust and statistically significant factor, indicating that larger firms tend to have higher levels of FinTech disclosure. Additionally, the variance inflation factor (VIF) values for the predictor variables are generally below 5, suggesting that multicollinearity is not a significant concern.

Insert Table 3 about here

4.3 Corporate Governance and FinTech Disclosure in Islamic versus Conventional Banks

Table 4 compares the impact of corporate governance on FinTech disclosure between Islamic and conventional banks. A new variable (IslamicDum) is introduced in Models 1 to 5, acting as a dummy variable that equals 1 for Islamic banks and 0 otherwise. The results consistently show a positive and statistically significant relationship between Islamic banks and FinTech disclosure, suggesting that Islamic banks tend to disclose more FinTech information compared to their conventional counterparts. This section explores the reasons behind these differences deeper and highlights key variables influencing FinTech disclosure in both types of banks. Therefore, we accept H2.

4.4 Key Factors Influencing FinTech Disclosure in Islamic and Conventional Banks

In both Islamic and conventional banks, larger board sizes are associated with higher levels of FinTech disclosure. This can be attributed to the increased diversity of perspectives and expertise that larger boards bring, which enhances the bank's ability to adopt and disclose advanced FinTech practices. For example, ElGammal et al. (2018) suggested that boards with a larger number of members tend to possess a broader spectrum of skills and knowledge compared to their smaller counterparts. This diversity could potentially enhance the board's oversight capabilities. Therefore, it is anticipated that companies with larger boards will exhibit a higher level of voluntary disclosure. Furthermore, the presence of Big4 audit firms is a significant factor in both types of banks. Big4 firms bring higher standards of transparency and regulatory compliance, which in turn promote higher levels of FinTech disclosure. Following the reputation theory, the Big 4 audit firms are more motivated to deliver high-quality audits to safeguard and uphold their reputation (Rusmin, 2010). Moreover, the market-to-book ratio is negatively associated with FinTech disclosure in all models. This suggests that banks with higher market valuations relative to their book values might be less inclined to disclose FinTech developments, possibly due to concerns over revealing strategic information to competitors. Finally, larger firms, whether Islamic or conventional, tend to have higher FinTech disclosure. This is because larger firms typically have more resources to invest in FinTech and are more likely to be scrutinized by stakeholders demanding transparency.

Insert Table 4 about here

4.5 Comparative Analysis of FinTech Disclosure in Islamic vs. Conventional Banks

4.5.1 Ethical and Regulatory Framework

Islamic banks operate under Sharia law, which emphasizes transparency, ethical investments, and risk-sharing principles. This ethical framework might drive Islamic banks to disclose more FinTech information as part of their commitment to ethical governance and stakeholder trust. Zaki et al. (2015) argued that the ethical guidelines of Sharia law significantly influence the disclosure practices of Islamic banks, promoting higher levels of transparency in applying firms' initiatives. According to Hussainey et al. (2017), Islamic banks tend to outperform conventional banks in terms of profitability. Furthermore, Islamic banks have shown increased efficiency following the global financial crisis period. Conventional banks, in contrast, operate under a secular regulatory framework that primarily focuses on profitability and shareholder value, which might not emphasize the same level of disclosure.

4.5.2 Stakeholder Expectations

Islamic banks often cater to stakeholders who expect higher ethical standards and transparency, which could explain their higher FinTech disclosure levels. Haddad & Souissi (2022) found that the stakeholder base of Islamic banks places a strong emphasis on ethical practices and transparency, thus driving higher levels of disclosure. Ahmed et al. (2024) emphasize that sustainable and Islamic equity markets are consistent with the Sustainable Development Goals (SDGs), underscoring the significance of sustainability reporting in Islamic banks. These banks follow Shariah principles, which advocate for social justice, environmental conservation, and ethical financial practices.

4.5.3 Governance Structures

The governance structures of Islamic banks often include Sharia boards in addition to conventional boards, adding an additional layer of oversight (Haddad & Souissi, 2022). This dual

governance structure can enhance transparency and accountability, leading to higher FinTech disclosure. As evidenced by Ahmed et al. (2024), the presence of Sharia boards ensures that Islamic banks adhere to strict ethical standards, thereby increasing transparency. Conventional banks typically do not have this additional layer of governance, which might contribute to lower disclosure levels.

4.6 Robustness Check and Additional Analysis

Tables (5) and (6) show the regression results of the Tobit regression, we use Tobit regression because our measure of FinTech disclosure is truncated to the lowest value of zero. The statistical summary reveals that scores for FinTech disclosure range from zero to 80, with an average score of 17.61. Given the censoring of our dependent variable, we initially employ Tobit regression models. The Tobit regression model, introduced by (Tobin,1958), is frequently employed in analyzing censored data scenarios. In cases where the dependent variable values are concentrated at a threshold, often zero. This characteristic distinguishes TOBIT regression from other models that only consider values above the limit when estimating the best fit (McDonald and Moffitt, 1980). The Tobit model equation is formed as follows:

$$\boldsymbol{y_t = X_t\beta + U_t \;\; if \; X_t\beta + U_t > 0}$$
$$\boldsymbol{= 0 \; if \;\; X_t\beta + U_t \leq 0}$$
$$\boldsymbol{t = \;\; 1, 2, \ldots, N}$$

Where N represents the total number of observations; $\boldsymbol{y_t}$ signifies the dependent variable at time $\boldsymbol{t}$; $\boldsymbol{X_t}$ denotes the independent variables at time $\boldsymbol{t}$; $\boldsymbol{\beta}$ stands for the coefficients, and $\boldsymbol{U_t}$ is the error term, as described by McDonald and Moffitt (1980). Tables (5) and (6) show the Tobit Regression results that confirm and validate the primary findings regarding the impact of corporate governance on FinTech disclosure. Specifically, the results show that board size and Big4 have a statistically significant association with FinTech disclosure across all models (Models 1 to 5). These Tobit Regression results fortify and validate the primary findings, reinforcing the understanding that corporate governance structures, particularly board size and firm size, play crucial roles in influencing FinTech disclosure behaviors.

Insert Tables 5 and 6 about here

Additionally, following Mallin et al. (2013) and Arena et al. (2015), we used principal component analysis (PCA) to assess corporate governance as an additional analysis. This involved the combination of various governance variables, namely Board Size, Big 4, Gender, Foreign, Board Meeting Numbers, and Audit Committee Number. PCA helped the strengthening of variables associated with each determinant into a unified composite score, effectively mitigating issues of multicollinearity and minimizing measurement error (Arena et al., 2015). This analytical approach is useful in reducing the number of variables and identifying the most important factors that contribute to corporate governance (Black et al., 2017). Table (7) presents the results of the impact of corporate governance score (using PCA) on FinTech disclosure score using two-way cluster and Tobit regressions, the Governance Score keep displaying a statistically significant positive association with FinTech disclosure. Similarly, in the Tobit model, the Governance Score demonstrates a statistically significant positive relationship with FinTech disclosure. Corporate governance practices lead to higher levels of FinTech disclosure, thus we accept H1 as mentioned before. Our findings are in line with prior research (Hussainey et al, 2022). When we incorporated IslamicDum into the analysis (Table 8), we still find a positive impact of corporate governance on FinTech disclosure levels. However, we noted that while IslamicDum was initially positive, it is currently deemed statistically insignificant which is not in line with our findings reported earlier in Table 6. This suggests that there are no statistically significant relationships between levels of Fintech disclosures in Islamic and non-Islamic banks. Thus, it is not safe to accept H2.

Insert Tables 7 & 8 about here

5. Conclusion

This thorough study has provided an in-depth analysis of FinTech disclosure practices in Jordanian banks, encompassing both Islamic and conventional institutions, over the period from 2015 to 2022. The descriptive and correlational analyses revealed a moderate yet varied level of FinTech disclosure within these banks. A significant finding of the study is the positive correlation between the extent of FinTech disclosure and various corporate governance factors, most especially the size of the board and the frequency of its meetings. This suggests that stronger, more robust governance structures are conducive to enhanced levels of FinTech disclosure.

Further detailed through regression analyses, the study establishes the critical role of corporate governance in determining the practices of FinTech disclosure. Key factors such as larger board sizes and the engagement of 'Big4' audit firms emerged as consistent predictors of increased FinTech disclosures. These findings highlight the idea that effective governance frameworks, characterized by expansive boards and prestigious audit relationships, are integral to the quality and depth of FinTech-related communications in banks.

A notable aspect of the study is the observation that Islamic banks generally maintain higher levels of FinTech disclosure compared to their non-Islamic counterparts. This could be due to the unique governance structures and operational models characteristic of Islamic banking, which may inherently prioritize technological advancements and transparency.

The application of Tobit regression analysis, accounting for the censored nature of FinTech disclosure data, further corroborated these findings. Additionally, using Principal Component Analysis (PCA) to create a composite governance score confirmed a positive association between robust governance and FinTech disclosure levels.

5.1 Implications of the Study

This research significantly contributes to the existing knowledge in the fields of FinTech and corporate governance, particularly within the context of Middle Eastern banking. It lays a foundation for future research, such as exploring the comparative effectiveness of manual versus automated content analysis methods and expanding this research framework to other geographic areas.

For banking management practitioners, the study highlights how stronger governance frameworks, particularly those with larger boards and frequent meetings, can significantly enhance FinTech disclosure practices. Specific recommendations include the establishment of dedicated FinTech oversight committees within boards to ensure continuous attention to evolving technological trends. This insight can guide banks in restructuring their governance models to foster better transparency and the incorporation of technology.

Policymakers can use these findings to develop regulations that encourage robust governance practices and support the adoption of FinTech, ensuring the financial sector remains innovative while maintaining stability. Examples of potential regulations include mandatory

disclosures of FinTech investments and their impacts on financial health, which could help mitigate risks associated with rapid technological adoption.

The societal implications of this study are profound, potentially influencing public attitudes toward greater transparency in banking and the adoption of FinTech. By advocating for improved disclosure practices in the banking sector, the findings support financial inclusivity and efficiency, particularly by enhancing financial inclusivity for underserved or excluded populations. This focus could significantly improve access to financial services for these groups, thereby enhancing their overall quality of life and promoting a more inclusive financial system. These changes could lead to a broader societal shift where financial resources and services are more accessible to everyone, regardless of their socioeconomic status.

In the academic arena, these insights can significantly enrich finance and business curricula by offering concrete examples of the interplay between technology and governance. Incorporating these findings into case studies and course modules could provide valuable real-world insights to students.

Banks and financial institutions can use these findings to refine their FinTech strategies, ensuring more effective communication with stakeholders and alignment with current governance standards. Strategies might include developing new FinTech-driven financial products or enhancing customer interfaces to improve user experience and transparency.

This research also carries significant implications for public policy, particularly in the development of regulatory frameworks that support transparent FinTech adoption while ensuring robust corporate governance. Policymakers can draw from these insights to craft regulations that not only promote technological innovations but also safeguard against potential risks, balancing the promotion of innovation with necessary risk management in the financial sector.

5.2 Research Limitations and Future Directions

This study provides valuable insights into the interplay between corporate governance and FinTech disclosures within Jordanian conventional and Islamic banks. However, its focus on a specific regional and economic context (Jordan) limits the broader applicability of the findings. Future research could benefit from extending this analysis to banks in other regions, incorporating diverse governance structures and economic environments to enhance the generalizability of the results.

Additionally, while this research used manual content analysis and quantitative methods from 2015 to 2022, the rapid advancement in FinTech could mean that recent developments are not fully captured. Future studies should consider extending the timeline to include more recent data, potentially employing real-time analytics to better capture ongoing trends and shifts in FinTech disclosure practices.

The study's methodology focused on certain aspects of corporate governance, such as board size, board meetings, and auditor reputation. Future research could expand this focus to include other governance factors like board diversity, CEO duality, and the roles of independent directors. Investigating these factors could provide deeper insights into how various elements of corporate governance influence FinTech disclosures differently in conventional versus Islamic banks.

Exploring the inclusion of emerging technologies, such as blockchain and artificial intelligence, within these governance frameworks could offer a richer understanding of their roles in enhancing or hindering transparency in financial innovations. Moreover, extending the study to include other financial institutions, such as investment firms and insurance companies, could provide more insight into the relationship between corporate governance and FinTech disclosure across the financial services industry.

Incorporating the concept of Knightian uncertainty, as detailed in Frank Knight's seminal work "Risk, Uncertainty, and Profit" (1921), is proposed for future research. This framework is particularly relevant in analyzing how banks manage risks and disclosures in an environment where outcomes are unpredictable and not easily measurable. Understanding how governance structures cope with such uncertainty, especially with the inclusion of FinTech, could provide critical insights into strategic decision-making processes in both conventional and Islamic banks.

Finally, future studies are also proposed to consider theoretical frameworks such as new institutional theory. This approach could help explore external pressures shaping FinTech adoption and how these pressures differ between conventional and Islamic banking contexts. Such theoretical inclusion could provide a more comprehensive understanding of the strategic interplay between governance and technology across different banking models.

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Appendix 1: FinTech Disclosure Index (FDI)

Green or Sustainable Fintech, Omnichannel Banking, Big Data in Banking, Digital banking, Electronic Banking Solutions, Digital offerings, Digital platform, Online and digital platform, Digitized banking, Digital bank Services, Digital branch, Digital self-service branches, Digital wallets, Digital account, Digital channels, Mobile app for banking, Mobile banking, Digital lending platform, Digital payments, Instant Transfers, Biometric Authentication, RPA (Robotic Process Automation), AI Financial Advisory, Predictive Analytics, Digital Identity Verification, Unified Banking Services, Smart AML (Anti-Money Laundering) Systems, Digital Crowdfunding, Smart Risk Management Systems, Integrated Financial Services, Artificial Intelligence (AI) Banking, Extended Blockchain Technology, E-KYC, NFC (Near Field Communication), Chatbots & Virtual Assistants, Data Analytics in Finance, Tokenization, IoT (Internet of Things) in Banking, Digital Onboarding, Cloud Banking, Smart Contracts, BaaS (Banking as a Service), Challenger Banks, Voice-activated Banking, Fraud Detection Technologies, RegTech, FinTech, Modern banking technology, Digital and electronic channels,

Decentralized Finance (DeFi), Open Banking, Quantum Computing in Finance, ACH - Automated Clearing House System, InsurTech, P2P Lending (Peer-to-Peer Lending), Distributed Ledger Technology (DLT), Neobanks, API Banking, Digital Only Banks, Machine Learning in Banking.

Source: Authors own work