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Fintech, Board of Directors and Corporate Performance in Saudi Arabia Financial Sector: Empirical Study

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Abstract: On a global scale, the Fintech sector has become increasingly important for keeping abreast of developments and progressions in the financial field. This study aimed to examine the impact of Fintech on the financial sector of Saudi Arabia and the role of Fintech in the relationship between the board of directors and corporate performance among Saudi financial firms listed on the stock market. Data were obtained from financial sector firms, covering banks and insurance firms from 2014 to 2020. The results revealed that board size, board independence, board meeting, board experience, and Fintech have a significant relationship with corporate performance. In relation to additional analyses, this study found that the board of directors' score has a significant association with performance. Moreover, this study found that Fintech does not moderate the relationship between the board of directors' score and corporate performance. This study sheds light on the effect of Fintech on the financial sector of Saudi Arabia, contributing new information to the literature. The study results are expected to have implications for several stakeholder groups. First, the study findings can be beneficial to academics, in terms of new knowledge and understanding of Fintech in the context of Saudi Arabia, a country that represents the Gulf region and the Arab World. The findings also have implications for policy-makers and practitioners in the Saudi and Middle-Eastern countries, Asia, and developing nations that have a similar culture, socio-economic institutions, or socio-economic environments.

Keywords: board of director characteristics; fintech; board of directors scores; Saudi financial sector; Saudi Arabia country

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1. Introduction

The corporate governance issue began gaining ground on international platforms after the collapse of major firms in 2008, including Fanny Mae, Freddy Mac, and Lehman Brothers and others, whose failure was attributed to corruption/failings in accounting and financial activity control [1]. To compound the matter further, the economic crisis badly hit banks and financial industry businesses, who had to turn to new technology adoption and service modernization to provide clients with the services they demand and secure sustainability. By 2008, a transformation had occurred in the form of a mandate to close portfolios and to adapt to the current strict market requirements, regulations, fine payment, and borrowing standards, for the purpose of survival [2].

Eventually, the corporate performance collapse resulted in the cooperation between the International Monetary Fund (IMF), the World Bank (WB), and the Organization for Economic Cooperation and Development (OECD), to examine the governance mechanisms, from which they highlighted five fundamental governance principles. They are as follows: protection of shareholders' rights; equal treatment among shareholders; stakeholders' role in corporate governance; disclosure and transparency; and lastly, the board of directors'

responsibilities. It is worth noting that shareholders' rights, which are largely dependent on the members of the board's goals, often conflicted with the shareholders' goals and the management of the firms [3]. Hence, governance procedures and standards are directed towards minimizing the deficiencies in the application of commercial legislation, in order to ensure that financial report quality is upheld and fraud cases are avoided [4]. According to [5], the application of an appropriate governance mechanism is directed towards the protection of stakeholders' interests. In this regard, the literature on corporate governance is largely based on theory and it is utilized to tackle the owner–agent conflict of interest.

According to agency theory, a contract is entered into between the company owner and the designated manager employed to manage and control the company [6]. The agency problem stems from the ownership–control separation, which is predominant among dispersed ownership firms, and as such a conflict of interest may eventually lead to the formation of information asymmetry and agency costs [6]. Thus, they recommended that such agency costs can be minimized, while enabling interest convergence, by setting up governance mechanisms.

In the context of Saudi Arabia, the Saudi capital market authority issued a mandate directing companies to follow the corporate governance standards in a list that clarified the rules and governance. The standards established the shareholders and stakeholders' rights protection. The Kingdom is making continuous efforts, in cooperation with other entities, to promote governance awareness and apply the best governance practices (Updated Code of CG, 2009).

According to [7], the primary governance mechanism holding the oversight responsibility of top management activities and actions is the board of directors. The authors contended that through the board's monitoring and controlling power, they can minimize agency conflicts, on the basis of the premise that managers may prefer distinct action plans that may clash with shareholders' interests; and thus the board of director's oversight is needed [8]. In the same way, it was suggested by [9] that the board of directors is responsible for acting on behalf of the shareholders in their supervision and overseeing capacity of management actions, providing the latter with advice and countering ineffective decisions when it comes to investments in production. As a result, boards are often blamed when things go wrong [10], and this is exactly what happened following the various corporate failures. Since the failures, boards have been scrutinized by regulators to a level where governance reformation had to take place, making it a worth-examining research topic. Hence, the primary aim of this study was to determine if the board of directors in Saudi firms is effective in their monitoring performance, regardless of the firm's ownership structure [11]. The argument that examining the monitoring incentives and the board's ability using several variables inspired this study. Indeed, the current study focuses on the board of directors' impact on the financial performance of Saudi firms listed on the stock market.

Viewed from a global level, Fintech's markets are increasingly growing in size and significance; and despite the varied pace of economic growth throughout the countries, the pace of collective development and growth of the entity is of great concern to older financial entities [12,13]. More specifically, Fintech technologies have led the way for small enterprises to access financial assistance. Fintech managed to fund 1387 deals, amounting to USD 24.6 billion in 2019 [12]. In the Kingdom, Vision 2030 stressed reforms to strengthen financial digitalization, urging for a society devoid of paper money, through an initiative that is aimed at transforming the game rules in the sector under the cover of the Financial Sector Development Program. This program is among the programs utilized to realize the Kingdom's Vision 2030 goals (https://vision2030.gov.sa/ (accessed on 25 March 2016)).

Added to the above, Fintech is expected to contribute to achieving financial stability through its key role in molding future transactions in financial services [12], and their technologies and products have proliferated in the past years, with some valued at more than USD 1 billion. In the face of such financial technology development, the Kingdom of Saudi Arabia is attempting to keep abreast by developing the sector, enabling strong investment returns for support. Financial technology firms furnish new solutions that are

useful for the financial sector in enhancing operational efficiency and effectiveness. In 2018, the Saudi Arabian Monetary Agency (SAMA) introduced the Saudi Fintech initiative to support the financial technology system, and ultimately boost the position of the Kingdom as a financial technology center that houses prosperous and responsible systems in its banks, investors, companies, universities, and state institutions, and assist them in their contribution to financial inclusion and digital financial transactions (https://fintechsaudi.com/ (accessed on 25 March 2018)). In 2019, the Kingdom of Saudi Arabia achieved 8% growth in its financial, insurance, and business services sector.

It is noteworthy that the financial sector of the Kingdom, following the financial crisis in 2008 that mandated the application of governance regulations, called for robust financial technology, to assist in achieving a good investment environment and credit for investors (local and international). This gap inspired the current study, which was conducted using qualitative means, to examine the impact of governance and financial technology. The financial sector is deemed to be one of the primary pillars of the national transformation initiative in the Kingdom's Vision 2030. Considering the aims and objectives of this study, its findings are expected to contribute to the literature on governance and Fintech in several ways. To begin with, the existent governance literature is extended by this study, as recommended by [14], as it examines the role of corporate governance characteristics in the Saudi financial sector. More importantly, the authors also suggest focusing on a distinct moderating variables that can improve the financial sector's performance level. Thus, this study employs a moderating variable that has not been examined, which may affect the financial sector's performance level (i.e., the Fintech).

The second contribution relates to the uniqueness of this study. Indeed, to the best of the authors' knowledge, this study is the first to investigate the effect of Fintech on financial firms in Saudi Arabia, a developing economy. Third, this study is also the first of its kind to examine the moderating effect of Fintech on the board of directors–financial firms performance relationship in Saudi Arabia. The study is expected to assist regulators, policy makers, companies, and stakeholders, when it comes to understanding the economic rationale behind possessing Fintech.

In the Section 2, a literature review and hypotheses development are presented, after which, the research methodology is subsequently discussed. The Section 4 is dedicated to reporting and discussing the results and the Section 6 concludes the study.

2. Literature Review and Hypothesis Development

Under this section, a review of the drivers of Saudi financial firms' performance through the extension, integration, and enrichment of several board of directors' variables (size, independence, meeting, commitment, and experience) is conducted. As stated, the study is unique in the sense that it is a pioneering study that examines the relationship between Fintech and the financial performance of financial firms listed on the Saudi stock market and the relationship between the board of directors and financial performance, via the moderating role of Fintech.

2.1. Board of Directors

The board of directors is evidently among the most significant corporate governance mechanisms [15]. It is the core entity in a company's internal governance, providing a monitoring responsibility, to deal with agency problems stemming from organizational management [1,16]. As for the updated Saudi Code of Corporate Governance, this mandates that companies' board of directors is responsible for business, referring to it as an internal corporate governance mechanism that directly impacts shareholders' returns [14,17,18]. Among the top responsibilities of the board of directors is the optimization of shareholder value, as mentioned by [19].

In the same line of study, ref. [8] indicated that the board of director's management monitoring role consists in regularly checking and controlling management, to ensure that all its actions are conducted based on rules and regulations. The characteristics of

a board of directors, including board size, board composition, and CEO duality, have a key role in affecting the financial performance of the firm, as mentioned in prior literature (e.g., [1,7,17,20–23]).

More importantly, the impact of the board of directors on the financial performance of firms is largely dependent on its effectiveness. Board effectiveness depends on three main elements (size, composition, and internal structure) [24]. Prior studies, such as [7,25], contended that board independence and board leadership structure are both crucial as board effectiveness determinants. Means and mechanisms are utilized by companies to carry out their CG practices for the purpose of minimizing agency conflicts and assist in promoting interest alignment [26]. Among the CG mechanisms, the board of directors is the most extensively studied, with monitoring by large shareholders and the compensation system for the alignment of incentives [20–23,26,27]. Thus, board size, board independence, board meeting, board commitment, and board experience are reviewed in the following paragraphs.

2.1.1. Board Size

The board size and composition are reflections of the external environment conditions, the current internal circumstances, and the prior firm financial performance [28]. Specifically, the number of board members is a crucial element in enhancing the firm's management [27]. In relation to the updated Saudi Code of Corporate Governance, it states that the members should consist of three to eleven members. According to the resource-dependence theory, larger-sized boards enhance the performance of firms, indicating a positive board size–firm performance relationship [27]. In the same way, ref. [29] revealed that firms with large-sized boards can be leveraged by the firm for their expertise and skills, which could work towards enhancing the firm's performance. Additionally, based on the efficiency perspective of the neo-institutional theoretical framework, large-sized boards enhance monitoring, with dominant CEOs being prevented from influencing the board members [30]. Based on these findings, board size and corporate performance have a positive significant relationship [22,31–34]. Some studies in the literature revealed an opposite finding (e.g., [35]), where large-sized boards are deemed to be challenged when reaching a consensus, which leads to several meetings [36–38], which could thus lead to wastage of time in reaching investment decisions, and eventually this adversely affects performance. In addition, large-sized boards lessen the firm's value because of the cost related to resolution of conflicts and coordination of communication flows [39].

On the other hand, large-sized boards have more experience, knowledge, and support [40]. However, the majority of the studies found a negative relationship between board size and corporate performance. These studies include [14,20,41–45]. Another set of studies found no effect at all on corporate performance [20,46–50]. On the basis of the above discussion, the present study proposes and tests the following hypothesis:

Hypothesis 1 (H1). *There is a significant negative relationship between board size and corporate performance.*

2.1.2. Board Independence

Members of the board that are non-executives are expected to monitor the managers' use of firm resources [51], hence minimizing agency issues and protecting the shareholders' interests. On the basis of the Saudi Code of Corporate Governance, the board should consist of a majority of non-executive members. Based on agency theory, the board should oversee the behavior of management, so that shareholders' interests are not compromised [6,52]. In relation to this theory, board independence is a monitoring tool that is useful in controlling the activities and actions of management [53,54]. In other words, independent directors are effective monitors compared to their counterparts when it comes to achieving shareholders' interests [10]. Similarly, the resource-dependence theory posits that the board of directors provides the company's resources and, thus, a greater number of independent directors is

expected to positively affect the performance of the company. In this regard, independent directors have a tendency to be a conduit between managers and stakeholders, and, as such, minimize agency problems [55].

In addition, Mathew et al., (2016) [56] stated that non-executive directors possess various backgrounds that could provide different perspectives to the board and lessen its complacent behavior, as well as the expertise needed to reach a judicious decision [57]. Prior empirical findings showed that board independence has a positive relationship with corporate performance (e.g., [14,20,46,58–60]).

In contrast, other studies showed a negative relationship between board independence and performance, namely [33,49,50,61–64]. Lastly, some other studies revealed a lack of relationship between the two variables (e.g., [22,48–50]). On the basis of the above discussion, this study hypothesizes that:

Hypothesis 2 (H2). *There is a significant positive relationship between board independence and corporate performance*.

2.1.3. Board Meeting

Board meeting is considered the number of yearly meetings that the board holds. Based on the Saudi Code of Corporate Governance, at least four yearly meetings have to be held by the board, with at least one meeting held every three months. The board meetings are crucial, because the board is acting on behalf of the shareholders who can, through meetings, collectively pass resolutions and reach decisions. A higher number of meetings is an indication of more opportunities to consider various board decisions and reach the ultimate decision [65]. According to [66], board meeting has implications on the performance of the firm, since strategic decisions regarding investment opportunities are reached during meetings. Meanwhile, [35] revealed that active boards generally reflect a response to negative performance, and [67] reported that poor board performance is reflected through their proactive stance towards enhancing operating performance, thus indicating a lag effect. On the other hand, the quality of the board meetings, as opposed to their frequency was underlined by [68], based on an argument that was advocated by prior studies that found a negative board meeting frequency–corporate performance relationship (e.g., [1,44]). Contrary to this finding, it was reported that board meeting assists the board's evaluation and the pursuit of board business for a period, and to find solutions to employee issues [28,69].

In the same line of study, shareholders' returns and premiums at the firm increase with early meeting of directors, which boosts the sales process [70]. According to [71], board meetings are informative corporate events that can result in decisive informed trading, changing the bid-ask spread. This was supported by [72], who contended that frequent board meetings and members' attendance of the meetings led to enhanced board performance. Ref. [66] noted implications of board meeting on the performance of the firm via strategic advice concerning opportunities for investment. Therefore, the frequency of board meetings may be stated as an element that could lead to enhanced firm performance and positively affect it, as evidenced in prior literature [37,38,73]. Contrasting findings were reported by some other authors, who found board meetings to have a neutral impact on corporate performance. These include studies by [44,48]. Considering the above discussion of prior findings, this study hypothesizes that:

Hypothesis 3 (H3). *There is a significant negative relationship between board meeting and corporate performance*.

2.1.4. Board Commitment

In business performance evaluation, another critical element is the commitment of the board of directors, which is generally required to realize the firm's target and to resolve

firm issues. Board commitment reflects the seriousness, oversight, evaluation, prominence, and excellence of the board in raising the business and investors' value [74]. In relation to the agency theory, separation of jobs makes for independent responsibilities and informed decision-making, brings about firm evaluation and monitoring, and demonstrates integrity for the stakeholders and transparency of information [6]. Specifically, affective commitment demonstrates the board members' performance and top managers' monitoring ability [75].

Similarly, ref. [76] revealed that directors holding legal backgrounds enable the provision of a higher financial reporting quality. Thus, board commitment is a reflection of the board members' obligation to enhance the firm performance [77]. Board performance has also been reported to be enhanced through frequent board meetings and board members' attendance of these meetings. Empirical findings showed that only a few studies have been dedicated to the relationship between board commitment and corporate performance and, thus, the present study is an attempt to reduce this literature gap. This study proposes that:

Hypothesis 4 (H4). *There is a positive relationship between board commitment and corporate performance.*

2.1.5. Board Experience

Board members' experience also indicates the board's monitoring role effectiveness, as mentioned in a study conducted by [78]. In relation to this, the Saudi Code of Corporate Governance requires that the firm's board of directors hold professional qualifications, experience, knowledge, skill, and independence for task completion. Meanwhile, ref. [1] illustrated that a financial expert as a board member reinforces corporate governance, by enabling the safeguarding of the owners' interests and increasing their value.

A financial expert refers to a board of director that is qualified and experienced in financial or accounting subjects and holds an accounting professional certificate [79], and this is represented by the proportion of financial expert members on the board. Prior studies [78,80,81] revealed that financial expert directors may be used as a proxy for effective board monitoring. Specifically, ref. [78] explained that board members' experience significantly determines the board monitoring effectiveness, while refs. [82,83] stated that board members' diversity and experience lead to the realization of informed strategic decisions that are a must for successful firms.

In a related study, ref. [84] revealed that the board of director's lack of experience in banks in Germany was positively related to losses for the years 2007 to 2008. In the same way, prior studies also found that board members' experience had a positive relationship with the performance of firms [1,78], while others reported no relationship between these variables (e.g., [85]). This study hypothesizes that:

Hypothesis 5 (H5). *There is a significant positive relationship between board experience and corporate performance.*

2.2. Fintech Direct Relationship with Corporate Performance

The topic regarding the relationship between information technology and financial services has been under research and focused on for a few decades in the literature, but interest in Fintech is still ongoing. In the context of banking, ref. [86] provided a discussion of the productivity and consumer welfare implications of IT. Two decades ago, ref. [12] provided a study that explained the consolidation of financial services. The study concluded that ongoing consolidation is more likely to be followed by specialization-induced fragmentation of the financial services in the corresponding industries. The author assumed that IT would lead to the specialized entrant players, which could lead to increased market niches and higher product customizations towards customers' preferences [12]. This is what is happening today in reality.

According to [87], changes and development in technology produce financial innovations among banks and have implications for Fintech development. In particular, non-intermediated peer-to-peer (P2P) lending, crypto-currencies, and smart contracts form a part of the novel new technology-assisted customized financial services realm. An unprecedented development is the level to which these developments entail non-intermediated transactions. Indeed, this study attempts to determine a significant value that could contribute to literature and provide an understanding of Fintech through empirical evidence. The study adopts the Fintech index from global Fintech Adoption Index 2019, to assist future authors in measuring this variable.

Additionally, when it comes to Fintech business, intermediation costs are lowered and the access to financial assistance is increased [13]. This efficiency-enhancing role of Fintech leads to overcoming and rectifying the asymmetries in information that form the banking business core, while steering clear of legacy technologies and a culture of efficient operational design. This is indicative of the considerable innovation capacity of Fintech firms compared to their traditional counterparts [88]. Major developments of digital technology include lending, payment systems, financial advising, and insurance, and the influence of Fintech is just beginning to surface in the banking field and capital markets [13].

Generally speaking, the belief about financial technology is that it has a key role in the current times; but applied studies have failed to address this factor's significance and its effects on performance in a logical and simplified way. Hence, this study aims to determine the effect of successful technology on the financial sector, especially in promoting financial services digitization, contributing to achieving financial stability, and shaping transactions and financial services in the future.

The allocation of Fintech-items was conducted through an unweighted-approach, which is an appropriate approach, since no specific user-group is given distinct importance [89]. Dichotomous-based numerical scoring was adopted to score the info-items, and more specifically, the unweighted Fintech-disclosure approach scores a firm "1" for an item provided in the annual report and "0" for its non-provision. The scores of Fintech were summed and calculated for every sampled firm, to form a ratio of the disclosure-score sum to the highest potential disclosure of the firm's Fintech items, and each of these items were reported in the form of a ratio, as suggested by [90,91]. On the whole, the unweighted Fintech-items reflect the level of the item's disclosure, as the proportion of the total Fintech-items that the specific company disclosed to the highest possible score applicable for the same company. According to [92], this is a widely accepted method for classifying the disclosure level based on an annual report.

This study makes the case that Fintech usage and adoption may improve the competitiveness and efficiency of the Saudi Arabian financial sector. Additionally, effective Fintech usage management may help the sector operate better and remain competitive. Considering previous research, the authors attempted to shed light on the relationship between Fintech and banks' performance in theory, and these include the works of [12,13,86–88,93–97]. Moreover, there have been few empirical studies that tested the relationship between Fintech and performance and found a good association [98,99]. Therefore, the present paper explores the impact of Fintech on financial firm (listed on the stock market) performance in Saudi Arabia. This study is a pioneering study that focuses on Fintech and financial sector performance. Thus, it is proposed that:

Hypothesis 6 (H6). *There is a relationship between Fintech adoption and corporate performance.*

2.3. Fintech's Moderator Effect

It has been shown that the developing Fintech industry positively impacts corporate performance. Due to Fintech, which enables consumers to handle their own accounts, consumers are more financially savvy than ever. Fintech, one of the most rapidly expanding sectors at the intersection of financial services and cutting-edge technology, is changing

how the traditional financial market operates. By using innovative techniques to produce products and services, technology start-ups and new market entrants are establishing the conditions essential for the successful expansion of Fintech in this market sector [100].

Smaller businesses' ability to compete on an equal footing with long-established banks and financial institutions is a major factor in the growth of the Fintech industry [2,86,93,98,101,102]. Due to the impact of Fintech, the competitive environment has transformed, with speed and response to the customers' constantly changing demands now being more important than scale. The "one size fits all" solutions offered by Fintech companies are also no longer applicable. A unique technique of combining financial services and information technology is described as "Fintech" in the current parlance. However, there is a long-standing relationship between technology and finance, which is often deepened and enhanced [13,103,104]. The financial crisis that hit the world in 2008 was a tipping point and was largely the impetus for Fintech's evolution into a fresh way of thinking. This transformation poses challenges for market participants and regulators, especially when attempting to weigh innovation's potential benefits and disadvantages. Fintech, an acronym for "financial technology", is the name given to innovations that are utilized to make financial transactions more straightforward, efficient, and profitable [105].

Fintech technology determines the confidence in the effectiveness of commercial banks. The use of digital technology has made significant strides in the fields of insurance, lending, payment systems, and financial counseling. Fintech has the power to lower the cost of financial intermediation, widen the availability of finance, and boost financial inclusion across all industry sectors. One of the reasons for this efficiency-improving role is the capacity to aid in resolving information asymmetries, which are the basis of the banking sector. Fintech businesses also have a culture of efficient operational design and do not have any old systems to maintain. They may innovate more than more established businesses [13]. The study by [103] further demonstrated that bank size is a moderating factor that affects the relationship between digital investments and profitability. Therefore, investments in financial technology for performance improvement benefit larger banks more.

According to [99], due to Fintech, banks have long-term potential for profitable development and competitiveness. Fintech promotes greater financial profitability, risk management, and innovation. Moreover, Fintech may enhance the conventional business model by lowering bank operating costs, enhancing customer service efficacy, bolstering risk management skills, and developing more client-focused business models for clients, thus increasing overall competitiveness [104,106,107]. As a result, the financial and banking industries' business strategies now take into account Fintech advancements. Financial organizations that follow this adoption process wisely may benefit from Fintech breakthroughs. As a result, the present market is more competitive and efficiency is increased [108]. Artificial intelligence, mobile technologies, and blockchain improvements to the financial technology sector are the main forces fueling competitiveness via better client services [109].

The banking industry is crucial to the economic growth and sustainability of a person, a sector, and a nation. Banks must give value to stakeholders via new procedures and services if they are to remain competitive and achieve consistent success in the banking business [110]. Utilizing cutting-edge technology to provide goods and services to stakeholders will accelerate growth [111]. As a result, technological advancements that led to advances in banking goods and services have fundamentally altered the banking industry's operations. Fintech's ultimate goal is to assist businesses in streamlining their operations and delivering more competitive goods and services. Competitiveness may refer to a multitude of concepts, such as effectiveness, efficiency, adaptability, technology, quality, production, value creation, etc. [112–114].

This study makes the case that Fintech usage and adoption may improve the competitiveness and efficiency of the Saudi Arabian financial sector. Additionally, effective management of Fintech usage may help the sector operate better and remain competitive. Considering previous research, the authors have attempted to shed light on the

relationship between Fintech and banks' performance in theory, and these include studies by [12,13,86–88,93–97]. Moreover, there are few empirical studies that have tested the relationship between Fintech and performance and found a good association [98,99]. Moreover, the existent governance literature is extended by the study as recommended by [14], since it examines the role of corporate governance characteristics in the Saudi financial sector. More importantly, the authors also suggested focusing on a distinct moderating variable that can improve the financial sector's performance level. Thus, this study employs a moderating variable that has not been examined, which may affect the financial sector's performance level (i.e., Fintech). Thus, the present study explores the impact of Fintech on financial firm (listed on the stock market) performance in Saudi Arabia. This study is a pioneering study, in the sense that it focuses on the moderating role of Fintech between the board of directors and financial sector performance. The study proposes a suitable index to measure Fintech, adopted from the global fintech adoption index 2019, to help future studies fulfill their objectives. Thus, it is proposed that:

Hypothesis 7 (H7). *Fintech adoption has a moderating role on the relationship between the board of directors and corporate performance.*

3. Research Method

3.1. Data Collection

Data were gathered from financial firms' (banks and insurance firms) annual reports. The sample consisted of 47 listed firms (financial sector) for the years 2014 to 2020. The total observation included 329 firms. This study focused on financial firms, as the regulations are different between financial and non-financial firms, and delisted firms with incomplete data were also included. Data were gathered from annual reports, DataStream, and company profiles. Several approaches were adopted to recognize the association between corporate governance, Fintech, and corporate performance, and suitable methods were selected for model fitting. Moreover, this study used TQ and ROA as dependent variables, since these variables allow short- and long-term integration, in order to continually control performance [115].

3.2. Methodology

On the basis of the procedures of hypotheses development, the regression equations to be estimated are as follows:

$$\text{Tobin-Q} = \beta 0 + \beta 1\ \text{BODSIZE} + \beta 2\ \text{BODINDE} + \beta 3\ \text{BODMEETING} + \beta 4\ \text{BODCOMMIT} + \beta 5 + \text{BoardACEX} + \beta 6\ \text{Fintech} + \beta 7\ \text{FIMSILOG} + \beta 8\ \text{BankSECTOR} + \beta 9\ \text{AGE} + \beta 10\ \text{Year} + \varepsilon i \quad (1)$$

$$\text{ROA} = \beta 0 + \beta 1\ \text{BODSIZE} + \beta 2\ \text{BODINDE} + \beta 3\ \text{BODMEETING} + \beta 4\ \text{BODCOMMIT} + \beta 5 + \text{BoardACEX} + \beta 6\ \text{Fintech} + \beta 7\ \text{FIMSILOG} + \beta 8\ \text{BankSECTOR} + \beta 9\ \text{AGE} + \beta 10\ \text{Year} + \varepsilon i \quad (2)$$

$$\text{Tobin-Q} = \beta 0 + \beta 1\ \text{BOD-SC} + \beta 2\ \text{Fintech} + \beta 3\ \text{FIMSILOG} + \beta 4\ \text{BankSECTOR} + \beta 5\ \text{AGE} + \beta 6\ \text{Year} + \varepsilon i \quad (3)$$

$$\text{ROA} = \beta 0 + \beta 1\ \text{BOD-SC} + \beta 2\ \text{Fintech} + \beta 3\ \text{FIMSILOG} + \beta 4\ \text{BankSECTOR} + \beta 5\ \text{AGE} + \beta 6\ \text{Year} + \varepsilon i \quad (4)$$

$$\text{Tobin-Q} = \beta 0 + \beta 1\ \text{BOD-SC} + \beta 2\ \text{Fintech} + \beta 3\ \text{Fintech*BOD-SC} + \beta 4\ \text{FIMSILOG} + \beta 5\ \text{BankSECTOR} + \beta 6\ \text{AGE} + \beta 7\ \text{Year} + \varepsilon i \quad (5)$$

$$\text{ROA} = \beta 0 + \beta 1\ \text{BOD-SC} + \beta 2\ \text{Fintech} + \beta 3\ \text{Fintech*BOD-SC} + \beta 4\ \text{FIMSILOG} + \beta 5\ \text{BankSECTOR} + \beta 6\ \text{AGE} + \beta 7\ \text{Year} + \varepsilon i \quad (6)$$

3.3. Measurement of the Variables

In this sub-section, the measurement method used on the variables is presented (refer to Table 1).

Table 1. Measurement of the Variables.

Variable Name and Abbreviation	Operationalization
Corporate performance (CP)	Performance is measured through accounting-based measurement (ROA), which represents net income or profit over total assets, and market-based measurement (TQ), which represents the ratio of market capitalization added to total debt, over the total assets of the company.
Board size (BODSIZE)	The board size measurement is based on the number of board of directors on the board.
Board independence (BODINDE)	Board independence is measured through the number of independent board directors to the total number of board directors.
Board meeting (BODMEETING)	This variable is measured by obtaining the number of meetings that the board held in a year.
Board commitment (BODCOMMIT)	Board commitment is measured by the ratio of the attendance of directors in annual meeting.
Board experience (BoardACEX)	Experience of the board is measured by the financial experts' board experience and is the percentage of financial experts on the board.
Fintech (Fintech)	Fintech is measured by the adopted index from Global Fintech adoption index 2019. To see more details, please refer to Appendix A no. 1.
Firm size (FIMSILOG)	The size of the firm is measured through natural log of total assets.
Firm age (AGE)	The age of the firm is measured by obtaining the number of years the firm has existed.
Sector (BankSECTOR)	Sector is measured through a dummy variable.
Years (Year)	Year is measured through a dummy variable.
BOD_SC	The study ensured standardization by dividing the actual company score in the category by the highest yearly value.
BODNONEX	Board non-executives is measured by the number of non-executive board directors to the total number of board directors.
Fintech*BOD-SC	An interaction variable between Fintech*BOD-SC.

4. Empirical Results

The chosen model had to be tested, to make sure that multiple regression assumptions were not breached and to avoid erroneous results. In this setting, the choice of the appropriate model was determined by certain underlying hypotheses and empirical investigations [116–118]. Due to the nature of this research, which spanned seven consecutive years and included 47 cross-sectional firms, the panel data model was used instead of the cross-section companies' model or the time series model, due to the benefits that the panel data model offers. The diagnostic tests considered issues with multicollinearity and heteroscedasticity after choosing the right model. When time series and cross-sections are combined to provide comparable results, panel data may enhance the amount and quality of data, as well as the quality of empirical analysis. This is not achievable when merely employing one of these two dimensions. To obtain identical outcomes, this would not be

feasible if just one of these two dimensions was used. However, over time, panel data are able to detect changes in the variable that is being controlled by it.

Panel data are able to impact a number of variables that have been excluded without even realizing that they existed [116,118]. The following list of inspections and tests were carried out in order to determine which model was most suited for use in this investigation. To choose between the random effect model and the pooled OLS regression, Breusch–Pagan–Langrangian multiplier random effects inspection was used (constant coefficients model). A choice was made between the two models of the model (LM). The outcomes of the LM examination, which are shown in Table 2, provide evidence that indicates substantial differences across companies, indicating that the null hypothesis should be rejected. Accordingly, taking into consideration the recommendations made by [118,119], the most appropriate option would be random effect regression. The Hausman specification test compares fixed effects to the random effects, in order to evaluate whether a model is more suitable for the data, supposing that each impact is uncorrelated with the other regressors in the model. This comparison was conducted despite the null hypothesis, which claimed that there was no correlation between the individual effects and the other regressors in the model. According to the findings shown in Table 3, Hausman specification tests were statistically insignificant (prob chi2 value greater than 0.05). As a result, the null hypotheses were not rejected; hence, it was possible to draw the conclusion that random effects regression could be performed in this article [118].

Table 2. Correlation matrix.

Variable	1	2	3	4	5	6	7	8	9	10	11
ROA (1)	1.000										
TQ (2)	0.148 ***	1.000									
Fintech (3)	−0.050	−0.300 ***	1.000								
BODSIZE (4)	0.055	−0.152 ***	0.345 ***	1.000							
BODINDE (5)	0.052	0.041	−0.036	−0.318 ***	1.000						
BODMEETING (6)	0.028	0.117 **	−0.067	0.175 ***	−0.055	1.000					
BODCOMMIT (7)	0.072	−0.115	0.284 ***	0.592 ***	−0.114 **	0.251 ***	1.000				
BoardACEX (8)	0.126 **	−0.122 **	0.382 ***	0.092 *	−0.006	−0.146 ***	0.133 **	1.000			
FIMSILOG (9)	0.088	−0.325 ***	0.778 ***	0.366 ***	−0.067	−0.114 **	0.319 ***	0.428 ***	1.000		
BankSECTOR (10)	−0.001	−0.331 ***	0.847 ***	0.381 ***	−0.135 **	−0.147 ***	0.197 ***	0.332 ***	0.829 ***	1.000	
AGE (11)	0.004	−0.317 ***	0.729 ***	0.366 ***	−0.135 **	−0.078	0.296 ***	0.221 ***	0.603 ***	0.728 ***	1.000

Note: all variables have described in Table 1; significance level as follows: (*) $p < 0.10$; (**) $p < 0.05$ and (***) $p < 0.01$, respectively.

4.1. Diagnostic Tests

A suitable model was chosen for the paper using regression diagnostics tests: these tests determine the meeting of the logistic regression assumptions for the entire variables and avoid reaching an ambiguous outcome. As part of this test, the multicollinearity issue was inspected using tests, prior to running the multivariate analysis, ensuring that the independent-dependent variable relationships were clearly specified [120]. This necessitated running diagnostic examinations, including a correlation coefficient matrix test and variance inflation factors (VIF). The correlation coefficient analysis outcome supporting a high statistical correlation, with values 0.9 and over, indicated a serious collinearity issue [120]. However, in Table 2, the correlation matrix reveals no serious multicollinearity issue as the variable correlations in the model remained under 0.90 (less than 0.8275). This meant that the correlation matrix test ruled out any multicollinearity issues in the models.

This study could not prove that there was a multicollinearity problem, since the correlation coefficient test only analyzes the relationship between two variables [120]. Tolerance and the value of the variance inflation factor (VIF) are both values that represent and quantify the amount to which one independent variable is not understood by another

set of independent variables. The VIFs for the models that study the association between TQ as DV and other independent variables are shown in Table 3, and this may be found along with those models. In VIF, values lower than 10 are acceptable, according to prior studies [120,121]; and based on Table 3, the VIF values all stayed within the threshold, which means there was no multicollinearity issue among the independent variables. Moreover, the model obtained a VIF value of 3.14, which further supports the non-existence of multicollinearity issues among the independent variables.

Table 3. Variance inflation factors (VIF).

Variable	VIF	1/VIF
BankSECTOR	6.14	0.1629
Fintech	4.55	0.2196
FIMSILOG	3.95	0.2531
AGE	2.51	0.3991
BODSIZE	1.93	0.5170
BODCOMMIT	1.84	0.5432
BoardACEX	1.29	0.7773
BODMEETING	1.16	0.8600
BODINDE	1.16	0.8602
Mean VIF	2.73	

Descriptive statistics interpreted the results obtained from the independent and control variables and for this study, and Table 4 contains the outcome of the descriptive statistics analysis. From the table, the TQ values for the companies differed from −3.57% to 6.77, and the mean value was 69.93%. This result is indicative of a high average TQ in the sample firms. The average Fintech of the study sample was 39.86%, which is, on average, good. Moreover, Saudi listed companies, on average, have a low application of Fintech in comparison to their developed counterparts.

Table 4. Descriptive statistics.

Variable	Mean	Std. Dev.	Min	Max
TQ	0.699	0.875	−3.572	6.767
ROA	0.014	0.049	−0.305	0.377
Fintech	0.399	0.327	0.000	1.000
Fintech	0.000	0.991	−1.266	1.794
BOD_SC	0.000	2.334	−6.535	5.195
BODSIZE	8.842	1.508	5.000	12.000
BODINDE	0.486	0.183	0.200	1.000
BODMEETING	5.523	1.704	3.000	12.000
BODCOMMIT	0.909	0.039	0.778	1.036
BoardACEX	4.262	1.363	2.000	7.000
Fintech*BOD-SC	1.014	2.093	−5.135	8.588
FIMSILOG	6.571	1.000	5.090	8.800
BankSECTOR	0.255	0.437	0.000	1.000
AGE	20.400	19.500	0.000	94.000

Regarding other independent variables, e.g., BODSIZE, BODINDE, BODNONEX, BODMEETING, BODCOMMIT, and BoardACEX, these were in an average range between 88.4, 84.60, 46.92, 55.22, 90.89, and 42.62, respectively, which means they were a good average in the study sample. Moving on to the control variables of the study, Table 5 shows that firm size (FIMSILOG) had a mean of 6.5711, with maximum and minimum values of 8.8 and 5.09, respectively. The bank sector had an average mean of 0.255, with maximum

and minimum values of 1.00 and 0.00%. The firm age (AGE) obtained a mean of 20.4%, with maximum and minimum values of 94% and 0%. However, descriptive analysis is a type of analysis that is limited, owing to its disregard of the independent variable's interrelations.

Table 5. Regression results.

Variable	Expected	Model 1 (TQ)		Model 2 (ROA)	
	−	**Coef.**	**z**	**Coef.**	**z**
BODSIZE	−	−0.0997	−1.820 ***	0.001	0.28
BODINDE	+	−0.5119	−1.730 ***	0.032	2.14 **
BODMEETING	−	0.0278	0.990	0.000	−0.01 *
BODCOMMIT	+	1.0833	0.700	0.050	0.51
BoardACEX	+	−0.0112	−0.240	0.047	1.61 *
Fintech	−/+	0.5328	1.770 ***	−0.047	−4.09 ***
FIMSILOG	−	−0.2566	−2.370 ***	0.015	1.77 *
BankSECTOR	−	−0.4319	−1.710 ***	−0.011	−0.58
AGE	−	−0.0082	−2.170 ***	0.000	0.77
Year	−	Yes			
_cons	−	3.2989	2.58 ***	−0.156	−1.48
Prob > chi2	−	0.0000		0.000	
R^2—R-sq: overall	−	0.2431		0.0875	

Note: all variables have described in Table 1; significant level as follow: (*) $p < 0.10$; (**) $p < 0.05$ and (***) $p < 0.01$ respectively.

4.2. Multivariate Results

Prior to running multivariate analysis, influential observations and outliers were controlled, as recommended in past studies [122], and the independent variables were examined for the presence of multicollinearity issues [122].

Table 5 shows the findings of the association between corporate performance measured by TQ, ROA, and Fintech and other mechanisms of corporate governance variables. Models 1 and 2 provide the results of an estimate model that investigated the relationship between performance as assessed by TQ, ROA, and Fintech and other corporate governance tools, notably the BODSIZE, BODNONEX, BODMEETING, BODCOMMIT and BoardACEX of the sampled companies H_1, H_2, H_3, H_4, H_5, and H_6. As reported in the model in Table 5, the association between TQ and ROA and independent variables in the model was significant ($p < 0.0000$).

These findings supported hypothesis H1 by revealing a negative significant relationship between TQ and BODSIZE. This finding supported hypothesis H1a and is consistent with past research [14,20,42,44]. Large boards are thought to have difficulty reaching an agreement, which might result in several meetings [36,37]. On the contrary, the findings revealed a positive but non-significant relationship between ROA and BODSIZE. The results did not support this hypothesis. This discovery is consistent with earlier research [20,46,48,50].

The findings for BODINDE revealed that it has a negative correlation with TQ. The findings did not support H2a. This discovery is consistent with earlier research [33,50,62,63]. An independent board controls management actions by acting as a monitoring instrument. BODINDE, on the other hand, shows a positive correlation with ROA. This meant that H2b was supported. This discovery is consistent with earlier research [14,46,58–60]. According to [56], non-executive directors have a variety of experiences, which may help the board obtain new ideas and reduce complacency.

BODMEETING shows a positive but non-significant relationship with TQ, according to the findings. H3a does not support this. This discovery is consistent with earlier research [37,38,73]. BODMEETING, on the other hand, shows a negative correlation with ROA. H3b agrees with this finding. This discovery is consistent with earlier

research [44,123]. Ref. [35] found that active boards are more likely to respond to bad performance, while ref. [67] found that poor board performance is reflected in their proactive approach to improving operational performance, suggesting a lag effect.

The findings showed that BODCOMMIT had a positive but non-significant relationship with TQ and ROA. H4 does not support these findings. Despite the necessity of members attending meetings to address concerns and the speed with which choices were made, which seemed to aid in the implementation of the company's strategic plan, the outcomes showed that the link between them is no longer necessary. This suggests that the meetings conducted may fall short of their objectives.

The findings for BoardACEX revealed that it has no significant relationship with TQ. In other words, the data do not support H5. BoardACEX, on the other hand, was shown to have a favorable correlation with ROA. This discovery is consistent with earlier research [78,123]. A financial specialist is a member of the board of directors who is knowledgeable and skilled in financial or accounting matters and carries a professional accounting certificate [79].

Fintech has a considerable impact on TQ and ROA, according to the findings. The findings thus supported H6. This is the first research to look at this connection with performance. When it comes to Fintech, the cost of intermediation is reduced and access to financial aid is expanded [13]. Due to Fintech's efficiency-enhancing function, the asymmetries in information that comprise the banking business core were overcome and rectified, while legacy technology and a culture of efficient operational design were avoided.

FIMSILOG, BankSECTOR, and AGE had a negative significant relationship with TQ as control variables. BankSECTOR and AGE, on the other hand, had a negative correlation with ROA. The coefficients of the regressors, which show how much TQ changes when any independent variable increases by one year, are expressed in the research model in terms of years.

5. Additional Analysis

The standardized indicators are factor-related [124]. Ref. [125] described standardization as a process that brings about result interpretation. The sum of the standardized characteristics of the board of directors forms the composite measure (i.e., the sum of board size, board independence, board meeting, board commitment, and board experience) [81,125–127]. This measure is suitable to be utilized as a fixed measurement of BOD-SC and Fintech; hence, the score was calculated in the following way:

$$\sum_{i=1}^{n}\left(1-\sum_{t=1} pij2\right)/n$$

Following [81,125–127], the factor identification required the standardization of five board of directors' characteristics, namely board size, board independent, board meeting, board commitment, and board experience; after which the governance index scores (BOD-SC) was obtained by calculating the mean sum of each factor's characteristics.

Table 6 shows the findings of the association between corporate performance measured by TQ and ROA and Fintech and other mechanisms of BOD-SC. Model 3 and Model 4 report the findings of the estimation models that examined the relationship between corporate performance measured by TQ and ROA and Fintech score and the BOD-SC mechanism score of the sampled companies. As reported in Model 3 and 4 in Table 6, the association between TQ and independent variables in the models was significant ($p < 0.0000$), at 22.05 and 7.0 percent.

Table 6. Regression results.

Varabile	Model 3 (TQ)		Model 4 (ROA)	
	Coef.	**t**	**Coef.**	**t**
BOD-SC	0.053	2.72 ***	−0.001	−0.64
Fintech	0.436	1.67 *	−0.036	−3.35 ***
FIMSILOG	−0.171	−2.18 **	0.020	2.33 **
BankSECTOR	−0.410	−2.36 **	−0.020	−1.14
AGE	−0.007	−2.57 **	0.000	0.73
_cons	2.392	3.97 ***	−0.095	−1.90 *
Year	Yes			
Number of obs	329			
Prob > F	0.000		0.000	
R-squared/R-squared-overall	0.2205		0.07	

Note: all variables are described in Table 1; significant level as follow: (*) $p < 0.10$; (**) $p < 0.05$ and (***) $p < 0.01$, respectively.

The findings in Table 6 reveal that BOD-SC and TQ have a connection. This finding suggests that combining factors provides a clear image, which will aid in improving company performance. Furthermore, the findings demonstrated that Fintech had a favorable impact on TQ. This finding backs up the views of those who have advocated for the adoption of financial technology because of its relevance in facilitating transactions between parties, which helps to improve the services offered by businesses and so improves their performance. These findings, on the other hand, demonstrate a negative negligible relationship between ROA and BOD-SC mechanism score, indicating that BOD-SC, as a set of points, has a statistically insignificant negative influence on the organizations' performance-TQ. This finding supports the idea that certain factors did not fit and, as a consequence, did not achieve their intended objective of boosting performance via synergy.

Furthermore, Fintech had a negative correlation with ROA. This result supports the possibility that the financial sector's services did not fully meet the requirements that customers sought from the sector, implying that the sector should always strive to conduct a survey to determine customer satisfaction with the quality and modernity of technology, in order to keep up with developments.

In terms of firm-specific characteristic factors, the results of Models 3 and 4 showed substantial negative associations between TQ and three variables: FIMSILOG, bankSECTOR, and AGE. On the contrary, the outcomes indicate significant positive relationships between ROA and FIMSILOG. In addition, the outcomes indicate non-significant relationships between ROA and BankSECTOR and AGE.

In terms of the YEARS, this was reflected in the study model the coefficients of the regressors, which indicate how much TQ and ROA changes when any independent variables increased by one year. YEARS had a negative impact and was statistically significant from 2014 to 2019, and on the contrary it had a negative impact, but it was not statistically significant in the year 2020, and this can be interpreted as a result of the pandemic that the world is going through and its impact on the sectors under study.

In Models 5 and 6, we used Fintech as a moderator in the association between BOD_SC-TQ and ROA, in order to know whether Fintech has an intermediate effect between them. Table 7 demonstrations the findings of the association between corporate performance measured by TQ, ROA, and Fintech and other mechanisms represented in BOD-SC. Models 5 and 6 provide the results of estimate models that investigated the link between corporate performance measured by TQ and Fintech, BOD-SC mechanisms score, and Fintech*BOD-SC as a moderator variable of the sampled companies. As reported in models 5 and 6, in

Table 7, the association between TQ and independent variables in the model was significant ($p < 0.0000$), with R^2 of 22.19 and 7.0 percent.

Table 7. Regression results of fintech as a moderator.

Varaible	Model 5 (TQ)		Model 6 (ROA)	
	Coef.	**t**	**Coef.**	**t**
BOD-SC	0.051	2.69 **	−0.001	−0.62
Fintech	0.440	1.67 *	−0.036	−3.3 ***
Fintech*BOD-SC	0.016	0.71	−0.001	−0.66
FIMSILOG	−0.179	−2.27 **	0.020	2.32 **
BankSECTOR	−0.394	−2.37 **	−0.021	−1.18
AGE	−0.007	−2.6 **	0.000	0.75
Year	yes			
_cons	2.423	4.02	−0.097	−1.9
Prob > F	0.000		0.000	
R-squared/R-squared-overall	0.2219		0.07	

Note: all variables are described in Table 1; significant level as follow: (*) $p < 0.10$; (**) $p < 0.05$ and (***) $p < 0.01$, respectively.

The outcomes showed that there is a connection between corporate performance-TQ and Fintech and this relationship is positively significant; this is in line with what we found for Model 5. On the other hand, and also in line with what we found for Model 6, the results display that there was a negative insignificant association between ROA and BOD-SC mechanisms represented as score, and this outcome means that BOD-SC as a group of points had a statistically insignificant negative impact on the companies' performance-TQ. In addition, Fintech and this relationship was negatively significant and this is in line with what we found for Model 6.

Moreover, Model 5 and 6 show the results of the assessment models that examined the relationship between corporate performance measured by TQ, ROA, and Fintech, BOD-SC mechanisms score, and Fintech*BOD-SC as moderator variables of the sampled companies. As reported in models 5 and 6, in Table 7, the associations between Fintech*BOD-SC, TQ, and ROA were non-significant. Meaning that, Fintech no effective association between BOD-SC and performance. This result supports the fact that the majority of insurance companies did not apply the same technology applied by banks, which in turn produced the absence of an impact of Fintech between the relationship BOD_SC and performance, which in turn reinforces that the sector must apply semi-unified technology, in order to ensure the provision of quality services that help improve the performance of companies in this sector.

In the Models 5 and 6, the results show that there were strong negative connections between TQ and three variables: FIMSILOG, BankSECTOR, and business age (AGE). On the contrary, the outcomes indicated significant positive relationships between ROA and FIMSILOG. In addition, the outcomes indicated non-significant relationships between ROA and BankSECTOR and AGE.

6. Conclusions

6.1. Summary and Concluding Remarks

Considering effective corporate governance application and the financial technology developments in the financial sector, this research aimed to investigate the direct and indirect relationship between board of director effectiveness, Fintech, and the performance of listed Saudi financial firms. The study sample comprised financial firms listed on the stock market for the years from 2014 to 2020. The study excluded non-financial firms, as they have regulations and organizations particular to their sector. The study also excluded

delisted firms and those with incomplete data. The findings showed a significant association between board size, board independence, board meetings, board experience, and Fintech and corporate performance. This study revealed that there is a significant correlation between the board of director scores and performance. Furthermore, this research revealed that the association between the board of directors score and corporate performance was not moderated by Fintech.

This paper contributes to the literature by providing insights into the theoretical and practical aspects of corporate governance relationships with Fintech. Different groups in varying fields have shown increasing interest in business concepts such as corporate governance and its relationship with Fintech. Despite this interest, sufficient theoretical and practical frameworks have yet to be proposed individually/synergistically. Accordingly, this study contributes to the literature dedicated to corporate governance and Fintech in the following ways: The study allows a better perception of the significance of the board of directors when it comes to Fintech. The literature regarding this topic has been mixed and attempted to furnish solid evidence for the significant question regarding the type of board members that could bring about enhanced corporate performance. This study presents findings of board of directors that have yet to achieve the desired level, in light of their size, independence, meeting, commitment, and accounting experience. Such findings add value to the proposed theoretical framework.

Another contribution concerns the evidence presented on the relationship between the board of directors and corporate performance in the context of developed economies, which are often mixed and ambiguous, failing to reach a consensus on this relationship. This study attempted to extend past studies, which tended to focus on the board of directors (e.g., [14,21–23,123]), rather than a present examination of the relationship between the board of directors and Fintech. This study adopted rigorous tests and measures to provide accurate results, reliable insights, and implications for corporate performance, leading to a more extensive and in-depth insight into the level of the board of directors and strengthening the analysis process.

Third, this study is one of the first studies to investigate the effect of Fintech on financial firms in the context of Saudi Arabia, a developing nation. Moreover, the study was first to test the moderating role of Fintech on the relationship between the board of directors and financial firms in the context of Saudi Arabia. The research findings have implications for regulators, policy makers, firms, and their stakeholders, in light of the economic rationale behind adopting Fintech. Lastly, the study findings are expected to assist the regulators of Saudi Arabia when it comes to corporate governance regulation development, as well as the Fintech firms in the financial sector.

6.2. Limitations and Future Suggestion

As in many previous studies, this study has some limitations. First, this study focuses on the financial sector. Given the differences in the regulations between the financial and the non-financial sector, we recommend that future studies consider non-financial sectors. Second, this study was the first to examine empirically the relationship between Fintech and performance, so we suggest more studies are conducted among the Gulf countries specially, as well as globally. Third, this study examined the board of directors and Fintech. Therefore, we strongly suggest future researchers take into consideration other corporate governance mechanisms and Fintech. Fourth, this study examined the association of the board of directors with Fintech, so we recommend that future studies examine empirically the direct association between Fintech and performance.

7. Notes

1. We tested the heteroskedasticity for ROA and TQ, the results found that Prob > chi2 (0.0116 and 0.0000), respectively. Based on this result, the study used robust to run the models.
2. We tested the Breusch and Pagan Lagrangian multiplier, in order to decide which model was appropriated such as, OLS and GLS. Based on the results, Prob > chibar^2

for ROA was 0.0017, meaning that this model was used with the Hausman test, in order to choose which kind of model was used, such as random or fixed. The findings showed that Hausman specification tests were negligible (prob chi2 greater than 0.05). As a result, the null hypotheses were not rejected, and it was possible to infer that random effects regression could be used in this article [118]. Moreover, for the TQ model, the value of Prob > chibar^2 (0.3991) was nonsignificant, meaning that the OLS was appropriate.

3. In relation to the occurrence of heteroscedasticity, which is one of the major violations in regression analysis using cross-section data [128]. This paper used [129] heteroscedasticity examinations to detect the heteroscedasticity problem. The model tests generally reflect the heteroscedasticity ranking, which means there are no persistent differences. This work employed robust standard errors to regulate heteroscedasticity [130–132].

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Conflicts of Interest: Authors assure that they have no competing professional, financial, or personal interests from other parties.

Appendix A

Table A1. Fintech Items (This Index Adopted from Global Fintech Adoption Index 2019).

Categories	Items
"Money transfer and payments"	"Online foreign exchange"
	"Overseas remittances"
	"Digital-only branchless banking"
	"Peer-to-peer payments and non-bank money transfers"
	"In-store mobile phone payments"
	"Cryptocurrency eWallet"
"**Budgeting and financial planning**"	"**Online budgeting and financial planning tools**"
	"**Online retirement and pensions management tools**"
"Savings and investments"	"Lending on peer-to-peer platforms"
	"Investments via crowdfunding platforms"
	"Online investment advice and investment management"
	"Online stock broking"
	"Online spread betting"
"**Borrowing**"	"**Online-only loan providers**"
	"**Online marketplaces and aggregators for loans**"
	"**Online loan brokers and broker facilitation websites**"
"Insurance"	"Insurance premium comparison sites"
	"Insurance-linked smart devices"
	"App-only insurance"

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