CORPORATE GOVERNANCE AND EFFECT IN FINTECH: EVIDENCE FROM GULF COOPERATION COUNCIL BANKING SECTOR

Aws AlHares *, Yousef AlBaker **

* *Corresponding author*, College of Business Management, University of Doha for Science and Technology, Doha, Qatar
Contact details: College of Business Management, University of Doha for Science and Technology, Al Tarafa, Jelaiah Street Duhail North, P. O. Box 24449, Doha, Qatar
** College of Business Management, University of Doha for Science and Technology, Doha, Qatar

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Abstract

This study looks at the banking sector in the Gulf Cooperation Council (GCC) from 2013 to 2021 to determine the impact that corporate governance had on financial innovation, as well as the impact that financial innovation had on performance. Thirty (30) commercial banks with 270 annual observations were selected, including 5 banks from each country. In order to quantify the factors at play, we queried databases such as Refinitiv Eikon and Fitch Connect. The research indicates that banks with a greater number of directors with backgrounds in finance or accounting, a higher attendance rate of directors, a higher ratio of independent directors, a higher average director education level, and a greater number of directors with a background in finance or accounting, provide more cutting-edge financial services. Since 2017, corporate governance has been a more significant factor in how banks approach providing new, cutting-edge financial services to their customers. Furthermore, a bank's profitability and value will rise in direct proportion to the extent to which it provides cutting-edge financial services. Furthermore, the value of financial holding subsidiary banks could rise if they provided more innovative financial services. However, the same action taken by non-financial holding banks could have a negative impact on their profitability.

Keywords: Fintech, Corporate Governance, Innovation, GCC, Banks, Ownership Structure

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1. INTRODUCTION

The rapid progression of financial technology is having a significant influence on the banking sector, and the provision of banking services has advanced as a direct result of financial technology over the course of the last decade (Belcher & Mackey, 2020). Either by increasing the value-added services that are provided to consumers or by collecting cash from fees charged for the convenience of modern financial services, banks may be able to increase their performance and hence their profitability.

The innovation-growth hypothesis postulates that financial innovation will transform the way banks deliver financial services and will also expand the variety of banking services. As a result, innovation in financial services contributes to the expansion of banking institutions by facilitating the enhancement of services, the sharing of risks, and increased efficiencies. According to the available research, banks that are situated in nations that have a greater degree of financial innovation have a faster rate of growth in their assets, loans, and earnings. It is critical for the economic growth of a nation to be able to adapt to new trends in the financial sector. One way this may be accomplished is by improving the efficiency of the nation's banking system and offering a wider range of financial products and services. It is important to do in-depth research on the topic of whether or not financial innovation has an effect on banks since, in general, it is requiring the banking sector to deal with change (Birla, 2020).

For the time period covered by this analysis (2013–2021), the research focused on domestic banks based in the Gulf Cooperation Council (GCC). Thirty (30) commercial banks with 270 annual observations were selected, including 5 banks from each country. Bank performance, financial innovation, corporate governance (CG), and bank-specific traits are the four categories into which the empirical variables are separated. To quantify our study factors, we consult the Refinitiv Eikon and Fitch Connect databases. The number of directors' shares held, the number of shares held by institutional investors, the size of the board, the number of independent directors, the percentage of directors who are present at board meetings, the average education level of directors, and the percentage of directors with experience in finance, accounting, or the law are all factors taken into account in our empirical models. Our research shows that banks with a higher percentage of institutional investors, higher attendance rates among directors, a higher ratio of independent directors, a higher average education level among directors, and a higher percentage of directors with a background in finance or accounting are more likely to provide cutting-edge financial services.

The paper is organized as follows. Section 2 discusses the literature review and Section 3 presents the research methodology. Section 4 provides empirical results, while Section 5 concludes the paper.

2. LITERATURE REVIEW

The significance of good corporate governance has recently come to the attention of people from all over the globe. This is due to the fact that good corporate governance encourages domestic savings and international portfolio investment. After the passage of the Sarbanes-Oxley Act, there has been a marked acceleration in the creation of CG soft rules in both developed and developing nations. Academics have also paid a lot of attention to the expanding issue of corporate governance in recent years. The great majority of corporate governance, on the other hand, has shifted its focus to finance and economics, using agency theory as the principal research method to guide their investigations (Belcher & Mackey, 2020). However, many academics in the field of governance have lately concluded that the assumptions of agency theory are too limited to properly identify and explain the size, structure, and board duties of distinct companies in terms of their performance. However, there is not a single, comprehensive theory that can account for all of the facets of corporate governance. As a result, there is a need to analyze corporate governance, especially board-related research, from the viewpoint of several theories. Because of the crucial role it plays in both the functioning of companies and the expansion of economies across countries, corporate governance has emerged as an intriguing subject of discussion in recent years. Inadequate corporate governance is a key factor in the collapse of many businesses, making it one of the most important contributors to the loss of trust among investors (Belcher & Mackey, 2020). At the same time, it is one of the most important factors in ensuring the continued existence of a company. Specifically, ownership structure has the power to diversify their assets and urge the firms in which they have invested to undertake ideas that have potential. Over the course of the last two decades, there has been a significant increase in the amount of academic attention directed toward the effect that corporate governance has on the financial success of a firm. Professionals generally think that this trend is a huge step forward for corporate governance practices. The traditional method of studying the effect of corporate governance on firm performance has given way to one that investigates the effect of corporate governance reforms on firm performance via a mediating mechanism, such as board roles. Recent years have seen a shift away from studying corporate governance and capital structure in academic research. Existing evidence suggests that leverage is critical for a company to both successfully finish innovation and ensure it has the financial resources necessary to launch new products profitably (Belcher & Mackey, 2020). On the other hand, corporate governance inevitably involves a large variety of parties, with promises made to significant stakeholders including consumers, brokers, competitors, and employees, as well as the time-based requirements of the business (Solikhah et al., 2022; Saif-Alyousfi & Saha, 2021; Antwi et al., 2021; Abdel-Baki et al., 2011).

Investors face less risk as a result of good corporate governance standards, which, in turn, boosts investor confidence in regard to capital investment and benefits the firm's overall financial performance. In order to accomplish its goals concerning revenue generation, the commercial enterprise needs access to sufficient financial resources (Birla, 2020). The literature study finds a research gap, which implies that the direct link between corporate governance and firm performance is ambiguous in oil-rich nations. This is shown by the fact that the research gap has been identified. It gives adequate reasons for this research, which will investigate whether or not corporate governance changes might reduce the effect of capital structure on the performance of companies listed in four developing stock markets in the GCC (Birla, 2020). In particular, they investigate the influence that CG mechanisms have on the market value of publicly

traded companies in oil-producing nations that are members of the GCC, with a specific focus on family-controlled businesses, as determined by Tobin's Q and the ratio of market value to book value. Therefore, it is necessary to investigate the elements that have the potential to influence the firm's capital structure as well as its financial performance. In this particular circumstance, the previous literature is lacking. There is no agreement among scholars about the elements that impact the success of firms, either in new markets or in markets that are already mature.

Cash is also sourced through the stock markets of GCC countries. By 2021, it is expected that the GCC countries will have amassed more than US$3.5 trillion in foreign direct investment (FDI). On top of that, efforts are being made to turn the region into a significant commercial hub serving customers in Southeast Asia, the Middle East, and Africa (Aldien, 2020). However, the combined market capitalization of GCC stock exchanges increased by 1.9% month-over-month to $1.03 trillion in January 2017 despite a reduction in equities that was in line with the price of oil. Despite the recent drop in oil prices (AlMubarak, 2018). It is also noteworthy that three GCC stock markets — Qatar, the UAE, and Saudi Arabia — rank among the frontier markets with the best risk-adjusted outlook for the next two years. The GCC markets are in a prime location and have the fastest growth rate of any market worldwide. Additionally, advancements in technology are having a significant impact on the growth of the GCC's financial sector infrastructure (Aldien, 2020). Several reasons have contributed to the unique growth of GCC financial markets, including the increased participation of ordinary investors, the record expansion in market capitalization of specific markets, and the emergence of a distinct asset class. The GCC stock markets are the most active in the Middle Eastern region since they do not impose taxes on dividends or capital gains. Both domestic and foreign investors can benefit greatly from these qualities since they boost their confidence in the equity market (Aldien, 2020).

There is a widespread belief that inadequate corporate governance standards in developing economies were the primary factor that led to Asia's economic crisis in 1997–1998. This is a perspective that is supported by evidence. According to the research that has been done so far, poor corporate governance procedures were a contributing factor in the poor performance of corporations throughout this crisis (Saif-Alyousfi & Saha, 2021). A company's ability to effectively manage its relationships with its stakeholders and shareholders, in particular, is directly impacted by the quality of the corporate governance practices that are considered to be important to the basic principles of the organization. The researchers are certain that the highest possible standards of corporate governance will be necessary for the future for the dependability of businesses, the performance of companies, and the maintenance of sustainable development. The nations that make up the GCC have made it a priority to develop robust corporate governance rules and procedures (Saif-Alyousfi & Saha, 2021). However, the topic of the connection between the company and its constituents is brought up while discussing corporate governance. At the same time, the issue of who the shareholders of the company are and why only components should be considered emerges. Despite this, there is a significant school of thought that advocates for broad corporate responsibility directives. notwithstanding the fact that the link between traditional concepts of corporate governance and restrictions. In contrast, corporate governance unavoidably encompasses a wide range of constituents, with commitments extended to major stakeholders including customers, brokers, competitors, employees, and time-based needs (Saif-Alyousfi & Saha, 2021). The mission and ethical foundations are very obvious; nonetheless, there are significant obstacles in the way of putting this vision into action. Firms that are governed by professional managers, who may not be answerable to dispersed shareholders, are the subject of a larger discussion on corporate governance and performance. This debate is taking place in relation to companies. It is common knowledge that today's businesses face a challenge brought on by the traditional division of ownership and management responsibilities. The problem is figuring out how to make sure that management is looking out for shareholders' best interests. Corporate governance issues brought on by geographically dispersed owners can be better understood via the lens of the agency theory. In light of the fact that modern corporations are run by self-interested managers whose actions may not be in their shareholders' best interests, the agency theory was put forth to explain the business model (Saif-Alyousfi & Saha, 2021). The modern corporation is defined as a managerial organization motivated by self-interest, hence this was done to accommodate this reality. In the framework of the separation of ownership and control in the modern corporation, agency theory takes a contractual perspective and says that managers or agents try to maximize their personal utility rather than striving for the utility of principles. Managers and agents, according to agency theory, are driven by the desire to maximize their own utility. The issue of agency arises when an agent begins to act in a way that is more advantageous to the agent than the principal. It happens when the agent puts his own needs ahead of those of the principal. However, there are concerns over agency issues, such as the costs incurred to carry out the procedures on behalf of the shareholders by the board to ensure that their money is being spent in a way that serves their best interests (Saif-Alyousfi & Saha, 2021).

In the GCC, an analysis of one hundred banks in the GCC economy found that profitability has a positive relationship with the growth of the banking sector, the growth of the stock market, the development of cost efficiency, and inflation (Boubaker et al., 2022). According to research on the factors that influence bank performance, which was conducted on 37 commercial banks in Qatar, Saudi Arabia, Oman, Kuwait, and the UAE, liquidity, non-interest income, credit risk, and capitalization all have a positive impact on profitability, while cost has a negative impact on profitability. The impact of inflation is null, but the effect of economic growth is large and positive. The findings demonstrated that an increase in bank capital contributes to increased

profitability, but an increase in bank size has the opposite effect. In spite of this, it was not possible to determine the relevance of the macroeconomic variables (Boubaker et al., 2022).

When looking at the elements that contribute to bank performance in GCC countries, researchers discovered that both internal and external factors played crucial roles (Robiyanto et al., 2020). In particular, the research found that both the size of the bank and its operational efficiency drove performance higher. This was in reference to the former. The performance of banks is negatively impacted by inflation, despite the fact that economic growth has a beneficial impact on the performance of banks. It is possible to understand the performance of banks by looking at both the internal and external forces at play. According to their results, the equity-to-asset ratio, bank size, and capital ratios all have a favorable impact on a company's profitability, but the effects of risk, operational inefficiencies, and inflation all have a negative effect (Robiyanto et al., 2020). According to their research on the factors that influence bank performance, they found that although a bank's huge size has a positive impact on its overall performance, a greater level of risk has the opposite effect. When it comes to the collection of internal variables, the only one that counts to explain bank performance is size. On the other hand, internal variables do not play a large part in the explanation of the performance of banks (Robiyanto et al., 2020).

An authorization to subsidize the pricing of petroleum products is issued by governments. This move may modify the influence that the prices of petroleum products have on inflation, which may have a detrimental impact on investment (Nourani et al., 2022). In addition, oil has extremely low and positive dynamic correlations with stocks in GCC countries, which suggests that investing in oil is also a dangerous investment. The standard explanation for volatility in stock prices, known as the leverage effect, may also be observed in the oil market. The scholars also reached the conclusion that gold is a more affordable hedge in GCC states (Nourani et al., 2022). The purpose of this investigation is to evaluate the statistical characteristics as well as the volatility series of the daily stock market returns. The authors conduct an analysis to see how well a number of different dual long-memory processes can identify a number of important characteristics, including long-range dependencies, asymmetries, non-linearity, and multiple seasonality or time-varying correlations (Nourani et al., 2022). It includes a large number of stylized data in the modeling technique in order to evaluate how well these new models reproduce and recognize the distinguishing characteristics of stock market indexes.

Boubaker et al. (2022) explore the existence of fractional dynamics in the returns and volatilities of six GCC stock market indexes, which include Bahrain, Oman, Kuwait, Qatar, Saudi Arabia, and the UAE. In light of this, a collection of dual long-memory models that reproduce a variety of stylistic elements is used in order to suit the dynamic structure of the series that was evaluated. The objective of the study is to assess the accuracy of forecasts generated by a variety of GARCH-type models when applied to three distinct time horizons: five, ten, and fifteen days in the future. In addition to this, it investigates the fundamental properties that drive the forecasting performance of these GARCH models and their ability to anticipate the future. They discovered that enterprises operating in the GCC conform to 69% of the criteria that were mentioned in the Corporate Governance Index (CGI). In addition, the data reveal that firms listed on the UAE stock market have the most adherence to the CG trait investigated in the research by Dieme (2020). This is followed by companies listed on the stock markets of Oman, Saudi Arabia, Qatar, and Kuwait, in that order. As a result, the study has examined the agency and resource reliance views in relation to board structure, board duties, and corporate success (Dieme, 2020). According to the research, boards that are bigger in size are better equipped to recruit more seasoned and capable star directors for their respective businesses. This was discovered in the body of academic work (Dieme, 2020). However, there is no previous study on the influence of the audit committee's thoroughness with respect to the functions of the board that can be found in the available literature. For this reason, the following hypothesis is operationalized with respect to the current body of research for the purpose of examining the link between corporate governance, capital structure, and the financial performance of GCC-listed enterprises.

H1: Financial innovation may be influenced by the ownership structure of a bank.

The financial performance of companies based in GCC nations is susceptible to being affected by corporate governance. In addition to corporate governance, the success of a company may also be affected by a variety of other factors, including the company size, the industry in which it operates, its financial structure, yearly impacts, and so on. In this study, we studied the influence of the board size, board meetings frequency, and institutional ownership on financial performance while controlling for other parameters (Copigneaux et al., 2020). The minimum number of board members required for a company in Oman is 6.30, whereas the typical value of board size in Kuwait is 8.5. Qatar has a mean value of frequency of board meetings (FOBM) of 3.96, whereas Saudi Arabia has the lowest possible value, which is 2.50 (Saif-Alyousfi & Saha, 2021). The financial performance metric known as ROA may reach a maximum of 4.85% in Saudi Arabia and 3.47% in Kuwait, while the accounting financial performance measure known as Tobin's Q can reach 1.34 in Qatar and 0.44 in the UAE. According to these findings, businesses that have smaller board sizes have higher performance (Saif-Alyousfi & Saha, 2021). This is due to the fact that companies with bigger board sizes have lower levels of net earnings. In a similar vein, businesses with a greater FOBM performed better and improved their financial performance. This is because these businesses defend the rights of their stakeholders via increased connectedness (Copigneaux et al., 2020).

H2: Innovation in banking may be influenced by the structure of a bank's board.

A company's innovation investment is subject to a negative moderating impact brought on by its ownership structure. However, the concentration of ownership does not have a substantial impact on the technical innovation performance of enterprises.

Certain forms of ownership, such as institutional or foreign shareholders, do, however, have a beneficial impact on this performance (Wang et al., 2021).

When it comes to a company's endeavors to engage in innovative endeavors, ownership and control structures play an important role. Family-owned businesses have a higher propensity to participate in creative product creation (Wang et al., 2021). The percentage of a company's shares held by institutional investors has a significant impact on the amount of money that business invests in innovative endeavors, whereas the percentage of shares held by the government has a negative impact on the amount of money that banks invest in financial innovation (Tsindeliani et al., 2021). When there is a larger proportion of directors and block holders among the bank's shareholders, the institution has a greater propensity to demonstrate higher levels of investment in financial innovation (Wang et al., 2021). According to the agency theory viewpoint, shareholders from various domains have varied interests in monitoring and diverse preferences with respect to a bank's actions related to financial innovation. This is also true from a preference standpoint. In Qatar, institutional local holdings tend to have a preponderant role in the ownership structure of financial institutions like banks (Wang et al., 2021). The following hypothesis is proposed:

H3: The background characteristics of directors have an effect on the financial innovation of a bank.

3. RESEARCH METHODOLOGY

As our research subjects, we chose domestic banks located within the GCC region, and we gathered all of the pertinent data between the years 2013 and 2021. After removing those institutions that lacked sufficient empirical data, a total of 30 commercial banks with 270 yearly observations were chosen, with 5 banks coming from each country. The GCC economic database was searched, and information on corporate governance and finances was retrieved. The banking industry in the GCC countries is still in the infant stages of financial innovation. Even though there is continuous growth in financial innovation, there is still a lack of relevant data and it is often incomplete. As a result, we first retrieve the data from the official bank websites and annual reports, and then we manually organize and archive the data.

The empirical variables are organized into 4 distinct groups: bank performance, financial innovation, corporate governance, and bank-specific features. Each of these groups has its own subcategory. Profitability is referred to as the factors that are assessed to evaluate a bank's performance. These variables include return on assets (*ROA*), return on equity (*ROE*), net interest margin (*NIM*), and non-interest income (*nonNIM*). Due to the paucity of available data on the subject of financial innovation inside banks, we use the creative financial services provided by banks as a stand-in for the variable of interest, financial innovation (Tsindeliani et al., 2021). When it comes to bank-level financial data, we use Refinitiv Eikon and Fitch Connect databases to measure our research variables. We analyzed the commercial banks' official websites and yearly reports in order to categorize the new financial services into 3 distinct categories: digital services, data applications, and artificial intelligence. It has come to our attention that the number of novel financial services that are made available by commercial banks has been growing on an annual basis. The rate of growth picks up considerably after the year 2017, particularly. From 2013 to 2016, banks provided a much greater number of products on average than they did in 2013. Despite this, the number of things that banks sell on average has increased over the course of the years 2017–2022, respectively. In addition, research has shown that the ownership structure, board structure, and background attributes of directors are the corporate governance factors that have the most influence on the amount of money invested in innovative projects. In our empirical models, we consider variables such as the shareholding ratio of directors, the shareholding ratio of institutional investors, the size of the board, the ratio of independent directors, the attendance rate of directors, the average education level of directors, and the ratio of directors with a background in finance, accounting, or the law. The empirical models further adjust for the influence of bank-specific factors, such as the capital adequacy ratio, bank size, and bank age. Table 1 shows the definitions of the variables.

Table 1. Definition of variables (Part 1)

Variable	*Definition*
Bank performance	
Tobin's Q (*TobinQ*)	(Year-end share price × Total number of ordinary shares outstanding + Book value of long- and short-term liabilities) / Total assets
Return on assets (*ROA*)	(Net income after tax / Average total assets) × 100
Return on equity (*ROE*)	(Net income after tax / Average shareholder equity) × 100
Net interest margin (*NIM*)	(Net interest income / Total assets) × 100
Noninterest net income rate (*nonNIM*)	(Net fee income + other noninterest net income)/total assets × 100
Financial innovation	
Number of innovative financial services offered by banks (*FIBUSINESS*)	*FIBUSINESS* = £ innovative financial services. The innovative financial services offered by the banks are classified into three types (i.e., digital service, data application, and artificial intelligence). A total of 28 innovative financial services are offered by GCC's banks
Corporate governance	
The ratio of directors with a legal background (*LAW*)	(Z number of directors with a legal background / Total number of directors) × 100
The ratio of directors with a financial or accounting background (*ACCOUNT*)	(Z number of directors with a financial or accounting background / Total number of directors) × 100

Table 1. Definition of variables (Part 2)

Variable	*Definition*
Corporate governance	
The shareholding ratio of directors (*BODHOLD*)	(Number of shares of directors / Total number of ordinary shares outstanding) × 100
The shareholding ratio of institutional investors (*INSTHOLD*)	[Number of shares of legal entity (including government agencies, domestic financial institutions, domestic trust funds, domestic corporations, other domestic legal entities, overseas financial institutions, overseas legal entities, and overseas trust funds) / Total number of ordinary shares outstanding] × 100
FHC bank (*FHC*)	Presented by a dummy variable. A financial-holding subsidiary bank, FHC = 1; a non-financial-holding bank, FHC = 0
Board size (*BODSIZE*)	Total number of directors
The ratio of independent directors (*INDRATIO*)	(Number of independent directors / Total number of directors) × 100
Attendance rate of directors (*ATTEND*)	[Z actual attendance of each board director / Z (actual attendance of each board director / Attendance rate)] × 100
Average education level of directors (*EDU*)	Assign numerical values to the education level of directors: senior high school and below = 1, university = 2, master's degree = 3, doctoral degree = 4; average education level of directors = the sum of the education level numerical values of directors/ total number of directors in the year
Bank-specific characteristics	
Bank size (*SIZE*)	Natural logarithm of the total assets
Bank age (*AGE*)	Years since the bank was founded
Capital adequacy ratio (*CAR*)	CAR = (Tier I + Tier II + Tier III (Capital funds)) / Risk-weighted assets × 100

Both cross-sectional and time-series empirical data are used. The two-way panel data random-effects model is used because dummy variables do not evolve over time and collinearity may arise from the fixed intercept term (Pindyck & Rubinfeld, 1998). The following empirical equations are constructed in order to test the aforementioned hypotheses.

$$FIBUSINESS_{it} = \alpha_0 + \beta_1 BODHOLD_{it} + \beta_2 INSTHOLD_{it} + \beta_3 BHC_{it} + \beta_4 CAR_{it} + \beta_5 SIZE_{it} + \beta_6 AGE_{it} + u_i + \delta_t + \varepsilon_{it} \quad (1)$$

$$FIBUSINESS_{it} = \alpha_0 + \beta_1 BODSIZE_{it} + \beta_2 INDRATIO_{it} + \beta_3 ATTEND_{it} + \beta_4 CAR_{it} + \beta_5 SIZE_{it} + \beta_6 AGE_{it} + u_i + \delta_t + \varepsilon_{it} \quad (2)$$

$$FIBUSINESS_{it} = \alpha_0 + \beta_1 EDU_{it} + \beta_2 ACCOUNT_{it} + \beta_3 LAW_{it} + \beta_4 CAR_{it} + \beta_5 SIZE_{it} + \beta_6 AGE_{it} + u_i + \delta_t + \varepsilon_{it} \quad (3)$$

$$PERFORMACE_{it} = \alpha_0 + \beta_1 FIBUSINESS_{it} + \beta_2 CAR_{it} + \beta_3 SIZE_{it} + \beta_4 AGE_{it} + u_i + \delta_t + \varepsilon_{it} \quad (4)$$

Financial innovation is the dependent variable used in an analysis of the relationship between corporate governance and presented in equations (1)–(3). The frequency with which banks provide cutting-edge financial products and services is measured in *FIBUSINESS*. The relationship between the independent variable of financial innovation and the dependent variable of performance is investigated using equation (4). The five factors that make up *PERFORMANCE* are the return on assets (*ROA*), return on equity (*ROE*), net interest margin (*NIM*), and Tobin's Q (*TobinQ*). There are firm effects, denoted by u_i, and year-effects, denoted by δ_t, with the residual term, ε_{it}, being the third variable. Table 1 provides the variable definitions.

4. RESULTS

4.1. Descriptive statistical analysis

Panel A in Table 2 reveals that the median *ROA*, *ROE*, and Tobin's Q for the sample banks are 0.647, 8.637%, and 0.10, respectively, with the greatest variation seen in *ROE* between institutions. With an average shareholding ratio of 55.257%, institutional shareholders appear to exert considerable influence on the GCC banking sector. There will be no change in the median number of *FIBUSINESS* offerings (innovative financial services) provided by 30 commercial banks between 2013 and 2021. The average attendance rate of directors is 89.144%, there are around 11 directors altogether, and the ratio of independent directors to total directors is 24% on the median. Directors with master's degrees fall about in the center of the pack, as the median of the average education level of directors is 2.82. Averages show that 33.51% and 15.03% of board members come from financial accounting and legal experience, respectively. Furthermore, Panels B and C of Table 2 show that FHC banks offer a greater median number (12) of innovative financial services than non-FHC banks (7 items). Furthermore, FHC banks have a larger number of independent directors and a higher ratio of directors having a background in finance, accounting, or law compared to non-FHC banks.

Table 2. Descriptive statistics of variables

Variable	Panel A: All sample			Panel B: FHC banks			Panel C: Non-FHC banks		
	Mean	Median	SD	Mean	Median	SD	Mean	Median	SD
ROA	0.689	0.647	0.359	0.688	0.687	0.273	0.689	0.600	0.442
ROE	7.650	8.637	3.273	8.589	8.717	2.837	8.717	8.640	3.714
NIM	0.002	0.003	0.003	0.003	0.001	0.003	0.002	0.004	0.002
nonNIM	0.009	0.008	0.002	0.010	0.080	0.002	0.009	0.011	0.003
TobinQ	0.107	0.100	0.045	0.110	0.110	0.053	0.092	0.090	0.029
FIBUSINESS	10.246	9.000	6.626	12.500	12.000	7.043	9.548	8.000	5.475
BODHOLD	16.454	10.037	15.487	15.298	8.872	15.367	20.566	20.510	14.131
INSTHOLD	55.257	67.257	16.413	68.704	70.488	9.789	62.788	64.260	22.315
BODSIZE	11.667	11.000	3.386	13.116	13.000	3.598	12.031	12.000	2.967
INDRATIO	26.083	24.000	7.927	27.863	26.128	8.594	25.988	25.000	6.769
ATTEND	89.144	90.617	5.826	90.108	90.378	5.276	90.243	92.610	6.560
EDU	2.813	2.820	0.354	3.016	3.073	0.315	2.733	2.778	0.344
ACCOUNT	33.515	32.329	0.256	44.813	40.000	0.287	27.364	26.970	0.160
LAW	15.031	8.093	0.195	17.472	9.087	0.228	14.149	10.556	0.134
CAR	84.024	115.907	62.426	135.82	132.012	19.411	13.052	13.220	1.730
SIZE	18.961	20.193	1.016	21.509	21.627	0.826	20.188	20.088	0.740
AGE	25.452	16.000	20.449	13.568	14.000	3.564	44.716	58.000	20.482

Table 3 displays the results of a t-test that compares the levels of innovation at banks that were either FHCs or non-FHCs before and after 2018. The 2018 figures in Table 3 Panel A show a decline in *ROE*, *nonNIM*, and *TobinQ*. This finding explains why banks spent a lot of money on developing new financial services but saw little improvement in their bottom line as a result. This can be because of the cutthroat rivalry in the banking industry or because of size-based inefficiencies. Table 3 indicates that when comparing FHC banks to non-FHC banks, Panel B shows that FHC banks have much higher *NIM*, *nonNIM*, *TobinQ*, and innovative financial services. Banks that provide a high volume of innovative financial services have a higher net interest margin, as seen in Panel C of Table 3. Perhaps the majority of consumers' novel financial service needs are met by firms operating on the traditional net interest margin.

Table 3. The difference comparison t-test

Variable	Panel A: Before vs. after 2017			Panel B: FHC vs. non-FHC banks			Panel C: High vs. Low innovation		
	Before	After	T-test	FHC	Non-FHC	T-test	High	Low	T-test
ROA	0.711[a]	0.556	-1.117	0.692	0.688	0.013	0.678	0.681	-0.059
ROE	9.024	8.248	-1.4835*	8.605	8.732	-0.254	8.501	8.562	-0.113
NIM	0.015	0.011	1.287*	0.005	0.005	3.018***	0.012	0.012	1.741**
nonNIM	0.005	0.004	-2.143**	0.013	0.012	1.377*	0.003	0.004	-0.573
TobinQ	0.115	0.103	-1.930**	0.120	0.095	3.997***	0.111	0.107	0.682
FIBUSINESS	5.336	15.805	18.715***	12.500	9.442	3.212***	20.334	8.252	19.664***

*Note: a. is the mean value. The definition of the variables is presented in Table 1. The asterisks ***, **, and * indicate significance levels of 1%, 5%, and 10%, respectively.*

4.2. Corporate governance, financial innovation, and performance

Correlation findings between corporate governance and financial innovation are shown in Table 4. Over the course of the study period, banks were less likely to provide cutting-edge financial services if they had a higher proportion of directors with legal experience. In contrast, banks are more likely to provide cutting-edge financial services if they have a higher percentage of institutional investors as shareholders, a higher ratio of independent directors, a higher attendance rate of directors, a higher average education level of directors, and a greater number of directors with a financial or accounting background. Corporate governance will have a greater effect on banks' ability to provide cutting-edge financial services beyond 2018. Previous research has shown that ownership (Chi, 2017; Choi et al., 2012), board structure (Balsmeier et al., 2017; Chen et al., 2016), and background traits of directors (Shen et al., 2020) are all linked to banks' involvement in innovation, thus these findings are in line with that. In contrast to earlier research, we did not discover any causal link between directors' shareholdings and financial creativity (Chi, 2017).

Table 4. The correlation between corporate governance and financial innovation

Variable	Panel A: 2013–2016 period			Panel B: 2017–2021 period		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
BODHOLD	-0.026			0.022		
	(1.276)			(0.625)		
INSTHOLD	0.040			0.223***		
	(2.151)			(9.685)		
FHC	-0.814			39.412***		
	(0.322)			(12.845)		
BODSIZE		-0.378***			0.343**	
		(5.078)			(2.276)	
INDRATIO		0.021			0.302***	
		(0.651)			(6.578)	
ATTEND		0.002			0.351***	
		(0.076)			(10.174)	
EDU			2.126***			-1.118
			(2.678)			(1.231)
ACCOUNT			2.684**			5.779***
			(2.207)			(8.146)
LAW			-2.329*			-3.347*
			(1.636)			(1.863)
CAR	0.013	0.002	-0.001	-0.195***	-0.036***	-0.023**
	(1.003)	(0.288)	(0.062)	(11.556)	(3.686)	(2.188)
LNSIZE	1.145**	1.532***	1.034***	0.485	3.881***	5.426***
	(2.515)	(4.321)	(2.872)	(0.804)	(8.952)	(11.615)
AGE	0.054*	0.014	0.022	0.305	0.028	0.133***
	(1.948)	(0.674)	(1.362)	(10.848)	(0.947)	(4.032)
Constant	-22.623**	22.774***	-23.394***	-31.184**	-108.729***	-98.922***
	(2.446)	(3.024)	(3.354)	(2.252)	(12.589)	(10.476)
Firm-effect	Yes	Yes	Yes	Yes	Yes	Yes
Time-effect	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.016	0.132	0.054	0.436	0.207	0.246
F-statistic	1.171	3.610***	2.102*	17.105***	10.170***	7.863***
Durbin-Watson	0.856	0.814	0.911	0.855	0.753	0.631

*Note: Model 1 is equation (1) used to verify H1. Model 2 is equation (2) used to verify H2. Model 3 is equation (3) used to verify H3. The definition of the variables is presented in Table 1. The value in parentheses is the t-value of the coefficient estimates. The asterisks ***, **, and * indicate significance levels of 1%, 5%, and 10%, respectively.*

In Table 5, we see the results of a correlation analysis between financial innovation and bank performance. From 2013 to 2016, the financial innovation of the banking industry in the GCC was still in its early stages. There is an opportunity in providing novel financial services, as there are not many competitors. Table 5, Panel A, demonstrates that engaging in financially-innovative activities boosts *ROA*, *ROE*, and *nonNIM*. The GCC government has aggressively promoted and encouraged the banking industry to participate in financial innovation, and the number of new financial services offered has steadily expanded since 2017. In contrast, though, market competitiveness has heated up. Table 5, Panel B, reveals a negative impact on *ROE* whereas favorable impacts are seen on *NIM*, *nonNIM*, and *TobinQ*. Our results corroborate the conclusion from the literature that new forms of financial innovation can boost banks' bottom lines (Cheng, 2018; El-Chaarani & El-Abiad, 2018).

Table 5. The correlation between financial innovation and bank performance (Part 1)

Panel A: 2013–2016 period					
Variable	ROA	ROE	NIM	nonNIM	TobinQ
FIBUSINESS	0.034***	0.305***	0.002	0.001***	0.001
	(3.372)	(3.024)	(4.313)	(2.643)	(1.182)
CAR	0.002	-0.005	0.000*	0.000	0.001***
	(1.285)	(0.432)	(1.844)	(0.368)	(6.947)
LNSIZE	-0.043	1.324*	-0.003***	-0.001*	-0.052***
	(0.648)	(1.762)	(3.782)	(1.667)	(5.908)
AGE	0.007*	0.056	0.002	0.001	0.002
	(1.718)	(1.315)	(0.824)	(0.141)	(2.276)
Constant	1.134	-21.161	0.068***	0.039**	1.063***
	(0.813)	(1.382)	(4.322)	(2.435)	(5.848)
Firm-effect	Yes	Yes	Yes	Yes	Yes
Time-effect	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.088	0.172	0.127	0.024	0.024
F-statistic	3.363***	5.036***	4.525***	1.608	16.230***
Durbin-Watson	1.598	1.684	1.425	1.328	1.512

Table 5. The correlation between financial innovation and bank performance (Part 2)

Panel B: 2017–2021 period					
Variable	***ROA***	***ROE***	***NIM***	***nonNIM***	***TobinQ***
FIBUSINESS	-0.002	-0.080**	0.002***	0.002***	0.001***
	(0.893)	(2.248)	(11.576)	(3.162)	(4.867)
CAR	0.002*	0.002	0.000***	0.000	0.001***
	(1.947)	(0.245)	(6.068)	(1.223)	(6.403)
LNSIZE	-0.055	1.352***	-0.005***	0.004***	-0.031***
	(1.074)	(3.373)	(11.880)	(5.594)	(6.443)
AGE	0.006*	0.039	0.000	0.000	0.001**
	(1.834)	(1.510)	(0.313)	(0.518)	(2.361)
Constant	1.520	-20.189**	0.104***	-0.067***	0.654***
	(1.457)	(2.506)	(11.687)	(4.512)	(6.667)
Firm-effect	Yes	Yes	Yes	Yes	Yes
Time-effect	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.024	0.111	0.559	0.181	0.172
F-statistic	1.712	3.596***	38.688***	7.567***	12.525***
Durbin-Watson	1.731	1.595	1.186	1.258	1.028

*Note: Equation (4) is used to verify H4, the five dependent variables are namely ROA, ROE, NIM, nonNIM, and TobinQ, respectively. The definition of the variables is presented in Table 1. The value in parentheses is the t-value of the coefficient estimates. The asterisks ***, **, and * indicate significance levels of 1%, 5%, and 10%, respectively.*

Further, we employ two-stage simultaneous equations (2SLS) to examine the connection between financial innovation and bank performance while accounting for the endogeneity of equations (1)–(4). (AlHares, 2020a). Table 6 displays the outcomes of the secondary regression analysis. When comparing *ROA* and *ROE* between 2013 and 2016, innovative financial services only showed a favorable correlation. After 2017, the banks' *ROA*, *ROE*, *nonNIM*, and *TobinQ* were positively correlated with the provision of new financial services, with the exception of *NIM* (AlHares, 2020b). There is no difference between these and the findings from Table 5.

We conclude by doing some analyses of robustness. We categorize the sample into high financial innovation and low financial innovation by comparing the top and bottom 25% of the number of innovative financial services offered by banks' dummy data. A high value is used as a benchmark to compare two different degrees of financial innovation. To examine the dissimilar effects of high and low financial innovation on bank performance, we include an extra interaction variable, *FIBUSINESSE* × *High*, in equation (4). In addition, we use a dummy variable for the years 2017 and later, and we add an interaction variable *FIBUSINESSE* x *After* to the previous equation (4) to assess how the rules have changed since 2017. Table 6 displays the findings.

Table 6. The effect of financial innovation on bank performance considering endogeneity

Panel A: 2013–2016 period					
Variable	***ROA***	***ROE***	***NIM***	***nonNIM***	***TobinQ***
FIBUSINESS	0.121**	1.288**	0.002	-0.001	-0.001
	(0.057)	(0.536)	(0.001)	(0.001)	(0.002)
Adj. R^2	0.0098	0.0163	0.0128	0.3165	0.3717
Wald x^2	14.78**	22.07***	4.02	24.62***	82.52***
Panel B: 2017–2021 period					
Variable	***ROA***	***ROE***	***NIM***	***nonNIM***	***TobinQ***
FIBUSINESS	0.060*	0.602**	-0.001	0.001*	0.006**
	(0.001)	(0.271)	(0.001)	(0.001)	(0.003)
Adj. R^2	0.1977	0.3402	0.1232	0.4462	0.3601
Wald x^2	16.22**	35.32***	31.37***	85.58***	46.73***

*Note: The results of the first-stage regression analysis and the firm-specific variables are not presented in Table 6. Definition of the variables is presented in Table 1. The value in parentheses is the t-value of the coefficient estimates. The asterisks ***, **, and * indicate significance levels of 1%, 5%, and 10%, respectively.*

Panel A of Table 7 displays substantial *FIBUSINESSE* x *High ROA,* and *TobinQ* coefficients of 0.006 and 0.001, respectively. Findings reveal a positive correlation between a bank's profitability and worth and the extent to which it offers services at the cutting edge of financial innovation. The significant *FIBUSINESSE* x *After* coefficients for *ROE* and *TobinQ* may be found in Panel B of Table 7. After 2017, there is evidence to suggest that banks can benefit from new financial services by increasing their profits and value.

Table 7. The results of the robustness analysis (Part 1)

Panel A: The impact of high and low levels of financial innovation					
Variable	***ROA***	***ROE***	***NIM***	***nonNIM***	***TobinQ***
FIBUSINESS	-0.008	-0.032	0.001	0.000	0.001
	(0.006)	(0.075)	(0.001)	(0.000)	(0.001)
FIBUSINESS x *High*	0.006**	0.050	0.001	0.000	0.001*
	(0.002)	(0.032)	(0.001)	(0.000)	(0.001)
Adj. R^2	0.2552	0.1942	0.0844	0.3524	0.3032
Wald x^2	70.83**	54.33***	43.35***	107.76***	193.07***

Table 7. The results of the robustness analysis (Part 2)

Panel B: The impact of new regulations issue after 2017					
Variable	***ROA***	***ROE***	***NIM***	***nonNIM***	***TobinQ***
FIBUSINESS	-0.002	-0.140	-0.001	0.000	-0.001
	(0.012)	(0.133)	(0.001)	(0.000)	(0.001)
FIBUSINESS x *After*	0.011	0.259*	-0.001	0.000	0.002*
	(0.013)	(0.136)	(0.001)	(0.000)	(0.001)
Adj. R^2	0.2277	0.1982	0.0944	0.3611	0.3415
Wald x^2	46.50**	54.15***	32.24***	79.61***	275.08***

*Note: The results of the firm-specific variables are not presented in Table 7. The definition of the variables is presented in Table 1. The value in parentheses is the t-value of the coefficient estimates. The asterisks ***, **, and * indicate significance levels of 1%, 5%, and 10%, respectively.*

4.3. The FHC banks and non-FHC banks analysis

For both FHC and non-FHC banks, the results of the association between corporate governance and financial innovation are shown in Table 8. Panel A of Table 8 reveals that during the study period, FHC banks had more directors with a financial or accounting background, more directors who attended board meetings regularly, and greater average shareholdings compared to other types of banks. According to Panel B of Table 8, non-FHC banks have more institutional investors, a higher percentage of director attendance, and more directors with a financial or accounting background, suggesting that they are better equipped to offer cutting-edge banking products and services.

According to agency theory (AlHares et al., 2019), FHC banks with more board members that hold stock engage more in financial innovation because they have a vested interest in the success of the FHC as a whole. Institutional shareholders will encourage banks to invest in financial innovation based on the profitability and market competitiveness of the bank. This is especially true of non-FHC banks, which have a higher proportion of institutional investors. In addition, directors' ability to oversee the bank effectively correlates positively with the proportion of directors who regularly attend board meetings. The board of directors will back the institution's efforts to fund new forms of financial innovation.

Table 8. The correlation between corporate governance and financial innovation for FHC and non-FHC banks (Part 1)

Panel A: FHC banks						
Variable	***2013–2016 period***			***2017–2021 period***		
	Model 1	***Model 2***	***Model 3***	***Model 1***	***Model 2***	***Model 3***
BODHOLD	0.052**			0.111**		
	(2.047)			(2.371)		
INSTHOLD	0.014			0.011		
	(0.397)			(0.428)		
BODSIZE		-0.107			0.081	
		(1.134)			(0.640)	
INDRATIO		0.072			0.022	
		(1.286)			(0.272)	
ATTEND		-0.078			0.160***	
		(1.384)			(3.522)	
EDU			-1.042			0.336
			(1.132)			(0.325)
ACCOUNT			4.934***			0.706
			(3.628)			(1.162)
LAW			-5.192***			-2.290
			(3.489)			(1.311)
CAR	0.002	0.003	-0.002	-0.040**	0.081***	-0.044**
	(0.171)	(0.189)	(0.170)	(2.531)	(4.249)	(2.600)
LNSIZE	1.458	1.322**	0.676	-0.243	-0.903	-1.124
	(2.846)	(2.627)	(1.645)	(0.337)	(1.502)	(1.567)
AGE	1.114	1.063***	0.997***	2.350***	2.027***	2.391***
	(10.027)	(8.341)	(10.087)	(22.300)	(17.294)	(21.845)
Constant	-39.778***	-28.035**	-19.529*	-10.841	-1.740	9.749
	(3.345)	(2.372)	(1.810)	(0.638)	(0.122)	(0.599)
Firm-effect	Yes	Yes	Yes	Yes	Yes	Yes
Time-effect	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.429	0.448	0.336	0.884	0.856	0.782
F-statistic	9.293***	8.766***	8.420***	118.964***	76.258***	96.489***
Durbin-Watson	0.722	0.742	0.712	0.513	0.703	0.617

Table 8. The correlation between corporate governance and financial innovation for FHC and non-FHC banks (Part 2)

Panel B: Non-FHC banks						
Variable	***2013–2016 period***			***2017–2021 period***		
	Model 1	***Model 2***	***Model 3***	***Model 1***	***Model 2***	***Model 3***
BODHOLD	-0.030			-0.072		
	(1.182)			(1.263)		
INSTHOLD	-0.004			0.244***		
	(0.431)			(6.283)		
BODSIZE		-0.067			0.286	
		(0.866)			(0.436)	
INDRATIO		0.015			0.281	
		(0.245)			(1.171)	
ATTEND		0.041			0.266***	
		(1.249)			(4.999)	
EDU			1.841**			-3.535***
			(2.282)			(2.897)
ACCOUNT			-0.958			13.449***
			(0.508)			(5.124)
LAW			1.767			- 0.085
			(1.034)			(0.024)
CAR	-0.901***	-0.854***	-0.655***	0.903***	0.787***	1.121***
	(7.123)	(8.829)	(4.847)	(3.030)	(3.133)	(3.757)
LNSIZE	0.272	0.131	0.234	3.071**	1.664**	1.606*
	(1.199)	(0.306)	(0.434)	(2.343)	(2.316)	(1.882)
AGE	-0.046***	-0.033**	-0.021	0.207***	0.011	0.083***
	(2.705)	(2.176)	(1.311)	(3.970)	(0.398)	(2.726)
Constant	11.171**	11.461	4.275	-85.400***	-66.760***	-31.692*
	(1.807)	(1.219)	(0.504)	(3.334)	(3.127)	(1.916)
Firm-effect	Yes	Yes	Yes	Yes	Yes	Yes
Time-effect	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.258	0.253	0.206	0.306	0.185	0.207
F-statistic	5.548***	4.606***	2.698**	5.441**	2.841**	3.132**
Durbin-Watson	1.183	1.217	1.107	0.712	0.752	0.635

*Note: The value in parentheses is the t-value of the coefficient estimates. The asterisks ***, **, and * indicate significance levels of 1%, 5%, and 10%, respectively.*

There is a correlation between financial innovation and performance, as seen in Table 9, which compares FHC and non-FHC institutions. Table 9, Panel A, demonstrates that it was not immediately clear how financial innovation will affect bank performance from 2013 to 2016. However, there was no meaningful association between financial innovation and bank performance during this time period since financial innovation in the banking industry of the GCC is still in its infancy and because few financial innovation services were supplied. As shown in Table 9, Panel B, non-FHC banks may see a decline in *ROA*, *ROE*, and *nonNIM* if they implement similar innovations after 2017, but FHC banks may see a rise in value if they do so. In comparison to non-FHC banks, those with FHC status have economies of scale and scope due to their bigger market shares and greater access to resources. Banks serving low-income communities (FHCs) can benefit from the provision of new financial services because of this. Non-FHC financial institutions, on the other hand, need to exercise greater caution when gauging the potential benefits of new forms of banking innovation.

Table 9. The correlation between financial innovation and performance for FHC and non-FHC banks (Part 1)

Panel A: 2013–2016 period										
Variable	***FHC banks***					***Non-FHC banks***				
	ROA	***ROE***	***NIM***	***nonNIM***	***TobinQ***	***ROA***	***ROE***	***NIM***	***nonNIM***	***TobinQ***
FIBUSINESS	0.022	0.146	0.000	0.000	-0.001	0.021	0.227	0.000	0.000	0.001
	(1.659)	(1.162)	(4.165)	(0.282)	(0.698)	(1.086)	(1.001)	(0.049)	(0.333)	(1.032)
CAR	0.002	0.006	0.000	0.000***	0.001***	0.110***	0.563	0.001***	0.000***	0.004*
	(0.655)	(0.263)	(0.876)	(3.222)	(3.731)	(3.121)	(1.337)	(2.606)	(2.573)	(1.785)
LNSIZE	-0.037	2.293***	-0.006***	-0.003**	-0.072***	-0.316**	-1.842	0.000	-0.003*	0.002
	(0.411)	(2.949)	(4.132)	(2.545)	(5.650)	(2.665)	(1.161)	(0.277)	(2.111)	(0.231)
AGE	0.043*	0.518**	0.000	0.000	0.008	0.015	0.111*	0.000*	0.000**	0.000
	(1.682)	(2.404)	(0.275)	(1.568)	(2.036)	(3.397)	(1.776)	(1.920)	(2.668)	(0.530)
Constant	0.676	-47.792**	0.136***	0.073***	1.476***	4.966**	33.847	0.001	0.063**	-0.004
	(0.323)	(2.610)	(4.165)	(3.101)	(5.267)	(2.134)	(1.009)	(0.049)	(2.587)	(0.017)
Firm-effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.170	0.077	0.222	0.116	0.111	0.211	0.108	0.303	0.219	0.219
F-statistic	3.654***	1.903***	4.448***	2.810**	15.268***	3.647**	1.187	5.236***	3.733**	0.884
DW	1.801	1.555	1.594	1.222	1.333	1.832	2.033	1.441	1.214	1.178

Table 9. The correlation between financial innovation and performance for FHC and non-FHC banks (Part 2)

Panel B: 2017–2021 period										
Variable	***FHC banks***					***Non-FHC banks***				
	ROA	***ROE***	***NIM***	***nonNIM***	***TobinQ***	***ROA***	***ROE***	***NIM***	***nonNIM***	***TobinQ***
FIBUSINESS	0.002	0.049	0.000	0.000	0.002**	-0.019***	-0.194***	0.000	0.000***	0.001
	(0.621)	(0.771)	(8.646)	(1.455)	(2.388)	(2.837)	(3.330)	(2.021)	(3.135)	(1.123)
CAR	0.003*	0.030	0.000**	0.000	0.000*	0.144***	0.874***	0.000	0.000*	0.008***
	(1.743)	(1.447)	(2.037)	(0.533)	(1.792)	(6.072)	(4.673)	(0.277)	(1.951)	(3.111)
LNSIZE	-0.029	2.155***	-0.006***	0.006***	-0.062***	-0.231***	-0.461	-0.001	-0.003***	-0.001
	(0.610)	(4.613)	(9.300)	(4.944)	(8.820)	(3.427)	(1.018)	(1.472)	(4.644)	(0.234)
AGE	0.005	-0.062	0.000	0.000	0.001	0.013***	0.092***	0.000	0.000***	0.000
	(0.361)	(0.458)	(0.238)	(1.078)	(0.292)	(5.197)	(5.637)	(0.801)	(6.080)	(1.215)
Constant	0.666	-42.107***	0.139***	-0.117***	1.369***	3.090**	3.915	0.025**	0.059	0.012
	(0.691)	(3.563)	(8.646)	(4.370)	(8.339)	(2.294)	(0.428)	(2.021)	(5.088)	(0.072)
Firm-effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R^2	0.021	0.338	0.540	0.287	0.291	0.421	0.471	0.143	0.403	0.534
F-statistic	1.332	4.651***	33.065***	8.085***	15.250***	11.511***	10.029***	3.415**	9.254***	4.553***
DW	1.633	1.211	1.222	1.481	0.734	1.472	1.332	1.132	0.841	1.222

*Note: The asterisks ***, **, and * indicate significance levels of 1%, 5%, and 10%, respectively. DW is for Durbin-Watson.*

5. CONCLUSION

The rapid development of digital technology in recent years has compelled banks in the GCC region to modify their customary approaches to conducting business. Online banking and now mobile banking have largely superseded traditional bank branches as the preferred method of transacting business. In this study, we consider the rate at which new banking services are introduced as a surrogate for financial innovation. Banks in the GCC that have a high percentage of institutional investors as shareholders, a high number of independent directors, a high rate of director attendance, a high average education level, and a high percentage of directors with experience in finance or accounting are more likely to offer cutting-edge financial services, according to a study of their performance from 2013 to 2021. Since roughly 2017, there has been an increase in the effect of corporate governance on the creativity of banks' financial services. To add to this, the more cutting-edge banking services a bank provides, the more money it will make and how much it will be worth. In conclusion, financial-holding subsidiary banks may benefit from delivering more innovative financial services. Conversely, doing the same thing could hurt the bottom lines of GCC banks that do not deal in finance.

The hypothesis states that shareholders' personal interests are more likely to be aligned with the interests of the company and that they would support the bank's investment innovation the more the ownership of directors and institutional investors. According to the agency theory of board structure, a higher percentage of directors should be present in GCC banks if the banks are to exercise better oversight, which in turn would encourage the banks to invest in financial innovation. However, over time, the development of innovative financial services, especially by GCC banks, will increase their franchise value. Our research adds to the growing body of evidence that banks in emerging markets need to prioritize scale and scope when implementing new financial service innovations. It is possible that the government or financial authorities are being alluded to here.

Despite the aforementioned benefits, there is a potential constraint related with the sample size that must be taken into account when evaluating the validity of this study. This study relies exclusively on information from GCC-listed banks and financial institutions. We think more research has to be done to determine the role played by the other industries. Research might expand to include analyzing companies in several areas. Because of the scope of the study and the data we had access to, we also did not go into how different types of ownership would impact a bank's ability to offer cutting-edge banking services. Governments, financial institutions, consortia legal persons, technological legal persons, trusted service managers, third-party payment and telecom operators, and so on are all examples of institutional investors. How do you think the introduction of innovative financial services will affect banks' ability to extend credit, increase their customer base, and attract new sources of funding? The aforementioned issues could benefit from more investigation. Further investigation may also focus on international comparisons, taking into account the different national regulatory and governance structures.

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