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How Environmental, Social, and Governance Mediates the Impact of FinTech Investments on Bank Performance in Gulf Countries

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ABSTRACT

This study examines the FinTech factors affecting bank performance in Gulf countries. The study followed a causal research design employing data from 2010 to 2023. The study unit of analysis is twelve banks in Kuwait, Qatar, the UAE, and Saudi Arabia. The study also uses PLS-SEM because of its advantage in examining mediating pathways that might be obscured in simpler regression analyses. According to the study's findings, FinTech factors such as mobile banking applications (MBA) and GDP per capita variables have a negative, statistically significant effect on bank performance. On the other hand, GDP per capita has not statistically positively affected both ROA and ROE of bank performance. Moreover, both MBA and GDP per capita directly enhance environmental, social, and governance (ESG) performance. The ESG does affect ROE. Besides, ESG plays a mediating role by strengthening the relationship between MBA, GDP per capita, and ROE, as it enhances banks ESG performance. The current study fills a gap in the body of literature since it considers previously overlooked factors that affect bank performance, i.e., FinTech variables and the mediating role of ESG on their effects on bank performance. The resulting policy implication is that banks in Gulf countries benefit most from investing in FinTech innovation since they can enhance operational efficiency and support sustainability efforts by driving better ESG performance, ultimately fostering long term stability and growth in the banking sector.

Keywords: FinTech, ESG, Mobile Banking, Bank Performance, GDP Per Capita and Mediating Role
JEL Classifications: C8, G21, M3, O30

1. INTRODUCTION

The emergence of young, digitally knowledgeable, fast-expanding economies, and high mobile and internet penetration boost rapid FinTech innovations (Alice et al., 2021). FinTech is a combination of finance and technology that is considered a sustainable innovation, such as blockchain, internet finance, and mobile banking, which are penetrating to form a digital revolution in the entire banking industry that provides a better banking system for bank users (Sajid et al., 2023). In addition, FinTech is determined by technology-based applications and technology-driven innovations where the former are mobile banking, internet banking, automated teller machine (ATM), point of sales (POS), and mobile applications (Zu et al., 2019) while the latter are internet of things (IoT), cloud computing, machine learning, blockchain and artificial intelligence (AI) (Varma et al., 2022).

FinTech plays a vital role in enhancing the bank's efficiency. Based on empirical research by Sajid et al. (2023) showed that FinTech improves the banks' operating efficiency by reducing transaction costs, lowering bank operating costs, decreasing risk-taking behavior, and reducing bank credit risk, as well as liquidity risks lead to improved bank performance with the mobile banking technologies. On the other hand, Dwivedi et al. (2021) asserted that FinTech influences bank competitiveness and performance through proper FinTech adoption that aligns banks in a good position for

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competition and boosts performance. Also, FinTech offers low-cost services with a variety of choices for customers to use financial services through mobile applications that transform customers' behavior to digitalization (Sajid et al., 2023). According to World Bank (2021), the proportion of mobile and internet payments, checking bank account balance, debit, and credit card use was about 35% in 2021.

Adherence to this trend underscores how the widespread proliferation of mobile smartphones affects various aspects of our lives, the economy, the financial system, customer expectations, and understanding of financial services offered within the banking sector (Rabaa'i, 2022). Dwivedi et al. (2021) indicated that the FinTech role is essential to the banking industry since FinTech will drive economic development and sustainability for firms and individuals. FinTech is witnessing substantial developments around the world, which brought banking closer to being more efficient and observant. For instance, in the aftermath of the global financial crisis (GFC) 2007-2009, FinTech development in developed countries such as the USA and UK has extended the financing transaction methods by algorithmic trading, assisting bank managers to initiate better compliance systems to manage risk as well as improve the digital payment systems (Sajid et al., 2023). Nevertheless, FinTech development in developing countries has expanded digital financial services across emerging markets, particularly during the COVID-19 pandemic (Sajid et al., 2023).

Moreover, Tang et al. (2024) stated that with the evolution and rapid spread of COVID-19 in December 2019, FinTech has grown swiftly, directly impacting banks by promoting the transformation of traditional business models and innovation across financial services and products. Therefore, investments in FinTech have significant growth worldwide. Based on KPMG (2022), worldwide investments in FinTech have increased in 2021 to reach US $226.6 billion compared to US $127.7 billion in 2020 and to US $215.2 billion in 2019. Moreover, Rabaa'i (2022) stated that FinTech investments in the USA reached nearly US $64 billion, then in Europe reached around US $58 billion, and thereafter the Asia Pacific reached US $13 billion.

Thus, this research paper investigated the impact of FinTech on bank performance in the emerging market banking context. With special attention to the influence of ESG standards and investigating it as a mediator in the relationship between FinTech and bank performance. The abbreviation stands for environmental, social, and governance of the bank's business environment. In terms of ESG history, according to Chueca Vergara and Ferruz Agudo (2021), ESG rating has been determined as an important issue since 2008 by the United Nations (UN) through setting up an agenda of 2030 for sustainable development goals (SDGs). Furthermore, ESG activities are determined as a unique method for illustrating the bank's good citizenship without limitation from being up to date and providing flexibility to enable quick response to FinTech innovations (Arayssi et al., 2020). Therefore, the purpose of this study is to analyze the relationship between sustainability and bank performance in a geographical context, such as the Gulf region, which has not been explicitly and critically studied.

This research is structured into four parts. The first part is the introduction of the current research, which outlines the research topic. The second part is the literature review represent past studies that support the research topic. The research variables from past studies that were considered relevant to the research topic were reviewed to establish the essential theoretical background that led to the study's research framework. In the third part, the research methodology is then systematically detailed, as well as the analysis and discussion of the results. Finally, the study's conclusion summarized the research findings and suggested future recommendations.

2. LITERATURE REVIEW

The review literature on FinTech can be sorted into two directions. The first direction of research studied FinTech on banking performance (Mohammed and Almashhadani, 2023). For instance, Le et al. (2021) employed Schumpeter's Technological Innovation framework to understand the impact of mobile banking applications on commercial banks' adoption of FinTech innovations. As for the second direction of research, it assessed the FinTech on the bank profitability and studied the factors affecting the financial performance for the repercussions of FinTech (Hermuningsih et al., 2023). Most of these studies' literature had relied on mobile banking adoption to construct their research models (Sanga and Aziakpono, 2023). Additional variable such as GDP per capita (Rickinghall, 2022), were added to assess the statistical relationship to the tested models (Hasaka, 2019).

2.1. Financial Technology (FinTech)

FinTech, as a term, is a merger of "Finance" and Information and Communication Technology in which technological innovations are used to provide financial services (Lien et al., 2020). Furthermore, FinTech is a neologism derived from the two words "financial" and "technology," and it refers to the integration of modern, primarily internet-related technologies such as smartphones and mobile applications with established business activities in the financial services industry, such as digital payments and online banking transactions (Gomber et al., 2017). Thakor (2020) ensured that the basel committee on banking supervision (BCBS) has adopted the financial stability board (FSB) definition of FinTech as an innovation leading to a new business process that significantly influences the banking businesses. On the other hand, Stewart and Jürjens (2018) defined FinTech as the use of technology platforms through virtual devices to enter bank transactions, bank accounts, credit through online networks, debit alerts through push notifications, and short message service (SMS) features.

According to past literature, FinTech has many different definitions of what FinTech represents based on different roles. For instance, FinTech, used to describe new driven technologies such as mobile technology, internet of things, big data, and cloud computing, has led to the creation of innovative financial solutions for organizations (Alhajjaj and Ahmad, 2022). Also, they indicated that FinTech was used to describe the process in the financial industry to innovate for solutions in the business model that deliver services to firms and individuals, so FinTech is not limited

in describe for applications or products (Alhajjaj and Ahmad, 2022). In this research scope, FinTech refers to technology based application which employ mobile technology to build innovative ways that result in new business models and processes in reshaping banking products and services in a more secure, affordable, and convenient to bank users.

FinTech has a positive effect on customers, banks, and the economy. For customers, FinTech is beneficial in the banking system as it simplifies banking transactions for consumers (Paulet and Mavoori, 2020). It has also supplied customers with low-cost banking services (Lien et al., 2020) and empowers customers to process banking transactions via electronic-based services at all times (Akhisar et al., 2015). As for banks, FinTech contributed to diminishing bank operating costs by importing technology into their banking system (Paulet and Mavoori, 2020). Furthermore, it enables banks to improve service efficiency and strengthen risk control capabilities in order to increase profitability (Wang et al., 2021). For the economy, FinTech contributed to an increase in GDP lead to the creation of more than 90 million jobs across all sectors (Abbasi and Weigand, 2017). It was estimated that digital finance would boost emerging economies gowth by US$3.7 trillion by the year 2025, resulting in prosperity of the economy (Singh et al., 2020).

2.2. FinTech Adoption

In recent years, FinTech adoption has become the most significant innovation that is widely spread today, resulting in great development changes in the roles of the banking ecosystem based on the era of the fourth industrial revolution (Iman, 2020). Therefore, Alice et al. (2021) indicated that 96% of global consumers are inclined to adopt FinTech, primarily due to appealing fees. In line with this trend, Albarrak and Alokley (2021) highlighted key aspects of FinTech adoption rise, including a significant reduction in financial transaction costs, a decline in the number of bank branches, and a noteworthy 63% of consumers expressing interest in using FinTech applications.

Although the overall global FinTech investment has surged 20 times over the past decade. For instance, within more than 140 economies surveyed by the global Findex 2021, developing economies reached a rate of adoption reached 57%; on the other hand, high-income economies showed a rate of adoption with value of 95% (World Bank, 2021). The digital disparity in FinTech is evident (Fu and Mishra, 2022). In some cases, it can be led by the digital divide to geographical restrictions, causes variatons in digital literacy, skills, and connectivity. In countries like Southeast Asia, the Middle East, and Africa, FinTech is still in the infancy stage, so technology is considered a second challenge in their banking sector, which might be a leading factor in the rapid growth in FinTech adoption to disrupt the traditional banking system (Bank for International Settlements, 2019). In other cases, the fierce competition from FinTech firms leads to encouraging banks adopt digital banking to have significant potential to revolutionize banking services by making these services risk-free and user-friendly (AlHares et al., 2022). Even individuals from different generations and demographic backgrounds incorporate new technology into their lives at different rates, as younger individuals have a higher level of knowledge about FinTech and, as a result, embrace digital services more rapidly (Solarz and Swacha-Lech, 2021).

2.3. FinTech Adoption in Emerging Markets

FinTech is of considerable importance for emerging economies due to dedicating resources that promote FinTech adoption, significantly through implementing initiative development plans and establishing robust regulatory frameworks (Lyons et al., 2022). For instance, the Central Bank of Kuwait (CBK) established a regulatory sandbox that integrates environmentally friendly FinTech products and services with environmental, social, and governance (ESG) standards to support contemporary financial technologies for the country's banking sector and economy without exposing the financial system to risk (CBK, 2022). Initiative development plans aligned with sustainable development goals known as SDGs 2030 are important in enhancing financial resources, digitalization, social prosperity, environmental sustainability, eliminating poverty, and diversifying economies' income. Emerging markets are among the economies that have adopted national development plans, such as China, India, Indonesia, Philippines, Thailand, Malaysia, Kuwait, Qatar, Poland, Greece, and South Africa, to boost and improve FinTech, which has witnessed an increased from 27.3% in 2018 to 171% of FinTech transactions value in 2023 (Statista, 2024).

The central banks in emerging market has fostered the COVID-19 financial policy response to support digital onboarding and enhance the financial services (Feyen et al., 2021). As a result, FinTech transactions have surged in value from the year 2020 to 2022 during the COVID-19 pandemic, leading to a significant increase in FinTech products and services, which prompted central banks in emerging markets to play a critical role in preventing losses for the banking business and addressing customers' needs during the COVID-19 outbreak (Sajid et al., 2023). As for the mobile and internet penetration rates in emerging market are dramatically increasing. Thereby, the percentage of individuals using the internet in emerging markets has increased from 38% in 2010 to 77% in 2021, and the percentage of mobile cellular subscribers has increased to 137% in 2021 as compared to 101% in 2010 (World Bank, 2023). On the other hand, the mobile cellular and internet penetration rates draw great attention to the percentage of banked and unbanked populations in emerging markets. Therefore, the average percentage of the banked population in emerging markets is 80%, which represents an important indicator of the financial inclusion position compared to the percentage of the unbanked population in emerging market is up to 20% (World Bank, 2021). As for emerging economies, central banks have started their FinTech incubators to encourage banks in FinTech innovation, such as the Central Bank of Kuwait, which launched an innovation hub accelerator initiative program called "Wolooj" to boost innovation and entrepreneurship, to provide an ecosystem to support FinTech innovation in the region (CBK, 2024).

2.4. The Study's Contributions

The literature analysis showed a shortage of research that assessed the impact of FinTech on bank performance in emerging markets. Some studies have observed that two or more FinTech elements,

such as mobile banking applications, GDP per capita, and mobile phone penetration rate, are either very limited or not empirical. Hence, the current study adds to the limited research on the relation between FinTech and bank performance in the attribution of ESG standards.

It was also noted from previous literature that limited studies had investigated the adoption of FinTech in emerging markets, more especially in the Gulf region. Within the revised literature, only a few study was performed in the emerging markets of Kuwait, Saudi Arabia, UAE, and Qatar, in which Al-Shouha et al. (2024) assessed the impact of FinTech in the role of mobile banking on bank performance. Which indicates that the emerging market of the Gulf region context is unexplored, and more studies need to investigate mobile banking applications of FinTech in the emerging market. In addition, to the best of the researcher's knowledge, none of the empirical studies have examined the direct impact of the age of mobile banking applications as an independent variable of FinTech on bank performance in the emerging market of the Gulf region. Therefore, this research makes impactful contributions to the FinTech adoption literature in general and the emerging market of the Gulf region banks settings.

2.5. Theoretical Framework

Several frameworks and theories have been developed and adapted to understand the impact of FinTech innovation and ESG rating on bank performance within the existing literature. After reviewing past studies, models, and frameworks, the authors found that the most consistent models within this research scope are Schumpeter's technological innovation theory, environmental kuznets curve (EKC) theory, unified theory of acceptance and use of technology (UTAUT), and resource dependence theory (Ziemnowicz, 2013; Kaika and Zervas, 2013; Galeone et al., 2024; Almubarak and Aljughaiman, 2024). The above mentioned models consider the relation between FinTech, ESG, and bank performance. Schumpeter's technological innovation theory provides a model to understand the impact of intervening technology on economics that leads to entrepreneurial innovation throughout major types of innovations, which are new methods of production, new products, new sources of supply, new markets, and new forms of business (Ziemnowicz, 2013). All the major types of innovations should include variables that are suitable for the firm level. Also, Schumpeter's technological innovation theory can be employed to represent its components based on the researcher's goals. For instance, Le et al. (2021) presented Schumpeter's technological innovation theory regarding the introduction of a new product. As for EKC theory, it covers the influence of economic development by income on environmental degradation through greenhouse gas emissions, in which emphasized the potential for high income levels by investing more in sustainable technologies to contribute to reducing environmental degradation (Kaika and Zervas, 2013). Furthermore, UTAUT used to be consistent with social influence supported by ESG standards that encourage the adoption of technology in banks (Galeone et al., 2024). Moreover, resource dependence theory addresses the impact of the governance role of the board of directors in managing the external resources in order to improve banks' FinTech due to their wide experience and empowerment in accessing outside resources (Almubarak and Aljughaiman, 2024).

Therefore, this research conceptual model was grounded in Schumpeter's technological innovation theory, EKC theory, UTAUT, and resource dependence theory to explain the impact of FinTech and ESG on bank performance. Neither theoretical framework stipulated the mandating of particular variables for representing the impact of FinTech and ESG on bank performance and left it to researchers to select the variables that most ideally align with the needs and requirements of their study. Thus, literature was revised to collect variables that were considered as an FinTech indicators and match the context of this research. Figure 1 portrays the conceptual model of this research.

2.6. FinTech and Bank Performance

Both independent and dependent variables play a vital role in banks financial position and their decesions process to adopt technological change. Also, FinTech's role is remarkable in the development of the banking sector (Le et al., 2021). Many banks in emerging markets during the 2020 pandemic went digital just as people did everywhere else in the world; their digital activities, such as the usage of mobile banking was a notable uptick (AlHares et al., 2022). According to Hasaka (2019), FinTech was found to be a critical variable of bank adoption level in mobile banking. Rickinghall (2022) confirmed that FinTech affects banks and policymakers' decisions in adopting mobile banking, as it has been proven that banks in emerging markets need to invest more in technologies to enhance their revenue. This paper examined bilateral FinTech dimensions and their impact on bank financial performance. After reviewing past studies, the selected FinTech for the scope of the current research were mobile banking applications. GDP per capita was also investigated as an FinTech dimension, given the influence of market impact on bank perfromance.

2.6.1. Mobile banking apps

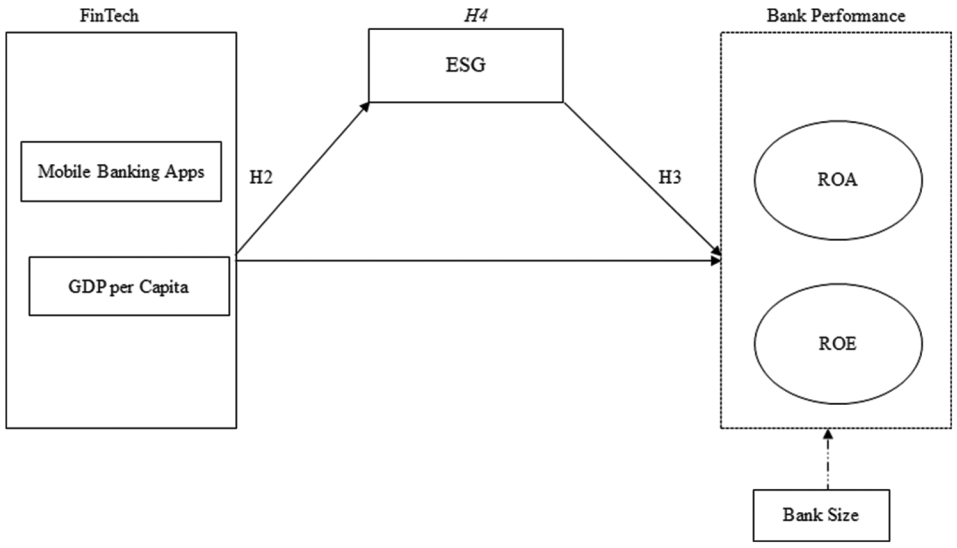
Mobile banking apps are defined as the application of technological innovations to provide financial services (Le et al., 2021). The impact of mobile banking apps is more evident for diffused new technology, since the usage of mobile banking reached 84% in the emerging markets of the Gulf countries (AlHares et al., 2022). Existing literature has established the significant role of mobile banking apps in predicting bank adoption of FinTech-based applications, as it is one of the most hypothesized and tested constructs of Schumpeter's technological innovation theory (Hasaka, 2019; Le et al., 2021; Rickinghall, 2022). Thus, the following hypotheses were constructed to be varified:

- H_{1a}: Adoption of Mobile Banking Apps have significant impact on banks' ROA
- H_{1b}: Adoption of Mobile Banking Apps have significant impact on banks' ROE.

2.6.2. GDP per capita

GDP per capita is used to refer to the macroeconomic effect in economic growth through benefit banks more from the technological development of their business, which substantially reduces their operational costs lead to an increase in the bank's cost efficiency and a positive effect on GDP (Hasaka, 2019).

Figure 1: Research conceptual model



Past studies demonstrated that the adoption of FinTechs results in an increase in GDP per capita, leading to open vacancies in over 90 million jobs across all sectors (Abbasi and Weigand, 2017). Literature supported that GDP per capita is interrelated to FinTechs, was positively impact on bank ROA and ROE (Le et al., 2021; Kanga et al., 2022; Rickinghall, 2022). Which confirm to the next hypotheses:

- H_{1c}: GDP per capita has a significant impact on banks' ROA
- H_{1d}: GDP per capita has a significant impact on banks' ROE.

2.6.3. ESG

ESG is criticial issue in the context that involves sustainability and technology (Galeone et al., 2024). In the realm of banking, ESG used to reflect banks' performance by reducing the conflict of interests among stakeholders, maximizing long-term bank value, reducing information asymmetry, considering information technology governance toward the evolution of FinTech, encouraging social influence to adopt technology in the banking sector, and using green finance systems to improve banks in support of environmental sustainability (Birindelli et al., 2018; Azmi et al., 2021; Sun et al., 2023; Almaqtari, 2024; Galeone et al., 2024). The role of ESG is more prominent in the context of bank performance due to the world's most pressing challenges by harnessing innovation in banking services to establish a more efficient, inclusive, and environmentally responsible economic system (Quenum, 2024). ESG has been shown to have a substantial impact on bank performance in past research (Azmi et al., 2021; Cantero-Saiz et al., 2024). Prior studies have also exhibited the mediation power of ESG on the relation between digital technology applications, environmental management practices, and firm performance (Ali et al., 2022; Fan et al., 2023). The following hypotheses were introduced to further explain ESG influence on FinTech and bank performance:

- H_{2a}: Adoption of Mobile Banking Apps have significant impact on ESG
- H_{2b}: GDP per capita have significant impact on ESG
- H_{3a}: ESG have significant impact on ROA
- H_{3b}: ESG have significant impact on ROE
- H_{4a}: ESG mediates the relationship between the adoption of mobile banking apps and ROA
- H_{4b}: ESG mediates the relationship between GDP per capita and ROA
- H_{4c}: ESG mediates the relationship between the adoption of mobile banking apps and ROE
- H_{4d}: ESG mediates the relationship between GDP per capita and ROE.

3. DATA AND METHODOLOGY

3.1. Data and Sample Selection

This study selected twelve banks listed in the capital market in the in Kuwait, Saudi Arabia, the UAE, and Qatar during the period of 2010-2023. In this study, balanced panel data availability on FinTech, bank performance, and control variable of twelve banks over a period of 14 years, spanning from 2010 to 2023 have been considered. The banks have been selected based on factors such as data availability, FinTech, performance, financial infrastructure, size, and significance in defining the country's economic circumstances in the GCC region. We have excluded those banks due to data unavailability for the time covered. The data were collected from the annual financial reports of sample banks and other data available through the datastream LSEG workspace. In addition, the annual reports of banks involve a comprehensive review of the banks' financial statements and sustainability practices to ensure compliance with regulatory requirements that ensure the implementation of the policies and procedures that are put in place regarding sustainable financing. Therefore, we have 168 bank-year observations (12 banks × 14 years = 168 observations) for analysis from four countries over 14 years.

3.2. Measurement of Variables

The FinTech dimensions and macroeconomic metrics have been included to test their effects on the performance of banks. The selection of variables has been made based on the available

research papers in this field and their significance in determining the performance of banks. For instance, return on assets (ROA) and return on equity (ROE) together offer a comprehensive assessment of a bank's performance from both operational and shareholder perspectives (Gazi et al., 2024; Kanga et al., 2022; Rickinghall, 2022). The independent variable is FinTech, measured by the mobile banking applications, GDP per capita (Le et al., 2021; Rickinghall, 2022). The intermediate variable is ESG, which is measured by the environmental, social, and governance indicators. The researchers also used control variables like bank size, which is measured by the natural logarithm of total assets, that affect the relationship between FinTech and bank performance through ESG.

3.3. PLS-SEM Analysis

Structural equation modeling using partial least squares (PLS-SEM) was used to test a predictive model. The PLS-SEM as a data analysis approach is one of the techniques used in structural equation analysis in exploratory research involving latent variables, where it is employed for this study to test the relationships between independent and dependent variables (Hair et al., 2019). This method is characterized by being effective with small samples that may be <150 subjects (Hair et al., 2017). In addition, it can deal with many studies of relationships between independent and dependent variables, even if they are multiple linear correlations, with the ability to measure combinations in a systematic way and measure structures in a formative way (Hair et al. 2019). PLS-SEM allows for the simultaneous estimation of direct, indirect (mediated), and adjusted relationships, making it particularly useful for analyzing documentary and secondary data, which are commonly used in financial accounting (do Nascimento and da Silva Macedo, 2025).

According to Ali (2025), the PLS-SEM approach is robust for predictive applications and facilitates the identification of significant relationships and mediating pathways that might be obscured in simpler regression analyses. The data obtained using Smart PLS version 3 software were tested into two main aspects measurement model and the structural model. The first focuses on reliability and validity, while the second involves selecting and analyzing the inner model. Finally, PLS-SEM is a variance-based approach that does not impose strict assumptions regarding data distribution or stationarity. Consequently, unit root and stationarity tests are not required for model estimation, and the analysis proceeds using the original and transformed variables as specified in the measurement model.

4. RESULTS

4.1. Descriptive Statistics

Table 1 presents the descriptive statistics for the variables. It provides details of the mean, standard deviation, minimum, and maximum values for both the dependent variable and its explanatory variables. The mean age of MBAs across the banks is 6.5 years, ranging from 0 to 13 years, which shows that mobile banking adoption is relatively recent but widespread. Similarly, the ESG scores have an average value of 26.40, with a minimum of 3.71 and a maximum of 72, reflecting considerable variation in banks' environmental, social, and governance practices. The independent variables GDP per capita, has a mean value of 45,120 USD (in $1,000s), with a minimum of 17,960 and a maximum of 98,041, indicating that while most countries have moderate levels of GDP, a few have very high economic output, like Qatar.

For the performance measures, the average ROA of banks in the sample is 0.099 with a standard deviation of 0.354, with a median of 0.018 and values ranging from 0.004 to 1.952, which indicates that the performance of banks is not good enough based on profitability. The ROE has a mean of 12.70 with standard deviations of 4.93, a median of 12.54, with a minimum of 3.33 and a maximum of 23.79, suggesting that equity returns are relatively stable across the sample. The results also mean that the ROA was more volatile in nature than the ROE during the study period. The ESG average obtained is 26.40. The maximum score is 72.01 out of 100, and the minimum is 3.71, indicating that no bank achieves the maximum ESG score possible. These results indicate that banks in Kuwait, Qatar, the UAE, and Saudi Arabia are making some effort to report on their sustainability activities, though they still have more room for improvement. Finally, the mean value for bank size measured in billions of dollars is 0.075, ranging from 0.0035 to 0.308, highlighting the presence of both small and very large banks in the dataset. The distribution is moderately right-skewed (skewness = 1.20) with slightly heavy tails (kurtosis = 2.50), indicating some banks have much higher returns than most.

4.2. Correlation Matrix and Multicollinearity Diagnosis

Table 2 demonstrates the Pearson correlation matrix and the results of the diagnostics of the multicollinearity for all FinTech dimensions, bank size, and performance factors. From Table 3, we can conclude that there is no significant concern as regards multicollinearity because the independent variables do not have high correlations among predictor variables. Regarding the FinTech-specific variables, GDP and MBA have positive relationships with both of the bank performance metrics, ROA, while MBA have negative relationship with ROE. These may indicate that the bank's ROA may be increased through the improvement of MBA and GDP, while the ROE of banks may be increased due to the increased level of GDP and bank size. All of the correlation coefficients among the independent variables, GDP, and MBA are <0.80, which primarily shows that the factors are free from multicollinearity (Field, 2018).

4.3. Assessment of Measurement Model

4.3.1. The first stage: The reliability and validity test

All constructs in this study were measured using single indicators. Consequently, traditional reliability measures such as Cronbach's Alpha, rho_A, Composite Reliability, and AVE are trivially equal to 1.0 and should not be interpreted as evidence of internal consistency. The use of single indicators was justified based on the nature of the constructs and prior literature (Hair et al., 2020; Hair et al., 2019).

4.3.2. The second stage: Discriminant validity tests

The researchers used a set of tests that must be verified collectively to judge the extent of discriminant validity, which are the

Table 1: Descriptive statistics

Construct	Mean	Median	Min	Max	Standard deviation	Kurtosis	Skewness
GDP_PC	45.12	42.82	17.96	98.04	21.45	0.24	0.99
MBA	6.50	7.00	00.00	13.00	4.03	−1.21	0.00
ESG	26.40	17.03	3.71	72.01	20.58	−0.54	0.96
ROA	0.099	0.018	0.004	1.952	0.354	1.20	2.50
ROE	12.67	12.54	3.33	23.79	4.930	−0.45	0.22
Size	0.075	0.057	0.035	0.308	0.069	1.90	1.48

Table 2: Pearson correlation matrix for diagnosis multicollinearity

Construct	GDP	MBA	ESG	ROA	ROE	SIZE
GDP	1					
MBA	−0.058	1				
ESG	0.075	0.723	1			
ROA	0.093	0.191	0.198	1		
ROE	0.033	−0.146	0.032	0.019	1	
Size	−0.050	0.389	0.404	−0.064	0.22	1

Table 3: R-square

Construct	R square	R square adjusted
ESG	0.532	0.526
ROA	0.05	0.027
ROE	0.105	0.083

following: First, the Fornell–Larcker test, where the average variance extracted must have the highest correlation for that latent variable with any of the other latent variables in the research model (Hair et al., 2019). Second, the heterotrait-monotrait ratio of correlations (HTMT), which is a popular method to assess discriminant validity in structural equation modeling latent variable must be loaded with the highest values with its dependent elements. These HTMT values should be below 0.85 (Hair et al., 2019). Therefore, as Table 4 displays, all HTMT values are <0.85; in fact, discriminant validity has been gained, and the constructs of the research model are reliable and valid.

4.4. Assessment of Structural Model

Following the confirmation of the external model's quality, the internal model is evaluated. During this step, multi-collinearity, coefficient of determination (R^2), effect size (f^2), and the significance of the path coefficients are evaluated (Hair et al., 2017).

4.4.1. Multi-collinearity

First, the variance inflation factor (VIF) or collinearity was checked, and all values were below 3, ensuring that the multi-collinearity issue of the inner model was resolved (Hair et al., 2017). As in Table 5, it was found that the "Variance Inflation Factor" (VIF) ranged from 2.174 (ESG) to 2.156 (MPA), which are below 3.00, indicating that the model did not have any multi-collinearity, and at the same time, suggesting that common method variance (CMV) bias is not an issue in our study (Kock, 2015).

4.4.2. Coefficient of determination

A model with a coefficient of determination (R^2) of 0.67, 0.30, or 0.19 is classified as strong, moderate, or weak, depending on how much variance in the endogenous constructs is explained by all of the exogenous constructs connected to it (Hair et al., 2014). this, Table 3 and Figure 2 show that the R^2 of the anticipated independent variables on the dependent variables are 5.0% of the variance in ROA ($R^2 = 0.05$) and 10.5% of the variance in ROE ($R^2 = 0.105$). According to PLS-SEM guidelines, these values reflect weak but acceptable explanatory power, particularly in the context of complex models and behavioral or ESG-related research (Hair et al., 2017). Accordingly, the model demonstrates a modest yet meaningful level of predictive accuracy. The results also indicate that the model explains a large proportion of the variance in ESG practices ($R^2 = 0.532$; adjusted $R^2 = 0.526$). According to Hair et al. (2019), this level of predictive and explanatory power can be considered moderate to high, suggesting that the adoption of mobile banking and per capita GDP both provide strong explanatory power for banks' performance in the ESG domain.

4.4.3. PLS predict

After this, the PLS prediction was additionally computed to assess the predictive power of the model (Ringle et al., 2023). Table 6 displays the sum of squares observed (SSO), sum of squares error (SSE), and the Q^2 values for the three study variables. Acceptable Q^2 values generally include 0.02, 0.15, and 0.35, which indicate weak, moderate, and sound effect levels of predictive relevance, respectively (Hair et al., 2019). The Q^2 values revealed that the model explains 52.5% of the variance in ESG, indicating large ($Q^2 > 0.35$) explanatory power. However, for bank size, GDP per capita, and mobile banking apps, the model explained no variance, as indicated by SSE equal to SSO, becouse this indepndendent varibles. The model also showed small explanatory power for ROA ($Q^2 = 0.041$) and ROE ($Q^2 = 0.082$) as shown in Figure 3, suggesting that both values are more than zero and sucess to effectively predicting these variables. Overall, the Q^2 for ESG, ROA, and ROE values indicate a satisfactory predictive power of the structure model (Hair et al., 2019).

4.4.4. Effect size

The f^2 effect size was assessed to evaluate the relative contribution of each exogenous construct to the explained variance of the endogenous constructs. According to Hair et al. (2019), f^2 values of 0.02, 0.15, and 0.35 indicate small, medium, and large effects, respectively. In Table 7, Mobile banking applications exhibit a large effect size on ESG performance ($f^2 = 1.123$), indicating that digital banking adoption is the dominant driver of banks' sustainability performance. In contrast, GDP per capita shows a negligible effect on ESG ($f^2 = 0.019$), suggesting that macroeconomic conditions play only a limited role once FinTech adoption is considered. Bank size does not exert a meaningful effect on ESG. All predictors display negligible effect sizes on ROA, with f^2 values well below the 0.02 threshold. This finding indicates that neither FinTech adoption, ESG performance, GDP

Figure 2: The coefficient of determination (R^2)

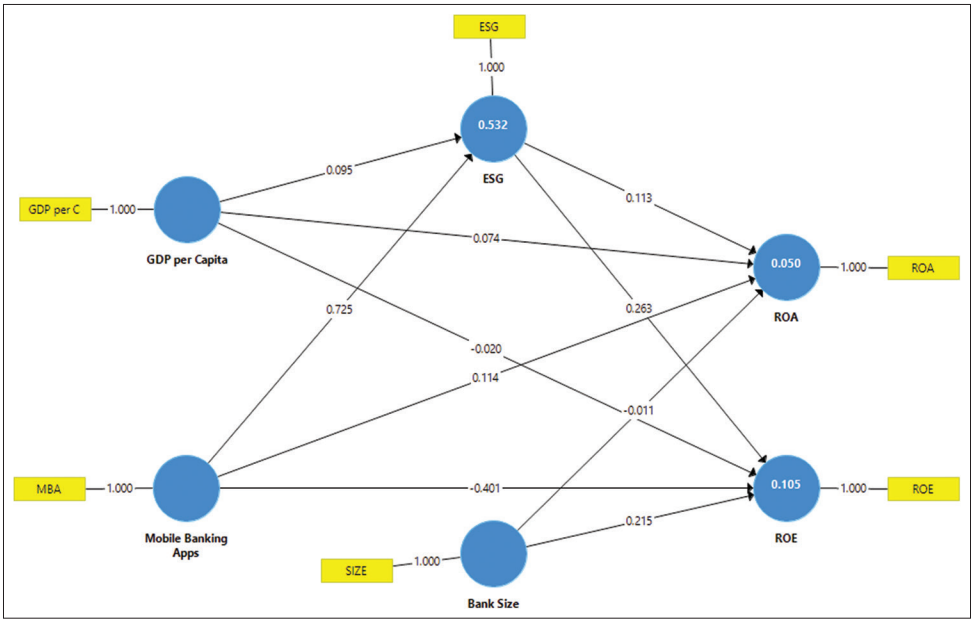


Table 4: Results of discrimination validity tests

Construct	Bank size	ESG	GDP per capita	Mobile banking apps	ROA	ROE
Fornell–Larcker						
Bank size	1					
ESG	0.282	1				
GDP per capita	−0.204	0.08	1			
Mobile banking apps	0.300	0.723	−0.02	1		
ROA	0.04	0.198	0.083	0.191	1	
ROE	0.172	0.032	−0.034	−0.146	0.019	1
HTMT						
Bank size						
ESG	0.282					
GDP per capita	0.204	0.08				
Mobile banking apps	0.300	0.723	0.02			
ROA	0.040	0.198	0.083	0.191		
ROE	0.172	0.032	0.034	0.146	0.019	

Table 5: VIF results

Construct	ESG	ROA	ROE
Bank size	NON	1.169	1.169
ESG	NON	2.174	2.174
GDP per capita	1.000	1.074	1.074
Mobile banking apps	1.000	2.156	2.156

Table 6: Construct cross-validated redundancy

Construct	SSO	SSE	Q^2 (=1-SSE/SSO)	Level
Bank Size	168	168	0.000	Low
ESG	168	79.844	0.525	Moderate
GDP per Capita	168	168	0.000	Low
Mobile Banking Apps	168	168	0.000	Low
ROA	168	161.033	0.041	Low
ROE	168	154.286	0.082	Low

per capita, nor bank size meaningfully contributes to explaining variations in asset-based profitability. ESG performance exerts a small but meaningful effect on ROE ($f^2 = 0.036$), supporting the argument that sustainability practices are valued by shareholders.

Table 7: f^2 effect size

Construct	ESG	ROA	ROE
Bank size	NON	0.002	0.044
ESG	NON	0.006	0.036
GDP per capita	0.019	0.005	0.002
Mobile banking apps	1.123	0.006	0.083

Mobile banking applications also show a small effect on ROE ($f^2 = 0.083$), while bank size demonstrates a very weak effect ($f^2 = 0.044$). GDP per capita exhibits a negligible effect on ROE.

4.4.5. Model fit

The model testing results in Table 8 show that, in general, the model has a fairly good level of fit. The standard mean residue ratio (SRMR) values in the saturated (0.020) and estimated (0.021) models are both lower than the general limit of 0.08, indicating a very small difference between the observed and predicted data, so the model can be shown to have a good fit. The NFI standard conformity index values of 0.998 and 0.982, respectively, indicate a degree of conformity greater than the standard value of 0.90, indicating that the model has an excellent conformity, although

Figure 3: Predictive Relevance (Q^2)

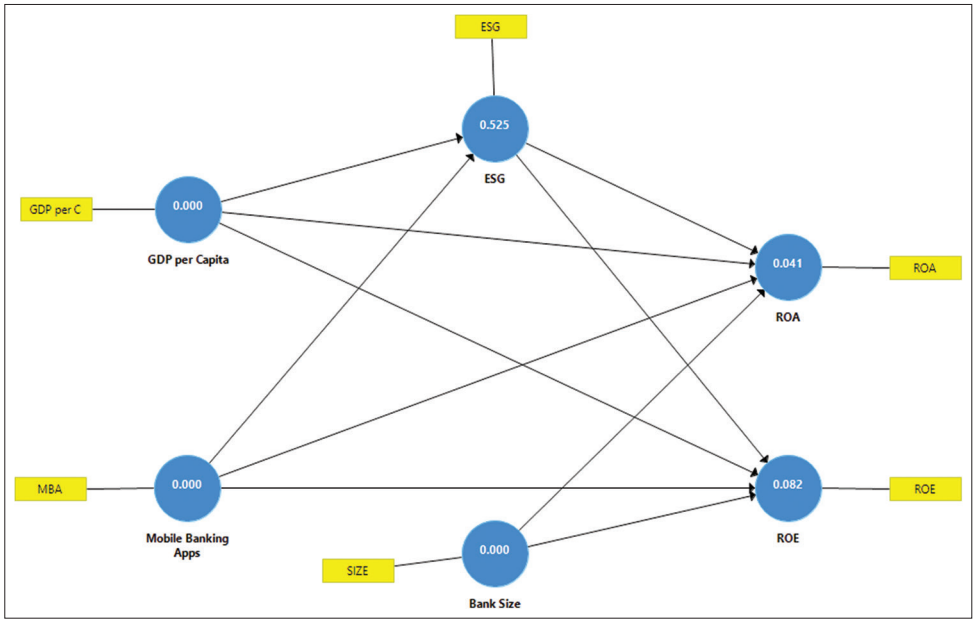


Table 8: FIT model

Fit indices	Saturated model	Estimated model
SRMR	0.020	0.021
d_ULS	0.003	0.009
d_G	0.001	0.004
Chi-square	3.166	3.188
NFI	0.998	0.982

there is still room for improvement to achieve a more ideal fit. The difference between the d_ULS and d_G values in both models is relatively small, indicating the complete stability of the model structure. Likewise, although the Chi-square value for the saturated model (3.166) is smaller than the chi-square value for the estimated model (3.188), without further information such as significance values or the ratio to degrees of freedom (χ^2/df), the explanation of the model fit of this indicator is low. In general, the model suggests an excellent level of fit, but requires to be supported by a larger, comprehensive explanation of each indicator to assess the model more strongly and adequately.

4.4.6. Diagnosis of path coefficients

The process generates several predetermined bootstrap samples; a 5,000-resample is advised. The bootstrap sample allows for checking the significance of paths (Hair et al., 2017). Based on the results of hypothesis testing in Table 9 and Figure 4, a number of important findings were obtained regarding the relationship between the variables studied. First, the results indicate that there is a statistically significant direct positive relationship between the MBA and bank performance (ROA). Specifically, MBAs are positively associated with ROA ($\beta = 0.114$, $t = 1.96$, $P = 0.025$), supporting H_{1a}. Therefore, the aforementioned finding can be methodologically explained by the empirical observation that the application of technology in digital banking services enhances operational efficiency and the efficient use of assets. In contrast, MBA shwo negatively affect banks' performance measured by ROE ($\beta = -0.401$, $t = 3.67$, $P < 0.001$), supporting H_{1b}.

The findings show that there exists a positive statistically insignificant relationship between GDP per capita and ROA ($\beta = 0.074$, $t = 0.94$, $P = 0.174$), leading to the rejection of H_{1c}. Similarly, GDP per capita insignificant direct impact on ROE ($\beta = -0.020$, $t = 0.28$, $P = 0.391$), resulting in the rejection of H_{1d}. These results indicate that the pace of economic recovery in the Gulf region is not directly translating into improved bank profitability.

Consistent with expectations, the results revealed a positive influence of MPA on ESG performance ($\beta = 0.725$, $t = 21.68$, $P < 0.001$), providing strong support for H_{2a}. This result indicates that digital transformation is a crucial factor in improving banks' ESG practices. In addition, GDP per capita is positively and substantially associated with improving ESG performance ($\beta = 0.095$, $t = 1.92$, $P = 0.028$), supporting H_{2b}. This finding suggests that banks operating in more developed economic environments tend to adopt stronger, sustainable, and environmentally friendly practices.

The results reveal that ESG performance does not have a significant direct positive relationship with ROA ($\beta = 0.113$, $t = 1.02$, $P = 0.154$), leading to the rejection of H_{3a}. However, ESG performance exerts a significant positive impact on ROE ($\beta = 0.263$, $t = 2.53$, $P = 0.006$), supporting H_{3b}. This result indicates that ESG initiatives are more valued by shareholders, reflecting improved short-term operational efficiency.

4.4.7. Mediation effects of ESG

To examine the mediating role of ESG, bootstrapping procedures were employed. Mediation is considered significant when the bootstrap confidence interval does not include zero (Preacher and Hayes, 2008). Table 10 demonstrated that ESG does not mediate the relationship between MBA and ROA, as the indirect effect is not statistically significant and the confidence interval includes zero ($\beta = 0.082$, CI = [−0.067, 0.198]). Thus, H_{5a} is

Figure 4: Model of PLS-SEM path analysis diagram

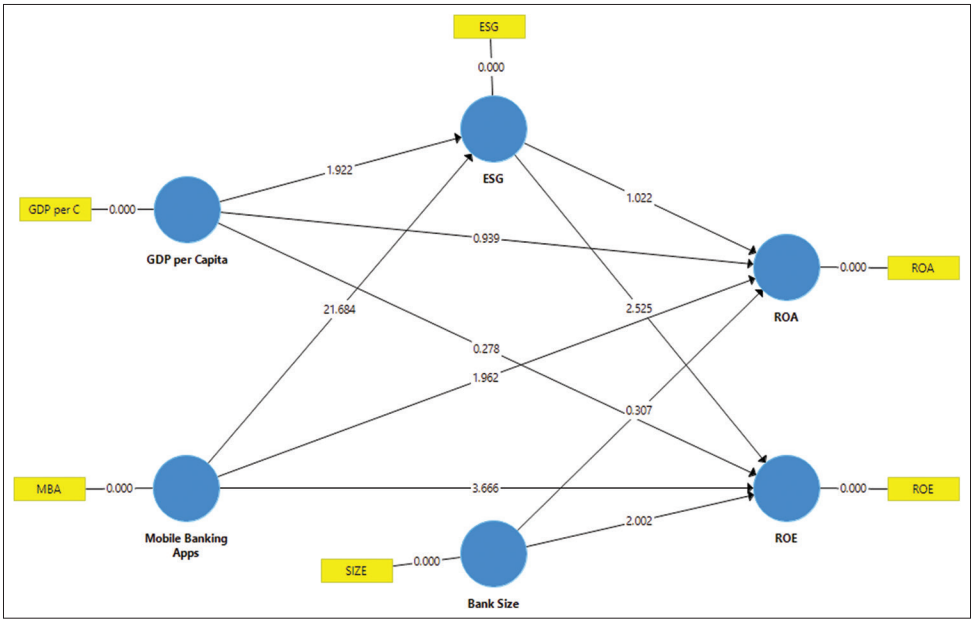


Table 9: Path coefficients (mean, sandard deviation, t-values)

No.	Path	Original sample (O)	Standard deviation	T Statistics (|O/STDEV|)	P-values	Descion
H_{1a}	Mobile Banking Apps -> ROA	0.114	0.058	1.962	0.025	Supported
H_{1b}	Mobile Banking Apps -> ROE	−0.401	0.109	3.666	0.000	Supported
H_{1c}	GDP per Capita -> ROA	0.074	0.079	0.939	0.174	Not Supported
H_{1d}	GDP per Capita -> ROE	−0.02	0.07	0.278	0.391	Not Supported
H_{2a}	Mobile Banking Apps -> ESG	0.725	0.033	21.684	0.000	Supported
H_{2b}	GDP per Capita -> ESG	0.095	0.049	1.922	0.028	Supported
H_{3a}	ESG -> ROA	0.113	0.111	1.022	0.154	Not Supported
H_{3b}	ESG -> ROE	0.263	0.104	2.525	0.006	Supported
H_{1}	Bank Size -> ROA	−0.011	0.036	0.307	0.379	
	Bank Size -> ROE	0.215	0.107	2.002	0.023	

Table 10: Mediating effect results

No.	Path	Original sample (O)	Standard deviation	T Statistics (|O/STDEV|)	P-values	5.00%	95.00%	Descion
H_{4a}	Mobile Banking Apps -> ESG -> ROA	0.082	0.08	1.02	0.154	−0.067	0.198	Not Supported
H_{4b}	Mobile Banking Apps -> ESG -> ROE	0.191	0.076	2.499	0.006	0.064	0.314	Supported
H_{4c}	GDP per Capita -> ESG -> ROA	0.011	0.013	0.809	0.21	−0.009	0.033	Not Supported
H_{4d}	GDP per Capita -> ESG -> ROE	0.025	0.017	1.663	0.072	0.002	0.058	Supported

not supported. In contrast, ESG plays a significant mediating role in the relationship between MBA and ROE. The indirect effect is positive and statistically significant (β = 0.191, t = 2.50, P = 0.006), with a bootstrap confidence interval that excludes zero (CI = [0.064, 0.314]). This result supports H_{4b} and indicates the presence of competitive mediation, whereby the negative direct effect of MBA on ROE is partially offset by positive ESG-driven benefits.

The results in Table 10 further indicate no indirect and insignificant impact of GDP per capita on ROA through ESG mediation (β = 0.011, CI = [−0.009, 0.033]). Therefore, H_{4c} is not supported. However, ESG plays a mediating role of GDP per capita on ROE (β = 0.025, t = 1.66, P = 0.072), with the bootstrap confidence interval remaining strictly positive (CI = [0.002, 0.058]). Accordingly, H_{4d} is supported at the 10% significance level.

5. DISCUSSION OF RESULTS

This study provides empirical evidence of the relationship between FinTech dimensions, ESG performance, and the performance of banks in emerging markets, with a particular focus on the Gulf region. As a result, this study explores the causal link between MBA, GDP per capita, ESG, and bank performance within a unified framework for structural equation modeling using PLS-SEM. The findings expand upon and summarize key research on the topic, offering a nuanced understanding of how digital transformation impacts sustainable banking performance.

5.1. MBA and Bank Performance

The empirical results confirm that MBAs exert a positive and significant effect on ROA, supporting H_{1a}. This finding is consistent with prior empirical studies that emphasize the role of digital

banking in improving operational efficiency, cost management, and asset utilization (Hasaka, 2019; Le et al., 2021; AlHares et al., 2022). In emerging markets like Gulf countries, mobile banking reduces the need for physical branch platforms and manual processing, allowing banks to thus lower operational costs associated with loan origination, optimize asset deployment, and enhance transaction efficiency. Consistent with Yoon et al. (2023), who find that FinTech significantly positively affects bank performance, primarily in underdeveloped countries. From the perspective of Schumpeter's theory of innovation, mobile banking applications deliver instant transaction processing that helps banks to recombine existing resources more efficiently, eliminating traditional banking, thereby improving management of asset performance. Thus, this study extends the technological innovation theory of Schumpeter's by emphasizing that MBA-driven innovations improve bank performance while exerting heterogeneous effects on shareholder returns.

However, the analysis reveals that there is a statistically significant and negative relationship between MBA and ROE, supporting H_{1b}. This result aligns with studies that argue FinTech adoption may initially suppress shareholder returns due to high implementation, maintenance, and cybersecurity costs (Rickinghall, 2022; Kanga et al., 2022). Unlike ROA, ROE is more sensitive to capital structure and equity expansion. Banks investing aggressively in mobile banking services may experience short-term equity investments dilution or increased operating expenses, leading to lower returns for shareholders, especially in regions with slower technology adoption or limited infrastructure (Kashyap et al., 2025). This finding contrasts with studies conducted in developed economies, where digital maturity and economies of scale enable banks' investment in FinTech firms to translate more rapidly into stock returns (Carlini et al., 2022), highlighting a structural difference between developed and emerging markets.

5.2. GDP per Capita and Bank Performance

The results indicate that GDP per capita does not have a statistically significant positive impact on either ROA or ROE, leading to the rejection of H_{1c} and H_{1d}. The result shows that an increase in GDP per capita does not necessity leads to an increase in bank performance in emerging markets like Gulf countries. One possible explanation is that economic growth in these countries is heavily reliant on oil revenues and government spending, which may discourage individuals from directly seeking credit in the private sector or engaging in banking intermediation. Furthermore, the banking and financial industry operates within a highly regulated environment, with stringent requirements imposed by regulatory bodies in the Gulf states, substantial government intervention, and ample liquidity, thus mitigating its vulnerability to fluctuations in overall income. Although this finding contrast the findings of Le et al. (2021) and Rickinghall (2022), who found a positive economic growth on bank profitability, it is consistent with evidence from emerging economies like Bangladesh who found an insignificant effect of GDP growth on bank profitability (Ghazi et al., 2024). This divergence highlights the importance of country-specific institutional and structural factors in shaping the growth and profitability nexus.

5.3. MBA and ESG Performance

According to the study, MBAs have a statistically significant positive effect on ESG performance, supporting H_{2a}. The study finding is consistent with studies that digital banking services and FinTech-related innovations contribute positively to firm sustainability outcomes (Birindelli et al., 2018; Galeone et al., 2024). Moreover, recent evidence suggests that FinTech applications such as mobile payments, blockchain technology, and artificial intelligence significantly improve corporate ESG performance across different stages of corporate life-cycles (Hu et al., 2025). From the lens of the UTAUT framework, the adoption of MBA is reinforced by social influence and facilitating conditions, which are embedded within ESG-oriented banking strategies (Galeone et al., 2024).

5.4. GDP per Capita and ESG Performance

The study revealed GDP per capita's statistically significant detrimental effects on ESG performance. The result shows that an increase in GDP per capita leads to increased ESG performance, supporting H_{2b}. The study supports studies grounded in EKC theory, which suggest that as income levels and an economy develop, greater financial resources become available for investments in sustainable technologies and institutional frameworks (Kaika and Zervas, 2013; Fan et al., 2023). In emerging markets, the growing income levels in emerging market economies enhance regulatory approach and stakeholder pressure, encouraging banks to integrate their sustainability practices into their operations (Arun et al., 2022). It is also odd that a study by Dwivedi et al. (2021) found that FinTech has an insignificant effect on economic development and sustainability for firms and individuals. On the other hand, the study findings add to the ongoing debate about the relationship between GDP and ESG performance, a relationship that remains inconclusive in the existing literature (Leogrande and Costantiello, 2023). Additionally, the findings reveal a positive effect of GDP per capita on ESG performance, whereas macroeconomic instability adversely affects banking sector profitability.

5.5. ESG and Bank Performance

The result shows that ESG does not significantly affect ROA, leading to the rejection of H_{3a}. This finding contrasts with Buallay's (2019), who confirmed that there is a significant and positive relationship between ESG and ROA, ROE, and market performance in European banks. However, the study measured each of the three ESG pillars individually shows that they affect performance differently, suggesting that aggregation may obscure differential impacts across performance dimensions. The mixed evidence observed in the present study aligns with the literature on ESG performance in the financial sector, which has expanded considerably over the last decade as banks have increasingly been considered as relevant actors in the issues of climate change and sustainability (Galletta et al., 2022).

In emerging and developing regions, empirical findings remain inconclusive. For instance, El Khoury et al. (2023) identify a non-linear relationship between ESG performance and financial performance of banks in the Middle East, North Africa, and Turkey, implying that ESG engagement may only translate into financial gains beyond a certain threshold. Likiwsie, Atan et al. (2018)

find no significant relationship between individual or combined ESG factors and ROE or company value among Malaysian listed companies. Moreover, Gutiérrez-Ponce and Wibowo (2023) reported that stakeholders often remain unconvinced that compliance with environmental practices and specific ESG investment decisions will generate bank financial returns in the future. Consistent with this view, the insignificant ESG–ROA relationship may reflect the short-term costs associated with ESG implementation, including adherence to ESG regulations, standards, and commitments, and technological investments, which can temporarily offset operational efficiency gains (Birindelli et al., 2018; Almaqtari, 2024).

However, the results show a significant and positive connection between the two ESG and ROE, thus supporting H_{3b}. This finding aligns with previous studies suggesting that strong ESG performance enhances investor confidence, reduces perceived risk, and lowers the cost of equity capital (Azmi et al., 2021; Cantero-Saiz et al., 2024). In line with this evidence, the combination of ESG combined emerge a positive predictor of ROE (Menicucci and Paolucci, 2023). From a resource dependence theory perspective and the stakeholder theory, stakeholder engagement in ESG practices generates a competitive advantage for a responsible bank, thereby improving shareholder value over the long term.

5.6. The Mediating Effect of ESG

Regarding the mediating effect of ESG, the indirect effect of mobile banking applications on bank performance, specifically return on assets (ROA), mediated by ESG performance, is positive but lacks statistical significance, thus rejecting the H_{4a} hypothesis. This suggests that while mobile banking adoption enhances ESG performance, its impact does not directly translate into improved asset-based profitability. The absence of mediation may imply that the significant investment and operational costs associated with adopting digital transformation strategies to boost financial performance and achieve digital competitiveness could limit short-term efficiency gains.

Conversely, the mediating effect of ESG standards between mobile banking adoption and return on equity (ROE) is statistically significant and robust, supporting the H_{4b} hypothesis. This finding suggests that ESG performance plays a crucial mediating role in transforming digital banking adoption into sustainable, profitable growth and enhanced shareholder value. From a resource dependency theory perspective, mobile banking initiatives enable banks to access technological and human resources and strengthen stakeholder relationships, while adherence to ESG standards enhances legitimacy and market reputation, ultimately boosting ROE (Almubarak and Aljughaiman, 2024).

Furthermore, the indirect effect of GDP per capita on return on assets (ROA) is an indicator assessing a bank's ability to generate profits from its assets through ESG performance. While positive, this effect is not statistically significant, thus rejecting the H_{4c} hypothesis. This finding suggests that although higher income levels are associated with improved ESG performance (Kaika and Zervas, 2013; Arun et al., 2022), commitment to these initiatives does not necessarily translate into short-term financial profitability as measured by ROA. This finding is consistent with previous research indicating that ESG spending sometimes involves upfront costs and requires additional investments that may reduce operational efficiency in the short term, particularly in highly regulated and structurally rigid banking sectors (Niţescu et al., 2025).

Conversely, the mediating effect of ESG performance on the link between GDP per capita and return on equity (ROE) is statistically significant (e.g., $P < 0.05$), confirming the H_{4d} hypothesis. This finding suggests that ESG performance acts as a conduit for returns, with higher income levels enhancing shareholder returns. Theoretically, this finding aligns with stakeholder and legitimacy theories, which posit that ESG participation maximizes shareholder value and reduces perceived risk, thereby improving equity-based performance metrics.

6. CONCLUSION

The rationale of the study is to examine the determinants of bank performance in Kuwait, Qatar, the UAE, and Saudi Arabia using panel data from 12 banks from 2010 to 2023. For analysis, the study used PLS-SEM with SmartPLS 3 software. The study developed twelve hypotheses based on the extant literature review. Out of 12 proposed hypotheses, the study confirmed that seven hypotheses are statistically significant. The study findings indicated that MBAs have a positive and a negative statistically significant effect on ROA and ROE, respectively. Besides, the GDP per Capita have a statistically insignificant effect on bank performance. It is due to the structural characteristics of emerging economies, particularly in Gulf countries, where economic growth is largely driven by oil revenues and government spending rather than private-sector credit expansion. Consequently, increases in income levels do not necessarily translate into higher loan demand, improved intermediation efficiency, or enhanced bank profitability.

Additionally, both FinTech factors, such as MBA and GDP per Capita, have a positive statistical effect on ESG performance within the banking industry, reflecting banks' strategic efforts to enhance sustainability practices while improving overall sector performance. Besides, the government and the policy maker should promote banks to increase their investment in FinTech sevices. However, ESG performance does not have a significant effect on the ROA variable, while it has a positive effect on the ROE. Although there is no significant effect, larger banks can contribute increase profitability through economies of scale, cost efficiency, and improved resource utilization. Thus, there is a chance that economies of scale will benefit banks.

Moreover, the study highlights the importance of ESG performance as a mechanism through which MBA and GDP per captia affect bank performance within the banking industry. It underscores the need for strengthening ESG performance to effectively channel the benefits of MBA and economic development into enhanced return on assets. These insights are particularly relevant for policymakers and bank managers in the Gulf region seeking to balance digital innovation, ESG compliance, and financial performance. The study's use of PLS-SEM techniques, which make it possible to

measure indirect effects of ESG performance, are some of its strengths. The study, however, has a flaw because it only includes 12 banks from 2010 to 2023. Additionally, the study adapted only two FinTech variables: MBA and the GDP per capita. Future studies on this subject should use a mixed-methods design that employs quantitative and qualitative approaches, as qualitative data helps triangulate the quantitative findings.

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