DOES GREEN BANKING AFFECT BANKS' PROFITABILITY?

Mohammed K. Al-Kubaisi *, Bashar Abu Khalaf **

* *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, P. O. Box 24449, Doha, Qatar
** College of Business Management, Banking & Fintech Department, University of Doha for Science and Technology, Doha, Qatar

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Abstract

This paper empirically investigated the impact of green banking on the financial performance of Qatari banks. This paper collected the data for all banks in Qatar during the period 2012–2021. Specifically, the data collected included all 7 banks in Qatar and gathered data from the Refinitiv Eikon platform, the annual reports of the banks, and the relevant stock markets. Ordinary least squares (OLS) and panel regression have been applied but the fixed effect technique was interpreted because of the significance of the Hausman test. The dependent variable was the return on equity, the independent variables were size, loan loss provision, and two dummy variables as a proxy for green banking, which are: the availability of online banking and the availability of mobile applications. The results showed a positive relationship between the size and the return on equity and a negative relationship between the loan loss provision and the availability of mobile applications on the return on equity. The availability of online banking had an insignificant relationship with return on equity. This implies that larger Qatari banks tend to have larger profits and banks who estimate higher loan loss provisions are expected to have lower profitability. Surprisingly, the availability of mobile applications is found to affect profitability negatively if the cost of having the application is not covered by the noninterest charges.

Keywords: Green Banking, Fixed Effect Technique, Qatari Banks, Profitability

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1. INTRODUCTION

The environment is an essential part of our lives that we all need to take care of in every industry in the world, not only in certain industries. Wastage of paper is one of the most harmful things to the environment. Suraj and Khan (2015) mentioned that 93% of the process of creating paper is based on trees, and one tree could barely create only about 8,000 papers. By imagining the huge number of papers that the banks are wasting we can imagine the huge impact on the environment since the trees are the lungs of our planet because of transferring H_2O to O_2, which means that we are destroying one of the most important parts of the environment. Therefore, banks tried to reduce it by replacing paper-based transactions with online-based ones (Akhter et al., 2021; Mirovic et al., 2023).

Green banking deliberates all aspects, such as environmental and social taking into consideration to preservation of natural resources and, most importantly, to protection of the environment (in other words what in today's empirical papers is called "sustainable banking") (Yin et al., 2021).

However, green banking services are not strongly efficient in every country because of the high costs of development and server's expenses which can be extremely costly in most of the countries. Moreover, cyber security services are one of the most necessary factors that the banks are forced to spend a huge amount of money on to prevent hacking and cyber-attacks which can lead to huge financial issues (Qatar Central Bank [QCB], 2023).

Moreover, online banking did not only impact the environment positively, but it also affected the profitability of banks since the high speed of completing the transaction through online banking and the mobile applications increased the efficiency of the operation, which led to more profit for the bank (Akomea-Frimpong et al., 2021). However, the high expenses of developing the online system at the beginning of implementation could lead to an increase in expenses in the early years (Venkataraman & Ashwini, 2022).

Qatar National Bank (QNB) is one of the biggest banks in Qatar; it was founded on the 6th of June 1964 and it is considered the oldest bank in Qatar. On the 6th of July 2013, QNB started their online banking services which really reduced the physical transactions since most of their basic transaction were available online through their website and mobile application. Thus, most of the customers started performing their transactions through online platforms rather than going to the branches physically. Consequently, this led to reducing the expenses and the cost on the bank so the profitability increased. The reduction of expenses is one major key that really impacted the profitability of banks. In addition, the efforts to employ green banking and sustainable banking fall under different pillars to conclude Qatar's Vision 2030 (QCB, 2023).

Furthermore, the adoption of online banking transactions reduced the expenses of the bank gradually. For example, the higher the banks' tendency to new financial technologies, the less the need for employees, and this, in turn, reduces the salary expenses. In addition, the marketing expenses are lower since the bank can advertise its new services and offers through the application of the bank rather than following the traditional marketing methods. Subsequently, the bank can increase its net profit not only by increasing the revenue but also by reducing the cost in general (Rega, 2017; Khalaf, Awad, & Ahmed, 2023). Thus, the significance of this paper relies on increasing the awareness of Qatari decision-makers on the importance of green banking and its impact on performance since reducing the expenses and providing several online services increase the customer base; consequently, this affects the profitability positively.

The main objective of this paper is to empirically investigate the impact of switching to green banking also known as "online banking" on the profitability of banks in the financial sector of Qatar using several regressions, such as ordinary least squares (OLS) and panel regression (fixed and random effect techniques). All the banks in Qatar switched to online banking but not all of them have the same number of services that are available in online banking. This research will provide a recommendation for Qatari bank managers regarding the application of green banking and the consequences of applying it. This, in turn, might affect the strategies and policies adopted. Therefore, this paper contributed to the previous literature about green banking implications on banks' profitability and delivered to the decision-makers in Qatari banks the main drivers that they should concentrate on when deciding to increase their green services.

The remaining structure of this paper is as follows. Section 2 reviews relevant previous studies. Section 3 highlights the methodology that has been used to investigate the impact of green banking on the performance of Qatari banks, specifically, the data used, the model developed, and the model used. Section 4 analyses the results based on the OLS and panel regressions, while comparing the results to previous studies. Section 5 concludes this paper.

2. LITERATURE REVIEW

Online banking, also known as "green banking", is claimed to be one of the most efficient ways to reduce the cost of the bank, which will lead to an impact on the profitability of the bank positively. However, not all the banks had the same amount of impact for several reasons that this paper will investigate to check what are the variables that are affecting the return on equity (ROE), which is the measurement of the profitability of the bank.

Abaenewe et al. (2013) investigated 4 banks as a sample in the Nigerian stock market during the years 1997–2010 to check whether online banking really affected the profitability measured by return on assets (ROA) and ROE. The results showed an improvement in ROE. However, ROA did not increase as much as ROE but the increase was slightly lower since online banking has its own expenses. For example, the servers, the customer service employees, the online support, etc. However, customer satisfaction was the major effect that the banks are aiming at in Nigeria because it would attract more customers, which would lead, in the long term, to an increase in the bank's profitability.

Karimzadeh and Sasouli (2013) collected a sample of 8 commercial banks in India and the period of the study was 13 years (1997–2010). The paper was prepared to investigate the effect of Internet banking on the ROE of Indian banks. The research found that the dummy variable of availability of Internet banking has a huge impact of 3% on the profitability of the bank. The research concluded that the profitability increases when using fintech, such as online banking. This application causes a reduction of cost because of decreasing expenses that the bank is entitled to when the transactions are not done physically such as paper, supplies and other expenses that are avoided during the online services are available.

Siddik et al. (2014) investigated the Bangladesh financial sector and collected a sample of 13 banks to investigate the impact of e-banking on the profitability of the bank during the period of 11 years (2003–2013). The study measures the performance of the bank using different profitability measures such as the ROE ratio to measure the returned earnings for the shareholders, which reflects the performance of the bank

management in getting the profit. Also, ROA measures the profitability of the bank and the net interest margin as a proxy of the bank's performance. The study focused on the ROE rather than ROA because it does not only measure the profitability of the bank but also it measures the efficiency of the management system in the bank and its performance. The paper concluded that the adoption of online banking impacted the ROE positively. This concludes that the adoption of e-banking impacted the performance of banks positively in Bangladesh.

Mawutor (2014) applied the questionnaire methodology and collected a sample of 150 customers of the Agricultural Development Bank in Ghana. This study covered the period from 2008 to 2013 to investigate the collected data about the e-banking system and check the number of users using the e-banking. Mawutor (2014) also measured the impact of the e-banking system on the ROE of the bank to check whether the e-banking system improved the performance of the bank positively. The results argued that 142 out of the 150 respondents agreed that they are using the e-banking system. Also, the ROE increased during the years that the bank used e-banking. However, that increase was not depending only on the e-banking system but it was one of the main factors of that improvement. The study concluded at the end that e-banking, which is also known as online banking, has a positive impact on the bank's performance and profitability.

Yadav et al. (2015) collected a survey of 210 bank consumers in India to check the satisfaction of the customers on the online banking services. They assumed that the "information-only" websites are not as effective as "transactional-based" websites on the profitability of the bank. This is due to customers cannot do any transactions through it, so the bank will not be able to gain any profits from that process. However, by implementing the transaction services in the website or the application they can gain customer satisfaction and they also reduce the cost of the physical services because they will not waste the effort of humans and supply resources.

Yang et al. (2018) collected a sample of 6 banks in China during a period of 10 years. They investigated the impact of e-banking on the performance of Chinese banks. The dependent variables that are used to measure the performance of the bank were ROA, ROE, and net interest margin to measure the profitability. The research concluded that the ROE increased and the efficiency of the bank increased due to the development of the e-banking system. However, the efficiency did not increase that much because of the expenses that are related to operating online banking, such as the networking expense of the server and the development of the banking programs and applications.

Islam et al. (2019) composed a sample of 30 banks in Bangladesh to check whether online banking affects the performance of banks and improves the ROE and ROA during the period of 2007–2016. They selected a mix of banks that have online services and others that do not. The researchers found that banks that applied online services had more ROA than the ones that did not, which concludes that banks that have online banking are performing better than the banks that do not have online banking since they give more features to their customers.

Akhter et al. (2021) collected a sample of 60 banks in Bangladesh, the study period was for 3 years (2016–2018). The objective of their study was to find the impact of green banking on the performance of banks. They applied mixed methodology (quantitative and qualitative) to empirically investigate the relationship between green banking and banks' performance. The dependent variables were ROA, ROE, and return on investment (ROI). The independent variables were the green banking compliance rate (GBCR) and the green finance ratio (GFR). The paper concluded that the GBCR had a positive relationship with the ROE and ROI. However, there is a negative relationship between GBCR and ROA. Moreover, GFR had a positive relationship with ROE and ROA and a negative relationship with ROI. The paper argued that the negative relationship between GFR and ROI is attributed to the concept that the financing of green banking is not profitable because of the high expenses of the development process of green financing.

Sharma and Choubey (2022) investigated the financial sector of Indian banks for a period of 10 years (2008–2018) and took a sample of 11 banks (5 private and 5 public banks) to check the impact of online banking on the profitability of the banks. The researchers concluded that there is a negative relationship between the online banking and the ROE. They have been attributing this loss to the networking expense because the servers that the bank needs to operate a good online service have a high cost which will impact the profitability of the bank if such cost is not covered with high usage of such services.

Pasha and Elbages (2022) collected a sample of 20 banks in Egypt to investigate the changes in ROE during the period of 10 years (2009–2018) due to the application of online banking. They included other variables to control for such a relationship, such as the bank size, operating income, and liquidity risk. The results varied among the Egyptian banks since not all the banks had similar services provided online so the bank with the more advanced online system showed the most improvement on the bank's ROE.

Hoque et al. (2022) investigated the impact of financial performance on green banking in Bangladesh. They covered the period of study of 2018–2022 and managed to collect the data from 70 banks. The dependent variable included in their model is green banking spending (GBS), which represents the expenditures that the banks are spending on green banking. The dependent variables were ROA, liquidity ratio (LR), and debt-to-assets ratio (DAR). They reported a positive relationship between GBS, the LR, and ROA. The positive relationship between ROA and the GBS is attributed that more profit gained can help in affording higher expenditures that the banks can contribute to green banking services.

Selvan and Priyadarshini (2023) investigated the impact of green banking on the profitability of the banking sector in India. They included all banks in India in their final sample. The dependent variable is ROE and the independent variables are efficiency and risk. They stated that green banking has

a positive relationship with profitability (ROE). Also, a positive relationship between ROE and efficiency was found. However, there is a negative relationship between ROE and risk. The authors concluded that the huge increase in profitability is due to the huge cost-cutting that green banking is providing to the banks. Also, the efficiency increases since the customers can do multiple services with green banking without going to the bank branches which needs more time and effort.

In conclusion, as evidenced by the selected previous studies, this empirical paper aims to fill in the gap to check the impact of green banking on the profitability of Qatari banks. In addition, this paper adds to the literature an empirical study that can help in comparing the results of the impact of green banking on profitability in the banking sector.

3. METHODOLOGY

3.1. Sample used

This empirical paper investigates the impact of green banking on the profitability of the financial sector in Qatar. It is based on all 7 listed banks operating in Qatar. This sample included 3 Islamic banks, which are Qatar Islamic Bank (QIB), Qatar International Islamic Bank (QIIB), and Ahli Bank, and the remaining are conventional banks. The period of the study was determined based on the availability of information on online banking and financial data of the bank. This study's period is for 10 years from 2012 until 2021 in order to check the impact of green banking on the profitability of Qatari banks since most banks started such principles during the last 10 years (QCB, 2023). The data has been collected from the Refinitiv Eikon platform, the Qatar Stock Exchange website, and the respective annual reports that are available on the banks' websites for financial information. This paper applied the OLS and panel regression (fixed and random effect techniques) to estimate the model that has been developed in the next sub-section (Khalaf, 2022; Khalaf & Alajlani, 2021). The significant result of the Hausman test favored the fixed effect results (Khalaf, 2023). It is highly recommendable to apply the mixed methodology for future research in order to collect the views of managers and check if this comes in line with the regression results.

3.2. Model development

The dependent variable is *ROE*, and the independent variables are the loan loss provision, the bank size, and two dummy variables as proxies for fintech, such as the availability of online banking and mobile applications. The model that has been developed aims to empirically investigate the impact of green banking on the profitability in Qatar's financial sector of listed banks.

3.2.1. Dependent variable

Return on equity (*ROE*) is used to measure performance (Mirovic et al., 2023). This dependent variable will not only show us the profitability of the bank but also lead us to know how well are the bank's management and operation. *ROE* is measured by dividing the net income by the total equity (Net income/Total equity). Al-Harbi (2019) has also argued that the *ROE* is commonly used as an efficient measurement of the profitability and performance of banks (Khalaf, Awad, & Ahmed, 2023).

3.2.2. Independent variables

The independent variables used are loan loss provision, the bank size, and two dummy variables, which are the availability of online banking and mobile applications. Such variables are included in our model to measure the impact of green banking on the profitability of Qatari banks.

Loan loss provision (*LLP*) is used to measure the risk of not getting paid back on the loans (Bayar, 2019). This variable is calculated by dividing the loan loss provision by the total loans (Loan loss provision/Total loans). Farook et al. (2014) found a negative relationship between the ROE and the independent variable *LLP*, which means whenever the *LLP* decreases, the *ROE* increases.

H1: This paper expects that there is a negative relationship between LLP and ROE.

The size of the bank (*SIZE*) is calculated as the natural logarithm of the total assets of banks. Rao et al. (2020) concluded that there is a positive relationship between the bank size and the *ROE* since the total assets of the bank support the operation of the bank, which will lead it to gain more *ROE*.

H2: This paper expects that there is a positive relationship between the SIZE and ROE.

Two dummy variables are included in this empirical paper to measure green banking: the availability of online banking and the availability of mobile applications. These variables are measured as 1 if this variable is available and 0 if it is not.

The availability of online banking (*AOOB*): is one of the dummy variables used for green banking. This variable is measured by 0 if this service is not available and by 1 if it is available (Available = 1, Not available = 0). Pasha and Elbages (2022) found a positive relationship between the dependent variable *ROE* and the independent dummy variable, which is the availability of online banking, and that suggested there is a rise to the *ROE* when the online banking is implemented.

H3: This paper expects that there is a positive relationship between the AOOB and ROE.

The availability of mobile application (*AOMA*): is a dummy variable used as a proxy for green banking. It is measured by a scale of 0 if it is not available and by 1 if it is available (Available = 1, Not available = 0). Hernando and Nieto (2007) concluded that the more services available in online banking, the more positive impact is expected on profitability. For example, if the bank has several services in the bank's mobile application, then the higher the effect expected on *ROE*.

H4: This paper expects that there is a positive relationship between AOMA and ROE.

3.3. Model

The following regression model is used to measure the impact of green banking on the profitability of banks in Qatar. The dependent variable is *ROE,* which is used to measure the profitability of the bank.

The first independent variable is the loan loss provision (*LLP*), which is used to measure the risk of banks' loans. The second independent variable is the size of the bank (*SIZE*), which is the measurement of the total assets of the bank. The third dummy independent variable is the availability of online banking (*AOOB*), which is used to measure the availability of online banking services of the bank. The last dummy independent variable is the availability of the mobile application (*AOMA*), which is used to measure whether the bank has a mobile application or not.

$$ROE = \alpha_1 LLP + \alpha_2 SIZE + \alpha_3 AOOB + \alpha_4 AOMA + \varepsilon \quad (1)$$

where, *ROE* represents the return on equity as a measure of profitability; *LLP* represents the loan loss provision ratio; *SIZE* represents the natural logarithm of the total asset of the bank; *AOOB* represents the availability of online banking; *AOMA* represents the availability of a mobile application; ε is the error term.

4. RESULTS AND DISCUSSION

Based on Table 1, it is concluded that the loan loss provision had a huge standard deviation and it is related to the big differences between the banks' size in the sample that is used in this paper. In addition, the bank size had a standard deviation of 0.955, which is relatively high because of the very high net assets that some of the big banks have in the sample. This result aligns with Farook et al.'s (2014) research which concluded that the bigger the size of the bank, the higher the loan loss provision because the amount of assets that the bank has is related to the loan loss provision. This means that the more the assets that the bank has, the more the loan loss provision it has, because of the high risk that the bank is facing through the loans.

Table 1. Descriptive statistics

	Min.	*Max.*	*Mean*	*Std. Dev.*
ROE	0.019	0.206	0.138	0.043
SIZE	8.880	12.689	10.317	0.955
LLP	13.508	21.604	18.243	1.659
AOOB	0	1	0.99	0.120
AOMA	0	1	0.81	0.392

Note: ROE stands for return on equity; SIZE is measured by the natural logarithm of total assets; LLP is loan loss provision; AOOB and AOMA are the availability of online banking and the availability of mobile banking, respectively.

Furthermore, the *ROE* has a mean of 13.8% in the Qatari market, which represents a very good economic system of the country, especially during the events that were happening in the previous years that affected the global economic system, such as the coronavirus pandemic. Mkadmi et al. (2021) investigated the ROE of the Tunisian bank industry, which was 10.2%, which is close to the Qatari market relatively but the research period covered the years 2005–2015. This means that this study did not have a huge bad event that really affected the global economy.

However, the Qatari market showed a stable economic system because even with the COVID-19 pandemic and the impact it had on the banking industry it stayed stable with an above average ROE of 13.8%. Mahajan et al. (2022) investigated the ROE of the Indian market during the year 2020–2021 and it was 3.3%, which explains the huge impact of the pandemic on the banking industry around the world. The total mean of ROE from the period of 2016–2022 was 7.8%, which is very low compared to the banking industry in Qatar. This comparison represents the efficiency and the good profitability level of the banking sector in Qatar.

Table 2. Correlation matrix

	ROE	*SIZE*	*LLP*	*AOOB*	*AOMA*
ROE	1				
SIZE	0.323**	1			
LLP	-0.150	0.713**	1		
AOOB	0.064	0.045	0.011	1	
AOMA	-0.162	0.317**	0.380**	0.252*	1

*Note: ** Correlation is significant at the 0.01 level; * Correlation is significant at the 0.05 level. ROE stands for return on equity; SIZE is measured by the natural logarithm of total assets; LLP is loan loss provision; AOOB and AOMA are the availability of online banking and the availability of mobile banking, respectively.*

Based on Table 2, the correlation coefficients were provided between the performance (*ROE*) and the variables included in the model developed in the previous section. Specifically, as evident in Table 2, the size of the bank is positive with the profitability measure (*ROE*) and this suggests that larger banks have better profitability. This is justifiable since large banks have easier access to the market and are expected to have a larger customer base (Selvan & Priyadarshini, 2023).

In addition, there is a negative correlation between loan loss provisions and profitability since higher provisions mean higher risk and this might affect the profitability in Qatar negatively. Furthermore, an interesting result is that the availability of mobile banking affects profitability negatively which suggests that either the cost of mobile banking in Qatar is huge to maintain or using mobile banking affected the number of customers visiting banks less, and this in turn, affected profitability negatively (Kevser, 2020).

Based on the below regression results in Table 3, there is a significant positive relationship between the bank's size and the return on equity. This result suggests that larger banks tend to have higher cash flow and larger owned assets that can be used to generate income. This result aligns with Rao et al.'s (2020) study which concluded the same result finding that the size of the bank has a positive relationship with the ROE. The research argued that the positive relation is due to the high net assets, equity, and cash flow that the bank has, which gives a big opportunity for the bank to gain more profit which will lead to a higher return on equity. In addition, Khalaf and Alajlani (2021) argued that larger banks tend to have a larger customer base and this should affect profitability positively. Therefore, larger banks should increase their online services to satisfy the needs of their customers and consequently increase their profitability.

Table 3. Regression results (Dependent variable — *ROE*)

Variables	*OLS*		*Fixed effect*		*Random effect*	
	Coefficient	*Significance*	*Coefficient*	*Significance*	*Coefficient*	*Significance*
SIZE	8.629	0.056	4.016	0.000	3.594	0.010
LLP	-3.658	0.026	-1.848	0.000	-0.985	0.000
AOOB	6.658	0.652	2.936	0.409	1.659	0.326
AOMA	-5.652	0.000	-2.150	0.070	-0.956	0.098
Constant	1.369	0.369	4.916	0.424	2.659	0.965
Adjusted R^2	0.265		0.393		0.315	
F-statistic	26.75***		46.37***		31.48***	
Hausman test			126.56 (0.000)			

Furthermore, the results concluded a negative relationship between the loan loss provision and the return on equity with a significance of 1%. This result basically states that banks with high loan loss provisions are facing less profitability since the loan loss provision can provide a measure of bad loans and this affects the profitability negatively. This result comes in line with Malik et al. (2022) who argued that the loan loss provision had a negative relationship with the return on equity, which is the measurement of profitability (Bayar, 2019). Del Gaudio et al. (2022) argued that banks will gain less when they have more loan loss provisions as higher risk is faced by that bank. Similarly, Khalaf (2022) argued that the lower the credit risk, the higher the expected profitability since this implies an efficient and effective credit process followed by the bank and a good collection department.

However, the availability of online banking showed an insignificant relationship with the return of equity to the bank (Batae et al., 2021). Nonetheless, the availability of mobile applications showed a negative relationship with the return of equity with a significance of 10%, which means that the more usage of mobile application of the bank, the less profit the bank gains. This is attributed to the high cost of development of the mobile application, the networking expenses, and the labor cost of employees that are working on the mobile application such as the support. This result is supported by Harelimana (2017), who enlightened that the loss the bank is facing through the mobile application is attributed to the services that the bank offers during the mobile application and pays an expense for it such as servers' expenses and the clients do not use it. For example, deposit and transfer were not used that frequently but it costs the bank a lot through the expenses of networking.

Robustness of results

Table 4 shows the results when running the different regressions (OLS and panel) for the model developed in sub-section 3.2. The performance of banks, which is the dependent variable, has been proxied by the *ROA* to check for the robustness of the results.

Table 4. Regression results (Dependent variable — *ROA*)

Variables	*OLS*		*Fixed effect*		*Random effect*	
	Coefficient	*Significance*	*Coefficient*	*Significance*	*Coefficient*	*Significance*
SIZE	4.275	0.062	3.024	0.000	2.789	0.046
LLP	-1.865	0.038	-1.786	0.000	-0.870	0.015
AOOB	3.593	0.548	1.775	0.386	1.232	0.463
AOMA	-3.445	0.000	-1.784	0.054	-0.875	0.085
Constant	1.372	0.463	4.384	0.365	1.993	0.756
Adjusted R^2	0.285		0.417		0.354	
F-statistic	31.45**		67.88**		51.46**	
Hausman test			164.28 (0.000)			

As evident from Table 5, the results of the different regressions did not differ and this confirms the robustness of the results. Specifically, the fixed effect results are still favored by the significant results of the Hausman test. The coefficient of the size of banks is positive and significant but the coefficients of the loan loss provision and availability of mobile banking are significant and negative. Which comes in line with the results reported in Table 4.

5. CONCLUSION

This paper investigated the impact of green banking on the profitability of Qatari banks. The sample included all 7 banks listed on the Qatar Stock Exchange. The period of the study covered 10 years, from 2012 to 2021. The OLS and panel regressions (fixed and random effect techniques) have been used to investigate the relationship between green banking and profitability; the Hausman test favored the fixed effect results. The dependent variable was return on equity and it was used to measure the profitability of the bank. The independent variables are size, and the loan loss provision, two dummy variables as a proxy for green banking were used, which are the availability of online banking and the availability of mobile applications. The regression results showed a positive relationship between the size and the return on equity with a significance of 1%, and a negative relationship between the loan loss provision and return on equity with a significance of 1%. In addition, a negative relationship between the availability of mobile applications and return on equity with a significance of 10% and a non-significant relationship between the availability of online banking and return on equity.

The results imply that larger Qatari banks enjoy higher profits since they have easier access to

the market and larger customer base, this in turn, affects the profitability positively. Also, if banks suffer higher loan loss provisions, then this will affect their profitability negatively since the higher risk is characterised with such banks and this is due to the high nonperforming loans that banks suffered. Then, the interesting result is the negative impact of green banking on the profitability of Qatari banks. This result suggests that the availability of such mobile applications incurs a high cost that does not get covered but the low number of transactions used through the application or the high cost of service incurred to make such service available.

Therefore, this empirical paper recommends that larger banks should highly invest in green banking and enjoy the profitability that will be associated with the high usage of their customers. This also will affect better environment and sustainable banking. Finally, we suggest researchers do a comparative study to check the differences between the Gulf Cooperation Council countries and the European region for future research.

This paper investigated the impact of green banking on the profitability of Qatari banks and this should be highlighted as a main concern as a limitation of this study. The results of this study applied to the Qatari market and the results of this empirical evidence cannot be generalised to other countries where this can be taken as future research that can be suggested. Researchers are encouraged to carry out new investigations to check the impact of green banking on the profitability in other markets such as the GGC region or the MENA region.

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