

The Impact of FinTech on Profitability: An Analysis of Determinants in Banks of Middle East and North Africa (MENA) Region

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Abstracts: This study analyzed FinTech's influence on MENA's banking sector. This paper collected the data from Refinitiv Eikon platform and the bank's annual reports, provided on the different Stock Exchanges websites. Our sample included Seven Countries namely; Qatar (7 Banks), United Arab Emirates (16 Banks), Kuwait (10 Banks), Egypt (10 Banks), Jordan (11 Banks), Saudi Arabia (10 Banks) and Turkey (9 Banks). Specifically, 73 Banks in the MENA region has been collected during the period 2014-2021 to investigate the impact of Fintech on Banks profitability. The model developed included several independent variables, such as the number of ATM machines, internet banking, size, growth and mobile application's availability, while the dependent variable is profitability (Return on Assets). The model used was estimated using panel regression (fixed and random effect techniques), Hausman test favored the fixed effect results. The results indicated that the number of ATM machines affects the bank's performance negatively. This suggests that the higher the number of ATM machines, the lower the performance, since the higher cost related to the usage of such machines with no charge of usage. However, internet banking, mobile applications and size affect Return on Assets positively.

Keywords: Fintech, Mobile Banking; Internet Banking, Actor–Network Theory (ANT), Transaction Cost Theory (TCT), Performance.

1. INTRODUCTION

FinTech as the innovation in digital technologies that transform financial institution rhythm of operation by the use of mobile, cloud, machine learning and other various technological advancements. In MENA region, the financial industry is regulated by the Central Banks of different stock markets. According to the annual report of the QCB, it has embarked on the journey of enabling companies to use FinTech to for the development of Qatar's economy (QCB, 2021). The main objective of this paper is to investigate the relationship of mobile banking, internet banking, the size and the growth of the bank to its profitability. This will aid in understanding how these variables affect the banking sector's profitability, which in turn strengthens the MENA economy. Since FinTech enables banks to offer financial services at lower costs than a traditional bank would, this may lead to increase in profitability. FinTech may allow banks to offer new and innovative products and services, which can make traditional banks hard to keep up with the changes and advancements. FinTech also enables banks to use digital platforms that have automation as part of the package (Feyen et al. 2021).

According to Kammoun et al. (2020), the banking sector in MENA region has had increases in growth in the rate of assets, deposits and loans. The growth can be an indication that FinTech could be one of the factors to this growth. Therefore, it is important to asses how FinTech has affected the MENA banking sector through empirical analysis, and the role it has played in the bank's margin of profit. According to Singh (2021), FinTech did not have enough data for analysis until recently. Singh also explains that advisory firms have considered FinTech to be a priority. However, Du and Liu (2022) argue that FinTech does not only bring opportunities but challenges as well.

Ebrahim et al. (2020) argued that some of the possible opportunities brought by FinTech are an improved banking experience, customized customer service, security of data and efficiency. They, however, argue that the risk of security still exists within the FinTech world. They also mention risks like regulatory, financial and technical risks which FinTech can bring to the table. Moreover, they argue that FinTech could be hard to implement because of inadaptation to the technologies and FinTech-resisting country's regulations. Haddad and Hornuf (2019) argue

the retention of highly qualified FinTech personnel is a possible challenge. Vasiljeva and Lukanova (2016) mention that FinTech can be categorized in three categories. The first category involves services that traditional banks offer like card payments, transfer of funds, payments by cards, peer-to-peer (P2P) lending, etc. The second category is the ability to shift how the company views information through the collection, processing and analysis of the data collected. The third category is to introduce more cost-effective and efficient models of operation.

The structure of this paper is as follows; section 2 will highlight selected previous studies and discuss the theoretical background of this topic. Section 3 will provide the sample used and the model development. In addition, Section 4 will analyse the data and compare the results. Finally, the conclusion will be provided in section 5.

2. LITERATURE REVIEW

2.1. Theoretical background

2.1.1. Actor–Network theory (ANT)

Latour (1987) has stated that society plays a big role in scientific theories and this is the basis of the Actor–Network theory (ANT). This indicates that the theories that are researched are not purely rational but can be the result of social interactions. The implications that can be drawn from this is that technology is as famous as socially perceived. McBride (2003) explains that the excellence of the technology does not play a role in its being socially accepted. It needs to have a large mass of users to promote its success. Shim and Shin (2015) have analyzed that FinTech has grown rapidly in China using the ANT framework. They concluded that both technological advancements and China's governmental policies have helped FinTech to thrive.

2.1.2. Reputation theory

Zhou and Chen (2021) explain reputation theory as the accumulation of information in private to gain long-term advantages by using this information. This means that a company, for example, can use the information it stores privately to create a strong image. They explain that FinTech platforms can make use of this private information to enhance the image and reputation of the company, resulting in benefits. They also explain that it can help organizations become more profitable. They argue, however, that the excessive innovation that will result from this can cause industry instability.

2.1.3. Transaction Cost Theory (TCT)

The Transaction Cost Theory (TCT) has had changes throughout the history, where it began as the theory of transaction costs and how to eliminate unnecessary costs, evolving to Transaction Cost Economics. Aric (2019) explains that the future of this theory is digital according to Benkler's views on the theory. Aric mentions that the introduction of open-source software along with co-creation by customers have revolutionized the economic activity. Aric analyzes that Benkler's ideas push TCT to include social production as an alternative to markets and firms. If this idea becomes the future of economic activity, this means FinTech will be one of the core technologies to accommodate such change.

2.2 Previous Studies

Fidanoski et al. (2018) explain in their results on bank's profitability that assets size, Gross Domestic Product (GDP), Capital Adequacy Ratio (CAR), Return on Assets (ROA), loan portfolio and Real Net Interest Margin (RNIM) are possible indicators in the Croatian market. ROA and RNIM were the dependent variables. They have selected Croatian banks panel dataset for the period 2007 to 2014. After testing stationarity and applying Pedroni and Kao tests, they ran DOLS machinery since the cointegration allows for the use of dynamic panel data model. The results show that ROA can be used as a profitability indicator for Croatian banks.

Jin & Yanathi (2019) argue that the use of Information Communication technology (ICT) has become a very important indicator to know if the bank is competitive enough. They analyzed 17 banks in South Korea from the period 2011 to 2017. They applied OLS regression on the variables Market Share borrow and lend as the dependent variables and IT scandals, IT center existence, Deposit Ratio, Return on Assets (ROA) and Net Interest Margin (NIM) as independent variables. The results have shown that ICT facilities readiness and scandals could affect the bank's profitability negatively.

Medyawati et al. (2021) investigated the determinants of a bank's profitability. They used data from the banks listed on the Indonesian Stock Exchange from the period 2014 to 2020. The model developed ROA as the dependent variable and Automated Teller Machine (ATM) transactions, mobile banking and internet banking as the independent variables. They have used panel regression and found that ATM alone does not have yield profit. However, ATM along with Internet banking and mobile banking have a positive effect on ROA. From this study, we can see that ROA is a good indicator of a bank's profitability.

Jílková & Kotěšovcová (2022) have analyzed the determinants in terms of microeconomics and macroeconomics on bank profitability. They mention that the global economy, affected by COVID-19, had a negative shockwave on European banks. The central banks had then responded with monetary policies that involved rate cuts in interest and the involvement in foreign exchanges to lessen the effect on the local currency. They have used the balances of 3257 banks in the years 2012 to 2019. They have collected the data from ORBIS Bank Focus and the World Bank. Return on Average Assets (ROAA), Return on Average Equity (ROAE) and Net Interest Margin (NIM) were the dependent variables. Various independent variables like the Tier 1 ratio, Gross Domestic Product (GDP), etc. were the independent variables. A multi regression model was run on the data. The research has shown that ROAE had no feasible solution with the regression model. Moreover, ROAA and NIM had four and six feasible solutions, respectively. They concluded that ROAA had a positive impact on the bank's profitability. Additionally, they have found a positive relationship between a bank's profitability and GDP.

Jeelan Basha & Tejesh (2021) have analyzed the banking sector in India in the period 2010 to 2019. They mention that the banking sector has had changes in its structure. This indicates that the economy of India has been affected. As a result, they researched the determinants of profitability of commercial banks after this structural change. They have used Return on Assets (ROA), Return on Equity (ROE), Net Interest Margin (NIM) and (Liquidity) LIQ as the dependent variables and Size (SIZ), Efficiency (EFF), Concentration (CON), Return on Investment (RI), Capital Adequacy Ratio (CAR), Private Sector Credit (PVT), (Liquidity) QUT, Gross Domestic Product (GDP) and inflation rate as the independent variables. They have used purposive sampling and collected the data of 14 commercial banks in India. The model of regression that was used is the fixed effect model. They found that this model fits ROE, NIM and ROE the best. Their results show that size, GDP, CAR and CON have a negative relationship with ROE, ROA and NIM. They also found out that a bank's liquidity is affected by the bank's size. More, they concluded that ROA, ROE and NIM have a positive relationship with the bank's efficiency.

3. METHODOLOGY

3.1 Sample Used

This empirical investigation collected the data using Rifinitiv Eikon for seven countries in the MENA region; namely; Saudi Arabia, Kuwait, Jordan, United Arab Emirates, Qatar, Egypt and Turkey. The final sample included 73 Banks of the MENA region. In specific, 7 Banks in Qatar, 16 Banks in United Arab Emirates, 10 Banks in Kuwait, 10 Banks in Egypt, 11 Banks in Jordan, 10 Banks in Saudi Arabia and 9 Banks in Turkey. This paper collected the data during the period of 2014-2021 to empirically investigate the impact of Fintech on Banks performance in the MENA region. All the banks included in our sample utilize FinTech, so all banks are relevant to the study. It is crucial to mention that any missing data was collected from the official annual reports of the banks or the related Stock Exchange Market.

3.2 Model Development

To analyze the data collected and based on the previous studies, this section will develop the model that has been used to investigate the impact of FinTech on banks' performance and will show the feasibility of ROA to indicate bank profitability as the dependent variable, and internet banking, size, number of ATM machines, and growth as the independent variables.

3.2.1. Dependent variable: Return on Assets (ROA)

Return on Assets has been used as a profitability measure. For example, this measurement has been used in previous research as an indicator of bank profitability, such as Munteanu & Ilie (2021). Return on assets is a good measure for banks profitability since it provides the return that banks achieved out of their investments in their assets. In other words, the higher the return on assets the higher is the performance of bank.

3.2.2. Independent variables:

ATM will indicate the number of ATM machines across the years. The first measure included for FinTech is the number of ATM's available for customers. Several papers highlighted the importance of ATM's existence to the satisfaction of customers and fulfil their needs, for example nowadays ATM's provide great financial technology of depositing money and even printing cheque books. (Adane et. al. 2021 and Fidanoski et.al. 2018). Based on the previous discussion, this paper expects that there is a positive impact of ATM's availability on the performance of banks.

Mobile indicates mobile application rollout in banks. This is the second proxy used in this paper for FinTech, which is the availability of banks mobile applications. For example, González et al. (2022) have studied how mobile applications and banking innovations improve a bank's profitability. They argued that banks are very adaptable to technological changes. Moreover, they show that technological innovations have a positive correlation with banks' profitability. Based on the previous discussion, this paper expects that there is a positive impact of mobile application availability on the performance of banks.

IBank indicates internet banking availability and this is the third proxy used for Financial Technology. As Medyawati et al. (2021) stated that the availability of internet banking in the Indonesian banks affected their performance positively. Also, as previously mentioned in the literature review, this study has indicated that return on assets as a profitability measure is affected by internet banking and mobile banking. Based on the previous discussion, this paper expects that there is a positive impact of internet banking on the performance of banks.

Size is the natural logarithm of total assets as suggested by several studies such as Lv et.al. (2022) and Shim & Shin (2016). In addition, Thi & Phan (2020) have studied the effect of bank size and its impact on the profitability, they have concluded that there is a negative relationship between profitability and size. They mention that this could be because large banks could be more inefficient than a small bank. Based on the previous discussion, this paper expects that there is a negative impact of size on the performance of banks.

Growth is measured by the market to book ratio following several studies such as Munteanu & Ilie (2021) and Medyawati et al. (2021). Many researchers argued that the high demand on a company's share can be a result of high growth opportunities faced by the company and positive net present value projects incorporated by their investment portfolio. This is expected to increase the share price and as a result they expect the performance to be better. Therefore, this paper expects a positive impact between growth and banks performance.

3.3. Model

In order to estimate the relationship, this paper applies the panel regression (fixed effect or random effect technique). The significant result of Hausman test showed that the fixed model would be the most appropriate. This is to measure the relationship between the ROA as the dependent variable and the number of ATM machines, bank size, growth, internet banking as the independent variable.

$$ROA = \beta_0 + \beta_1 \text{ ATM} + \beta_2 \text{ Mobile} + \beta_3 \text{ IBank} + \beta_4 \text{ Size} + \beta_5 \text{ Growth} + \varepsilon$$

Where;

ROA is return on assets as a proxy for profitability.

ATM/Mobile/IBank are proxies for FinTech availability.

Size is measured by natural logarithm of total assets.

Growth is measured by the Price to Book Ratio.

4. RESULTS AND DISCUSSION

Based on the below Table 1, the results of the data collected show that the standard deviation in the number of ATM machines is vast and the highest between banks, which indicates that the number of ATM machines differ hugely from bank to bank. Specifically, it seems that certain banks do offer ATM's everywhere in order to help their large customer base everywhere.

Table 1: Descriptive statistics

Statistics	Min	Max	Mean	Std. Dev
No. of ATM	48	508	153	5.89
Mobile application	0	1	0.79	0.41
IBank	0	1	0.84	0.37
Size	8.88	17.69	12.32	1.95
Growth	0.30	1.37	0.07	0.83
ROA	0.02	0.86	0.07	1.79

Moreover, the standard deviation of 1.95 for size, which could indicate the high difference in banks size in MENA region. Additionally, the profitability of banks in the MENA region seems to also vary between banks, as indicated also by the high standard deviation of 1.79.

Table 2: Correlation Matrix

Variables	No. of ATM	Mob App	IBank	Size	Growth	ROA
No. of ATM	1					
Mob App	0.224	1				
Int Bank	0.144	0.540**	1			
Size	0.865**	0.007	-0.002	1		
Growth	-0.081	-0.130	-0.092	-0.125	1	
ROA	-0.045	0.174	-0.048	-0.238*	0.026	1

In the above Table 2, the correlation between the profitability and the mobile application is positive and this indicates that more available application might affect the profitability positively in the MENA region. Moreover, there is also a high correlation between internet banking and mobile application, which indicates that that both co-existed most of the years. The size of the bank and the number of ATM machines has high correlation, this means that the size of the bank is highly related to the number of ATM machines they have. Also, the size of the bank and the existence of a mobile application also has a positive correlation.

Additionally, the number of ATM machines seems to have a negative correlation with the growth of the bank. This indicates that the number of ATM machines did not contribute to a positive bank's growth. Mobile applications, internet banking and size also seem to be negatively correlated with growth. This could be because banks need high operational costs to run them and this does not result in the desired growth. Lastly, ROA seems to have negative correlations with the number of ATM machines, internet banking and size. The results indicate that having a higher number of ATM machines may attribute to the goodwill of a bank but not its profitability.

Table 3: Regression Results based on Fixed Effects Regression

Dependent Variable (ROA)			
Variable	Coefficient	Significance	VIF
No. of ATM	0.096	0.010	1.35
Mobile application	0.275	0.001	1.29
Internet Banking	0.463	0.056	1.16
Size	-0.381	0.000	1.29
Growth	-0.076	0.154	1.76
Constant	2.456	0.000	
Adjusted R ²	0.228		

The results of fixed effect regression in the above table 3 show that the model used explain the dependent and independent variables by 22.8%. For the number of ATM machines available, availability of Mobile Banking and usage of Internet Banking, the result is positive and highly statistically significant at 1 percent for the Number of ATM's and mobile application but significant at 5 percent for the internet banking Adane et al. (2021). This suggests that the application of FinTech in banks in MENA region has affected the profitability positively Ebrahim et al. (2020) and Fidanoski et al. (2018). Specifically, the higher the number of ATM's available the more the usage, the more the availability of mobile application and the more the usage of internet banking; the higher is the profitability of MENA region Banks Lv et al. (2022). As for internet banking, it could also be explained that its operational income may yield it to increase in profitability (Shim & Shin, 2016). This contradicts the results found by Medyawati et al. (2021) where they found that internet banking is not profitable, unless combined with mobile applications, which we do not find similar results or further research is needed. However, the existence of mobile applications and the growth of a bank seem to be positively correlated (Zhou & Chen, 2021). Ebrahim et al. (2020) explained that FinTech improves the experience of banking. Thus, using mobile applications could result in the higher ROA as a result of the ease of banking experience.

Moreover, the size of the bank has a negative coefficient and significant at 1 percent, this highlights that the larger the bank the higher the cost associated with its operations and this affect the profitability negatively Ebrahim et al. (2020). Lastly, the growth of the bank is found to be insignificant. Although growth is found insignificant, it seems to have a negative correlation with ROA. This indicates that a higher growth bank yields less profits. The Variance Inflation Factor (VIF) shows that there is no high correlation between the variable so there is multicollinearity problem within the data used in our analysis (Khalaf, 2023).

CONCLUSION

FinTech is the use of advancements in technology to improve the financial sector. FinTech brings opportunities like an improved experience and convenience. However, FinTech is also tied with data and cybersecurity risks. In this study, a data sample of banks in MENA region is used to investigate the impact of FinTech on the profitability (Return on Assets). The independent variables used are internet banking, mobile application, ATM machine number, size and growth of the banks. The paper applied the panel regression (fixed and random effect techniques) but the Hausman test favored the fixed effect results. The results show that the number ATM machines, internet banking and mobile application affect the profitability positively and significant at 1 percent, 5 percent and 1 percent respectively. This suggest that FinTech affects the profitability of banks in the MENA region positively.

Therefore, the results of this paper recommend that banks should include more Financial Technologies in their operations in order to increase the profitability. But surely while taking into consideration the negative impact of size. As in larger banks should monitor their costs since the result suggests negative relation with profitability. This paper highly advice researchers to recheck the model in other regions such as Gulf Cooperation Council (GCC) or The Organization for Economic Co-operation and Development (OECD) to check the implication of FinTech on the performance of companies in such regions.

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