

The Impact of Market Risk Exposure on Banks' Financial Performance: Evidence from the MENA Region

Amer N. Bani Yousef¹, Roshaliza Taha^{1*},
Siti Nurain Muhmad¹ and Ahmad Firdhauz Zainul Abidin²

¹Faculty of Business, Economics and Social Development,
Universiti Malaysia Terengganu, Malaysia

²Centre of Transformation, Strategic Planning and Risk,
Universiti Malaysia Terengganu, Malaysia

ABSTRACT

This study investigated the relationship between market risk and bank financial performance in 14 Middle East and North African (MENA) countries, employing quantile regression estimations. The data of 135 banks in the MENA region from 2015 to 2019 were collected from the Bankscope and World Bank. The OLS results showed that market risk was positively associated with bank performance. Quartile regression also indicated that only banks in the median and 90% quartiles had a positive association between market risk and performance. This proved that MENA banks have high performance when exposed to high market risk, in line with the perspectives of risk-return trade-off views. This implies that banks are risk-takers in conducting business in the highly competitive market in the MENA region. Banks tend to provide various financial services, which can secure generating returns. Besides, the findings also provide insight into banks' preference in utilizing leverage to generate profits. The findings provide a cogent argument to the bankers and regulators in MENA region on the role and impact of market risk towards banks financial stability.

Keywords: Market risk, financial performance, OLS, quantile regression.

ARTICLE INFO

Article History:

Received: 13 December 2022

Accepted: 10 July 2023

Available online: 01 August 2023

* Corresponding author: Roshaliza Taha; Faculty of Business, Economics and Social Development, Universiti Malaysia Terengganu, 21030 Kuala Nerus, Terengganu, Malaysia; Email: roshaiza@umt.edu.my; Tel: +609 668 3684

INTRODUCTION

The lack of government deregulation, limited social and technological development, and ever-changing market structures represent the volatile settings in which banks in the Middle East and North Africa (MENA) region operate (Otero et al., 2016; 2017). The inability of banks to meet their financial obligations may lead to their failure, leaving them vulnerable to internal and external risks (Mutukua, 2016; Elamer et al., 2021). With the highly developed banking system in the MENA region, the competition among banks is beyond monitoring since maintaining and establishing relationships for the long term is difficult as achieving such economies of scale is unrealistic due to the increased competition (Albaity et al., 2019; El Moussawi & Mansour, 2021).

Large banks are intensely competitive, putting them at risk of reduced profits and insolvency. Most of the well-established MENA banks come from a less competitive market. The banks' profits may decline in the highly competitive market, placing them in a volatile position as they take an excessive risk (Albaity et al., 2019). The significant challenge MENA banks face is limiting financial risk's impact on profitability. Besides, ongoing crises caused by economic uncertainty, terrorism, political instability, oil price volatility, and civil wars have exacerbated the problem. These issues have impacted the economic development in the region and resulted in inefficient bank performance (Mrad & Mateev, 2020; Zaiane & Moussa 2021).

Otero et al. (2020) found that global financial markets have become unstable since the global financial crisis (GFC) in 2007/2008. This has led to a slew of criticisms on risk management systems in dealing with erratic events that cause significant impact, further sparking the pursuit of improved methodologies to overcome this issue. During a crisis, the effect on the market structure is more important than ever, particularly on the institutional level, where the whole cost function is strongly linked to inflation and GDP. Thus, regulators should formulate policies that enable the financial market sector to be competent and increase their capital to overcome any future financial crisis.

Decades after the impact of the GFC 2007/2008, the MENA region still has a low rate of economic recovery due to the ongoing political disputes in governments, oil price volatility, and trade agreements as banks are exposed to the risk of failures. Statistics shows that, MENA's economic growth dropped to 0.6% in 2019 and was expected to rise to 2.6% in 2020 and 2.9% in 2021. Voluntary reductions in oil production were responsible for a 1.5% revision in April, in addition to an intensification of global economic contraction and a significant decline in the Iranian economy due to rising geopolitical tensions (World Bank, 2020). The economic forecast for the MENA region is fraught with dangers, intensified global economic headwinds, and increasing geopolitical tensions. Demonopolizing domestic markets and liberalizing regional commerce help foster export-led growth (World Bank, 2020). Hence, investigating how market risks impact MENA banks' financial performance was the aim of this study. The importance of managing risk should be considered to ensure a strong MENA bank's financial performance.

The banks' profitability shows that after the financial crisis, banks in MENA were unable to recover their capital and returns as they were exposed to risk during and post-crisis. This situation can also be explained as banks in MENA generally have a smaller size than other countries. This low economic recovery reflects the struggling of financial institutions in MENA to recover their capital and returns (Olson and Zoubi, 2011). Despite market vulnerability, the banks in MENA have become more involved in risk-taking activities (Albaity et al., 2019).

Over the years, there has been high competition in the financial market of the MENA region (Mrad and Mateev, 2020) where bank owners' risk-taking behavior led to inefficient operations (Mrad and Mateev, 2020). Such behavior can be realized from the perspective of financial institutions as they need to compete with larger banks. Moreover, this behavior risks then becoming more fragile in the event of a future crisis, lowering their profits and high insolvency risk and unable to recover their capital (Albaity et al., 2019). As the high-risk-taking behavior by MENA banks, there is a loophole of why this behavior occurs first. Although risk-taking behavior is one of the investment decisions for good measure of overall bank performance and returns, empirical evidence in this context found that banks in MENA are struggling with profitability and efficiency (Mrad and Mateev, 2020);

Elfeituri and Vergos, 2019). One of the reasons is the opportunistic behavior among bank managers for their interest that jeopardizes the banks' value.

Consequently, another aim of this study was to determine how the banks' performance relates to market risk. Mainly, through financial leverage, market risk's influence is explored in this study in determining financial performance. Based on the findings, the study identified several implications for both authorities and researchers concerning policies and operations, which will ultimately help boost the banks' financial performance in the MENA region. This will also add a new chapter to the literature on banks with regard to efficiency, stability, profitability, and risk reduction and knowing how to handle them. Market risk greatly impacts the banking sector's financial performance in the MENA region. Also, as the capital reserve requirement should not be breached and the challenges resulting from interest rate caps should be avoided, improved monitoring mechanisms in banks are required; hence, the development of new guidelines is advocated in this study.

The following is the structure of the remaining sections of this paper. The empirical and theoretical perspectives from the previous literature are discussed in Section Two. Section three presents the sources of the data and the research methodology, followed by the empirical results in Section Four. Finally, the discussion is concluded, and the implications and recommendations are highlighted in Section Five.

LITERATURE REVIEW

Market risk is anything that occurs due to price volatility at the security or product level, including currency rate and services. Other factors that can directly increase risk exposure include market values, commodity rates, equity, exchange rates, and price variations (Ghosh, 2012; Holod et al., 2020). A poor balance sheet due to market price volatility is among the conditions resulting from market risk (Valitov & Nigmatzyanov, 2014). For instance, the increase in market risk exposures, leading to changes in market values, exchanges rates, and stock prices, are examples of such risks (Othman & Ameer, 2009; Valitov & Nigmatzyanov, 2014; Polizzi & Scannella, 2020; Fantazzini & Zimin, 2020). On another note, information

regarding standard risk metrics should be provided to market participants in a sound banking system (Valitov & Nigmatzhanov, 2014). Thus, reducing information asymmetry regarding market information increases decision-making effectiveness for market participants and banks' managers (Hirtle, 2016).

Apart from its financial nature, market risk is also related to financial market variations in numerous aspects, like credit spreads, commodity prices, financial leverage, equity prices, foreign exchange rates, interest rate risks, interest rates, and other financial instruments that have fixed values in the public market. In some cases, it is also linked to the mismatch between liabilities and assets (Scannella, 2018; Huy et al., 2021). On the other hand, some works (Christoffersen, 2012; Feng et al., 2015; Tian, 2017) described the market risk as the possibility of incurring losses caused by unanticipated changes in financial instruments. This type of risk is difficult to control as it is based on uncertain events that can happen at any time in the future. Financial companies with high commerce activities are vulnerable to extreme market fluctuations and overall economic situation at the institutional level, exposing them to market risks (Aruwa & Musa, 2014; Koch & MacDonald, 2014). Prior studies (Worzala, 1995; Cornelia, 2012; Ali et al., 2020) have noted that banks are the leading players in financial instruments, exposing them to market price fluctuations and collateral credit risk.

Regarding the debt's element of tax shield, a company partially financed through debt is considered to have leverage. Aruwa & Musa (2014) used banks' financial leverage to analyze how operating earnings were impacted by debt and determine the appropriate obligation level. It was discovered that greater financial risk corresponded to greater financial leverage. Previous studies on market risk in the MENA region provided evidence that MENA banks are exposed to risks that can affect their performance (Maghyreh & Al-Zoubi, 2006; Muriithi et al., 2016). Additionally, Odubuasi et al. (2020) indicated that market risk significantly affected financial performance. The relative performance and the value of the MENA region's emerging equity markets were previously investigated by Maghyreh & Al-Zoubi (2006). The researchers observed and found that MENA markets were vulnerable to market risks. Ghosh (2017) discovered that MENA banks with stronger market financing kept large buffers. The size of the bank was also significant, as evidenced by the increased market

funding support deviation that enhanced capital buffers. These results suggest that financial leverage has become a vital capital resource as it acts as a buffer for banks to cover capital liquidity during a crisis.

Market risks commonly have various indicators that expose the risk, where banks face a higher risk when dealing with financial instruments that fluctuate in normal market conditions (Cornelia, 2012; Koch & MacDonald, 2014). Market risk can be classified based on the type of risk, including financial leverage (Aruwa & Musa, 2014; Muriithi et al., 2016; Dey et al., 2018; Odubuasi et al., 2020; Zhou et al., 2021;). It occurs when a bank's assets, such as bonds, currencies, off-balance-sheet contracts, equity products, and commodities, experience adverse market prices (Van Greuning & Bratanovic, 2009; Jobst et al., 2020; Guzel, 2021). It should be noted that providing market investors with knowledge of common risk indicators is essential to a healthy banking system. It increases the comparability of bank risk profiles by increasing information symmetry. This is critical because the risk-taking decisions made by banks are substantially influenced by other market participants, creditors, and shareholders (Hirtle, 2016).

In Muriithi et al. (2016), market risk was discovered to significantly impact the bank's long-term and short-term financial performance. This implies that if the bank's level of market risk increases, the bank's profitability declines. Also, financial leverage, foreign interest rates, and exchange exposure affect bank profitability. Besides, Kioko et al. (2019) investigated how the banks' financial performance is affected by financial risk. According to their results, financial performance was adversely impacted by financial risk, including market risk. In more recent research, Zhou et al. (2021) investigated the effects of financial leverage and found that it has a negative effect. Moreover, they showed that financial leverage significantly reduces financial performance, particularly during a financial crisis.

On the other hand, some research (Dey et al., 2018; Kassi et al., 2019) have studied how financial performance was influenced by financial leverage and found a positive relationship between them. Karim et al. (2018) studied the organization's sensitivity to market risks, such as inflation, foreign exchange, and interest rate. Profitability was positively associated with market risk, based on the findings. Also, Ali & Oudat (2020) studied financial

performance's relation to financial risk, where a positive relationship was found upon market risk measurement. Kahihu (2021) explained that market risk influences financial performance, where a significant and positive relationship was found between financial leverage risk and interest rate. At the same time, a negative impact was also discovered for foreign exchange risk.

In summary, market risk can significantly impact the financial performance of a bank. Changes in market prices, such as interest rates, foreign exchange rates, commodity prices, and stock prices, give conception to this type of risk. When a bank is exposed to market risk, it will bear the risk of incurring monetary losses as a result of adverse market movements. Additionally, market risk can have an adverse impact on a bank's financial performance. For instance, if a bank's portfolio is significantly invested in assets that are negatively impacted by market movements, such as equities, and if there is an unexpected decrease in the equity market, the bank may incur losses that jeopardize its profitability and financial stability. Similarly, if a bank has significant exposure to foreign exchange risk and the local currency decreases significantly, the bank's financial position could be negatively impacted. However, banks can manage market risk and minimize its impact on their financial performance by taking the appropriate measures. Effective risk management strategy can assist in mitigating the potential negative impact and ensuring the financial stability and profitability of the bank.

METHODOLOGY

Data and Sample

Our sample comprised 135 banks from 14 countries in the MENA region from 2015 to 2019, with a total of 675 banks-year. We chose 2015 as the starting year in line with the introduction of BASEL III, where banks were required to restructure their core capital. Financial data was gathered from the Bankscope database, while country data was collected from WorldBank. After removing missing data, we analyzed unbalanced panel data with a sample of 602 banks-year.

Models

The econometric equation represents the pooled Ordinary Least Square (OLS) model of this study as follows:

$$FP = \beta_0 + \beta_1 DFL_{it} + \beta_i CONTROLS_{it} + \epsilon_{it} \tag{1}$$

Where FP represents financial performance proxied by accounting performance measures, Return on Assets (ROA) and Return on Equity (ROE). A higher ROA indicates that an organization can utilize the available assets efficiently to be profitable in its operations. ROA was chosen because of its ability to measure the banks’ profitability based on asset utilization (Ahmed et al., 2015; Wuave et al., 2020). ROE represents the profits generated from the shareholders’ equity (Handayani & Winarningsih, 2020; Akbar, 2021). This performance measure reflects the bank’s survivability when exposed to risk (Chen, Chen & Huang, 2021).

Degree of Financial Leverage (DFL) reflects banks’ strategies to finance their capital and investments (Kassi et al., 2019). Aruwa and Musa (2014) used the financial leverage of banks to analyze how operating earnings were impacted by debt and to determine the appropriate level of obligations. It was discovered that greater financial risk corresponded to greater financial leverage. This parameter represents the ratio between earnings before taxes (EBIT) to the deduction of Interest expenses from EBIT (Muriithi et al., 2016; Odubuasi et al., 2020).

Regarding control variables (CONTROLS), we included bank size (BSZ), bank age (AGE), and Country’s gross domestic production (GDP). Banks’ Geographic region (GEO) and Countries (COUNTRY) were included as dummy variables. β_0 is the intercept, and ϵ_{it} is the error term.

From equation 1, we employed quantile regression to examine whether the market risk affects different levels of banks’ performance. Our basic quantile model was derived as follows:

$$Q\tau (FP_{it} | X_{it}) = a_i + \beta_1 \tau DFL_{it} + \beta_i \tau CONTROLS_{it} + \epsilon_{it} \tag{2}$$

Where $Q_{\tau}(FPit | Xit)$ is the τ -th quantile regression function.

Table 1 presents the measurement of all variables.

Table 1: Measurement

	Variable name and Abbreviation	Measurement	Data Sources
Performance	Return on Assets (ROA)	Net income to total assets	Bureau van dijk - Bankscope
	Return on Equity (ROE)	Net income to total equity	Bureau van dijk - Bankscope
Risk	Degree of Financial Leverage (DFL)	Earnings before interest and taxes (EBIT) / [EBIT – interest]	Bureau van dijk - Bankscope
Control	Banks' Size (BSZ)	In 10 billion USD	Bureau van dijk - Bankscope
	Banks's age (AGE)	Years since the firms' constitution	Bureau van dijk - Bankscope
	Country's gross domestic production (GDP)	GDP in trillion (USD)	World Bank
	Banks' regional location (REGION)	Banks' regional location (Dummy variable for country in MENA)	World Bank
	Countries (COUNTRY)	Dummy variable for every country	World Bank

RESULTS AND DISCUSSION

Descriptive Analysis

Table 2 presents the descriptive statistics of all variables. The results showed that ROA, ROE, and BSZ had the same value of mean and median. The mean and median values for ROA, ROE, and BSZ were 0.11%, 0.21% and USD 15.557 billion, respectively. Regarding market risk, DFL had a mean (median) value of 0.97(0.992). For bank's age, the banks were around 32.92 years on average. Lastly, the mean(median) value for country's GDP was 0.198(0.120). Data with similar or close median and mean indicated that the distribution was not skewed too badly. This was proven based on the result shown in the last column. The assumption of a normal distribution was rejected as the p-value for the Shapiro-wilk test was lower than 5 % ($p < .05$).

Table 2: Descriptive Statistics

Variable	Obs	Mean	Q10	Median	Q90	S.D.	Min	Max	vif	S-W test
ROA	602	.011	.002	.011	.022	.011	-.045	.048		9.030***
ROE	602	.021	.003	.021	.039	.02	-.076	.100		9.082***
DFL	602	.97	.831	.992	1.086	.156	.136	1.641	1.14	11.178***
BSZ (10 billion USD)	602	1.557	1.3	1.557	1.787	.176	1.143	1.937	1.71	2.964***
AGE	602	32.92	10	36	57	17.5	0	69	1.23	6.827***
GDP	602	.198	.021	.12	.422	.208	.012	.817	1.31	10.542***

Table 3 shows the tabulation of dummy variables, which are geographical and country factors in the MENA region. The majority of banks in the sample were from the Middle East, with 498 banks (82.87%), while only 104 (17.28 %) were from North Africa. The highest number of banks in the sample was from UAE, with 80 banks (13.29 %). Lebanon had the least number of banks, with only 5 (0.83 %) of the total sample.

Table 3: Tabulation of Dummy Variables

REGION	Freq.	%
Middle East	498	82.72
North Africa	104	17.28
Total	612	100.00
COUNTRY		
Bahrain	47	7.81
Egypt	42	6.98
Iraq	60	9.97
Jordan	55	9.14
Kuwait	50	8.31
Lebanon	5	0.83
Morocco	17	2.82
Oman	40	6.64
Palestine	25	4.15
Qatar	33	5.48
Saudi Arabia	55	9.14
Syria	43	7.14
Tunisian	50	8.31
UAE	80	13.29
Total	602	100.00

Source: WorldBank

Results for pairwise correlations of all variables are presented in Table 4. There were high correlations between ROA and ROE. This high correlation between variables did not bring multicollinearity issues in the model, as each dependent variable was regressed separately. There were positive correlations between DFL and financial performance.

Table 4: Pairwise Correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) <i>ROA</i>	1.000							
(2) <i>ROE</i>	0.966***	1.000						
(3) <i>DFL</i>	0.110***	0.078*	1.000					
(4) <i>BSZ</i>	0.179***	0.116***	0.344***	1.000				
(5) <i>AGE</i>	0.111***	0.090**	0.134***	0.407***	1.000			
(6) <i>GDP</i>	0.171***	0.099**	0.123***	0.465***	0.071*	1.000		
(7) <i>REGION</i>	0.044	0.056	-0.006	-0.090*	0.235***	-0.120***	1.000	
(8) <i>COUNTRY</i>	-0.029	-0.201***	0.153***	0.198***	0.050	0.321***	0.031	1.000

Effect of Market Risk on Bank's Performance

Table 5 presents the main effect of market risk on bank's performance based on two different estimation approaches for comparison. First, we used the pooled OLS model for ROA and ROE (Panel A). The initial analysis failed to provide evidence of the relationship between market risk and bank's performance. Thus, we applied robust standard error, as suggested by Hoechle (2007), to handle the problem of heteroscedastic and autocorrelations (Panel B). From the robust estimations, there was evidence that market risk positively impacted both performance measures. The results implied that banks exposed to higher market risk have higher performance. This ruled out the earlier finding by Ekinçi & Poyraz (2019) on the negative relationship between risk and performance. However, as our data failed to meet the linearity assumptions, our results might be biased.

Table 5: The Effect of Market Risk and Bank’s Performance (OLS)

Variables	Panel A: OLS		Panel B: OLS ROBUST SE	
	ROA	ROE	ROA	ROE
DFL	0.00459 (0.00433)	0.00862 (0.00782)	0.00976** (0.00242)	0.0189** (0.00549)
BSZ	0.0239*** (0.00608)	0.0399*** (0.0110)	0.0136* (0.00572)	0.0213 (0.0107)
AGE	1.37e-05 (4.92e-05)	9.45e-06 (8.95e-05)	5.16e-05** (1.29e-05)	7.88e-05* (2.95e-05)
GDP	-0.0451*** (0.0122)	-0.0920*** (0.0218)	-0.0465*** (0.00620)	-0.0949*** (0.0103)
REGION	Included	Included	Included	Included
COUNTRY	Included	Included	Included	Included
Constant	-0.0295*** (0.00939)	-0.0436** (0.0170)	-0.0206 (0.0117)	-0.0286 (0.0226)
Observations	602	602	602	602
R-squared	0.206	0.255	0.143	0.172
Number of groups	125	125	125	125
Linearity test Chi2 (p-val)	25.85***	17.18***	24.17***	11.51***

Notes: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Second, we applied quantile linear regression. This estimation method analysed the data outside of the mean as the normality test of each variable showed that our data violates assumptions of normality ($p < .05$) as reported under the S-W test in Table 2. The quantile regression was also useful for the data that are non-linear as it captures the bank’s performance along the quantile distribution (Jiang et al., 2020). The results are presented in Table 6. DFL had a positive association at a 1 % significance level ($p < .01$), with both ROA and ROE in the first column of Table 6. Later, we used the simultaneous quantile regression to investigate the effect of market risk on bank performance at 10, 50, and 90 % quartiles distributions levels. In panel C, the quantile regression with ROA as the dependent variable showed that DFL had no association with ROA in the 10% quartiles (q10). However, the results showed a positive association for the 50 % quartiles (q50) at the 1 % significance level ($p < .01$) and a positive association at the 10 % significance level ($p < .10$) in the 90 % quartiles (q90). Meanwhile, in Panel D, DFL had a positive association with ROE at q50 at the 1 % significance level ($p < .01$) and a positive association at the 5 % significance level ($p < .05$) for q90 quartiles.

The findings implied that the effect of bank's exposure to market risk on performance was positive across the distribution of bank's performance, as shown in Figure 1 and 2. The quantile plot in Figure 1 and 2 shows that the relationship between market risk and performance was positive and fluctuates across the quantiles. The positive effect of DFL on ROA is in the banks with medium and high levels of performance based on the ROA reported between 0.011 to 0.048 in Table 2. Low-performing banks at q10 of ROA between -0.45 to 0.011%, when exposed to market risk, did not impact their performance. DFL also affected ROE for medium and high-performing banks with ROE between 0.021 to 0.1 % and can generate profits when exposed to market risk.

The positive findings can be explained by the risk-return trade-off perspective. In financial markets, the association between risk and returns are expected to be positive, as taking a high risk can be justified when expecting higher returns (Ghysels et al., 2005). When firms take a strategic decision to enter a new market, expand the business portfolio, or introduce a new product, firms possibly make high-risk investments to maximize profits and expect higher returns (Chari et al., 2019). From this risk-return trade-off view, the risk-return association is expected to be positive as managers and shareholders prefer any decision that strategically optimizes the financial return (Diez et al., 2017). The logic behind this perspective is acceptable among previous researchers, who argue that firms with high risk-taking behaviours expect to gain higher financial returns (Brick et al., 2012; Gupta & Pathak, 2018). Performing firms tend to have a positive relationship between risk and return, while underperforming firms have a negative relationship (Holder et al., 2016; Santacruz, 2020).

Moreover, larger firms with high capital and resources might be involved in business diversification, which helps reduce risk exposure and increase returns (Bromiley & Rau, 2010). In our case, high-performing banks might be involved in more diverse financial business due to MENA's highly competitive and challenging market. Those high-performing banks might offer wider financial services, thus contributing toward a higher return. As we measured market risk from the degree of financial leverage, it is safe to argue that banks with high financial leverage have more resources that can be utilized in their operations, thus contributing to generating profits (Santacruz, 2020).

Table 6: Simultaneous Quantile Regression

Panel C: Dependent Variable: ROA				
Variables	ROA	q10	q50	q90
DFL	0.00977*** (0.00274)	0.00157 (0.00277)	0.00977*** (0.00299)	0.00955* (0.00541)
BSZ	0.00574* (0.00325)	0.0293*** (0.00678)	0.00574* (0.00344)	-0.0108 (0.00712)
AGE	9.33e-05*** (2.47e-05)	1.35e-05 (3.93e-05)	9.33e-05*** (3.17e-05)	7.75e-05*** (2.63e-05)
GDP	-0.00937 (0.0116)	-0.0431 (0.0275)	-0.00937 (0.0125)	-0.00856 (0.0233)
REGION	Included	Included	Included	Included
COUNTRY	Included	Included	Included	Included
Constant	-0.00919* (0.00498)	-0.0474*** (0.0104)	-0.00919** (0.00404)	0.0241** (0.00984)
Observations	602	602	602	602
Pseudo R-squared	0.131	0.206	0.131	0.239
Panel D: Dependent Variable: ROE				
VARIABLES	ROE	q10	q50	q90
DFL	0.0206*** (0.00540)	0.00164 (0.00584)	0.0206*** (0.00373)	0.0210** (0.00840)
BSZ	0.0103 (0.00642)	0.0575*** (0.00903)	0.0103 (0.00750)	-0.0182 (0.0123)
AGE	0.000126*** (4.86e-05)	3.84e-05 (4.13e-05)	0.000126** (5.71e-05)	0.000135** (5.42e-05)
GDP	-0.0192 (0.0229)	-0.0760** (0.0373)	-0.0192 (0.0142)	-0.0277 (0.0292)
REGION	Included	Included	Included	Included
COUNTRY	Included	Included	Included	Included
Constant	-0.0145 (0.00983)	-0.0917*** (0.0161)	-0.0145 (0.0123)	0.0443** (0.0193)
Observations	602	602	602	602
Pseudo R-squared	0.114	0.201	0.114	0.289

Notes: Standard errors in parentheses ; *** p<0.01, ** p<0.05, * p<0.1

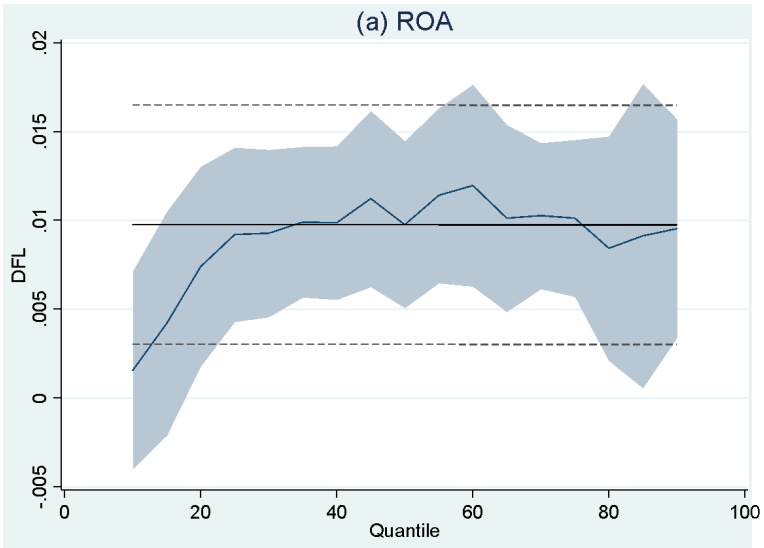


Figure 1: Quantile Plot Between DFL and ROA

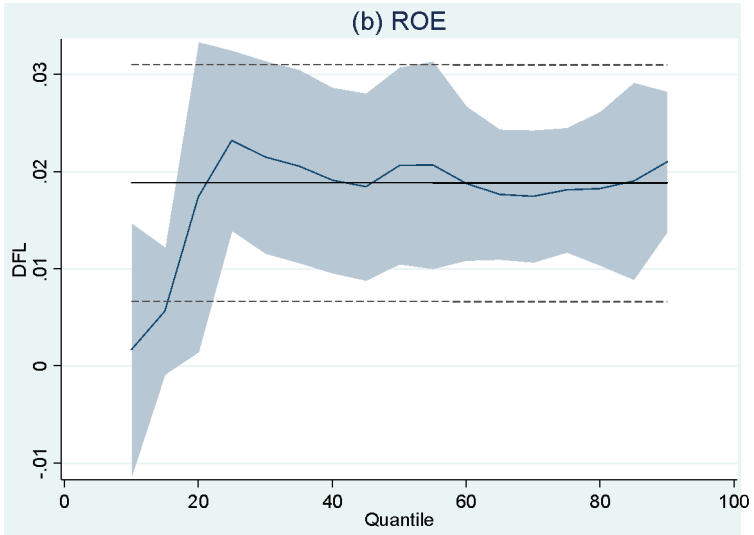


Figure 2: Quantile Plot Between DFL and ROE

CONCLUSIONS AND RECOMMENDATIONS

Although a long list of studies has been conducted to examine the relationship between market risk and financial performance, the inconclusive findings obtained have motivated us to conduct this study. We focused on banks in the MENA region because their financial market has unique characteristics and is less liquid and volatile. In addition, the market in this region also faces challenges, including political instability and economic uncertainty. Therefore, this situation motivates banks in MENA to take excessive risks to gain competitive advantages, thus dominating the market and increasing their exposure to market risk. The study aimed to examine the impact of market risk on banks' performance in the MENA banking sector from 2015 to 2019. To determine the relationship, ROA and ROE were used as proxies for bank's performance, and DFL was used to represent the market risk. All data were gathered from the Bankscope database and The World Bank.

We conducted robust pooled estimations to examine the effect of market risk (DFL) on banks' financial performance (ROA and ROE). The results provided evidence that MENA banks' market risk is positively associated with financial performance. Nevertheless, as the data structure violates normality assumptions, our result might be biased; thus, we applied a non-linear regression approach using quantile regression.

By assuming that market risk might have a different effect on different performance levels, we conducted a quantile panel regression analysis to examine the effect of market risk on banks at 10% quartiles, 50% quartiles, and 90% quartiles. These three distribution levels also represent banks' distributions based on low performance, medium performance, and high performance. A positive association was found between DFL and performance at 50 and 90 % quartiles. This provides evidence that MENA banks have high performance when exposed to high market risk, which aligns with the perspectives of risk-return trade-off. This also implies that MENA banks are considered risk-takers in conducting business. In a highly competitive market such as MENA, banks tend to provide various financial services; thus, this action might help banks generate returns. Moreover, as DFL involves banks' leverage, the findings provide insight into banks' efficiencies to utilizing the leverage and contributing to generating profits.

The findings, however, have several limitations. Firstly, our data is based only on accounting-based measures for DFL and performance. Future studies should include market-based measures or risk-related ratios such as Sharpe ratios to capture more accurate findings regarding the relationship between market risk and performance. Secondly, our study relied on 5 years of observations, which is considered a short period that might influence the findings. A long-term period, such as more than 20 years of observation, should be conducted, as some major events might have occurred, such as pandemics, economic crises, banking policy, and other macroeconomic events that contribute toward bank's behaviours and reactions to the market risk, especially in the MENA region.

REFERENCES

- Ahmed, S. U., Ahmed, S., Islam, M. N., & Ullah, G. M. W. (2015). Impact of Basel II Implementation on the Financial Performance of Private Commercial Banks of Bangladesh. *European Journal of Economics, Finance and Administrative Sciences*, 1(77), 74–84.
- Akbar, J. S. (2021). The Effect of Return on Assets and Return on Equity on Price to Book Value on Banking Companies Listed on the Indonesia Stock Exchange. *International Journal of Economics, Business and Accounting Research (IJEBAR)*, 5(3), 9-20
- Albaity, M., Mallek, R.S. and Noman, A.H.M. (2019). Competition and Bank Stability in the MENA Region: The Moderating Effect of Islamic Versus Conventional Banks, *Emerging Markets Review*, 38, 310–325.
- Ali, B. J., & Oudat, M. S. (2020). Financial risk and the financial performance in listed commercial and investment banks in bahrain bourse. *International Journal of Innovation, Creativity and Change*, 13(12), 160-180.
- Ali, R., Mangla, I. U., Rehman, R. U., Xue, W., Naseem, M. A., & Ahmad, M. I. (2020). Exchange Rate, Gold Price, and Stock Market Nexus: A Quantile Regression Approach. *Risks*, 8(86), 1-16.

- Aruwa, S. A. S., & Musa, A. O. (2014). Risk components and the financial performance of deposit money banks in Nigeria. *International Journal of Social Sciences and Entrepreneurship*, 1(11), 514-522.
- Bromiley, P. & Rau, D. (2010). Risk taking and strategic decision making, in Nutt, P. (Ed.), *Handbook of Decision Making*, John Wiley and Sons, West Sussex.
- Brick, I. E., Palmon, O., & Venezia, I. (2015). On the Relationship between Accounting Risk and Return: Is There a (Bowman) Paradox? *European Management Review*, 12(2), 99-111.
- Chari, M. D., David, P., Duru, A., & Zhao, Y. (2019). Bowman's risk-return paradox: An agency theory perspective. *Journal of Business Research*, 95, 357-375.
- Chen, W. D., Chen, Y., & Huang, S. C. (2021). Liquidity risk and bank performance during financial crises. *Journal of Financial Stability*, 56, 100906.
- Cornelia, E. T. (2012). *The problems and prospects of management of small-scale business in Nigeria* (Doctoral dissertation, Doctoral dissertation, Department of management, Faculty of Business administration).
- Dey, R. K., Hossain, S. Z., & Rahman, R. A. (2018). Effect of corporate financial leverage on financial performance: A study on publicly traded manufacturing companies in Bangladesh. *Asian Social Science*, 14(12), 124-133
- Díez-Esteban, J. M., García-Gómez, C. D., López-Iturriaga, F. J., & Santamaría-Mariscal, M. (2017). Corporate risk-taking, returns and the nature of major shareholders: Evidence from prospect theory. *Research in International Business and Finance*, 42, 900-911.
- Ekinci, R., & Poyraz, G. (2019). The Effect Risk on Financial Performance of Deposit Banks in Turkey. In *3rd World Conference on Technology, Innovation and Entrepreneurship*. İstanbul, Turkey.

- El Moussawi, C., & Mansour, R. (2021). Competition, cost efficiency and stability of banks in the MENA region. *The Quarterly Review of Economics and Finance*, 84, 143-170.
- Elamer, A. A., Ntim, C. G., Abdou, H. A., Owusu, A., Elmagrhi, M., & Ibrahim, A. E. A. (2021). Are bank risk disclosures informative? Evidence from debt markets. *International Journal of Finance & Economics*, 26(1), 1270-1298.
- Elfeituri, H., & Vergos, K. (2019). Is the MENA banking sector competitive?. *Journal of Banking Regulation*, 20(2), 124-135.
- Fantazzini, D., & Zimin, S. (2020). A multivariate approach for the simultaneous modelling of market risk and credit risk for cryptocurrencies. *Journal of Industrial and Business Economics*, 47(1), 19-69.
- Ghysels, E., Santa-Clara, P., & Valkanov, R. (2005). There is a risk-return trade-off after all. *Journal of financial economics*, 76(3), 509-548.
- Ghosh, A., (2012). *Managing Risks in Commercial and Retail Banking*. John Wiley and Sons, US. Available at: Online resources/ Ebrary/ <http://site.ebrary.com/lib/westminsterintl/docDetail.action?docID=10538600>
- Ghosh, S. (2017). Capital buffers in Middle East and North Africa (MENA) banks: is market discipline important? *International Journal of Islamic and Middle Eastern Finance and Management*, 10(2), 208-228.
- Gupta, R. D., & Pathak, R. (2018). Firm's risk-return association facets and prospect theory findings—an emerging versus developed country context. *Risks*, 6(4), 143.
- Guzel, A. (2021). Risk, Asset and Liability Management in Banking: Conceptual and Contemporary Approach. In *Financial Ecosystem and Strategy in the Digital Era* 121-177. Springer, Cham.
- Handayani, N., & Winarningsih, S. (2020). The Effect of Net Profit Margin and Return on Equity Toward Profit Growth. *Moneter-Jurnal Akuntansi dan Keuangan*, 7(2), 198-204.

- Hirtle, B. (2016). Public Disclosure and Risk-Adjusted Performance at Bank Holding Companies. Federal Reserve Bank of New York Staff Reports, *Economic Policy Review*, 2, 1-15.
- Hoechle, D. (2007). Robust standard errors for panel regressions with cross-sectional dependence. *Stata Journal*, 7(3), 281–312.
- Holder, A., Petkevich, A. & Moore, G. (2016). Does managerial myopia explain Bowman's Paradox? *American Journal of Business*, 31(3), 102-122.
- Holod, D., Kitsul, Y., & Torna, G. (2020). Market risk-based capital requirements, trading activity, and bank risk. *Journal of Banking & Finance*, 112, 105202.
- Huy, D. T. N., Thach, N. N., Chuyen, B. M., Nhung, P. T. H., Tran, D. T., & Tran, T. A. (2021). Enhancing risk management culture for sustainable growth of Asia commercial bank-ACB in Vietnam under mixed effects of macro factors. *Entrepreneurship and Sustainability Issues*, 8(3), 291.
- Jiang, H., Zhang, J., & Sun, C. (2020). How does capital buffer affect bank risk-taking? New evidence from China using quantile regression. *China Economic Review*, 60, 101300.
- Jobst, A. A., Sugimoto, N., & Broszeit, T. (2020). Valuation and Capital Resources. *Principles, Concepts, and Frameworks*, 458.
- Kahihu, P. K., Wachira, D. M., & Muathe, S. M. (2021). Managing market risk for financial performance: experience from micro finance institution in Kenya. *Journal of Financial Regulation and Compliance*. 29(5), 561-579.
- Karim, N. A., Alhabshi, S. M. S. J., Kassim, S., & Haron, R. (2018). Measuring bank stability: a comparative analysis between Islamic and conventional banks in Malaysia. In *Proceedings of the 2nd Advances in Business Research International Conference* (169-177). Springer, Singapore.

- Kassi, D. F., Rathnayake, D. N., Louembe, P. A., & Ding, N. (2019). Market risk and financial performance of non-financial companies listed on the Moroccan stock exchange. *Risks*, 7(1), 20-49.
- Kioko, C., Olweny, T., & Ochieng, L. (2019). Effect of financial risk on the financial performance of commercial banks in Kenya listed on the Nairobi Stock Exchange. *The Strategic Journal of Business & Change Management*, 6(2), 1936-1952.
- Koch, T., & MacDonald, S. (2014). *Bank management*. Nelson Education
- Muriithi, J. G., Muturi, W. M., & Waweru, K. M. (2016). The Effect of Market Risk on Financial Performance of Commercial Banks in Kenya, 4(4), 225-233.
- Mrad, F. & Mateev, M. (2020). Banking System in the MENA Region: A Comparative Analysis between Conventional and Islamic Banking in the UAE, in *International Risk Management Conference, 1*, 61-85 Milan, Italy.
- Mutukua, C. (2016). Unpublished MBA- research project submitted in partial fulfilment of the requirements for the award of the degree of Masters in Business Administration, School of Business, University of Nairobi.
- Odubuasi, A., Wilson-Oshilim, U. D., & Ifurueze, M. (2020). Effect of market risks on the financial performance of firms in Nigeria. *European Journal of Accounting, Auditing and Finance Research*, 8 (6), 28-45.
- Olson, D., and Zoubi, T. A. (2011). Efficiency and bank profitability in MENA countries. *Emerging markets review*, 12(2), 94-110.
- Otero, L., Razia, A., Cunill, O. M., & Mulet-Forteza, C. (2020). What determines efficiency in MENA banks? *Journal of Business Research*, 112, 331-341.
- Otero, L., Razia, A., Vivel, M., & Lado, R. (2017). Competition, concentration and risk taking in banking sector of MENA countries. *Research in International Business and Finance*, 69, 4781–4786.

- Otero, L., Rodríguez, L., Martorell, O., & Merigó, J. (2016). The effect of financial innovation on European banks' risk. *Journal of Business Research*, 69, 4781–4786.
- Othman, R. & Ameer, R. (2009). Market risk disclosure: evidence from Malaysian listed firms, *Journal of Financial Regulation and Compliance*, 17(1), 57-69.
- Polizzi, S., & Scannella, E. (2020). An empirical investigation into market risk disclosure: is there room to improve for Italian banks? *Journal of Financial Regulation and Compliance*, 28(3), 465-483
- Santacruz, L. (2020). Measures of firm risk-taking: revisiting Bowman's paradox. *Managerial Finance*, 46(3), 421-434.
- Scannella, E. (2018). Market risk disclosure in banks' balance sheets and the pillar 3 report: the case of Italian banks. In *Contemporary issues in banking* 53-90. Palgrave Macmillan, Cham.
- Tian, W. (2017). *Commercial Banking Risk Management*. New York: Palgrave Macmillan US.
- Valitov, S. M., & Nigmatzyanov, A. A. (2014). New requirements of the basel committee on banking supervision to capital as a measure to ensure the stability of the banking sector. *Mediterranean Journal of Social Sciences*, 5(24), 294-294.
- Van Greuning, H., & Bratanovic, S. B. (2009). *Analyzing Banking Risk A Framework for Assessing Corporate Governance and Financial Risk*. The World Bank.
- World Bank (2020). *MENA Economic Update: Trading Together — Reviving Middle East and North Africa Regional Integration in the Post-COVID Era*. Retrieved from: <https://www.worldbank.org/en/region/mena/publication/mena-economic-update-trading-together-reviving-middle-east-and-north-africa-regional-integration-in-the-post-covid-era>.

- Worzala, E. (1995). Currency risk and international property investments. *Journal of Property valuation and Investment*, 13(5), 23-38.
- Wuave, T., Yua, H., & Yua, P. M. P. (2020). Effect of liquidity management on the financial performance of banks in Nigeria. *European Journal of Business and Innovation Research*, 8(4), 30-44.
- Zaiane, S., & Moussa, F. B. (2021). What Drives Banking Profitability During Financial Crisis and Political Turmoil? Evidence from the MENA Region. *Global Journal of Emerging Market Economies*, 13(3), 380-407.
- Zhou, M., Li, K., & Chen, Z. (2021). Corporate governance quality and financial leverage: Evidence from China. *International Review of Financial Analysis*, 73, 101652.