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Banking security and performance of islamic banks in middle east: the role of regulatory quality

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ABSTRACT

Transaction security is critical for the reputation and trust of banks. Few studies examined how transaction security can impact the financial performance of Islamic banks in developing countries with mixed results emerging in the literature. The research examines how transaction security affects bank financial performance. Three indicators are used to measure the financial performance and includes return on assets (ROA), return on equity (ROE), and Tobin's Q. Regulatory quality are proposed as a moderating variable. Data was collected from 59 banks in MENA between 2015 and 2022. The results showed that transaction security affected positively ROE and Tobin's Q. However, there is no significant effect on ROA. Regulatory quality moderated only the effect of transaction security on ROE and Tobin's Q. Enhance the transaction security and improving the regulatory quality will enhance the financial performance of banks in MENA.

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1. INTRODUCTION

Banks are relying heavily on technology to conduct business. Example of this includes the online banking transaction and other online activities and tasks. The usage of technology to conduct transaction has its pros and cons. From one side, it is beneficial for banks because it reduces the workload and reduce the cost of operations. However, on the other side, it is costly to implement technology and protect the data of customers [1]. Due to cyber-attacks and other security threats, digital transformation in banking has increased the demand for effective security measures [2]. Cybersecurity procedures, physical security systems, and general data protection regulation (GDPR), payment card industry data security standard (PCI DSS), and Basel III compliance are all part of banking security [3]. These procedures protect financial institutions from various threats. Phishing, ransomware, distributed denial of service (DDoS) attacks, and internal dangers like fraud and embezzlement are examples of the risk that can be confronted by banking transaction [4]. Therefore, the strength of the security measures can have an essential effect on customer and stakeholder trust and ultimately on banks profitability [5].

Existing studies in the literature have mainly focused on the role of corporate governance or financial technology in achieving better performance [6], [7]. Financial technology or FinTech are used by bank to access customers [8]. Most studies measures FinTech by the accessibility of banks to customers because it is measured by number of ATMs and functionality of mobile application [9]. Nevertheless, few studies examined the transaction security and its impact on financial performance of banks [3], [10]. Modern banking security uses encryption, multi-factor authentication, blockchain, biometric verification, and

AI-powered fraud detection. These technologies safeguard financial data against cybercrime and ensure its security, privacy, and accessibility. Banks implement these technologies to preserve customer financial assets and enhance their performance [11].

Against this background, implementing high level of technology is costly and has derived mixed findings in term of its link with financial performance [12]. Supporters of the positive effect indicated that using the technology can reduce the theft, fraud, cybercrime and hacking which enhance the performance [13]. On the other hand, those who derived negative result indicated that training employees and establishing the technology requires high investment which affects the return on asset (ROA) and return on equity (ROE) of banks. In addition, the increase in procedures complicates the transaction and customer with low banking transaction knowledge might change to traditional and cash method which might have negative effect on banks' performance [14].

This study examines the effect of transaction security on financial performance of Islamic banks. ROA and ROE measure a bank's profitability and efficiency. Secure transactions can promote client trust, increasing deposit inflows and transaction volumes [15]. This can increase ROA and ROE. Effective security solutions also reduce fraud-related financial losses, increasing profitability [16]. Tobin's Q measures a bank's market performance relative to its asset value. Strong security measures can increase a bank's image, investor interest, and market worth, raising Tobin's Q [17]. Critics say the costs of implementing advanced security systems might strain Islamic banks, particularly smaller ones. The initial investment, continuous maintenance, and need for specialist staff may outweigh the security benefits [14], [18]. The rapid pace of technology innovations requires continual financial investment, which may divert resources from customer service and product development [2], [19]. Advocates say long-term benefits outweigh costs. Improved security reduces financial risk and builds client trust and loyalty, which Islamic banks need to succeed [13], [20]. With cyber threats becoming increasingly sophisticated, disregarding security measures might have far-reaching effects. The repercussions can include money losses, legal fines, and reputation harm [9], [21].

Regulatory framework and banking technology differs among banks and countries [22]. While the technology and the security of transaction is advanced in industrialized countries, it is less in non-industrialized countries [10], [17], [23]. In addition, the type of banks also play a critical role. Islamic banks must adhere to shariah law and avoid interest [24]. This study focuses on Islamic banks. One of the regions that is active in Islamic bank is the Middle East and in particular, the gulf cooperation council (GCC) and Jordan [25]. These countries shares similar characteristics of being monarchy and follow similar procedures [26]. Islamic banks in Jordan and the GCC operate in a fluid financial climate [27]. Islamic banking has grown in the areas due to strong demand for Sharia-compliant financial services [28]. Islamic banks are vital to Jordan's financial system and economic growth [29]. GCC nations have deliberately embraced Islamic banking as a vital part of their financial sectors. Regulatory quality is a critical factor in determining the procedures of banks [30]. High regulatory quality maintain regulations and urge banks to adhere to specific rules in term of transaction security [31]. On the other hand, the weak regulation such in the case of several developing countries [22] can weaken the procedures of banks and the transactions [32]. Therefore, in this study, it is proposed that regulatory quality can play a moderating role between transaction security and financial performance. Accordingly, this study examines the effect of transaction security on financial performance which is measured using ROA, ROE, and Tobin's Q. It also examines the moderating role of regulatory quality.

2. LITERATURE REVIEW

2.1. Theoretical framework

Two theories describe how transaction security affects financial performance and how regulatory quality moderates this association. Resource based view (RBV) indicated that a firm's resources and competencies influence its competitiveness and performance [33]. Transaction security can enhance banking performance by implementing strong procedures of encryption, fraud detection, and secure authentication [34]. These security methods are hard to reproduce, providing an economic advantage [7]. Effective transaction security reduces attacks and fraud losses. It increases profits, decreases costs, and increases customer loyalty [35]. Client data and financial asset protection help banks retain clients and improve financial performance [36]. Regulation improves transaction security by ensuring banks satisfy strict security standards [37]. Security investments perform better under regulatory scrutiny. Insufficient regulations can lower security costs owing to slack standards [38].

Institutional theory explains how high regulatory quality guarantees banks have clear, stringent, and effective transaction security processes. According to institutional theory, banks earn reputation by obeying laws. Excellent regulatory standards strengthen the bank's brand and investor trust [39]. Secure banks attract more investors, boosting their finances. Regulatory frameworks minimize transaction security's financial

impact. High-quality regulatory systems encourage banks to implement robust security measures, limiting breaches and losses [40]. Strong regulations specify security best practices and drive progress. The regulatory help improves transaction security and financial performance [41]. Low-quality regulatory system may not advise or require banks to maintain adequate security practices, lowering transaction security's financial performance advantages [42].

This research uses RBV and institutional theory to explain the relationship among the variables. Transaction security is a strategic resource that delivers competitive advantage (RBV), but regulation considerably affects the link between transaction security and performance (Institutional Theory). High regulatory quality guarantees banks build and maintain solid security procedures, boosting transaction security. Transaction security and robust regulatory frameworks help banks avoid losses, build customer confidence, and improve operational efficiency. Regulatory quality boosts security investment returns, improving financial results. Banks should invest in sophisticated security and work with regulators to create and follow high-quality regulations. This dual strategy preserves transaction security as a strategic resource and maximizes its financial performance benefits.

2.2. Conceptual framework and hypotheses development

Most banking security literature focuses on conventional banks, with few research addressing Islamic banks [13], [21], [43]. This gap obscures Islamic financial institution banking security concerns and potential. Cross-sectional studies often examine the link between banking security and financial performance at a specific moment in time [14], [18], [44], [45]. Panel data analyses are critical for capturing dynamics and trends over time, revealing the sustainability and long-term consequences of financial security measures. The literature often overlooks factors affecting banking security and financial performance, especially in diverse regions like the GCC and Jordan. Context-specific insights need consideration of these locations' regulatory systems.

This study proposed that banking transaction security affects positively the financial performance (ROA, ROE, and Tobin's Q). It also proposes that regulatory quality moderates the effect of banking transaction security on ROA, ROE, and Tobin's Q of banks in GCC and Jordan. Since this study includes seven countries with different gross domestic product (GDP) and inflation rate, the study controls for GDP and inflation rate. This in line with previous studies [46]–[50]. In addition, the study includes banks with different size, age, and leverage. Therefore, the study controls for bank size, bank age, and leverage. This is also in line with other previous research [51]–[53]. Figure 1 shows the conceptual framework of this study.

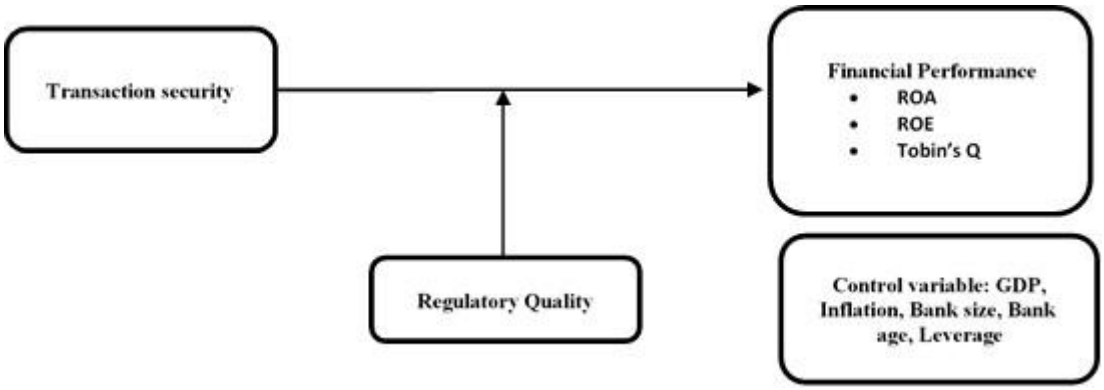

Figure 1. Conceptual framework

2.2.1. Transaction security and bank performance

RBV considers transaction security a strategic resource that boosts bank efficiency [54]. ROA assesses how well a bank uses its assets to enhance profit. Banks can decrease fraud and cyberattacks and financial losses by investing in strong transaction security systems [17]. Asset usage efficiency boosts profitability and ROA [43]. Security improvements boost productivity and lower fraud and breach costs [2], [55]. Thus, the following is hypothesized:

H1a: Banking transaction security increases ROA.

Transaction security protects shareholder ownership and gives banks a competitive edge [11], [23]. ROE evaluates bank performance from shareholders' viewpoint [56]. Strong transaction security reduces security breaches and ensures steady revenues. The consistency boosts shareholder confidence and equity returns [20]. Secure transaction methods improve client trust and retention, increasing business and profitability and ROE [13]. Strong security policies improve financial performance indicators like ROE. Therefore, the following is hypothesized:

H1b: Banking transaction security increases ROE.

Tobin's Q, the ratio of a bank's market value to its asset replacement cost, indicates the market's outlook for growth and health [17]. Transaction security boosts a bank's market value by ensuring operational stability and customer confidence [43]. Improved dependability can attract investors, raising the bank's market value [16]. A secure bank has a reduced risk profile, which boosts its market value compared to its asset replacement cost [2], [19]. Better security leads to greater market values [11], [23]. Hence, it is hypothesized:

H1c: Banking transaction security increases Tobin's Q.

2.2.2. Moderating role of regulatory quality

Based on institutional theory, banks' stability is ensured by effective regulation [42]. Security measures improve with these restrictions, improving asset usage and ROA [57]. In countries were regulatory quality is high, the central banks and other regulatory bodies observe closely the procedures of banks and enact policy to protect the customers [58], [59]. In strict regulatory environments, banks must have sophisticated security measures, decreasing the possibility of major financial losses from breaches [20]. Regulatory quality promotes financial outcomes by preserving shareholder investments and ensuring predictable financial performance, helping banks maintain consistent and higher ROE [60]–[62]. Institutional theory also suggests that strong regulatory frameworks improve transaction security, which boosts market trust and the bank's price relative to asset replacement costs [39]. Banks' market value rises when investors trust its regulation. Tobin's Q indicates regulatory trust boosts market value and transaction security. Effective regulations boost company values [63], [64]. Therefore, the following is hypothesized:

H2a: Regulatory quality moderates the effect of transaction security on ROA.
H2b: Regulatory quality moderates the effect of transaction security on ROE.
H2c: Regulatory quality moderates the effect of transaction security on Tobin's Q.

3. RESEARCH METHODOLOGY

This study is quantitative using panel data. The study examines the effect of banking transaction security on financial performance in GCC and Jordan. A total of 59 banks that have data between 2015-2022 were included in this study. Several sources were used to extract the data that are related to the variables of this study. Bank related variables such as ROA, ROE, Tobin's Q, bank size, bank age, and leverage were collected from annual reports. GDP (natural log of GDP) and inflation rate was obtained from the World Bank and national statistics organizations. The transaction security data was measured using an index. Data on regulatory quality was obtained from the World Bank's Worldwide Governance Indicators (WGI) [22]. Panel data spans 2015–2022 to capture long-term trends and consequences. The study uses the following regression model to analyses the data:

$$\text{Performance}_{it} (\text{ROA, ROE, Tobin's Q}) = \beta 0 + \beta 1 \text{Sec}_{it} + \beta 2 \text{RegQ}_{it} + \beta 3 (\text{Sec}_{it} \times \text{RegQ}_{it}) + \beta 4 \text{GDP}_{it} + \beta 5 \text{Inflation}_{it} + \beta 6 \text{Size}_{it} + \beta 7 \text{Age}_{it} + \beta 8 \text{Leverage}_{it} + \epsilon_{it}$$

Where:

- Performance: represents the financial performance measures (ROA, ROE, Tobin's Q) for bank i at time t.
- Security (Sec) denotes the level of transaction security for bank i at time t.
- Regulatory quality (RegQ) represents the regulatory quality for country i at time t.
- Sec×RegQ: is the interaction term between transaction security and regulatory quality.
- GDP and Inflation: are the macroeconomic control variables.
- Size, age, and leverage: are the bank-specific control variables.
- ϵ_{it}: is the error term.

A total of 59 banks were included in this study. These banks are all Islamic banks working in GCC and Jordan. The data is balanced because observations from all banks are available. In total, the study

collected 472 observations (8*59=472). The data was examined for the assumption of regression analysis and it was found that there is no multicollinearity issues (variation inflation factor (VIF) is less than 5 and 1/VIF is greater than 0.20) among the variables and the data has normal distribution (skewness and kurtosis less than 2).

4. FINDINGS

4.1. Descriptive information

Table 1 shows the descriptive information of the variables. For transaction security, the index indicated that there is high level of transaction security among banks with mean of 0.92 and low variation. The regulatory quality is low with value of 0.39 where 2.5 considered high and -2.5 considered low. ROA and ROE were negative and this could be due to COVID19 while the mean of ROA accounted to 2.33 and for ROE, it is 7.79. For Tobin's Q, the market value is higher than the book value with mean of 1.02. Further, the natural log of bank size accounted for 16.13 while the bank age ranged between 13 and 47 and mean of 19 years. The leverage ratio ranged between 0.21 to 0.59 and mean of 0.29. For GDP, the values ranged between 17.23 and 23.4 and mean of 21.34. The inflation was between 1 and 4 and mean of 2.1.

Table 1. Descriptive information

Variable	Minimum	Maximum	Mean	Std. deviation
Transaction security	0.59	0.97	0.92	0.12
Regulatory quality	-0.33	0.59	0.39	0.21
ROA	-1.03	18.70	2.33	2.39
ROE	-2.18	29.21	7.79	3.81
Tobin's Q	0.83	1.39	1.02	0.34
Natural logarithm bank size	13.66	17.13	16.13	1.11
Bank age	13	47	19	1.21
Leverage	0.21	0.59	0.29	1.49
Natural Log GDP	17.23	23.40	21.34	0.74
Inflation	1.00	4.00	2.1	1.32

4.2. Hypotheses testing

The hypotheses of this study was examined using Stata. As shown in Table 2, there is no issues of autocorrelation or heteroscedasticity among the variables. In addition, the Hausman test showed that the fixed effect model is more appropriate. The models are statistically significant and it can explain between 37.9% (Tobin's Q) to 39.1% (ROA) of the variation in financial performance.

Table 2. Result of hypotheses testing

	ROA	ROE	Tobin's Q
Transaction security	0.091	0.21**	0.34***
GDP	0.14**	0.19***	0.16**
Inflation	0.09	0.08	0.11**
Firm size	0.22**	0.23***	0.19**
Leverage	0.11**	0.25**	0.12**
Age	0.18**	0.18*	0.22**
_cons	0.16**	0.29**	0.17**
R-square	0.391	0.382	0.379
Prob > F	0.00	0.00	0.022
Breusch-Pagan / Cook-Weisberg test	1.99 (0.41)	2.03(0.49)	2.19 (0.76)
Breusch-Godfrey LM test	1.413 (0.1312)	1.349 (0.1913)	1.512 (0.5122)
Hausman tTest	31.41 (0.002)	34.15 (0.001)	39.12 (0.000)

*Note: *, significance at 0.1 level, **, significant at 0.05 level, ***, significant at 0.01.*

The results of this study indicate that transaction security has a positive effect on bank performance, specifically in terms of ROE and Tobin's Q. No major influence on ROA. For the control variables, the effect of GDP, firm size, leverage, and age on ROA, ROE, and Tobin's Q are significant and positive. For inflation, it showed that the effect is only significant with Tobin's Q. Strong transaction security has increased investor and consumer trust, improving ROE and Tobin's Q. Efficient transaction procedures decrease financial losses and fraud, stabilizing and predicting profits. This boosts ROE. Implementing effective security measures might also improve bank market value. These strategies can enhance Tobin's Q by reducing risks and boosting investor confidence. These results support RBV theory. This idea holds that transaction security can provide banks an advantage by maintaining financial stability and investor trust [33]. Transaction security

impacts external impressions and shareholder, not asset usage efficiency, which may explain its lack of influence on ROA [34]. ROA depends on the bank's assets' operational efficiency, which may be less influenced by transaction security than shareholder returns and market values.

For testing the moderating effect of regulatory quality, Table 3 shows the results. It shows that regulatory quality moderated the link between transaction security and ROE and Tobin's Q. However, it did not moderate the influence on ROA.

Table 3. Result of moderation

	ROA	ROE	Tobin's Q
Transaction security	0.08	0.23**	0.36***
Regulatory quality	0.13**	0.17**	0.19**
Regulatory quality*transaction security	0.04	0.13**	0.16**
GDP	0.15**	0.18***	0.14**
Inflation	0.09	0.08	0.12**
Firm size	0.23**	0.24***	0.18**
Leverage	0.10**	0.24**	0.12**
Age	0.15**	0.16*	0.21**
_cons	0.18**	0.31**	0.19**

*Note: *, significance at 0.1 level, **, significant at 0.05 level, ***, significant at 0.01.*

The findings above indicate that strong regulatory quality ensures banks follow high security requirements, improving transaction security. Transaction security boosts shareholder profits and market value with regulatory monitoring. This monitoring assures investors and stakeholders of the bank's stability and security. Institutional theory emphasizes the role of formal regulatory frameworks on organizational practices and performance [40].

5. IMPLICATIONS

This study has contributed to the literature and practices. The applicability of RBV is confirmed because transaction security is a unique asset that can boost shareholder returns (ROE) and market value (Tobin's Q). This study emphasizes transaction security's strategic value to banks' financial performance. The RBV suggests that internal resources and competencies drive business success. Regulating quality moderates' transaction security's effect on ROE and Tobin's Q, emphasizing institutional frameworks' importance. Strong regulatory requirements help banks maintain security, improving financial performance. Institutional theory emphasises the effect of regulatory, normative, and cultural-cognitive elements on organisational behaviour and outcomes, and this finding emphasises the need of a strong banking regulatory framework.

Banking management should invest in effective transaction security measures to boost shareholder returns and market value. Investments are crucial to consumer trust and financial stability. Effective transaction security protects against financial losses and builds a good reputation. This is crucial to acquiring and maintaining consumers and investment. Policymakers must set and maintain strong regulatory requirements to maximize transaction security benefits. Policymakers must emphasize bank security legislation and enforcement. This will protect investors and market confidence. The creation of regulatory frameworks should emphasize transaction security best practices. These frameworks should have explicit criteria and strict control to assure compliance.

6. CONCLUSION

This research found that transaction security improves bank ROE and Tobin's Q. The research also stresses the importance of regulatory quality in regulating this link. The results emphasise financial security and regulatory efficiency. Transaction security and strict regulatory requirements can improve banks' financial performance, boosting shareholders and market trust. Bank management and regulators can learn from this research about the necessity of security investment and tight regulatory framework. This study was limited to transaction security which might not fully explain the financial performance. The study is also limited to GCC and Jordan. To increase generalizability, future study may include more nations and a longer time span. Expanding banking settings may reveal the worldwide influence of transaction security on bank performance. Additional variables can be included such as technical advances, cybersecurity investments, and market competitiveness. Adding these characteristics can help explaining the link between transaction security and financial performance. Qualitative data from bank management and regulator interviews can be a direction for future work to explain the relationship between transaction security and financial performance.

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AUTHOR CONTRIBUTIONS STATEMENT

Name of Author	C	M	So	Va	Fo	I	R	D	O	E	Vi	Su	P	Fu
Mohammed Abd-Akarim Almomani	✓	✓	✓	✓	✓	✓		✓	✓	✓			✓	
Adai Al-Momani		✓				✓		✓	✓	✓	✓	✓		

C : **C**onceptualization
M : **M**ethodology
So : **So**ftware
Va : **Va**lidation
Fo : **Fo**rmal analysis
I : **I**nvestigation
R : **R**esources
D : **D**ata Curation
O : Writing - **O**riginal Draft
E : Writing - Review & **E**diting
Vi : **Vi**sualization
Su : **Su**pervision
P : **P**roject administration
Fu : **Fu**nding acquisition

CONFLICT OF INTEREST STATEMENT

Authors state no conflict of interest.

DATA AVAILABILITY

Data availability is not applicable to this paper as no new data were created or analyzed in this study.

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