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THE IMPACT OF FINANCIAL AND OPERATIONAL RISKS ON EARNINGS QUALITY: EVIDENCE FROM JORDAN

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ABSTRACT

The study aims at investigating the impact of financial and operating risks on earnings quality of listed commercial banks in Jordan. The study also investigates the impact of COVID-19 pandemic on both risk levels and earnings quality. Data was collected from the quarterly financial statements of all thirteen listed banks during the period from quarter one of 2019 to quarter three of 2020. The descriptive analysis results reveals that credit and operating risks have increased significantly during the pandemic period while earnings quality has decreased. Moreover, the multiple regression analysis results show that credit risk and the pandemic have a significant negative impact on earnings quality, while liquidity risk has a significant positive impact on earnings quality. The study concludes with several recommendations for bank managers and regulators to lessen banks reliance on government interventions during financial crises and enhance the quality of earnings in the Jordanian banking sector.

KEYWORDS: Earnings quality; Financial risk; COVID-19 pandemic; Risk management; Banking sector.

1 INTRODUCTION

In today's sophisticated and uncertain business environment, banks encounter different types of financial risks, that require effective risk management to encounter their detrimental impact on banks' financial health and sustainability (Xie, *et al.*, 2021; Al Rahahleh *et al.*, 2019). Excessive risk taking behavior and poorly managed risks in the banking sector have been widely considered as one of the primary causes for bank failures and instability (Schwarcz & Peihani, 2018). For instance, credit risk (borrowers default to repay loans on time) and liquidity risk (clients sudden withdrawals of their deposits) are considered the main drivers of banks' instability and insolvency (Ghinimi, *et al.*, 2017). Thus, Banks excessive reliance on clients' deposits for lending and financing assets, accompanied by loose credit policy, have detrimental impact on banks' financial health and sustainability. Both risks are often interconnected and mutually reinforcing in practice, where each risk can influence the other directly or indirectly (Chegri & Elbakkouchi, 2022; Hakimi, *et al.*, 2020; Ferhi, 2018).

Risk management theory suggests managers use different strategies to overcome and resolve excessive financial risks. Although, earnings management adversely harm the quality of reported earnings, managers may engage in manipulative behavior to alter accounting earnings as an additional strategy to manage these risks and reduce earnings volatility (Nguyen, 2026; Campa, 2020). This in turn would reduce the quality of earnings as it distorts the true picture of the firm's financial position (Valdiansyah & Murwaningsari 2022).

Earnings quality indicates how well reported earnings predict a company's future performance without being distorted by earnings management (Valdiansyah & Murwaningsari, 2022; Elzahaby, 2021; Dang *et al.*, 2020; Nam, 2019; Kingu *et al.*, 2018; Tabash, 2018). Maintaining high-quality of earnings is essential to gain investors' trust and market efficiency (Abd Alhadi *et al.*, 2021; Garania, 2023; Fassas *et al.*, 2023). Financial analysts perceive earnings as high quality when they accurately reflect a company's current operations, act as strong indicators of future performance, and serve as a reliable metric for valuing the firm. Additionally, investors place a higher value on companies with stronger earnings quality, reflecting a preference for lower risk (Garanía, 2023; Fassas *et al.*, 2023).

Several prior studies have investigated the impact of individual risks on earnings quality (e.g., Rincon, *et al.*, 2024; AL-Arda & Al-Okdeh, 2022; Kingu *et al.*, 2018; Mamun *et al.*, 2020). However, examining the

effect of various risks simultaneously in the context of the COVID-19 pandemic remains underexplored (Acheampong *et al.*, 2024). In addition, from a crisis management theory perspective, studying how banks respond to such a crisis and risks provides valuable insights into risk management and stability of banking sector (Rincon, 2024).

This study addresses this gap by examining how liquidity risk, credit risk, operational risk, and insolvency risk simultaneously impact earnings quality in the banking sector. To our knowledge, this is one of the first studies in Jordan to examine the combined effect of all four risks on the earnings quality of Jordanian banks in the context of the pandemic, thus adopting a multivariate model rather than a bivariate model. The purpose of multivariate models is to test whether bivariate relationships continue to be significant in the presence of other variables, thus minimizing the probability of falsely rejecting a null hypothesis, inherent in bivariate models (AL-Dahiyat 2003).

The remainder of this study is structured as follows: Section 2 provides the theoretical framework and model. Section 3, presents the research methodology. The empirical analysis and findings are presented and discussed in Section 4. Finally, the conclusion, recommendations and limitations are presented in Section 5.

The Model, Hypothesis development & Variables measurement

This study adopts a comprehensive model, as depicted in Figure 1 below, to examine the impact of financial risk (liquidity, credit, and insolvency risks) and operational risk on earnings quality. The model also incorporates bank size and the COVID-19 pandemic variables to control for variation in bank size and the pandemic effects (Filbeck, *et al.*, 2022; Adous, *et al.*, 2021).

Moreover, the pandemic represents a significant external shock that fits the definition of systematic risk impacting the banking sector. Thus, studying how banks respond to such a crisis provides valuable insights into risk management and financial health in the banking sector (Acheampong, *et al.*, 2024; Rincon, 2024).

The model is based on several theories explaining how financial risks impact earnings management. For instance, agency theory suggests that financial risks, like liquidity, credit, and insolvency risks, exert pressure on management to meet profit expectations and targets. Thus, managers may manipulate earnings to overcome the perceived risk of not meeting earnings targets. This in turn would reduce

the quality of earnings as it distorts the true picture of the firm's financial position (Valdiansyah & Murwaningsari 2022).

Moreover, according to the signaling theory, managers may engage in manipulative behaviors to overcome uncertainties in business environment, signaling favorable economic performance, and overcoming financial risks' adverse impact on investors' perception and trust. In addition, when financial risks and uncertainty are high, managers may engage in earnings management to alter their reported earnings and to influence investors' perception of companies' financial flexibility, solvency, and image (Kim & Park, 2021).

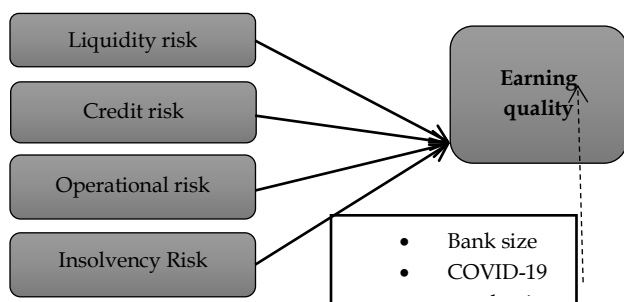


Figure 1: the study model

Several studies reveal that financial and operational risks negatively impact bank performance (Islam & Nishiyama, 2016; Fang, *et al.*, 2019; Abdelaziz *et al.*, 2020; Yahaya *et al.*, 2022; Valdiansyah & Murwaningsari 2022). Thus, when banks encounter risks, they may engage in manipulative practices to avoid signaling financial distress (Kothari, *et al.*, 2005; Graham, *et al.*, 2005). In the same vein, operational risks, due to operational disruptions or inefficiencies may induce managers to manage earnings, thus undermining earnings quality and the accuracy and predictability of financial performance (Valdiansyah & Murwaningsari 2022; Chegri & Elbakkouchi, 2022).

Based on the previous arguments, this research proposes four primary research hypotheses:

- H1:** Credit risk negatively impacts earnings quality.
- H2:** Liquidity risk negatively impacts earnings quality.
- H3:** Operational risk negatively impacts earnings quality.
- H4:** Insolvency risk negatively impacts earnings quality.

Measurement of Variables

Earnings quality (EQ): Measuring EQ is problematic, and no universal measurement is available (Hoque & Islam, 2011). Two approaches are

used in the literature for measuring EQ. The first approach measures EQ as the standard deviation of operating income divided by standard deviation of operating cash flow, the higher the ratio the higher EQ (Leuz, *et al.*, 2003). While the second approach measures EQ as the ratio of operating cash flow divided by net income, the smaller the ratio the higher EQ (Penman, 2001). Hoque & Islam, (2011) used both approaches for measuring EQ and found that both approaches reveal consistent results for measuring EQ in the banking sector, and that Penman's approach is the simplest approach to use.

Accordingly, the current study adopts the Penman's (2001) approach to measure EQ, calculated as the ratio of operating cash flow (OCF) to Income (OCF/Income). The smaller the ratio (less than 3) reflects high earnings quality, whereas a higher ratio (more than 3) reflects low earnings quality, since a large discrepancy often signals the presence of earnings management (Houque & Islam, 2011).

Liquidity risk (LR): Loans-to-deposits ratio measures liquidity risk (Abdelaziz *et al.*, 2020). High LTD ratio entails high liquidity risk as the bank is lending out a large amount of its deposits, thus, has less buffer to handle unexpected withdrawals or financial shocks. Generally, the optimal LTD ratio is typically 80% to 90%, where as a ratio of 100% or more means the bank does not have enough reserves for contingencies (Eltweri *et al.*, 2024).

Credit Risk (CR): Refers to borrowers default to repay loans on time. Loans-to-earnings ratio measures credit risk (Eltweri *et al.*, 2024). High ratio indicates that a large portion of the bank's earnings depends on lending activities, potentially increasing dependence on loan repayments and increasing credit risk if borrowers default.

Insolvency Risk (INS): refers to the inability of the business to pay interest and long term debt when it becomes due, particularly in times of adverse market conditions. Equity to assets ratio measures how much of bank assets are financed by shareholders' equity, as opposed by long term debt and obligations. This ratio is critical to assess bank financial health and risk. The high this ratio (above 50%) ensures that the bank is less reliant on debt to finance its assets, thus enhances its ability to pay long term debt, thus, reduces the insolvency risk. Whereas, the low ratio (below 20%) indicates highly leveraged and a heavily reliance on debt, which increases insolvency risk (Gurung, 2025).

Operational risk (OR): refers to the corporate loss resulted from internal processes, system failure, people error or external events such as Covid-19 pandemic (Mehembe & Mutezo, 2025). The ratio of

operating expenses divided by income ratio measures operational risk (Muthia *et al.*, 2020). The high ratio suggests that the bank is less efficient in managing its operations. This is because high operating expenses relative to income can reduce profitability and increase vulnerability to financial distress, particularly during economic downturn. Finally, the control variables, the **COVID-19 pandemic (COV)** is measured using a dummy variable that takes the value 1 for the pandemic period (Q1-Q3 2020), and 0 for pre-pandemic period (Q1-Q4 2019). **Bank size (Size)** is measured using the logarithm of total assets.

The model equation is represented as follow:

$$EQ_{it} = \alpha_0 + \beta_1 LR_{it} + \beta_2 CR_{it} + \beta_3 OR_{it} + \beta_4 INS_{it} + \beta_5 COV_{it} + \beta_6 Size_{it} + \varepsilon$$

2 METHODOLOGY

The study population includes all thirteen commercial banks listed in Jordan during the period from Q1 2019 to Q3 2020. Islamic banks were excluded to maintain comparability and consistency because they operate under different accounting principles and structures, Sharia-compliant principles, compared to conventional banks (Ahmed & Khan, 2020).

Data was obtained from quarterly financial statements of all thirteen banks published at the Amman stock exchange (ASE) website. Given the short timeframe (seven quarters) and small

population size (thirteen banks), the study uses quarterly financial statements, rather than annual statements, to increase the number of observations to 91 bank-quarter observations, and enhance the study's statistical power and the reliability of findings.

The impact of the pandemic on the banking sector became evident in the first quarter of 2020 (Goodell, 2020; IMF, 2020; Demir & Daisman 2021). Thus in this study, the period from Q1-Q4 2019 is considered pre-pandemic period while the period from Q1- Q3 2020 is considered the pandemic period.

3 EMPIRICAL ANALYSIS

Descriptive Analysis

Table 1 shows the comparative descriptive statistics for the study variables and the significance of mean differences among the variables before and during the pandemic periods. The results reveal that the earnings quality ratio (OCF/Ni) has increased from 2.31 before the pandemic to 4.33 during the pandemic, with a corresponding rise in standard deviation from 7.14 to 10.17. To recall from our earlier discussion, the increase in the CFO/Ni ratio suggests a decline in earnings quality and indicates the presence of earnings management. Thus, during the pandemic, Jordanian banks may have increased loan loss provisions (LLP), which may have affected net income, retained earnings, and equity without impacting cash flows (Valdiansyah & Murwaningsari, 2022).

Table 1: Descriptive Statistics before and during pandemic

	Before pandemic		During pandemic		Two-sample t- test	
	Mean	Standard deviation	Mean	Standard deviation	Sig.	Mean difference
Earnings Quality (EQ)	2.31	7.14	4.33	10.70	0.05	Yes
Credit Risk (CR)	16.70	9.90	22.41	10.20	0.00	yes
Operating Risk (OR)	0.37	0.08	0.48	0.14	0.00	Yes
Liquidity Risk (LR)	0.72	0.17	0.78	0.13	0.06	No
Insolvency Risk (INS)	0.15	0.13	0.12	0.03	0.40	No

In addition, banks may have benefited from Central Bank of Jordan (CBJ) support programs, such as reducing the compulsory reserve ratio on deposits to boost cash flow and liquidity (CBJ, 2021). Meanwhile, the increase in EQ standard deviation indicates greater volatility across banks, highlighting the uneven impact of the pandemic on earnings quality among banks. Some banks may have experienced significant differences between OCF and NI, possibly due to variations in risk exposure and earnings management practices.

The descriptive statistics also reveal that credit risk and operating risk have increased significantly during the pandemic. This may be attributed to increasing non-performing loans provisions due to high uncertainty of

borrowers' ability to repay loans, and/or potential disruption of bank operational processes due to the pandemic. In addition, CBJ have encouraged banks to continue providing credit and use equity buffers to increase lending to alleviate the pandemic's effect on the economy (Demirguc-Kunt. *et al.*, 2020).

Table 2: Correlation matrix

	EQ	COV	CR	INS	LR	OR	SIZE
EQ	1.00						
COV	0.12*	1.00					
CR	0.29*	0.29*	1.00				
INS	0.01	-0.09	-0.11	1.00			
LR	0.11	0.20	0.23*	-0.14	1.00		
OR	0.15	0.43*	0.25*	0.01	0.30*	1.00	
SIZE	0.08	0.01	0.05	-0.30*	0.34*	0.13	1.00

The results also reveal that liquidity risk (loan-to-deposit ratio) has increased from 0.71 to 0.77 during the pandemic, however, this increase was not significant and still within the acceptable range for banks' liquidity risk, 80%-90% (Eltweri *et al.*, 2024). Banks may have prioritized liquidity during the pandemic to meet deposit withdrawal demands. In addition, the CBJ intervention programs to enhance liquidity of banking sector in Jordan may have also contributed to this finding. On the other hand, the insolvency risk (Equity to assets) ratio, has declined from 0.146 to 0.129 during the pandemic, although not significant, indicating increased insolvency risk, as banks in Jordan became more reliant on debt and deposits to finance assets rather than on stockholders' equity.

To conclude, the results of descriptive analysis suggest that the pandemic has impacted banks in Jordan by lowering earnings quality and increasing credit and operational risks significantly. This is consistent with prior studies (e.g., El Nahass, *et al.*, 2021; Abdelaziz *et al.*, 2020; Valdiansyah & Murwaningsari, 2022).

Hypothesis Testing

Table 2 presents the correlation matrix and shows that multicollinearity problem among independent variables does not exist, as all of the coefficients are less than 0.7 (Hair *et al.*, 2010).

In addition, based on the Hausman test (10.05; P value 0.18) and the Lagrange Multiplier (LM) test (2.82; p-value 0.11), the pooled ordinary least square (OLS) model is used to assess the impact of financial and operational risks on earnings quality.

Table 3 presents OLS multiple regression results. The model demonstrates goodness of fit, as evident from the F-test results (5.148; p-value 0.01), and does not suffer from model misspecification, such as omitted variables, heteroscedasticity, or autocorrelation, as evident by the LM test results (2.82; p-value 0.11). Moreover, the R-squared value of 44% suggests that 44% of the variance in the dependent variable can be accounted for by the independent variables.

The results reveal that credit risk ratio (Loans-to-earnings) has a significant positive impact on earnings quality ratio (OCF/NI) (coefficient = 0.041, p-value = 0.01). To recall from earlier discussion, a higher OCF/NI ratio corresponds with lower earnings quality (EQ) and vice versa. This means that the higher the credit risk the lower earnings quality. This finding aligns with prior studies, which suggest that banks facing high financial risks, such as credit risk, are more likely to engage in manipulative behavior to avoid signaling financial distress and to

hide the negative effect of credit risk on performance (Valdiansyah & Murwaningsari, 2022; Yahaya *et al.*, 2022). Thus, the first hypothesis (Credit risk negatively impacts earnings quality) is accepted.

Dependent variable: earnings quality	
(Constant)	- 5.952 (- 0.661)
CR	0.041** (4.666)
LR	- 1.264* (-1.969)
OR	1.557 (0.678)
INS	-0.701 (-1.131)
COV	0.608** (2.845)
Size	- 0.399 (-0.661)
Adj. R2	0.443
F-statistics	5.148**
LM test	2.82 (1.61)
t-values in parentheses; * & ** indicate significance at 0.05 & 0.01 respectively.	

The results also reveal that liquidity risk ratio (LTD) has a significant but negative impact on quality of earnings ratio (coefficient = -1.264, p-value = 0.05). This implies that as liquidity risk increases, earnings quality ratio decreases thus, EQ improves. Surprisingly, this result contradicts our prior expectations that liquidity risk has a detrimental impact on performance and quality of earnings.

This finding may be attributed to the study earlier finding that liquidity risk in Jordanian banks does not exceed the threshold of LTD, thus, bank managers are less inclined to engage in earnings management practices to conceal violations to liquidity risk covenant (Valdiansyah & Murwaningsari, 2022; Agustia, *et al.*, 2020). Perhaps, a significant deviation from the threshold of LTD entails increasing liquidity pressure and encouraging earnings management to signal stability (Allini, *et al.*, 2025). This is also consistent with prior studies' findings that liquidity risk positively impacts bank profitability, thus managers are less inclined to manipulate earnings to meet expected profit targets (Islam & Nishiyama, 2016; Larasati & Syaipudin, 2024; Eltweri *et al.*, 2024). Thus, the second hypothesis (*Liquidity risk impacts earnings quality, positively rather than negatively as expected*) is also accepted.

With regard to testing the third and fourth hypotheses (*Operating risk and insolvency risk negatively impact earnings quality*), the results show insignificant impact on earnings quality (1.557, p = 0.678 and -0.701, p = 1.131, respectively), which is consistent with prior studies (Al-Kayyat, *et al.*, 2024; Agustia, *et al.*, 2020; Egbunike & Igbinovia, 2018). Thus, both hypotheses were not supported.

Regarding the control variables, the results reveal that the pandemic has a significant positive impact on earnings quality ratio (coefficient = 0.608, p-value

= 0.01) confirming our earlier finding that during the pandemic period banks' quality of earnings has significantly deteriorated. Whereas, the impact of bank size on earnings quality was insignificant (coefficient = 0.399, p-value = 0.08).

5 CONCLUSION AND RECOMMENDATIONS

This study has examined the impact of financial and operating risks on earnings quality and whether the COVID-19 pandemic has impacted risk and earnings quality levels of listed commercial banks in Jordan. The findings reveal that earnings quality has deteriorated and credit and operational risks have significantly increased during the pandemic, compared to the prior pandemic period. Furthermore, the findings reveal that banks have successfully maintained the liquidity risk within optimal levels during the pandemic, perhaps due to the Central Bank of Jordan (CBJ) intervention and support programs.

However, the decrease in the equity-to-assets ratio, along with the significant increase in credit and operational risks during the pandemic, indicates that banks have become more reliant on funding from debt and deposits, rather than equity, which raises concerns about banks' financial health and ability to repay debts in the future, particularly in times of economic down turn and deteriorating market conditions. Furthermore, the findings reveal that both credit risk and the COVID-19 pandemic have a significant negative impact, while liquidity risk has a significant positive impact on the quality of earnings. On the other hand, both operating risk and

insolvency risk have an insignificant impact on earnings quality, implying that these risks may not directly influence earnings quality in the short term. The study concludes that effective risk management is imperative for maintaining financial health and sustainability in the banking sector. Banks facing heightened financial risks (exceeding optimal levels or thresholds) are more inclined to manipulate earnings to hide their deteriorating impact on performance. Thus, it's imperative for bank managers and regulators to focus on strengthening banks' capital reserves to mitigate future financial risks, enhance liquidity buffers, improve credit risk management and adopt financial sustainability strategies to lessen banks' reliance on government interventions during financial crises. In addition, the findings reveal the importance of maintaining strong regulatory oversight on banks operations, and promoting transparent financial reporting to enhance the quality of earnings.

The limitations of this study provide direction for future research. Further research is required to investigate the impact of financial risks on earnings quality by adopting comprehensive and multivariate models, including additional risk variables, using modified variable measures and proxies and larger sample-years sizes, and conduct more robustness tests. Future research could also explore the moderating impact of macroeconomic factors and government stimulus programs during crises to mitigate and clarify the inconsistent findings on financial risk and earnings quality relationship.

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