

Article

The Impact of Non-Interest Income on Commercial Bank Profitability in the Middle East and North Africa (MENA) Region

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Abstract: This study examines the effects of non-interest income on bank performance in the Middle East and North Africa (MENA) region, addressing existing research gaps and conflicting results. The analysis is based on data from 40 banks (5 banks from each country) operating in Bahrain, Egypt, Jordan, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates between 2010 and 2022. Using correlation analysis and three regression models (OLS, FE, and RE), this study explores the relationship between non-interest income, overheads, capital adequacy, loan loss provision, bank size, and return on assets. The findings reveal positive associations among banks' overhead, size, capital adequacy, and loan loss provision. Additionally, a favorable correlation is observed between non-interest income and bank performance. Non-interest income significantly influences the profitability of MENA region banks across all three models, supporting the main hypothesis. While the study's limitations include sample size and geographic focus, the findings of this study provide valuable insights for policymakers, allowing them to recognize the positive impact of increasing non-interest income on commercial bank profitability in the MENA region and consider implementing policies that encourage and support banks in diversifying their income sources.

Keywords: non-interest income; return on assets; capital adequacy; credit risk; size; panel regression; MENA

JEL Classification: G20; G29; G39



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1. Introduction

In the last several decades, the banking business has seen substantial transformations, stemming from the evolution of the competitive environment, technological advances, government policies, and customer demand. This study covered the years starting from 2010. Since then, interest rates globally and in the MENA region have been low, resulting in banks seeking alternative sources of income. These changes have contributed to the appearance of new non-traditional products and services within the industry, as well as the alteration of existing ones. In this context, non-traditional products and services generate non-interest income for financial institutions, which previously operated primarily with a focus on interest as the primary source of income (Andrzejuk 2017). The primary sources of non-traditional revenue included commissions, service fees, and security trading. The appearance and expansion of these services have prompted a large volume of research studies focusing on the association between the non-interest produced and the financial success of banks such as Antao and Karnik (2022) and Al-Tarawneh et al. (2017).

When considering the main indicators used for the assessment of financial performance, it is possible to note the emphasis on profitability as one of the core areas. The primary indicators used for analysis of profitability were the return on equity (ROE) and the return on assets (ROA) ratios. The focus of the quantitative research was on evaluating the

discrepancies between the ROA and ROE and the non-interest income that banks produced (Phan et al. 2023). At the same time, it was possible to observe a fundamental lack of consistency in the results of the research studies associated with the financial performance of banks and non-interest income. While Phan et al. (2023) declared a negative performance of banks associated with non-interest income, Stanley and Muturi (2023) conducted research stating a positive relationship between non-interest income and financial performance. In addition, Lee et al. (2014) and Williams (2016) identified additional risks for the financial performance of banks associated with non-interest revenue (Phan et al. 2023). Furthermore, it was possible to note that non-interest income could be the adverse factor preventing revenue growth for banks. The differences between the conclusions made in the other studies were partially due to the different geographic regions used for the collection of data. The studies, which covered multiple regions, also arrived at varying outcomes. Therefore, it is possible to note the importance of assessing a particular region when considering the association between non-interest income and bank financial performance. Such an approach may address the disparities in development levels demonstrated by the banking systems in various regions.

The purpose of this study is to examine how non-interest revenue influences the success of banks in the Middle East and North Africa (MENA) region, due to the lack of previous empirical evidence. The region accounts for five percent of global gross domestic product (GDP). Simultaneously, the Middle East alone contributed six percent to the global GDP growth in the past decade (Gatti et al. 2023). In this regard, the stability of the banking system, in spite of quick changes in the sector, is particularly essential for the global economy. Through non-traditional products and services, banks can generate revenues to remain resilient; however, it may increase their exposure to risks outside the traditional banking sector.

This research includes a literature review which focuses on selected previous studies in Section 2. In Section 3, we present the research methodology and develop the model used. The results of the analysis are discussed in Section 4, providing further insights into the research outcomes. Finally, in Section 5, we provide the conclusion of this empirical study summarizing its key findings.

2. Literature Review

2.1. Non-Interest Income and the Determinants of Bank Revenue Diversification

The determinants of bank revenue diversification have been extensively examined in the banking literature (Berger et al. 2004; Nguyen 2012; Tennant and Sutherland 2014). Research has focused on various factors that structure bank revenues, including competition, regulatory policy, bank-specific characteristics, and economic environment factors. Regulatory changes, such as universal banking and technological innovations, have played a significant role in encouraging banks to diversify their traditional product offerings with fee-based services (DeYoung and Rice 2004). Competition, driven by both regulatory changes and the increasing number of banks (also changing market concentration), has also been identified as a key driver of revenue diversification (Williams 2016).

Bank-specific characteristics and environmental factors such as size, creditworthiness, liquidity, efficiency, financial development, market concentration, and inflation volatility have been shown to impact non-interest income (Tennant and Sutherland 2014). The relationship between non-interest income and net interest margin, as well as the quality of a bank's loan portfolio, has also been explored (Lepetit et al. 2008).

To gain a comprehensive understanding of the determinants of bank revenue diversification, Table 1 provides a summary overview of key findings from relevant studies in this area.

Table 1. Determinants of Bank Revenue Diversification.

Study	Key Findings
DeYoung and Rice (2004)	Regulatory changes and technological advances encouraged banks in the United States to diversify their income sources through non-interest income.
Berger et al. (2005)	Deregulation in the United States led to increased competition, prompting local banks to diversify their income sources.
Stiroh (2006)	No significant relation between non-interest income and bank stock returns.
Baele et al. (2007)	Non-interest income has a significant negative impact on a bank's total risk but a positive effect on the bank's systematic risk exposure.
Dvorak and Hanousek (2009)	Non-interest income is related to banking industry concentration and macroeconomic volatility.
Calmès and Théoret (2010)	Non-interest income provides time-varying diversification benefits, influenced by changes in bank risk measurement regulation.
Laeven and Levine (2007)	Diversification benefits from non-interest income accrued only to banks with significant economies of scope.
Nguyen (2012)	Loan quality has a time-varying positive relation with non-interest income.
DeYoung and Torna (2013)	Different sources of non-interest income have different effects on bank risk of failure. Fee-for-service income is negatively associated with a bank's probability of failure.
Lee et al. (2014)	Non-interest income's impact on bank risk varies with bank specialization and the macroeconomic context.
Tennant and Sutherland (2014)	Non-interest income generation is influenced by bank-specific characteristics and country-level environmental factors. Large, solvent, liquid, and efficient banks tend to profit more from non-interest income. Banks also benefit from fee income in countries with higher financial development, bank concentration, and inflation volatility.
Williams (2016)	Non-interest income in the Australian context is associated with increasing revenue volatility, but it does not increase bank insolvency risk.
Saunders et al. (2016)	Non-interest income to interest income ratio is associated with higher profits, and this result is not time-varying.
Berger et al. (2004); Lepetit et al. (2008); Nguyen (2012) and Tennant and Sutherland (2014)	Non-interest income is negatively related to net interest margins.

Source: Authors' Analysis.

2.2. Empirical Evidence

[Pennathur et al. \(2012\)](#) conducted research focusing on income diversification and risk for banks operating in India. The study included data from 203 banks and covered the period between 2001 and 2009. The authors assessed the factors representing the non-interest income of banks and their effects on profitability and risk-related measures. The methodology used by the authors differentiated between public sector banks, private domestic banks, and foreign banks. The collected evidence demonstrated lower volatility in profits generated by the banks. Furthermore, foreign banks were generating higher levels of non-interest income than local banks.

[Köhler \(2014\)](#) used the Deutsche Bundesbank's prudential database (BAKIS) for the assessment of risks associated with non-interest income generated by banks. The total number of banks covered by the data was 20,000 for the period between 2002 and 2012. The author relied on an empirical model incorporating regression analysis. The results showed that non-interest income has very different effects on banks that focus on regular customers and banks that focus on making investments. Based on their higher Z-scores, retail-oriented banks benefited more from the higher proportion of non-interest income in the institution's total income. On the other hand, investment-oriented banks demonstrated higher risks with a higher share of non-interest income.

Lee et al. (2014) conducted research focusing on the effects of non-interest income on profitability and risk. The sample included banks from 22 countries in Asia. The sample included data from 967 banks between 1995 and 2009. The authors relied on the regression model for the analysis of the collected data. The authors suggested that the higher profitability of the banks was contributing to the respective higher levels of risk.

Williams (2016) analyzed the effect of non-interest income on the performance and risks of banks in Australia. In particular, the research sample included confidential data from twelve Australian banks. The period covered in the research ranged between 2002 and 2008. The authors relied on the Value at Risk (VaR) model, which incorporates dependent and independent variables. The research demonstrated that banks with a higher level of non-interest income indicated higher risks. At the same time, it was possible to observe improvements in the levels of profitability for the banks with a higher share of non-interest income.

Alhassan and Tetteh (2017) looked at the impact of non-interest revenue on MENA banks, namely Ghanaian banks. The research relied on a sample of 26 banks in Ghana. The period covered in the research was between 2003 and 2011. In this regard, the authors relied on regression analysis to test the effects of non-interest income on the efficiency of banks. The link between the contextual factors and the bootstrapped efficiency ratings was put through the ringer by the five-stage model. The collected evidence indicated that non-interest income was positively affecting the efficiency of banks amid higher levels of risk. In this regard, the authors underlined the importance of regulatory measures to limit the potential risks. In addition, the study highlighted the importance of regulatory factors, such as capital adequacy requirements and restrictions on activities, in influencing the level and impact of non-interest income. The diversification of revenue streams through non-interest income can enhance a bank's ability to withstand financial shocks and fluctuations in the interest rate environment.

Ahamed (2017) assessed the effects of non-interest income, including its quality, on the profitability of Indian banks. The sample used in the research consisted of 107 commercial banks functioning in the banking sector. The period covered in the study ranged between 1998 and 2014. The return on assets (ROA) and risk-adjusted return on assets were the profitability indicators employed in the research. A regression model was used to assess the association between non-interest revenue and profitability. According to the results, a larger percentage of non-interest income contributed to the higher ROA and risk-adjusted ROA. In this aspect, foreign banks generated higher levels of profitability relative to the private and public banks headquartered in India.

Andrzejuk (2017) conducted research to test the connection between non-interest income and profitability using the evidence from Liechtenstein. The study relied on a sample consisting of 26 banks specializing in wealth management and private banking headquartered in Liechtenstein. The period covered in the research ranged between 2014 and 2016. The profitability indicators selected for the assessment were the ROE and ROA. The methodology of the research relied on the Pearson correlation coefficient. The findings indicated a negative correlation between the share of non-interest income and ROA. At the same time, the research suggested an absence of correlation between non-interest income and ROE. In this aspect, the authors concluded that the diversification of revenue sources had a positive effect on the banks' profitability.

Abedifar et al. (2018) examined the relationship between non-interest income and bank performance in a sample of U.S. banks. Using regression analysis, the sample contained 6921 commercial banks. The period covered in the research ranged between 2007 and 2016. The methodology focused on the credit risk model, incorporating a range of descriptive statistical measures, including R-squared and F-statistic. The findings indicated a positive and significant impact of non-interest income on both ROA and ROE, suggesting that non-interest income contributes to the overall performance of the banks. The authors reached the conclusion that non-interest income positively affects banks' profitability, indicating

that diversifying income sources can lead to improved performance. Furthermore, the research found declining risks for banks amid the higher diversification of revenue streams.

Ghosh (2019) assessed the effects of non-interest income on the profitability and risks of banks. The author focused on the U.S. banks, with the sample consisting of 5491 commercial financial institutions. The period covered in the research ranged between 2001 and 2016. The research incorporated ROA and ROE as the main profitability indicators. The research incorporated the econometric model with specific statistical indicators within the scope of the methodology. The results indicated that a higher share of non-interest income was contributing to higher levels of risk. On the other hand, the authors underlined the controversial nature of the results regarding profitability. Specifically, the share of non-interest income represented a minor share of revenues for banks in the U.S. In this aspect, the rising share of non-interest income indicated a limited effect on profitability.

Park et al. (2019) assessed the effects of non-interest income on the overall banks' performance operating in the U.S. The sample included 916 banks with 3087 observations. The period covered in the research was between 2007 and 2009, to represent the global financial recession. The authors relied on regression analysis as the primary methodology tool for the research. The findings indicated that non-interest income had an insignificant influence on the risks and profitability of banks in the U.S. At the same time, the authors found that a higher share of non-interest income had negative effects on profitability and risks during the crisis periods.

Phan et al. (2023) focused on the effects of the non-interest income in the ASEAN region's banks. The sample of the research included 36 commercial banks, with the period covered between 2008 and 2020. In this aspect, quantile regression was the primary tool used in the research. The findings indicated a negative impact of non-interest income. At the same time, the authors underlined the importance of revenue diversification for banks.

Stanley and Muturi (2023) conducted research to investigate the impact that non-interest revenue has on the overall performance of Kenyan banks. The sample included 42 commercial banks from Kenya. The period covered in the research ranged between 2012 and 2021. The authors relied on the descriptive survey approach within the scope of the methodology. The collected evidence indicated a positive association between non-interest income and profitability. In this aspect, the authors underlined the value of revenue diversification for commercial banks. In addition, the following Table 2 provides a summary for a selected empirical paper that highlights the sample used, the period of study and findings for each paper. Also, the following Table 2 provides a summary of selected literature that investigated the impact of noninterest income on the performance of different banks in different markets.

Table 2. Summary of Empirical Findings.

Study	Country/Region	Sample Size	Period	Findings
Pennathur et al. (2012)	India	203 banks	2001–2009	Non-interest income reduced profit volatility of Indian banks, and foreign banks generated higher levels of non-interest income than local banks.
Köhler (2014)	Germany	20,000 banks	2002–2012	Retail-oriented banks benefited more from non-interest income, while investment-oriented banks demonstrated higher risks with a higher share of non-interest income.
Lee et al. (2014)	Asia	967 banks	1995–2009	Higher profitability of banks contributed to higher levels of risk.
Williams (2016)	Australia	12 banks	2002–2008	Banks with higher non-interest income indicated higher risks, but also improvements in profitability.

Table 2. Cont.

Study	Country/Region	Sample Size	Period	Findings
Alhassan and Tetteh (2017)	Ghana	26 banks	2003–2011	Non-interest income positively affected the efficiency of banks amid higher levels of risk. Regulatory measures were important in limiting potential risks.
Ahamed (2017)	India	107 banks	1998–2014	Larger percentage of non-interest income contributed to higher profitability. Foreign banks generated higher levels of profitability compared to private and public banks in India.
Andrzejuk (2017)	Liechtenstein	26 banks	2014–2016	Negative correlation between the share of non-interest income and return on assets (ROA). No correlation between non-interest income and return on equity (ROE). Revenue diversification had a positive effect on banks' profitability.
Abedifar et al. (2018)	United States	6921 banks	2007–2016	Non-interest income had a positive and significant impact on both return on assets (ROA) and return on equity (ROE), leading to improved performance and declining risks for banks.
Ghosh (2019)	United States	5491 banks	2001–2016	Higher share of non-interest income contributed to higher levels of risk. Controversial results regarding profitability, with a limited effect on profitability for U.S. banks.
Park et al. (2019)	United States	916 banks	2007–2009	Non-interest income had an insignificant influence on risks and profitability of U.S. banks during crisis periods.
Phan et al. (2023)	ASEAN region	36 banks	2008–2020	Non-interest income had a negative impact, highlighting the importance of revenue diversification for banks.
Stanley and Muturi (2023)	Kenya	42 banks	2012–2021	Positive association between non-interest income and profitability, emphasizing the value of revenue diversification for commercial banks.
Ashraf et al. (2023)	Pakistan	12 banks	2007–2018	Bank size, ownership, capital adequacy ratio, net interest margin, loan to assets ratio, implicit interest payment, and management quality are significant estimators of non-interest income.

Source: Authors' Analysis.

3. Methodology

3.1. Sample

This research relies on a comprehensive dataset that encompasses a thirteen-year timeline from 2010 to 2022 and collected the data for 40 banks (5 commercial banks from each country—Bahrain, Egypt, Jordan, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates). The purpose of including five banks from each country is to have an equal and comprehensive understanding of the MENA countries included in the sample in order to generalize the recommendations. In addition, these banks have diverse scales of operations, financial performance levels, and asset bases, ensuring an all-encompassing, complex view of the MENA region's banking industry. The main source of this dataset is the Refinitiv Eikon platform. Nevertheless, the challenging obstacle is in the presence of missing data and in order to tackle this issue, supplementary data sources have been utilized as necessary. In instances, data were sourced from appropriate stock markets or the annual reports of the corresponding banks for the given year. Moreover, the comprehensive nature of this sample aids in mitigating the potential for sample selection bias, thereby contributing to the validity and robustness of the study's findings.

3.2. Model Development

3.2.1. Dependent Variable

Return on Assets (ROA)

Bank performance, the dependent variable in this model, is measured using return on assets (ROA) and return on equity (ROE). This paper used the ROA and ROE as a measure of profitability following [Phan et al. \(2023\)](#) and [Antao and Karnik \(2022\)](#). ROA, in particular, is a valuable measure of a bank's profitability and operational efficiency as it indicates how efficiently a bank manages its assets to generate earnings ([Ghosh 2019](#)). Furthermore, ROA offers a holistic evaluation of a bank's performance as it integrates the effects of income generation, asset usage, and risk management. Hence, this study will primarily use ROA as the dependent variable ([Mehzabin et al. 2023](#); [Calmès and Théoret 2010](#)). Return on equity has been used as another ratio to check for robustness of results ([Senyo et al. 2015](#)).

3.2.2. Independent and Control Variables

Non-Interest Income

Non-interest income forms the primary independent variable in this study. The literature provides substantial evidence indicating a positive correlation between non-interest income and bank performance. The banks with a higher share of non-interest income tend to demonstrate improved profitability ([Köhler 2014](#); [Karakaya and Er 2013](#)). Several studies confirmed that a decrease in non-interest income should decrease profitability and report inefficient performance by banks such as [Meslier et al. \(2014\)](#); [Salike and Ao \(2018\)](#); and [Phan et al. \(2023\)](#). This income encompasses service charges, fees, trading income, and other sources that are not derived directly from the bank's lending activities. In this study, the measure of non-interest income will be the ratio of non-interest income to total income ([Minh and Trinh 2020](#)). This measure provides a comprehensive picture of the relative importance of non-interest income in a bank's overall income profile. For robustness checks, the ratio of non-interest income to operating income has been used. The positive relationship suggested by previous literature leads to the first hypothesis:

H₁: *This study anticipates a positive connection between non-interest income and the performance of banks.*

Size

Bank size, another key independent variable, is measured as the natural logarithm of total assets ([Mehzabin et al. 2023](#); [Antao and Karnik 2022](#)). This measurement is chosen because it reflects the bank's market position, operational scale, and access to resources ([Jaffar et al. 2014](#)). According to [Köhler \(2014\)](#), the logarithm of financial assets is found significant and negative for all bank groups, this factor is utilized to account for bank size and indicates that larger banks are riskier, regardless of their overall business model. On the other hand, [Antao and Karnik \(2022\)](#) argued that larger banks do have the advantages of economies of scale and can absorb negative financial shocks since they can earn more with the model used for their portfolio selection. The second hypothesis, based on the previous mixed results, is as follows:

H₂: *This study expects that there is a relationship between the size of the bank and the performance of commercial banks.*

Loan Loss Provision

It is possible to measure the loan loss provision by the loan loss provision to income (LLPI) ratio, which shows the share of the expense allocated for uncollected loan payments and loans relative to the net income ([Danisman et al. 2021](#)). Lower values of this ratio indicate better efficiency ([Sun et al. 2017](#)). A high LLPI may suggest a high share of the uncollected loans and loan payments versus the net income, which could negatively impact profitability and, thus, performance ([Ahamed 2017](#); [Antao and Karnik 2022](#)). In addition,

Mustafa et al. (2012) argued that the loan loss provision can be interpreted as the quality of credit provided by banks and the capital risk; therefore, if bank officers lack the experience needed to control and decide adequately the credit provided, this will increase the capital risk and affect the profitability negatively (Binsaddig et al. 2023). Therefore, the ratio would demonstrate a negative relationship between bank efficiency and bank profitability:

H₃: *This study expects a negative relationship between bank credit risk (as measured by the Loan Loss Provision to Income Ratio) and the performance of commercial banks.*

Capital Adequacy Ratio (CAR)

The ratio demonstrates the share of the bank's capital relative to the weighted assets and current liabilities (Baldwin et al. 2019). A higher CAR could indicate a lower risk profile as the bank is using more of its deposits for loans. This could potentially lead to stronger liquidity and a positive effect on the financial performance of financial institutions. In addition, Ajayi et al. (2019) argued that if a bank has a high CAR, then this means that the possibility to pay the financial obligations and the depositor demands is high since the higher the CAR the better is the cushion of safety that the bank is enjoying (Baldwin et al. 2019). If banks in a certain market have a high CAR, then this means that the financial system of this market is healthy and stable (Almazari et al. 2022). In this aspect, the fourth hypothesis is:

H₄: *This study predicts a positive relationship between bank capital adequacy (as measured by the Capital Adequacy Ratio) and the performance of commercial banks.*

Overheads

It is measured by the overhead to income ratio (OIR). The ratio focuses on contrasting the bank's operating expenses with the revenue the financial institution generates (Gao et al. 2020). A lower OIR can imply that a bank is minimizing business expenses that do not contribute to its main activities. In this regard, a lower OIR would contribute to the stronger performance of the financial institution (Minh and Trinh 2020). Furthermore, Antwi (2019) stated that management has to apply an effective system to manage their overheads since the lower the overheads charged to the bank, the better the performance. Sufian and Chong (2008) and Flamini et al. (2009) also agreed that the higher the OIR the lower the performance since banks will try to find a way to pass this level of expenses to either their depositors or borrowers by either higher interest rates on loans or lower interest rates on deposits. In order to check for robustness, this paper applied the overhead to operating income ratio. Therefore, the fifth hypothesis is:

H₅: *This study expects a negative relationship between bank overhead (as measured by the Overhead to Income Ratio) and the performance of commercial banks.*

3.3. Model

Based on the previous section, the following model has been developed to investigate the impact of non-interest income on the profitability of banks in the MENA region. The following model will be estimated using three regressions (OLS, fixed effects and random effects techniques), Lastly, the regressions have been tested for robustness using different ratios for the variables included in the model:

$$ROA_{t,i} = \beta_0 + \beta_1 NoninIncome_{t,i} + \beta_2 Size_{t,i} + \beta_3 LoanLossProv_{t,i} + \beta_4 CapRatio_{t,i} + \beta_5 Overheads_{t,i} + \varepsilon_{t,i}$$

where:

ROA is return on assets and a proxy of performance for bank *i* in period *t*;

NoninIncome is the ratio of non-interest incomes divided by the total income;

Size is measured by the natural logarithm of total assets;

LoanLossProv is measured by the loan loss provision-to-income ratio;

CapRatio is measured by the bank's capital to the weighted assets and liabilities;

Overheads is measured by the overheads-to-income ratio.

4. Results and Analysis

The study relied on the data collected from the national and bank levels in the MENA region, covering the period between 2010 and 2022. It is possible to observe the statistical results of variables included in Table 3. The return on assets (ROA) ranged between 0.06 and 1.32 for the selected banks. The mean ROA for the selected sample was 0.12, while the standard deviation from the mean reached 0.17 and this comes in line with results reported by Minh and Trinh (2020) but for the Vietnamese banks. The non-interest income as a share of total income ranged between the minimum value of 0.02 and 0.47. The mean non-interest income share reached 0.04, with the standard deviation from the mean at 0.35 and this implies that the banks in the MENA region on average get 4 percent of their income by charges and fees on non-interest operations. This result is approximately close to the mean value of 2 percent reported by Antao and Karnik (2022).

Table 3. Descriptive Statistics.

<i>Variables</i>	<i>Min</i>	<i>Max</i>	<i>Mean</i>	<i>Standard Deviation</i>
<i>Return on Assets</i>	0.06	1.32	0.12	0.17
<i>Non-Interest Income</i>	0.02	0.47	0.04	0.35
<i>Size</i>	6.93	16.39	9.79	1.53
<i>Loan Loss Provision</i>	0.10	0.42	0.13	0.35
<i>Capital Adequacy</i>	0.12	0.54	0.16	0.62
<i>Overheads</i>	0.02	0.23	0.04	0.04

Source: Authors' Analysis.

The standard deviation of the banks' size variable is 1.53 which has the highest standard deviation relative to the other variables, which entails the highest dispersion of the data relative to the mean; this comes in line with Phan et al. (2023). In this regard, it is possible to state that the sample included small and large banks operating in the MENA region. Such an outcome contributes to the accuracy of the analysis from the standpoint of its ability to incorporate a broader range of financial institutions.

Table 4 demonstrates the coefficient correlation analysis between the variables included in the model. It shows that the correlation between non-interest income and profitability reached 0.042 which indicates that the higher the non-interest income the higher the profitability in the MENA region. Specifically, if banks charge more on non-interest operations as in charges and fees on their operations or increase the volume of financial services, then the return on assets should increase and the efficiency of the bank is better. Thus, this comes in line with Abedifar et al. (2018).

Table 4. Correlation Matrix.

<i>Variables</i>	<i>ROA</i>	<i>Non-Interest Income</i>	<i>Size</i>	<i>Loan Loss Provision</i>	<i>Capital Adequacy</i>	<i>Overheads</i>	<i>VIF</i>
<i>ROA</i>		1.00					
<i>Non-Interest Income</i>	0.042 ***	1.00					1.28
<i>Size</i>	0.031 ***	0.245	1.00				1.19
<i>Loan Loss Provision</i>	0.025 ***	0.053	0.142	1.00			1.47
<i>Capital Adequacy</i>	0.054 **	0.025	0.196	0.041	1.00		1.37
<i>Overheads</i>	0.067 **	0.042	0.150	0.121	0.0123	1.00	1.29

Note: ***, ** stands for significance of 1 percent and 5 percent respectively. Source: Authors' Analysis.

On the other hand, the correlation between the profitability and bank size reached 0.031 which indicates that the larger the bank the higher the profitability is expected since large banks have easier access to the market and this in turn should affect the profitability positively (Kawshala and Panditharathna 2017). Similarly, the correlation between the ROA and loan loss provision reached 0.025 which indicated that the higher the loan loss provision the higher the profitability, which indicates that MENA banks seem to have good

collection departments that managed to collect bad loans and increased their profitability (Danisman et al. 2021).

In addition, Table 4 reports the variance inflation factor (VIF) in order to check if the data suffer from multicollinearity problems, and as evident, all variables have a factor less than 5. This confirms that no serious multicollinearity exists among the different variables included in the model as per Ciftci et al. (2019).

Table 5 demonstrates the results of the three regression models utilized for the analysis, namely the fixed effects (FE), random effects (RE), and ordinary least squares (OLS). It shows that non-interest income has a statistically significant and positive relationship with ROA across all three models. Such a result confirms that any increase in the non-interest income of MENA banks will lead to a better performance (Abedifar et al. 2018); and thus, confirms our first hypothesis.

Table 5. Regression Results.

Variables	OLS		Fixed Effect		Random Effect	
	Coeff	Significance	Coeff	Significance	Coeff	Significance
Non-Interest Income	0.204	0.010	0.142	0.000	0.113	0.000
Size	0.096	0.000	0.065	0.000	0.012	0.000
Loan Loss Provision	-0.132	0.032	-0.219	0.000	-0.183	0.000
Capital Adequacy	0.084	0.110	0.065	0.050	0.054	0.063
Overheads	-0.023	0.054	-0.192	0.051	-0.153	0.075
Constant	0.089	0.072	1.092	0.129	1.74	0.102
Adjusted R ²	0.23		0.32		0.29	
F-Statistics	35.57 0.000		23.68 0.000		49.23 0.000	
Hausman Test	116.49 ***					

*** The statistical significance levels are at 0.01. Source: Authors' Analysis.

Such an outcome is consistent with the findings presented by Lee et al. (2014) and Williams (2016) who also argued that if banks increase their charges and fees on non-interest operations then this should increase the efficiency and increase the profitability. However, our findings refute the ones of Phan et al. (2023) and Sun et al. (2017) who found an inverse relationship between the bank's non-interest income and its return on equity (Flamini et al. 2009).

Similarly, the results confirm our second hypothesis that bank size has a positive association with ROA in all models. Such a result indicates that larger banks have higher returns on assets. Several researchers argued that larger banks usually face easier access to the market and have a better portfolio diversification and this in turn usually affects the profitability positively (Al-Fehani et al. 2021; Harban et al. 2021; Alhassan and Tetteh 2017; Kawshala and Panditharathna 2017). Hence, large banks offer extensive financial services to their clients in an attempt to rely more on non-interest income; and thus, increase profits. Nevertheless, our result contradicts other studies for Phan et al. (2023), Minh and Tranh (2020), and Ebenezer et al. (2019) who proved a negative relationship between the bank's size and its profitability.

Consequently, our third hypothesis about the relationship between the bank's credit risk and its performance is also validated. Hence, the loan loss provisions negatively impact the ROA across all models. This signifies that as banks allocate more funds for potential loan losses, this in turn lead to their return on assets to potentially change as a result of a decrease in their effective income-generating assets. The result supported the outcomes of the preceding research studies such as Hong et al. (2020) and Sun et al. (2017) and contradicts the results of Ghosh (2019) who argued that while LLP lowers the level of risk

exhibited by banks, it may have a negative effect on their ability to generate profits in the long term.

The results also confirmed our fourth hypothesis about the relation between the bank's capital and performance. Capital adequacy, though not statistically significant in the OLS model, becomes significant in the FE and RE models, with coefficients of 0.065 ($p < 0.05$) and 0.054 ($p < 0.1$), respectively. This suggests that there might be some within-entity variation or time dynamics at play that are not captured in the OLS model. A possible interpretation is that banks with better capital adequacy ratios enjoy higher returns on assets. The findings of the research conducted by [Alhassan and Tetteh \(2017\)](#) demonstrated that capital adequacy was among the factors affecting non-interest income and the profitability of banks. Furthermore, [Al-Homaidi et al. \(2020\)](#) identified capital adequacy as a critical factor affecting the profitability of banks. Thus, previous studies confirmed that the higher the CAR the better the capital available to meet the financial obligations and the less the risk is to face financial shocks. Nevertheless, our result contradicted [Sun et al. \(2017\)](#) who pinpointed that the capital adequacy ratio of Chinese banks is negatively influencing their return on equity.

Overhead costs exhibit a negative and marginally significant relationship with ROA in all models, indicating that higher operating expenses can potentially lower the return on assets. [Ozili's \(2021\)](#) findings entailed that higher overhead costs could contribute to the lower profitability of banks, which is consistent with the results of the prior studies ([Köhler 2014](#)). In addition, [Minh and Trinh \(2020\)](#) stated that if the overheads increased, then the profitability is expected to reduce in the Vietnamese banks unlike a study involving Chinese banks which did not find a significant association between the bank's costs and its return on equity ([Sun et al. 2017](#)).

The adjusted R-squared values for the OLS, FE, and RE models are 0.23, 0.32, and 0.29, respectively, indicating that it is possible to explain 23.0 percent to 32.0 percent of the variation in ROA by the models. The F-statistics in all models are significant at the $p < 0.01$ level, verifying the overall significance of the models. The Hausman test, with a value of 116.49 ($p < 0.01$), provides strong evidence that the fixed effects model is more appropriate compared to the random effects model. Such an outcome suggests that there is significant variation within entities over time that is not captured by the random effects model.

The regression model outputs indicate that non-interest income has a substantial and positive effect on the performance of commercial banks in the MENA region, even when controlling for other important factors such as bank size, loan loss provisions, capital adequacy, and overheads ([Alhassan and Tetteh 2017](#)). The significance of these effects, however, varies across different regression models, reflecting the complexities of the relationships under study. A notable limitation of this study is the heterogeneous nature of different banking sectors, which warrants caution when making cross-country comparisons ([Bos et al. 2009](#)). The inherent diversity among these sectors, stemming from variations in regulatory frameworks, institutional structures, and economic conditions, introduces potential confounding factors that may affect the generalizability and interpretation of the study's findings. Therefore, the results obtained from this research should be interpreted within the context of each specific banking system, recognizing the potential for divergent outcomes across different countries. It is important to acknowledge that the complexities inherent in comparing banking sectors across countries may limit the extent to which the study's conclusions can be applied universally.

Robustness of Results

Based on the below Table 6, the results of the model hold when the dependent variable ratio used is the return on equity. In addition, the non-interest income to operating ratio has been used as a proxy for the non-interest income ratio and overheads to operating income used for the overheads variable.

Table 6. Regression Results (Robustness Check).

Variables	OLS		Fixed Effect		Random Effect	
	Coeff	Significance	Coeff	Significance	Coeff	Significance
Non-Interest Income	0.196	0.024	0.163	0.000	0.124	0.000
Size	0.068	0.015	0.074	0.000	0.043	0.000
Loan Loss Provision	−0.119	0.045	−0.243	0.000	−0.114	0.000
Capital Adequacy	0.075	0.252	0.079	0.050	0.061	0.045
Overheads	−0.034	0.041	−0.215	0.051	−0.139	0.084
Constant	0.091	0.043	1.253	0.129	1.56	0.143
Adjusted R²	0.25		0.36		0.31	
F-Statistics	43.23 0.000		68.35 0.000		65.98 0.000	
Hausman Test	106.20 ***					

*** The statistical significance levels are at 0.01. Source: Authors’ Analysis.

Finally, the above table confirmed that our results hold, although different ratios have been used as proxies to three of our variables. The direction of impact for each variable remained the same. In other words, the non-interest income is still significantly positively affecting the profitability of banks in the MENA region and this suggested that banks have to find ways to increase their charges and fees and/or the volume of their financial services in an attempt to increase profitability. In addition, the loan loss provision ratio as a proxy for credit risk significantly negatively affected the profitability, and this implied that if banks have lower loan loss provisions, then they will enjoy higher performance since they managed to provide quality loans.

5. Conclusions

The evolution of the banking industry has become apparent in recent decades amid the rapid introduction of new technology, the appearance of new services and market participants, as well as the emergence of new products and services. In this aspect, the share of non-interest income in the total earnings of banks has increased relative to the preceding periods. Such a tendency resulted in the need to assess the effects of non-interest income on the financial performance of banks, which underlines the importance of the topic. The review of the existing literature demonstrated that the main indicators used for the assessment of financial performance, namely profitability, were the return on assets (ROA) and the return on equity (ROE). It was also possible to observe several deficiencies in the existing literature. Specifically, the studies provided inconclusive results regarding the relationship between non-interest income and the financial performance of banks. Furthermore, the research studies lacked a focus on the MENA region. This research addressed these shortcomings by including a broader range of variables to assess the effects of non-interest income on the financial performance of banks in the MENA region.

The sample included data between 2010 and 2022 from 40 commercial banks in the MENA region. The banks included in the sample were operating in Qatar, the United Arab Emirates (UAE), Kuwait, Bahrain, Oman, Saudi Arabia, Jordan, and Egypt. The methodology used in the research relied on a regression-based model with the ROA as the dependent variable, as well as non-interest income, capital adequacy, loan loss provisions, bank size, and overheads as the independent variables. The OLS, FE, and RE regression models were critical for obtaining the results. The main hypothesis entailed a positive relationship between non-interest income and the financial performance of banks. At the same time, the researchers hypothesized a positive relationship between bank size, bank capital adequacy, and financial performance. Furthermore, the hypotheses entailed a

negative relationship between bank efficiency, bank overhead, and the profitability of banks. The correlation matrix indicated a weak positive relationship between the independent variables, which confirmed the absence of collinearity between the independent variables. The correlation indicated a limited positive effect of non-interest income on financial performance. Nevertheless, the regression models, namely the OLS, FE, and RE, used in the research indicated a strong relationship between non-interest income and the financial performance of banks in the MENA region. These results are significant in the existing body of literature, as they contribute to the preceding results by confirming the existing relationship between non-interest income and the financial performance of banks. Similarly, the findings contribute to the research by expanding the scope to the MENA region.

6. Limitations and Recommendations

It is also critical to consider the limitations of the research. Specifically, the focus on a single region could narrow the scope of the study and the ability to apply it to a broader range of banks. In addition, the regression analysis with the controlled variables included a set number of banks, which could also impair the quality of the findings. The limitations mentioned provide further opportunities for broader research with the ability to address the shortcomings. At the same time, the research was effective in testing the established hypotheses and confirming the main hypothesis, namely the strong relationship between non-interest income and the financial performance of banks operating in the MENA region. The reliability of the research stems from the quality of the data sources used and the sample selection procedure. The ethical approach to the collection of data and the preparation of the research also supports the dependability of the findings.

Given the obtained results, it is possible to provide recommendations for banks operating in the MENA region regarding non-interest income. Specifically, it is possible to suggest that banks should increase the share of non-interest income in their total earnings, which would have a positive effect on their profitability. It is possible to expand future research to address the limitations of the current study. The researchers could focus on expanding the sample size, including the types of banks relative to their size. In addition, the studies could broaden the geography of the sample to include other markets and regions, such as EMEA or Latin America.

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