

# THE EFFECT OF ECONOMIC FREEDOM AND FINANCIAL REGULATION ON BANK PROFITABILITY: EVIDENCE FROM OIC REGION

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## ABSTRACT

Banks with a free economic environment and constructive regulatory platforms can operate efficiently, increasing their profitability. This research aimed to analyze the impact of freedom of the economic environment and financial regulations on the profitability of banks in the countries that make up the Organization of Islamic Cooperation (OIC). The research has incorporated 1453 banks where panel data collected for 13 years between 2008 and 2020 were used in the analysis. The System-GMM method was employed due to the persistent nature of the data and profitability indicators. The NIM, ROAA, and ROAE were taken as dependent variables and tested separately. The study shows that most economic freedom indicators negatively impact bank profitability, except investment freedom. The rule of law negatively affects all profitability indicators, while regulatory quality in the financial system shows a relatively positive impact on profitability. In addition, bank-specific performance indicators adversely affected profitability except for bank size. It is also found that country-specific factors like inflation, tax, and interest rate significantly influence banks' profitability in the OIC region. Being an Islamic bank has been found significantly affect profitability performance in OIC banks. Finally, the current health crisis (Covid-19) negatively affects OIC banks' profitability.

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*Keywords:* Bank Profitability, Economic Freedom, Covid-19, Islamic Bank

## I. INTRODUCTION

Scholars believe financial institutions are crucial to actual economic progress, domestically and globally (Kassim, 2016). As the financial sector grows, it can better distribute funds to productive initiatives and stimulate economic development (Zarrouk et al., 2017). Financial institutions also play a crucial role in effectively bridging financial flows to investments to boost economic growth and reduce income disparity, particularly in emerging and developing countries, such as some members of the Organization of Islamic Cooperation (Harbi, 2019). Banks are among the core financial intermediaries that channel the supply

and demand for finance. Banks bridge finance providers and individuals who need cash to support economic development. Banks can also help in the execution of financial and economic policies. Profitable banks will therefore ensure the continuation of economic growth (Masrizal and Trianto, 2022).

Banks that can consistently turn a profit have a wide variety of options at their disposal for broadening their business, protecting themselves from potential risks, and rewarding their stakeholders. Therefore, for a banking institution to continue operating as a bridge in the financial world and a vital contributor to a country's development economically, its management needs to have a good grasp of and maintain an up-to-date understanding of the factors determining its profitability. As a result, studies on the factors that impact bank profitability will remain a fertile topic for academics, bank executives, financial market experts, and regulators (Shahidul and Shin, 2016). The metrics used to estimate profitability are NIM, return on assets, and equity. Banks use this profitability metric (Hardianto and Wulandari, 2016). Banking profitability affects the economy. Banks' use of modern technologies to save costs should decrease prices for customers and shareholders (hence more significant access to finance) so that profits can soar (Kumankoma et al., 2017). Numerous studies have shown significant discrepancies in profitability amongst conventional and Islamic banks across time and geography (Johnes et al., 2012). However, the most critical problem is identifying the determining issues which affect the profitability of banks. Answering such kinds of issues could help policymakers and corporate leadership implement measures that promote the sector's long-term health and growth (Dietrich and Wanzenried, 2011).

Previously conducted studies on profitability determinants have categorized variables as bank-specific and macro-factors (Short, 1979; Bourke, 1989; Dietrich et al., 2011; Athanasoglu et al., 2008). The internal factors, also known as the CAMEL model, are used to measure bank-specific performance and its effect on profitability. The external factors, such as governance, are macroeconomic and institutional factors that significantly impact bank profitability. In detail, the micro-level factors of bank profitability are efficiency in management, capital adequacy, availability of sufficient liquidity, and asset quality. In addition, bank profitability is subject to economic growth, the country's financial Regulation, freedom of business operation, government involvement in the financial system, control of corruption, inflation, and interest rates (Lohano and Kashif, 2019). Economic freedom index measures how flexible economic players see a country's policies (Harkati et al., 2020). Banking rules help countries manage and recover from economic shocks. The economic freedom index examines four economic and entrepreneurial factors

such as regulatory, government size, the profitability by regulatory organizations, and the openness of markets (Kassim, 2016). Freedom in the economy, regulatory profitability, and market openness are core rights regulating labor and property.

The profitability of financial institutions signals the effectiveness of the economy to banks. Freedom in the economic sector results in market openness, including commerce, investment, and finance. The free, accessible, and competitive market encourages disadvantaged people to establish enterprises and raise salaries and prices. Poor people may repay debts and improve their finances when they earn more (Heritage, 2022). Government laws such as justice and property rights boost economic prosperity by creating harmonized economic environments. Financial institutions are economic centers affected by government regulations (Haque & Brown, 2017). Factors such as fulfilling regulatory requirements and government size cost financial institutions and banks more. Government expenditure, tax burden, and fiscal soundness may measure government size. Government actions considerably impact economic development.

Economic transparency and solid policies diminish government influence. Increased government taxation will also harm certain banks (Hussain et al., 2021). Some studies have linked economic freedom with bank profitability performance. For example, Hussain et al. (2021) and Asteriou et al. (2021) found a strong engagement of economic freedom in the financial performance of banks in the developed world, such as China, the USA, and EU member countries. The study by Sufian and Habibullah (2011) proved the significance of freeing the economy to boost a bank's financial performance. An empirical study conducted by Katsiampa et al. (2022) in the case of the Chinese banking system shows that business and monetary flexibility boost bank profitability. Another survey by Chortareas, Girardone, and Ventouri (2013) examined the effect that economic freedom has on profitability is more significant in nations with more free political platforms with good governance policies and regulations (Zarrouk et al., 2016). Financial freedom and bank profitability are linked because financial organizations are better at cost management and resource allocation when they have fewer limitations on how to run their firm (Boukhatem & Moussa, 2017).

Four main reasons have dragged into the motivation behind conducting this study. The first is that few studies address the impact of financial freedom on profitability. Another reason is that the survey has incorporated all three profitability indicators to be examined and see whether each indicator has a significant difference. The third motivational factor is that OIC is a hub of 57 countries from both categories of economies (from LDC to DC). This can be a good addition to banking literature to compare how macroeconomic factors

affect bank profitability across different economies. The prevalence of Islamic banks in the area is another motivating factor for me to conduct this study. It is challenging to locate appropriate research that considers Islamic banks, even though more than 90% of banks in this area are Islamic. To conduct the analysis, the researcher looked at data from 1453 conventional and Islamic banks in the OIC. Therefore, this study examines how economic freedom and financial regulations affect banks' profitability in the case of the OIC region. The study answers the following three significant research questions.

1. Does Economic Freedom affect bank profitability?
2. Does Financial Regulation affect bank profitability?
3. Do these effects differ in the case of Islamic banks?
4. Does the global health crisis affect the profitability performance of banks?
- 5.

## **II. REVIEW OF RELATED LITERATURE**

### **Banking in OIC Region**

The Organization of Islamic Cooperation (OIC) is a region that is a vital source of economic stability worldwide. They control most of the world's natural resources, including roughly two-thirds of its oil reserves, with 75 percent of its oil and oil-related products (The International Monetary Fund, 2018). Within this larger context, the leading banks have a preponderant position in the financial sector (Naceur & Omran, 2011). The ratio of private credit to GDP is roughly 65 percent on average, which is higher for oil exporters than oil importers. In addition, several countries have a dual banking system, which allows Islamic banks (including Islamic windows) to coexist with conventional banks. However, the region's popularity of these two types of banking is unequal. The percentage of Islamic banking assets in the GCC nations averaged 42% in 2017 (The Islamic Financial Services Board, 2018), but it is substantially lower in the OIC area (without the GCC) at 29%. As a result, assessing the performance of banking systems in the OIC area has become a crucial empirical topic. The previous study has looked at several facets of their performance. For instance, Beck et al. (2013) analyzed 510 banks operating in 22 OIC nations between 1995 and 2009 regarding their business structures, profitability, and solvency.

In terms of business orientation, they discover few substantial distinctions between the two kinds of banks. IBs have a lower cost-effectiveness ratio but a more excellent intermediation ratio. Furthermore, IBs have more capital and better assets and are less likely to be slashed out of the financial system during a crisis. Louati et al. (2015) use data from some OIC and South East Asian member nations from 2005 to 2012 to evaluate and compare the behavior of IBs and CBs concerning capital adequacy. The findings indicate a

substantial inverse link between CB liquidity and credit risk. Unlike CBs, IBs' market dominance does not directly influence the connection between capital level and bank conduct. Lassoued et al. (2017) discover how ownership structure in financial institutions differs in its influence on earnings management by conventional and Islamic banks of the OIC region. The findings reveal that IBs manage their profits less effectively than CBs but improve financial reporting dependability. Both banks use discretionary loan loss provisions with more concentrated ownership to control their profitability. Much empirical research has also looked at how the recent financial crisis of covid-19 affected the performance of IBs differently (Olson and Zoubi, 2011).

### **Bank Profitability, Economic Freedom, and Financial Regulation**

The relationship between economic freedom and bank profitability lately piqued different researchers' attention and became the primary focus area (Sufian and Habibullah, 2011; Chortareas et al., 2013). There are various reasons to believe that economic freedom may improve bank profitability. According to Claessens and Laeven (2004), the increased freedom in the financial world may boost the productivity level of commodities, improving bank profitability. Greater financial freedom should lead to a more favorable business operating environment and faster economic growth, helping to improve bank profitability and stability. Furthermore, countries with higher levels of economic freedom often have higher real income levels (Holmes et al., 2008), implying a greater demand for banking services. The study by Gropper, Jahera and Parker (2015) discovered a favorable relationship between bank performance, state financial independence, and political connections in United States banks.

According to their findings, excessive regulatory involvement in banking decreases banks' profitability and restricts the freedom of the economy. Furthermore, according to Blau (2017), income equality reduces bureaucratic complexity and promotes free movement and trade, protecting against market failures. It implies that economic freedom should help the profitability and stability of banks. Higher economic freedom should result in increased competition, lower inflation, and a better economic macroeconomic environment. Research conducted by Sufian and Habibullah (2011) examined how growing financial and economic freedom impacts the financial systems of China and Malaysia. They found that business success increased when businesses had more freedom to operate. In another study, economic freedom among the 27 EU member states has been linked to a productive banking system since 2000 (Chortareas et al., 2013). Expanding loan competition may reduce interest rates and improve the possibility of low-income borrowers accessing loans, thereby hurting profitability, as shown by a new study by Papanikolaou (2019). However,

this might be reduced if financial institutions improve their methods of credit checking. His research suggests that more economic freedom may affect overall bank profitability because it is linked to increased competition in the banking business.

It may increase the sector's net interest margin, which would benefit the company. Still, it would also increase the cost of borrowing for corporations and the percentage of bank loans that aren't performing, which would be bad for business. In conclusion, the impact of financial freedom on profitability is widely anticipated optimistically. However, increased economic freedom may affect banking performance. More accessible entrance into the business and increased competition may jeopardize banks' average profitability. Improving economic freedom may increase competition for bank deposits from other financial intermediaries such as hedge funds, shadow banks, and private equity. These financial intermediaries also give financing to enterprises, which might reduce bank profitability. It has been observed that in developing nations, the state has a more significant influence over bank lending choices.

*H1: Economic freedom can positively affect bank profitability*

Pelster et al. (2016) explored how regulation and supervision affect banking performance. Before the GFC, there was a consensus that reducing regulation would improve banking profitability. There was also a mistaken belief that financial self-regulation worked better than external regulation. The financial crisis showed unrestrained bankers might wreck the banking system, threatening profitability. Post-crisis literature has focused on changing the regulatory policies to strengthen financial stability in the banking sector via stronger economic regulations and transparency. Chortareas et al. (2013) examined bank supervision, regulation, and profitability in 22 EU nations. Their findings suggest that a more robust regulatory and supervisory structure improves bank profitability by reducing financial hardship, agency issues, and market power. Regulation, notably capital adequacy standards, prevents bank failures and protects clients and the economy from economic externalities, according to several studies. Despite its advantages, excessive Regulation may hinder bank profitability by raising costs and limiting productive activity. Banks try to minimize the burden of regulation by participating in riskier activities and investments, which might hurt bank profitability and stability (Jalilian et al., 2007).

The findings were revealed by Barth et al. (2004) using survey data gathered from more than 100 countries to assess how a regulatory and supervisory approach affects bank growth and profitability. Their findings suggest that bank activity limits its profitability level and raises the risk of a banking crisis. In the study carried out by Dermirgüç-Kunt et

al. (2004), a worldwide dataset consisting of over 1400 banks from 72 countries was utilized to analyze the influence that bank rules, market formation, and organizations have on NIM, and the costs associated with financial interference. The cost of transferring money goes up when there are more rules about banks, which could hurt both the net interest margin and the stability of banks. Barth et al. (2012) study examined bank regulatory development and its effect on banks operating in 125 countries. After analyzing the advantages and downsides of several pieces of legislation, they concluded highly restrictive rules and regulations would not enhance the profitability of financial institutions. In contrast, some scholars denote that supervisory agencies may reduce bank managers' risk-taking and the likelihood of declining profitability in countries with less sophisticated financial standards (Fernandez and Gonzalez, 2005). The other study by Agoraki et al. (2011) found that more significant capital requirements, activity limits, and market power lower credit risk and default risk in 546 European banks. In conclusion, rules affect banking profitability and stability empirically.

*H2: Financial Regulation negatively affects bank profitability*

The effect of different macroeconomic factors on Islamic banks' profitability, such as economic freedom and financial regulation, has become an important area of research. On the other hand, the OIC region is the substantial home of Islamic banks, whose economic freedom and regulatory standards vary markedly from their conventional counterparts (Grassa, 2014). As a result, analyzing the impact of economic freedom and regulation on Islamic banks' performance became an essential topic to research. Srairi (2015) finds, using data from hundred sixty-one Islamic financial institutions operating in the OIC area, that economic freedom and regulation favorably influence the performance of Islamic financial institutions. The main limitation of these investigations is the short observation time which reduces their validity and magnifies biasedness. Ghosh (2016) analyzed data from more than one hundred Islamic and conventional banks from twelve countries that are members of the Organization of Islamic Cooperation from 2002 to 2012 to solve this issue. His finding confirmed no significant difference between Islamic and conventional banks regarding the influence of freedom of financial services or regulatory changes on profitability. Safiullah, along with Shamsuddin (2018), investigated the risk differences in both conventional and Islamic, emphasizing whether Islamic banks' degree of risk is impacted by their dual board economic freedom and regulatory structure. Increased Shariah Supervisory Board size and percentage of members holding higher academic degrees minimize Islamic bank insolvency and operational risk; nevertheless, these risks increase as the number of SSB members with great reputations grows. However, the issue of whether institutional quality

has a discernable differential influence on the performance of Islamic banks in the OIC region requires further investigation. Therefore, we developed the following hypotheses based on the above assumptions.

*H3: Islamic Bank profitability is affected by economic freedom and financial regulations different from conventional banks*

The emergence of covid-19 has devastatingly affected countries' social and economic performance. Financial institutions, especially banks, were among the victims of the pandemic due to different reasons. In this regard, various studies have been conducted to measure and examine to what extent the pandemic has affected bank performance. Banks' problems during the pandemic were the credit process and continuity during the lockdown. The study was conducted in the case of United States banks and found that banks were more restrictive in lending money to SMEs (Greenwald et al., 2020) while most banks were facing an increase in non-performing loans (Beck and Keil, 2021) and vulnerability (Hasan et al., 2021) in the credit system. This scenario has been studied in different locations and found relatively identical results (Çolak and Öztekin, 2021; Demirgüç-Kunt et al., 2021). In the Elnahas et al. (2021) study, more than 1000 banks found that bank profitability declined during the year's first quarter since the pandemic started. This finding was like the case of china as studied by Dong (2021), who found that the pandemic has a significant negative impact on the return on assets of Chinese banks. The other study by Hladika (2021) found a decline in loan quality in Croatia since the pandemic began. Therefore, this study aims to add value to the existing literature in the case of the OIC region, and the following hypothesis has been developed for further analysis.

*H4: Bank profitability is negatively affected by Covid-19 (GHC)*

### **III. METHODOLOGY**

#### **Data Overview**

This study has used panel data consisting of 13 years of data collected from 57 OIC member countries. Panel data is appropriate when we have data composed of both time-series and cross-sectional data types. Because panel data will be supportive of controlling the individual heterogeneity behavior of the data, this study's dataset covers annual end-of-year data for banks operating in the OIC region. For this purpose, 1453 banks were considered in the analysis. Of which, 1292 were conventional banks, while the rest 161 were



Islamic banks operating in 56 OIC member countries. The data is collected from different accredited sources. The bank-level data were collected from Fitch Connect from 2008-2020, while the macro-level data were collected from the World Development Indicator (WDI), the Worldwide Governance Indicator (WGI), and the Heritage Foundation. The data was collected annually with the most recent banking data. The data are analyzed to determine the impact that economic freedom and financial regulation have on the profitability of Islamic and conventional banking institutions.

## **Variables**

In this section, we'll look at the factors that are considered when assessing the financial health of banks in OIC countries. The literature identifies several factors, both internal and external to the banking industry, which impact the profitability of banks. Macroeconomic (external) variables (economic freedoms such as financial, trade, labor, investment, and others) and financial regulations are used as focus variables to be tested. The study also uses bank-specific variables as control variables, namely bank size, capitalization, management efficiency, asset quality, and liquidity, as internal determinants of bank profitability. In addition, government involvement indicators such as tax burden, government integrity, and political stability as external control variables are used in this study.

## **Dependent Variables**

The net interest margin (NIM), return on average asset (ROAA), and return on average equity (ROAE) measures are considered bank performance indicators based on previous studies (Garcia et al., 2009; Phan et al., 2020; Dietrich & Wanzenried, 2011; Katsiampa et al., 2022). Financial performance with profitability is linked in numerous academic research (Kanas et al., 2012). ROAA calculates the income generated by asset-based investments as a percentage of the bank's total assets. ROAE, on the other hand, measures revenue generated as a percentage of total equity, whereas NIM measures the real interest difference between earnings and payments. Our research checks robustness using all three financial performance criteria. The first two variables are often employed as profitability ratios to measure a financial institution's investment profits (Naceur & Omran, 2011; Dermirgüç et al., 2004; Chortareas et al., 2013). In this study, all three indicators were tested to check which profitability indicator is most affected by the independent variables.

### **A. The Explanatory Variables**

The Heritage Index, also known as HER-IND<sub>it</sub>, were used to investigate the function of economic freedom (EF). It is often used in the academic world, such as in the phrases

"business freedom," "labor freedom," "monetary freedom," "trade freedom," "investment freedom," "finance freedom," and "total economic freedom" (OV). A composite index with values ranging from zero to one hundred is created by giving the same weight to each of these seven elements in the academic world, such as in the phrases "business freedom," "labor freedom," "monetary freedom," "trade freedom," "investment freedom," "finance freedom," and "total economic freedom" (OV). A composite index with values ranging from zero to one hundred is created by giving the same weight to each of these seven elements. A higher number indicates more economic freedom. We used the information gathered from the financial institution legislation and supervision survey databases, in which several academic sources were collected, as a proxy for measuring the regulatory and supervisory policies of the banks in our group of nations (Anginer et al., 2019). In this research, I made use of two regulatory indicators. The regulatory quality (RQ) score and the rule of law score are shown here (RL). These elements significantly impact the bank's performance (Barth et al., 2012).

### B. Control Variables

In addition, the impact of CAMLZ (part of the CAMEL model) on bank profitability as bank-specific factors cannot be ignored. Furthermore, political stability, tax, and government integration in the banking industry could significantly affect banking profitability. In this regard, in this study, All CAMLZ variables, including political stability (PS), tax burden (TB), and government integrity (GI), are used as control variables. The description of variables has summarized by the following table 2.1.

Table 1 – Definitions of the Variables and Data Sources

Code	Variable	Description	Source
CAMLZ & PS, TB, GI	Capitalization	Common Equity / Average Total Assets	Fitch Connect
	Asset Quality	NPL/Gross Loans (%)	Fitch Connect
	Management Efficiency	Cost to Income Ratio (%)	Fitch Connect
	Liquidity	Liquid Assets / Deposits & ST Funding (%)	Fitch Connect
	Size	Log of Total Assets	Fitch Connect
	PS	Political stability & absence of violence	WGI
	TB	Tax burden score	Heritage Foundation
	GI	government integrity score	Heritage Foundation
Profitability	Earnings	Net Interest Margin	Fitch Connect
	Earnings	Operating ROAA (%)	Fitch Connect
	Earnings	operating ROAA (%)	Fitch Connect
Financial Regulation	RL	The rule of law: rank	WGI
	RQ	Regulatory quality: rank	WGI
Economic Freedom	BF	Business	Heritage Foundation
	FF	Financial	

	IF	Investment
	LF	Labour
	MF	Monetary
	OV	Overall score
	TF	Trade

Source: Author Compilation, 2022

## Model

GMM (generalized method of moments) analyzes the factors contributing over banks' profitability. It is the most effective technique when we use micro panel data, which may resolve exogeneity/endogeneity issues. Using the least square estimation methods may cause endogeneity problems due to the dynamic nature of the cross-section units. As a result of the lagged dependent variable among the independent variables, there will be autocorrelation and individual effects describing heterogeneity between individual units. Therefore, using the Generalized system Method of Moment (GMM) could be a solution to overcome such problems as previously applied by other researchers (Arellano & Bover, 1995). Such a technique is based on the first difference transformation, which removes the predicted correlation between the delayed dependent variable, the error time, and the bank-specific fixed effects. This method eliminates the expected relationship between the dependent variable, the time of the error, and the fixed effects unique to the bank by employing a first difference transformation. Also, a two-step robust test and an overidentification test are used to determine if system GMM estimator instruments are correct (Roodman, 2009). Since the GMM system is also suitable for micro panels and imbalanced data, we depend on it in our investigation. However, our time is limited compared to the cross-sectional units (Jallow, 2022). The following model has been constructed to assess the effect of economic freedom and financial regulation on bank profitability in the OIC region.

## General Model

$$\pi_{it} = \alpha + \beta_1\pi_{it-1} + \beta_2ECFR_{it} + \beta_3REG_{it} + \beta_4CTR_{it} + \sum DummyIDS_i + \sum DummyGHC_i + \varepsilon_{it}$$

.....[1]

## Where:

$\pi_{it}$  is a bundle for bank profitability. This bundle holds the three profitability indicators: net interest margin, asset return, and equity. All three indicators are tested separately.

The other one is called lagged effect bundle ( $\pi_{it-1}$ ), which contains the lag effect of all three profitability indicators. It is argued that profitability has a lag effect (the previous year has an impact on the current year's performance) on its recent performance. Therefore, we use GMM models (so-called dynamic). The other bundles are used for explanatory (focus) and control variables. The  $ECFR_{it}$  basket represents the economic freedom factors, while the  $REG_{it}$  refers to the financial regulation factors. The  $CTR_{it}$  has been designed to reflect control variables such as CAMLZ (bank-specific factors) and country-specific factors such as tax burden and political stability. Furthermore, the dummy variables for bank specialization, which is Islamic or conventional ( $\sum DummyIDS_i$ ), and global health crisis which is covid-19 ( $\sum DummyGHC_i$ ). Since the data incorporated the time of the covid-19 pandemic year, it is essential to check whether there is a significant change during a pandemic. The figures such as "it" represents a cross-section unit and time while " $\epsilon_{it}$ " defines the error term. In this regard, the following three models show the general model's detailed explanation using the three individual profitability indicators as explained by equations 2 to 4.

### Profitability-Specific Models

$$NIM_{it} = \alpha + \beta_1 NIM_{it-1} + \beta_2 ECFR_{it} + \beta_3 REG_{it} + \beta_4 CTR_{it} + \sum DummyIDS_i + \sum DummyGHC_i + \epsilon_{it}$$

.....[2]

$$ROAA_{it} = \alpha + \beta_1 ROAA_{it-1} + \beta_2 ECFR_{it} + \beta_3 REG_{it} + \beta_4 CTR_{it} + \sum DummyIDS_i + \sum DummyGHC_i + \epsilon_{it}$$

.....[3]

$$ROAE_{it} = \alpha + \beta_1 ROAE_{it-1} + \beta_2 ECFR_{it} + \beta_3 REG_{it} + \beta_4 CTR_{it} + \sum DummyIDS_i + \sum DummyGHC_i + \epsilon_{it}$$

.....[4]

## IV. RESULTS AND DISCUSSION

### Descriptive Statistics

Measures like mean and standard deviation are used to measure each variable's central tendency of observations. The standard deviation summarizes the differences between each observation and the mean. Bank profitability performance was examined using 13-year bank data from 1453 banks (Islamic and conventional) from the OIC region. In this study, all profitability indicators, such as net interest margin, return on asset, and return

on equity, are employed to represent profitability as dependent variables. In the descriptive analysis part, measures of central tendencies such as mean, standard deviation, skewness, and kurtosis are presented for both dependent and independent variables in Tables 2 and 3, respectively. The mean average result of profitability indicators, as shown in Table 2, is positive, which is a good indicator of the financial health of banks in OIC. The mean net interest margin is 5.17, while for return on assets and equity is 1.6 and 13.6, respectively. The mean return on equity is higher, indicating that banks in OIC operate effectively using their capital assets (equity) to grow profitability. The skewness, on the other hand, is used to test whether the data is normally distributed, and the p-value of the skewness should be higher than 5% to accept the null hypothesis. In the case of profitability indicators, skewness and kurtosis values for all variables are higher than 5 percent, which indicate the data in this study is normally distributed.

Table 2 – Descriptive Statistics of Dependent Variables (Bank Profitability)

Var	Obs	Mean	St. Dev	Min	Max	Skewness	Kurtosis
NIM	9631	5.17	5.94	-77.30	160.00	0.9082	0.456
ROAA	9777	1.60	4.36	-104.70	65.00	0.238	0.311
ROAE	9777	13.60	20.10	-79.80	75.00	0.642	0.5657

*NIM (net interest margin);  
ROAA (return on average  
asset); ROAE (return on  
average equity)*

*Source: Author Calculation,  
20222*

In the case of independent variables, table 3 indicates that all bank-specific and country-specific variables have a positive meaning which is a good indicator of the economic performance of countries. However, some variables, such as asset quality performance of banks, bank size, inflation, and interest rate, have weak performance compared to other independent variables. Regarding the distribution nature of data, we can conclude that data is normally distributed since its skewness shows a higher value than the accepted standard.

Table 3 – Descriptive Statistics of Explanatory Variables

Var	Obs	Mean	St. Dev	Min	Max	Skewness
BF	9634	63.50	11.70	23.40	94	0.817
FF	9391	45.90	15.60	0.00	90	0.929
MF	9563	73.50	6.68	43.00	89	0.566
TF	9413	72.60	10.40	0.00	89	0.668
LF	9634	61.20	15.20	20.00	97	0.444
IF	9473	46.30	17.10	0.00	80	0.238
OV	9328	59.70	7.25	40.30	78	0.665
RQ	10029	40.60	21.30	1.42	85	0.370
RL	10029	37.80	20.20	0.47	83	0.979
TB	9390	83.40	9.27	44.80	100	0.873
C	10514	17.10	17.00	0.29	94	0.804
A	7459	9.50	14.70	0.00	146	0.748
M	10434	62.60	40.80	8.57	314	1.137
L	10328	49.20	93.80	2.99	791	0.782
Z	10500	9.10	0.86	4.79	12	0.551
INF	9941	6.10	8.07	-6.80	151	1.505
INT	7454	6.20	8.67	-35.0	61	0.128
PS	10029	26.50	19.90	0.00	97	0.102
GI	9634	34.50	12.50	8.00	79	1.532

*BF (business freedom); FF (financial freedom); MF (monetary freedom); TF (trade freedom); LF (labour freedom); IF (investment freedom); OV (overall freedom); RQ (regulation quality); RL (rule of law); TB (tax burden); C (capitalization); A (asset quality); M (management efficiency); I (liquidity)*

Source: Author Calculation, 2022

The other issue we need to address regarding descriptive statistics is the correlations between variables. According to autocorrelation theory, variables with higher correlation values can have a higher probability of a multicollinearity problem. Therefore, it cannot be very sensible to use such variables simultaneously. In other words, Correlation results indicate whether two variables have a significant linear association (meaning they change together at a constant rate). The correlation coefficient may only be -1-0-1. The closer it comes to -1 or 1, the more significant the correlation between the two variables; the closer it gets to zero, the weaker the link. The partnership might be helpful or detrimental. Table 4 below shows the correlation results of the variables in this study. The following shows the correlation matrix of variables in this study.

**Table 4 – Correlations matrix for All Banks**

[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]
1																	
-	1																
.13*	-0.06*	-0.14*	1														
.05*	-0.11*	-0.19*	0.22*	1													
.05*	-0.08*	-0.19*	0.19*	0.47*	1												
.02	-0.06*	-0.19*	0.29*	0.65*	0.39*	1											
.03	-0.07*	-0.18*	0.29*	0.16*	0.09*	0.17*	1										
.04*	-0.05*	-0.10*	0.19*	0.65*	0.41*	0.42*	0.05*	1									
.12*	-0.08*	-0.20*	0.54*	0.76*	0.49*	0.71*	0.46*	0.55*	1								
.09*	-0.06*	-0.16*	0.38*	0.35*	-	0.39*	0.45*	-	0.56*	0.42*	1						
					0.007			0.009									
19*	0.13*	-0.16*	0.09*	0.21*	0.03*	0.18*	0.14*	0.12*	0.20*	0.16*	0.21*	1					
.03	-0.23*	-0.24*	-0.02	-0.06*	-0.15*	-0.08*	0.021	-0.04*	-0.06*	-0.18*	0.001	0.17*	1				
.02	-0.46*	-0.47*	-0.07*	0.04*	0.009	-0.02	-	0.03*	-0.04*	-0.05*	-0.06*	0.14*	0.22*	1			
							0.019										
08*	0.09*	-0.06*	0.04*	0.05*	-	0.05*	0.04*	0.08*	0.06*	-	0.06*	0.63*	0.24*	0.09*	1		
					0.015					0.007							
.34*	0.02	0.15*	0.25*	0.08*	-	0.13*	0.016	0.006	0.25*	0.26*	0.22*	-0.46*	-0.24*	-0.32*	-0.26*	1	
					0.005												
10*	0.08*	0.10*	-0.15*	-0.33*	-0.47*	-0.26*	-0.09*	-0.26*	-0.38*	-0.36*	-0.14*	-0.05*	0.08*	-0.01	-0.01	-0.1*	1
13*	-0.02	-0.08*	-0.04*	0.10*	0.05*	0.08*	0.14*	0.17*	0.04*	-0.03*	0.04*	0.12*	0.04*	0.04*	0.04*	-0.2*	-0.3*
.11*	-0.07*	-0.08*	0.31*	0.27*	0.36*	0.40*	0.29*	0.05*	0.47*	0.61*	0.38*	-0.02*	-0.15*	-0.08*	-0.05*	0.16*	-0.3*
.24*	-0.05*	-0.11*	0.48*	0.55*	0.43*	0.58*	0.28*	0.30*	0.79*	0.82*	0.45*	0.08*	-0.15*	-0.12*	0.02	0.37*	-0.3*

Source: Author Calculation, 2022

*NIM* (net interest margin); *ROAA* (return on average asset); *ROAE* (return on average equity); *BF* (business freedom); *FF* (financial freedom); *MF* (monetary freedom); *TF* (trade freedom); *LF* (labor freedom); *IF* (investment freedom); *OV* (overall freedom); *RQ* (regulation quality); *RL* (the rule of law); *TB* (tax burden); *C* (capitalization); *A* (asset quality); *M* (management efficiency); *L* (liquidity availability); *Z* (bank size); *INF* (inflation rate); *INT* (interest rate); *PS* (political stability); *GI* (government integrity)

The summarized correlation matrix of table 4 above indicates that business freedom, financial freedom, trade freedom, investment freedom, overall economic freedom, tax burden, political stability, and government integration has a significant negative association with profitability indicators. However, labor and trade freedom, management efficiency, and interest rate negatively correlate only with return on asset and equity. Bank size has a negative and positive significant association with NIM and ROE, while it shows no relation with return on asset. Surprisingly, inflation positively correlates with all profitability indicators in the case of banks in OIC. The correlation matrix generally shows that variables significantly correlate with each other regardless of their direction in positive or negative ways.

#### a. Econometric Analysis

After running for choice for system and difference GMM, the results for all profitability indicators directed us to apply system GMM for all models. The choice theory between difference and system GMM argues that the coefficient of lagged dependent variable in Pooled OLS is upward bias, while in Fixed Effects, it is downward bias. Use these two coefficients as upper and lower bounds, respectively. If this coefficient in Differenced GMM is closer to Fixed Effects or below it, then apply System GMM. The number of instruments should be not more than the number of groups. The p-value of AR (1) should be less than 0.05, whereas the p-value of AR (2) should be more than 0.05. Null hypothesis: No Autocorrelation. Hansen/Sargan p-values should be more than 0.05. Null hypothesis: The instruments are valid. If you apply the robust option, then refer to the Hansen test. Table 5 shows the pooled OLS, fixed effect, and difference GMM for all profitability indicators.

Table 5 – Choice between Difference and System GMM

	POLS	FE	DGMM
Net Interest Margin <sub>-1</sub>	0.828*** [0.006]	0.607*** [0.011]	0.663*** [0.141]
L. Return on Assets <sub>-1</sub>	0.362*** [0.014]	0.070*** [0.016]	0.082*** [0.160]
L.Return on Equity <sub>-1</sub>	0.369*** [0.013]	0.092*** [0.016]	0.124*** [0.157]

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

*POLS (Pooled OLS), FE (fixed effect), DGMM (difference GMM)*

**Source:** Author Calculation, 2022

As the above tables show, for the net interest margin, the difference between POLS (0.828) and DGMM (0.663) is 0.165, while the difference between FE (0.607) and DGMM is 0.056. For return on asset, the difference between POLS (0.362) and DGMM (0.082) is 0.280, while the difference between FE (0.070) and DGMM is 0.012. For return on equity, the difference between POLS (0.369) and DGMM (0.124) is 0.245, while the difference between FE (0.092) and DGMM is 0.032. This result shows that the difference between DGMM and fixed effect is lower than between POLS and DGMM for all lag variables of profitability. This trend indicates that the value of the difference GMM is closer to the value of the fixed effect. In this regard, we can use system GMM in our further analysis.

### General GMM Result for Net Interest Margin, ROAA, and ROAE

The statistical value presented in table 6 shows the influence that economic freedom as well as financial regulations created on net interest margin using system GMM estimators. According to system GMM rules, we must confirm the instruments' validity to accept a given model for analysis. The basic conditions to validate instruments are that AR-1 should be less than 5% while AR-2 should be higher than 5%. Similarly, the number of instruments should be lower than the number of groups. Finally, the Hansen test should be higher than 5%, and it is recommended to choose results between 13% and 25%. The diagnosis of table 6 shows that all instruments of the study are valid for further analysis.

Table 6 – System GMM Outputs for Net Interest Margin

	1	2	3	4	5	6	7	8
NIM <sub>t-1</sub>	0.790*** (0.125)	0.813*** (0.066)	0.842*** (0.059)	0.902** (0.036)	0.890*** (0.039)	0.750*** (0.034)	0.745*** (0.043)	0.733*** (0.040)
Labour Freedom						0.011** (0.004)	0.012*** (0.004)	0.012*** (0.004)
Investment Freedom		0.011** (0.005)	0.010** (0.005)	0.011*** (0.004)	0.009** (0.005)		0.011** (0.004)	0.010*** (0.004)
Overall, Freedom		-0.046*** (0.015)	-0.039** (0.017)	-0.039*** (0.014)	-0.031** (0.014)		-0.050*** (0.014)	-0.053*** (0.014)
Regulatory Quality		0.011* (0.006)						
Rule of Law		-0.013* (0.006)				-0.010* (0.006)		-0.013* (0.007)
Capital Adequacy	0.027** (0.012)	0.109*** (0.034)	0.093*** (0.032)	0.084*** (0.028)	0.066** (0.029)		0.095** (0.042)	0.088** (0.036)
Asset Quality	-0.007** (0.004)					-0.014** (0.007)	-0.015** (0.006)	-0.017*** (0.007)
Management Efficiency	-0.008*** (0.002)						0.010* (0.006)	0.010** (0.005)



Liquidity	-0.002** (0.001)	-0.006*** (0.002)	-0.005*** (0.002)	-0.004** (0.002)	-0.003** (0.001)	-0.004* (0.002)	-0.004** (0.002)	
Bank Size	-0.217* (0.131)			0.473** (0.215)				
Inflation	0.020* (0.012)			0.019* (0.010)		0.025** (0.012)	0.024* (0.013)	
Interest Rate						0.006* (0.003)	0.021* (0.012)	
Political Stability					-0.004* (0.002)			
Govt Integrity		-0.007* (0.004)	-0.008* (0.004)					
Specialization ID		0.310*** (0.119)	0.243** (0.104)	0.165* (0.100)				
Pandemic	-0.274*** (0.064)	-0.366*** (0.136)	-0.395*** (0.081)	-0.345*** (0.068)	-0.339*** (0.076)	-0.277*** (0.080)	-0.363*** (0.085)	
Constant				-3.300* (1.937)			-0.335*** (0.081)	
AR-1	0.004	0.000	0.000	0.000	0.000	0.000	0.000	
AR-2	0.090	0.085	0.083	0.087	0.087	0.063	0.072	
Hansen	0.162	0.198	0.109	0.342	0.190	0.112	0.201	
Sargan	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Instruments	61	114	140	79	105	67	78	
Groups	545	545	545	545	545	545	545	
GMM Type	A two-step system GMM							
Robustness	tasted	tasted	tasted	tasted	tasted	tasted	tasted	

**Source:** Author Calculation, 2022

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

*Note: variables such as business freedom, trade freedom, monetary freedom, and financial freedom are excluded from the model after they were found insignificant in all eight models.*

Regarding net interest margin, eight models were designed to test economic freedom and regulation's influence on NIM. Table 6 shows that some economic freedom indicators, such as trade, business, financial, and monetary freedom, found no significant effect on the net interest margin. In this regard, we have removed them from the final model. Regarding the rest economic freedom indicators, labor freedom and investment freedom were found to affect net interest margin while t positively. On the other side, financial regulations were found insignificant in some models. However, depending on the results of the 2nd, 6th, and 8th models, we can conclude that rule of law negatively impacts the net interest margin. Concerning control variables, management efficiency, asset quality, and liquidity negatively impacted the net interest margin. While the other indicators, such as capital adequacy, inflation, interest rate, and political stability, showed a positive effect. The dummy variables, such as the global health crisis (covid-19), negatively affected bank profitability in OIC. These effects on Islamic banks are higher in some models, such as models 2, 3, and 4.

Similarly, the statistical value presented in table 6 shows the influence that economic freedom, as well as financial procedures, created on the other bank profitability indicator, called return on asset. This test has also developed eight different compositions of models. The GMM result on return on asset shows that economic freedom indicators such as business freedom, financial freedom, monetary freedom, and overall economic freedom negatively impact banks' return on an asset in the OIC region. The only economic freedom indicator that positively affected ROA was relatively logical investment freedom. A better investment environment can let banks operate and fund different ventures that, in turn, can generate better returns and increase ROA.

Table 7 – System GMM Outputs for Return on Asset

	1	2	3	4	5	6	7	8
ROAA <sub>t-1</sub>	0.320*** (0.062)	0.205*** (0.074)	0.206*** (0.073)	0.205*** (0.061)	0.215*** (0.061)	0.215*** (0.059)	0.220*** (0.058)	0.277*** (0.056)
Business Freedom			-0.008* (0.005)	-0.013** (0.006)	-0.012** (0.006)	-0.014*** (0.006)	-0.013** (0.005)	-0.010* (0.006)
Financial Freedom	-0.010* (0.006)	-0.015** (0.006)	-0.017** (0.007)	-0.017*** (0.006)	-0.016** (0.007)	-0.017*** (0.007)	-0.016** (0.007)	-0.021*** (0.008)
Monetary Freedom	-0.020* (0.011)			-0.021* (0.011)	-0.021* (0.011)	-0.022** (0.011)	-0.022** (0.011)	-0.030** (0.012)
Investment Freedom	0.008* (0.004)	0.020*** (0.006)	0.017*** (0.006)	0.014** (0.006)	0.012** (0.005)	0.014*** (0.005)	0.015*** (0.005)	0.016** (0.007)
Overall, Freedom		-0.038* (0.021)	-0.036* (0.021)					
Rule of Law	-0.021*** (0.007)	-0.021** (0.010)				-0.017* (0.010)	-0.017* (0.010)	
Capital Adequacy	0.035*** (0.009)	0.121*** (0.046)	0.108*** (0.037)	0.104*** (0.034)	0.095*** (0.031)	0.096*** (0.030)	0.094*** (0.029)	0.060*** (0.023)
Asset Quality	-0.047*** (0.010)	-0.047*** (0.010)	-0.051*** (0.011)	-0.053*** (0.011)	-0.055*** (0.011)	-0.056*** (0.011)	-0.055*** (0.011)	-0.063*** (0.011)
Management Efficiency	-0.027*** (0.006)	-0.025** (0.011)	-0.018* (0.010)	-0.017** (0.007)	-0.013** (0.006)	-0.014** (0.006)	-0.013** (0.006)	
Liquidity	-0.002* (0.001)	-0.006* (0.003)				-0.003* (0.002)		
Bank Size		0.534** (0.246)	0.523* (0.268)	0.587** (0.230)	0.582*** (0.214)	0.557** (0.218)	0.593*** (0.210)	0.488*** (0.157)
Inflation					-0.025* (0.014)	-0.027* (0.014)	-0.025* (0.015)	-0.029* (0.016)
Interest Rate	-0.009* (0.005)	-0.011*** (0.004)	-0.008** (0.004)	-0.011** (0.005)	-0.011** (0.005)	-0.013*** (0.005)	-0.012** (0.005)	-0.011* (0.006)
Govt Integrity								0.013* (0.007)
Pandemic	-0.352*** (0.093)	-0.390*** (0.101)	-0.366*** (0.086)	-0.427*** (0.084)	-0.413*** (0.079)	-0.386*** (0.086)	-0.370*** (0.084)	-0.355*** (0.084)
Constant	6.008*** (1.673)							
AR-1	0.001	0.005	0.005	0.004	0.004	0.003	0.003	0.001

AR-2	0.537	0.515	0.533	0.539	0.557	0.557	0.559	0.616
Hansen	0.110	0.129	0.186	0.109	0.149	0.125	0.114	0.001
Sargan	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instruments	61	85	114	140	163	183	200	179
Groups	545	545	545	545	545	545	545	545
GMM Type	A two-step system GMM							
Robustness	tasted	tasted	tasted	tasted	tasted	tasted	tasted	tasted

*Source: Author Calculation, 2022*

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Furthermore, one of the financial regulation indicators, the rule of law, is significant. Control variables such as institutional quality, government integration, and bank-specific factors such as capital adequacy, management efficiency, and liquidity significantly affect ROAA. The dummy variables, such as the global health crisis (covid-19), negatively affected bank profitability in OIC. At the same time, religion does not matter regarding the effect of economic freedom and financial regulations on return on assets. This means that the effect is identical in conventional and Islamic banks in the OIC region. The other variable tested using the GMM model was the return on equity, which is one of the banks' most significant performance indicators, especially for Islamic banks. Table 8 below demonstrates how economic freedom and financial regulation affect the return on equity in the OIC region.

Table 8 – System GMM Output for Return on Equity

	1	2	3	4	5	6	7	8	9
ROAE <sub>t-1</sub>	0.272*** (0.073)	0.353*** (0.076)	0.369*** (0.095)	0.404*** (0.087)	0.369*** (0.087)	0.361*** (0.084)	0.361*** (0.085)	0.364*** (0.083)	0.370*** (0.079)
Business Freedom	-0.055* (0.032)	-0.059** (0.030)	-0.081*** (0.030)	-0.078*** (0.029)	-0.070** (0.030)	-0.066** (0.030)	-0.074** (0.029)	-0.065** (0.029)	-0.058** (0.029)
Financial Freedom		-0.084** (0.043)	-0.111*** (0.042)	-0.116*** (0.040)	-0.108*** (0.040)	-0.099** (0.041)	-0.113*** (0.041)	-0.101** (0.041)	-0.091** (0.042)
Monetary Freedom	-0.142** (0.055)	-0.135** (0.055)	-0.094* (0.048)	-0.099** (0.046)	-0.074* (0.044)				-0.115** (0.054)
Trade Freedom		-0.094* (0.057)							
Investment Freedom	0.078** (0.031)	0.107*** (0.032)	0.127*** (0.046)	0.114*** (0.032)	0.117*** (0.032)	0.122*** (0.033)	0.122*** (0.030)	0.118*** (0.033)	0.121*** (0.032)
Overall, Freedom					-0.207* (0.114)	-0.244** (0.124)	-0.210* (0.120)	-0.234* (0.125)	-0.255** (0.126)
Regulatory Quality				0.082* (0.050)					
Rule of Law	-0.125*** (0.046)	-0.086* (0.051)	-0.100** (0.050)	-0.093** (0.044)			-0.092* (0.051)	-0.091* (0.051)	-0.087* (0.050)
Tax Burden	-0.209*** (0.060)	-0.183** (0.088)	-0.206* (0.113)	-0.138* (0.082)	-0.156* (0.082)	-0.173** (0.082)	-0.157* (0.083)	-0.175* (0.091)	-0.194** (0.090)

Capital adequacy	-0.115** (0.048)								
Asset Quality	-0.172** (0.069)	-0.197*** (0.069)	-0.186*** (0.069)	-0.202*** (0.073)	-0.207*** (0.068)	-0.199*** (0.068)	-0.186*** (0.066)	-0.184*** (0.064)	-0.190*** (0.066)
Management Efficiency	-0.209*** (0.032)	-0.100*** (0.034)	-0.097** (0.045)	-0.076* (0.041)	-0.070** (0.033)	-0.077** (0.033)	-0.097*** (0.035)	-0.098*** (0.035)	-0.092*** (0.033)
Liquidity		-0.012* (0.007)							-0.011* (0.007)
Bank Size		2.392** (1.187)	3.640** (1.804)	2.710** (1.154)	3.047*** (1.128)	2.879** (1.157)	2.570** (1.082)	2.546** (1.193)	2.612** (1.225)
Interest Rate	-0.109*** (0.029)	-0.133*** (0.041)	-0.089*** (0.031)	-0.114*** (0.027)	-0.130*** (0.032)	-0.136*** (0.034)	-0.136*** (0.034)	-0.128*** (0.035)	-0.131*** (0.037)
Govt Integrity	0.084** (0.040)								0.074* (0.042)
Pandemic	-2.042*** (0.602)	-1.948*** (0.754)	-2.296*** (0.577)	-1.978*** (0.487)	-1.681*** (0.540)	-1.599*** (0.561)	-1.398** (0.557)	-1.246** (0.628)	-1.318** (0.628)
Constant	60.542*** (8.927)	36.786*** (9.714)	22.608** (10.250)	25.745*** (9.203)	26.308*** (8.241)	28.069*** (9.009)	31.227*** (9.345)	33.027*** (9.312)	33.746*** (9.511)
AR-1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AR-2	0.692	0.505	0.504	0.454	0.494	0.501	0.507	0.500	0.490
Hansen	0.207	0.112	0.126	0.115	0.139	0.108	0.122	0.156	0.141
Sargan	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Instruments	61	240	85	114	140	163	183	200	214
Groups	545	545	545	545	545	545	545	545	545
GMM Type	A two-step system GMM								
Robustness	tasted	tasted	tasted	tasted	tasted	tasted	tasted	tasted	tasted

*Source: Author Calculation, 2022*

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

This model was tested using nine different compositions of instruments where all economic freedom indicators showed a negative effect on return on equity. In addition, factors such as financial regulations, bank-specific factors such as capital adequacy and bank size, and macroeconomic factors except for government integrity negatively influence return on equity. In this regard, we can conclude that the variables discussed in the above table are significant and valid to be analyzed.

### **GMM Result for all profitability Indicators**

An overall model of the impact of economic freedom and financial regulation is displayed in Table 9. The table incorporated all bank profitability indicators such as NIM, ROAA, and ROAE. The explanatory variables in this model have been classified in terms of economic, regulatory, bank-specific effect (control), macro-effects (control), and dummy effects such as IDS and global health crisis effect represented by the pandemic.

The models for all profitability indicators have passed all diagnosis tests of the system GMM model. Accordingly, the number of instruments is lower than the number of groups; AR (2) and the Hansen tests are higher than 0.05, while AR (1) is less than 0.05, which

makes instruments valid. In the following sub-parts of 4.2.2.1., 4.2.2.2., 4.2.2.3., 4.2.2.4., and 4.2.2.5, the effects are discussed using the GMM model based on the results presented in the following table 9.

Table 9 – System GMM Outputs on Bank Profitability

		Net Interest Margin		Return on Asset		Return on Equity	
		Coefficient	St. Err	Coefficient	St. Err	Coefficient	St. Err
<b>Lag Effect</b>	NIM <sub>t-1</sub>	0.842***	(0.059)				
	ROAA <sub>t-1</sub>			0.320***	(0.062)		
	ROAE <sub>t-1</sub>					0.404***	(0.087)
<b>Economic Freedom Effect</b>	Business			-0.014***	(0.006)	-0.081***	(0.030)
	Financial			-0.021***	(0.008)	-0.116***	(0.040)
	Monetary			-0.030**	(0.012)	-0.142**	(0.055)
	Trade					-0.094*	(0.057)
	Labour	0.012***	(0.004)				
	Investment	0.010**	(0.005)	0.020***	(0.006)	0.127***	(0.046)
	Overall	-0.039**	(0.017)	-0.038*	(0.021)	-0.255**	(0.126)
<b>Regulatory Effect</b>	Regulatory Quality	0.011*	(0.006)			0.082*	(0.050)
	Rule of Law	-0.013*	(0.006)	-0.021***	(0.007)	-0.125***	(0.046)
<b>Control Variables (Bank-specific and Macro-effect)</b>	Tax Burden					-0.209***	(0.060)
	Capital Adequacy	0.093***	(0.032)	0.121***	(0.046)	-0.115**	(0.048)
	Asset Quality	-0.017***	(0.007)	-0.063***	(0.011)	-0.207***	(0.068)
	Management Efficiency	0.010**	(0.005)	-0.027***	(0.006)	-0.209***	(0.032)
	Liquidity	-0.005***	(0.002)	-0.006*	(0.001)	-0.012*	(0.007)
	Bank Size	0.473**	(0.215)	0.593***	(0.210)	3.640**	(1.804)
	Inflation	0.024*	(0.013)	-0.029*	(0.016)		
	Interest Rate	0.006*	(0.003)	-0.013***	(0.005)	-0.133***	(0.041)
	Political Stability	-0.004*	(0.002)				
	Govt Integrity	-0.008*	(0.004)	0.013*	(0.007)	0.084**	(0.040)
<b>IBs and GHC effect</b>	Specialization ID	0.310***	(0.119)				
	Pandemic	-0.395***	(0.081)	-0.413***	(0.079)	-2.296***	(0.577)
	Constant	3.300*	(1.937)	6.008***	(1.673)	60.542***	(8.927)
	AR-1	0.000		0.001		0.000	
	AR-2	0.083		0.537		0.692	
	Hansen	0.109		0.110		0.207	
	Sargan	0.000		0.000		0.000	
	Instruments	40		61		61	
	Groups	545		545		545	
	GMM Type			A two-step system GMM			
	Robustness	tasted		tasted	tasted	tasted	

Source: Author Calculation, 2022

\*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

## The Lag Effect

In addition to variables and unobserved individual bank effects, the initial lag variable of profitability indicators is incorporated into the model for this investigation. Since the impacts of respective banks are inherently linked with the lagged dependent variable, using the typically static estimators may result in inconsistencies. Arellano & Bond (1991, 1995) developed a difference GMM estimator for such models. The first lagged dependent variable in the difference GMM model is instrumented with lagged exogenous variables in levels and lagging factors. The system estimator uses the lagged first differences of the series in the level equation. The system-GMM estimator corrects the difference estimator's bias and asymptotic imprecision (Blundell & Bond, 1998). The result from table 9 shows that all bank profitability indicators of OIC banks have a significant lag effect. Net interest margin has 84 percent persistency while return on asset and equity has 32% and 40% lag effect at 99% significance level. This trend indicates that all bank profitability indicators currently are highly affected by the previous year's performance. In this regard, the net interest margin is more highly influenced by its lag performance than the other two profitability indicators.

### **The Economic Freedom and Financial Regulation Effect**

Financial institutions which work in an environment that defends investors could earn more money (Sufian & Habibullah, 2011). Economic freedom is critical in establishing a climate that enables people to access and compete in markets, promotes innovation, and protects privately held property; consequently, they may achieve quicker economic development (Chortareas et al., 2013). However, the findings of this case study reveal that all economic freedom indicators, independent of profitability indicator type, negatively influence bank profitability. This finding is in line with the results of different studies (Sufian & Zulkhibri, 2015; Turgutlu, 2014), which found no significant influence of freedom on the profitability of financial institutions. According to the above table-9, results on economic freedom affect bank profitability, and most of the indicators have a negative effect on profitability. Business, financial, monetary, and trade freedom are found insignificant in the net interest margin, negatively impacting return on assets and equity with significant value. Overall economic freedom negatively and significantly affects NIM, ROAA, and ROAE, and the effect is high in the case of return on equity. On the other hand, investment freedom positively affected NIM, ROAA, and ROAE, while labor freedom had no significant impact on ROAA and ROAE. The labor effect is positive in the case of the net interest margin of banks operating in the OIC region.

The regulatory effect was represented by two indicators such as financial regulatory quality and the rule of law, also called institutional quality in the financial service industry.

In the literature review part, we argued that financial regulations (institutional quality) negatively affect bank profitability in the OIC region. Banks are likely to do better in nations where people have greater access to political and regulatory forums due to the positive correlation between financial regulation and bank profitability. Similarly, the government's efficacy directly affects bank profitability through quality policy design and the credibility of the government's commitment to such programs. The regulatory effect result shows mixed outcomes regarding its effect on profitability. For example, regulatory quality was found to affect two indicators of bank profitability positively and significantly except for the return on an asset opposite to our prediction. However, the effect is almost near zero, making the result insignificant. In this case, we better consider the rule of law as a better indicator of financial regulation. The country's rules also govern financial institutions.

However, some findings argue that solid financial regulations and government interference negatively impact bank profitability. In this regard, the rule of law in OIC banks' profitability shows a negative influence. Therefore, we can conclude that financial regulations have a negative effect on bank profitability. This finding is in line with our hypothesis and supported by other studies (Rocha et al., 2011; Haque and Brown, 2017).

### **The Control Variables Effect**

Furthermore, we have applied control variables in this study to check how bank-specific factors, such as bank size, and macro-variables, such as political stability, affect profitability. Furthermore, we have applied control variables in this study to check how bank-specific factors, such as bank size, and macro-variables, such as political stability, affect profitability. It is known as the CAMEL model, which excluded earning, the dependent variable in this study. Different works of literature discussed how these factors significantly determine bank profitability. In this study, capital adequacy has been found to affect NIM and ROAA while negatively affecting ROAE significantly. Its effect on the net interest margin is weak and closer to zero. Capital adequacy indicates the bank's efficiency in its cost management. Banks with high capital adequacy levels may earn higher assets and NIM returns. Simultaneously, as shown in Table 9, it lowers the value of the return on equity.

Furthermore, banks with lower deposits, higher capitalization, and greater liquidity are more successful. The empirical result in this study falsifies the argument that asset quality

and liquidity negatively affect all bank profitability indicators. On the other hand, management efficiency has a positive effect on the net interest margin, while it has a negative impact on other bank profitability indicators. Technically, it is predicted to affect bank size and profitability negatively. This is because the risk and cost of large banks affect the net income, affecting profitability. The study conducted by Haque & Brown (2017) found a significant and positive relationship between bank size and profitability. Our empirical study confirms their work, as displayed in table 9, where bank size significantly positively influences net interest margin, return on asset, and equity in the case of banks in the OIC region. Other macroeconomic variables such as tax burden, inflation, interest rate, political stability, and government integrity were also presented in table 9. The impact of such factors on bank profitability is significant in different countries and regions (Gasaymeh et al., 2022; Fratzcher et al. (2016).

The tax burden was found to affect only significantly negatively return on equity in the model, while political stability affects NIM. However, the impact is relatively close to zero, which weakens the effect, which might be due to the region's political stability at its best level. Conversely, inflation affects NIM positively and ROAA negatively, while it does not significantly impact ROAE. The other macroeconomic indicator (interest rate) significantly negatively affects ROAA and ROAE, while government integrity in the financial system supports banks' profitability in the region. These findings are supported by the results of different studies (Beltratti and Stultz, 2012; Bermpei et al., 2018; Daher and Saout, 2017). Generally, we can conclude that regardless of its direction of effect, both bank-specific and country-specific (macro-variables) significantly affect the profitability of banks operating in the OIC region.

### **The Dummy Effect: - Does the impact on profitability differ among Islamic Banks?**

The other important issue raised in this study is whether religion and the current global health crisis (covid-19) affect banks' profitability in OIC. To analyze this effect, we developed a dummy variable such as IDS and GHC. The IDS dummy represents the ID of specialization, Islamic or conventional. The GHC dummy described the current global health crisis called covid-19. In this part, we will discuss two issues regarding dummy variables. The first will examine whether the dummy variables (specialization and GHC) affect banks' profitability which is presented in table 9. The second part tests whether the effect of economic freedom and financial regulations on bank profitability differs among Islamic & conventional financial institutions, as illustrated in the following table-10.

Table 10 – System GMM Outputs IDS

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	RQ		FF		IF		OV	
	0	1	0	1	0	1	0	1
<b>NIM (P-Values)</b>	-	-	-	-	-	-	-	0.001
<b>Coefficient</b>	-	-	-	-	-	-	-	-0.063
<b>ROA (P-Values)</b>	-	0.027	-	0.02	-	0.006	-	0.03
<b>Coefficient</b>	-	.022	-	-0.014	-	.017	-	-0.044
<b>ROE (P-Values)</b>	-	-	-	0.041	-	0.01	-	0.039
<b>Coefficient</b>	-	-	-	-0.0851	-	.117	-	-0.269

Source: Author Calculation, 2022

Note: - 1 stands for Islamic banks, while 0 for conventional banks.

P-values less than 0.05 shows the validity of the hypothesis

Islamic banks have different natures and business structures than conventional banks. Islamic banks operate by the rule of shariah which makes them different from the rest of the world. In this regard, their profitability can differ from conventional banks. Hypothetically, traditional banks are predicted to

generate more profit than Islamic banks due to different factors.

The specialization result from the general GMM result model (table 9) reveals that the specialization of banks holds a strong and positive effect on NIM. At the same time, it lacks significance in the case of ROAA and ROAE. Therefore, Islamic financial institutions are generating 30% more profit rates in the form of net interest margins than conventional banks. The effect of the pandemic on bank profitability is arguably found to be negative by multiple studies (Xiazi and Shabir, 2022). The empirical research showed that the current pandemic significantly adversely affected bank profitability in OIC. The statistical evidence indicates that covid-19 has a 39.5% effect on NIM, 41% effect on ROAA, and more than 200 percent effect on ROE negatively. In this regard, we can conclude that the pandemic has adversely affected banks' profitability in the OIC region. This finding is supported by other research conducted in different locations (Katusiime, 2021; The World Bank, 2022; Bitar and Tarazi, 2022).

The second dummy issue is whether economic freedom and financial regulations' effect on bank profitability differs between Islamic and conventional banks. Table 10 presents which variable is significant in the case of Islamic banks. After running all variables, we only found regulatory quality, financial freedom, investment freedom, and overall economic freedom significant. This result indicates the effect of economic freedom and regulatory quality on Islamic financial institutions' profitability over conventional ones. The overall economic freedom's impact on Islamic banks' profitability is higher than conventional banks' profitability. This effect increases by 6% on NIM, 4% on ROAA, and 27% on ROAE. Financial freedom negatively affects Islamic bank profitability in the OIC region. This effect was applied only to ROAA (by 14%) and ROAE (by 8.5%), while it does not have a significant difference in the case of net interest margin. Investment freedom has a strong and more positive additional contribution to the profitability of Islamic banks than conventional banks. This positive contribution is applied in the case of regulatory quality for return on assets.

To summarize, economic freedom indicators such as financing and investment freedom alongside regulatory quality significantly differ in their effect on Islamic banks' profitability. These results are congruent with previous research on bank performance, such as Mateev and Bachvarov (2019), who asserted that institutional quality and bank-specific attributes affect bank profitability.

The profitability of Islamic banks seems to be driven mainly by regulatory consequences, which are more visible in government banks and institutions with considerable foreign ownership. Because Islamic banks follow Shariah principles, it is uncertain how much they resemble conventional banks in terms of their dependence on the government's ability to establish and implement reasonable rules and regulations that enable and promote banking sector expansion.

## V. CONCLUSIONS AND POLICY IMPLICATIONS

The study examines how different issues, such as financial (economic) freedom, as well as financial regulations, affect profitability based on countries from the OIC region. The research paper has incorporated around 1453 conventional and Islamic banks. This research demonstrates effective freedom in the financial world, and legal frameworks which support banks well and are friendly to banks may improve the business climate, which in turn affects how well banks do financially. The study has considered NIM, ROAA, and ROAE as dependent variables tested separately; likewise, economic freedom and financial regulation were the focus or independent variables. Furthermore, bank-specific performance indicators and some macroeconomic indicators of bank profitability are deemed to be control variables. The study employed the GMM model using data collected from 156 countries in the OIC from 2008-2020, and the result is summarized in the following table 11.

Table 11 – Summary of Results

<i>Variable</i>	<i>Hypothetical Effect</i> <i>NIM/ROA/ROE</i>	<i>Finding</i>	<i>Significance</i>	<i>Decision</i>
			<i>NIM/ROAA/ROAE</i>	<i>NIM/ROAA/ROAE</i>
<i>Business Freedom</i>	+/+	No/-	No/Sig/Sig	Reject/Reject /Reject
<i>Financial Freedom</i>	+/+	No/-	No/Sig/Sig	Reject/Reject /Reject
<i>Investment Freedom</i>	+/+	+/+	Sig/Sig/Sig	Accept/Accept/Accept
<i>Labor Freedom</i>	+/+	+/No/No	Sig/No/No	Accept/Reject /Reject
<i>Monetary Freedom</i>	+/+	No/-	No/Sig/Sig	Reject/Reject /Reject
<i>Trade Freedom</i>	+/+	No/No/-	No/No/Sig	Reject/Reject /Reject

<i>Overall, Freedom</i>	+/+	-/-	Sig/Sig/Sig	Reject/Reject /Reject
<i>Rule of Law</i>	-/-	-/-	Sig/Sig/Sig	Accept/Accept/Accept
<i>Regulation Quality</i>	-/-	+/No/+	Sig/No/Sig	Reject/Reject /Reject
<i>Capital Adequacy</i>	+/+	+/-	Sig/Sig/Sig	Accept/Accept/ Reject
<i>Asset Quality</i>	+/+	-/-	Sig/Sig/Sig	Reject/Reject /Reject
<i>Management Efficiency</i>	+/+	+/-	Sig/Sig/Sig	Accept/Reject /Reject
<i>Liquidity</i>	+/+	-/-	Sig/Sig/Sig	Reject/Reject /Reject
<i>Bank Size</i>	+/+	+/+	Sig/Sig/Sig	Accept/Accept/Accept
<i>Political Stability</i>	+/+	-/No/No	Sig/No/No	Reject/Reject /Reject
<i>Tax Burden</i>	-/+	No/No/-	No/No/Sig	Reject/Reject /Reject
<i>Government Integrity</i>	+/+	-/+	Sig/Sig/Sig	Reject/Accept/Accept
<i>Inflation</i>	-/-	+/-/No	Sig/Sig/No	Reject/Accept/Reject
<i>Interest Rate</i>	-/-	+/-	Sig/Sig/Sig	Reject/Accept/Accept
<i>Lag Effect</i>	Yes	Yes	Sig	Accept
<i>Dummy IDS</i>	Yes	Yes	Yes	Accept
<i>Dummy GHC</i>	-/-	-/-	Sig/Sig/Sig	Accept

*Note: symbol “+” indicates a positive relationship between the dependent variable and independent variable, and the “-” symbol expresses the negative relation between the dependent and independent variable and the Word. In addition, “No” represents that there is no significant relationship between the dependent variable and dependent variable, “/” symbol is used to differentiate the sequence of results as per profitability indicators such as NIM, ROAA, and ROAE, respectively.*

*Source: Author Compilation, 2022*

The result confirms that the impact of economic freedom was not identical or similar in the case of the three profitability indicators. Investment freedom was the only economic freedom variable in line with our hypothesis and identical across all three profitability indicators (NIM, ROAA, and ROAE), which was positive. It is acceptable that better investment freedom would help banks to finance more profitable ventures, making them more profitable. The overall freedom negatively affects profitability indicators.

Most economic freedom indicators showed a significant adverse effect on bank profitability, except for some. For example, trade, finance, monetary, and business freedom

do not significantly affect NIM, while they negatively impact the rest profitability indicators. Regarding the impact of financial regulations on bank profitability in the OIC region, the rule of law has negatively affected banks' profitability. This result is in line with our hypotheses and other findings conducted in the preceding periods. Surprisingly, regulatory quality does not significantly affect ROAA, while the rest of the profitability indicators were affected positively. However, as a rule, we can conclude that financial regulations and governance quality strongly influence bank profitability. Concerning bank-specific effects on profitability, we expected a positive association. However, the reality shows that most bank-specific factors adversely affect bank profitability except bank size for all indicators and capital adequacy for NIM and ROAA. The other surprising result found in this study is that the impact of political stability on ROAA and ROAE and the tax burden on NIM and ROAA were insignificant. At the same time, we expect negative or positive influences.

The impact of other control variables, such as government integrity, inflation, and interest rates, on bank profitability, was mixed across NIM, ROAA, and ROAE. The study found that all profitability indicators (NIM, ROAA, and ROAE) have a significant lag effect on their performance which made the data persistent and drove us to use dynamic panel data analysis techniques. Furthermore, the dummy variables such as specialization and global health crisis are found significant in their effect on profitability. In some circumstances, the influence of economic sovereignty and financial regulations on bank profitability differs from that of Islamic banks. Finally, the current global health crisis issue, Covid-19, has shown significant negative impact on their profitability performance in the region which was identical across all profitability indicators.

There are various directions that policymakers might go with the findings of this research. Managers of financial institutions need to look for methods to boost their institutions' capitalization and try new approaches to increase their non-interest income. In addition, they need to keep an eye on their banks' liquidity reserves as they transform customer deposits into revenue-generating assets. In addition, members from the OIC should review their financial policies to lower business costs, increase investment opportunities, and foster a more productive institutional setting underpinned by free market principles. Protecting and guaranteeing regional investments and being consistent with global norms are two of the most effective ways to boost trust and lessen the likelihood of disrupting the economic climate, respectively. Regarding the banking industry and the economy, governments must implement effective regulatory frameworks that promote competition and accelerate growth. To work together in the future, governments and banks must

establish research groups to explore, evaluate, and better manage the elements that might affect regional bank profitability.

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